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ABSTRACT

This book describes 119 award-winning projects from a program which established a national teachers' competition to select and disseminate superior teacher-planned and developed programs which use photography as an integral part of the K-12 school curriculum. All subject areas, grade levels, and states are represented in summaries of projects that were granted \$200 implementation awards after being selected by a National Education Association (NEA) review panel from entries submitted by each state NEA affiliate. Chosen from final reports of these programs submitted to the NEA, reports of six grand prize winners are first presented in their entirety. These reports and summaries of the other projects include project title; teacher; locale; subject; grades; a purpose and description of project; activities; materials, resources, and expenses; and outcomes and adaptation. Grand prize winners include programs in fourth grade language arts, secondary science, kindergarten reading readiness, and intermediate art, social studies, and geology. (LMM)

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CAMERAS IN THE CURRICULUM

An NEA/KODAK Program

A Challenge to
Teacher Creativity

Volume 1 1982/83

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Cameras in the Curriculum

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The National Review Panel 1982-1983

Teachers

Robert S. Bannister—Golden Ring Middle School
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Joseph B. Burnette—Washington Irving Intermediate
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Karen Darner—Taylor Elementary School, Arlington,
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Louise Fishbein—Claremont Elementary School,
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Kathy Lore—Hereford Junior/Senior High School,
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Kathryn Porter—Twinbrook Elementary School,
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Association for Supervision and Curriculum
Development, Nancy Olson
National Art Education Association, James Anderson,
John Lechner, Caroline Marshall
National Association of Elementary School Principals,
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National Council of Social Studies, Ronald Wheeler
National Council of Teachers of English,
David England, Patricia Hancock, Margot Racin,
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National Council of Teachers of Mathematics, Edward
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National Science Teachers' Association, Richard Gates

Cameras in the Curriculum

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Forward

In August 1982 the National Education Association and Eastman Kodak Company announced a joint NEA Kodak program which sought to promote more effective classroom instruction by the use of photography as an integral aspect of classroom curricula at all grade levels, K-12. This program provides an excellent example of the kind of cooperation that should exist between public education and the corporate world.

A year has passed and the program has been carried out. On the basis of the evidence thus far, we have every reason to believe that it has been a resounding success. Let the teachers speak for themselves.

- "Without a doubt, this has been the best approach I have ever used in my 24 years of experience teaching industrial arts."
- "The improvement in school/community relations was demonstrated by the fact that neighbors and friends, not just parents, made a point to visit the school in order to view the weekly showcases."
- "The beauty of the program is its adaptability to the environment of the child."
- "This program has been the most successful, exciting, and rewarding teaching experience we have had with trainable mentally-retarded students. On performance skills tests, the scores of most students, including the nonverbal, increased."
- "Various sociometric instruments also showed substantial movement by the children away from an isolated cast-off position toward a more positive place in the class hierarchy."
- "Many students volunteered their free hours, the silent spoke up, and the students prone to cutting class stayed on the scene."
- "Photography was the key that enabled us to unlock the interest of our students in integration, and their own personal family histories."
- "Even students who were weak in the basic academic areas were meeting success through this project."
- "The use of photography helped stimulate creativity, encouraged students to express how they felt, and was an important aid in their search for identity in their fast-changing world."

This program enabled teachers to tell their stories through program designs of their own, and provided them with opportunities to show the general public what they can do. We are glad that publication of their programs will give them the chance to share their successes with colleagues nationwide.

Support for this program will continue. We hope to make it possible to involve many more teachers in developing their own curriculum ideas—and to share them universally. We are proud of our partnership and enthusiastically support the kind of cooperation between business and education that makes possible new approaches to the improvement of education and the enhancement of learning experiences for students. Relationships such as that between Kodak and NEA hold considerable potential for strengthening educational systems all across the nation.

Acknowledgements

We wish first to express our sincere appreciation to the teachers, administrators, and community volunteers who participated in the "Cameras in the Curriculum" program—not just those who were awarded prizes or received implementation awards—but all those teachers who took the time to reach for new ways to improve instruction. We thank all who submitted proposals (even those who vigorously talked about it but decided to compete another time), all who worked with the project leaders and found ways to be supportive and to bend with the special requirements of the project, and all those photography pioneers who have spent years in building the right educational environment for this important kind of program.

We thank those state education association staff and teacher members who played such important roles in coordinating the state-level programs. Their efforts contributed significantly to the large number and wide geographic distribution of applications that were received.

The greater-Washington-area teacher association presidents and participating educational organizations sent us superb educational leaders to serve on the National Review Panel. They helped with the development of program policy and reviewed applications and final reports. We are very proud of both the nominators and the representatives whose outstanding work contributed so much to the success of this first project year.

Appreciation is extended to the many NEA staff members who provided us with essential expertise: Robert McClure, Francis Quinto, and Brice Verdier of Instruction and Professional Development; Sam Pizzigati, Nancy Harris, Penny Grayson, and Carl Luty of NEA-Communications; and Charles Lovett of the U.S. Department of Education.

Special thanks is due to Allen Schmieder of the U.S. Department of Education who consistently and generously shared his valuable time and inexhaustible store of educational wisdom.

Finally, we applaud Faye Ford who reflected the energy and high quality of our teacher contributors in accomplishing the monumental task of uniformly, yet creatively, editing all of the final reports in this volume.

Sharing Teacher Successes 1982-83

Introduction

Researchers agree that educators learn most of what they know about their profession while on the job. With the increasing demands made upon teachers by society's rapidly changing technological advances, it is more important than ever to promote a variety of ways for teacher-to-teacher communication about the best of what they have learned on the job. This volume is an important way to accomplish that goal.

Commitment to Education Excellence

The book is about classroom success. It describes how teachers are able to involve students actively in rich curricular experiences which also promote increased visual literacy and understanding, improve self-esteem and self-confidence, enhance peer relationships, increase motivation, develop independence, and foster creative thinking. It presents 119 case studies illustrating how teachers have voluntarily developed their own programs for using photography to assist in improving their teaching as well as in providing more exciting learning experiences for their students.

The outstanding examples contained in this publication, coming from every state in the nation, cover all grade levels and all subject areas. They illustrate an impressive array of classroom and community activities that have become typical in many American schools. While some of the projects were designed by expert teacher/photographers, the vast bulk of the ideas presented in this book were conceived, organized, and implemented by teachers who are not camera "pros." And even in those cases when outside professional photographers were involved, they were usually recruited from the local community and used in ways that can be duplicated anywhere. These teacher-developed models (that proved to be so highly popular with students, administrators, and parents) can easily be adapted and used in a broad range of classroom settings. There is something here for everyone!

Regardless of how you replicate the many instructional projects contained in this volume, we are confident you will agree that teachers across this nation are enthusiastically working to make our schools more effective. These teachers are ready to take both initiative and responsibility in curriculum development, and are leaving the children and youth of our nation in extremely capable and creative hands.

We are certain you will not only find use for the programs described herein, but you will also be stimulated to explore ways to communicate regularly with the rest of our profession regarding your own ideas—those that reflect commitment to educational excellence—about how to improve instruction and raise the quality of educational experiences for your students.

Program Overview

The 1982-83 National Education Association/Kodak program, administered by the National Foundation for the Improvement of Education (NFIE), was made possible by an education grant from Kodak of a quarter-million dollars. Called "Cameras in the Curriculum: A Challenge to Teacher Creativity," the program established a national teachers' competition to select and widely disseminate the best teacher-planned and developed programs which use photography as an integral part of the K-12 school curriculum.

The program involved teachers in a learning and sharing process, and not simply a contest or competition. It provided teachers with a means to create their own photography-related curriculum by encouraging, supporting, and reinforcing their efforts to plan, develop, field test, evaluate, and most importantly, share their innovative curriculum practices with colleagues everywhere.

A National Review Panel, comprised of teacher leaders and representatives from a cross section of national education organizations, worked with the NFIE and Kodak to develop specific criteria and rules for the competition, which were then distributed nationwide with the goal of reaching every school system.

The program announcement asked applicants to address five elements relating to the use of photography in their classrooms. Expected program outcomes were: resources that would be needed to implement the program—both human and physical; specific activities that would constitute the program; the potential of the program for replicability or adaptation in other schools; and plans for evaluating the program's degree of success. Interested teachers also were asked to specify the subject area and grade level to which their programs were targeted.

NEA's state affiliates screened their state's applications and submitted the five best entries to the NEA in Washington for judging. The National Review Panel then studied these outstanding proposals and chose the best 130 to receive \$200 implementation awards. These 130 winners carried out their projects over a four-month period and submitted final program reports to the NEA. These reports were carefully analyzed by the Review Panel, which selected the top six programs as grand-prize winners. Prizes of \$1,500, \$1,000, and \$500—one in each category for elementary and secondary levels—were awarded to the grand-prize winners. Recommendations were also made concerning how all of the good materials generated with the support of the "Cameras" program could be widely shared with educators across the nation. Reports on the six winning programs, as well as comprehensive summaries of all the other top programs, are contained in this volume.

Organization of the Volume

Reports of the grand-prize-winning programs are found in the first section of the book, essentially in their entirety, although the format was altered to improve readability.

The remaining implementation award programs are summarized, but every effort has been made to represent their contents accurately. To make reading, comparisons, and adaptations easier, a common format is used throughout. Names and schools of the teacher/developers, as well as the program emphases of each of the case studies, are provided.

Teacher readers will have their own subject matter interests. All program descriptions, therefore, with the exception of the top six, are arranged according to subject focus and grade level. A table of contents will facilitate easy location of particular topics.

We hope that you will read every page, not only to enjoy the solid and creative work of your colleagues, but to discover what we believe to be a great many new and excellent ways to use cameras in *your* curriculum.

Sonja J. Nixon
Project Director

A Challenge to Teacher Creativity

First Prize Winner, Kindergarten/Elementary School

Project Title:

Eye Shutter To Think

Teacher: Jack Lopez

Locale: Cirby Elementary School, Roseville,
California

Subject: Language Arts

Grade: 4

Purpose and Description of Project

Communicating what we think and do through clear, concise writing is a critical skill in today's fast-moving world, and it is just that skill—and all it entails—that elementary teacher Jack Lopez has helped develop in his 26 fourth graders through the use of photography. By teaching his students to use a camera and then incorporating their photographs into various activities in the language arts curriculum, he explains, he has been able to "focus the interests of students who might otherwise remain unmotivated. The mind has many doors leading in—photography is one of those doors."

The skills emphasized in this program include alphabetizing names, writing a summary, outlining, using reference materials, and writing poetry, among others. The activities used to help develop these skills were making a student directory, creating an historical time line, noting similarities and differences in related objects, writing poetry, and using English idioms in a playful manner.

Lopez feels that the program succeeds best if the teacher has already taught the skills that the activities were designed to reinforce and demonstrate. And he points out that the results have included not only language skill building, but also a sense of pride and accomplishment among the students. Specific skills, he says, can be measured by teacher-made or standard tests, but "I feel the most valid criterion of the success of this program is the change in student attitudes that it has brought about."

All that's needed to get started is a camera and lots of color film. "Refinements such as a tripod, a variety of lenses, and fancy mats for photographs are desirable," Lopez notes, "but inessential."

Activities

Lopez used student-taken photographs to dramatize and highlight five separate activities that were carried out in a step-by-step fashion.

1 Student Directory. The first step was to emphasize the importance of knowing and using last names in order to gather information about people from reference materials. Students first suggested sources

of information about well-known people and then were asked to alphabetize the names of all the students in the class.

Next Lopez discussed the idea of an illustrated student directory and explained that each student would be responsible for taking a picture of and writing a directory entry for his or her partner in the project. He also went over the use of his 35 mm camera and began right away to supervise the students in taking photos of their partners.

As a resource for writing the entries, each student wrote his or her name on a piece of paper and surrounded it with as many words and phrases each could think of that described himself or herself. Then the students found words and phrases that seemed to belong together and grouped them under appropriate headings. This exercise produced a rough but functional outline for each person's partner to use in writing the directory entry, which was transferred to an index card. After correction of spelling and writing, each entry was mounted with that student's photograph on tagboard and construction paper and arranged on a bulletin board headed "Student Directory."

2 Historical Time Line. This activity began with discussion of what it would be like to go back in a time machine and be someone else. Again in teams, the students selected an important historical character to learn about during the next week so that they could put together a period costume and photograph each other portraying their chosen character.

The students researched their subjects and wrote short biographies while also coming up with costumes and drawing scenes representing the time of the character. Then the corrected essays, photos of students in costume, and drawings were mounted on a large roll of yellow butcher paper. This became their historical time line.

3 Alike and Different. To get students thinking about more than surface impressions, Lopez asked them to list as many differences and similarities as possible between an old lady and a newborn baby. Then the students were grouped into teams of four or five and told to come back the next day with their choice of two objects that were both alike and different. The teams wrote their lists of likenesses and differences on large pieces of newsprint and began to photograph the objects they had brought. Examples included salt and pepper and apples and oranges. The lists were then transferred to regular paper. Because most teams had taken more than one picture of their objects, Lopez was able to mount similar photos back to back on tagboard, with the similarities displayed on one side and the differences on the other. The results were finished products that were hung like mobiles.

4 *Images* Poetry writing periods began with what Lopez calls "imagery gymnastics." This involved turning out the lights and having students close their eyes, relax, and picture objects, shapes, and colors in their minds' eye. Since everyone can do these "gymnastics," Lopez believes that it's a nonthreatening way to lead into poetry writing. The students had previously read and analyzed William Carlos Williams' poem *So Much Depends*, so the class discussion now turned to the interrelation of events and objects, which was to be the subject of their poems.

The students then went for walks in small groups in the field behind the school to look for something they could photograph and write a poem about. Their photographic subjects ranged from anthills to flowers to old crushed cans. By this time, says Lopez, the actual poetry writing was easy, with most students modeling their efforts on the Williams poem. The poems and photos were then mounted together and displayed at an open house. The pictures were so sharp, notes Lopez, that he had to post a notice declaring that the children had actually taken them.

5 *Eye Shutter To Think*. This activity focused on the use of idioms, and the class found it the most enjoyable of all the photo-based activities. After explaining what an idiom is and giving examples, he asked the students what would happen if people took such idioms literally. Drawing from what became an "avalanche of examples" from the students, the teacher then had them draw pictures of a literal interpretation of an expression such as, "You drive me up the wall." The activity continued the next day as the students came up with more and more ideas. The drawings were displayed on a large bulletin board. Finally, again pairing off, the students selected their favorite idioms and took photographs of each other to be cut out and incorporated in a drawing portraying the expression. Using jumbo prints to make the cutout job easier, the students thus became the stars of their final drawings. In "You Drive Me Bananas," for example, two of the students' photos were placed in a banana-shaped car rolling along the highway.

Materials, Resources, and Expenses

Lopez kept his photographic equipment to the bare minimum. The centerpiece was his "seven-year-old, fully manual, 35 mm camera with a so-called normal lens." He bought a tripod because he doesn't like to use flash and finds it difficult to take sharp pictures indoors while handholding a camera at the slow shutter speeds required by the medium-speed color film he used. He explains that he got by without "filters, reflectors, or other photographic paraphernalia simply because I didn't have any."

All the students' photos were taken on 36-exposure rolls of KODACOLOR II Film which was processed locally. Matting materials were generally obtained free from local print and frame shops. Spray glues for matting the pictures work well, the teacher notes, but they are expensive and rubber cement will serve.

Because he already had a camera, the cost of Lopez' project primarily amounted to buying film and having it processed, which he says can range from \$7 to \$12 for a 36-exposure roll depending on print size. Even without a camera, he could have bought one and carried out the whole program for less than \$250, he estimates.

The only other materials Lopez used were books and articles about photography and poetry that were acquired by the school librarian.

Outcomes and Adaptation

Lopez found that his program produced the expected outcomes in development of language skills by his students and some bonuses as well.

In the Student Directory and Historical Time Line activities, the students learned to outline, write concisely, and alphabetize, as well as to use encyclopedias, biographical dictionaries, and other reference works. Students who had previously demonstrated little interest in writing or in research got excited when those activities focused on their classmates or on dressing up like Vikings.

In the Alike and Different, Images, and Eye Shutter To Think projects, students developed the abilities to observe and discriminate and to express fine distinctions in words. Lopez believes that the photographs students took were especially critical in these activities because the pictures preserved particular moments in time and unique images so that the students could retrieve them repeatedly and gain inspiration for writing language. This comfort level was demonstrated in the increasingly natural conversations they were able to produce in their writings.

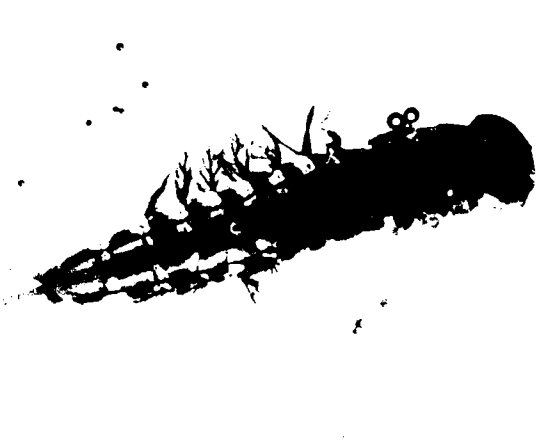
Among the unexpected outcomes, says Lopez, "was the sense of pride my class developed on account of the many school personnel who dropped by our room to admire the children's photographs and poems on display. Children whose lack of manual dexterity had never allowed them to produce winning drawings could now produce winning photographs." Another bonus, he found, "was the opportunity for ingenuity and resourcefulness that these activities provided."

The students not only started writing longer and more detailed compositions for class, but also turned their new skills to personal pursuits, Lopez reports, including using reference works to find out more about their own interests and writing for pleasure on their own time.

“Photography, simply by being a different medium, something a bit unfamiliar, can arouse and focus the interests of students,” declares Lopez, leading them to join in activities they might have considered boring or threatening. Being able to succeed in such a new endeavor also gives the students a feeling of achievement, he adds. In short, concludes Lopez, “photography is inextricably bound with what I feel is the overwhelming success of this program.”

Lopez also urges other teachers to incorporate photography in classroom activities, and stresses that the actual picture taking is quite simple and that his ideas can be adapted to virtually any area of interest.

And student testimonials from Lopez’ class also speak to both the success and the ease of introducing the camera into the classroom. As one said, “It was different from our regular language assignments, but I liked it better I especially liked the images that our class took. It’s easier for me to write poems now.” And, as another youngster put it, “You can take pictures of almost everything. The only way you can’t take a picture of something is if it runs away or if it flies away. Photography is the best thing I’ve ever done.”



First Prize Winner, Secondary School

Project Title

A Look at The Interrelationship Between a Pond and Its Drainage Basin Through Photographic Prints and Slides

Teacher Daniel L. Pokora

Locale Kenowa Hills Independent School District, Kent County, Michigan

Subject Fresh Water, Biology, Photography, and Environmental Science

Grades 10-12

Purpose and Description of Project

Helping students learn to look at their surroundings from differing perspectives and gain insights into interlinking chains of relations was the goal of this prize-winning project developed by secondary teacher Daniel L. Pokora. By using photographs taken from various perspectives—from a satellite's eye view, from a plane a few hundred feet up, from ground level, and through the lens of a microscope—students gained new understanding of the interdependence of all elements of the environment.

In studying the complexities of the ecological chain, Pokora led his students on a voyage of exploration focusing on a farm pond and its surrounding drainage basin. This area, while just a few minutes' walk from the high school, in seemingly familiar surroundings proved to be a source of exciting discoveries about the impact its varying inhabitants—from the tiniest microorganisms, to those most intrusive of creatures, people—have on each other. And rather than gaining just fleeting glimpses, the students were able to preserve their findings in both black-and-white photos and a color slide presentation.

The examination of the pond area was designed primarily for the benefit of Pokora's Limnology of the Great Lakes class and members of that class did most of the work. However, they received enthusiastic support from students in photography and environmental science classes.

The study covered both physical influences on the pond and basin such as topography, geology, soil, and climate, and living influences such as plant and animal life. Students gathered pond life with plankton nets and minnow seines, measured the temperature, oxygen content, and acid/alkaline balance of the water, and took soil profiles. By taking photographs, they were able to "freeze moments in time" from their living

laboratory as the pond and its conditions evolved. This not only contributed to students' understanding of the relationships among organic and inorganic elements of one small link in the larger environmental chain, but also allowed them to share their discoveries with each other.

Activities

Instructional methods used throughout the project included large group discussions, small group discussions, filmstrips, slide shows, lectures, reports and assignments, and field work. Specific activities included:

- Walk around the pond, development of individual lists of factors affecting the pond, and discussion of the lists. (Time: 2 hours)
- Viewing of filmstrip on site and area mapping and discussion, study of topographical maps of school and pond area. (Time: 2 hours)
- Drawing of individual student maps of the pond. Marking off a square around the pond with stakes placed every 100 feet took three class periods, and the actual mapping was then done during a full school day set aside with special permission from the superintendent.
- Studying communities and their structures, food chains, and food webs, with special emphasis on the types of food chains and energy that flow through a system. (Time: One week of classes)
- Sampling of physical factors and organisms in the study area. Students were divided into four groups each time they sampled, with group activities rotating so that all students could experience different assignments. For example, Group One collected data on air temperature, water temperature, relative humidity, oxygen, pH, and weather. Group Two collected plankton. Group Three collected bottom organisms. Group Four used a minnow seine to collect organisms living in the water. Students were then asked to identify the organisms they collected, discuss what the organisms ate, and construct a food chain and energy flow. This was done on the basis of an earlier study of organisms from a reference collection.
- Photographing the pond site and plankton found in the pond, with photos and slides displayed on bulletin boards and shown in class. (Photos were taken during after-school hours once or twice a week.)

- Papers on any fresh-water organisms, were found, which interested the students. Students used six class periods for library investigation and their own time to gather additional information for these papers. Information that was gathered on feeding habits of the organisms later contributed to construction of a food chain based on further sampling.
- Aerial photographs of the pond taken from a commercial plane. This was done on a Saturday, but cost and time constraints limited participation to four students.
- Creation of a slide presentation. Students examined all the slides they had taken, chose the ones with the best photographic composition, decided on the information the presentation should cover, and wrote an accompanying script. About 20 hours after school and in the evenings were devoted to writing the script. The show was presented to the Kenowa Hills School Board, selected junior and senior high school classes, and the owner of the pond.

Materials, Resources, and Expenses

Pokora made extensive use of human resources and materials at the local, county, and state levels, most of them free of charge. His success in gaining such broad cooperation was perhaps in part due to the fact that he initially discussed the project with area newspapers and gained coverage that not only stimulated student interest but also brought the study to public attention.

He obtained aerial photos of various views of the area studied, including satellite photos from meteorologists at a nearby television station and other aerial shots from the property description and mapping department of the county and from the Michigan Department of Land Resource Program. The TV station also provided local and national weather data, including temperature and precipitation records, and the State Department of Natural Resources provided topographical maps. Soil maps came from the Soil Conservation District Office which also provided assistance in reading both soil and topographical maps.

When the students turned to their own mapping, equipment such as compasses and tripods and mapping tips were provided by the Grand Valley State College Geology Department. Other advice and assistance came from sources as diverse as a local photo store which provided information about the use of tungsten film in microphotography; other teachers at Kenowa Hills High who helped arrange for the students' airplane flight, prepared titles for the slide show, recorded the script, and helped with mapping the

pond; area college faculty who assisted in identifying plant and animal life; and the owner of the pond who gave permission to do the study and shared information about the pond's history and origin.

Photographic equipment required included camera, microscope adapters, and camera adapters, KODAK EKTACHROME Film (Daylight and Tungsten), photographic paper, black-and-white photo developing chemicals, black-and-white photo developing equipment, a darkroom (which doubled as the book storage room), and a projector and screen for showing slides.

Other requirements for the study included dissolved oxygen testing materials, a secchi disk for measuring light penetration, a minnow seine, dip nets, pH meter and pH paper, plankton nets, buckets and jars, graph paper, forceps, a burette for titration, and iodine. Students also had use of a boat for sample gathering and water testing.

Pokora estimates the total cost of the entire project came to less than \$590. His breakdown shows: maps \$5, film \$145, microscope and camera adapters \$87, film development \$75, airplane flight \$55, photographic paper \$20, mounting of prints \$75, duplication of slides \$87.74, use of studio light, black-and-white photo developing materials \$0. Funding came from the NEA/Kodak program and the school district. Other resources such as an extensive bibliography in biology and ecology and a Kodak slide program about picture taking used in the photography class did not involve special expense.

The teacher points out that he has been told by experts that the slide presentation alone would have cost about \$2,500 if done by outside professionals. His costs were greatly reduced by having access to the facilities of the Kent Intermediate School District's audiovisual department and the volunteer talent of his own faculty members. However, he notes that costs could have been reduced even further if his group had done their own slide development.

Outcomes and Adaptation

Pokora believes that the most important overall outcome of this project is that his students learned that all aspects of a given environment are interrelated and each aspect must be studied and considered in order to fully understand the whole. Further, he notes, they "learned that a given area can take on different perspectives based on the manner in which it is viewed" and that "environments must be viewed as total units of a much larger environment and not just as small units that exist in isolation."

In developing this broad understanding, however, the students also gained an enormous range of new experiences and knowledge. They found that by photographing conditions at a particular moment, they can compare their findings with other records of other times and differing conditions. They learned specific photographic techniques through hands-on trial and error. For example, Pokora says, the students learned how to take pictures through a microscope and found out that daylight film does not work as well as tungsten film because of the tungsten light from the microscope which produces a yellow cast to daylight film.

Students also had to work out the problems they encountered in using other types of camera lenses, and to apply photographic composition techniques in putting together their slide show.

Central to the project, of course, was the students' examination of the interrelationship between the pond and its drainage basin and their discoveries about how physical and living forces interact. They used sampling equipment such as minnow seines and plankton nets, learned about common pond species, and traced food chains. They learned to use mapping equipment which also involved applying trigonometry principles. They learned to relate the contours of topographical maps and aerial photos to the nearer reality of what they saw up close and even to the microscopic world that must be magnified many times to be seen at all.

A perhaps immeasurable, but critical, outcome was the creation of wonder among the students as their eyes were opened to new perspectives. Looking at topographical maps, Pokora says, "the students were excited to see the contour of the land around their homes." And "excitement was evident on students' faces when they viewed their microscopic pictures," he adds, just as their satisfaction was evident when they presented their slide show to various groups. Also, Pokora says, the students invested more than 100 hours of their own time in the project and "their self-esteem showed a marked improvement," as demonstrated in their attitudes both at school and at home.

These students have also created a continuing resource for other classes and other classes in the district, Pokora points out. "The data can be used as baseline data to compare the succession of the pond as it changes through time," he explains. "In my invertebrate class, I will be discussing arthropods very soon, and therefore, can use the slide presentation to help students learn common species. Next year I will use it in my biology class and will make it available to other teachers in the school." And, he concludes, not just the substance of what the students found but their demonstration of techniques will be valuable.

"The concept of a drainage basin exists for any area—a school, a parking lot, a field, a park—and so most of the project could be duplicated in any area," says Pokora. "Instead of the microscopic life in the pond, the microscopic life of the soil could be examined. All physical factors can be studied for an area—topography, soil, climate, pH, etc. With today's emphasis on ground water contamination and toxic waste, use of herbicides and fertilizers, even the lawn of a school and its drainage basin could be investigated," as students in their project concluded in their slide presentation, "Nature . . . Motion . . . Change. Biological and physical forces of life. What do you see in the environment around you?"



Two little bears
went to the park to
play on the monkey
bars.



Then seven little
bears were left
at home.



Under chairs



Bears, bears,
bears, bears,
bears.

Jamie, Jamie,

what do
you
see?



I see everybody looking
at me!



Second Prize Winner, Kindergarten/Elementary School

Project Title

Learning to Read For Meaning

Teacher Sheryl Walquist

Locale Maple Grove School, Metropolis, Illinois

Subject Reading Readiness

Grade Kindergarten

Purpose and Description of Project

The first step in getting children ready for reading is to get across the idea that there is meaning lurking in those funny squiggles we call print, and that is what this project was designed to accomplish. Walquist used photographs of the children in her two kindergarten classes to dramatize what printed words were meant to convey and to thereby make print an exciting new world the youngsters were eager to explore. In conjunction with the photos, she used print in ways so predictable that the children were able to read it almost without realizing it.

Using pictures of the kindergarteners, teacher and students made their own large-print versions of three books all relating to bears. Because of the related subject matter, the use of pictures of familiar faces, the fact that the children also acted out the stories, and the repetitious and/or rhyming captions, explains Walquist, the books were so predictable that they became instantly readable.

Complementary activities carried out during the project were a classroom display asking students to "match our names with our pictures," student-made autobiographies, a "Workers in Our School" bulletin board, a "Where is Everybody?" bulletin board using pictures of the children to illustrate basic relationships, words, a scrapbook about their visit to a dairy farm, sequenced photos of the school's National Library Week balloon launch, and a display of photos taken throughout the year and attached to the appropriate month of the classroom calendar.

Walquist reports that nearly every student progressed in understanding of print, according to a book-handling knowledge inventory and/or writing samples, and that "the project inspired enthusiastic kindergarten interest in reading." She believes that using photography is "a perfect way to make print so meaningful and interesting that the children want to read it and so predictable that they find they can read it."

Activities

Walquist implemented nine photography-related activities with her students over a three-month period.

1 Making Our Own Version of Favorite Books. The children donned bear ears and noses made of construction paper and were photographed dramatizing *Bears* by Ruth Krauss (morning class) and *Ten Little Bears* by Mike Ruwe (which grew to 16 bears to accommodate the afternoon class). The students' version of the books used their own pictures and print large enough to be seen from the back of the reading group. The kindergarteners read both books frequently in class, both with the teacher and by themselves. To emphasize that the meaning is in the print, to develop concepts of top-to-bottom and left-to-right directionality, and to keep the place for the children, Walquist moved her finger along the print as the words were read, pausing to let the children complete sentences or fill in key words.

2 Autobiographies. Using a few minutes per day over a three-week period, an autobiographical book was made for each child. Each student's photo went on the first page, with a caption saying "My Name is _____." The children then made drawings to illustrate pages about their age, home, parents, and other relatives, and things they like to do as the teacher wrote down the information they provided. Once the books were typed and bound and the illustrations glued in, the children printed titles for the covers saying "My Book About Me by _____." The teacher then read each of the books to the class and to the individual students involved while pointing to the print and leaving out key words.

3 The Match Game. Individual photos of the children were mounted on posters with pockets to hold cards with the name of each child. The children worked individually and in groups to match names with pictures and also used the display for their own purposes—to spell names when they wanted to pass notes, to put notes in the correct mailboxes, and to pass out workbooks.

4 What Do You See? Walquist adapted another book about bears—*Brown Bear, Brown Bear, What Do You See?*—in two ways. First, she and the children made a book for each class substituting the children's photos and names for "brown bear," and then a book on the same pattern using pictures of animals cut from magazines in conjunction with the children's photos. Because the questions and answers that the children needed to enjoy the book were repetitious, they did not really need to understand the print. However, Walquist felt that "knowing what was there and having it confirmed on every page would help them transfer their learning to other material."

5 *Where Is Everybody?* The focus here was a bulletin board using photos of the kindergarteners in arrangements that illustrated such relationship words as top, middle, bottom, first, next, last, inside, outside, little, big, right, beside, between, in front of, behind, on, under, up, and down. The relationship words were highlighted in color in the captions, and after the board was taken down, the pictures and captions were bound together to make a book.

6 *Workers in Our School.* This bulletin board featured photographs of the school, the superintendent, secretary, teachers, aides, volunteers, bus drivers, custodians, and students, with captions listing their various jobs in large print.

7 *Our Visit to the Dairy Farm:* This is the title of a scrapbook based on the kindergarten classes' trip to the Walquist family farm, where the teacher's seventh-grade son photographed the children during such activities as milking a cow, petting calves, feeding the cows, looking in the milk tank, and having milk and cookies. Subsequently, the children drew pictures of their experiences and looked at the photographs while the teacher taped their comments for use as captions in the scrapbook.

8 *Sequencing.* Photographs were taken to illustrate various phases of the action during the National Library Week balloon launch in which the entire school participated. To show steps represented by the words first, next, and last, photos showed the children tying their cards to their balloons and then standing outside with them, the balloons just after they were released, and finally, the balloons high in the sky. The children studied the photos, deciding what was happening in each and which happened first and why. The result was a sequential display on flannel board of the appropriate photos and captions (both of which had sandpaper glued to the back).

9 *The Year in Retrospect.* Teacher and students read in class the books *Chicken Soup with Rice: A Book of Months* and *The Ox-Cart Man*. They discussed the changes in the trees and the changes in weather that occur during the year as well as the times that special days are observed. The classroom calendar on which they had been marking off days and noting special events was then cut apart and mounted along the back wall of the classroom. Then the children looked at photographs that had been taken all year—of events celebrating such days as Halloween and Christmas and of the classes outdoors—and discussed which month matched which picture and why. The photos were then attached to the proper calendar page.

Materials, Resources, and Expenses

Human resources included parents who helped make covers for and type the children's autobiographies, helped in class during the pre- and posttests, and went along on the field trip; virtually an entire school staff, who posed for pictures; and Walquist's whole family who showed the children around the dairy farm.

Photographic equipment included the teacher's 35mm Canon AE-1 camera and about ten rolls of 24-exposure color film. Other materials used were two quarts of rubber cement, 200 sheets of 14 x 8 1/2-inch white typing paper, a scrapbook, 80 sheets of 12 x 18-inch construction paper, a roll of one-inch masking tape, four large sheets of heavy tagboard, three felt tip markers, two felt tip pens, a yard of fabric, and a wallpaper sample book (for book coverings), 36 old file folders, and a borrowed typewriter.

Walquist estimates the cost of the project at about \$100 for film and developing and \$32 for other supplies.

Outcomes and Adaptation

By using a whole range of activities involving the children's photographs and accompanying print, Walquist kept her project flexible enough to appeal to children at various stages of understanding and to build on whatever concepts of reading and writing they already possessed.

To measure progress, she used an informal evaluation of book handling knowledge adapted from Marie Clay's *Sand* test at the beginning and end of the project. Throughout the project, the children were also periodically given the opportunity to write what they wanted and the samples were collected.

Walquist explains that the book handling knowledge inventory "indicates whether a child understands that print (rather than pictures) communicates meaning and whether he or she understands concepts such as letters, words, top-to-bottom, and left-to-right directionality." She adds that writing samples "also indicate what concepts and insights he or she has about written language"

As examples of the children's progress, Walquist notes that at the beginning of the project only one child could read any of the print in the inventory, compared with nine being able to read some of the print when retested. Also, at the beginning several students indicated that books held only pictures. By the end, all but one child realized that books also contain words.

Other improvements include comprehension of authorship and directionality; the concepts of beginning, middle, and end; the difference between one and two words; and the correct place on a page to start reading. Some of the children also progressed from being able to write only single words to composing complete thoughts.

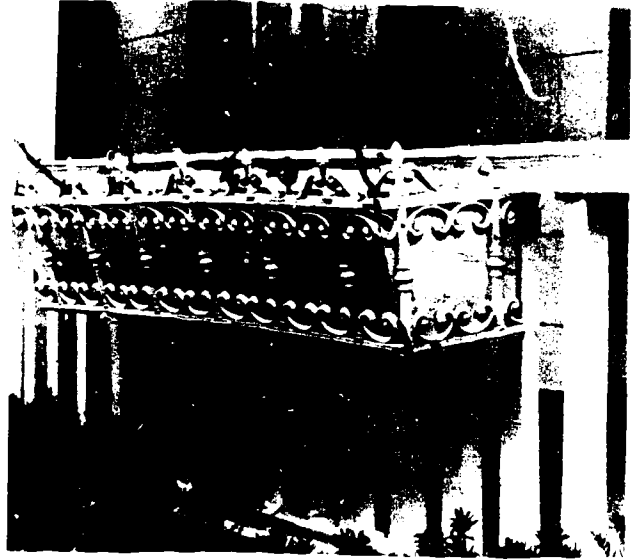
According to Walquist's evaluations and observations, the most successful aspects of the project involved the books that she and the children made. The sequencing activity (involving balloon launch photos) she found to be too easy for most of the children, while the calendar exercise—although a good orientation—had minimal reading value because the youngsters were not yet fully familiar with the names of the months or their order.

The picture name match game, the teacher says, was not only fun but challenged the children to distinguish between similar names. She feels that kindergarteners are so enthusiastic about reading and writing their own and each other's names, and doing so contributes so much to their understanding about language, that their names and photographs should be a standard kindergarten classroom display.

In general, assesses Walquist, her project challenged students to do what they had not done before while not pushing them faster than they felt capable of moving. She believes that the children will enter first grade feeling that reading is fun and meaningful and important to them and something they can do and want to do. The kindergarteners will go into first grade expecting reading to make sense.

Walquist also points out that any activity in her project can be adapted to any kindergarten class and that none of the activities depends on any other or necessarily precedes any other, so any part of the program can be used. If teachers want to use the whole package, she recommends that it would be more practical to spread it over an entire year due to the considerable time involved.

The activities are also adaptable to any classroom organization, according to Walquist. "We used the activities as a whole class, in rotating groups, and individually as, for example, when the books were put on a reading table where students could use them when they finished other work," she states. The basic concepts can also be carried out in differing formats, she explains, noting that the "Where is Everybody?" bulletin board turned out to be even more successful when remade into a book.



Second Prize Winner, Secondary School

Project Title:

Look Before It's Too Late— A Photographic Study of Your Town's Architectural Heritage and Alternative Plans for Tomorrow's Community

Teacher: Mary Purcell

Locale: Ocean City Intermediate School, Ocean City,
New Jersey

Subject: Art

Grades: 6-8

Purpose and Description of Project

This program focuses on the need to develop students' visual literacy and increase their awareness and understanding of the architectural history of their city. In achieving these goals, says Purcell, "my students and I discovered that photography was an invaluable educational tool for investigating, exploring, observing, and recording their city's architecture."

Before embarking on their architectural expedition, Purcell's students learned to operate both an instant and a 35 mm camera, and were instructed in basic photographic techniques and composition. They then turned their new-found skills to producing photographs and slides to establish a visual resource album for interpreting the architectural development of the city. They also designed a photographic architectural time-line chart and marked the location of each building photographed on a map provided by the city.

To generate community and school participation in the selection of buildings to be photographed, the students passed out suggestion forms, set up a building-shaped mail box in the school lobby to receive completed forms, and stimulated coverage of their project in the local newspaper. They also gathered information about architecture, city planning, photography, and research skills from experts in these fields and developed a detailed data sheet to record the information they garnered from their photographs.

Then, building on the knowledge they had gained through photographic study, research, and personal discoveries, Purcell's students formulated alternative proposals for future city development and preservation and presented these proposals to the city planning board.

Purcell assessed her students' awareness of the city's architecture by having them view the slides they had taken and identify styles on a response sheet. The proposals for future development were critiqued and rated by both teacher and students according to the students' understanding of the environment problem-solving process.

Activities

The activities described here were carried out by sixth through eighth graders in regular art classes and seventh and eighth graders belonging to the school's photo club.

- Students were instructed in basic camera operation, handling, and care, as well as in photographic composition through the use of a filmstrip and demonstrations. They were then assigned buildings in their neighborhoods to photograph.
- When the resulting photos were examined, the students' camera handling and composition skills were evaluated, and they began to discuss the similarities and differences of the houses they had shot. The photos were labeled and placed in an album according to location—north, south, or central. Slides were labeled and numbered and entered on a master list. These exercises continued throughout the project.
- Students suggested ways to involve the entire school and the community in their project. They decided to distribute forms in homerooms and school mailboxes, soliciting suggestions about buildings that were unique, especially attractive, or considered worthy of preservation. An architecture mailbox was set up in the school entrance hall. Students also sent some of their photos to the local newspaper, which resulted in a front-page article, and designed a display for the school's main entrance showcase.
- A large map was obtained from the city so that students could both record the locations of buildings as they were photographed and find the new candidates for pictures requested on the suggestion forms that had been returned. Students also analyzed the map to seek out unexplored areas of the city and to determine whether clusters revealed historical significance that called for further investigation. The map was coordinated with the albums and slide file.
- To aid in identification of local architectural phenomena, students researched various styles in the city historical library and the school media center. Using books, filmstrips, slides, photo albums, and classroom visits by an architect and the city's environmental planner, students discovered correlations, acquired a specialized vocabulary, and cultivated an appreciation for their "built environment."

- As the project evolved, students created an architectural time-line chart to illustrate the city's architectural growth from the first recorded building through today. Students' own photos of existing structures were used and supplemented from other sources by photo copies of pictures of structures no longer standing.
- Through analysis of their photographic albums, map, chart, and knowledge accumulated from research and professional input, the students culminated the project by formulating ideas for future development of the city and presented their proposals to the city planning board.

Materials, Resources, and Expenses

Human resources contributing to the success of Purcell's project ranged from the school staff who handed out photo suggestion forms to consultants from the community who shared their knowledge and expertise with the students. An architect brought plans and photographs of a house he had designed and explained how site, client, economics, and zoning laws influenced design. The city environmental planner discussed the new city zoning map and his role as adviser to the city on environmental relations.

Both the school librarian and the librarian of the Cultural and Historical Museum provided materials and assistance with research and identification of building styles. Both also helped promote Purcell's project. A bulletin board in the school media center was reserved for display of the students' photographs so that the progress of the project could be shared with the entire school, and the museum exhibited photos and project materials for two weeks to expand that sharing to the overall community.

A local camera store provided free photo albums and free loan of wide-angle and telephoto lenses for use with the school's cameras—all of which were inadvertent blessings since Purcell had gone to the store simply to buy film and happened to mention the project. Similarly, the photographic studio provided albums of historical photographs that helped give students a perspective on the city's past and helped them locate "unique surviving treasures." The studio's senior photographer also advised students on photographing architecture and critiqued some of their shots.

Physical materials and equipment required for the project were three photo albums, one 35 mm SLR shutter-speed priority automatic camera with manual override, 90 mm-230 mm auto zoom telephoto lens, 28 mm-50 mm wide-angle zoom lens, four 35 mm automatic fixed-lens cameras, one instant camera, 10 units of 35 mm slide film (KODACHROME 64 Film,

36 exposure), 10 PK36 prepaid processing mailers for 36-exposure slide film, 10 packages of instant film (10 exposure), one bulk film loader, one enlarger and lens for printing 35 mm film, four developing trays for 8 x 10-inch prints, one developing tank with five-reef capacity for 35 mm, one thermometer and mixing rod, three photographic beakers, one black bag, and four sheets 24 x 36-inch bristol tagboard.

Purcell notes that the school photo club had the 35 mm cameras and developing and enlarging equipment, the two lenses were borrowed, and the instant camera was hers. So costs were essentially limited to purchase of film and processing of slide film. Many students or parents had their own cameras, she adds, and if they did not have access to a camera, the students were assigned one on a rotating basis.

Outcomes and Adaptation

Purcell's program focuses on developing visual literacy and expanding awareness of architectural developments. The title *Look Before It's Too Late* is especially applicable, she explains, because a new industry has dramatically changed the demographics and economy of the city and what she calls "condo-mania fever" is rapidly altering the structural environment.

Her students used the camera as an investigative and recording tool. They "were not initially thrilled about photographing architecture," Purcell acknowledges, but once they had mastered the simple technology, their photos "inspired them to continue without teacher motivation." She points out that their learning behavior shifted from feeling they had to find assignments to eagerly looking for new aspects for the project.

A major factor in helping the students recognize design elements in various architectural forms, she notes, was the capability of viewing the large images projected by slides. Examining photographs strengthened the students' observational skills, while research helped them understand the interrelationships among housing, economics, politics, and land use.

For her photo-club members, Purcell found that the project was a tremendous help in demonstrating the "unique expressive qualities of black-and-white photography" so that the students actually came to prefer it to color because of "the richness of detail and texture revealed in the black-and-white enlargements."

When the students were asked to identify architectural styles from slides of buildings they had photographed, Purcell found that they could correctly label 80 percent of the slides. The students' proposals for the future and preservation were judged on comprehension of the environmental problem-solving process (i.e., awareness, observation, information

gathering, analysis, selection of alternatives, and action). Overall, she says, they came up with creative ideas and all understood the dynamics of the process.

Another measure of the success of the program is that it is not really over. Next year the students plan to continue photographing, recording, and adding to the map and chart. Teachers from various disciplines will be brought in to help with documentation, the suggestion box will be used again, and suggestions will be drawn from additional community sources. More public support and participation will be sought through publicizing the program further. Purcell hopes that the photo album and slide file will not only grow but also be duplicated for use in the local museum and public library.

Purcell also stresses that this project is "highly adaptable to a variety of classroom uses in part or in its entirety." For example, fourth and fifth graders at her school are going to use the growing compilation of visual aids that the project has produced to study Ocean City history, and Purcell's art students have been inspired to build mobiles based on the styles illustrated.

The project can be replicated by teachers of grades 6-12 with little change in activities, she advises, and can be used in a multidisciplinary approach with several teachers participating or by one teacher in a self-contained classroom. Further, individual activities such as the architectural time-line chart can be used as class projects.

Purcell suggests the following subject-area applications for the program:

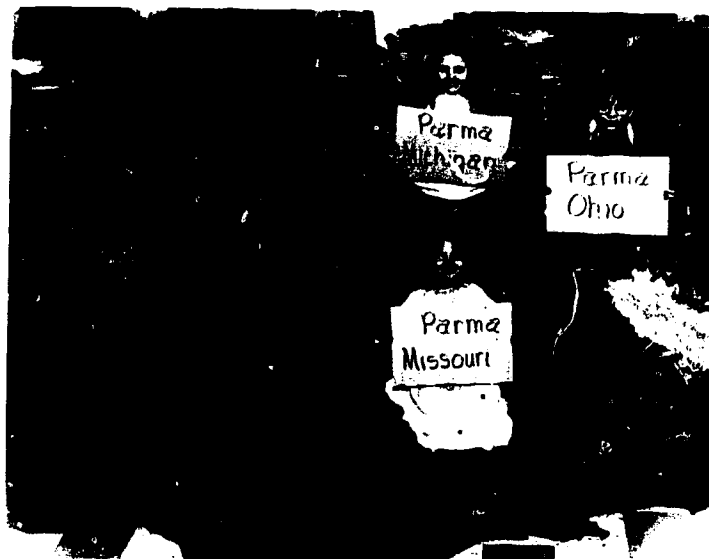
- *History*—study of historic origins of building designs and methods of historic documentation
- *Career Education*—learning about the jobs of an architect, building contractor, craftsman, and city planning engineer
- *Math*—discovering geometric shapes found in building structures, creating shapes and angles using basic geometric hypotheses
- *Science*—studying the environmental impact of a proposed building site
- *English*—writing articles for the local newspaper highlighting unique architectural structures



Here is Angela thinking about an answer on a mind bender.



Some of the ALP class went on a little field trip to Edwards Photography Store to get supplies.



A view from Parma in words and pictures.

Third Prize Winner, Kindergarten/Elementary School

Project Title:

A View From Parma in Words and Pictures

Teacher: Elsie L. McCalley

Locale: Thoreau Park Elementary School, Parma, Ohio

Subject: Social Studies

Grades: 4-6 (Able Learning Program)

Purpose and Description of Project

This project involving fourth, fifth, and sixth graders focuses on increasing students' awareness of and information about themselves and their families, school, and community. Photography played a basic role in all the activities comprising the project, according to Elsie McCalley, and students were exposed to a wide range of photographic experiences—from the functions of the camera to the use of a darkroom.

Activities centered around four major products: Individual student posters with a photograph and brief rundown about the students; a photo essay by each student about his or her family including captions; and two books, one on the school, and one on the community. These were produced by the entire group of 20 students. The books combined photographs taken on several field trips with informative essays.

The most exciting aspect of the project, according to McCalley, was the opportunity students had to share their materials with a sister school in Parma, Michigan. They also received information about the Parma (Michigan) Elementary School fifth grade, and the relationship became so close and enthusiastic that a two-day visit to Ohio was arranged for the Michigan students.

According to McCalley, pre- and posttests demonstrated that students gained a significant amount of knowledge about their school and community as well as increasing their knowledge about their families and gaining completely new information about their sister school and community in Michigan.

McCalley's project was carried out over a period of 12 weeks with the 20 students from the fourth, fifth, and sixth grades who participated in her Able Learning Program (ALP) class. She worked with the students three times a week with some on Monday, the rest on Friday, and all of them on Wednesday. The ALP involves numerous special activities designed to encourage creativity and to develop problem-solving strategies and thinking skills.

Activities

An initial step in the project was correspondence with the directors of supervision and curriculum development in the three other Parma school systems in the country (Idaho, Missouri, and Michigan). The letters described McCalley's project and her NEA/Kodak award and requested assistance in pairing her ALP class with a fifth-grade class in one of the districts. While awaiting replies, the students designed a bulletin board showing the locations of all the Parmas, and McCalley requested aid from the school's career education office in securing relevant materials, equipment, and speakers.

At this point, the principal of Parma Elementary in Michigan called to say that fifth-grade teacher Karen Crosthwaite and her students would participate in the project. Now all was ready for the project itself to commence. Activities included the following:

- Students were given a preactivity survey covering their interests and their knowledge of family, school, community, and photography. The Michigan class was given an identical survey, and results were later exchanged.
- A professional photographer instructed the children in techniques for taking good pictures. They practiced holding the camera steady, setting up a shot, framing the picture, and shooting. A question-and-answer session completed the presentation.
- The students prepared posters to introduce themselves to their sister class, beginning with a class discussion about various poster styles and the setting of criteria for the finished products. Using negatives from an earlier project to save time, the students printed and mounted their photos and completed the posters with headlines and brief listings of information about themselves. Three of the more creative formats, notes McCalley, were an "Eye-Dent" card, a "Driver's License," and a "Hospital Chart."
- The next class speaker was a photojournalist from the local paper who used samples of his work to illustrate his remarks. He explained and demonstrated how to tell a story by using an overall photo, several medium shots, and a close-up. He discussed possible photo subjects to represent Parma and answered students' questions.

- Students next created formats for using six pictures with captions of two to five sentences for each picture to describe their families. Students reviewed photojournalist techniques for telling a story with pictures and submitted outlines before actually taking pictures. They created newspapers, magazines, pamphlets, and brochures to tell their family stories, and this part of the project took more than three weeks because cameras had to be shared.
- While working on the family activity, students also brainstormed to develop their own conception of their sister city in Michigan. After they had come up with answers to how their lives would be different if their families moved to the other Parma, McCalley shared the Michigan surveys with the students so that they could compare their speculations to the survey information.
- At this juncture, word came from Michigan that the students from that state's Parma would visit Ohio for two days if housing and meals could be arranged. Because of the tightened planning time requirements, McCalley and her students had to begin work simultaneously on developing the school and community photo essay-books. They selected the areas of the school they wanted to cover, were given a tour by the custodian, and completed photos and interviews over four Mondays and Fridays.
- At the same time, the students developed ideas for photos about the city and broke into groups of four or five to go on field trips. One trip involved an interview with Mayor John Petruska in his office, while others covered the police and fire stations, municipal court, and various other subjects such as churches.
- During this period, the students also learned to make pinhole cameras with the assistance of one student's father. He used precut materials to demonstrate the process, helped small groups to assemble cameras, and set up time exposures to test them.
- To coordinate plans for the visitors from Michigan, McCalley visited these students and their teacher. She took a walking tour of "the other Parma" with Crosthwaite's students who used McCalley's camera to photograph some of their favorite places to share with their Ohio counterparts. McCalley also delivered her students' family photo essays and picked up the Michigan students' posters.
- The final four weeks were spent putting the finishing touches on the students' materials and preparing for the Michigan visitors. Teacher and students finished printing their pictures, made comparison graphs from the preactivity survey, and completed two sets of the books on school and community—one set to be given to the guests. McCalley's students also volunteered to serve as hosts to the small groups into which the Michigan class had been divided. They printed name tags, painted welcome signs, and practiced speeches.
- The visit by the 26 Parma, Michigan, students, their teacher and principal, and four parent chaperones was partially supported by contributions from the Kiwanis, Jaycees, and Elks. A church provided their overnight accommodations, the YMCA gave a swim party, the school district held a breakfast, and the PTA threw a spaghetti dinner. Mementos of Parma, Ohio, were provided for the guests by the Chamber of Commerce, the Parmatown Merchants Association, the Parma Historical Society, and the mayor's office. While totally unanticipated at the project's inception, the visit turned out to be the highlight of the project—a learning and sharing experience and an exceptional example of school/community cooperation.

Materials, Resources, and Expenses

McCalley's project received broad support from people in the school system and in the community. The school career education coordinator provided cameras and helped arrange field trips, the principal was involved, the custodian led school tours, and various members of the school staff granted interviews. Other assistance came from a photographer, a photojournalist, city officials, and members of community groups.

Students used KODAK INSTAMATIC® Cameras and 126 black-and-white film to take their family photos. The career education department purchased six of these cameras for use in this project, and they will now be available for other classes to borrow. The students enlarged and printed their photographs using KODAK POLYCONTRAST Rapid II RC Paper and Filters. McCalley also provided them with instruction and experience in using a 35 mm camera with ISO 125 black-and-white film. She used her own camera, enlarger, and equipment for processing negatives.

Other materials used to produce the final products were construction paper, magic markers, and rubber cement.

Because of the Kodak/NEA award, says McCalley, she and her students were able to take and print as many photos as they wished. However, she points out, that because most materials and equipment were available from the school, she could have conducted the project for the price of five or six rolls of film and the processing.

Outcomes and Adaptation

The main measures of the success of this program, according to McCalley, are increases in learning between the pre- and postactivity surveys, improvement in the quality of student photography over the term of the project, student evaluations of the completed project, and students' willingness to postpone some of their darkroom work and their instruction in color photography in order to take advantage of the educational and social experience of visiting with their Michigan counterpart.

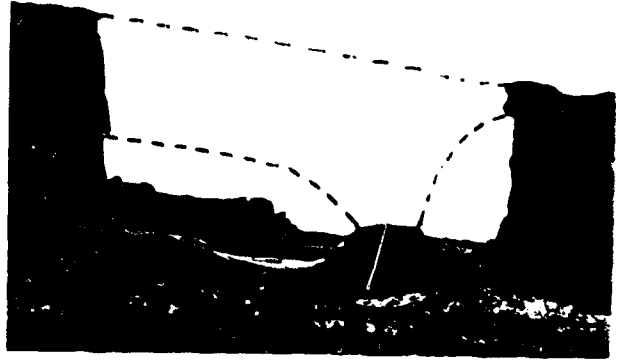
The initial survey gauged student interest and assessed their knowledge about themselves and their families, school, and community as well as photography. The follow-up survey showed gains in all these areas, especially school and community. Students' own evaluations indicated that they feel they have learned a lot about all these areas (plus Parma, Michigan) with the heaviest positive margins accruing to school, community, and photography.

Due to advice from experts and their own experiences, says McCalley, the students' photos steadily improved. She feels their use of photography made them more aware of the world around them and its details.

Summarizing the accomplishments of her students, McCalley points out that they learned to successfully operate a camera and develop pictures; they gathered information about family, school, and community; and corresponded with other students so well through photographs and limited writing that they generated the visit from their counterpart school.

She also points to the immediate adaptability of the project, as demonstrated by the Michigan teacher's ability to fit it to her class, time schedule, and budget at short notice. McCalley herself will be teaching an enrichment class in photography next year using many of the same techniques and activities.

Her own experience with students from three grades also shows that the project can be implemented at various levels, and McCalley says it can be applied to a whole class, small group, or individuals. She believes, in fact, that carrying out the project would be easier for a classroom teacher than it was for her as a specialist. Time frame, she points out, became her biggest problem, but a classroom teacher could extend the program over a semester or a school year as well as making additions or deletions according to the particular class situation.



Sheep Rock is a prime example of what will eventually happen to a fin. The dotted lines represent where an arch might have existed years ago, but through erosion and weathering the fin has worn down to what we see today.



Three Gossips



Third Prize Winner, Secondary School

Project Title

Photographic Geology: A Multimedia Module for Individualized Field Trips

Teachers Bernard Radcliffe, Daniel Shepardson

Locale Grand County Middle School, Moab, Utah

Subject Science

Grades Intermediate

Purpose and Description of Project

Radcliffe and Shepardson's photographic geology module is in essence a "do it yourself" kit that provides their middle school students with an unusual opportunity for independent investigation of geological concepts through field study of actual formations. At the same time it allows them to creatively communicate their findings through photography.

The teachers' goals were to improve their students' geology experiences, photographic skills, and creativity; increase parental involvement; and enhance the school district's geology curriculum. They found that the module not only fulfilled their expectations but achieved additional positive outcomes as well.

To help the students experience geology in a concrete manner and expand the classroom environment to incorporate nature, each student was assigned to go with his or her parents on a field trip to Arches National Park. Each student-parent team was equipped with a cassette player, prerecorded cassette tape discussing geological features of 13 stops throughout the park, a field manual, a student manual, and a camera and film.

Each team listened to the recorded lecture while referring to the field manual, which includes photographs and diagrams prepared by the teachers to illustrate geological principles. Then the students answered questions in the student manual and took their own photographs to illustrate such concepts as arches, faults, mineralization, and erosion. Additional photographs were taken for student essays about the formation of arches.

Photography is integral to this project and helps students to develop three separate sets of skills, according to Radcliffe and Shepardson. Creative photography allows students to express their ideas through essays, evaluative photography enables them to demonstrate their understanding of a concept by taking a picture of an actual example, and interpretative photography requires students to analyze photographs taken by others.

The success of the program was measured through pretests and posttests, questionnaires, students' written responses and photographs, and the teachers' personal observations.

Activities

While the cassette recording developed by Radcliffe and Shepardson leads each student-parent team to the same set of geological formations, each group experiences the wonders of the trip in a unique way and gains its own special viewpoint. So, while the information in the field manual and on the tape provides important guidance, the teachers' real goal is that "the topography of the land becomes the teacher." As students travel through the park with their parents, they are guided by the tape to each stop and then listen to an explanation of the geological phenomenon exhibited at that particular location. The audio program is cross-referenced with the field and student manuals so that students can compare the teacher-prepared photos and diagrams with the actual formations and then carry out prescribed activities.

Among these activities are:

- Discussing the phenomenon observed by using both words and diagrams
- Applying concepts learned at early stops to interpret subsequent phenomena
- Photographing examples of geological concepts according to assignments in the student manual
- Analyzing photographs and recording the analysis in the manual
- Observing the various geological phenomena, recording the observations, and answering questions in the manual
- Interpreting diagrams to demonstrate understanding of a particular geological concept
- Developing a photo essay illustrating the life cycle of an arch
- Interacting with parents in spontaneous ways so that open discussion and shared thinking help reinforce the learning process

The audio program developed by Radcliffe and Shepardson is a model of detail, providing mileage information and descriptions of each stop, directing the attention of each party to the particular feature under discussion, explaining the feature, and referring the listener to photographs and diagrams in the field manual. Parent evaluations emphasize the effectiveness of reinforcing points through audio, photographic, and concrete demonstration and of being able to rerun portions of the tape when related questions arise later.

An example of the way in which the field and student manuals and audio tape reinforce each other is provided by the second stop on Radcliffe and Shepardson's geological tour.

Guided by the tape, the student-parent team arrives at a position to view a major faulted area (a break in the earth where vertical shifting occurs). Discussion on the tape proceeds to a faulted wall, and both the tape and the student manual instruct the student to photograph the wall and use stick-on arrows to identify the direction of the faulting.

After completing the photo assignment, the student then listens to further taped discussion of the site, including information about rock strata, coloration resulting from mineral deposits leached out of water, and the effects of weathering and erosion. The tape refers to photographs in the field manual showing that different minerals cause sandstone to take on different colors and illustrating erosional patterns. After their observations, students then list and explain several forms of erosion and weathering in the student manuals.

At the end of the tape—many stops and much learning later—students and parents are directed to a picnic area so that students can complete a short final exam right on the spot. And as a bonus, the tape adds that if the student has any film left, it can be used to photograph any subject the student finds of interest.

Materials, Resources, and Expenses

In developing this program, Radcliffe and Shepardson had access to a wide range of human resources, from educators to geologists. These include: Assistance from and facilities of the Moab Teacher's Center; advice from the director of the school district's media center; information from the park naturalist for Arches National Park; field checking of the program by the head of the McDougald Geological Service who pointed up weaknesses and strengths of the program's geological content and provided insights into the geology of the area that were incorporated into the program; field testing by a layperson in geology for concept understanding, terminology, and instructional clarity; and recording of the audio portion by a former music instructor from the school district.

The teachers then field tested the program themselves using several students and their parents from the district.

The completed program consists of a classroom slide presentation, field and student manuals, recorded cassettes, a cassette player, and KODAK EK6 Instant Camera with a film pack of KODAK Instant Color Film.

In developing these materials, the teachers used two Minolta Cameras with various lenses and KODAK EKTACHROME 64 Film to produce transparencies for the slide show and prints for the manuals. The field manuals contain one 8 x 10-inch and 19.5 x 7-inch enlargements to demonstrate geological concepts that

are cross referenced to the audiotape. The student manual contains questions and instructions, one 5 x 7-inch enlargement for student analysis, and pockets for student-taken photos.

The teachers also drew on a number of geology texts during the research phase of the program.

The cost of developing such an individualized field trip program ranges between \$75 and \$100, according to Radcliffe and Shepardson, depending on the availability of an KODAK INSTAMATIC Camera and a cassette player. However, this does not include the time and travel required of the teachers in developing the program.

Outcomes and Adaptation

Various indices were used to measure the teachers' desired outcomes in the areas of geological experiences, parental involvement, photographic skills, creativity, and curriculum enhancement. For example, comparison of pre- and posttests shows a mean gain in student knowledge of 61 percent, and parent evaluations indicate a mean rating of 4.6 on a scale of one to five.

Student responses to concrete activities at each stop of the trip were also evaluated on a scale of zero to 100 and the mean score found to be 90.5. In addition, the teachers made direct observations during the field testing by following participants in another vehicle but communicating in no way with them. They observed student and parent actions and interactions, and took note of time spent at each stop, form of student-parent interaction, percentage of parent involvement, and the types of discussions that went on.

In addition to the proposed outcomes, the teachers found that the program produced the following additional positive results:

- Improvement of students' observational skills
- Increase in students' interest in photography
- Development of student-parent interaction, relating to photographic techniques (as well as to the subject matter)
- Improvement in students' use of geological terminology
- Immediate adaptation of the program by elementary instructors

In summary, say Radcliffe and Shepardson, the photographic geology module stimulates and reinforces learning, promotes creative thinking, and involves parents in their children's education. It allows students to use photography to communicate, evaluate, and analyze concepts and phenomena based on their own personal experiences.

The teachers are especially pleased that elementary instructors began to adapt the program even before it was fully implemented, demonstrating that the program has already established a creative base for the development of future programs within the district." Further, they point out, the program can be used again and again and will "be in existence until it is physically worn out."

A major plus of the program for teachers elsewhere who are interested in replicating the project is that it opens a way for providing students with individualized geological field trips even if their districts lack funding for more formalized field trips.

Radcliffe and Shepardson note that while their program is based primarily on physical geology, it could be adapted for the study of any outdoor environment. "Our program provides the same type of learning methods or styles incorporated into any well-balanced education program," they state. "Opportunities for creativity are demonstrated in photography, writing, observation, analysis, synthesis, and evaluation. These creative skills are adaptable to any program within any curriculum area, geographic location, and environmental setting."

In short, they conclude, "adaptation of the program format—use of photography in three modes (creative, interpretative, and evaluative), parental involvement, and concrete activities to elicit creative responses—is limited only by the creativity of the instructor."

Project Title

Occupationally-Related Social Skills Development

Teacher Gayle L. Macklem

Locale Hamilton-Wenham Regional High School,
South Hamilton, Massachusetts

Subject Life Skills

Grade High School

Purpose and Description of Project

This project involved photographing simulated or on-site situations related to getting or keeping a job, with the goal of improving the occupationally-related skills of special-need students. Macklem was working with students who were deficient in social skills due to behavioral disorders, passivity, minimal brain damage, or learning disabilities.

Students photographed each other practicing teacher-identified skills in simulated employment environments such as the school kitchen and a prevocational training work area. Then they visited actual work sites to investigate employment opportunities, photograph specific job tasks, and meet area employers. Principal teaching methods were modeling, role-playing, performance feedback, simulation, and discussion. Macklem found that using photography with the simulated work environments not only maintained motivation, but seemed to reduce students' inhibitions about role-playing because they were concentrating on learning how to use the camera.

Activities

Students studied nonverbal communication by demonstrating various expressions, gestures, postures, etc. and producing a series of slides showing how such communication is relevant to interpersonal relations. Each student also completed a thorough self-evaluation of interests, values, aptitudes, and skills in order to complete a self-profile in notebook format. The notebook included photos illustrating those social skills in which the student felt weak.

Each student chose three jobs he or she felt were suitable, actually visited potential employers, and completed written assignments about the jobs. Students also practiced and photographed simulated interviews and used the slides to study relevant skills. Another slide collection showed the tasks involved in various jobs that students had learned about during on-site visits.

Two additional slide collections developed by the students covered other skills needed to keep a job—such as paying attention to directions and accepting suggestions—skills that would help a worker deal with stressful situations on the job.

Materials, Resources, and Expenses

Human resources included the school's work/study coordinator who helped in training and arranged for site visits, the language pathologist and teacher aides who on occasion served as interviewers and took students to job sites, and an English teacher/photographer who discussed camera use and photographic composition and content.

Cameras used were loaned by staff and the school Pupil Personnel Services Department. Simulated training sites and props were found in the school building.

Outcomes and Adaptation

Students' progress during the project was evaluated through skills checklists, sections of an employability inventory, and an occupational skills assessment instrument. Student responses were assessed according to observation and questionnaires. Macklem found growth on every measure—including interview skills, ability to respond to a want ad, and on-the-job skills.

The teacher suggests that this program could be used in distributive education courses, in work/study programs, and by guidance departments. Further, says Macklem, a similar approach could be used in the teaching of social skills in middle or elementary schools by substituting the playground or the cafeteria for work environments.

Project Title

Using Photojournalism To Teach Career Exploration

Teacher Debra Roudman

Locale Birchwood School, San Jose, California

Subject Career Exploration

Grades 4-5

Purpose and Description of Project

The objectives of this project were to introduce students to photography and photojournalism and to help them use these skills to explore careers. Roudman believes this approach "bridges the gap between the external world and the world of the classroom because of the emphasis on first-hand, meaningful experiences and activities."

The teacher used films, publications, lectures, and demonstrations to familiarize students with camera/photographic techniques and the ways in which words and pictures enhance each other. Students were grouped in committees of three to five to develop career interview forms and practice their new skills on school personnel by photographing each subject on the job, doing an interview with the subject, and writing a story and captions to go with the photos. This same procedure was used as students went out into the community to learn about different careers and express what they learned through photo essays.

Roudman found that the use of photography made students more enthusiastic and motivated and improved writing skills. "Those whose reading and writing skills are not fully developed are able to express complicated ideas through the visual medium and convert those ideas to written form via the committee framework," she explains.

Activities

The project began with an introduction to photography, study of photographic terms and camera parts, discussion of photo essays, and demonstration of film development procedures.

Working in committees, students interviewed school personnel using a career interview form of their own design, photographed these individuals on the job, and collectively wrote stories and captions for the photos. The displays were critiqued by classmates and the teacher.

After studying material about a variety of careers, students chose those they would like to investigate further, and mini-field trips were set up with parents and community members who volunteered to be interviewed. The resulting photo displays were then judged by an outside professional (the managing editor of a magazine), and ribbons and certificates were awarded to the committees producing the best displays and to the individual students taking the best photos. The project culminated with a photography show for parents, teachers, and other students.

Materials, Resources, and Expenses

Major human resources were the parents and community volunteers who either visited the school to discuss their careers or allowed students to visit them on the job.

Students used a PENTAX K1000 Camera and five rolls of 20-exposure, black-and-white KODAK TRI-X Film. Developing materials included a changing bag, film tank, film apron, can opener, photographic thermometer, developer, fixer, KODAK PHOTOFLO Solution, measuring cup, squeegee, and photographic paper. (The school has a darkroom.) Roudman estimates the cost of such a program at \$75 if students develop their own film and make the prints.

Outcomes and Adaptation

Roudman says that the photojournalism approach "successfully motivates the passive learner while providing creative expression for all students." She also found that the use of committees of students promoted positive interaction and teamwork. But perhaps most important, she concludes, was that the project "served to bring the real world into the classroom setting."

Photojournalism is adaptable to any subject or learning situation, according to Roudman, and such a program is easily implemented, as was demonstrated by the fact that a substitute teacher with no previous photography experience carried out the latter phases of the project while Roudman was on sick leave.

Project Title

A Picture of Safety

Teacher Richard Kuzminczuk

Locale Spotswood High School, Spotswood,
New Jersey

Subject Cooperative Industrial Education

Grade 12

Purpose and Description of Project

The camera was a major tool in Kuzminczuk's effort to train students to evaluate on-the-job situations and safety practices and identify any potential hazards. "By studying work situations and looking for photographic opportunities, I think students come to subconsciously use similar investigative techniques as they go through their own work routines," the teacher believes.

Due to the limitations, only a select group of students was able to visit job sites, but their photographic products were shared by the entire class. These included bulletin boards, collages, a slide presentation, and a safety manual. The teacher says that the lessons "became more vivid and alive when illustrated with photographs and slides" and that "having their classmates as role models made the safety lessons more valid to students than seeing strangers posing in textbooks.

Kuzminczuk says that the industrial education students were enrolled in that course because they were "anxious to get out into the real world and begin their work life" so they were considerably more responsive to an approach involving on-site photography than they would have been to safety lessons based solely on textbooks. He also says that the students took the need for safety practices more seriously when actual company representatives emphasized the importance of these practices in real-life situations.

Activities

Students and teacher visited various work sites and plants, surveyed the work areas, and looked either for existing hazards or situations in which mock hazards could be set up for photographs. They then photographed these situations, taking turns as camera operator and role model. Using the resulting prints, the students developed bulletin boards depicting work situations with photographs showing the correction of unsafe conditions or simply demonstrating hazards. These photographs were then photocopied for a classroom safety manual that included discussion of safety rules and regulations.

A major teaching tool was compiled from slides based on the students' photographs. The slides were shown and students were asked to identify the problems they illustrated. The information in the slide show was reinforced by the safety manual, which served as a reference guide to the slide presentation. The slides were also used as a testing instrument.

Materials, Resources, and Expenses

The teacher found most of the companies he contacted to be quite willing to cooperate with the project. They offered on-site visitation opportunities, access to their own safety films and materials, guest speakers, and assistance in setting up hazardous situations to photograph. Another human resource was the school photography teacher who provided camera instruction and discussion of career opportunities in photography.

The total cost for this project was only \$86 for five rolls of print film and four rolls of slide film plus processing. All the other equipment and supplies were available through the school. Photo equipment included a MINOLTA XG 35 mm Camera, MINOLTA 132x Auto Electroflash, zoom lens with attached close-focus lens, copy stand and lights, and KODAK CAROUSEL Projector. If he had to buy this equipment, it would have cost just under \$750. Other equipment and materials used were a duo binding machine, plastic spiral binders, a typewriter, a bulletin board, and construction paper.

Outcomes and Adaptations

Kuzminczuk found the use of photography an effective way of teaching students to identify work hazards and of emphasizing the importance of safety practices. "This is especially true," he says, "when dealing with students who dislike and possibly can't retain the thousand words that each of the pictures represents."

The teacher believes that this approach would be particularly effective in teaching safety tips and proper procedures in health, home economics, physical education, and shop courses.

Project Title

Movement in Still Photography: Capturing Aesthetic Experiences

Teacher Marie A. Barragato

Locale Meadowbrook School, Hillsdale, New Jersey

Subject Aesthetic Education

Grade 4

Purpose and Description of Project

Marie Barragato used photography in a variety of ways to enhance the teaching of dance to her fourth graders.

The four main components of the program that were photographed were the instruction of dance elements by teaching dance artists, the childrens' participation in movement activities, the activities of teachers in their various roles, and dance performance by professionals. Through these pictures the teacher was able to capture many different examples of each dance movement being taught so that the students could not only study the pictures illustrating each dance element again and again, but compare their own movements with those of the teachers and professional dancers.

Activities

During instruction by the teaching artists, Barragato was able to photograph both the artists and the students in a range of exercises, from curved body shapes to mirroring done by partners. Once the photos were processed, the children were enthusiastically interested in their own pictures and were able to analyze what they were doing and describe their movements in terms of the elements of dance.

Barragato also projected slides of the children on a screen while the students looked among photographs of performers for those who were demonstrating the same dance concepts. This technique not only promoted discussion of the dance concepts, but allowed the teacher to judge the students' understanding and retention of what they had been taught.

Displays of the childrens' pictures, teaching artists, teachers, and professional performers were presented in the school's entrance corridor. Barragato says that, based on the positive comments she has received from parents, colleagues, and administrators, a better understanding of and appreciation for the dance program has resulted.

Materials, Resources, and Expenses

Human resources included two teaching artists from the Lincoln Center for the Performing Arts and dancers from the American School of Ballet who put on four productions at the school.

Barragato used a 35 mm MINOLTA X700 Camera; 50 mm, 28 mm, and 80 mm and 200 mm zoom lenses; ISO 400 black-and-white film and ISO 64 color slide film; and a slide projector and opaque projector. Her costs were \$7 each for ten rolls of black-and-white film and processing, \$8 for one roll of color slide film and processing, and \$2 each for 5 x 7-inch enlargements. She will also be buying albums for the photos not mounted on the bulletin board.

Outcomes and Adaptation

The teacher says that listening to the children "express their views and respond to directed questions about movement as they examined the photographs gave me a clear evaluation of two aspects, namely that children were learning the elements of dance and that their photographs were a way to verify that learning." Also by viewing their own photos, says Barragato, the children "could identify the body part that was being stressed and recall the ease or difficulty of doing the particular exercise. I witnessed a growing awareness of and respect for the human machine and all its movable parts, literally from head to toe."

Barragato also notes that such photos could be the basis for both music and art activities and could serve as the basis for creative writing.

Project Title

Anatomy and Dance Through Photography

Teacher Karen Larka
Locale Virginia Avenue School,
Bakersfield, California
Subject A Humanities Approach to a
Dance/Science Class
Grade 6

Purpose and Description of Project

Larka integrated the study of dance and anatomy through photography to familiarize students in two self-contained sixth-grade classes with a whole host of topics. These included the elements of dance, bone and muscle anatomy and function, structure and function of the eye, ear, and heart, the circulatory and nervous systems, basic nutrition and energy transformation in the human body, and basics of lenses, light, and photography.

Products included 16 x 20-inch black-and-white photos of the individual children dancing, a dance recital for parents and school officials, a slide show documenting the project, and student science and photography reports.

Activities

Larka's project involved 19 separate activities. These included lecture demonstrations of camera use, photographic techniques, and exercises to prepare the students for movement and acquaint them with their physical capabilities, exercises based on the elements of dance, including individual and group work; comparison of pulse rates before and after dancing and study of the location and action of major muscle groups; viewing of films on photography and anatomy and discussion of the elements of photography; daily journals of dance activities and notebooks on lectures; photographing of dance performances to experiment with lighting and exposure; and photo sessions to produce quality negatives from which enlargements were made.

Students, drawing on clear plastic overlays, used the enlargements to study bones and muscles. They made a photo collage of pictures they took at home, wrote science, dance, and photography reports, and presented them on a number of public occasions.

The finale of the project was a parent night. Exhibits included the enlarged dance photos, science and art overlays, science diagrams, and the science and photography reports. Visitors were shown a slide presentation documenting the entire project and then treated to a dance recital.

Materials, Resources, and Expenses

Human resources involved in this project were many. They included other teachers, a science consultant from the county superintendent's office, a veterinarian who spoke on animal anatomy and showed x-rays, a dance therapist, and photography experts.

Photo supplies included 35 mm cameras, KODAK Technical Pan Film 2415 to produce very large photos with little grain, KODAK POLYCONTRAST Rapid II RC Paper, Type F, 16 x 20-inch, developers, rapid fixer, stop bath, KODAK PHOTO-FLO Solution, enlarger, and a KODAK CAROUSEL Projector. Other materials were skeletal charts, a drum for dance rhythm, record player and records, photography books and reproductions of famous paintings, tissue paper for tracing figures and design elements, and laminating plastic, matte board, and spray adhesive for mounting pictures. Design work in class required drawing paper, glue, scissors, paint, brushes, cardboard, and colored pens and pencils. Larka estimates her costs at \$100 per 30 students because everything except the photo supplies was already on hand.

Outcomes and Adaptation

Larka found that the children achieved a significant degree of cognitive learning through experiences with their own photographs but believes that the most important gains were "in the affective domain, as indicated by the children's increasingly positive self-image." Students also saw photography practically applied and learned that it can function as a recording device, an art medium, and an analytical tool.

The program easily fits into existing upper-elementary curriculum areas, says the teacher, and can be carried out by teachers with general background in science, physical education, and photography.

Project Title:

An Introduction to Photography as an Art Form Through the Construction of a Pinhole Camera

Teacher: Gerald G. Vath

Locale: Southwest Elementary School,
Lebanon, Pennsylvania

Subject: Elementary Art

Grade: 6

Purpose and Description of Project

The goal of Vath's project was to develop in his students the ability to express themselves through photography, but as he points out, "the road to that goal was a long and complex one." To provide a foundation, Vath and others instructed the students in the history of photography. They also discussed how a simple camera works and parallels the functioning of the human eye, how a pinhole camera works, how to use composition and light effectively, and how exposed photographic paper is processed in the darkroom. Students were then assigned to build their own pinhole cameras from scratch, take photographs, and process the photos in a converted in-school darkroom.

Vath remarks that initial reactions included total disbelief that what he was asking was possible but that "three months later, 44 sixth-grade students could look back with pride and satisfaction and a bit of amazement in knowing that they met that challenge with unqualified success." The photographic process no longer seems mysterious to the students, says Vath, and with all this technical information securely in hand, they are free to turn their attention to self-expression through photography.

Activities

Activities in this program fall into four general areas: introductory lectures, camera construction, picture-taking and evaluation, and darkroom work. Students kept worksheets to correlate the vast amounts of information covered during the lectures and accompanying question-and-answer sessions. They then turned to actual construction of their cameras, which involved construction of a five-sided box, and a removable lid, sealing of the box and lid with tape, and the making and placement of the pinhole.

Students then loaded their cameras in class and took the pictures on their own time, the process being repeated so that each student had five photographic opportunities. They observed the processing of several negatives in the darkroom to get a grasp of the procedure, although the teacher did the actual processing due to space and time limitations. Between each photograph, teacher and students evaluated the previous photo so that any necessary adjustments could be made in technique or equipment. Each student's best photograph was then selected and

collection was exhibited for an audience of parents, school administrators, and others who either contributed to or expressed interest in the project. Also included in the exhibit were examples of the pinhole cameras and other material related to the program plus a sound-synchronized slide show created by Vath to document the students' activities and what they had learned.

Materials, Resources, and Expenses

Human resources supporting Vath's project included handicapped workers at the Lebanon County Workshop who cut the 450 pieces of mounting board used to construct the cameras, the staff of a local camera store, a professional producer with expertise in film, videotape, and photography, and a local photographer and artist.

The introductory lectures required charts, graphs, student folders for worksheets, notes, and photographic negatives; a selection of various types of cameras for discussion purposes; and both black-and-white and color photographs illustrating composition and light. Camera construction called for one-sided black mounting board, glue, black vinyl electrical tape, duct tape, tooling aluminum foil, and pins. For darkroom work, Vath needed photographic paper, developer, stop bath, fixer, hypo-clearing agent, a rinse system, sink, safelight, photo trays, tongs, and glass.

Total cost of constructing the cameras and processing photographs for 44 students, according to Vath, would be about \$270. His expenses ran only about \$200 because many of the darkroom materials were already on hand. The largest single cost items were 275 sheets of KODABROME II RC Paper (\$100) and 60 sheets of 22 x 28-inch black mounting board.

Outcomes and Adaptation

In evaluating the results of this project, Vath states that "a quick look at the 185 photographs taken by the students indicates their comprehension of the important elements for successful, interesting pinhole photographs, namely an understanding of the particular camera being used and their effective use of light and composition. Analysis of the photos also reveals, according to the teacher, student awareness of various focal length properties of light and shadow, and the importance of camera stability and light tightness. Best of all, he adds, "photography became obvious as the simple process it is—light reflected off objects enters a box through a small hole and causes a reaction on light-sensitive material." Vath advises that students do not necessarily have to construct their own boxes. "A sturdy shoe box, oatmeal box, or any suitable box with a lid will do," he explains, although it must be sealed to shut out all light except that coming through the pinhole. He adds that the program is most suitable for students of sixth-grade level and above if a full understanding of the concepts involved is to be gained.

Project Title:

The Movement and Sound of Chords in Music

Teacher: Nancy Bennett

Locale: Hubbard Elementary School,
Forsyth, Georgia

Subject: Music

Grade: 6

Purpose and Description of Project

Nancy Bennett uses slide photography to introduce her students to the movement and sound of musical chords (two or more notes played together with one hand), providing them with the background to experiment with chords themselves on the piano and actually write their own songs.

She uses a KODAK EKTAGRAPHIC EF Visualmaker to prepare the slides and shows them in color on a TV-sized KODAK EKTAGRAPHIC AudioViewer screen to musical accompaniment. Her original stories told through the slides feature her own invention, the "Kordels." These are different colored "chord people" with happy and sad faces (for major and minor chords) who illustrate the musical lessons told in her stories. She has found that this approach provides a "meshing of the aural and the visual that helps students attain a fuller understanding of how music works."

Activities

Bennett first showed her students "The Story of the Kordels," a 10-minute slide presentation that gives chords a human quality and introduces the youngsters to the movement and sound of chords. In addition to having happy or sad faces, the chord people are color coded by key—blue for C major, yellow for D minor, etc. The show also begins students' exposure to musical terms.

Next, students experimented with chords on the piano, using another Bennett invention, *A Rainbow of Chords*. The "rainbow" comprises 24 colored dots that are stuck on the piano keys in such a way that a student has only to press four dots of the same color to hear a chord. And from this beginning, students moved on to songwriting, each composing an eight-measure song using the Kordels. Each student then played his or her song on the piano, recorded it on a cassette tape along with an accompanying drumbeat record, and played the song back on the EKTAGRAPHIC AudioViewer machine with corresponding slides. An original melody and words were added last to complete each child's personal composition.

The last two phases of the project involved ear training and analyzing and were based on two more musical stories, *The Kordels Do Magic* and *The Kordels on Jazz Street*. The first story emphasizes the differences between major and minor keys, and the second provides simple definitions of jazz and blues music and helps students learn to analyze music and make conclusions about it.

Materials, Resources, and Expenses

In addition to the EKTAGRAPHIC AudioViewer, Bennett used three rolls of 20-exposure KODACHROME 64 Film (126 cartridge), transparency markers, index cards, a record of background drumbeat music, and cassette tapes. Her cost, including developing, was about \$40.

Outcomes and Adaptation

As a result of this project, Bennett's students learned to differentiate major and minor chords, recognize when chords changed, and to listen more acutely and more analytically. The teacher was also particularly pleased by their songwriting activities, which she says "markedly increased their self-esteem. They had no idea they could write a song just like their favorite music stars. And, most important, the slides of the Kordels have enabled my students to see their songs happen right before their eyes. What was abstract has now become concrete."

Bennett suggests that the project could be used as an ear-training exercise in music theory class or be focused fully on developing students' creative composition skills. She believes that it could be modified to work well with other grade levels.

Project Title

Drawing with Light

Teacher Jo Campbell

Locale Wagonwheel Elementary School,
Gillette, Wyoming

Subject Art

Grades 1-6

Purpose and Description of Project

In this project photography is used as a motivational tool for an art unit on figure drawing for students in grades 4-6 and to teach perspective and composition to those in grades 1-3. The end product for the older students was a folder of drawings and photographs showing their progress as they experimented with various techniques. Younger students designed a background for one of their favorite toys that would produce a three-dimensional effect. In total, 385 students were involved.

Campbell says that the integration of art with photography produced "a truly exciting classroom activity that many students enjoyed so much that they spent many free hours working in the art room on extra drawings." Students also signed up for extra time in the darkroom both before and after school. The primary children, she adds, were so excited about using a "real" camera that they started bringing their toys to school well before they were actually needed and later insisted on taking their photographs home to show their parents rather than just having them displayed at school.

Activities

The older students began by making a drawing of a classmate and discussing right and left brain functions and how use of the creative right side of the brain can be encouraged. They then went on to "gesture drawings" which make quick observations of an object, "contour drawings" which are done swiftly without lifting the drawing tool from the surface, and then "blind contour drawings" which were created in a number of ways. Students began the blind drawing by looking at the subject and making a pencil drawing without looking at the paper. From this point, there was a natural progression to drawing in the air with a penlight in front of a 35 mm camera in a totally dark room. Students worked in pairs, one handling the camera and one drawing.

At this point, Campbell brought in a professional photographer who explained the process of developing negatives and printing pictures and worked with the students in the darkroom. Student work was then critiqued and displayed in the school hallways. After these discussions, students completed their final drawing of a classmate as the last item in their folders.

Simultaneously, the primary students created, with tagboard and markers, backgrounds for photographs of their favorite toys. "They did a wondrous job of creating the illusion of perspective by focusing, placing their toy, and photographing their composition with a 35 mm camera," remarks Campbell.

Materials, Resources, and Expenses

Major human resources were the photographer who acted as darkroom technical advisor and the school's library/media specialist who helped gather the necessary equipment. Combined equipment needed for both segments of the project were a 35 mm PENTAX Camera, tripod, cable release, ISO 125 black-and-white film, small penlight, copy stand lights, tagboard, and felt-tip markers. Processing of film called for PATTERSON Reels, fixer, KODAK PHOTO-FLO Solution, stopbath, sink, KODAK HC-110 Developer, measuring flasks, developing tank, clothespins, and wire. Processing and printing required an enlarger, timer, KODAK DEKTOL Developer, 11 x 14-inch trays, tongs, plastic bottles, resin-coated paper, safelight, and blackout paper for door edges and vent. Expenses were for paper (\$200) and chemicals (\$30), plus a fee to the photographer, and were defrayed by a grant from the Wyoming Council on the Arts as well as the NEA/Kodak award.

Outcomes and Adaptation

A comparison of first and final drawings by students in the figure drawing unit shows that they "had drastically improved in almost all cases," according to Campbell. She says that these students' work shows "great improvement in eye/hand transfer of image" and that they learned more about right and left brain functions than she had anticipated. The younger students developed an understanding of perspective and the use of various techniques, such as shadows, to create an illusion of realism. She believes that the project has succeeded in developing a lifelong skill and interest in photography in many of the students and can readily be adapted to other art classes.

Project Title:

Using Photography To Teach Design, Composition, and Color in Art

Teacher: Jonne M. Goeller

Locale: Henry D. Sheldon High School,
Eugene, Oregon

Subject: Art or Photography

Grades: 6-12

Purpose and Description of Project

The goal of this project was to have students illustrate their understanding of the principles and elements of design, color, and composition through the use of photography as an artistic medium.

During vacation and weekend time as well as on a field trip, the students used both black-and-white and color film to get shots illustrating specific requirements laid out by Goeller such as straight and curved lines, contrasts of light and dark, and shiny versus rough textures.

One of the most important outcomes of the project, according to Goeller, is that she "learned to stress the artistic side of photography and will *never* go back to encouraging students on a purely technical basis. It gave them a chance to really soar, and their work wildly exceeded my expectations in its scope and quality."

Activities

During an initial orientation week Goeller outlined the parameters of the program, showed students a slide show of her own that covered specific design assignments, distributed and explained students' assignment sheets, and reviewed 35 mm camera operation. During the subsequent spring break they shot their black-and-white film. Returning from the break with their homework, students began processing the film in the school darkroom while also getting individual instruction from the teacher, viewing video discs on photography, and doing independent study with resource books.

In the third week, Goeller passed out color film, reviewed the assignment sheet, and showed another teacher-oriented slide show, this one specifically illustrating use of color. Teacher and students then went on a field trip to the University of Oregon Art Museum and, armed with their cameras, toured one of the more picturesque sections of Eugene. They spent the rest of the week making black-and-white enlargements, finished up their color rolls over the weekend, and then, while waiting for the color slides to be processed, learned how to make prints from slides.

The slides were returned at the beginning of the fifth week to be viewed and critiqued by teacher and students, and selections were made from the slides that would be made into final prints. The final two weeks were spent working in the darkroom, mounting prints, and displaying the work in the school's front hall showcase.

Materials, Resources, and Expenses

Human resources supporting Goeller included the school principal, a teacher's aide and student assistant, and two guest speakers, one from a local camera store and the other a university student.

Equipment needed by the teacher included personal slides and prints, photo and art reference books, slide projector, KODAK EKTAFLIX Printmaker, Model 8, KODAK EKTAFLIX PCT Activator, five sheets of 30 x 40-inch matte board, video discs and player, 16 mm movie projector, and spray mount adhesive. Student requirements were one roll of 20-exposure KODAK PLUS-X Pan Film and one roll of 20-exposure KODACHROME 64 Film, 10 sheets of 8 x 10-inch KODAK POLYCONTRAST Rapid II RC Paper, two sheets of 8 x 10-inch KODAK EKTAFLIX PCT Reversal Film and matched KODAK EKTAFLIX PCT Paper, a 35 mm camera, and access to the school's darkroom. Total cost was \$194.

Outcomes and Adaptation

Goeller found that her students "had stretched beyond their normal visual reach to come away with some extraordinarily beautiful and graphic photographs that truly expressed the concepts I had taught them."

She points out that a similar program could be carried out without sophisticated cameras or a darkroom. While she emphasized photo lab work, the same principles of design, color, and composition could be taught with commercial labs doing the processing and printing. Although outside lab work would add to costs, she notes that counterbalancing savings could be achieved by having students work in teams and shoot less film.

Project Title

Another View

Teacher Carlton Nickerson

Locale SHAPE International High School, American Section (Supreme Headquarters of the Allied Powers, Europe) Silly, Belgium

Subject Art/Humanities

Grades 7-12

Purpose and Description of Project

To make his students become more aware of their home and school environment, take a closer look at the world around them, and see themselves as others see them, Nickerson centered his program on the creation of visual statements in which students' photographs are superimposed on provocative backgrounds.

The students begin by photographing each other from behind while in a variety of stances. Then they select and photograph all sorts of backgrounds, including nearby places, artwork, and far-away sites found in magazines and books. Finally, the students cut themselves from the first photo, superimpose themselves on the new backgrounds, and photograph the new composition.

"As much as everyone enjoys the final pictures," emphasizes Nickerson, "the real learning takes place in the process. This program develops organizational skills, practical skills in photography, and the quality of patience. The final print is a reward for task commitment."

Activities

Meeting with students once a week during the lunch hour, Nickerson first showed examples of file photographs, explained the objectives of the lesson, and let the students see and handle the photographic equipment. During subsequent meetings, students brainstormed about different ways to position themselves, clothes to be worn, backgrounds, and twists on the basic idea. Nickerson also photographed each student with his camera and photographed each student's hand with a KODAK EKTAGRAPHIC EF Visualmaker. Students then viewed the prints and started to collect visual backgrounds for the new photos. The students' assignment was to do three finished visuals using themselves with three different backgrounds

Materials, Resources, and Expenses

Nickerson stresses that the materials and equipment involved are "very, very basic. It's the creativity and task commitment that are most important." He used film and flashcubes, magazines, books, postcards, and small objects, a regular handheld camera, and a KODAK EKTAGRAPHIC EF Visualmaker. A worker in a base photo lab helped Nickerson dry mount the photos for the final exhibit. Total expenses were minimal.

Outcomes and Adaptation

Nickerson found that students grew in three major areas—creativity, skill with the materials and equipment, and attitude toward work. And while he feels the value of the project was the creative experience gained during the process, he also notes that the photographs, which are the students' own products, are "more meaningful than a test result, or a graded report, or a report card."

Nickerson particularly points to the potential for replication of this kind of project by teachers of social studies, art, and humanities and by those involved in values clarification. He believes that it should not be implemented as just a separate lesson but rather as complementing various courses. He found that the photographs tied in with study of contemporary artists and frequently inspired original drawings around the cutout figures. He also made photos of a student viewing each of the elements of art (line, colors, forms, texture, etc.) and did the same with the principles of art. He advises that the best format is to have a large-group orientation followed by small-group, hands-on activity

Project Title

Stop, Camera, Action— That's Art

Teacher: Billie Griffin

Locale: Mansfield High School, Mansfield, Arkansas

Subject: Art

Grades: 7-12

Purpose and Description of Project

Griffin's goal is to help her students explore photography both as an art form in itself and as a tool for developing the visual perception, judgment, and skills of expression that will also serve them in other artistic endeavors. Hands-on experiences with basic cameras and picture-taking, she believes, will help move students toward the objective of letting their artwork "tell what you are, what you see, what you feel."

The nine-week program focused on three types of subject matter—portrait, still life, and landscape—and culminated with a short videotape produced by and starring the students. As photos were taken and developed, they were evaluated, and then students made drawings from their favorites. "Drawings were not careful renderings of the exact photo," notes Griffin, "but instead students were encouraged to omit or to add anything which they felt would enhance the artwork. Good composition was stressed, with photographs and drawings graded separately."

Activities

The project began with instruction about the basic mechanics of photography and also included walking tours, a visit to an artmobile, a day-long visit to nearby historical areas, and the production of a short movie on videotape. Students took photographs both in the art room and on the field trips and developed a portfolio of photos and related drawings. Role playing was used extensively, both to demonstrate how to set up portrait photography sessions and to prepare for videotaping by testing different dialogue and props and helping students get over stage fright. Overall, six weeks was devoted to photography and three weeks to moviemaking.

Materials, Equipment, and Expenses

Griffin found a local photographer, historical landmarks, and the school library to be important resources for this project. Photographic equipment used included two KODAK EKTRALITE 500 Cameras, a KODAMATIC Instant Camera, pinhole cameras made by each student, and several student-owned cameras. A PANASONIC Video System used for the videotaping was obtained from the library. Other materials included two films on photography obtained from Kodak and a number of reference books from the library. Total cost was \$200.

Outcomes and Adaptation

The enthusiasm for photography engendered by Griffin's project has been demonstrated in a number of ways. For example, the art club has begun fund raising projects so that they can set up a darkroom with cooperation from the school's journalism teacher and classes, with the facility to be used by both groups. As to specific outcomes, Griffin says that pre- and posttests and periodic critiques have shown that students can identify and label each part of basic cameras, can understand the elements of good picture-taking, have improved their perception and drawing skills by producing artistic renditions of their photos, and have gained an increased appreciation of their cultural heritage by producing a videotape production inspired by the TV series *The Blue and the Gray*, which was filmed in their area.

Even students who had never held a camera and/or had little, if any, success in art were able to perform at a high level through this program, stresses Griffin. And she adds that "since the bulk of materials and resources needed for this project are found in most communities, the potential for other teachers to adapt this program is ideal. Every community has a library, a pool of interested people to serve as volunteers, and a cultural heritage just waiting to be tapped."

Project Title:

Still Photography in the Secondary Program

Teacher: Sandra McLain

Locale: Stevens High School,
Rapid City, South Dakota

Subject: Art and Creative Writing

Grades: 10-12

Purpose and Description of Project

In this program, art and creative writing students learned photographic and darkroom techniques and then worked together to relate words to pictures, create audiovisual essays, and gain new viewpoints on the elements of art.

The six main assignments developed by McLain involved all the students in the participating art and creative writing classes although some aspects were actually carried out by teams or individuals or by the teacher. Projects ranged from a photo poetry journal to a tape/slide presentation developed for an elementary school as a basic tool to communicate with the community about the school's activities and programs.

Activities

McLain's project spanned six major activities:

1. All beginning drawing students learned about the use of cameras and the 10 basic elements of photographic composition—from viewpoint to perspective. Then they divided into groups of four and were provided with one roll of 36-exposure film per group and a sheet of motivational ideas. They then were taken on a field trip where they took both photographs and slides. After the pictures were developed, they were presented to creative writing students, who were asked to write poems depicting the photographs. The products of these cooperative efforts were a photo poetry journal and a slide/tape presentation in which the photos were set to music and accompanied by a display of the poems scripted in calligraphy and shown with an opaque projector.
2. Selected art students worked with an elementary school's students, principal, and other staff members to develop an audiovisual production that is used at school functions to promote good community relations. Using a 35 mm camera, the students took slides of all aspects of the school environment from special events to classroom activities, and coordinated the slides to a tape using music, narration, and sound effects.
3. McLain took 150 slides of student works of art to be used to explain techniques within a specific art assignment and to compete in local, regional, and national art competitions.
4. Each week students voted one of their classmates a "student of the week" in each of four areas—basic drawing, ceramics, interior design, and gifted art. The winners' photos were displayed in a special section of the school bulletin board.
5. Craft students went to the University of South Dakota to learn darkroom techniques, including the production of photograms (pictures taken without a camera by placing objects on photographic paper and exposing them to light).
6. Advanced art students took photos and slides of selected pieces of art they had created to go into a personal portfolio for their own reference or submission to contests.

Materials, Resources, and Expenses

McLain worked with the school's creative writing and photography instructors, a photography professor at the University of South Dakota, a camera store that provided technical advice, and various staff members at the cooperating elementary school.

Students provided the cameras that were used, and some materials—slide projector, tape recorder, opaque projector, and typewriter—were on hand. Cost items were film for 50 students, processing of photos and slides, photographic paper, slide sleeves, photo albums, trip to the university workshop, tapes, and mileage and gas. Total expenses came to \$282.

Outcomes and Adaptation

McLain finds that photography reveals to students new meaning in both art works and commonplace items and scenes, ties together visual and verbal aspects of the same subject, and promotes creativity and cooperation among students. It also lends itself to "the interdisciplinary method of teaching that should be occurring in schools today," she says, so that students see the relationships among their classes rather than viewing each as a separate entity. Various aspects of this project also improved students' self-image, especially the "student of the week" activity.

Adaptation possibilities are "limitless," McLain believes, and the program could be adopted by any high school art class. If a creative writing class does not exist, it could be done in conjunction with an English composition class. If cameras are not readily available, she adds, pinhole photography could be substituted at a minimal cost.

Project Title

Cameras, Cupolas, and the Community

Teacher Norma Coret

Locale Woodbine Community School,
Woodbine, Iowa

Subject Art

Grades 10-12

Purpose and Description of Project

Coret's project is designed to teach students about the history of their community and its buildings, architectural styles, photography, and career opportunities in both photography and architecture. She says that students learned basic photographic and darkroom skills, came to see photography as an important communication tool, and became able to identify several architectural styles and decorative features--a feat since their initial interest in architecture was at "rock bottom."

Highlights of the project, according to Coret, were a flatbed truck tour of Woodbine, introduction to darkroom procedures, and a special presentation by a visiting architect/artist. She believes that due to the project, both architecture and photography have gained positions of respect in the art curriculum, and links between the school and the community have been strengthened.

Products of the project include individual student photo boards, with shots of each student's selected building from different angles and distances, plus captions. A videotape was made showing students explaining their photo boards. The latter is one segment of a resource-material package to be made available to community organizations.

Activities

Students viewed films and slide presentations on architecture and photography. They heard speakers on local history, the rehabilitation of historical buildings, and the use of cameras and photographic techniques. They also gained practical experience in both camera use and darkroom procedures and went on a tour of the community, during which the teacher used a portable microphone to point out interesting features and the history of many buildings. Creative writing students also joined the tour and wrote about it.

In developing their final product, the photo boards, students took photos of unusual views of their selected buildings, created the photo board layout, and wrote captions explaining the architectural features. The latter involved both research and personal interviews

with building owners and other knowledgeable sources. They also developed their own film, printed proofsheets, and selected negatives to print.

Students' work was exhibited at school, displayed in a downtown store window, and entered in a local art show and a state competition.

Materials, Resources, and Expenses

Human resources included a representative from the county historical society, the local newspaper editor who provided photographic pointers, a speaker on architecture and preservation arranged by the Iowa Arts Council, a media specialist from the area education agency who consulted on photographic and darkroom techniques, advanced art students and a local amateur photographer who assisted students with film and print developing, and homeowners and senior citizens who were interviewed about the history of dwellings.

In addition to films, slide shows, books, and pamphlets on the program's dual subject, the only other material required were simple snapshot cameras (borrowed from the area education agency), the high school darkroom, the art room's 16 mm projector, tape player, and KODAK CAROUSEL Slide Projector, three rolls of black-and-white 35 mm film and 14 rolls of black-and-white 126 film, slide film, 100 sheets of photographic paper, developing chemicals, mounting materials, and outside development of some film. Total cost was \$183.

Outcomes and Adaptation

Coret found the use of cameras as a study aid to be "fantastic" and believes it has "unlimited possibilities and could be used with any discipline." In addition to increasing students' knowledge about photography and architecture, the project also helped develop students' pride in their heritage and brought community attention to the need for preservation of historically significant buildings. Students' photo boards were graded on photographic quality, use of captions and titles, and composition, and Coret reports that all but one of her 16 students boosted their scores on the pre- and posttests. Some of these test gains were dramatic, with one student jumping from 14 percent correct to 88 percent.

Saying that her program is easily adaptable to other situations, Coret stresses that "each community has a unique history, architecture of all kinds, and students eager to work with cameras."

Project Title:

Foreign Language Photo Album Exchange

Teacher: Roberta Jean Matt
Locale: Marie Drake Junior High School,
Douglas, Alaska
Subject: Spanish
Grade: 9

Purpose and Description of Project

Matt's first-year Spanish students took pictures of their everyday lives and activities and compiled them in a photo album with both Spanish and English captions. Then they exchanged this album for a similar one with a class in the Dominican Republic.

The teacher found that putting together the album was not just "a really fun project" for her students, but that the exercise enhanced their oral and written Spanish vocabularies and increased their cross-cultural awareness. The photos were also used for various mini-projects such as bulletin boards, class presentations, and vocabulary reinforcement aids, and as the basis of tests.

"Since students had an immediate need for vocabulary words in compiling the album, they did not view it as a boring translation exercise," explains Matt. "And while making their photo choices, they came to better understand differences between the two cultures." She also reports that "students who showed little interest in the regular class did a superior job of taking pictures and displaying them in the album."

Activities

The students decided to take pictures reflecting three categories: people, domestic and education scenes, and entertainment. The class was divided into groups, with each group handling one category. Pictures were taken outside of class over a month's time, and students also brought in pictures from home to depict those subjects such as snow that could not be photographed in spring. Out of all the photos taken or gathered, students then selected the most representative shots and began labeling them in Spanish and English. As a result, the album also became an English reader for the class in the Dominican Republic.

Students also came up with a dual-purpose format for the album. They folded large pieces of construction paper in half rather than using regular pages so that the sheets could be used as bulletin board displays of photos and essays before the album was assembled. The album is also bound in such a way that the class in the Dominican Republic can unbind it for a similar display.

Before sending the album to the Dominican Republic, students used the pages for other projects including talks in Spanish about specific pictures they had taken or presentations on the general topic of a completed page. The album was also shown to other classes in the school.

During the course of the project, the class explored foreign cultures and photography through classroom exercises, guest speakers, and films.

Materials, Resources, and Expenses

A friend of Matt's who had taught in the Dominican Republic helped set up the exchange with her former school and visited Matt's class to talk about the country and help them with vocabulary. A local photographer showed the students how to use a camera and how to organize a photo album.

Students used their own cameras or borrowed ones, some taking slides and others prints, although Matt now believes that prints alone are sufficient and would cut down on costs. Her only expenses were for film and processing, and she generously shared her NEA/Kodak grant money with the Dominican Republic school.

Outcomes and Adoption

Matt has been "extremely pleased by the excitement this album created in my students. Developing a vocabulary for their pictures enables the students to discover Spanish words relevant to their own lives, and the project brought meaning to the abstract vocabulary words in their text." She also found that the students scored higher on tests using their photos as opposed to tests using cartoons or other types of pictures. The photo album from the sister class also provides a tangible depiction of life in another country and can be used with future classes.

She suggests that other applications of this photo-based approach would be essay writing in language arts classes and identification of various sites in geography classes.

Project Title

“Who Is It?”—

A Socialization Unit Using Still Photography

Teacher Kathleen Noneman

Locale Traver Middle School, Reno, Nevada

Subject English as a Second Language

Grade ESL students, ages 12-15

Purpose and Description of Project

Kathleen Noneman used photography as the basis for a variety of activities to help her 45 students improve their command of English as a second language and expand their interaction with each other and others in school. The students came from nine countries and were placed in beginning, intermediate, and advanced categories.

The students, according to their level, were involved in some or most of the learning activities. They began by taking pictures of each other, their teachers, and the school surroundings, learning to identify each other, and use descriptive words and phrases about other elements of the pictures. Students also developed a picture and data file of school personnel based on photo interview sessions. Then they used their photographs as the inspiration for writing and speaking projects, for games, and for orienting themselves and others to the school.

Noneman found that the photo unit furthered the development of vocabulary, confidence, and verbal fluency.

Activities

Noneman divided the students into two groups, one for beginning students and one for the intermediate and advanced. Activities were organized so that the groups sometimes worked together and sometimes separately. All students were introduced to the instant and 35 mm cameras, and a vintage camera was set up as a display model to which they could return when they had free time. While the teacher worked with beginners as they took instant pictures of each other, the other students researched the names of camera parts and worked with the display model. The teacher used the beginners' photos to get them started on simple dialogue. Students worked together to design procedures and interview questions for the "Staff Identification File," and the more advanced group carried out the actual picture-taking and interviewing while Noneman continued vocabulary exercises with the beginning group.

Using photos they had taken so far, the intermediate and advanced students went on with individual projects such as autobiographies and custom-made picture postcards to send to relatives. They also worked with the beginners to launch the "mystery student game," filling out questionnaires on all the class members, and developing clues based on this information for posting on a "Who Is It?" board. In the game, clues were added until someone won, and then the mystery student's picture was added to the display and the game repeated.

The students' staff identification project was exhibited on a display table in the school and their other work posted on walls for several weeks, while the mystery game went on for the rest of the year.

Materials, Resources, and Expenses

Cameras used were a 35 mm and an instant camera, using two rolls of 24-exposure KODACOLOR 400 Film, a take-two pack of KODAK Instant Film, 20 exposure, and three twin packs of black-and-white film. Cost of film and developing was \$43, and total cost of the project, \$74.

Outcomes and Adaptation

Noneman reports that her beginners all learned each other's names and learned to identify colors and articles of clothing. They had a 75 percent success rate in question-and-answer exercises and could name all the school personnel with whom they came into daily contact. She also says that the intermediate and advanced students did very well remembering staff names and duties and that a written test showed about 60 percent retention of the camera and film vocabulary. Students' enthusiasm for the project she rates "an unqualified success."

"Since this is basically a language socialization unit," Noneman says, "it can be used by all language teachers, K-12. It is especially applicable to English as a second language classes, bilingual classes, and all foreign language classes."

Project Title

Les Deus Drapiers (The Two Fabric Merchants)

Teacher: Mary A. Rich

Locale: Liberal Senior High School, Liberal, Kansas

Subject: French

Grades: 10-12

Purpose and Description

Mary Rich's project was designed for and executed by students studying French. They wanted to do something creative and different—write, photograph, act in, and record sound and dialogue for a one-act play based on a French short story.

As Rich explains, the project gave these students experience not just in their field of study but also in dramatic writing, acting, tape recording, photography, building sets, and devising makeup and costumes. And, stresses the teacher, "no professional help was hired or sought. This was solely a student/teacher project."

These students have benefited from a creative learning experience by using photography to express literature and have also produced a resource for use by future French classes.

Activities

Through brainstorming, demonstrations, discussions, problem-solving, improvisation and experimentation activities, students learned how to turn a story into a drama, a process that they found to require a great deal of attention to French grammar usage and idiomatic expressions. In building their set, they borrowed and revamped flats from the drama department and leftover projects from the industrial arts department. After the set was built, they learned about set lighting, makeup applications, and the operation of "slave lights" when used together with a bounce flash camera attachment.

Once the play got underway, additional challenges were showing emotions in "mime" fashion, learning to judge the quality of photos, and synchronizing audio tapes with still pictures. They also had to learn to deal with their own performances, both sound and visual, and to give and accept constructive criticism.

When the production was in final form, students premiered it for their parents.

Materials, Resources, and Expenses

School staff, from the custodians to the principal, enthusiastically cooperated and provided materials that students could adapt for use in preparing the production.

Photo equipment included a 35 mm SLR camera, 50 mm and 100 mm lenses, bounce flash attachment, three slave lights, two umbrellas, darkroom tanks, trays, and thermometers. Supplies were six rolls of 36-exposure KODAK EKTACHROME Slide Film, 100 slide mounts, and a Process E-6 developing kit for processing slides. Approximate costs were \$50 for film, \$23 for the E-6 kit, \$15 for paint and brushes, \$65 for slave lights, \$10 for slide mounts, and \$20 for "other." Total: \$173.

Outcomes and Adaptation

Rich says students felt that they had used photography in a new and effective way and they enjoyed feeling that they had accomplished this project totally on their own. According to the teacher, they learned to exercise ingenuity, manage time, motivate themselves to work efficiently, and plan and carry out a project from beginning to end, even though it was a lot more work than they had envisioned.

This type of project would be particularly adaptable to classes in English, drama, reading, social studies, creative writing, and any foreign language, according to Rich.

Project Title

French-Speaking Africa— A Pictorial

Teacher Janice A. Nease

Locale Sissorville High School,
Charleston, West Virginia

Subject French

Grades 10-12

Purpose and Description of Project

Janice Nease used photography in a variety of ways to improve the linguistic skills of her students in the French language and to promote intercultural understanding of French-speaking Africa.

One of the teacher's main resources was a pictorial essay she developed from slides she had taken in Senegal. From this slide/tape show and a variety of other learning experiences, such as cultural simulations, students explored both traditional themes and mores and contemporary attitudes and problems of French-speaking Africa. They also prepared a similar pictorial essay on significant cultural features of the Appalachian region for an imaginary Senegalese audience.

Nease found that her cross-cultural approach helped students' misconceptions and stereotypes about African culture, served as an instrument for acquisition, reinforcement, and refinement of foreign language skills, and made them aware of the cultural impact of photographs as well as giving them experience in the techniques of successful photography.

Activities

Students were involved in a wide range of activities during this project. A sampling of these follows:

- Students collected realia of French-speaking African countries and prepared displays of these items such as jewelry, sculpture, musical instruments, and garments, for school showcases.
- They compiled a list of nouns unique to African culture, learned about the cultural significance of these nouns, and developed a similar collection of nouns unique to their own culture.
- Students viewed Nease's slide program and took part in a number of follow-up activities, such as simulating the practice of bargaining during shopping and writing postcards as if they were on a trip to Africa.

- They studied the role of the "griot" in African culture, contacted the oldest member of their family to investigate their own family history, and collected photographs relevant to the family history. Students then photographed their collection or had prints made of negatives to create personal family history albums.
- Students worked in groups of four or five to plan and prepare pictorial essays about Appalachian culture and also designed a bulletin board contrasting cultural traits of French-speaking Africa with those of Appalachia.
- Students researched typical recipes of French-speaking Africa and prepared a dinner to which parents, teachers, and community guests were invited. The student-prepared pictorial essays were shown and students photographed each other in African dress.

Materials, Resources, and Expenses

Human resources included a teaching assistant from France for editing and recording of Nease's slide program, a professor of photography for technical advice, local college professors for expertise in African culture, and a consultant from the State Travel Bureau for advice on the students' photo field trip.

Students used a 35 mm camera and slide film to photograph the Appalachian region. Other equipment used was a slide projector and screen and a cassette tape recorder and tapes. The only costs were for film, processing, and tapes.

Outcomes and Adaptation

Nease says that tests and student surveys showed that students gained new understanding and appreciation of another culture, increased their linguistic skills, and learned photographic techniques. Through photography, she states, "the students were able to experience another culture in as direct a manner as is possible within the confines of a classroom."

The teacher notes that photo essays, if prepared in English, would be suitable teaching devices for nearly every area of the curriculum, but especially for anthropology, world cultures, sociology, and art.

Project Title

First Steps with Kodak

Teachers: Marlene Thompson, Pam Tinklenberg

Grade: Rogers Elementary School,
Rogers, Minnesota

Subject: Language Arts, Reading Readiness

Level: Kindergarten

Project Description of Project

The project was developed by Pam Tinklenberg, a first grade teacher at Rogers Elementary School. The project was designed to help children learn to use a camera to take photographs, and picture taking to help them develop or improve their language arts skills. The teacher also found that the project produced benefits in the areas of motor skills and social development.

Activities centered on photos from outside sources, those taken by the teachers, and finally, pictures taken by the students themselves. While looking at the photos, the children were stimulated to ask questions, retell events, and use complete sentences. They also learned about and were able to depict sequences of events and such concepts as size, time, space, shape, opposites, and color. The teachers also found that photographs helped children make "that difficult step from dealing with real objects to learning and talking about those objects in a representational form."

The children's final products included two photo journals with captions, "Opposites" and "Our Field Trip to the Nature Center."

Activities

Students began by bringing pictures from home to examine and discuss and then went on to photography books. The teachers also took a camera along on a field trip to photograph the children's activities, and a school media specialist showed the students how to develop film and make prints. The pictures were mounted in the field trip book and the children dictated captions.

The children began learning how to take their own pictures in sessions during which they explored and labelled parts of different kinds of cameras. Subsequent sessions centered on learning and practicing photographic techniques with "pretend" cameras (cardboard rectangles with squares cut out for viewfinders). And finally the children were given the opportunity to take their first photos. Each child then taped his or her photo to a Language Master card and recorded a sentence about it.

Students now were ready to use photos to illustrate concepts. They began with opposites (push/pull, empty/full, etc), suggested ways to demonstrate the concepts, and took turns photographing scenes posed by students to illustrate their ideas. These photos were also mounted in a book with dictated captions.

The students went from opposites to space and size concepts, use of pronouns, and sequencing. In the latter, for example, the students photographed each stage of a muffin-baking project and an Easter activity including cooking eggs, coloring them, and making bunny costumes.

Photo projects were shared with parents during home visits by the teacher.

Materials, Resources, and Expenses

Human resources were a speech clinician, classroom aide, and the school media specialist.

The camera used by the children was a KODAMATIC 960 Instant Camera, although other cameras were available in the photography center for the children to use in practice and role playing. The only costs were for the instant camera and the film for each of the 20 children to take five or six pictures.

Outcomes and Adaptation

In addition to helping children expand and use their language skills, the project provided them with photographic skills and led to the development of independence and self-esteem. The teachers said "many students who were reluctant to participate in class activities eagerly volunteered to be a participant when it involved working with the cameras." Pre- and posttesting with a number of instruments verified the students' progress. On the Test of Auditory Comprehension of Language, for example, the children showed an average growth of more than 23 months.

The teachers say that this program could be used as a photography unit but that they feel its strength is in using it as a structure within which skills are taught, learned, and transferred by means of cameras and pictures as tools. Thus, the structure could be used by others to teach a variety of skills and concepts.

Project Title

Learning about People, Places, Actions, and Things

Teacher Eileen Van't Kerkhoff
Locale Marne Elementary School, Marne, Michigan
Subject English
Grade Kindergarten

Purpose and Description of Project

Eileen Van't Kerkhoff used alphabet charts personalized with photographs to teach her kindergarteners the beginning sounds of words, to recognize different categories of words, and to be confident about reading and using words.

Basic materials for the project were four charts, one each for people, places, things, and action words. Each chart included a segment for each letter of the alphabet on which were arranged a large cut-out letter, a photo illustrating a word beginning with that letter, and a printed word identifying the photo. The "J" section of the "people" chart, for example, showed a large letter J, a photograph of all nine students in the class whose names began with J, and a list of their names.

The personalization of the charts is the secret to high student motivation for learning," Van't Kerkhoff explains. "The people photographed are classmates, school workers, or other students. The action photos show students acting out a word. The photos of things are all objects frequently used in the room. The places are rooms and other areas in our school building." And, she adds, students themselves chose the words.

Activities

Once introduced to the concept of the alphabet charts, students brainstormed to come up with words to fit each letter in each category. They especially enjoyed finding names on the "people" chart, says the teacher, and even did research to come up with Quinta and Zeke (which became dolls' names since they couldn't find real people to match). They were equally resourceful when stumped on a classroom object for the letter X and found a dental x-ray to bring to the room.

Students chose the words and subjects that would illustrate them and, although the teacher hadn't really planned on it, wound up taking some of the pictures themselves. Because the kindergarteners were so enthusiastic about an old, filmless camera she brought in, says Van't Kerkhoff, "I got serious and purchased a tripod so that each child could actually shoot a photo of one of the places in our school."

After the charts were assembled and duplicate pictures mounted on separate sheets for easy handling, the children used the materials for a number of exercises. They learned to classify the photos by category, match pictures to the proper letter of the alphabet, and put together the appropriate pictures and words. Other activities included participating in an in-school Easter egg hunt by following signs and forming sentences by selecting a word from each category (people, places, things, action). The project concluded with an evening open house at which the children showed off their work to parents, siblings, and friends.

Materials, Resources, and Expenses

Teacher and students used a 35 mm camera and tripod, which Van't Kerkhoff purchased for \$130. Other cost items were film, developing, twin prints, contact paper, and materials for letters, totaling \$63. Materials available from the school were poster board, letters, glue, laminating, and markers.

Outcomes and Adaptation

Van't Kerkhoff reports that the children's "ability to use beginning sounds is more highly developed than any other kindergarten class I have taught. Their interest in reading words and their confidence in reading is remarkable. All the children feel a great pride in themselves, our room, and the school building."

She advises that the project should work as well for first- or second-graders and could be adapted to any school since the subjects of the photos are drawn from that particular school and are therefore familiar.

Project Title

**Still Photography—
A Visual Learning Tool for Language
Development and Communications Skills**

Teacher Ruth P. Wright

Locale Adams Elementary School, Boise, Idaho

Subject Language Development

Grade Kindergarten

Purpose and Description of Project

Ruth Wright found that the use of photographs stimulated language use, communication, and self-esteem even among shy or insecure children and those with limited language experience.

There were three major elements in her project design: (1) Adults took pictures of the children during their work activities, and these pictures were displayed and then compiled into books with dictated accounts from the children of what the pictures portrayed. (2) During an activity called "What the Third Eye Sees," the children themselves took photos which were sorted, discussed, and critiqued in one-to-one sessions with the teacher. (3) Professional photographs in books, magazines, and newspapers were used to stimulate conversation and humor.

Activities

In the first phase of the project adults photographed the children during various activities, both in class and on field trips. These photos were displayed on a bulletin board or at the writing table, and the children were free to look at and talk about them. The children dictated captions in one-to-one or group discussion with the teacher. The pictures were eventually made into books and placed in the reading center.

In the next segment of the project, which the teacher found the most rewarding for both her and the children, the children began by looking at professional photo books and discussing color, form, shapes, and space. Wright had them imagine "what things would look like if you had a third eye where your belly button is, or if you were a bird or a bug." She then divided the class into two groups for instruction on camera parts and film loading, took each group outside for their initial color shots, and let them loose on the school grounds to select and take their own shots. In one-to-one sessions, the teacher and each child discussed these pictures, and they were then mounted (without the photographer's name) on construction paper. This procedure was then repeated for the taking of black-and-white pictures, with additional discussion and study of light and shadow. Each group also met for a group critique of the second batch of pictures.

Wright now remounted the color photographs in groups according to who took them and had each child invite an older child in school to visit the class and look at the kindergartener's prints. The teacher says that the younger children bloomed under this attention and that the contacts with the older children in many cases extended beyond this specific activity.

The children's photos were also displayed during prekindergarten registration and during the school's science/art fair, and the children took duplicate sets of the black-and-white prints home with them.

The third phase of the program involved finding "silly" photos in various publications. These were posted and used at group reading periods to generate discussion and laughter. The children began to understand the nature of humor as they wrote about these photos.

Resources, Materials, and Expenses

The teacher and a parent volunteer used a 35 mm camera, with KODAK TRI-X Pan Film for black-and-white pictures and KODACOLOR II Film for color prints. The children used KODAK INSTAMATIC X-15 Cameras (borrowed from the school district's teacher resource center) with both color and black-and-white cartridge film. Their photo books were made with plastic-coated wallpaper and laminated construction paper for covers. Color film was commercially developed and printed. Wright had the black-and-white negatives developed commercially and then made nearly 160 prints herself. Her total cost, primarily for film and processing, was about \$270.

Outcomes and Adaptation

Wright found that the photographic experience "seemed to bring success for some children not recognized in other ways. Children who were normally shy in group conversation began to participate." After just two camera-usage experiences, she says, "Children were sensing a photographic vision. I was terribly excited to find that five- and six-year-olds are not too young to begin to communicate through photography."

She says that the program is easily replicable and that the use of an instant camera might well increase the level of response since the children could see their results immediately.

Project Title:

The Secret Camera

Teacher: Bonnie Thornton

Locale: John Jay School, Mount Prospect, Illinois

Subject: Language Arts

Grade: 1

Purpose and Description of Project

This project uses photographs to stimulate creativity and aid in the joint instruction of composition and reading. Thornton photographed each child individually and as they participated in such activities as field trips, art projects, and school programs, and these pictures became her "magic motivators" in getting the students to compose stories, first along with the teacher, and later independently. The children also progressed from dictating stories to the teacher and tracing the words she wrote to actually printing their own compositions.

Thornton found that the project not only enabled children to translate their thoughts into written form but also improved self-awareness and peer relationships. However, she believes that the most telling evaluation of her program was the enthusiasm of the students which was exemplified by the child who brought her a film coupon he had cut out of a magazine. "Here, Mrs. Thornton," he said, "you can use this when you take our pictures. I like it a whole lot when you take pictures of us." (And she used the coupon.)

Activities

Early in the school year Thornton assigned her students a number of manipulative exercises such as sorting old Christmas tree lights by color, working puzzles, and matching upper- and lower-case letters. As they worked they also played "secret camera," which meant that as she took each child's photo, the child pretended to be asleep. After developing, the pictures were mounted on colored construction paper with lined paper below, and in a one-to-one setting each child dictated a story about the picture. Thornton printed the story, read it back to the student, and had the student trace the printed words. The photos and stories were then posted on the wall and each story was read to the whole class.

Throughout the school year, Thornton continued to photograph field trips, art projects, members of the school staff, and various class happenings. The students then followed the same steps as in the initial activity, except that group-composed stories were often used. The same procedure was also followed with pictures from magazines.

Gradually, the children reached the point where they could print their own stories about the subject photos, and in the final development, they began to draw their own pictures and print accompanying stories about both real and imaginary events.

Materials, Resources, and Expenses

"My little first graders were the best resource of all," declares Thornton, since they were her most frequent photographic subjects. She used her own KODAK EKTRALITE 10 Camera and about ten rolls of 110 KODACOLOR II Film, 24-exposure. Other materials were lined paper, construction paper, story paper, pencils and crayons, glue and paste, scissors, and magazines and story books. Film and developing ran to about \$100.

Outcomes and Adaptation

Thornton says that the children improved in such areas as the writing of words, letter formation, spacing, sentence structure, left-to-right progression, punctuation, and composition. Perhaps more important, however, was that "seeing themselves in photographs excited the children so much that they dropped their hesitations and desired to at least try to compose their own stories in print by themselves."

The teacher believes that "this program could be adapted to any grade level as a motivation for creative writing and the furthering of language arts skills." She notes that if funds were short, students could bring photographs from home, and that in higher grades, students could take the photos themselves.

Project Title:

Creating Picture Stories with Instant Photography for Dramatic Play

Teacher: Yvonne Tillman Parris

Locale: Corale Reef Elementary School, Miami, Florida

Subject: Language Arts

Grade: 1

Purpose and Description of Project

Parris' first graders created their own stories, acted them out, and preserved the drama in pictures. In addition to spurring creativity, the exercises were designed to help the children learn sequencing, perfect oral speech, interpret pictures, follow directions, and interact positively with their peers.

Instant photography is an especially good motivator, contends the teacher, because of "its almost magical way of producing images" that enables students to immediately see a visual representation of their ideas and allows the teacher to identify difficulties and provide skill reinforcement right away.

Activities

Parris got her students discussing general areas of interest, such as trees, houses, the school, or the park, and then solicited suggestions for story titles embodying these subjects. Students were assisted in taking pictures that fit the title—taking one topic per week—and arranging their photos in story form. Individual students dictated stories into a cassette recorder, and, in the final step, the class as a whole reviewed and summarized the story. Students divided into teams of six for the photo assignments. They then took their photos around school or on field trips.

Materials, Resources, and Expenses

Human resources included a resource person who came to the class to conduct a lesson on the instant camera, a tour guide for a museum field trip, and several photo dealers "who patiently answered questions," says Parris.

Equipment included one camera for the teacher and 12 children's cameras, film for all, cassette recorder and tapes, crayons and pencils, drawing and writing paper, and paper plates. Total cost of the project (including initial secretarial services) was \$240.

Outcomes and Adaptation

Parris says that through formal and informal testing, teacher observation, and question-and-answer sessions, the children demonstrated knowledge of the basic parts of an instant camera, of the mechanics of taking good pictures, and of the language arts objectives of the program. She also found that the students' "self-worth and self-concept increased tremendously. They were motivated to read their stories on their own and also to do related language arts work in class."

The teacher adds that "this plan can be adapted to any grade level by adding more complex photographic assignments, extending the dramatic play to include the memorization of lines, and requiring characters to wear costumes." And after the one-time expense of buying basic equipment, she believes that yearly costs would be well within most teachers' instructional budgets.

Project Title

Spotlight Special

Teachers Jean A. Monserud, Marjorie Drahn,
Bona Dean Feller

Locale M-F-L Community Schools, Monoma, Iowa

Subject Language Arts/Career Education

Grade 1

Purpose and Description of Project

These teachers used photography in a series of activities designed to improve the self-image and confidence of first graders, involve parents in their children's activities and draw them closer to the school, and enrich the curriculum.

The project was introduced at the school's September open house, which featured "unique ME" displays that focused on the specialness of each child, a bulletin board illustrating camera parts, teacher demonstrations of camera use, and learning centers featuring camera activities. Then, throughout the year, the camera played an important role in a number of activities. For example, each child's family was allowed to check out the camera (receiving instruction in its operation as it was checked out) so that the parents could share in what the child was learning about photography and also in the picture-taking. And, each week a spotlighted child also became a "special person" and the star of a hall showcase displaying the photos taken at home as well as information about the child's interests and qualities.

On the basis of improved skills, the children's obvious pride in various displays, and enhanced school/community relations, Monserud, Drahn, and Feller judge "Spotlight Special" to be a "true success."

Activities

Camera instruction began with the bulletin board showing an enlarged drawing of a camera with labeled parts and a companion worksheet that students took home to share with parents. The children also added to their vocabularies in this exercise as they learned to read and write such words as shutter release and viewfinder lens.

Oral language skills were the academic element in the I or ME posters children made to communicate their uniqueness. These posters, made at home with parent cooperation, covered six categories: about me, my family, three wishes, favorite things, things I don't like, and what I want to be when I grow up.

The weekly "special person" displays included three photographs taken when the family checked out the camera, plus any items which the child chose to express about how he or she was unique, such as toys, drawings, illustrations of favorite TV programs or food,

and books. With parental help, the children wrote captions for these items. Then they were photographed with their showcases and took turns being school photographer for a week.

At the end of the year, each child wrote a story about himself or herself, and these stories, along with showcase photographs from the entire year, were machine copied to make up enough copies of a class-assembled book for each child to keep.

Materials, Resources, and Expenses

The teachers gathered photographic pointers and assistance from the high school newspaper and yearbook adviser, high school newspaper photographer, local camera store staff, and local newspaper editor. A teacher aide and some older students helped with the reproduction and assembly of the children's story and photo books.

A KODAK Disc 4000 Camera and film were purchased using the NEA/Kodak \$200 award. Previously, note the teachers, all the pictures for the children's activities had been taken by a school photographer using the school newspaper camera, and this person continued to take any black-and-white photos that were needed since the disc camera makes only color prints. However, the teachers say they now plan to get their own camera for black-and-white prints next year. Costs were: disc camera, \$48; film and processing for five photos per child \$3 each; projected cost of camera for black-and-white prints, \$80-\$100.

Outcomes and Adaptation

Monserud, Drahn, and Feller say that the children learned to read, write, and spell new words and increased their vocabularies as well as developed organizational skills as a result of their activities in this project. They also learned how to handle a camera, most of them for the first time. And the children produced clear, colorful, and well-composed photographs that thrilled the teachers (who had expected a considerable number of blurs). For the children, report the teachers, the "use of the photography enriched the curriculum by providing a new and exciting experience." The camera "survived beautifully" even though "the very first child to use it dropped it on a concrete floor."

The improvement in school/community relations was demonstrated by the fact that neighbors and friends, not just parents, made a point to visit the school in order to come view the weekly showcases.

The teachers see "spotlight special" as adaptable to any grade or ability level, noting that upper grades could focus on one special interest or use photos to illustrate autobiographies.

Project Title

Teaching Sequence With the Camera

Teacher June M. Case

Locale Evans School, Fond du Lac, Wisconsin

Subject Language Arts

Grade 2

Purpose and Description of Project

Case's goals were to have each child tell a sequential story with photographs and write a sentence or two to caption each picture, and for the students to learn some basic camera skills and recognize the components of a good photograph.

Although "sequencing—figuring out what comes first, second, and third in a logical order—is difficult and not too interesting for most second graders," according to Case, "this program allowed each child to achieve success. Even the slowest learner in the class produced an acceptable story."

Activities

The project began with a visit from the school's audiovisual instructor who showed the children how to use a simple camera, used posters and pictures to point out the elements of a good photograph, and showed the students how to make photograms (pictures made without a camera by placing an object on light-sensitive paper and exposing the arrangement to light to make a design). The children brought items from home, practiced their designs on newspaper, and then made the photograms with help from the teacher and the audiovisual instructor.

The students then discussed sequencing and worked with picture story sequence cards and, at the end of the week, were issued cameras to take home for the weekend and develop their own picture stories. Once the pictures had been developed, the children laid them out in sequence and started working with sixth-grade partners to develop their stories. The older students acted as recorders, taking down the captions dictated by the second graders. Then an aide mounted the pictures on tagboard and typed the students' sentences on pressure-sensitive labels.

The big day came when all the storyboards were completed and each child showed his or her story to the class and read the captions. As Case put it,

Everyone had "show and tell" on this day! The stories were then displayed on a bulletin board and were proudly shown off by the children at the next parent-teacher meeting.

Materials, Resources, and Expenses

Making the photograms required only KODAK Studio Proof Paper and a portable bright light. In doing the sequence stories, the children used KODAK INSTAMATIC cameras supplied by the school's audiovisual department. Materials for mounting the pictures and captions came from the art department. For those interested in replicating the project, Case notes that the cameras would run about \$13 each and that other expenses would be about \$3 per child (10 cents for the photogram proof paper, \$1 for black-and-white film, \$2 for processing, and 15 cents for tagboard and labels).

Outcomes and Adaptation

Case says that "this was one project in which it was not difficult to involve every student. Children who were poor listeners at other times became very attentive when the camera unit was presented. Every one of my 22 students was successful, and each child had a good feeling about himself or herself." She also reports that parents were very supportive, with some even planning special activities for the weekend their children photographed their sequence stories. Parents and other relatives even became part of the stories, as in the cases of stories based on a family trip to a baseball game and on an aunt's home permanent wave.

The teacher points out that similar programs would also be successful in other curriculum areas. Science students, for example, could record the stages of growth after a seed is planted.

Project Title:

Relating Writing and Photography

Teacher: Sara Ann Beach

Locale: A. L. Bristol School, (Department of Defense Overseas Dependents Schools) Argentina, Newfoundland U.S. Naval Facility FPO, New York

Subject: Language Arts

Grades: 2-4

Purpose and Description of Project

Beach's goals were to help her students examine two forms of communication—photographs and the written word—and discover the interrelationship between the two, then demonstrate an understanding of both by taking photographs to illustrate their writings.

Beach concentrated on the specific skills of matching captions and photos, classifying photos by topic, writing paragraphs and stories, identifying the main idea of a paragraph and illustrating it with a photo, and planning the composition of a photo to illustrate a story. In addition, she sought to instill in her students an appreciation of photography as a means of communication and as an art form while piquing their interest in related careers such as photography, writing, illustrating, and publishing.

The students' primary products were photo/essay expressions bound into books or mounted on construction paper. Their work not only met the teacher's expectations, but she also noted outcomes that had not been specifically planned for, such as the building of self-confidence in children whose photos were successful when their attempts at art had not been.

Activities

The project began with discussions of communications in general and photography in particular, examination of photos brought in by the teacher and the students, and exercises in identifying what photos depict. Students went on to match prepared captions with the proper photos and write their own captions for photographs.

Students now learned the basics of photography with assistance from a visiting photographer and went on to write paragraphs and plan and shoot photos to illustrate them. Students themselves posed for the pictures, which were mounted with the paragraphs and put on display. These same steps were then repeated with the more complex task of writing and illustrating a complete story. Students copied these stories into booklets and glued in their photos.

Materials, Resources, and Expenses

Equipment and supplies included five KODAK INSTAMATIC Cameras and about a dozen rolls of 110-size 24-exposure color film, photo collections for study, lined and unlined paper, glue, construction paper, cardboard, fabric, staples, and stapler. Costs of \$275 were for cameras (\$25 each), film (\$50), and developing (\$100).

Outcomes and Adaptation

Beach says that the children enjoyed the project and that it "provided a way for them to practice language skills (oral and written) away from the context of the language book." They were evaluated on the basis of their products by several written forms, and through teacher observation, which showed participation in class discussions, enthusiasm for completing activities, and cooperation with each other.

The project could be easily implemented at higher grade levels, according to Beach. She suggests that students could be asked to write on specific topics, illustrate books of poetry, drama, fiction, or nonfiction, or write and illustrate their own magazines and newspapers.

Project Title:

The Fun-Fangled Filmstrip

Teacher: Debbie Ellis

Locale: Dickerson Elementary School,
Greenwood, Mississippi

Subject: Reading Comprehension

Grade: 3

Purpose and Description of Project

Having observed that even children who do poorly on reading comprehension tests can discuss movies and TV shows with accuracy and enthusiasm, Debbie Ellis decided to take advantage of the situation by involving students in the production of a filmstrip. She felt that, if "students were made aware that all movies, serials, and even commercials begin with a script, they might conquer the printed page with accuracy and enthusiasm" and in the process "develop reading comprehension skills that, once instilled, can be applied to all areas of learning."

The students participated in or were involved with every facet of production of *The Big Race*, the story of a child who suffers extensive teasing by students after losing a race but gathers the courage to enter a track meet and not just win but be gracious to the losers. Ellis says that creation of the filmstrip "did indeed develop reading comprehension skills" and "reinforced positive self-concepts as faculty, parents, and friends applauded the students' hard work at the premiere performance."

Activities

Activities fell into four phases. Students discussed TV programs and writers, read children's stories, and developed their own storyline and characters. The script was written on a flip chart, and students worked out the number and sequence of photographs needed. They then worked on action scenes, costumes, and props and each played a part. Actual photographing took place "on location" at the high school stadium. Ellis, with the aid of another adult, handled the picture-taking.

After making decisions on background music and sound effects, the students recorded their speaking parts and put all the pieces together for their big premiere.

Materials, Resources, and Expenses

Human resources included faculty members who were drafted to play some parts and a coach who provided access to the stadium and dressing rooms. Equipment included a PENTAX K-1000 Camera with telephoto and zoom lenses, two cassette tape players, a record player, and a KODAK CAROUSEL Projector and a screen. Materials were three rolls of KODAK Slide Film (35 mm, ISO 200, 36 exposures), blank cassettes, a flip chart, vinyl letters for titles, pieces of glass used in making credits, and record albums. Cost was \$40, but Ellis notes that this could be reduced by using posterboard and stencils for lettering the credits and borrowing record albums.

Outcomes and Adaptation

Ellis reports that reading comprehension skills were reinforced through development of the story idea, characters, and sequence of events in the filmstrip. Also, the photography helped students distinguish fact from fiction, they came to a deeper appreciation of the use of music to set mood, and a forgotten item at a taping session taught a valuable lesson in dependability.

The teacher suggests that short stories, interviews, and documentaries in any grade level can be presented in filmstrip form to take advantage of most students' visual orientation while also emphasizing the importance of words.

Project Title

The Golden Door

Teachers: Jane Barricelli, Arlene Knittle

Locale: Robertsville School, Morganville, New Jersey

Subject: Language Arts

Grade: 4

Purpose and Description of Project

The three major goals of this project are to promote family pride and help students learn about the immigration process as reflected in their own families, to develop an appreciation and understanding of photography as a means of sharing information and expressing feelings, and to teach photographic skills.

In researching and writing about their families' past and present, the students also improved their investigative, organizational, and composition skills, note Barricelli and Knittle. However, the teachers were most impressed at how involved the students became in finding out how and why people emigrated to this country.

Individual student products were family history books which included autobiographies, biographies, descriptions of home and family, family trees, and time lines. As a group, they created a SOMA poem (a story told with slides and music only) to trace the story of immigrants arriving in America "in search of a dream."

During these activities, say Barricelli and Knittle, "photography was the key that enabled us to unlock the interest of our students in immigration and their own personal family histories."

Activities

Steps involved in developing the family histories were as follows:

- Students studied film and written accounts of the experiences of immigrant families, developed family questionnaires, searched for old family photos, and wrote to relatives.
- A media specialist demonstrated camera use and had students photograph family members, homes, pets, etc.
- Students wrote biographies of parents and grandparents, and descriptions of their siblings, pets, homes, etc. They also developed time lines of their own lives, historical time charts of their families, and family trees.
- Each student created a coat-of-arms for the cover of his or her booklet, laminated the covers, and assembled the completed booklet with written work coordinated to photos.

Activities related to creation of the SOMA poem were as follows:

- To develop common themes of the immigration experience, students shared their family history books, visited Ellis Island, recreated the experiences of their ancestors, and spoke with the U.S. Department of Immigration and Naturalization.
- They drew pictures illustrating why and how immigrants came to this country and showing the flags of countries from which they came.
- After a demonstration of the KODAK EKTAGRAPHIC EF Visualmaker, students made slides of drawings, old family photos and documents, and recent photos (for a "then and now" contrast). They also took slides of each other in costumes from various countries.
- Students selected music to accompany slides, coordinated the visual and audio portions of the slide show, and learned how to use two slide projectors to create "fading in" and overlapping effects that help build feelings and moods in observers.
- Students presented their family history booklets and SOMA poem to the school population at an assembly, to family members at a PTA evening program, and to the community at a Heritage Day program.

Materials, Resources, and Expenses

Human resources included the school media specialist, who demonstrated the camera and the EKTAGRAPHIC Visualmaker usage; another teacher who explained the use of the school's TELEXPLORER Equipment for conference calls; a parent who discussed obtaining passports and visas; staff at the Department of Immigration and Naturalization, the Bureau of Indian Affairs, and Ellis Island; and most important, families who searched through "dusty attics and damp basements" for memorabilia.

Basic equipment comprised four KODAK INSTAMATIC cameras, print and slide film, an EKTAGRAPHIC EF Visualmaker, tape recorders and cassettes, and slide projectors and screen. Cost was \$200 for 80 color slides, 200 prints, cassette tape, and the trip to Ellis Island.

Outcomes and Adaptation

With photography as the motivator, say Barricelli and Knittle, "our goals for this project were not only accomplished but surpassed. Tears in the eyes of the grandparents who watched our SOMA poem were the best testimonial."

The teachers say that they "strongly feel that this project would be beneficial to all students" and add that "in some areas, teachers may wish to emphasize cultural heritage rather than personal family histories."

Project Title

Animating Cats

Teacher: Becky W. Lewis

Locale: A. C. Moore Elementary School, Columbia, South Carolina

Subject: Reading

Grades: 4-5

Purpose and Description of Project

Lewis involved her students in the making of an animated film to enrich their study of T. S. Eliot's *Old Possum's Book of Practical Cats* and to give them practical experience in teamwork and problem solving. And, Lewis notes, "film making is a process loaded with challenges." Students had to figure out exactly what they were going to shoot, make puppets, set up scenes, and manipulate their props so that a series of frames taken in the proper sequence would show apparent movement. They used dictionary skills to understand words in the poems, reading skills to learn how to use the camera, and math skills to compute such things as the number of frames per second of film.

The product of the students' efforts was a 55-foot film with taped narration and music that Lewis says had its "world premiere before an enthusiastic audience of parents and friends."

Activities

Students read and discussed Eliot's "cat poems," listened to the sound track of the Broadway musical *Cats*, and watched animated films, and discussed how they are made. They also read books about animation and studied camera uses and techniques.

Work on the film began with the students drawing pictures of their favorite cats and making two-dimensional puppets from the drawings. The children then used these characters as the basis for a storyboard for their film. They built sets, set up a studio, experimented with filming, and viewed and critiqued their experimental films. Then came lights, camera, action.

Students worked in filming crews of three—one to click the camera, one to manipulate the puppets, and one to record the steps involved and the frames taken. "Here Come The Cats" is the result of their two months of hard work.

Materials, Resources, and Expenses

Human resources included parent volunteers who helped with the puppets and the animation work, a University of South Carolina graduate student in media arts who taught students some of the technical aspects of film making, and the students' instructor.

In making the film, the students used a super 8 CHINON Camera with the capability of taking single-frame exposures, a copy-stand tripod, KODACHROME 40 Movie Film, and a tape recorder. Puppets and sets were made with poster board, felt-tip magic markers, and acrylic paints. A small room in the school basement was set up as a filming studio.

Lewis says that if the camera, copy-stand tripod, and tape recorder can be borrowed, and if the necessary art materials are available from the school, the project will cost only \$72. This is for three rolls of film and developing, lamps, batteries, gray card, reels, and cassette and splicing tape.

Outcomes and Adaptation

In addition to learning the technical skills involved in film making, the students learned to creatively solve problems and to cooperate and compromise, says Lewis. Also, she found "their sustained work resulted in an achievement in which they could take pride." And, of course, the students became intimately acquainted with the poems they were studying. A more general aspect of the project's results, Lewis adds, is that it has helped bridge the gap between literature and today's increasingly visual world.

The teacher believes that animation can enrich almost any curriculum and suggests, for example, that students studying a rain forest could use natural materials to construct plants and animals and film a forest teeming with life. Or math classes could animate numerals, letters, and geometric shapes.

Project Title

**Children Helping Children:
An Audiovisual Presentation Teaching
Students How To Be Friendly Helpers**

Teachers Ron Bloodworth, Karen Howard

Locale Morningside Elementary School,
Salem, Oregon

Subject Guidance and Media

Grades 4-6

Purpose and Description of Project

Ron Bloodworth and Karen Howard's project blend the goals of the school counselor and the media specialist by involving children with special problems in the creation of a slide/tape presentation for use as a training tool in peer counseling.

The eight students selected for this project were chosen on the basis of four criteria: low self-esteem, the need for an alternative educational experience, relationship problems with other children and/or adults, and the potential for leadership. The teachers' goals were to improve the self-concept and school behavior of the participating children while teaching photographic skills and producing an audiovisual program demonstrating how students can help each other.

While the project had not been fully completed by the anticipated deadline, Bloodworth and Howard report that it was "a useful and worthwhile learning experience for the students and adults."

Activities

At their first session, teachers and students played "picture poker," which involved dealing out five photos to each student and having the students write a story based on the pictures and present it to the class. The game is designed to teach visual interpretation, sequencing, and creativity.

Next students learned about the KODAK INSTAMATIC Camera, its parts, and its care as well as good photographic techniques. On a photo excursion outside the school, each student had an opportunity to take at least one shot of a still subject, an action subject, and people interacting. Then the students, who had earlier viewed a slide/tape program and discussed how it was made, worked together to come up with ideas for their theme of "Children Helping Children," ranging from involving a child left out in a game to getting assistance for a sick student. Each of the eight students was assigned to photograph, script, and tape one segment for the presentation, which included finding their own "actors." They all worked on the artwork for the opening and closing frames.

Materials, Resources, and Expenses

Required equipment included INSTAMATIC Cameras, print and slide film, flash units, a copy stand, slide projector and trays, cassette recorders (one with synchronization mode), records, and cassette tapes. Cost items were three KODAK INSTAMATIC Cameras (\$56), flashcubes (\$13), processing (\$46), film (\$32), cassettes (\$4), and slide tray and holder (\$9), for a total of \$160.

Outcomes and Adaptation

The teachers say that even though the project had not been completed by the deadline, the children did exhibit gains in self-esteem and school behavior, and acquired skills and knowledge about photography. Anecdotal evidence from the students themselves supports this view. When students were asked how they felt about being chosen for the project, one said, "I was surprised because I usually don't get picked for things," while another remarked that "I thought they must think I am capable, and I was excited."

Bloodworth and Howard advise that carrying out this kind of project with children of varying abilities and motivation requires a considerable amount of time and individual assistance, noting that schools without resource staff might find this level of commitment unrealistic.

Project Title

Enhancing the Study of Poetry with Photography

Teacher Thomas (Kelly) Sisk

Locale Zweibruecken Elementary #1
(Department of Defense Overseas
Dependents School)
Zweibruecken, Germany

Subject Language Arts

Grade 5

Purpose and Description of Project

After 10 years of teaching poetry," comments Sisk, "I have found that most fifth and sixth graders do not share my enthusiasm at the onset of a particular unit." However, he has found the use of photography such a motivator that he plans "to ask for funds to purchase some school cameras solely for this purpose."

The program began with reading all types of poetry and discussion of various aspects of poetry writing. Students then turned to their own compositions on any of four group-selected topics—school life, life in a military community, family life, and jobs. At the same time, they began learning about the use of a camera from the local base photographer and began to take pictures around school. The students wrote everything from limericks to long, serious poems. Some created the poem first and tailored photographs to their writing, while others took their pictures first and developed verses to accentuate the impact of the photographs.

The students' photo/poetry works were mounted on display screens or in albums and displayed in the school media center.

Activities

Teacher and students brainstormed to come up with the four topics for their poems, read poetry and listened to records, and recorded some of their own writings. The base photographer instructed the children in the use of small pocket cameras and showed them all types of cameras as well as allowing them to operate various pieces of equipment at her studio and develop their own photograms. Then, during class photo sessions, students took turns acting as photographers and models.

The students' final mounted compositions have drawn many favorable comments, according to Sisk.

Materials, Resources, and Expenses

Most of the cameras used were the property of the students' families and were primarily 126 or 110 pocket cameras. Sisk purchased one roll of film per child and flash equipment for those without automatic flash. The few students without cameras borrowed either Sisk's personal camera or the school camera. Sisk says \$200 covered the photographic equipment and supplies he purchased. The photo albums, tagboard, etc., were additional.

Outcomes and Adaptation

According to Sisk, "this was one of the most worthwhile projects I have ever carried out with my students." Among the positive results, he found that the students learned from one another, came to appreciate poetry more, began to see photography as a means of self-expression and gratification, and gained pride in their accomplishments from seeing their work displayed throughout the school. He also observed that even "students who were weak in the basic academic areas were meeting success throughout this project."

The teacher says he would like to try a similar experiment in a science class or social studies setting and that the project can easily be adapted to lower or higher grades.

Project Title

**Picture This:
Focus on Calligraphy to Develop Students'
Writing Skills**

Teacher Constance S. Ricchiuti

Locale Warner Elementary School, Wilmington,
Delaware

Subject Language Arts

Grade 5

Purpose and Description of Project

Ricchiuti found that by focusing on calligraphy and recording students' activities, she was able to motivate students to improve their handwriting and improve their composition skills.

Students' primary products were a slide/tape show about the history of calligraphy and a photo-album record of their activities, lessons, and field trips. And along the way, they did everything from making their own inks to doing tombstone rubbings and learning to write in Chinese and Arabic. The use of cameras was integral to these positive experiences, says Ricchiuti, who notes that the students were fascinated and awed by the KODAK EKTAGRAPHIC EF Visualmaker, pleased at the disc camera's almost foolproof operation, and especially delighted with the instant camera because the picture developed "right before their eyes." Photos were taken by either teacher or students, depending on the activity involved.

Activities

Students were presented with calligraphy as a fun way of improving writing skills. Her initial inspiration for the project was a former student who, as a fifth-grader, had researched calligraphy for a reading project and became so proficient through self-teaching that just a year later, she acted as an instructor for the project.

The class began by discussing calligraphy, looking at samples, and gathering items for a classroom library of hands-on calligraphy materials. Then they were instructed by the sixth-grader and practiced writing using her supplies. Soon, however, they started making their own ink, based on a recipe from a chemistry teacher, and cut gull feathers to make quill pens. Pictures were taken throughout these activities.

For their slide/tape show, students developed a list of subtopics related to calligraphy and divided into small groups to gather information and write scripts. At this point they were introduced to the EKTAGRAPHIC Visualmaker.

The highlight of the project, says the teacher, was a field trip to a cemetery where students made rubbings of the headstones and tried their hands at writing epitaphs. The final activity was learning to write Arabic and Chinese, which also gave two minority students in the class a chance to share their cultures.

Materials, Resources, and Expenses

Primary human resources were Ricchiuti's former student who taught calligraphy, a high school chemistry teacher who devised ink recipes, and a parent who acted as photography adviser.

Cameras used were a KODAK EKTAGRAPHIC EF Visualmaker, a KODAK Disc 6000 Camera, and a KODAMATIC "PARTYTIME II Instant Camera. A 35 mm camera was also made available for any last-minute slides that needed to be added to the show. Film was KODAK EKTACHROME 126 and 135 for slides, disc film, and KODAMATIC Instant Film HS144-10 for pictures.

Students' individual activities were accomplished through supplies available at school as well as parchment (reserved for special assignments), alcohol and ammonia for cleanup, smocks to protect clothing, and glycerol, various methyls, powdered methylenes, and stains to make the ink. The program cost \$125 primarily for film and processing since most equipment and supplies were available at school or borrowed.

Outcomes and Adaptation

According to Ricchiuti, students' activities and products demonstrated that they had become more cognizant of the basic principles of good handwriting, become knowledgeable critics of their own performance, and improved their ability to write neat, legible, coherent paragraphs about an assigned topic. The use of cameras to carry out the project "brought it to life" by visually recording the children's experiences, concludes the teacher.

Ricchiuti also advises that many features of this project are transferable to entirely different applications. Ink-making adapts to chemistry, tombstone rubbings to art, and the making of quill pens to ornithology.

Project Title

A Picture Is Worth A Thousand Words

Teacher Anita Crane

Locale Melvin H. Kreps School, East Windsor,
New Jersey

Subject Language Arts

Grade 5

Purpose and Description of Project

Anita Crane used photography to give her students an experiential basis for their creative and expository writing so that their work would gain authenticity.

The students were given assignment sheets along with 16 photo-writing sheets, envelopes in which to store photos, and journals in which their compositions and one or two related photos could be mounted together. Examples of the coupled assignments include photographing a group of people and using the photos as the basis for an imaginative story, shooting facial expressions and inventing reasons for the smiles, frowns, etc., and acting out a newspaper story for the camera and then rewriting the article with new characters and a new ending.

Activities

To learn about photography, students made pinhole cameras and saw a demonstration of darkroom procedures. These experiences led directly to the first items on their assignment sheets—photographing the construction of a pinhole camera and writing about how pictures are developed.

Students carried out other assignments at the rate of one or two a week and went on photo excursions in groups of three per camera. Each member of a group took three pictures and relied on the others for support and ideas. The class looked at the resulting pictures, identified their subjects, pointed out what they liked, and also discussed the journal assignment. One or more pictures from each assignment were mounted in each student's journal.

The final activity of the project went beyond the assignment sheet and involved a walking tour of a local duck pond. Students could photograph and write about anything they wished, which was designed to demonstrate their ability to use their imaginations and combine what they had learned from other assignments in a new way.

When the school had a curriculum fair, the students chose their favorite photos and compositions to be mounted for display. Their work was also featured by a local newspaper and the school TV news program.

Materials, Resources, and Expenses

An art teacher instructed the students in photographic composition and helped them make pinhole cameras. The assistant principal, a professional photographer, also shared his expertise.

Students used three 35 mm cameras and an occasional KODAK INSTAMATIC™ Camera. Crane purchased one of the cameras for \$50 and spent about \$350 on film and processing. She used a darkroom to load photo paper in the pinhole cameras and developed those pictures in her bathroom.

Outcomes and Adaptation

Crane reports that the students were highly motivated by the involvement of cameras in their writing assignments and felt special because they were allowed to go anywhere on the school grounds to take pictures. She says that they developed considerable photographic know-how through trial and error and that they've gained new perceptions of things around them. Writing a journal based on their photo experiences also motivated them to use correct grammar, punctuation, and sentence and paragraph form, according to Crane.

She advises those interested in replicating the project that when she repeats it, she intends to engage in fewer activities so that she can concentrate more on students' writing styles.

Project Title

A Visual Representation of Speech Sound Positioning

Teacher S Wayne Butler

Locale Mountain View School, Brigham City, Utah

Subject Speech Therapy

Grades K-5

Purpose and Description of Project

The objectives of Wayne Butler's project were to (1) photograph students' mouths as they pronounced various speech sounds, (2) compare the pictures with accepted sound-production positions, (3) encourage students to practice using the correct positions, and (4) photograph students with oral deviations and alert teachers to watch for similar problems in other students.

Butler was able, with some adjustments in anticipated methods, to carry out all four components of his project, and his work also stimulated other photo-based activities in the district.

Activities

Butler had originally envisioned photos of just the mouths of the students, but he found that they seldom sat still long enough for the focusing required for extreme close-ups. Pictures showing more of the face were not only easier to get, he found, but also made it easier for students to recognize orientation points. Without eyes or noses to go by, students frequently looked at the pictures upside-down.

The teacher had students examine the correct mouth positions for making various sounds and also use a mirror to adjust their own sound formations. An additional resource in this activity was a commercially produced set of Form-a-Sound cards, which led Butler to also make up sheets containing pictures of correct and incorrect facial positions shown together, as well as written hints for making various sounds correctly.

The teacher's idea of putting a small mirror on each student's desk so that he or she could practice during the day just didn't fly. Students were embarrassed, and the mirrors were frequently "accidentally" broken. Repetitor picture hang-ups, magnetic buttons, and band-aid reminders on toothbrushes—all for use at home—comprised a successful substitute.

The fourth objective, photographing examples of oral deviations and sharing these pictures with classroom teachers, posed no difficulty.

Materials, Resources, and Expenses

Materials and equipment included a CANON AE-1 Camera with flash attachment, copy stand with floodlights, close-up lens, slide film and KODAK TRI-X Pan Film, a tripod, and a shutter-release cable.

Outcomes and Adaptation

Butler reports that students, teachers, and parents responded to his program in a positive manner. The project also stimulated other activities. Butler himself was inspired to make slides and a filmstrip of a booklet he had written earlier entitled "It's YOUR Voice," which was an attempt to get students to understand that problems can result from excessive use or abuse of their voices. The presentation was shown to all kindergarten and first grade classes in the district, and Butler says a noticeable reduction in classroom noise has resulted.

Other new photo-related activities resulted from Butler's work. One involved a fifth-grade teacher who traced silhouettes of his students by using an opaque projector and black construction paper. Another involved a principal who is getting to know his students better via a card file with each student's picture, name, birthday, and telephone number.

Project Title

**Community Search:
Navajo Students Explore Elements of Their
Community and Surrounds**

Teachers Bruce Hucko, Paul Pitts

Locale Montezuma Creek Elementary School,
Montezuma, Utah

Subject Language Arts/Social Studies

Grades 5-7

Purpose and Description of Project

This project combines photography and language arts to both increase students' communication skills and enhance their awareness of and respect for their community. Under the guidance of Paul Pitts (teacher/writer) and Bruce Hucko (photographer/artist-in-residence), the students explored their community on the Utah Navajo Reservation.

Students photographed and interviewed their parents at work and also produced photo essays about sites of local, historical, mythological, or scenic significance. Finished pieces were mounted on poster board so that they could either be displayed, shared by teachers in various social studies units, or bound into a comprehensive "Community Search" book.

Hucko and Pitts believe that the project not only helped students learn to transfer their thoughts, which are in Navajo, into English writing, but also brought them a greater understanding and appreciation of their roots.

Activities

The 26 students involved in the project produced 19 jobs and services articles and seven pieces on places to go. They began by studying photographic and interviewing skills and researching their topics to produce a "prewrite" of all they knew before doing their interviewing. Students worked in teams of two and had the opportunity to be both journalist and photographer.

Once students had interviewed their resource people, they worked on constructing first drafts from their notes while Hucko processed their film. After these drafts were submitted to Pitts and polished, students entered their articles on the school's APPLE II Word Processors. Final copies were made by the computer. Each student team then met with Hucko to select the best of their photos to go with the article and, after a demonstration of darkroom techniques, printed the photos. Final articles and photos were mounted on 14 x 22-inch poster board.

Materials, Resources, and Expenses

Pitts and Hucko say that "the indispensable human resources for the project were the parents and community members who took the time to make each interview so memorable."

Equipment and supplies included two 35 mm cameras, black-and-white film, developing chemicals, photographic paper, and the school darkroom. The \$200 in grant money was spent on film, chemicals, and photographic paper.

Outcomes and Adaptation

Pitts and Hucko found student growth in the three main skill areas emphasized: inquiry, which involved drawing people out during interviews, notetaking, which meant filtering out essential facts and emotional responses, and organizing, which involved grouping information and photos in logical order. They found the finished pieces well organized, with written information well matched to visuals, and said that "the act of photographing focused students' attention on the subject matter, which led to more detailed writing." However, they believe that the most important outcome of the project was the reinforcement of positive relationships among students, parents, and community members.

The teachers say that "such a project is valid for all communities" and could probably work even better in areas without a language barrier.

Project Title

Creative Story Illustrated with Slides

Teacher Marilyn B. Nagel

Locale Devlin School, Havre, Montana

Subject Language Arts

Grade 6

Purpose and Description of Project

This project allowed Nagel's students to put into practice the story-writing skills they had learned by creating a slide/tape version of their own composition. She believes the project not only honed their language skills but also was instrumental in increasing the students' ability to work together and deal with criticism.

Students were first divided into groups, each of which wrote a story and shared it with the entire class. The students as a whole then selected the story that they liked best and that would best lend itself to visual illustration. They revised and polished the story as a group and selected the scenes to be illustrated. Preferring to make drawings to be photographed, the students rejected the idea of posed pictures. Then they learned the basic functions of a camera and copy stand to carry out their plan.

Students then edited and sequenced the slides, recorded music and narration, and made a final check of the completed product. Their product, "Leprechauns vs the Past," has been a big hit with other classes and with parents, who were invited to an evening showing.

Activities

Once the students had selected the one story they wanted to develop and made initial revisions, Nagel transferred it to transparencies for an overhead projector so that it was on view for further group editing. This operation was repeated at various stages of story development so that students could see their oral suggestions take shape. During this process, the children learned proofreading and pointed out errors in mechanics to be corrected.

With the story in final form, students selected the points they wanted to illustrate and the medium for each illustration, put these ideas on paper, and cut them to uniform size. The next steps were listening to readings by class members and voting on their choice of the person to do the narration, creating credits for the slide show with vinyl letters and construction paper, and picking background music. Now, the class was ready for the big event--the camera work.

Nagel spent three days introducing the students to the functions of a 35 mm camera, lenses, a copy stand, and a cable release. Two days were devoted to photographing the illustrations, with students working two at a time with the teacher. After the slides were processed, the class put them in sequence and chose the ones to be used in the final product. The last activity involved only the narrator, the student in charge of music, and the teacher, who put together the audio portion of the slide show.

Materials, Resources, and Expenses

Primary human resources were a local camera specialist and a professor from Northern Montana College, both of whom shared their photographic expertise.

Equipment used included the teacher's 35 mm CANON AE-1 Camera, KODAK EKTACHROME 160 Film (Tungsten), close-up lenses, cable release, copy stand, overhead projector and transparencies, slide projector, THERMOFAX copy machine, nonglare glass, cassette tape and recorder, and typewriter. The children used paper, pencil, crayons, felt markers, scissors, dictionaries, and vinyl letters. Total cost was about \$140.

Outcomes and Adaptation

Nagel says that of all the techniques she has tried in order to get students interested in writing stories, this project has been the most successful by far. "The students tactfully helped each other, put their writing skills to use, and enjoyed themselves while learning," she states. And she was especially pleased that "the students *all* worked together for an end result that seems to have given each child a positive feeling of success."

Nagel believes that the "basic ideas of this project would easily adapt to any classroom setting" and suggests that others might prefer to have the children pose for illustrations rather than make drawings.

Project Title

Fantastic Slide Show Festival

Teacher Michael V. Kloehn

Locate Wildwood Elementary School
Federalway, Washington

Subject Reading Language Arts/Art

Grade 6

Purpose and Description of Project

The products of this project are student-created slide tape presentations that reinforced the study of the elements of plot, theme, and character in a dramatic context, allowed students to put theory into practice, and required them to use conceptual and other critical thinking skills.

In order to produce these slide dramas, Kloehn explains, each student had to select a theme and write a script which was turned in to the teacher. He then chose 14 scripts from the two sixth-grade classes for the actual production phase. While all students' work did not make it to "the stage," everyone was involved in the production of the scripts that were used.

Culmination of the project was a "Slide Show Festival" presented to the school's student body, which then voted on winners in nine categories ranging from slide show of the year to best voice. And during the week in which Hollywood's Academy Awards program was shown, Kloehn's students had their own awards luncheon.

Activities

Following review of basic concepts, students selected themes and developed story lines based on a chart progressing from the setting of the scene to the introduction of conflict, the climax, and the resolution. They then developed rough drafts and polished their work. Once 14 scripts had been selected for production of slide shows, the authors chose production crews from among the other students and broke their scripts down into scenes. After getting pointers from a professional artist on how to set a scene and use props, the students decided on a medium to create their characters, some choosing plasticine clay figures and others using paper figures.

Each production team then divided the script into frames for actual shooting. Because "we were shooting 14 scripts, some with as many as 70 frames," Kloehn says, he opted to do the shooting. New teams were chosen for the soundtrack phase of the project and cassette tape recordings were made. After the slides were developed, students arranged them in sequence, created title frames on the school's computer, and prepared for their big showing. The festival was held in the school gym over two days, 45 minutes per day.

When the ballots were tabulated, winners accepted plastic trophies at their awards luncheon. Four of the shows also represented the school at the district's annual Young Authors Conference.

Materials, Resources, and Expenses

Production of the slide shows required a 35 mm camera, slide film, cassette recorder, cassette tapes, microphones, slide trays and projector, construction paper, tag board, cardboard boxes, clay, colored pens, paint, plastic trophies, and outside slide processing. Kloehn estimates the cost of each 36-frame slide show at \$20, or \$280 for all 14.

Outcomes and Adaptation

The teacher evaluated scripts according to a point system involving various criteria such as plot elements, theme, character development, grammar, spelling, syntax, paragraph development, and originality and creativity. However, he believes that the most important outcome of the project was that "students entered the realm of process and creative application." "Their motivation is demonstrated by the fact that they were willing to work on the project outside of regular school hours," he adds.

Kloehn says that the project can easily be adapted to fit other grade levels or subject areas. In social studies or science, for example, students could create visual reports on a specific subject. A variation Kloehn himself is considering is having students use prints rather than slides and illustrating books they write.

Project Title

Our World: Past and Present

Teacher Charles Yonce

Locale Macon Middle School, Franklin, North Carolina

Subject English/Science/Social Studies

Grade 7

Purpose and Description of Project

Working with a team of teachers, Charles Yonce has developed a series of "local studies" units designed to use the community as a classroom and laboratory to study English, science, and social studies. The wide range of activities related to these study units has received funding from other sources in addition to the NEA/Kodak grant, but Yonce says photography has played an important part at every stage of this project. Student activities have been documented in photos and slides, and the youngsters have created a number of photo displays and slide/tape shows.

Yonce's primary goal is to get students out of the classroom and into the community to learn a variety of things about their physical and cultural environments and their heritage. In addition to fulfilling academic goals, the teacher wants to show students how local culture, tradition, and skills are related to facts and concepts in textbooks and to help them develop personally in such areas as poise, responsibility, and self-esteem by having them take charge of activities and work with community resource people.

Thus far, students have been involved in organic gardening, soapmaking, school beautification projects, historical research with primary sources, study of British and American folk music and regional country-western music, and an ecology/conservation field day. Yonce is a dedicated proponent of hands-on learning, saying, for example, that a few sessions "making soap or planting and caring for an organic garden taught the children more about science than they could have learned in weeks of textbook learning."

Activities

The following summaries briefly touch on some of the students' local studies activities:

- **Organic Gardening**—with the help of a local gardening club, students laid out experimental plots on school grounds. They learned about regular planting, intensive cultivation, natural and artificial fertilizers, mulching, and farming techniques of past times and other countries. A slide show is being compiled.
- **Beautification**—students worked with the parent-teacher organization, which donated flowering shrubs, to landscape and otherwise beautify the school grounds.

- **Soapmaking**—in practicing this pioneer skill, students learned chemistry, biology, and history. Each took home a cake of soap.
- **Studying History with Primary Sources**—highlights were compiling family histories, searching old records, finding old photos, taping interviews, and entering a creative writing contest focusing on heritage. Students also learned about using documents, photos, and artifacts in historical analyses.
- **Folk Music**—students studied the musical traditions of the Appalachian region from a number of angles. A country music bandleader discussed the origins of regional music and instruments, sang, and demonstrated performance styles. Two other guests discussed British folksongs and how they evolved into American versions. Next year, students will make such traditional instruments as dulcimers and photographically document the processes.
- **Ecology/Conservation Field Day**—seven resource teams from four government agencies set up activities at a nearby federal game preserve and campground. Students learned about such things as providing forage for wild game and controlling erosion. A slide record is being developed.

Materials, Resources, and Expenses

The project has involved a series of government agencies, community and civic groups, and individual experts too numerous to mention. They range from the National Humanities Faculty and the North Carolina Archives to individual scholars and performers. Yonce notes that the school has a camera and audiovisual equipment and that many of the materials needed for other aspects of the projects have been borrowed or donated.

Outcomes and Adaptation

Yonce says that students involved in these local studies activities have done at least as well on tests and reports as students doing traditional classwork and that "the interest, enthusiasm, and amount of self-initiated work are greater." He adds that photography is "a very valuable tool for a local studies course. It allows creative expression while teaching some very specific skills of observation and analysis. It is especially valuable for students who lack verbal skills."

The teacher feels that a local studies course could be implemented in any school system and adapted to take advantage of the particular resources and kind of environment available locally.

Project Title

Using Photography as a Prewriting Experience in a Middle School Remedial Composition Class

Teacher: Marcia Maeda

Locale: Windsor Middle School, Windsor, Colorado

Subject: Language Arts

Grades: 7-8

Purpose and Description of Project

Marcia Maeda had her students photograph topics for composition assignments in order to help them focus on a specific subject and get used to providing details in their writing.

Having observed that when a student brought photos to class, he or she became the center of attention, Maeda decided to take advantage of this attention-getting device to focus students' writing skills. She says this approach is especially useful with students who have expressive language problems and have not had much past success at writing. Once students learn to focus on a subject to take a picture, she says, they can transfer that skill to writing. She also found that students continued to consult their photographs for details or inspiration as they wrote and revised their assignments.

Activities

Students were given two kinds of writing assignments—unstructured practice writing in their daily journals, and weekly structured paragraphs. Either before or during an assignment, they took pictures of their subjects, which could be their rooms, families, most treasured possessions, pets, or leisure activities.

The class was divided into two editing groups. Each group received copies of the other's papers. Each writer read his or her paper and classmates commented on its general quality or need for improvement. Students were then paired for editing of mechanical errors and preparation of final drafts. To help students feel more at home in their editing groups, the first assignment was an informal written biography, which involved pairs of students in photographing and interviewing each other.

Materials, Resources, and Expenses

The only out-of-school human resource was a former professional photographer who shared his experiences and pictures with the class and discussed various jobs involving photography. Students used a POLAROID 660 Camera to take their pictures. Cost of the camera and six twin packs of film was \$200.

Outcomes and Adaptation

During this project, according to Maeda, students learned the value of proofreading and revision. They also learned to view their peers as an audience, to use details in composing, and to concentrate on a specific subject in a paragraph—all while using the camera as a motivational tool. As the teacher explains, "when they took pictures, they were thinking about their subjects. When they showed the pictures to their friends, informal discussion took place. It then seemed easy to put those thoughts down on paper."

Project Title

What Makes Me Unique

Teacher: Anna Dahinden

Location: Vaughn Public Schools, Vaughn, Montana

Subject: Language Arts

Grade: 7-8

Purpose and Description of Project

Dahinden's goals were to make students more aware of themselves and their surroundings and to help them learn to express this awareness in words and photographs. Junior high students are on the verge of adulthood and are testing their individuality, she explains, so a project that teaches them to consider and communicate their unique qualities without embarrassment is especially suitable.

The students started out by writing about themselves in five areas selected by Dahinden—hobbies, travel experiences, peculiarities, special talents, and being a Montanan. This information formed the base for the five compositions they would write and illustrate with photographs to complete individual workbooks. The photos also had to fall into each of five categories—a story picture, a picture to inspire poetry, a photo showing facts to support a statement, a photo that is simply beautiful in its own right, and one picture or a series expressing why being from Montana is unique for a particular student. The students learned about photographic techniques from a professional photographer who visited their classes, took a tour of a photo lab and watched their film being developed, and went on a field day to expand their photo opportunities.

Students' final products were individual workbooks with five stories and five correlating photos. Within the broad guidelines set down by Dahinden, they were allowed considerable freedom of choice and expression. The teacher found that the students not only met expectations in such areas as outline writing and correct grammar and spelling, but approached the assignments with enthusiasm, unusual ideas, and amazing diversity.

Activities

The teacher guided students through the first exercise, which was writing about their hobbies, and then let them follow through on the remaining topics on their own unless there was an obvious need for assistance. This initial guidance took the form of classroom discussions—a talk about the teacher's hobby, tentative hobby lists that were reviewed in one-on-one sessions, and the checking of student outlines for their compositions. Once the students actually began writing about themselves and things they were interested in, says the teacher, "They worked hard and found it enjoyable."

Assessing students' responses to this writing-photo project, the teacher reverses the old saying and concludes that "Words can create a thousand pictures in our own minds, each unique to its viewer."

Materials, Resources, and Expenses

Dahinden believes that the work of two other teachers, one who gave a unit on values clarification and another who got students thinking about career goal-setting, helped create a foundation for her work focusing on student individuality.

Students used a variety of available cameras—110, 126, and 35 mm cameras, disc cameras, and instant cameras. Her only costs were for film and developing.

Outcomes and Adaptation

Students were graded on proper use of outlining, grammar, spelling, and fulfilling the five written and photo requirements. Each project was also judged as a whole on the basis of observation and student evaluations. Dahinden believes that the use of photography helped stimulate creativity, encouraged students to express how they felt "without worrying that someone would think they were weird," and was "an important aid in their search for identity in their fast-changing world."

She adds that the project can be altered to suit the requirements of virtually any subject area including health, history, career education, book reports, social studies, and science.

Project Title

Cameras in The Curriculum

Teachers: Sue Randolph, Barbara Peck

Locale: Paducah Middle School, Paducah, Kentucky

Subject: Communications and Media

Grades: 7-8

Purpose and Description of Project

The project involved the use of both still photography and video taping for students of the school's practical arts career education program, gifted and talented classes, and yearbook.

According to Randolph and Peck, the practical arts classes had already studied the free enterprise system and the importance of advertising to this concept, learned basic camera techniques, wrote and produced a TV commercial on videotape, and compared print with TV advertising.

The gifted and talented students studied photojournalism and creative photography, in special camera effects using a 35 mm camera, and film processing. They also studied magazine layouts and produced an ad about a special school event.

The yearbook students took on extra assignments involving action photography and candid shots.

Activities

Activities centered around five topics: a study of deceptive advertising, production of TV commercials, production of print advertising, camera use and photographic techniques, and darkroom techniques.

The study of deceptive advertising exposed students to such techniques as "weasel words" and vague claims and taught them to carefully analyze what they hear and see in the media. Students each chose what seemed an especially deceptive ad and wrote to the company placing the ad to point out the deception and suggest improvements.

To improve their TV commercials, students worked in teams of two or three. Each team produced a 60-second videotaped commercial with all members of the team experiencing both acting and production roles. Work was done in the practical arts department's closed-circuit TV lab. Students learned about camera operation, staging, timing, and organization.

Students who developed magazine ads were led through the entire procedure by a graphic arts technician from a local printing company and learned the importance of both content and form. Their completed ads were printed and posted around the school.

In the camera use and darkroom activities, students learned about snapshot and SLR cameras, composition principles, editing skills, creative photography, the development of three different kinds of film, making contact sheets and test strips, exposure time, and ways to create special effects.

Materials, Resources, and Expenses

Class presentations were made by four TV-station staff members (an advertising representative, commercial production coordinator, anchorperson, and camera operator), a graphic arts specialist, a photography hobbyist, and a newspaper photojournalist.

Randolph and Peck did not provide an estimate of the costs of this project for others because the types of equipment that could be used vary so widely in price. Virtually everything they needed was available at their school. The closed-circuit TV lab includes three PANASONIC Black-and-White Cameras, a mini-console with basic special effects, overhang microphones, and adequate lighting. They note that commercials could be done with a one-camera system and videocassette recorder. The gifted and talented classes have a darkroom with the equipment necessary for black-and-white film development and print enlargement. The school also has three 35 mm cameras and supplies most of the film, and basic art supplies are sufficient for producing the magazine ads.

Outcomes and Adaptation

Students involved in this project have learned technical skills in a variety of areas, have become more analytical about what they hear and see in the media, and have become more aware of the role of advertising in a free enterprise system, according to the teachers. The activities have also "motivated some students to get excited about school who have not otherwise been involved or participated in class," they add. And they believe that "the potentials of creative photography in any classroom are infinite."

Project Title:

So Your Family Is Moving To Newburyport

Teacher: Dorothy V. Clarkson
Locate: Rupert A. Nock Middle School
Newburyport, Massachusetts
Subject: Language Arts, Social Studies
Grade: 8

Purpose and Description of Project

Looking for a device to get her students to look at their hometown in new ways, Dorothy Clarkson came up with a letter from an Ohio youngster who was moving to Newburyport and wanted to know more about the community from a "kid's eye" point of view. From discussion of this letter (which the teacher finally admitted was fictitious) came the idea for a slide presentation focusing on four aspects of the town—geography and history, recreation, fun and food, and education.

The 20 students were divided into four teams, then scouted the town for picture ideas, took the pictures, and wrote a narrative for the show which was titled "So Your Family Is Moving To Newburyport." And, as a result, says the teacher, the students "developed an appreciation for the city as a fascinating and historical place to live."

Activities

Students discussed their city and what makes it special, selected their four areas of focus, and divided into four groups. Each group drew its assignment out of a hat and worked out individual tasks and schedules. Then, after being instructed in camera use by the owner of a local photography studio, the students shot slides over a three-week period. They critiqued their slides and group leaders selected and organized the 54 final choices for the presentation.

Another team of five, made up of students with particularly good writing skills, developed a narrative to go along with the slides. The finished product received "an enthusiastic reception" from other students.

Materials, Resources, and Expenses

In addition to the photo studio owner, human resources were the "patient parents who drove eager photographers around town to their assignments," says Clarkson.

The students used four KODAK X-15F INSTAMATIC Cameras, 20 rolls of KODACHROME Slide Film, 126-size and a KODAK CAROUSEL Projector and screen. The cameras cost about \$90.

Outcomes and Adaptation

Clarkson says that students not only learned to use organizational, analytical, and creative skills but "learned many things about their city and about each other and took considerable pride in their final product."

She adds that the project could be used in any language arts, social studies, or civics class and could be adapted to focus on different aspects of a city such as ethnic neighborhoods, industrial development, or different periods of architecture.

Project Title

Creative Writing—Point of View

Teacher John C. Lutz III

Location Lincoln Junior High School,
Lancaster, Pennsylvania

Subject English

Grade No grade given

Purpose and Description of Project

Lutz decided to teach his students narrative and descriptive writing by exploring a point of view through personification of an animal or insect, that is, he had students take on the role of that creature and write about what it would see, do, or feel.

Students researched their chosen subject's habitat and behavior, photographed the habitat, and developed slide or oral narrative presentations about the animal or insect that had been chosen. With the assistance of colleagues, Lutz evaluated the presentations on the basis of English composition proficiency, scientific accuracy, and artistic expression.

As a result of the project, the students' writing did improve, reports Lutz, even though virtually all the students had initially viewed writing "as a chore that ensures failure." And although many had been "unwilling to express even their own point of view," he recalls, they were gradually able to take on the role of an animal or insect. The biggest leap of progress in this effort, the teacher says, occurred when the students went outdoors to look for the habitats they would photograph.

Activities

In the first phase of the project, the primary concern for students was learning about the habitat and characteristics of the animals and insects they had chosen. Students gathered information on physical description, type of habitat, food source, and life span, entered the data on a prepared worksheet, and wrote essays about a day in the life of their subjects.

The second phase was designed to help students begin taking on the personas of their creatures. Lutz drew a crude map of the area around the school soccer field, and the students, each armed with a copy of the map, went out to look for probable habitats and marked the sites on their maps.

The third phase saw the students making lists of 20 or 30 possible photo opportunities and shooting as many of these as possible. Lutz says he was surprised at the creativity students displayed, such as using found items to provide special effects. One, for example, held a piece of film so that the photos seemed to depict an animal's view from its hole.

In the final phase the students sorted and arranged slides into logical order for their shows, developed narration, and wrote compositions describing the soccer field from the animal or insect viewpoint.

Materials, Resources, and Expenses

Major human resources were the school librarian and the art and science teachers who made suggestions and helped evaluate the slide programs. Photo equipment included three 35 mm cameras and two KODAK INSTAMATIC Cameras, a 5F multivision filter, color slide film, and a macro lens for very close work. To carry out the project for three classes, Lutz spent about \$305 for film, developing, and the 5F filter.

Outcomes and Adaptation

Lutz says that photography aided the students in transcribing their thoughts and eased the transition from the abstract to the concrete as it enabled them to provide a better description of a given area. Both writing skills and motivation improved.

Since this project, although designed for an English class, directly incorporates science and art, it would be particularly well suited to replication by teachers of these subjects.

Project Title

The Pen Is a Camera

Teacher: Katherine Watson

Location: Phoenix School, Tempe, Arizona

Purpose and Description of Project

Katherine Watson used photography to stimulate her students to more creative, insightful, and detailed compositions, including essays, short stories, and poems. She tried to make them aware of the "high correlation between the art of photography and the art of writing" and pointed out that such photographic terms as focus, composition, detail, perspective, point of view, tone, light, angle, distortion, foreshadowing, image, and subject are equally applicable to literary works.

Activities

Watson gave a wide variety of assignments in her effort to have students demonstrate for themselves the interrelations of words and pictures. She sometimes had them both photograph and write about a subject such as themselves, family heirlooms, athletic events, a dune-buggy race, or a hot-air balloon flight.

At other times, students were asked to begin with a literary passage and take photos to match the mood and content of the piece or write about how they would photograph a fictional character if they had the opportunity. On other occasions, assignments were based on photography books, and students were asked to examine a picture, explain its emotional impact, and describe technical aspects of the photograph, such as lenses, angle, light, and perspective.

Materials, Resources, and Expenses

Watson used photography books for inspiration and technical advice.

Outcomes and Adaptation

Watson said that her "goal" was to help her students believe that "writing is not just a job" but a "craft" and that "writing is a way of life." She said that "the most vivid compositions that were left with my students will remain beautiful to them because they opened their eyes to see, their minds to write, and their hearts to feel."

Project Title

Visions in Pride

Teachers: Carolyn Bantam, Jan Ristow

Location: Lincoln Northeast High School, Lincoln, Nebraska

Year: 1984

Grade: 10

Purpose and Description of Project

Carolyn Bantam and Jan Ristow's students created photo essays highlighting the "contributions of typical workers to our community" for display in public places. In the course of the project, say the teachers, the students not only learned photography, interviewing, writing, and editing skills but how to work together, deal with strangers, and understand "the relevance of work and workers to their own lives."

Students began by writing about jobs they themselves had held and then each "shadowed" a worker during a typical day and wrote about that job experience. From this pool of choices, the classes chose 13 workers—from a soybean researcher to a band director—as the focus of their displays.

Activities

To get students thinking about the "tasks of ordinary people as being productive and interesting," the teachers first assigned students to write personal narratives about jobs they had held. Next students chose an adult to "shadow," arranged appointments, and studied interviewing techniques. Their choices varied widely, one student spent the day with a registered nurse and saw a baby within minutes of delivery, another rode in a police patrol car.

Students then wrote narratives based on their experiences, and the two classes evaluated the essays to choose the 13 to be used in the photo displays, one class selecting on the basis of the quality of the writing and the other according to the uniqueness of the worker's job and contribution to the community. To complete the project, students were divided into committees—photographers, an editorial board, a display design group, and a crew for display setup and removal.

The photographers held practice sessions, photographed their subjects, and selected five shots for each of the subjects. Meanwhile, the editorial board developed two-paragraph summaries of the appropriate essays, and the design group worked on mounting, layout, and lettering. The setup/removal crew took full responsibility for getting the display ready for installation in the public sites (two shopping malls and a library).

Materials, Resources, and Expenses

A professional photographer/writer for a magazine lectured on "people photography" and the school's journalism teacher taught students how to use the camera and let students develop prints in his darkroom.

Students used a variety of cameras, some their own and some from the school journalism department, and 24 rolls of 36-exposure black-and-white KODAK TRI-X Pan Film and Ilford 400 Film. A film shop developed the film and printed proof sheets, and the students made 65 enlargements. Displays required heavy poster board, construction paper, hinges, tape, markers, and glue. Total cost was \$168.

Outcomes and Adaptation

Among skills gained by students, report Bantam and Ristow, were writing narratives and dialogue, choosing precise words for the displays, spelling accurately, planning and conducting an interview, summarizing, notetaking, editing, and proofreading. The use of photography, say the teachers, was a great motivating factor since students "had never had a chance to illustrate their writing in this way." The teachers also say that knowing that their products were to be displayed for real audiences was a great stimulus for students.

They add that the project is adaptable to "many English, social studies, or career education classes, can be refocused to a wide variety of objectives, and can be as simple or elaborate as money and time allow.

Project Title

Our Town—An Exercise in Photography

Teacher Jane Ferrill Johnson

Locate Carmel High School, Carmel, Indiana

Subject Audiovisual Production

Grades 9-12

Purpose and Description of Project

Johnson's goal was to teach basic camera operation and to increase the students' awareness of their own community. To reach these outcomes, she involved the students in creating a photographic essay in a color-slide format to express their perceptions of and feeling for the "old town" area of their community.

Johnson was particularly interested in a unit involving active participation and hands-on experiences because a number of her students are academically unmotivated and/or learning disabled. For such students, she says, photography projects are ideal because they can be successfully carried out with virtually any level of ability. And, better yet, she found that some of the students had unexpected photographic talents.

By project's end, the teacher saw definite improvement in students' ability to recognize and take quality photos, their attitude toward the community, and their confidence in their ability to express themselves.

Activities

Two hours of discussion and demonstration were devoted to each of three topics: introduction to photography (different types of cameras and film), use of an adjustable camera functions, (do's and don'ts of handling), and photographic composition (examination of sample photos, a slide show on techniques). Following this, students participated in a number of activities:

- Practiced taking pictures of specific assignments in the same area in which the slide show would be set
- Were visited by a local photographer who examined and critiqued their initial slides
- Shot final slides illustrating various aspects of old Carmel including transportation, commerce, houses, public services, and people

- Made independent decisions about the best slides and how they should be organized, filling in gaps with additional slides or retakes
- Completed the slide presentation and audio track which involved using two slide projectors with a dissolve unit and deciding on a music-only background
- The slide show is to be shared with other classes and with community groups

Materials, Resources, and Expenses

Human resources included staff from the school's media center and performing arts and audiovisual departments as well as community members who allowed themselves, their homes, and their businesses to be photographed.

Cameras used included students' own and three borrowed from the school. Two slide projectors, a dissolve unit, and a sync-sound audio cassette recorder were also supplied by the audiovisual department. When estimating expenses, Johnson advises planning on two rolls of film per student (one practice and one final) plus developing costs if facilities are not available at school.

Outcomes and Adaptation

According to Johnson, "the opinion of instructor and students alike was that the photography project was a successful, positive experience and one that perfectly illustrates the axiom, 'I see and I forget, I hear and I remember, I do and I understand.'" Evaluating primarily by observation, she felt all her initial objectives were met.

A similar project could be carried out using prints rather than slides, notes Johnson, or students could concentrate on a narrative rather than impressionistic slide show and write a script prior to shooting slides.

Project Title

Quality Seekers

Teacher: Mary Kim Triefenbach

Location: Francis Howell High School,
Webster Spring, Missouri

Subject: Language Arts

Grades: 10-12

Purpose and Description of Project

For her three classes composed of students repeating Language Arts I, Mary Kim Triefenbach felt she had to come up with a new approach that would make the world of grammar, punctuation, and spelling more meaningful the second time around.

To do this and to turn these students into "quality seekers," she initially focused on the possessive case, which she finds "the most difficult grammar concept to teach and the concept most often miswritten by adults." She walked through a shopping mall and took slides of just such adult errors on commercial signs to pique her students' interest.

From here, students themselves went out to find all sorts of mistakes and, under the teacher's guidance, to write each store's manager about these grammar, punctuation, and spelling lapses, sending along a photograph as verification. When the thank-you notes started coming in from those stores, rather than stern letters of rebuke, reports Triefenbach, "their initial mistrust of my project disappeared."

From this beginning, the teacher says, her students turned into "active, pragmatic learners as opposed to passive receivers with their heads down on their desks in the back rows of English classes."

Activities

After their experience of pointing out stores' mistakes, Triefenbach notes, the students came to view English grammar as being relevant to the real world rather than just an abstraction. The quality seekers began changing student-made signs around campus and spending class time on error-finding missions in old magazines and newspapers. From the samples they found, they made flash cards and played games. They even made up exercises that would demonstrate grammar concepts more clearly than the exercises found in textbooks. An important part of the project became what Triefenbach and the students called their "publicity wall." This was the wall outside her classroom on which were taped the letters the students sent and received, collages of pictures of signs they had photographed, and photos of the quality seekers themselves. The "Can you find the mistake?" segment of the wall became a center of interest for students and school staff.

In the process of all these activities, teacher and students became local celebrities. Local newspapers and the school district newspaper published articles and photos; the school audiovisual department made slides of the quality seekers' photos for use by others, and the local teachers association supplied personalized stationery with letterhead drawn by one of the students. And, at this point, the students started sending out their own news releases and photographs. As Triefenbach says, "Now we were the ones actually making the news, influencing opinions!"

With their newfound self-confidence, the students are going on to bigger and better things. At last report, the students were working on their own movie, *The Newspaper: What Would We Do Without It?*, because they had viewed a film of the same title that "bored them silly" and decided they could do a better job.

Materials, Resources, and Expenses

Triefenbach's project required only a camera and film, and the only cost was for film and processing. She even got a \$2 per roll discount on developing from a store in one of the malls that she and the students visited on their field trip.

Outcomes and Adaptation

Because her students were mostly "won't-doers" rather than "can't-doers," Triefenbach knew success was only a matter of finding the right key. Through this project, she says, "the learning of grammar, letterwriting, proofreading, and spelling became a **means** rather than an **end** in itself; therefore, the participation level increased dramatically among the chronic non-doers."

She adds that "this type of project could be duplicated with almost any type of student from intermediate elementary groups through senior high. If my students responded so well, the average student group would be able to double our success."

Project Title

Audiovisual Production Techniques

Teacher Pat Lakin

Locale Forest High School, Ocala, Florida

Subject Language Arts

Grades 10-12

Purpose and Description of Project

In Pat Lakin's still photography unit, which is to become part of a comprehensive semester-long course on audiovisual production techniques, students were introduced to camera use, storyboard development, narration writing, and music selection.

Each student in the class produced a photo essay of black-and-white pictures and worked in a group of two or three to create a three- to six-minute multi-image slide-tape presentation. And a major motivating factor, notes Lakin, is that the products were not merely academic exercises but were developed for practical use by a client -- either a teacher in the school system or a professional in the community -- who also evaluated the students' work. In one case, says the teacher, the client, a racquet club, even offered to pay the students for the slide-tape show they made about the club.

Activities

Students began by discussing the various ways photographs can communicate and studying the parts and operation of a 35 mm camera. As a practice exercise, students worked with Lakin to produce a black-and-white photo essay on how to take good pictures with a 35 mm camera, sketching out what each picture needed -- or "storyboarding," and then photographing each step in the process.

Next, students came up with ideas for their own essays, ranging from the fundamentals of a golf swing to the ecology of Florida, secured "contractors" for their projects, and storyboarded their ideas. During this portion of the unit, students also learned more about angles, depth of field, and composition. They then each shot a 20-exposure roll of film to fill the storyboard requirements. While shooting their pictures out of class, the students worked in class on learning layout and design techniques, choosing either to use the dry-mount press to attach their pictures to a poster board, or to display their photos in a picture album. Rather than printing all the pictures he or she took, each student selected the best shots from a contact sheet for an essay of five to ten photos. Students wrote narratives and titles, mounted them with their photos, and then gave speeches to the class explaining their projects.

Final activities of this portion of the project were to turn over the finished projects to the contractors and have them fill out evaluation forms.

For the slide-tape presentations, students divided into groups and followed much the same procedure -- selecting topics, developing storyboards, and taking pictures. They then analyzed their results, sequenced the slides, and recorded music and/or narration on cassette tapes. The final productions were turned over to the contractors for evaluation.

Materials, Resources, and Expenses

Students used 35 mm cameras, some belonging to relatives and some borrowed from friends or school personnel. Also borrowed were two slide projectors and trays, a stacker for the projectors, a dissolve unit, a synchronized cassette recorder, and two slide sorters. Expenses were approximately \$200 for purchase and processing of a 20-exposure roll of black-and-white film for each of the 17 students and a 36-exposure roll of color slide film for each group of two or three students.

Outcomes and Adaptation

Lakin says that the still photography unit made the students more aware of visual communication techniques and was particularly effective because the students learned photographic and organizational techniques, not simply as a classroom exercise, but to implement projects for real clients. So in addition to developing skills, she states, "They were also developing a sense of pride and a desire to produce quality work."

She advises other teachers carrying out similar programs that students would benefit from practicing with an additional roll of black-and-white film before beginning to take photos for actual use.

Project Title

On Photography and Poetry

Teacher: Diana Marie Cain

Location: South Lakes High School, Reston, Virginia

Subject: English

Grades: 10-12

Purpose and Description of Project

Diana Cain takes advantage of the visual impact of photographs and of students' love of popular music to enhance their understanding and appreciation of poetry, especially poetic imagery and themes.

In a synthesis of poetry, art, music, and photography, students create presentations of slides that illustrate poetry, song lyrics or more traditional poetry set to suitable music. Students' slides may be of "real life" subjects, art prints, or book illustrations. Such presentations stimulate the student to interpret the poem and then express those interpretations in visual images.

"The beauty of this activity," explains Cain, "is that it links something the students need to learn but may not like—namely, poetry—with something they already know a lot about and really like—music."

Activities

Cain began by showing students a slide show of her own that demonstrated the type of work she expected them to do and distributing copies of Varian's poems. Students read and discussed the poems and tried to come up with examples of visual imagery that could be represented photographically. Working in small groups, students then submitted poems or poetic songs they wanted to use for this activity for similar class discussion. Students then looked for subjects to illustrate their poems, choosing magazine or book pictures, original slides, or ones made from family pictures. Most of them used their own cameras.

On the day of the presentations (three per class period), each small group taught the class a lesson on the imagery and theme of a poem or song and presented its slide/music accompaniment. Students then were assigned to evaluate each other according to the same criteria used by the teacher. These ranged from coordination of poetry, music, and slides to appropriateness of selection.

Materials, Resources, and Expenses

Students used their own cameras, some simple types and some 35 mm. A slide projector, record albums, tapes and cassette players, screens, and slide trays were available from the school. Cain says costs run \$9 to \$10 for each roll of film and its processing.

Outcomes and Adaptation

Cain found that this project caused students to get personally involved with poetry, music, and photography so that they felt like active participants rather than passive members of a teacher-dominated classroom. She says the activity "lets students see poetry not as something separate from themselves and their lives, but as something that is all around them if they just open their eyes with photography and their ears with music."

The teacher feels that this approach could easily be adapted to any aspect of literature or art study.

Project Title

Focus On Learning

Teacher: Lisa Anne White

Location: Francis Howell Senior High, St. Charles, Missouri

Subject: Language Arts

Grades: 11-12

Purpose and Description of Project

White used photography in a series of activities designed to help students in a dropout prevention program progress in several areas—awareness of the environment, perception, descriptive writing, problem solving, and self-image.

She believes that the program was successful in achieving its central purpose of improving the students' self-concept. "Most of these students have few successful experiences in the school situation," she explains. "They do not learn easily from books and teacher talk. Examining the camera, taking pictures, studying pictures in travel brochures, and going for walks resulted in the students actively involving themselves in their learning and allowed them to experience success."

Activities

The students began by visiting a nearby cemetery and writing about their observations. Then they visited the same area and looked at it through a viewing card (card with a small rectangle cut out) in preparation for using a camera. They studied how a camera works, the mechanics of picture-taking, and the elements of good photography.

At this point the students took their first pictures, and each had an opportunity to learn about developing in the darkroom. When the photos were displayed, students saw new things in them, and White felt this sharpened their perceptive abilities. She went on to have the students compare verbal with pictorial images and pretend to be a camera when writing descriptive passages about photos from magazines.

Students began to discuss problem-solving techniques and relate these techniques to using a camera and a variety of lenses. Students also visited a nearby wildlife area to take more pictures, and teachers photographed each student during a learning activity in class. The students' photos and writing were compiled in a scrapbook, and a picture of each was put on display and sent home to his or her parents.

Materials, Resources, and Expenses

White's co-teacher in this program was the greatest human resource, helping supervise the students on walks, interpret assignments, and take pictures of the students.

The project involved the use of three 35 mm cameras (one belonging to the class, two loaned by the teacher) and some student-owned cameras. Wide-angle and zoom lenses were borrowed from the school yearbook staff. Other materials were viewing cards, travel brochures donated by a local travel agency, construction paper, mailing envelopes, a scrapbook, assorted photography books, film, photographic paper, and chemicals. Costs totaled \$218 (for photo paper, film, scrapbook, envelopes, photocopying, chemicals, and some commercial processing).

Outcomes and Adaptation

During the project, White says that the students began to notice more about their surroundings, to identify good photo composition, and to increase their understanding of perception—how we see and how we tend to filter what the eye is capable of seeing. They were also able to write descriptively by pretending to be a camera, to compare written with photographic images, to understand a correlation between photography and problem solving, and to operate a camera. Taken together, says White, "these successes helped to increase their self-concepts."

Since the use of photography provides "an opportunity for students to use more of their senses in the learning process," according to White, "teachers can apply the techniques of this project toward almost any learning objective."

Project Title

Shakespeare's Photo Finish

Teacher Scott R. Tudehope

Location Filer High School, Filer, Idaho

Subject English

Grade 12

Purpose and Description of Project

Tudehope used photography to motivate student interest in and understanding of Shakespeare and to improve students' research skills and study habits. He asked members of his senior literature/composition classes, who were studying *MacBeth*, to illustrate quotes from the play by photographing each other. And, he says, it did indeed generate new interest -- even among students who were "convinced that nothing short of mind-altering substances would get them through the last act."

The photos and quotes were mounted and used for bulletin board displays and as the basis for quizzes that the two classes developed and administered to each other.

Activities

Tudehope explained the project, instructed the students in the fundamentals of photography, and presented a list of quotes from *MacBeth*. The objective was for the students, working in teams of two to correctly interpret the quotations in photographs. The teams chose their quotes and spent the next class period setting up shots and taking pictures of each other portraying the meaning of the quotes.

While the photos were being developed, the teacher presented lectures on the photographic interpretation of literature using some of his own slides and asked students to come up with possible quotes to go with the images. Then each class mounted the photos, attached three quotes (only one of which was correct), and made up a quiz for the other class. By using the class assignments as quizzes, notes Tudehope, he "got extra mileage from the assignment, and the students got immediate feedback on whether their quote/picture combination was clear to others. I then made up the combinations into a bulletin board."

Material, Resources, and Expenses

The students used 35 mm SLR cameras. Total costs were about \$50 for black-and-white film and processing. For mounting the photos, only construction paper, adhesive tape, and glue were required.

Outcomes and Adaptation

Asserting that "there is nothing more motivating than to see yourself in pictures," Tudehope reports:

...students who had up to this time *never* searched for material in a literary text were poring over the play. Also, he says, they were spurred on in their research by the desire to confound the other class with the quiz based on their photos.

Tudehope's technique can be applied to any type of literature or to other material that students need to research carefully.

Project Title

Friendship Across the Grades

Teacher: Marcia L. Sauvie

Locale: Carmen High School, Flint, Michigan

Subject: Language Arts

Grade: Initiated at high school level to involve lower grades

Purpose and Description of Project

This outreach program integrates photography with writing older students with younger ones, and loving with learning—says Sauvie, who notes that her academic goal is to strengthen the communication skills of the high schoolers.

Sauvie's English classes "adopted" three first-grade classes by sending them a grant letter and class photo and inviting them to be special friends. When the youngsters responded positively to this overture, the older students launched a series of activities that culminated in a visit by the children to the high school for a day of meeting and sharing experiences with the high schooler each had chosen as his or her "very own high school friend."

Sauvie's students improved academically, but she feels that their most important gains were in the areas of attitude and motivation. It is a rare student who does not become excited at the prospect of "photos, slides, videotapes, and assignments where they can **move**," declares the teacher. She found that many students volunteered their free hours, those who tended to be silent in class spoke up, and students prone to cutting class stayed on the scene.

Activities

After the "adoption" was set, the older students wrote individual letters and attached photos of themselves so that each young one could choose his or her special friend and send a return letter and photo. The high schoolers then made bookmarks for their elementary partners and began writing childrens' stories. Soon, they broke into groups, with one writing and taping a childrens' book to be used permanently in a first-grade learning center, one writing a "computer" book with a word processor so that personalized copies could be made with each young child's name, friends, pet, and address inserted, another group writing and rehearsing a marionette play, and the final group making a slide-tape program about the high school to introduce junior high school students to their future school. At the same time the elementary students wrote "All About Me" books, telling about their lives, and they constructed a mobile of their class pictures.

The big day came about three months after the initial communication. The children came to the high school and were met by their friends. They read the special book written just for them, read their "All About Me" books to the high schoolers, and shared the sack lunches the older students had made for everyone. To entertain their guests, the high schoolers portrayed animals telling stories, put on the marionette show, played games while paired with their friends, and led a group sing. One of the students presented the surprise ending of the day—a song written about "Friendship Across the Grades."

Finally, both elementary and secondary students wrote thank-you notes and, to commemorate the project, Sauvie's students made bulletin boards, sent articles and photos to the school newspaper, and showed a videotape of the special day.

Materials, Resources, and Expenses

Human resources included several Carmen High School faculty and elementary teachers who helped coordinate the school-to-school activities.

Equipment on hand included a dry-mount press, videocassette recorder, variety of tape recorders, several 15-minute tapes, and six flipflash. Equipment that had to be purchased included two KODAMATIC™ CHAMP™ Instant Cameras (\$40), a CANON SURE-SHOT Camera for 35 mm prints (\$90), 16 rolls of KODAK 35 mm Slide Film (\$48), 10 double packs KODAMATIC™ Instant Color Film HS144-10 (\$146), six rolls KODACOLOR II Film 135 (\$18), and two rolls KODAK Black-and-White Film (\$4), for a total of \$346. Materials for the books, bookmarks, etc., included various kinds of paper and board, cloth remnants, markers, crayons, and pencils.

Outcomes and Adaptation

Sauvie found academic improvement in writing, punctuation, spelling, adapting to an audience, and organizational skills. On the basis of questionnaires and testimonials, she also found the reactions and attitudes of students, teachers, and administrators to be "overwhelmingly positive."

She says that the program is easily adapted as long as the students involved are separated by two or three grades and that teachers of other subjects could have the students center their writings and photos on some particular area, such as history.

An Exploratory Preview of English Literature

Teacher: Jan N. Martin

Location: Albertville High School, Albertville, Alabama

Subject: Literature/Language Arts

Grade: Secondary

Purpose and Description of Project

Jan Martin and her students produced a 45-minute slide-tape presentation depicting highlights from English literature. She says the 130-slide production expanded the students' knowledge of both history and literature and gave them practice in such skills as photography, planning, decision-making, problem-solving, writing, and acting. It will also be a valuable resource for introducing future English classes to English literature.

Highlights of the project, according to Martin, were field trips to photograph pigs for Orwell's *Animal Farm* and sheep for Marlowe's *The Passionate Shepherd to His Love* and a six-course Henry VIII banquet complete with trumpeters and Elizabethan entertainments.

The teacher says that students were introduced to a culture's great literary tradition which became more meaningful to them because of their direct participation in the project, and that the production was "the single most rewarding educational experience of my career."

Activities

Because this kind of project requires a wide variety of skills, says Martin, students can contribute according to their individual abilities and talents. Those who already had some photographic experience handled the slide-taking, while a group of about 15 collaborated on the script. Others worked on creative ways to set up shots, served as models, or helped make costumes and props. The project involved lectures, small- and large-group activities, independent study, research with both assigned and self-selected topics, learning centers, and individual learning contracts.

Teacher-made tests were given, and students also showed what they had learned in other ways, such as during command performances at the banquet, when students were called on to recite sonnets, name Henry's wives, or describe period food and dress. They also demonstrated creativity in setting up shots or taking advantage of unexpected occurrences to get illustrative sides, as when a student photographed a rat tortoise standing to represent a battle scene.

Materials, Resources, and Expenses

In addition to several school staff members, major human resources were a local photographer who contacted students, initial slides, and two faculty members from a local junior college who helped with taping of the narration and music. Also participating was a fifth grader who was invited to take part due to her interest in photography and who contributed 40 slides, many of which were selected for the final product.

The teacher and students used their own 35 mm SLR camera. Other materials and equipment were slide film (ISO 64 and 200), KODAK CAROUSEL Slide Projector, plastic slide sleeves, slide sorter, cassette player and tapes, and recording equipment at the junior college. Cost was less than \$100, primarily for film and processing.

Outcomes and Adaptation

Martin found that student interest and enthusiasm remained high throughout the project. In addition to learning about literature and history in a very personal way, she says that students polished or developed skills such as organizing, synthesizing, and visualizing, and responded to technical difficulties with determination and creativity. "Although the end product is an impressive audiovisual presentation that can be used for both student and parent groups," she stresses, "the most valuable outcome was a shared and enjoyable learning experience."

Martin adds that in replicating such a project, "grade level, subject matter, and location do not have to be primary considerations. The idea could be adapted easily to a survey of world history, American literature, or mythology."

Project Title

Camera Catching Kids

Teacher: Karen Hamilton Bafus

Location: Lake Hills Elementary School, Bellevue, Washington

Subject: Physical Education/Playground Behaviors

Grades: 1-5

Purpose and Description of Project

Bafus' project involves the use of still photographs to build student self-esteem, visually reinforce appropriate play and social interaction skills, and help eliminate sex stereotyping in relation to students' play activities. Her idea was to "catch kids" with the camera while they were involved in positive behaviors—sharing, smiling, enjoying physical activities, helping others, exerting themselves to their full potential, initiating creative and cooperative play, and interacting with other children regardless of sex, in activities once considered to be sex specific. These photographs, along with explanatory or questioning captions, were then displayed in the school's office windows and in the library.

According to Bafus, students were motivated to copy the behaviors illustrated in the photographs, and the individuals who were pictured "felt successful, accomplished, important, and worthwhile to have contributed to a learning process and to have captured their peers' respect."

Activities

Over a 12-week period, the teacher developed lists of safe playground behaviors, sports skills, and social skills, with the help of students and other staff members, discussed the project with students and related and photographed student modeling behaviors on the list, worked with students to come up with questions and comments to accompany the photos, and began to display the photos. Bafus periodically replaced the pictures with new ones and collected the previously displayed pictures in a three-ring binder that students could check out of the library. Over the space of a couple of years, she hopes to photograph every child in the school.

Materials, Resources, and Expenses

Bafus obtained two free POLAROID One-Step Instant Cameras through an educational project advertised in a magazine that required her to send in a sales receipt for 20 packs of film. Other materials were the 20 packs of POLAROID SX-70 Film (\$150), two binders (\$6), 100 plastic protectors (\$12), colored paper and adhesive tape (supplied by the school), marking pens (\$3), and plastic dividers (\$5). Total cost was \$176.

Outcomes and Adaptation

The teacher evaluated the project through observation and student questionnaires. Both display sites generated continual crowds, and the increasing number of appropriate behaviors Bafus found to photograph indicated that the model behaviors were being repeated. The project had another important advantage: It did not require a child to display academic skill, or to be particularly popular with classmates or to be adept at sports in order to have been a successful model. And, Bafus adds, "there is a wonderful esprit de corps at school because the primary and intermediate students are working together on a project rather than competing."

Bafus notes that the process she used could easily be transferred to reinforce positive behaviors in many other settings—in the library, on the school bus, during a fire drill, on a field trip, or in the lunch room. She also suggests that the students themselves could become the photographers.

Project Title

Principles of First Aid and Treatment of Athletic Injury

Teacher: Ron D. Fischer

Location: Fargo North High School, Fargo, North Dakota

Subject: Physical Education

Grades: 9-12

Purpose and Description of Project

Ron Fischer and his students developed a comprehensive audio/visual presentation as a resource for the teaching of a standard first aid and athletic training course at the school. Fischer researched, wrote, and made 400 slides, while his students helped with the photography, narration, and the demonstration of injuries and treatments.

The slide program is made up of 10 units that can be used together or separately and range from "The Care of Wounds" and "Recognition and Treatment of Shock" to "Cardiorespiratory Emergencies" and "Principles of Supportive Taping." The goal of the program is to develop quality student athletic trainers by exposing them to a variety of treatments and such equipment as traction splints and ultrasound.

Activities

Fischer first developed the narration, although he points out that "if I had it to do all over again, I would have involved the students in the writing." Then, before the shooting of each injury sequence, teacher and students reviewed the injury situation, symptoms, and proper first aid procedures. Once the shots were devised, the instructor or a student acted as victim while the student trainers cared for the injury and slides were taken of the step-by-step treatment process. Additional slides were taken from sports medicine journals and athletic training textbooks.

Students were allowed to express their creativity in the choice and use of available first aid materials as long as their approaches remained "within the bounds of appropriate first aid," says Fischer. And when acting as photographers, students decided on the best angles and photographic composition. Students also helped with the narration of various scenes to add to their team's

Materials, Resources, and Expenses

Human resources included an elementary teacher and amateur photographer who helped take pictures and a North Dakota State University student who helped create realistic wounds and fractures.

Photography-related equipment included a NIKON EF Camera, an electronic flash unit, KODAK EKTACHROME 64, 200, and 400 Film, cassette tapes, a tape recorder, a KODAK EKTAGRAPHIC Projector, and slide trays. Fischer puts total cost at about \$200 but says the presentation could have been done for less if he had not had to retake so many shots and had not used a rush developing service.

Outcomes and Adaptation

Fischer believes that the use of photography is especially valuable in helping students recognize injuries and treatments that may be difficult to comprehend from written descriptions. He found that the students' reactions were much more positive simply because the scenes were being photographed rather than being set up just for the sake of practice. They were able to learn while also helping produce a resource that will be used at the school for years to come.

Changing Seasons

Author: Susan M. MacDougall

Address: James M. Smith, Brook Lawn, New Jersey

Grade: Kindergarten

Grade Level: Kindergarten

Purpose and Description of Project

The project uses still photography to help children better understand seasonal changes. Each of MacDougall's 26 kindergarteners "adopted" a tree or plant as the subject of his or her personal photo album, which would include a photo of the child with the subject, several photos of the subject as seasons changed, a writing sample, and in some cases, a drawing.

By the end of the project, notes MacDougall, "the children had become quite possessive and proud of their subjects' accomplishments." They also developed the ability to observe both obvious and subtle changes in nature, learned to operate three different cameras, and became professional photographers.

Activities

MacDougall formed small groups, most manageable for 15-minute sessions, but used large-group lessons to teach and explain what the children would be learning and doing to accomplish. The introductory lesson in February involved looking at and holding the cameras as well as examining and loading three types of film. The teacher also explained the use of a tripod, which sparked a general discussion of differing heights. Next, students and teacher went on a nature walk to choose subjects and then embarked on their first photo session using a KODAK Pocket INSTAMATIC. Camera basics: they had to lean litter from beneath the trees, then a tree branch came away with a lesson in ecology. Because the prints from this first session "showed many of the fingers in front of the lens," says MacDougall, "we practiced holding the camera in a better way."

In subsequent sessions, the children also used a MINOLTA AG-1 35-mm Camera mounted on a tripod and a KODAMATIC PARTYTIME II Instant Camera. MacDougall ordered duplicate prints from the 35-mm film and instant film, so the children could have their own sets. They used the instant camera primarily when the teacher wanted to avoid the delay of processing

prints. Throughout the project the children studied their camera, discussed what they could see happening to their trees and plants, and drew pictures of their subjects to supplement the photos. The final element in their albums was a writing sample. The children told the teacher what they saw happening to their subjects, she printed the sentence, and they copied the words in their own handwriting.

Materials, Resources, and Expenses

Basic equipment included three cameras and a tripod belonging to MacDougall, film, and materials to mount the photos and put together the children's albums. The cost, she estimates, was about \$190, including film and processing duplicate prints.

Available human assistance was provided by school staff members who helped identify trees and plants and lent a hand in supervising the class during photo sessions.

Outcomes and Adaptation

MacDougall found the project "very motivational" for both the students and herself. "We no longer take for granted the natural beauty of our school environment," she says, "and the announcement of 'picture day' brought smiles and shouts of delight." Other work got done quickly and with few disruptions, she adds.

The children learned to arrange their photos sequentially according to seasonal change, even when their subjects showed little change. MacDougall explains that they used such clues as snow or the height of surrounding grass once they discovered that not all plants undergo change in the same way or at the same rate.

The kindergarteners also learned the differences between the three types of cameras and increased their ability to control camera movement. The instant camera, which the teacher had worried would be awkward and hard to handle for little fingers, turned out to be their favorite, and they could load and operate it easily. In short, concludes MacDougall,

"cameras are now so simple to use, I cannot imagine my teachers not being able to share this experience with their classes. The project is easily adaptable for use in all elementary grades, including special education classes and gifted and talented programs."

She plans to expand the program to both kindergarten sessions next year, have the children draw both "before" and "after" pictures, and photograph the students next to their subjects in all shots so that the youngsters' growth will also be demonstrated. Variations on the project include showing seasonal changes through peoples' activities and dress, and planting seeds in the classroom and charting their growth in photos.

The Inquiring Eye

Teacher: Marie Burnworth

School: Parkside Elementary School
Pittsburg, California

Subject: Environmental Education

Grade: Kindergarten

Purpose and Description of Project

The major motive in this project is the lens of a camera through which the kindergarteners gain both awareness and understanding of their environment. Burnworth notes that the use of cameras enabled the youngsters to isolate the subjects being studied and to better observe their significant features.

These subjects were wide-ranging, including clouds, birds, plants, and insects, and Burnworth stresses that the children were directly involved in taking the pictures and also learned about developing film and making prints, although the teacher did the actual processing.

Burnworth sees the most valuable aspect of photography in this project as its ability to bring students into direct contact with their environment. They were studying their subjects directly, not studying about them. Facts are more quickly learned in association with a meaningful context, she explains. Further, she says, concepts are more clearly understood when developed through direct experience and skills are best reinforced through application.

Activities

The kindergarteners investigated five general areas of their environment:

1. They took pictures of each other's shadows at various times of day, compared them, and discussed why they differed so much in length. The children also outlined their shadows on paper, cut them out, and lined up the cut-outs on the floor sequentially. Then, using a model of these bodies and a flashlight, a darkened room, the teacher gave a demonstration of the shadow cast when an object stands between the sun and the earth.

The students' photos of clouds helped them understand how clouds are formed and how rain occurs. Even though clouds move and change rapidly, notes Burnworth, a picture can hold the image as long as needed for study. Related activities included boiling water to show condensation and tracing the water cycle from ocean evaporation to rain.

2. The study of birds followed the incubation and hatching of chicken eggs and the growth of chicks into adults. Photographs recorded the children's activities and the chickens' step-by-step development from the first crack in the eggs to full growth.
3. To learn about insects, the students first collected spiders, crickets, and beetles from around the school. They studied the insects' physical characteristics and movements through magnifying glasses, plastic bugboxes with magnifying sides, and photographic enlargements. Then, since Burnworth is a beekeeper, the children were treated to a personal demonstration of beekeeping equipment and used a telephoto lens to get close-up photos of her swarm.
4. Changes in plant life, says Burnworth, were the easiest to explore because the plants didn't fly, run, or blow away. The children studied and photographed growth from seed or bulb to sprout to plant of various species and also followed the seasonal changes of trees.

Materials, Resources, and Expenses

Most pictures were taken with the teacher's 35 mm OLYMPUS OM-1 Camera, mounted on a tripod and with a cable release. Three 126 KODAK INSTAMATIC Cameras were also made available for the students use and were handheld. Burnworth developed almost all of the film herself at home and made all the prints either at the local community college photo lab or in her kitchen darkroom. She spent approximately \$150 on film, chemicals, and photographic paper.

Outcomes and Adaptation

Burnworth says that a photograph exhibit of students' work at an open house showed that the children were eager to explain their activities to their parents and that they demonstrated expanded vocabulary and environmental awareness both on this occasion and in the classroom.

Those wishing to duplicate this program could probably do so at even less cost than Burnworth incurred, she adds, since her students sometimes took as many as a dozen exposures of a single scene.

Project Title

Exposing Ordinal Numbers

Teacher: Evelyn A. Perry

School: Hamilton Elementary School
Livonia, Michigan

Subject: Mathematics

Grade: 1st

Purpose and Description of Project

Evelyn Perry used photographs in a variety of ways to support her students' intensive study of the first six ordinal numbers, first through sixth, a unit that includes yes, sequence, time, and left-to-right activity.

The teacher photographed the children in numerous activities and used the pictures for displays and exercises. She surrounded them in a cocoon of ordinals when she ordered the numbers which, in an activity, paired students, started them on the road to understanding how secondary roads are formed from primary ones.

Activities

Among the exercises designed by Perry were the following:

- Children were photographed on six occasions during the day, from the time they said the Pledge of Allegiance until they left for home. The photos were then arranged, numbered, and displayed in the proper order under the caption "The School Day."
- The students studied the similarities between cardinal and ordinal numbers and then arranged themselves in teams of six, drew numbers from a stack, and positioned themselves in the correct order to be photographed. Individuals were then encouraged to shuffle and reorder the photos.
- Students were photographed acting out *The Three Little Pigs*. Then they ordered the photos according to the story and labeled and displayed the pictures.
- The child was photographed as she hopped along a sequence of large plastic numbers, and the pictures were put on the bulletin board with pockets underneath so that the students could put cards labeled "first" through "sixth" in the correct pockets.
- During a field trip to a potato chip company, each stage of chip making—from peeling through packaging—was photographed and the pictures later labeled and displayed.

Materials, Resources, and Expenses

Photo supplies included a CANON SURE SHOT Camera and a MINOLTA 35 mm Camera with zoom lens for special shots, along with Kodak 135 color film and some black-and-white film. Cost, primarily for film and developing, was about \$100.

Outcomes and Adaptation

Perry says that three of the most important results of using photography in this project are childrens' longer attention span, improved listening skills, and harmony in working together. Incidents of unrest, boredom, and frustration are virtually nonexistent," she states. And, as she predicted prior to beginning the project, posttests showed that 95 percent of the children in the class could successfully complete the tests.

The teacher advises that the technique of this project can be used in any setting that involves series learning. I can visualize mathematical data, historical facts, and laboratory analyses being studied in this way.

Project Title

Using Photography to Heighten Ecological Awareness

Teachers: Nancy Anderson, Barbara Adams

Location: North Shoreview School,
San Mateo, California

Subject: Environmental Education

Grades: 2 and 4

Purpose and Description of Project

To heighten awareness of plants and animals and the necessity to maintain the delicate ecological balance. Anderson led these primary children through a nine-week study of San Francisco Bay that combined observation, instruction, and the use of cameras. Using cameras, she notes, made them slow down and look at specific elements of an environment they had tended to view only generally.

The main activities of the study were a series of walking tours and a visit to the Coyote Point Museum and animal shelter. The children were instructed in the use of cameras and were divided into groups of seven or eight, each with a leader and co-leader, during the trips. They took photos and made notes about the visits for their writing activities and began to notice details and to demonstrate concern for living things—such as the toad they rescued after a bulldozer flattened its home.

Anderson also reports that the students developed a beginning understanding of basic photographic terms such as "focus" and "composition," and, of special significance to teachers, demonstrated greater clarity in writing. Photography helped them to write with greater sensitivity and understanding, she says, than they had exhibited working from notes or recall alone.

Activities

The culmination of the students' activities was the publishing of a book on ecology illustrated with their own pictures and observations about marshes, the bay, Coyote Point, bees, trees, and plants and flowers. The children themselves selected their best photos and writing from which teachers made final choices for the book.

Materials, Resources, and Expenses

Among human resources supporting this program were the staff of the Coyote Point Museum, the Corps of Engineers Bay Model, and the Palo Alto Baylands Environmental Center; parents who joined the trips; aquarium experts; the school librarian; and a human relations aide who made it possible for a disturbed child to participate.

Materials and equipment included 110-size KODAK Cameras, 35 mm cameras (some belonging to the teacher and the school, and some borrowed), film and prints (both at a discount), teacher's film processing equipment and darkroom for 35 mm processing, teacher's science and photo books, school and public library books, science films from county film library, and *Ranger Rick*, *National Wildlife*, and *National Geographic* magazines. Anderson estimates cost of the total program at \$800.

Outcomes and Adaptation

Anderson says the teachers involved were very satisfied with the children's progress and that pre- and posttests demonstrated they had gained a great deal of knowledge about photography and their environment. The interest and enthusiasm shown by the students was such that the teachers are now exploring ways to set up a camera club and a darkroom at school.

And, the teacher concludes, "while not all schools may have easy access to a body of water and such rich plant and animal life as exists in the bay, using a camera in any natural environment can help heighten children's awareness of an interest in their own setting and be a vehicle for further classroom study."

Project Title

Photography and Plants— A New Insight

Teacher Freda Starks

School Amory Elementary School
Amory, Mississippi

Subject Science

Grade 3

Purpose and Description of Project

By using photography, Starks' third graders have become more aware of the cycle of plant life from seed, growth to maturity, decay, and formation of soil for new plant life. In carrying out this project, students studied the school garden and planted their own radishes, watched seeds develop in a glass jar experiment in the classroom, explored the school nature trail, compiled reports about plants in or around their homes, and created games based on what they learned.

Among the children's major end products were slide presentations they developed for other third-grade science classes, a general student assembly, and a meeting of the parent teacher organization. They also produced two booklets that have been placed in the school library: *A Photographic Limited Index of Native Trees* and an *Illustrated Nature Trail Map*. A copy of the tree index was also presented to the public library.

Perhaps the most exciting outcome, according to Starks, has been the wholehearted involvement of all students in every aspect of the project. Shyness, lack of self-confidence, inadequate self-motivation—none of the usual deterrents to student achievement prevented the children from becoming engrossed in project activities. In fact, she notes, one of the previously irresponsible children in class was the first to volunteer to make a group presentation.

Activities

Starks and her students spent 20 classes over a 12-week period on this project. Among their activities to learn about the life cycle of plants, the students

- Found and photographed examples of decomposition and undertook a bread mold experiment
- Discussed plant reproduction and used various methods to begin new plants, including planting seeds, setting leaf and stem cuttings in water or soil, planting a potato half, and placing above-ground roots on or in soil. They also photographed these activities.
- Studied monocots and dicots and found examples on the trail and in the in-school planter
- Planted a corn and a bean seed in jars and radishes in the school garden, and also dug up wild flowers and grass to study parts of the plants
- Learned to use three identification books and photographed nearby trees

- Reviewed the slides and prints made to date and came up with games and other activities using them
- Made a complete tour of the nature trail, with guidance from a soil conservationist, and took more pictures. Photography sessions continued during both class and recess time
- Worked in small groups to illustrate the nature trail map, make related board games, and develop slide presentations
- Carried out a home project involving a record of changes in an already growing plant, a report on a tree growing in their yard, or a diary of the growth of a plant they started themselves
- Assembled the two books on trees and the nature trail and, at last, harvested their radishes

Materials, Resources, and Expenses

Human resources included the district conservationist from the Soil Conservation Service, local amateur photographers, a building contractor who supplied wood for trail markers, a middle-school industrial arts class that cut out the markers, a land surveyor who provided materials for marking the trail, and parents who took part in home projects.

Cameras used were a HAWKEYE INSTAMATIC II Camera, a YASHICA Electro 35 Camera, and a YASHICA TL Electro X Camera with close-up lenses. Other photo supplies were a tripod, ISO 25, 64, 100, and 400 slide film, and ISO 100 and 400 film for prints. Materials for the final products included poster paper, notebooks, unlined paper, plastic covers, and rubber cement. A slide projector owned by the school was used for slide presentations. Costs were \$230 for film, processing, and prints, \$15 for poster paper, loose-leaf notebooks, glue, and paper, \$20 for materials to life slides, prints, and negatives, and \$16 for a newspaper ad inquiring about unusual trees to shoot.

Outcomes and Adaptation

Students learned to discern the life cycle of plants and to identify their native trees. They were also able to build a permanent record of their findings for their own use and that of other students and teachers. Student eagerness to see and share with others the slides and prints they had produced translated into self-confidence and willingness to work together.

Starks notes that segments of her project can be replicated at a fraction of the cost over a shorter period of time and that teachers can save about half the photo processing costs if they use a discount store rather than a 24-hour processing service. She recommends beginning the project in the autumn for optimum use of the products during the school year and to avoid delays in noticeable plant changes that can result from a late spring.

Using Still Photography

Author: Jennifer A. Brereton
Institution: Herdwith Elementary School
Address: 1000 S. 1000 E. Kentucky
City: Louisville, Kentucky
Subject: Elementary Science
Grade: 4

Purpose and Description of Project

This project demonstrates how photographs can be used as an integral part of science experiments and to enhance resulting science fair displays. Brereton finds that photos help students achieve a high level of accuracy in their experiments because the students can compare the original subject to itself after application of a variable, and record their observations at various time intervals. Use of photography also helps the students communicate their findings more clearly and adds dramatic value to their displays. The students were required to set up displays demonstrating a question, an hypothesis, an experiment, including materials, procedure, and results, and finally, a conclusion. Questions were drawn from their science units, namely ecology, heat as energy, and the universe.

Activities

Students printed their step-by-step activity, from question through conclusion, on poster board. The board formed the background of the final display and was taped so that the photographs were in the middle section and became the focus of the procedure segment of the experimental step.

Questions on which experiments were based included whether a bean plant grows better in artificial or natural light, what causes the apparent changes in the moon's shape, how and why the direction of shadows changes throughout the day, and why a can impaled upon being partly filled with water, subjected to heat, and sealed.

An example of the students' hands-on experience is provided by the bean plant project. Two student experimenters planted bean seeds in two pots, labeling them "A" (artificial light) and "B" (sunlight) and taking opposing hypotheses as to which would grow better. They treated the plants equally, except for light source, and photographed them first after one week when they were found to be about the same size. After three weeks, they were again photographed so that each could be compared with the other and to its own previous state. By this time, the sunlit plant was vastly superior, and the final results were displayed at the science fair.

Materials, Resources, and Expenses

A major human resource was the father of one of the students. As the photographic editor of a local newspaper, he gave students pointers on how to use a camera and assisted in photographing the phases of the moon because that project required more expertise and more complex equipment than was available through the school. Other aid was given by the school principal and the Jefferson County schools' elementary science director and science resource teachers.

Actual equipment included a KODAK INSTAMATIC X-15 Camera, four rolls of 126 KODACOLOR II Film, 12 exposures, three packages of flashcubes, clay pots, potting soil and seeds, and film processing. Brereton was able to get an "Instamatic Camera (though a dated one) that worked beautifully" from the school media center and borrow a hot plate from the science equipment center. However, she estimates that total cost would have run just about \$81 if these items had to be purchased. (This does not include the experiment in which the photographer/father used a NIKON F-2 Camera with a 500 mm f 8 mirror NIKON Lens and KODAK TRI-X Pan Film (black-and-white) to photograph the phases of the moon.)

Outcomes and Adaptation

The student displays were judged on the basis of scientific method, creativity/originality, thoroughness, neatness and clarity, and student understanding, and Brereton found that photographs were "a plus in each of these categories." She believes that both the students conducting experiments and those viewing the displays developed a more accurate understanding of how change occurs over time, plus the ability to identify the effects of a variable by comparing "before" and "after" photos.

The use of photography, Brereton says, helped teach the value of accuracy in scientific experimentation especially since, with the aid of pictures, the students learned that their hypotheses were not always correct. Finally, the science fair displays demonstrated how photography can help communicate the methods and results of experiments. She also thinks that the photographic displays will inspire more students to participate in next year's science fair, since they will be on exhibit throughout the next school year. She adds that the project is applicable to students ranging in age from 8 to 12 years.

Project Title

Peas, Particles, & Posters

Teacher Terry Ross

Contact Essex Middle School,
Essex Junction, Vermont

Subject Science/Math

Grade 4

Purpose and Description of Project

This project uses photographs to help stimulate abstract thinking and problem-solving skills. According to Ross, it originated when 16 students were released from the regular classroom to participate in a science enrichment unit called "Peas and Particles" (an Elementary Science Study Committee unit published by McGraw-Hill) which the teacher extended and expanded with student-created materials.

In the unit, which teaches problem-solving and estimating, students were provided with 10 posters showing a large number of objects and asked to solve word problems associated with each poster. With this background, five students volunteered to continue the project on an after-school basis in order to create five of their own posters using photographs taken in or within walking distance of the school.

Students discussed and critiqued each other's ideas for pictures and the wording of problems, took the photographs, and wrote captions that would spur creative thinking in other students. Due to time limits, the film was professionally developed. Students then chose the final five photographs to be enlarged and mounted and polished up their captions. The posters are on display at school and will become permanent additions to the science resource materials at the school. An example of one of the posters is a picture of the backs of five students' heads with the question,

How many hairs does this group of people have?

Activities

The initial program with all 16 students who worked with the first 10 posters occupied a dozen 45-minute sessions. The youngsters were divided into groups of two or three and presented with a problem based on each poster. Each group developed an informational and procedural premise and recorded its solution. Solutions were presented to the entire class which then chose the ones they rated highest. The later after-school sessions involved similar techniques plus the creating of students' own posters.

Materials, Resources, and Expenses

The school's learning center coordinator provided Ross and the students with a camera and instruction on its use. Cost items were film, development, enlargements, and mounting. However, Ross points out that the expense could be reduced by creating a bulletin board for the student photos and related problems rather than making posters that require professionally enlarged and mounted photographs.

Outcomes and Adaptation

Ross found that the problem-solving skills developed during this project were of the greatest educational value. Given the visual aid of the poster, the teacher reports, "students were motivated to tackle problems that would have seemed impossible in written form." Students demonstrated higher levels of abstract thinking, learned to work together to solve problems, and accepted criticism from their peers, explains the teacher. They also learned that there is often more than one way to solve a problem and also often more than one acceptable *solution*. The students who went on to create their own posters also acquired photography and writing skills.

Ross advises that the project is appropriate for any third- through sixth-grade class and that the "Peas and Particles" unit is inexpensive and durable. While these particular students had been identified as gifted, the teacher believes that "similar results would be possible starting with almost any classroom group."

Project Title

**D.O.T.S.—
Doors Open to Science**

Teacher: Doreen M. Ross

School: BUILD Academy, Buffalo, New York

Subject: Science and Social Studies

Grades: 4-8

Purpose and Description of Project

Ross and her students used photography to design and produce resource materials that would "open the doors" of the Buffalo Museum of Science to all the school's classes by keying various museum exhibits to the students' curricula in science and social studies. Products of the project were extensive loose-leaf catalogs, which can be added to and updated, and a gallery of photos drawn from the catalogue that were enlarged and displayed in the school. A total of 50 fourth through eighth graders from the school's reading classes were involved in one or both projects.

For the catalogue, students chose 183 of several hundred photos taken of museum exhibits. They were sorted by curricula and captions were written including descriptive information and questions about the subject. The catalogue also contains a multitude of other materials including floor plans of the 20 museum exhibit halls, a chart coding halls by grade and curriculum, lesson plans, forms designed to give direction to student observations, suggested projects, and a bibliography.

The School Hall Wall Museum Gallery of Exhibits includes 8 x 10-inch enlargements of 63 of the catalogue photographs which were selected to generate student interest in the general subject-matter areas and encourage visits to the museum.

Activities

Students visited the museum (slightly less than a mile from school) 23 times in the course of the project. Working in teams, they each gained experience in the three basic tasks involved—taking the actual photographs, handling lights that were required to deal with reflections from glass cases, and recording information about the exhibits.

All pictures were coded on the back by museum hall and hall exhibit, curriculum, and grade level and then filed for easy retrieval. The 183 best and most relevant pictures were used in the catalogue along with pertinent materials to make museum trips both inviting and productive.

For the school displays, the first order of business was to learn how to use an enlarger and to make enlargements. Ross, an assistant, and six students spent an extended class period at a nearby high school photography department and then wrote a lesson plan for the other students. Then they set up a dark room in a closet and, working two at a time, took just three days to produce the 63 enlargements to be displayed. The enlargements were glued to tagboard and framed with tape, their titles, descriptions, and codes added in large print with a felt-tip marker.

Materials, Resources, and Expenses

Ross and her students demonstrated a remarkable talent for getting a lot done at little cost. The teacher used her own cameras, reflector, and extension cords and borrowed enlargers and timers from a local high school. From her own school's vocational teacher, she got plastic trays for developing chemicals and the use of a sink and a closet darkroom. Donations from various sources included 65 sheets of tagboard envelopes, mounting tape, materials for drying and hanging enlargements, plastic gloves, calipers, and felt-tip markers. Money spent came to just \$245, ranging from \$125 for film to the \$25 museum membership fee.

Human resources included the museum's director of science education, a retired teacher who helped raise money, and the high school photography teacher who explained how to make enlargements.

Outcomes and Adaptation

Ross found that "this project exceeded by far the original concept in both quality and magnitude of student involvement. Students' motivation to participate made them attentive to project purposes and to following directions, and increased their self-discipline, cooperation, and responsibility." In the process of preparing the two educational instruments (the catalogue and the display), the students took part in discussions, made group decisions, learned photographic techniques, and did independent research to gather information about museum exhibits.

The students also have the satisfaction of seeing their work being put to practical use—the catalogue for correlating museum trips with specific curriculum studies, and the displays for reinforcement of the relevance of museum exhibits to school work. Students in any community could produce similar products by relating local facilities of various kinds to their school's curricula.

Project Title:

Scientific Inquiry Through Photography

Teacher: Vance H. Luke

Locale: Steele Elementary School, Tucson, Arizona

Subject: Science

Grade: 6

Purpose and Description of Project

Luke's students designed and assembled pinhole cameras and then took photographs to demonstrate the impact of changing one aspect of the procedure with each successive picture, with the goal of increasing their knowledge of the nature of light. "The students were impressed right from the beginning," says Luke. "at the mere fact that a pinhole camera, consisting of just a lighttight box with a hole in it and something to cover the hole, would actually take pictures."

The basic experiment required students to take four pictures, changing one variable (such as distance from the subject or the size of the aperture) on each occasion. They developed hypotheses as to the result, checked their predictions against the actual prints, and displayed the photos on the bulletin board. Then the four photographs taken by each student were assembled into a visual and oral presentation that detailed whether his or her hypothesis proved correct, what was learned, and how the student planned to expand on the experiment.

Activities

In beginning their study of light, students used the textbook, films, filmstrips, commercial and personal worksheets, and materials about the eye. The photographic experiments that followed taught them more about the properties of light and gave them a working knowledge of scientific inquiry. They constructed pinhole cameras from available materials such as oatmeal boxes, determined the normal capabilities of the camera by taking and developing a few pictures under varying conditions, and plotted experiments involving four different variables of photographic procedure. Then they made class presentations using boards on which their photos and related captions were mounted. The oral portion included a description of the experiment, the variables and invariables, hypotheses, the outcomes, what the students learned, and suggestions for further study.

Materials, Resources, and Expenses

Luke stresses that he designed this project to require a minimum of outside resources so that virtually anyone could try it. Materials for the cameras were cardboard boxes, disposable pie tins for the pinholes, electrical or masking tape, sandpaper, opaque paper, and straight pins. For the darkroom (initially the classroom with black butcher paper over the windows; later a converted outdoor bathroom), the project required photo paper, KODAK DEKTOL Developer, stop bath, rapid fixer, four long cake pans, a piece of glass, and a safelight. "All these materials cost only between \$25 and \$30," says Luke.

Outcomes and Adaptation

Evaluation of students' work was based on creativeness in approaching the problem, how well they followed the prescribed procedure, their visual presentation (organization, neatness, etc), and their oral presentation (description of experiment, use of proper terms). Further, reports Luke, "the students found this to be an exciting adventure from the start" and "were constantly approaching me with ideas they wanted to pursue when the experiment was over."

Although all the students enjoyed the project, he adds, it seemed to benefit students at the extreme ends of the scale most. He noticed that less advanced students "really came to life with this 'hands-on' project, while the more gifted ones were spurred on to such advanced work as constructing telephoto lenses and computing angles of refraction." However, he stresses that "all the students achieved the desired outcome at various levels of competency" and that virtually any teacher could implement this program.

Project Title

A Camera's View of a Science Classroom — Recording Changes

Teachers: Arlander Boyd, Mary Larrick

Locale: The Campus School of the College of Education
Memphis State University,
Memphis, Tennessee

Subject: Science

Grade: 6

Purpose and Description of Project

Since many of the units of study in the school's sixth-grade science curriculum involve the observation of changes, Boyd and Larrick decided to have their students record these changes through photography. Working in pairs, the students chose subjects to suit several curriculum areas. These subjects included the growth of a flowering tree, a shrub, and a frost-damaged tree and changes observed in sprouting seeds, birds, flowers, a natural environment, and weather.

The teams furnished their own cameras, photographing their subjects periodically and writing down their observations. They also looked at professional photographs and began to notice elements of composition for their own pictures as well as to be better observers of the changes in their subjects.

Once the students had chosen subjects and practiced taking pictures and writing on observable changes, Boyd and Larrick allowed them total independence in choosing days and times for their observations. Students were then evaluated on the clarity of their notes, the appropriateness of their photos, and their ability to verbally share their experiences and findings.

Activities

In carrying out their projects, students followed these steps:

- They met as a group to decide on the format for picture and note-taking and chose to observe subjects.
- After deciding to work in teams of two, the students went outside to start taking photographs.
- When the film had been developed and the prints returned, they matched the prints to their notes and completed the group-designed forms.

Materials, Resources, and Expenses

In preparing for the program, the teachers brought in a professional photographer to demonstrate various cameras and took the students to visit the Photographic Services Department and the Fine Arts Gallery of the university. The children used several KODAK INSTAMATIC Cameras, several 35 mm CANON Cameras, and a 35 mm KONICA Camera. About \$100 was spent on film, developing, and printing.

Outcomes and Adaptation

A major outcome reported by Boyd and Larrick was that students learned to use the camera as part of scientific observation and their prints to enhance the scientific process. They were able to more closely observe changes in the element of the environment that they studied, to discuss and describe their observations more clearly, and to operate the camera effectively.

The teachers found that this project would be useful to any age group and could be implemented in any curriculum area in which changes are to be observed. They used small-group instruction for the most part but believe that the program could also be implemented in a large-group setting.

Project Title

Photography in the Science Curriculum

Teacher James Gibb

Locale South Dorchester School,
Church Creek, Maryland

Subject Science

Grades 6-8

Purpose and Description of Project

Gibb's project is designed to help his students learn about the workings of cameras, the composition of pictures, and darkroom equipment and processes, while at the same time increasing their knowledge of science, making them more observant, and stimulating their creativity. He has also found that the program teaches decision-making and enhances students' ability to interact cooperatively in groups and work independently.

The students created three slide/tape shows with accompanying black-and-white pictorial displays which are studies of a wildlife refuge, mineral identification, and animal and plant classification. They have not only gained from the creation of these products but have shared their discoveries with all the schools in the county.

While Gibb and the students initially met at recess, the popularity of the program after the first month led to scheduling changes that allowed regular sessions for the next six weeks. Further, there was a wide clamor for cameras, and pictures were being snapped all over school and at home by students who were not even in his course, which surprised Gibb. "I never expected there would be such an impact on the school population in general," he says.

One of the most gratifying results of the project, the teacher says, was that his students entered the county film festival and won five of six first places in black-and-white photography, and it was the first time anyone from their school had ever entered. "I could see their confidence increase from a point of being totally unsure and wanting close guidance to being completely sure of themselves," recalls Gibb.

Activities

Instruction in camera use, film processing, enlarging, and mounting was presented in large-group settings with demonstrations involving a few students. Then, students who had practiced various skills directly with the teacher turned to instructing others, and they all proceeded at their own pace. In putting together the

slide/tape shows, the students made one field trip to the Blackwater Wildlife Refuge but used only local resources for the other two presentations. They also heard visitors lecture on photography and on plant and animal life, but Gibb stresses that they developed the shows, including writing and recording the scripts, with a minimum of assistance and supervision.

Materials, Resources, and Expenses

In addition to lectures, Gibb especially valued parent volunteers who transported students, supervised classes, and even taught other mini-courses so that my photography program could exist."

Gibb and his students used three 35 mm cameras (Gibb's own, one purchased by the school during the program, and one owned by a student), wide-angle and telephoto lenses, a 3X extender, and flash attachment. A darkroom was set up in the teacher's science storage room using an expensive enlarger, clock, and other accessories that he had bought for himself a few years ago. The only other equipment necessary were a slide projector and tape recorder from the school media center and a KODAK INSTAMATIC Camera Gibb had brought for \$2 at a garage sale. The equipment need not be elaborate, he stresses, and once it is in place the only costs are for film and developing, either in one's own laboratory or commercially.

Outcomes and Adaptation

At the outset 75 percent of Gibb's students were unfamiliar with a 35 mm camera and none had ever been in a darkroom. By the end 19 or 20 students were skilled in both areas. And while only three students initially owned cameras, 11 purchased cameras during the program and another has begun a camera collection. The students have gained both self-confidence and the admiration of their peers.

The slide/tape shows produced by the students can be added to the school collection each year, and the students have already come up with more than 30 ideas for new programs in science and other curriculum areas. Gibb suggests that social studies, language arts, physical education, and biology can all use variations of his project to enrich their courses and notes that processing can be done outside if suitable instruction and darkroom equipment are unavailable.

Project Title

Uncovering the Creative Potential of Gifted Students Through Photography

Teacher: Cresencia B. Osborne

Location: Jefferson Township Middle School,
Oakridge, New Jersey

Subject: Science

Grades: 6-8

Purpose and Description of Project

Cresencia Osborne integrated the use of photography with the study of light in science to provide "multidimensional learning experiences" for students who were gifted in one or more ways—academically, creatively, psychosocially, or kinesthetically.

She says that the project allowed students to take active roles in learning and to use investigative techniques to solve problems of real interest to them. The unusual ideas and imaginative products that resulted from these activities, moreover, enabled her to uncover each student's potential.

Activities

According to Osborne, photography served the needs of the academically gifted by providing opportunities for adventure for "the experimenters and the risk-takers." By adjusting any one of the many variables involved in photography, these students could produce new and exciting results. Their theoretical knowledge of ratio, direct and indirect proportions, relationships, and other concepts was also made more meaningful in the process of taking, developing, and enlarging photographs.

Students who were creative were able to exercise their originality by producing variations on their subjects, says Osborne, and they could combine various elements and seek complex asymmetrical forms.

The psychosocially gifted students participated in photo contests, exhibits, school plays, the yearbook, athletic events, and the publication of the first school newspaper, explains the teacher. They also wrote mystery stories using photographs and were able to share their ideas in social settings such as the camera club they organized.

The interests of the kinesthetically gifted, Osborne reports, lay in being able to magnify, minify, and alter certain portions of their photographs and in the construction of background supports, screens, and pinhole cameras.

A wide variety of photographic techniques and products was interwoven in the students' study of the sources of light, the theory of light, and the properties of light. Their study of natural light, for example, included an introduction to photo processing and the making of photograms, while discussion of artificial light sources was related to flash photography.

Materials, Resources, and Expenses

Human resources ranged from photo hobbyists to college professors. Equipment included several types of cameras (one of which, was purchased with the grant money from the NEA/Kodak) and darkroom paraphernalia such as an enlarger, trays, tongs, thermometer, timer, and safelight. Consumable materials included film of several types, developing chemicals, and photographic paper.

Outcomes and Adaptation

Through this project, states Osborne, "students became producers and not mere consumers of information." The students learned the scientific skills of observation and notetaking, developed creative writing skills, validated theoretical principles in actual situations, became competent camera users, and learned to measure their progress by their own set of standards rather than by comparing themselves to their peers. The latter point is particularly important, explains the teacher, because gifted students often have difficulty coping with their own success.

Osborne says that students of virtually any ability level can benefit from studying photography and the nature of light in relation to each other.

Project Title

An Environmental Classroom Through Photography

Teacher Gene M. Stukel

Locale Granite Falls High School,
Granite Falls, Minnesota

Subject Earth Science/Geography

Grades 7-8

Purpose and Description of Project

Students in this project studied their local natural environment through photography and also produced enrichment materials for various earth science units. For these photo reports Stukel's students went out into the field to photograph characteristics of a river valley and initiated a study of the process of farming that began with spring activities and will continue through final harvesting in the fall.

These topics were chosen, according to Stukel, because teacher and students are concerned about the impact of the river on the community and because they live in an agricultural area. The teacher has seen an increase in the number of students interested in both science and photography and attributes this to the fact that photography has helped them relate their own environment to concepts presented in textbooks.

Stukel is also excited about an anticipated exchange of slides with students who live in other types of environments. This plan will allow his students to vicariously experience differing environments without leaving the classroom, and vice versa.

Activities

After choosing the river valley and the farming process as topics, students began discussing suitable scenes to photograph and scouting various areas to report back to the group. After a series of discussions of the camera and how it works, students took and evaluated pictures to learn ways to produce quality and impact in their own photographs. Then they spent 20 hours of shooting time on weekends and, after the photo assignments were completed, critiqued the pictures according to content and quality.

Students were also encouraged to interview individuals involved with the processes they were documenting, and to use the school and public libraries for additional research. In their study of the Minnesota River, they covered such subjects as waterfalls, power generation, and flooding. In the farming project, they took pictures and gathered information relating to the enormous costs of farming, the disking and planting processes, and the effects of government programs on farmers, seed companies, implement dealers, and elevators that sell fertilizer and herbicides.

Materials, Resources, and Expenses

Human resources included a professional photographer, a farmer, an agriculture teacher, science teachers, parents, a park ranger, a meteorologist, and an elevator manager.

To take their pictures students used 35 mm cameras with normal, wide-angle, and telephoto lenses. Other materials were school and public library resources, topographic maps, rocks and mineral samples, fossils from the river area, and slide/tape shows and printed materials about photography.

Stukel estimates the cost of replicating the project in any local environmental situation to be between \$100 and \$200, including film, processing, and some transportation.

Outcomes and Adaptation

Stukel finds that photography makes it easier for students to understand the concepts of river valley living and some of the aspects of farming. "It simply makes for a more understandable and tangible situation," he states. He also was pleased to discover that a number of students who seemed to have little interest in science and were getting poor grades were among the first to sign up for the photography sessions. And an unanticipated benefit was the involvement of parents in the weekend photo shoots.

The teacher used pre- and posttests on camera operation, spring planting procedures, and conservation methods to evaluate student progress. He also studied student responses to his questions as slides were projected and discussed.

He advises that "this project is definitely replicable in other settings and environments in which students can photograph and discover unique features of their geographic region."

Project Title

Pictorial Overview: Wildflowers of Kanawha County

Teachers Anita Joan Spera, Paul Franklin, Jr.

Locale John Adams Junior High School,
Charleston, West Virginia

Subject Science

Grades 7-9

Purpose and Description of Project

Spera and Franklin found that cameras are an invaluable resource in creating an outdoor classroom for the study of wildflowers and general conservation issues because "learning by doing, by discovery, touches students like a magic wand." Photography, they say, not only stimulates student learning but is much superior to herbarium mounts as a teaching method because the mounts fade and disintegrate and cannot be made without disturbing the environment.

While field work is essential to teaching wildflower identification and appreciation, the teachers also use discussions, large-group instruction, drills with slides, and classroom activities. For these activities the students' own prints, slides, and video productions were often used. Materials created by the students for their own use and for sharing with others included photo albums, photographic survey units, wildflower coloring books, wall murals, posters, slide shows, print exhibits, a movie, and videocassette programs in such formats as games and talk shows. These lasting resources, stress the teachers, can be studied and admired again and again.

Activities

Spera and Franklin began with an "icebreaking" session to get a feel for students' initial level of information about and appreciation for wildflowers and went on to more organized discussions of both flowers and the use of cameras, different types of film, and photographic techniques.

Next came large-group instruction using slides to classify flowers by the most elemental aspect—color—and then development of flower lists, plant records, and compilations of characteristics such as edibility. Outdoor exercises included nature walks and wildflower surveys, with cameras in hand to record specified subjects and to preserve special finds. The students then put together their own displays using their slides, prints, and video productions.

Materials, Resources, and Expenses

Spera and Franklin called on a variety of consultants, ranging from university faculty members and the staff of government agencies to local photography or wildflower enthusiasts.

Photographic equipment was either donated, loaned, or the personal property of the teachers. This included 35 mm cameras, film, a videocassette camera, slide projectors, slide trays, photographic paper and chemicals, and darkroom supplies. Other materials needed are string, stakes, and garden tools, art paper, colored pencils, and rulers, index cards and India ink, tape recorders, and wildflower field guides.

Outcomes and Adaptation

Spera and Franklin found that taking pictures of local examples of what students see in textbooks makes nature more real to them, that photographs preserve flowers in an unchanging condition for repeated study, and that the photos usually capture the plants' habitat as well. They report that on the basis of slide recall, field practices, identification, of flashcards made from photos, and written tests, 93 percent of the 352 participating students were shown to have recall of wildflowers in the 93- to 100-percent range. Further, tests became less threatening when they were about things the students had actually experienced.

The teachers also discovered a number of unanticipated benefits. Students became more reliable and self-disciplined as a result of their outdoor camera excursions, and several students with behavior problems improved as they began to taste success in this undertaking.

Students also learned about various applications of photography as a scientific concept, a learning activity, and a hobby with the teachers reporting that 84 students are independently pursuing their interests in picture taking.

In short, state the teachers, "the day has arrived when the camera is as important as any other scientific tool. Photographs give a better display of the plant, are more realistic than a book, can be duplicated at little cost, are long lasting, can be changed in size while retaining true proportion, and leave the environment unharmed." They also point out that the program can be adapted to the flora of any area and that it is flexible. Earth science students can concentrate on erosion, weathering, and alteration of terrain, for example, while life science students can study flower parts and reproduction.

Project Title

The Mathematics of Photography

Teacher: Carolyn Joy Peterson

Locale: Virgil Grissom Middle School,
Mishawaka, Indiana

Subject: Mathematics

Grade: 8

Purpose and Description of Project

In designing this project, Carolyn Peterson had two goals: (1) to teach a mini-course in photography while using the camera and the photographic process as practical examples of mathematics in action; and (2) to have students apply this knowledge through photographing activities that demonstrate math concepts so that these abstractions become more real and comprehensible to the students.

To test whether photographing math activities would help students learn new concepts more thoroughly, Peterson first taught basic photographic techniques to her entire class and then divided the class into a control group and an experimental group. The control group photographed math activities relating to concepts learned earlier in the year, while the experimental group concentrated on photographing concepts directly related to the geometry unit that the class was currently studying. Scores of the experimental group were then compared with the scores of the control group to see if photographing concepts as they were being learned made a difference.

Peterson found that "on the posttest, the experimental group did have a higher average score than the control group." The project seemed to increase **all** students' interest and motivation by providing them with practical applications of mathematics, according to the teacher, who says she is now "intrigued with the idea of using photography as a year-long tool."

Activities

During the opening mini-course in photography, Peterson brought in two types of cameras and allowed students to practice focusing and making the appropriate settings. She tied together the photography lesson and math concepts in a number of areas relating metrics to lens sizes, geometry to the formation of images, and angles to the effects of lighting, for example

When the photography lesson was completed, the entire class began its study of the geometry unit during the first half of the class periods. During the latter half, the control group had study time, while the experimental group worked on photographing geometric concepts. While the experimental group was given assignments, they also had considerable freedom to design and lay out their shots. One experiment, for example, involved measuring the length of the shadow cast by the school. Students then used this measurement and information they had learned about triangles to compute the height of the school. In another picture, students are shown comparing the circumference of a round wastebasket to its diameter to understand why pi is about 3.1416.

Subsequently, the control group spent the same amount of time photographing math concepts, but their activities focused on non-geometry math topics.

Finished photographs from both groups were displayed in classroom exhibits and a photo album, and will be used as resources by future math classes.

Materials, Resources, and Expenses

Students used two 35 mm SLR cameras and one 35 mm viewfinder camera. All film was 36-exposure KODACOLOR II Film. Other equipment and supplies included automatic flash units, flood lights, a 100-page photo album and three-section folding screen for displays, and mathematical models. Expense items were eight rolls of film (\$25), the album (\$7), processing (\$55), and reprints (\$10).

Outcomes and Adaptation

Peterson's students learned to use both SLR and viewfinder cameras, and she "was actually surprised at the overall quality of their pictures." By using the cameras, she says, they also learned and could apply such concepts as metrics, infinity, and proportions. The posttest showed that direct involvement of photography with math concepts while they were being studied "enhanced the experimental group's performance, and the project as a whole indicated that photography helps students "bridge the gap between concrete and abstract math concepts," states Peterson.

The teacher advises that "teachers of various content areas could replicate this pilot program to make countless abstract ideas more real for students" although they "would likely prefer to bypass the control group process."

Project Title

Physics Photos

Teacher Joanne Beach Hayhurst,
Francis H. Rossire, Jr.

Locale Kent Center School, Kent, Connecticut

Subject Physical Science

Grade 8

Purpose and Description of Project

Hayhurst and Rossire used photography to motivate student interest in scientific principles by having the students put together slide shows on laboratory setups and real-life examples of these principles.

Feeling that "many of the standard activities used to explain physical phenomena are essentially passive," the teachers decided to use photography to get the students "actively involved in the learning process" so that they would "truly assimilate the concepts rather than be passive observers and memorizers." And by having the students focus on both lab demonstrations and "real world" examples of the principles studied, the teachers felt they could help students "become astute, analytic observers, connecting classroom learning with their real lives." The students also taught the concepts they learned to their classmates, using their own slides and student-created pre- and posttests.

In evaluating the project, Hayhurst and Rossire found that their photography-based approach was neither expensive nor difficult and that it was an "exciting and successful" way to make classroom abstractions more real to students and to make them active participants in the educational process. Simply finding natural examples of scientific principles to photograph, they note, "necessitates a full understanding of those principles by the student."

Activities

Two groups of eighth graders were each assigned a principle relating to the nature of light—the behavior of light waves using mirrors and lenses on the different frequency of each color of light. Each group researched its subject, experimented with lights, lenses, prisms, and gels (colored sheets of plastic), and suggested lab setups that would demonstrate the topic. Students photographed the lab examples and then developed a list of natural examples of the principles and photographed them, specifying what each photo illustrated.

The groups then developed pre- and posttests on the concepts shown in their slides and teaching lessons that accompany the slides. The students taught the lessons to their classmates, gave the tests, and analyzed the results.

Materials, Resources, and Expenses

For the photography, two 35 mm cameras, two rolls of slide film, and a tripod were used. Other supplies included a slide projector and screen, water tank, three filmstrip projectors (light sources), and a variety of lenses, prisms, mirrors, and gels. Since almost all the equipment and materials involved were either available from the school or borrowed, the only expenses were for film and development.

Outcomes and Adaptation

Testing showed significant student learning about the light concepts illustrated in the slide shows. One of the groups moved from a mean pretest score of 25.9 to a posttest score of 77.5. The other group's mean score went from 25 to 80. The teachers also believe that the use of the camera has caused students to develop sharp and accurate observational skills and to analyze and understand photographs taken by others. They found, for example, that the camera users had dramatically higher scores even on tests about principles their particular group had not been assigned to investigate.

Hayhurst and Rossire say that the photo-based approach could be integrated into any unit of a science curriculum and could be adapted to the needs of younger students without sacrificing any of the program's vital aspects.

Project Title

Focus on Environment

Teacher George L. Boehm

Locale Fairhope Middle School, Fairhope, Alabama

Subject Environmental Science

Grades Middle School

Purpose and Description of Project

The goal of this project was to make Boehm's students more aware of both positive and negative factors in their environment and to capture a photographic record of what they found. They also ran into positive and negative factors in their photographic adventures because both teacher and students were starting from scratch, but, Boehm maintains, "the learning experiences we encountered more than compensated for our mistakes."

The environmental topics central to this study were salt marsh areas, federal reserve areas, litter control, erosion, and native plants and animals. Students were divided into groups with each focusing on one of these areas and taking pertinent photographs relating to its particular concerns. The groups then combined their results, tying together all the issues studied into an overall "Focus on Environment" slide show. Then they wrote an accompanying script and are sharing their findings with other classes.

Boehm believes that carrying out the project was in itself a learning experience because of the appreciation students gained for environmental issues, and that having a photographic record reinforces and enhances that experience.

Activities

After gathering photographic tips from local photographers, Boehm's students and their adult supervisors went on field trips to examine various aspects of their environment. Each group took one camera on each trip, with everyone collaborating on camera settings and then selecting one person to take the shot. The locales visited included a local salt marsh area, a federal reserve area, a sanitary landfill, land configurations demonstrating the effects of erosion, and a local animal reserve.

Class discussions concerned both photographic techniques (why some slides were too dark and others too light) and the environmental factors students had identified on their trips. An example of their increased awareness, Boehm notes, is that students had played in gullies around Fairhope for years but had never before viewed them as examples of soil erosion.

Materials, Resources, and Expenses

Among human resources were volunteers who acted as chaperones and provided such assistance as photographic advice, transportation for field trips in private cars, access to the landfill and animal reserve, and information about biology and botany. In addition to related texts, actual equipment comprised just a 35 mm camera, seven rolls of 36-exposure film, and the school slide projector. The only costs were for film and processing and gas for the field trips.

Outcomes and Adaptation

Boehm found that his students gained a better appreciation of their environment plus more understanding of the skills that go into producing good pictures. These results are supported by students' own evaluation of the project; observation of students in the field by teachers; and evaluation of the final product (the slide show) by nonparticipants. Further evaluation of actual retention of subject matter by the students is planned.

Beyond these substantive outcomes, Boehm points out that "both teachers and students share pride in our completed project," partly as a result of the positive responses of other students and teachers who have viewed the slide show. He also says that students are eager to do another show involving even more detail and that he hopes the school's science classes will now do one such project each year, building their own slide file.

Boehm believes that "this project can easily be adapted to any classroom situation. The fact that many of the photographs were of less than professional quality did not seem to make a difference." He also stresses that it doesn't matter which environmental factors are studied, the main point being to choose those concerns with which students can most closely identify

Project Title

Camera Conservation Energy Hunt

Teacher: Robert E. Beckwith

Locale: Cambridge High School, Cambridge, Idaho

Subject: Physical and Earth Science

Grades: 8-9

Purpose and Description of Project

This project is designed to teach students about various forms, uses, and impact of energy. As a basis for this study, Beckwith developed a list of 56 items related to five general headings: alternate and renewable energy (including items such as wind and water), conservation (insulation, car pooling), nonrenewable energy (oil, coal), transportation (horse, train), and uses (appliances, manufacturing). Students had to research and be familiar with all 56 items on this Camera Conservation Energy Hunt and were assigned to find and creatively photograph examples of 12 of these items, write about the significance of the items they photographed, and demonstrate their understanding of the important energy messages or concepts related to their photographs and to other list items as well.

The students' photographs were used to create two primary products: individual "energy photo albums" that also included the students' observations and a photo lab test made up of enlargements of 25 of the student photos with two questions about each. Evaluation, explains Beckwith, was based on students' description of the 56-item list, their photo albums, the lab test made up of their photos, and a 100-question pre- and posttest. Beckwith finds that the use of photography improves student learning because to get a good photo demands a good understanding of the concepts the photo is supposed to demonstrate, and that most of his students "enjoyed the picture taking from start to finish."

Activities

Introducing his eighth and ninth graders to the energy hunt list, Beckwith explained that they would be expected to learn the significance of each item, to photograph examples of 12 items, and to explain the impact of those 12 items on America's energy picture and how that impact could be improved.

Students were then given a short course in photography that included a lecture, viewing of slides, and discussion on picture-taking techniques. Then they divided into groups according to their photo assignments (one group for those photographing items 1-12, another for items 13-24, etc). This, says Beckwith, was "the fun and dynamic learning phase" when students began "to exchange ideas and crystalize what and how they were going to photograph." Actual photographs were taken during a short field trip conducted on and off campus or as overnight homework assignments.

"We developed and enlarged all our film," notes the teacher; the students put together their albums, and then Beckwith and they discussed and evaluated the results. Small contact-sheet photos were used for the albums, with just those 25 photos chosen for the lab test needing enlargement.

Materials, Resources, and Expenses

In addition to textbooks, Beckwith used materials from Energy and Man's Environment (a nonprofit organization promoting energy education) and a filmstrip series called *Energy: The Challenge Is Now* produced by United Learning.

For the photography aspects, he used 10 KODAK INSTAMATIC Cameras (borrowed from another school district), one or two rolls of film per student, and darkroom and enlarging equipment (including developing tanks, chemicals, enlarging paper, etc). He estimates costs at less than \$150, or about \$4 per student. Using commercial services for processing, printing contact sheets, and making enlargements would not only double processing costs, notes Beckwith, but would also deprive the students of the benefits of the darkroom experience.

Outcomes and Adaptation

Beckwith found that while students enjoyed the photography experience and demonstrated increased learning as a result, there were some difficult adjustments to be made at the beginning. The students "were actually being asked to be creative, to think, and end up with a product," he explains, and also were initially unfamiliar with, and therefore unsure about, using a camera. However, once the students got "out of the classroom and started taking pictures, then the magic began. The negative attitudes, frustrations, and concerns melted away into excitement."

And with excitement came learning. Beckwith notes that ninth graders (who, apparently because of their greater energy background, showed greater improvement than the eighth graders) performed 31 percent better with a camera than without. The average score of the older students on the posttest improved 16 percent, while the younger ones demonstrated a 12-percent improvement. The students themselves recognized the impact of picture-taking. Or, as one student answered when asked if the camera helped him learn, "Yes, it was easier to remember the information and stuff."

Beckwith believes that his energy hunt project can be modified to suit any community's local resources and that his data indicate that "using the camera to teach energy education can be invaluable."

Project Title:

What's In It For Us?

Teachers: Laura R. Ostrander, Terry B. Carden

Locale: Princess Anne Junior High School,
Virginia Beach, Virginia

Subject: Biology and Earth Science

Grade: 9

Purpose and Description of Project

This project combines the study of marine science with community activism. In addition to achieving classroom objectives, explain Ostrander and Carden, they worked with students to win funding and support for a proposed marine resources museum in their community. To do this, students and teachers visited the National Aquarium in Baltimore and used photography to document specific educational objectives that can be pursued in a marine museum and to spotlight learning experiences that could not be carried out elsewhere.

The students' primary product was a sound/slide program titled "Close Encounters of the BEST Kind" which has been presented to the local PTA and is being offered to various civic groups to encourage support for the museum. In preparation for this presentation, students studied basic photographic techniques, visual techniques that may be used to get attention and/or influence opinion, the use of marine resources in the community, and citizen participation in community issues. Then they put their knowledge to work on the museum field trip and assembly of the sound/slide show.

Activities

Students participated in one or more of the following activities related to the project (the museum trip, for example, was optional because students were assessed a \$20 fee for the trip):

- Students collected and read articles pertaining to the proposed Virginia Museum of Marine Sciences and the general use of marine resources and they produced individual annotated "Tidewater Marine Resources" scrapbooks.
- The school debate team argued the museum issue in a special after-school session.
- Students interviewed civic leaders and staff members of the museum-to-be.
- They developed lists and photographed examples of visual techniques that communicate without words and designed posters to "advertise" the region's marine resources.

- The field trip to Baltimore involved 123 students who recorded their scientific observations and took photos to illustrate what they learned at the museum, concentrating on things that would be difficult to comprehend from a book or other teaching aid.
- Students mounted the processed slides and incorporated them into their sound/slide presentation to the community.
- They also gathered seafood recipes from various sources to be included in a book titled "Marine Cuisine" and containing more than 200 recipes. Each student and faculty member gets a copy, and the others will be used to raise funds for the museum.

Materials, Resources, and Expenses

This project called for 35 mm cameras, copy stands, color slide film, processing of KODAK EKTACHROME Film, flash bulbs, slide projectors, audio tapes and recorders, lettering aids and print resources of the Career Development Center of Virginia Beach, bulletin boards, and the school word processing facilities.

Outcomes and Adaptation

Ostrander and Carden say that this project provided students with a broad spectrum of experiences. They learned to communicate in a visual medium and to critically analyze visual messages. How school experiences are integrated with community resources, participated in community action, and produced (as opposed to merely consuming) visual messages. The teachers observed that the use of photography increased student concentration on assignments and stimulated interest, enthusiasm, and cooperation with peers. Students were also evaluated on pre- and posttests covering environmental awareness, community issues, resources, leaders, regional geography, local marine resources, and selected science concepts. The real test of their performance, of course, will come in the form of expanded support for the museum.

Variations of the project, note the teachers, could be applied in several broad categories such as involvement of students in any controversial or community issue, inclusion of more specific learning activities during the field trip, a focus on community resources in order to foster community and school pride, and application of the activities to specific curriculum objectives.

Project Title

Entomology Photography

Teacher: Mark Irvin Parker

Locale Somerset High School, Somerset, Texas

Subject: Biology (Entomology Unit)

Grades: 9-12

Purpose and Description of Project

Parker's objectives in integrating photography with the study of insects by his three biology classes were to take his students literally and figuratively out of the lecture hall and into the real world of insects and, thereby, to help them improve the collections they developed as their class projects. He hoped that by using photos taken during entomology field studies to identify specimens for their collections, rather than digging through taxonomy texts, students would save time that could in turn be devoted to expanding their actual collections.

Not only were these objectives achieved, Parker reports, but the problem of getting students involved in entomology, which he had experienced for 11 years, was solved. "The first time I brought the pictures in, I thought I was in a different classroom," he declares. "The enthusiasm of my students has been beyond belief."

Activities

Before beginning the project Parker took photos of insects so that students would have an idea of the type of shots they would be expected to get. He then introduced them to the use of the camera, covering the functions of various camera parts, settings, and lighting.

Students and teacher then spent one day a week for four weeks taking pictures of common insects in the area. As specimens were located, students could snap the shot themselves or have someone else do it while the discoverer positioned the insect for the most dramatic effect. At each photo opportunity students gathered to discuss the insects and their habitats and witness such characteristics as protective coloration and mimicry. They also talked about such photographic topics as angle, lighting, background, and camera settings. In each instance the name of the student, the exposure number, and the type of insect were recorded.

During this period students also read, heard lectures, and watched films about insects and constructed a corkboard display for their photos, which were mounted according to correct biological order and captioned with the insect's name and the name of the person taking the photo. The project ended with about 80 photos on the board that matched a majority of the orders listed.

The next three weeks were devoted to what Parker sees as "the true test of the project -- the students' actual insect collections." Grouped in teams of four, students collected, pinned, mounted, and identified the elements of their own developing collections while also building collection boxes.

Materials, Resources, and Expenses

In addition to human resources (teachers who allowed Parker's students out of class to work on their collections and the general construction teacher who let some students build collection boxes) Parker's project required:

- A MINIGLTA X-700 Camera, a PANAGOR Auto Macro Converter for close-up shots, a VIVITAR 28-50 mm Wide-Angle Zoom Lens, a LONE STAR 80-200 mm Zoom Lens, and eight rolls of ISO 100, 24-exposure film processed by a one-hour photo lab
 - Regular and supplemental texts, two films about insects from the Regional Education Service Center, and teacher-made tests
 - A 3 x 9-foot piece of corkboard for the photo display
- Because Parker used his own camera and lenses, total cost of the project was under \$220 which included a macro-converter, \$100; film and processing, \$104; and corkboard, \$15.

Outcomes and Adaptation

Parker's first concern is the quality of the students' insect collections, the majority of which he says are "considerably better this year than any I have ever had turned in." Most collections had 50 to 100 more insects, students were more independent in identifying their finds before asking help, and by the last week of picture-taking, students were getting excellent shots about 80 percent of the time. A major reason for the improved collections, Parker feels, is that students were able to classify insects according to their own photos, and thus had more time to spend in collecting.

The other primary factor that resulted in higher quality student work, Parker says, is simply the curiosity and excitement stimulated by the photography experience. "If photography of insects can generate so much enthusiasm in my classroom," he states, "I am sure the bounds of such use of a camera in other curriculum areas are limitless."

Project Title

Using The Process Camera To Encourage Creativity and Subject Mastery

Teacher: Robert Howard Guyette

Locale: Bangor High School, Bangor, Maine

Subject: Biology

Grade: 10

Purpose and Description of Project

The key feature of Guyette's project is the use of student-generated pictorial materials, such as line drawings, to illustrate the meaning of complex bioethical issues for others and to enhance their own understanding. He finds that many students experience difficulty in learning due to an inability to transfer information from figurative language to visual images. However, the increased use of simple line drawings can make learning more exciting and meaningful, he believes, and pictorial materials increase both speed and retention of learning.

Therefore, this project aims to shift the emphasis from verbal learning to visual learning in order to obtain parity between the left and right brain hemispheres and provide for maximum development and accomplishment. Guyette found his 10th graders' artistic development lagged far behind their verbal ability and that they especially experienced difficulty when attempting to produce drawings smaller than 8 x 10 inches. Therefore, he turned to the process camera to reduce their regular-size drawings to fit a two- or three-column, magazine-article format, and the students used the drawings to illustrate outside articles that they had studied and recast in their own words.

While studying bioethical questions, says Guyette, the students developed skills in reading with acuity, recording variances, organizing and synthesizing findings, attributing data to appropriate authorities, and formulating an original conclusion (in a sketch or cartoon).

Activities

A carefully selected article suited to the subject matter under study was duplicated and cut up into manageable columns of 400 to 700 words, with a column assigned to each student. The students read their columns carefully and tried to come up with an appropriate visual (sketch, picture, cartoon, logo) and reword the material in a creative way. Guyette stressed the importance of breaking up complicated passages into fragments that were easily understood. Since his project focused on raising students' bioethical consciousness, he chose *Living on a Lifeboat* by Garrett Hardin.

Students then sorted out and reviewed their individual notes, formulated a thesis, and organized the material into a logical sequence. From this they built a rough draft and then a polished version incorporating their drawings.

Materials, Resources, and Expenses

Guyette worked with colleagues in graphic arts, art, economics, language arts, and typing. He sees this project as "an excellent opportunity for a team-teaching approach," which adds cohesiveness and promotes wider applicability to various curriculum areas. Equipment used included a ROBERTSON Horizontal Process Camera, Model 480, a 19-inch lens with a range of two enlargements (200 percent) to five reductions (20 percent), KODAK PMT[®] Paper, and typewriters or word processors. Cost, notes the teacher, is approximately \$50.

Outcomes and Adaptation

In addition to increasing their subject-matter knowledge and evaluating bioethical issues, students learned to read carefully, draw conclusions, and visually synthesize their findings. Also, says Guyette, they learned the remarkable power of cartoons to communicate complicated issues "with splendid economy."

The teacher advises that the program can be adapted to virtually any high school subject simply by substituting an article appropriate to the desired specialty, and that, while he applied the technique with 10th graders, it is suitable for grades 9-12. He also suggests that the project could be repeated several times within the same subject area simply by selecting additional articles. "It is conceivable that in language arts this format could be used exclusively as a language lab," he states. "It would certainly lead to mastery of communication skills."

Project Title

Utilization of KODAK Disc Cameras in Science

Teacher Michael H. Farmer

Locale Riverside High School,
Greer, South Carolina

Subject Physics

Grades 10-12

Purpose and Description of Project

This project demonstrates the value of photography in physics lab work and resulted in the development of five physics modules built specifically around the KODAK Disc Camera, which Farmer says, is uniquely suited to science education due to such features as rapid exposure capability and predetermined minimum time between exposures.

Farmer and his students used the camera to study nonaccelerated, accelerated, simple harmonic, and curvilinear motion. Use of photography wrought enormous changes in the attitudes and achievement levels of his class when it was introduced in mid-year. In the past, he says, students found lab work frustrating and threatening. Now, they are eager, ask questions, complete assignments on time, and ask permission to work in the lab after school to try out ideas. The difference is partly, according to students, that photography "helped me clearly see the effects I was looking for" and "allowed me to study my experiment for as long as I wanted." In short, it allowed them to get a firm grip on what had been fleeting and sometimes confusing scientific concepts.

Other measures of the impact of Farmer's program are that several students are planning science projects using photography and that, for the first time in the history of the school, there will be two large physics classes next year.

Activities

The project opened with a lecture on using the camera and setting up equipment, presentation of sample pictures, and questions and discussion. Students were then given an assignment sheet listing their lab groups (four per group), the date they would have access to the camera, completion dates for all labs, and specific photographic assignments. With Farmer juggling simultaneous lecture and lab sessions, the students managed to finish their photo assignments in four days.

When the processed film was returned and distributed to students, Farmer at the same time, gave out a set of five modules with instructions for completing the labs, questions, and final reporting forms. The modules covered were time constancy of a disc camera, determining the restoring force acting on a pendulum, studying the motion of a steel ball on a metal track, nonaccelerated motion in a straight line, and curvilinear motion.

In these modules students are required to suggest uses for the disc camera, think through variations of the labs they performed, and experiment with the variations, plot graphs using a microcomputer-graphics program, interpret their graphical data, derive an equation for the plotted data, if possible, and answer questions about possible contradictions of their results.

Materials, Resources, and Expenses

Many of the materials used were available from the high school science supplies. Purchased materials and equipment were one KODAK Disc 6000 Camera, KODACOLOR HR Disc Film, a solid-state, sound-activated switch module for stop-action photography, and a battery-powered train for the curvilinear motion study. Fortunately, as the project progressed several students either brought or borrowed additional cameras. To do the project right, Farmer believes a one-time expenditure of \$575 would be necessary for seven disc cameras, three electric trains, two time-activated switches, a remote-control airplane with transmitter, etc. for aerial photos, and miscellaneous items such as batteries and steel balls. His cost for one camera, train, and switch was, of course, much less. He discovered that students are willing to pay for film and processing if they are allowed to be in the photos and keep them after the labs are completed.

Outcomes and Adaptation

While Farmer plans a more objective evaluation using standardized tests, he is sold on this project already on the basis of informal discussions, observation of student attitudes, grade performance, and quality of lab work. The class average in physics labs, for example, increased 17 points over the first half of the year when photography was not used.

The teacher feels he has only begun "exploring the possibilities of using the disc camera in the science lab. When time and funds allow, I plan to adapt the disc camera for use with a microscope, telescope, and microcomputer and develop an interface that will increase or decrease times between exposures. And he feels that there is great potential for camera use in biology, chemistry, and social sciences.

Project Title

Ecology in My-Town, USA

Teacher Joanne F. M. Dunlap

Locale Concord High School,
Concord, New Hampshire

Subject Biology/Ecology

Grades 10-12

Purpose and Description of Project

The objective in this project was for students to use the knowledge they gained in classroom study of maps, slides, and filmstrips to find and document photographically local examples of habitats, seasonal succession, and the influence of people on the environment. They then constructed displays summarizing the results of their field studies.

Dunlap reports that the students were evaluated according to pre- and posttests on vocabulary and habitat characteristics, group reports, and participation in field work. On the tests, for example, student averages rose from 33.1 to 78.47. She also feels that students have an increased awareness of their environment and a greater concern about it. An example of their enthusiasm for the project, she notes, is that on the day of their major field trip they braved rain, hail, and sleet without a complaint.

An important factor, she believes, in their dedication to the project was simply that they were studying their own, home-grown examples of the various concepts they were learning. As she puts it, "stumps decaying are more interesting if they are local stumps."

Activities

Dunlap identified these major activities during the project:

- Students were pretested and presented with an overview of the unit, learned how to use a map, and studied maps of New Hampshire and the Concord area as well as maps of North America and the world showing major biomes (predominant vegetation patterns, such as desert, rain forest, deciduous forest, etc).
- They studied filmstrips and slides on succession and went to a nearby wooded area to get photos demonstrating this phenomenon. This mini field trip was partly a warm-up experience getting students used to cameras and to thinking in pictures.

- Returning from vacation to see their developed pictures, the class prepared a group report on succession.
- The class discussed field trip assignments in which they were to document a habitat and a human-caused environmental change, talked about human-caused change, and planned specifics of the trip.
- Students were issued cameras and film and transported to various locations. They were then debriefed about what they learned and posttested while their photos were developed.
- They prepared final group reports displaying their findings about habitats and human-caused changes.

Materials, Resources, and Expenses

Dunlap received assistance from the state historical society in finding old maps and photographs of Concord, the school media aided in rounding up cameras, film mailers, and audiovisual equipment, and camera store personnel in gathering tips about film and developing.

Materials used were six KODAK INSTAMATIC Cameras, color print film; slide film; flash and attachment; instant camera with flash for photos of students; instant color film; slide and filmstrip projectors; slides on seasons; filmstrips on ecology; maps of the world, continent, state, and city; student worksheets and pre- and posttests; and posterboard, glue, and markers. Primary expenses were for film and developing.

Outcomes and Adaptation

Major outcomes, according to Dunlap, were that students learned to identify major biomes of North America on outline maps, use photographs to demonstrate the sequence of changes in succession in forest environments, and identify and locate the types of habitats found in the city. They also planned, directed, and executed their own field trip with minimal teacher help and photographically documented examples of human-caused environmental change in the city.

Dunlap says that the program can be replicated anywhere since it is designed to discover the local area rather than fit a textbook situation. "Every place in the world has an environment," concludes the teacher, urging others to make the most of unusual local natural features.

Project Title

A Photography Program

Teachers: Helen Broughton, Diantha Winton,
David Wright

Location: Oakhaven High School, Memphis, Tennessee

Subject: Earth, Life, and Physical Sciences, Biology,
Chemistry, and Physics

Grades: 7-12

Purpose and Description of Project

These teachers are carrying out a truly massive photography program that has been integrated into the entire high school science curriculum. They maintain that "it is massive but totally manageable. It is absolutely inclusive but very flexible."

The camera was introduced as a permanent tool in these teachers' science program three years ago, say the three, and since then, "there has been a tremendous rejuvenation of interest in all of the science classes. The cameras have come out of the closets and taken their place alongside the calculators of the mathematics classes." Their motto is, "If you can see it, you can photograph it; if you can photograph it, you can study it."

The goals of Broughton, Winton, and Wright in using photography in their science classes are academic progress and photographic skill development.

Activities

This comprehensive program involves a great variety and number of activities. The three major areas are:

- Photosketching for seventh and eighth graders. This involves taking black-and-white photographs, drawing on them with India ink, and treating them chemically to bring out the students' changes in the pictures. This skill exercise helps students understand chemical reactions in cells and chemical analysis of rocks and minerals.
- Black-and-white film developing and printmaking for ninth and tenth graders. This exercise helps students understand the concepts of light, lenses, and mirrors. They take photos around the campus, develop the film in the darkroom, and print enlargements. They study physical changes in the environment and selected topics in biology. For topics such as bacteria, microphotography is used.
- All the previous techniques plus filmstrip and slide making for chemistry and physics students in grades 11 and 12. Because these students can build on the photographic and academic foundation gained in the earlier grades, they require a minimum of instruction and are left to independently design and execute photographic illustrations of the laws of the universe.

Materials, Resources, and Expenses

The materials and equipment for this program are purchased from the teachers' normal yearly science budget, which totals \$700 for physics, chemistry, biology, and physical sciences. The students use a 35 mm camera. Supplies for the photosketching include quill pens, India ink, iodine, sodium thiosulfate, and black-and-white photos.

The developing and printing study requires black-and-white film, photographic paper, KODAK D-76 Developer, KODAK DEKTOL Developer, fixer, and stop bath; a film canister and an enlarger; microscopes; and an attachment to mount the camera for photomicrographs. The filmstrip and slide-making process requires no additional equipment except a Process E-6 chemical kit and KODAK EKTACHROME Film. Processing for all these activities is done in a school darkroom set up in half the biology storage room, which includes a sink.

Outcomes and Adaptation

Broughton, Winton, and Wright say they are "pleased and surprised with the level of enthusiasm, skill attainment, and academic achievement at all levels of our photography program." In grades seven and eight, they emphasize photographic skill but have also found evidence of greater student understanding of other chemical processes. Skills were also emphasized for students studying black-and-white photography, but they showed improvement in physics tests on the areas of light, lenses, and mirrors as well. In the more advanced courses, photographic techniques were incorporated with subject matter—with photomicrographs definitely and distinctly used to study cell functions, for example. These students not only tested well but "exhibited a level of creativity far greater than we expected," state the teachers.

They note that their entire project was carried out at minimal cost and in a very limited environment. Other teachers could get started with just three basic elements running to less than \$600—an enlarger, a camera, and a photo kit containing chemicals, small equipment, and paper.

Project Title:

Fargo in Pictures

Teacher: Rodney Hardie

Locale: Roosevelt Elementary School, Fargo, North Dakota

Subject: Social Studies

Grades: 3-4

Purpose and Description of Project

Hardie's project was developed to help students become more aware and appreciative of their local surroundings through creating a pictorial essay about their city.

Specific learning objectives were sharper observational skills, proper use of a camera, construction of a pinhole camera, creative writing, layout and design of a publication, group interaction, the planning by students of their own field trips, and taking pictures to illustrate specific topics.

The students' end product is a photo/essay book, *Fargo in Pictures*, which they launched at a special unveiling party.

Activities

The students first learned about camera use and photographic techniques through making their own pinhole cameras, visiting a local art gallery, viewing a film, and the visit of a professional photographer.

The group was then divided into nine teams assigned to various aspects of the city—government, education, geography, industry, recreation, health care, transportation, homes, and businesses. Each team compiled information about its subject and developed a working outline of the photographs they needed to take. Each team was also responsible for setting up its own field trip and arranging transportation.

While the photographs were being developed, the youngsters delved into the history of their city, writing captions for magazine pictures, designing ads for merchants of earlier days, and drawing travel posters promoting the city. Then they selected the pictures they wanted enlarged and learned about layout and design from a local advertising executive. Each group then designed its chapter of the book, wrote an introduction, and devised captions for the pictures in that chapter. The book was typeset and printed by the graphic arts instructor at a local high school.

Materials, Resources, and Expenses

Students used CANON 35 mm Cameras provided through a local studio, which also developed their film and provided proof sheets. Enlargements were made by a local camera shop. Cost was \$150 including film, processing, and printing of the book.

Outcomes and Adaptation

The students developed a better understanding of their city, according to Hardie, because they were looking at it in a different way in order to understand how each individual topic fit into the overall functioning of the city. And, he says, "this gave the students a better understanding of how they fit into society as well."

He believes this "project can be applied to a wide range of curriculum areas, with a wealth of different outcomes."

Project title

History Through the Eyes of the Photographer

Teacher Wayne T. Dennis

Locale Jefferson Elementary School
Riverton, Wyoming

Subject Language Arts/Social Studies/Art

Grades 4-5

Purpose and Description of Project

Students involved in this project have had a unique opportunity to study the history of their home state and are also in the process of compiling what they have learned for the use of others. In the course of their explorations, under the guidance of teacher Wayne Dennis, they have visited more than 350 historical sites and famous places in Wyoming and taken more than 2,000 color slides designed to make up five separate slide shows—The Railroad Through Wyoming, The Plains Indian, The Mountain Men, The Homesteaders, and Wyoming Today.

The project involved extensive preparatory research, six three-day field trips, and numerous one-day outings. And while the teacher and his more than 100 students completed only one of the slide shows during the school year, they feel that, with the slides in hand and the research done, they can finish the others during the summer. They also hope to create activity packets to accompany each show for the use of other teachers and their classes.

Dennis says that the photography project has not only been a "new and exciting" experience for the students but has been "the most enjoyable experience I've had in my teaching career thus far."

Activities

While the district's artist-in-residence helped some of the students build a darkroom in a storage area, Dennis and the others planned the trips necessary to cover all the historical points they had in mind. They divided a map of the state into six areas and selected visit sites and resource people to interview. They then arranged with schools in these areas to house the traveling students. While the six overnight trips were limited to 10 students each (those whose research was most pertinent to the sites), the additional one-day outings allowed everyone to be involved at some point.

Narration for the shows was drawn from the students' research reports and from the taped interviews gathered on the various trips. The students' instruction in photography was handled by the artist-in-residence, and they not only did their own developing but built an enlarging unit that was used to produce prints of some of their pictures for a year-end art show.

The high point of the project was the preview of the completed slide show that students arranged for their parents.

Materials, Resources, and Expenses

Materials required for this project included four PENTAX 35 mm Cameras, 35 rolls of black-and-white KODAK TRI-X Pan Film, 40 rolls of color film, KODAK CAROUSEL™ Slide Projectors, trays, and sorters, enlarger and timer, developing chemicals and trays, photographic paper, film mounts, tape recorders and tape player, programmer/dissolver, and visual-sync recorder. Most equipment was available from the school district, and expenses for other materials and the trips were defrayed through the NEA/Kodak grant and another grant from the Wyoming Arts Council.

Outcomes and Adaptation

Looking back, Dennis says he has no regrets that he and his students were not able to finish all five shows as quickly as they had anticipated. They have had the experience of seeing their pictures and research brought together, learned photography, gained more appreciation of music (as they chose accompaniment for the audio portion of the show), demonstrated heightened ability to work cooperatively, and had an unprecedented opportunity to immerse themselves in their state's history. And Dennis feels that in some ways the project is just beginning because students each day come up with new suggestions for using their photos.

While other teachers may not want to take on a project quite as extensive as this one, the basic idea can be used for enriching historical studies in any state.

Project Title

Facades of History

Teacher: Joshua Taylor, Jr.

Locale: Ashlawn Elementary School,
Arlington, Virginia

Subject: Social Studies and Language Arts

Grades: 4-5

Purpose and Description of Project

Joshua Taylor's project involves the use of architecture as a vehicle for studying American history and is also designed to acquaint elementary students with the basic techniques of slide photography.

"By photographing buildings and interviewing occupants," explains the teacher, "students discovered that buildings are as much a record of the past as any other historical evidence." The students investigated their own neighborhoods and went on a number of field trips, with a primary focus of finding examples of colonial architecture. Their photographs have been displayed at the local public library and their slide/tape show, "The House I Live In," which shows examples of both historic buildings and the students' own homes, has been shared with other students, school administrators, and the community.

Activities

Students learned about the history of photography, use of the 126 and 35 mm cameras, similarities between the human eye and a camera, composition, portraiture and candid shots, use of flash, and slide editing.

In researching colonial architecture, the students studied maps, census information, and old newspapers; learned to identify major styles; and became familiar with architectural terms. And in preparation for field work, they also studied interviewing techniques by role-playing interview situations and critiquing their performances on videotape.

Students were divided into three groups—18th century colonials, 20th century colonials, and 21st century colonials—for their major activities. In one of these they built model dwellings that were required to contain at least five colonial elements and that were judged by their peers. The houses were displayed and photographed, with some of the photos later used in the slide show.

Central to preparation for the slide program was the photographing of students' homes, buildings in their neighborhoods, and historical properties. In their own neighborhoods, the students were able to find out how old their homes were and who had previously occupied the sites. They searched out the oldest surviving structures, and interviewed local people as well as photographing the buildings. On field trips, students visited the Smithsonian Institute, Mount Vernon, Arlington House, Woodlawn Plantation, old Alexandria, the White House, and Octagon House.

Writing assignments related to these activities formed the basis for the script of the slide/tape show, which eventually came to include 110 slides.

Materials, Resources, and Expenses

Human resources included several members of the school staff, parents, and library and historical society staff. Class presentations were made by the museum education coordinator of the George Washington Bicentennial Center, who conducted a time line activity to help students visualize life in the 18th century, and an architectural historian who conducted a workshop on house styles.

Equipment and supplies used included three 120 and four 35 mm cameras, 15 rolls of film, a video camera and recorder, and reel-to-reel tape recorder. Cost was about \$160, primarily for film and processing.

Outcomes and Adaptation

On the basis of both tests and observation, Taylor judged the project to be very successful, adding that curriculum specialists in social studies and language arts also gave it a positive rating. He found that a greater number of students passed the photography posttest than any other science test (photography having been taught in lieu of a science unit), that students took on writing assignments with less complaint than in other activities, and that low-achieving students were given opportunities to excel. He also believes that the project would be equally effective for studying any period of architecture.

Project Title

Sliding and Taping Success

Teacher: Bernice Parrott

Locale: Bethesda Elementary School,
Lawrenceville, Georgia

Subject: Social Studies

Grade: 5

Purpose and Description of Project

Students in Parrott's gifted resource class have created a slide/tape version of their field trip to Washington, D.C., which is designed to give viewers an understanding and appreciation of the major parks, monuments, and buildings in the nation's capitol. In the process of compiling materials and completing "The Washington Experience," the students learned about the city and its institutions, photography and media production, and human relationships.

"This project motivated the students to research capitol sites, to learn new photographic techniques, to think creatively, and plan, organize, and work together cooperatively," states Parrott. And, she adds, "students' comments revealed a feeling of great pride and accomplishment," which was underscored by the high ratings their production was given when entered in the Georgia Media Festival.

Activities

Once students decided on the objective of their slide/tape show, they began simultaneously to study photography and research their topic. Information about photography was gathered from numerous sources to be distilled into the students' own "Tips for Good Photography," which was distributed to each member of the group, and sample photographs were gathered so that students could study and evaluate them. At the same time, each member of the class chose two Washington sites to research and collected information over a two-week period while also practicing taking pictures.

With research complete, students elected a committee to assimilate the information and develop a script and storyboards with sketched ideas for slides. The whole class then decided which slides would be in collages of student art work, which would be drawn from books, and which would be shot on location. The first two types of slides were completed prior to the field trip. Once in Washington, the students, accompanied by a parent who is an amateur photographer, took various views of the sites for which they were responsible.

Once students were back home and their on-site slides had been processed, they chose those of the highest technical quality that suited the script and turned to working on the audio portion of the show. Two of the students who auditioned were chosen to make the tape and another to handle background music.

With the production complete, students invited parents to view it on a special media night, shared it with other classes, and donated copies to the school library and the county's gifted education library. The production was also entered in the county, district, and state levels of the Georgia Media Festival.

Materials, Resources, and Expenses

Major human resources were the parent who helped with photography and the school media specialist who assisted students as they learned to use audiovisual equipment. For photography, equipment included various cameras owned by the children, a KODAK EKTAGRAPHIC EF Visualmaker, 35 mm camera with tripod, 35 mm film, zoom lens, close-up lenses, slide film, and flashcubes; for the slide show, slide projector, screen, and visual-sync recorder; for recording, tapes and recorder, sound effects table, patch cord, and extension cords. Cost per copy of the slide/tape show was \$45, which includes film, flashcubes, tapes, and processing.

Outcomes and Adaptation

Parrott found this project to be "a great motivational tool because it gave students good reasons for researching, planning, creating, and problem solving." She says they learned technical skills while also developing an understanding of group decisionmaking and the importance of cooperation.

The teacher advises that "the idea of using a slide/tape show to enhance a field trip is one that can be used by almost any teacher in any setting, and what better way to stimulate learning?"

Project Title

Rhode Island History Slides

Teacher Beatrice Browning Parker
Locale Stony Lane School, North Kingstown,
Rhode Island
Subject Social Studies
Grade 5

Purpose and Description of Project

Beatrice Parker began by using photography to get her students more interested in the study of Rhode Island history, but their enthusiasm and effort has been such that their growing collection of slides showing colonial homes, historical personages, Indian life, and other elements of the state's history has become a permanent addition to the school library.

The teacher concluded that, if students associated historical leaders with local landmarks, facts would be reinforced whenever they saw or heard about these landmarks. The project spurred students to research both historical sites and figures and to match up those that belonged together. To do this, the youngsters had to come up with clear-cut relationships if the "association concept" was to be fulfilled. An example was the matching of the state capital building and the state's first governor, Benedict Arnold (not **that** one, but his grandfather).

Activities

Students began by polling parents and other adults about historical figures they remembered from their schooling, reading about the state's historical background, and searching through books and file materials for pictures to be photographed or ideas for taking original photos. Working as a group, they also compiled a list of landmarks and held discussions to assign individual projects. Photographs were then taken and organized in such categories as homes, battle sites, or "tours" of certain areas.

The slides have not only generated student learning, according to Parker, but become the basis for other educational exercises. "They enjoy using this resource to enrich their oral reports," she notes, and on "biography day" they dressed in costume to portray the subjects of their reports. In the process of their research, the students learned about subjects as diverse as the Indian words from which geographical names are derived, games played by colonial children, and the kitchen utensils common in those early days.

Materials, Resources, and Expenses

A representative of the Rhode Island State Department of Education visited the school several times and helped in formulating a list of influential people for the project's evaluation instrument. A member of the history department of the University of Rhode Island also provided assistance, and one of the school's other teachers helped Parker's students with photography.

Equipment available at the school included KODAK CAROUSEL Projectors, simple cameras, and a KODAK EKTAGRAPHIC EF Visualmaker. Only expenses were for film, flashcubes, and processing of prints and slides.

Outcomes and Adaptation

Parker's evaluation instrument focused on the ability to match a name with a landmark and included leaders in art, government, religion, the military, and industry. Shown slides of the landmarks, students indicated the person's name they associated with a particular slide. Parker says that the pre- and posttest "show a great degree of success in visual association," adding that an unanticipated outcome was the high level of student interest in future expansion of the collection.

She notes that "replication of such a program can be undertaken on a gradual scale with additions made as time and budget permit," and she points out that the skills students acquire in planning, doing background research, and using photographic equipment can be easily utilized in other areas of the school.

Project Title

Photographing The Past To Enrich The Present

Teacher: Judy R. Morgan

Locale: McGibney Elementary School, Pittsburgh,
Pennsylvania

Subject: Social Studies

Grade: 5

Purpose and Description of Project

Morgan led the fifth graders of McGibney School on an odyssey to rediscover how Americans lived, worked, learned, and played during this nation's great westward expansion in the 19th century. During their two-month study, the students researched five major areas—education, country stores, home life, leisure time, and entertainment—recreated many of the activities common to the period through simulations, and compiled a photographic record of their findings and activities.

The students produced four books that included their own photographs, reproductions of old pictures, and extensive information about their objects of study. They culminated their project by holding "Laura Ingalls Wilder Day" to share what they had learned with all the school's students and with the community. They also produced a 20-minute slide/tape production to introduce the day of simulated activities.

Morgan found that the students were not only motivated to learn by this excursion into living history, but that they also developed leadership and problem-solving skills. Further, she notes, school, home, and community were drawn closer together as students sought out information and artifacts during the project.

Activities

Students began reading books by Laura Ingalls Wilder, including the well-known *Little House* series. After choosing the five main areas for study, they divided into small groups to research various subtopics and come up with 15-minute presentations on each. These presentations included photos or slides showing how their research was done, quotes from the Wilder books to relate the activities to the lives of the Ingalls family, and a demonstration producing a product or service.

During their study, students also experienced a day's "live-in" at a nearby restored 19th century village, visited a county park for the demonstration of maple sugaring, and discussed artifacts provided by a representative of the Western Pennsylvania Historical Society. Their research also included surveying parents about special areas of expertise they might have; going through old books, letters, and magazines, and writing to country stores and schools all over the nation.

Finally on "Laura Ingalls Wilder Day," the fifth graders presented their slide show (complete with narration and music) and recreated many activities from the years of westward movement for other students and community members. Demonstrations and exhibits included a one-room school, a country store, sausage making, butter churning, a puppet show about the Ingalls family, an old-fashioned printing press, and quilting.

Books resulting from the study are a record of the special day's activities: *What Is It?* (showing artifacts), *19th Century School Days*, and *Ye Olde Country Store*.

Materials, Resources, and Expenses

Human resources included historical society personnel, former one-room school teachers and country store owners, parents, educational director of the restored village, a naturalist from the county park, local grocers who provided food for the "Wilder Day" demonstrations, and the school staff, especially the fifth-grade teachers who assisted with the project and allowed Morgan (a resource teacher) to work with their classes two half days a week.

Equipment and supplies included a KODAK EKTAGRAPHIC EF Visualmaker, a 35 mm camera, KODAK INSTAMATIC® Cameras, slide and print film, flashcubes, a slide projector and screen, and tape recorder and tapes.

The activities also required a vast array of antiques and collectibles (from a stereopticon to a churn) and supplies for demonstrations and exhibits (such as paraffin for candle making and apples for cider). Most of these items were loaned or donated.

Outcomes and Adaptation

Morgan says that the students learned a great deal about the period they were studying because they were able to actually experience how people lived in those days. The experience was enhanced, she says, by both old photos and students' own pictures, and the slide show and books produced "will remain a part of the school for many years." Students also developed or improved skills in a number of areas including handwriting and spelling, scientific problem solving, leadership, research, use of an atlas, photography, observation, manual dexterity, and critical analysis. "History can come alive for any classroom," says Morgan, "through hands-on experiences, meaningful research, and photography."

Project Title

Paiute Indian Customs and Language

Teacher Mabel Huber
Locale Natchez School, Wadsworth, Nevada
Subject Social Studies
Grade K-6

Purpose and Description of Project

Natchez School is working with the community and the Pyramid Lake Tribal Council to introduce students to the customs and language of the Paiute people and to preserve this culture, which has been largely neglected and forgotten over the years, for future generations.

To create an audiovisual program that enhances and reinforces their program of Indian studies, the students involved in Huber's program (1) photographed and recorded community resource guests teaching Paiute songs, vocabulary, handcrafts, and dancing and (2) developed an audiovisual syllabus of the unwritten Paiute language

Students at different grade levels took responsibility for differing aspects of the work. For example, students in grades four, five, and six handled the photography and developing of slides and prints while younger children recorded vocabulary words and acted out the concepts they represent

"Because all the students realized that this unusual program was being recorded and photographed," says Huber, "they were motivated to excel and new vocabulary was reinforced." The students were aware that they were preserving a heritage "that can only be authenticated by the older persons of the tribe who will not always be available," explains Huber.

Activities

The initial sessions of Huber's project were devoted to planning the vocabulary activities and starting the storyboard for the slide show, with each student selecting five required vocabulary words and three optional words to be included. Some students learned to operate cameras that would take black-and-white prints and color slides to record teaching methods, guest contributions, and vocabulary studies. For the vocabulary ideas, students divided into teams with one student directing, one recording vocabulary, and one taking the pictures (with younger students as models). Roles were rotated. The most experienced photographers were assigned to cover various speakers and guests

The completed slide show and photo collection are being used to supplement instruction about Paiute activities

Materials, Resources, and Expenses

Information on local history and customs has come from a wide range of sources, including parents, grandparents, Tribal Council speakers, and members of a senior citizens' group. A foster grandmother, for example, taught beading, reviewed vocabulary, and helped students working on Indian dancing costumes, while two fathers played drums and sang

Equipment included a 35 mm rangefinder camera for black-and-white photos and a 35 mm reflex camera for slides, film, a tripod and flash attachment, tape recorder, tapes, and clip-on microphone, slide projector and screen, slide mounts, and, for developing slides, a film drum, motor base, chemicals, and measuring graduates. Huber says that the cost of a slide program is about \$190 if film is processed commercially—\$40 for film, processing, and blank tapes, and \$150 for the camera. If students develop their own slides, she says the \$100 will buy the necessary equipment and that chemicals cost less than lab processing.

Outcomes and Adaptation

Huber says that in addition to impressive gains in learning vocabulary words and photographic techniques, the students grew in the areas of confidence, maturity, social skills, visual awareness, organization, and investigative experimentation. The program was "especially stimulating to students with low verbal and reading skills," she adds, "because, for the first time, they could equal or surpass their peers." The students have created a lasting resource not just for the school but for the community as well, and parent interest has led to presentations of the student displays at school events not originally considered

While this project was particularly suited to unwritten material, according to Huber, she believes it could be used "at any grade level, in any subject, with any normal or special group of students" because "photography cuts across academic levels, language barriers, and age factors."

Project Title

Discover Biltmore Estate

Teachers Marilyn Shellenberger, Richard Cooper

Locale Red Oak School, Weaverville, North Carolina

Subject Social Studies

Grade 8

Purpose and Description of Project

Under the guidance of Shellenberger and Cooper, students in the Red Oak Camera Club used photography to enhance their study of a national historic landmark and to produce a slide/tape presentation so they can share their research discoveries with others.

The teachers' academic goals were to accentuate the educational values of a local historical site—the Biltmore Estate and Pisgah National Forest (which was originally part of the estate); to sharpen students' skills in the areas of research, organization, and literary and photographic composition; and to produce an educational resource to be used by teachers throughout the county as part of an introduction to the estate. Beyond this, the project was designed to instill in students a sense of pride in their local community and its people.

One measure of their success is that the slide/tape presentation created by the students is already being used not only by local teachers to prepare classes for field trips to the estate, but also by the Biltmore Company, which operates the estate as part of its orientation materials.

Activities

In the first phase of the project, students studied the camera and photographic techniques. They learned about composition, subject placement, camera-to-subject distances, camera angle, natural lines, and backgrounds and lighting. Then they practiced implementing what they had learned during a "camera safari" around the school grounds.

In the second phase, students researched their topic. Based on the available literature, insights from resource people, and preliminary trips to the estate, they decided which elements of the estate they wanted to photograph and formulated an outline for their slide/tape show. They then went on picture-taking excursions to the estate at different times of day and under varying weather conditions so that they could experiment with different lighting, shadows, and filters.

In the final phase of the project, the students correlated the slides with their research, wrote a script, taped the narration, and added background music. The premiere showing was to the school's fifth-grade class which was planning a field trip to the estate.

Materials, Resources, and Expenses

Human resources included staff of the Biltmore Company and the national forest, and the news director of a local radio station who assisted students in recording the audio portion of the show.

The camera used was a 35 mm RICOH Camera with 50 mm f1.8 lens, 80-200 mm f4.5 w/macro lens, skylight filter, polarizing filter, and strobe unit. Other equipment included a KODAK EKTAGRAPHIC EF Visualmaker, KODACHROME 64 and KODAK EKTACHROME 400 Film, projectors and projector stand, a dissolve unit, tape recorders (visual sync and reel-to-reel stereo), a slide sorter, and screen. The only expenses were for film, processing, and audio tape used in recording the script.

Outcomes and Adaptation

Students were evaluated on the basis of written assignments, discussion, and observation of how they used their new knowledge to produce the slide/tape presentation. Shellenberger and Cooper believe that the use of photography contributed to student achievement in three primary ways: 1) Students were given a sense of purpose and were motivated to carry out research because they realized they had to know what the Biltmore Estate is about and why it is there before they could intelligently attack it photographically. 2) Focusing a camera also focused student attention on individual aspects of the house and gardens, which led to heightened awareness of the subject, and raised new questions. 3) Students wanted the quality of their research and their written and oral assignments to match the quality of their photographic compositions.

According to the teachers, "all aspects of this project are transferable to other school settings, rural or urban. It can be accomplished by average students researching any local site of historical pride and interest."

Project Title

Origins: A Study of Local History

Teacher Marilyn W. Latta

Locale Dothan High School, Dothan, Alabama

Subject Social Studies:History

Grades 9-12

Purpose and Description of Project

Under Marilyn Latta's direction, six student library aides researched their hometown's history and created a slide/tape program depicting historic and unusual characteristics of the area. Each student chose a phase of local history that interested him or her, researched pertinent facts, took the necessary slides, wrote up facts about the topic in script form, and took part in final assembly of the 240-slide presentation for its premiere showing to history classes.

Latta says that the "students were delighted with an opportunity to participate in an activity that had a useful final product. They were not just learning **how** to do something worthwhile, they were **doing** it." In the process, according to the teacher, they developed skills in the use of cameras, recording equipment, and projecting equipment, locating and authenticating historical sites, researching both oral and written history, communicating facts in an interesting way, organizing their material in a logical sequence, and meeting deadlines.

The production will be used in history classes, become part of the school media center's permanent collection, and be made available to community groups.

Activities

Students involved in their project were volunteers. Each student selected an area of concentration for his or her research and photography, and all were encouraged to work in areas of their own "history," that is, to use what they already knew about familiar neighborhoods and their backgrounds as a basis for their research. When the students were ready to begin photographing, they checked out cameras and received individual instruction in picture-taking. As slides were developed, the group critiqued them and retakes were done if necessary.

Students selected pictures from historic collections and books, made up-to-date pictures of many of the sites shown in the old pictures, and used combinations of new and old pictures for "then-and-now" shots. When the photography was completed, students decided on the approach they wanted to take, sequenced the slides, and wrote and recorded the script.

Materials, Resources, and Expenses

Human resources included community members and city officials, local historians and librarians, and local people with photographic and slide production expertise.

Equipment included a MINOLTA SRT 200 Camera and a YASHICA MF-2 Camera, a copy stand, KODAK EKTACHROME 200 Film for color slides, a SINGER CARAMATE 3300 Projector for previewing, tape recorders, a slide sorting table, and a KODAK CAROUSEL " Projector. Latta says the show cost 50 cents per slide for film and processing.

Outcomes and Adaptation

The students developed "skills in photography, research, interviewing, writing, decision-making, and organizing; an understanding of local history; a sense of sharing with their fellow students; and an exhilarating sense of achievement." In fact, Latta says, both teacher and students can hardly wait to start on "Origins II" because there was a wealth of material they didn't have room for in the first program.

She advises other teachers that a similar history/research/photography project should meet equal enthusiasm anywhere and stresses that the skills involved in 35 mm slide production are easily developed.

Project Title

Teenagers and the Aged

Teacher Michael Richard Scott

Locale Anna-Jonesboro High School, Anna, Illinois

Subject Social Studies/Sociology/English

Grades 9-12

Purpose and Description of Project

In this project, Scott and his teenage students went a long way toward bridging the generation gap as they worked, played, and communicated with older people in order to explore myths about—and discover the realities of—the world of senior citizens.

Teacher and students worked with a senior citizens center to set up opportunities for the young people and their elders to interact and to record their shared experiences on tape and film, with the final products being a slide/tape show, a photo album, and the mutual enrichment of the lives of both groups.

The students were prepared for these group activities by lectures, discussions, guest speakers, films, and class exercises and were evaluated at the beginning and completion of the project through a photographic test and questionnaire.

Activities

Students dined with the senior citizens and on other occasions served their meals, sang for them, and interviewed them. The two groups also danced, bowled, played video games, and just talked together. The teenagers also put out a special newspaper, the *Intergenerationa! Gazette*.

Students read a wide range of materials prior to these direct activities, including pamphlets from the center, which helped them begin to understand the needs and wants of senior citizens. Scott singles out *Over 55 Is Not Illegal* as being of exceptional value. Among guest speakers were a registered nurse, who led a discussion of the physical, emotional, and mental process of aging, and a representative of a home health services organization, who described their experiences in day-to-day work with older people. Among other exercises, students simulated the physical limitations that sometimes accompany aging, such as hearing loss.

Materials, Resources, and Expenses

A local newspaper printed the students' newspaper and also publicized the teen/senior citizen project, as did the local radio station. The Learning Resources Service Center of Southern Illinois University developed the students' slides. But, says Scott, "our most important resource was the senior citizens. They were the sounding boards, the ones with experience to share, those who welcomed us with open arms."

Materials and equipment included a KODAK INSTAMATIC Camera; developing chemicals and paper; auto focus and manual 35 mm cameras with normal and wide-angle lenses; cassette, reel-to-reel and slide/sync recorders; microphones and auxiliary speaker; tape splicer; flash cubes and bulbs; tape and film; a photo album and inserts; and guides on photography and producing slide/tape presentations.

Outcomes and Adaptation

Scott says his "main concern as far as evaluation was involved was that of attitude change. This was measured by a photographic pre- and posttest and a pre- and postquestionnaire. The results were very positive."

For teachers interested in replicating the project, the teacher declares that "a group of senior citizens, teenagers, an average teacher who doesn't mind working, a newspaper, and access to commercial photo and audio equipment is all it takes!"

Project Title

Housing . . . Yesterday, Today, Tomorrow

Teacher Harryette Graham
Locale Central High School, Little Rock, Arkansas
Subject Home Economics
Grades 10-12

Purpose and Description of Project

Harryette Graham's students researched, planned, prepared, and presented an 80-frame slide/tape presentation spanning houses and furnishings of historic significance, contemporary styles, and alternative housing for the future.

During the project Graham found that "the process of putting the presentation together was as important and educational as the finished product, and the unique method of teaching captured the imagination and attention of the students. The slides and script illustrate examples of architecture, furnishings, and housing alternatives that would have been much harder and taken longer to teach otherwise."

The show is being shared with other housing classes at the school and is being used to recruit new students for next year's classes. Additional copies are also being sent to the Arkansas Art Center in Little Rock as a community resource and to the University of Arkansas Dissemination Center in Fayetteville for use by vocational teachers throughout the state.

Activities

The slide show was divided into three parts—the ancestry of housing and historic examples, today's styles, and innovative alternatives for tomorrow. Students suggested ideas for use in each area of the presentation, and each student was then assigned one idea to develop further through research. Based on the information gathered, two students and the teacher developed a storyboard and script.

Students were introduced to photography by an employee of a photo store who also gave more in-depth instruction to several volunteers from the class. Photo-taking expeditions included visits to the territorial restoration in Little Rock, a mobile home sales and display business, a local furniture store, and an area around the school containing examples of both architectural and historical significance. A representative of the Arkansas Architectural Preservation Society also brought a lecture and slide presentation to the school.

The finished product, drawn from student research and some 250 slides, is "Housing...Yesterday, Today, Tomorrow."

Materials, Resources, and Expenses

In addition to other teachers, major human resources were the photo store owner who lent a camera, lenses, and the expertise of an employee; business owners who hosted tours; and a member of the state Architectural Preservation Society.

The camera used was a NIKON FE Camera with 50 mm and wide-angle lenses. The only costs were for film and developing, which Graham estimates came out to about 35 cents a slide.

Outcomes and Adaptation

Graham says that the project achieved her four anticipated goals of creating a slide presentation for use in instruction and recruitment, providing students with specific information about housing, motivating all students, and reaching gifted students. However, she also got some bonuses. She says that student attitudes changed positively toward each other and the teacher, that she herself gained new information about housing and photography, and that some students became so interested in photography that they are pursuing it not just as a hobby but as a possible career. And she found that students who were not academically gifted turned out to be equally gifted in other areas, such as setting up shots or using the camera.

Graham suggests that similar presentations could be used in art, industrial arts, drafting, or history classes.

Project Title

Probing the Past Through Pictures

Teacher Robert J. Morgan

Locale Bolton High School, Alexandria, Louisiana

Subject American History

Grade 11

Purpose and Description of Project

Morgan developed a series of slides closely paralleling his students' history textbook to help bring alive the parade of events discussed in print. To produce the slides, he photographed pictures and illustrations from books and magazines and actual events, people, and objects representing points in history from the Civil War to the present. His subjects ranged from characters of the *Gunsmoke* television show, who helped him spur discussion of the Old West, to newspaper headlines depicting the assassination attempt on President Reagan.

Student reaction, says Morgan, was excellent. He believes this is due to the fact that so much of today's communication, especially via TV, concentrates on the visual. Students are thus more receptive to similar presentations in class. Best of all, he adds, slides can be used for years, shown in series or as individual illustrations, and updated as events unfold.

Activities

As Morgan went about gathering illustrations for his slide series, he involved both students and parents. He invited them to his own home to view some of his work, and this put them on the lookout for relevant objects, illustrations, or slides that they themselves might have. Morgan was particularly excited at the discovery of a genuine World War II ration book.

The slides were taken over a period of a few weeks. All illustrations were photographed outdoors in bright sunlight to avoid the use of such equipment as flood lamps and copy stands. However, Morgan found that to correct for sky glare, he needed to prop up the book or magazine at a 10-degree angle. Also, he had to use a heavy piece of glass to keep pages flat and avoid distortion.

In showing the slides, the teacher used blackout blinds in the classroom to achieve the minimum 90-percent darkness he believes is essential for the most effective display.

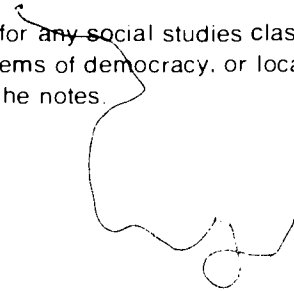
Materials, Resources, and Expenses

Morgan used a NIKON FTN 35 mm Camera and KODACHROME 64 Film, 36-exposure. His costs ran 37 cents a slide and 57 cents each for duplicates.

Outcomes and Adaptation

Morgan says this was "one of the most stimulating and rewarding studies that I have been involved in for a long time. The outcome was well received by students, parents, and Rapides Parish school staff at our media resource center." Also, the school librarian has expressed an interest in having a set of the slides for the visual-aid resource room, and the parish's director of secondary education has asked that Morgan make a presentation to an in-service workshop for history teachers.

"Slides can be made for any social studies class—civics, geography, problems of democracy, or local, state, or world history," he notes.



Project Title

Political Involvement and Citizen Participation

Teacher Minnie Armstrong

Locale Tupelo High School, Tupelo, Mississippi

Subject Social Studies

Grades 11-12

Purpose and Description of Project

Armstrong used photography to enhance projects designed to stimulate her students' interest and involvement in public issues and the politics of democracy. She led her students through a whole range of activities, from a voter registration drive to a forum featuring local candidates, and worked with them to produce two major photographic products. These are a slide presentation about the roles and duties of county officials and a "snapshot scrapbook" of highlights of the entire project.

According to the teacher, the project has spurred active student interest and involvement in politics and an awareness of the importance of citizen participation.

Activities

Armstrong says that her role was primarily one of introducing topics and that the students themselves were responsible for planning and coordinating the learning experiences. The five major activities were:

- A Voter Education Drive: Armstrong discussed the importance of voting, with the deputy circuit clerk as a guest speaker. Students then distributed pamphlets reminding people to register and made follow-up phone calls.
- A Candidate Forum: Since it was an election for county officials, the students sponsored a public forum at which candidates expressed their views on key issues. Students took pictures, and the forum also drew newspaper and TV coverage.

- Coverage of Board Meetings: Students attended county board meetings and turned in written reports.
- Student Registration: Eligible students registered to vote.
- Government Agency Visitations: Students met with government officials to find out about the services provided by their offices. Students took photos and gathered information for the script of their slide show.

Materials, Resources, and Expenses

In addition to cooperation from elected officials and candidates, Armstrong was aided by a number of school personnel including a counselor with professional photographic skill, the media specialist who helped put together the slide show and provided tapes of pertinent TV programs, and the journalism instructor. The teacher also showed a number of filmstrips on politics and political issues. (Specific data on camera equipment and costs were not provided.)

Outcomes and Adaptation

Armstrong judges the project a success on the basis of student test scores, the high quality of their reports, the response of parents and elected officials, and, most importantly, the enthusiasm of students for getting into politics. "The students have all promised to become actively involved in the election campaigns this summer," she says, "and we have planned an organizational meeting already."

Since, as the teacher points out, the need for active, involved citizens is universal, her project could be implemented in any school district.

Project Title

A Centennial Photographic History

Teacher Jacob R. Seitz

Locale Morgantown High School,
Morgantown, West Virginia

Subject Social Studies

Grade 12

Purpose and Description of Project

Jacob Seitz' work with seniors in a social studies elective course on local history has spurred a wide variety of activities centering on the history of the school itself. And his students' research and discoveries have stimulated such interest among other students, school staff, and the community that the course is being extended another year so that new seniors can build on the work already completed and produce a centennial photographic history of the school.

According to Seitz, photographs have been an integral part of many of his students' projects, although they did not initially contemplate that their activities would snowball into a full-fledged published history.

In addition to generating interest in history, Seitz' program has also sharpened students' research skills, including the gathering, organizing, evaluating, compiling, and presenting of information. The teacher also reports that school spirit has burgeoned as a result of the project.

Activities

Seitz and his students began by discussing the definition, value, and methods of researching local history and surveying the limited information available about the school. Their interest was first sparked by the homecoming activity of the school, which led them to investigate old yearbooks and club scrapbooks to compile lists of former homecoming themes, queens, and football scores. Their efforts produced both articles and photographs for a special souvenir program. The class also built its own float for the parade and created a display of memorabilia and original photos for the school showcase.

As a class or in groups the students also researched old class wills, past athletic activities, and school traditions of earlier days. Some of the students even developed computer programs to make information on some topics more accessible, while others microfilmed old school and board of education documents and gathered oral history. A study of present school faculty who are graduates also drew considerable attention, especially a contest to identify them from their graduation photos.

Other projects were two slide shows and a time capsule. One show was a brief history of the school, and the other honored current graduates, integrating pictures of the past with shots of the seniors' years at the school. The time capsule includes lists of students, programs from school events, tapes of musical performances, articles of clothing, and numerous photos.

Materials, Resources, and Exenses

Human resources have included the school yearbook adviser and staff, who have provided photographic advice; faculty, who have shared information and memorabilia; West Virginia University staff, who have assisted students' research; and community members who graduated from or taught at the school.

Items purchased for the project were a copy stand with lights (\$87), a 35 mm camera with a macro lens (\$330), and a cassette tape recorder. A microfilm camera and reader were available at the school.

Outcomes and Adaptation

Seitz says the project has caused the entire school population to become more knowledgeable and aware of the school's history and to view their own roles in a historical perspective. Within his class, the project gave students an opportunity to actually put research and other academic skills into practice, says Seitz, who adds that the photographs involved attract "even the most reluctant social studies scholar."

"Any elementary or secondary school can use this type of project," says the teacher. "The gathering of information about former students and school activities is an exercise all ages can learn from and enjoy."

Project Title

Using Photography To Teach Language Development Skills to Hearing-Impaired Students

Teacher Lynn A. Riddle

Locale Belle Stone School, Canton, Ohio

Subject Language Development

Grade Primarily Hearing-Impaired

Purpose and Description of Project

Riddle uses photographs as a vehicle for expanding her students' oral language, vocabulary, and ability to use correct sentence structure. Of her eleven students, ten have hearing losses ranging from severe to profound, and one has a language delay.

As the children made candy and clay pots and went on field trips to see a maple sugar bush and a fire station, the teacher photographed their step-by-step activities. At the time, the children were given opportunities to react orally, describing what they were doing or how they felt. The next day the experience was relived, with the teacher asking students to make up captions for the pictures, and on subsequent days the pictures were reviewed. Thus, the photographs allow the same activity to be used to review vocabulary words and to learn about present versus past tense of verbs. Sentence structure develops throughout all these exercises.

When each activity was completed, the pictures and captions were made into an album that was taken home by each child in turn. This provides yet another opportunity for review and helps ensure that the language development that occurs in class is carried over into more informal settings and generates more parent involvement.

Riddle attributes much of her students' progress to the use of photography saying that "the children have become so much more involved in language and communicating because they want to share the pictures and events . . ."

Activities

Riddle follows the same basic procedure in each activity that she enhances through photography. For example, as she went through the candy-making process, pictures were taken and the children watched, reacted, and completed statements such as "I like the . . ." The next day teacher and students captioned the pictures saying, for example, "Mrs. Riddle is stirring the chocolate." The third day, the class made candy footprints as the teacher photographed each step. The fourth day the pictures were again discussed, now in the past tense. Next the children practiced sequencing the pictures and worked on correct sentence patterns. The latter was done by listening to the teacher say a sentence, finding the corresponding picture, reading the caption, and then repeating the sentence without reading it.

Materials, Resources, and Expenses

Riddle makes considerable use of human and community resources, from local volunteers who can demonstrate candy making to a fire fighter who brings equipment to class to prepare the children for a tour of the fire station. Her photographic equipment, on the other hand, is straightforward—a KODAK PLEASER II Camera, film, and flashcubes. Her only photo expenses, she says, were for film and flash, a total of \$90 for all four activities discussed in this project. Materials involved in the candy and pottery making and expenses for the field trips totaled \$311.

Outcomes and Adaptation

"The use of a camera to record events in my classroom and out-of-school experiences has been so successful that I plan to keep this as a permanent part of my language development program," states Riddle. The "most remarkable outcome," she says, is that through the photographs, the children have gained self-confidence, become excited about oral language, and become eager to communicate with others. Virtually all of the eleven students in the project are now able to use a natural oral sentence using a subject, verb, and object; pronounce all the vocabulary words listed for each activity; and arrange pictures in the correct sequential order. Unanticipated outcomes include the ability to use nominative and possessive pronouns properly and to transfer correct structures in oral language to written forms.

She believes the same basic activities could be adapted to students of any ability level or setting.

Project Title

Reading The Metro Way

Teacher Mary Jane Saylor

Locale Rock Creek Valley School,
Rockville, Maryland

Subject Functional Reading for Hearing-Impaired
Students

Grades 3-4

Purpose and Description of Project

Mary Jane Saylor's students produced a slide/tape presentation about the Washington, D.C., metropolitan area's subway system and, in the process, improved their reading skills, learned how to use the Metro system, and developed a learning resource that both they and other students in the school can use again and again.

The 65 slides in the presentation show students' experiences on the subway and provide written text about the operation of the Metro system. The package also includes an "endless" tape of music and sound effects (the latter recorded on location) that recycles for as long as it takes for students to view and read the slides. Saylor says the slide/tape presentation can be used for vocabulary review, classroom preparation for future field trips requiring Metro transportation, sharing by the hearing-impaired students with other students in their mainstreamed classes, and presentations to other teachers and parents.

Activities

This project grew out of discussion of a newspaper article about the Metro when it was learned that only one member of the class had ever ridden the subway. The class wrote to the Metro PR department for booklets and maps, role-played a trip from entrance to exit, and used a Metro trip as the background for creative writing assignments illustrated with student drawings.

Since Saylor and her students are "in the habit of recording almost everything we do in photographs," she says a film record of a Metro trip "was a foregone conclusion." They took slides of their step-by-step experiences on the system and recorded environmental sounds to combine with music for the taped background. Next they wrote appropriate slide texts to be paired with the picture slides, sequenced the slides and added the background tape, and presented their product to the third and fourth grades as a reading lesson.

Materials, Resources, and Expenses

Required for the project were KODAK INSTAMATIC Cameras and NIKON F Cameras, KODAK EKTACHROME 200 Daylight Film, EKTACHROME 64 Film, tape recorder and cassettes, slide projector, music albums, and printed materials on the Metro system. The cost was about \$50.

Outcomes and Adaptation

In addition to learning how to use the Metro system, which Saylor says is a resource in itself for future field trips, the students gained experience in reading maps, reading to follow directions, writing letters, creative writing, functional math, and drawing. Further, says the teacher, the hearing-impaired students were able to present a functional reading lesson to their peers in the mainstream classroom, and "the boost to their self-esteem that this activity created was beautiful to see."

Saylor believes that the methods used in this project can "be used with many subject areas to extend the classroom to a site away from school" and should be especially helpful for social studies and science field trips.

Project Title

Seeing, Learning, Developing: The Camera in The SLD Classroom

Teacher Vicky Pielsticker

Location Boyl E. Smith Elementary School,
Milford, Ohio

Subject Language Arts

Grades 3-5

Purpose and Description of Project

This program uses still photography in the learning activities of specific learning disabilities (SLD) classes to enhance the students' development and understanding of communications concepts. Pielsticker says that pictures helped the children to define their environments and their relationships to those environments and to their peers.

The students learned camera techniques and took pictures to demonstrate concepts they were studying, such as shape, size, or the sequential steps of an activity. The children not only learned from real-life experiences, notes Pielsticker, but created their own learning materials. "The program offered a rare opportunity for the children to be a central part of their curriculum," states the teacher. "They were not just subjects but organizers, camera people, and learners as well."

Pielsticker found that the program stimulated creativity, self-expression, and communication skills and made passive learners active and involved.

Activities

The children were first introduced to the camera. They took turns pretending to take pictures and were provided with individual posters showing enlarged camera parts. Next, the students studied photographic terms and reasons for taking pictures, such as for pleasure and for keeping a record.

For actual picture-taking, students divided into groups of two or three and were assigned photographic objectives. They worked together to plan the pictures that would fulfill their assignment and then went out on photo excursions. Their objectives varied widely—from finding "round things" to recording a student's typical day at school. For many of the photographs, the children were required to provide an explanatory text or caption.

Students also learned how to use a KODAK EKTAGRAPHIC EF Visualmaker and made copies of pictures in magazines to fulfill some of their objectives.

For the final product, Pielsticker organized all the photographs and related language arts exercises into looseleaf notebooks that also include pre- and posttests for each activity. These teaching materials will be used for future classes.

Materials, Resources, and Expenses

Primary human resources were faculty members who shared photographic expertise and equipment, and parents who helped students come up with items to be photographed and provided transportation for after-school activities.

Materials and equipment used were cameras (brought from home or borrowed), film (20 rolls, 24 exposures each), flashcubes (14 packs), posters, notebooks, laminating machine, plastic envelopes, library pockets, hole punch, EKTAGRAPHIC Visualmaker, and slide projector and screen. Pielsticker's only expenses were for film and development, notebooks, and plastic envelopes, all of which ran a little more than \$200.

Outcomes and Adaptation

Through their involvement in the taking of pictures and related activities, says Pielsticker, the children learned to identify spatial relationships, recognize factual representations, place pictures in an organized sequence, realize that parts make up a whole, remove the unsuitable item in a series, categorize and classify information, and label related photos. They also developed stronger vocabularies and became more responsible and self-confident. she observed

Similar learning packages could be developed around many topics and, notes the teacher, "the beauty of the program is its adaptability to the environment of the child."

Project Title

Vocabulary Development (Adjectives) for Hearing- Impaired Students

Teacher Cherrilyn Bradford

Locale Green Acres Elementary School,
Manchester, New Hampshire

Subject Language Development

Grades 4-5

Purpose and Description of Project

Cherrilyn Bradford used photographs to increase the correct use of adjectives by her hearing-impaired students, who have moderate to profound hearing losses and resulting language deficiencies.

Bradford had her students role-play situations requiring descriptive words, photograph each other in such situations for particular adjectives, and participate in exercises to transfer the knowledge they gained to written forms. She says that "using photography helped to broaden their understanding of vocabulary, grammar, and syntax much faster and in a more visually meaningful way than more traditional teaching methods." She was also somewhat surprised to find that the photographic method was just as successful with two control groups—language-impaired students and a mainstream fourth-grade class.

Activities

Students were instructed in the use of cameras and, after being introduced to new vocabulary words, came up with their own ideas for translating that vocabulary into images. They decided on props and poses, set the stage, and photographed their impressions of each selected descriptive word.

The prints were then used for vocabulary acquisitions and for review and retention practice. Photographs were grouped into several categories: comparison pictures (tall/short), opposites (plain/fancy), sign language pictures (showing sign language for the word), sequential pictures (showing "sour" throughout the eating of a grapefruit), synonym pictures (several shots of the same concept), and comparative and superlative pictures (bad, worse, worst).

The next step was to write basic sentence patterns with blanks for the insertion of adjective pictures. Other activities include concentration games, bulletin board displays, and picture dictionaries.

Materials, Resources, and Expenses

The project required two KODAK INSTAMATIC™ X-35 Cameras and film.

Outcomes and Adaptation

Bradford found that the project increased the students' adjective fluency and usage in written English, with significant improvement noted in the knowledge of meaning, word placement, and appropriate form. Posttests showed increased sentence length, improved sentence structure, more creative use of vocabulary, the use of compound adjectives, and flexibility in the placement of adjectives. Bradford also says that the students gained a more positive self-concept and a sense of accomplishment by mastering both camera and language skills.

The suitability of this photographic approach to other students was demonstrated during the project when both a mainstream fourth-grade class and a class of language-impaired students showed marked improvement after only brief exposure to the teaching method.

Project Title

Why Do We Have a Special Education Room at Our School and Why Are Those Kids in There, Anyway?

Teacher Sheila C. Bell
Locale Sunrise Elementary School,
Ve adale Washington
Subject Special Education Awareness
Grades 4-6

Purpose and Description of Project

Sheila Bell and her 16 special education students developed a slide/tape presentation to help other students and teachers better understand the purpose of the special education program and also to feel more comfortable dealing with the special ed students.

Bell's students, who have learning disabilities or are behaviorally disordered, developed ideas for the slide show and script themselves and narrated the audio portion of the program, while a third grade teacher, who is also an expert photographer took the slides. The presentation not only drew positive feedback from the rest of the school population, according to Bell, but helped the special ed students talk out their frustrations, strengths, and weaknesses.

While the target audience for the presentation was initially students and teachers, Bell says it is now being used to develop increased awareness among parents and community members

Activities

Students and teacher worked together to come up with a list of things the students "would like other students to know about them and their classroom." Among the main points to be covered in the script were that children learn in different ways; special ed is for those who have learning disabilities or difficulty controlling their behavior; "learning disability" means these students process information in different ways. Special ed students have a normal capacity to learn; their classroom may look different, but the children are like other students in many ways. Special ed students excel in some areas but find some things more difficult than other students, and they like to join in activities with other students

Students made lists of specific ideas to be illustrated within the major topic areas. Bell worked up a tentative script, polished it with input from the children, and turned it over to the teacher/photographer for picture-taking. Each student appeared in at least three slides and had two to four parts in the narration, which was recorded at a nearby professional recording studio. When the slides and narration were put together, the special ed students invited all fourth-, fifth-, and sixth-grade classes (one class at a time) to view the presentation and ask questions.

The presentation has also been shown to the school board, a neighbor district's board, the council of the parent/teacher/student association, and a meeting of the Chamber of Commerce.

Materials, Resources, and Expenses

Equipment included a 35 mm camera, slide film, slide projector, and screen. A professional studio's recording equipment was used, although Bell notes that narration could be made on a regular cassette recorder. She says the main costs are for film and processing and that the project could be replicated for anywhere from \$20 to \$200, depending on the level of sophistication of the presentation and the degree of volunteerism elicited.

Outcomes and Adaptation

Bell believes that, as a result of the presentation, her students are considered a more integral part of the school. She has found that feedback from other students and teachers is positive and indicates "increased understanding of and compassion toward these special students and their challenges in the educational environment." Her students have gained skills in a number of areas, she says, including brainstorming, categorical listing, setting priorities, and verbal skills.

The teacher urges that "any teacher who deals with groups of students who have unique learning problems could pattern a program of better understanding after this concept."

Project Title

Footprints Across Oklahoma

Teachers Shirley Armstrong, Maryette Roderick
Locate Pleasant Vale Elementary School,
Enid, Oklahoma
Subject Remedial Reading and Learning Disabilities
Grades 4-6

Purpose and Description of Project

Shirley Armstrong and Maryette Roderick's project which started as a classroom unit on Oklahoma history to celebrate the 75th anniversary of statehood, expanded to include recreations by students of pioneer life, and culminated in the production of a 20-minute slide/tape presentation featuring notable Oklahomans.

The emphasis in these special classes, explain the teachers, was to develop students' research skills, motivate them to read about a particular area of interest, and teach them to communicate what they learned in visual, oral, and written formats. In addition to fulfilling these expectations, report Armstrong and Roderick, the students' self-confidence was boosted as they interacted with adults and other students in presenting the slide show. And, they add, "the more actively the students participated in the program, the higher their self-worth. It provided them with not only a product to be proud of but with photographic skills they can use on their own to express and interpret the world around them."

Activities

Students began by studying such facets of Oklahoma history as Indian tribes, settlers, the land rush, and political figures as well as the geography of the state and the locations of various historical incidents. As part of their lessons on pioneer life, they did some of their history reading in tents of their own construction, cooked a meal outdoors over a fire, and played games that pioneer children played. They also participated in the Cherokee Strip Celebration commemorating the land rush, dressed in costumes for Statehood Day, and toured and photographed local points of interest including windmills, the Cherokee Strip Museum, and a refinery.

Next each student chose an outstanding personality from Oklahoma to research and write a report about. The reports, written on boot-shaped pieces of paper, were displayed on a bulletin board that featured a map of the state indicating where each subject came from or had lived. The personalities chosen ranged from outlaw Belle Starr to Governor George Nigh. For the slide show each student chose a picture of his or her subject, made a slide, and wrote a summary of the report on that person for inclusion in the script. Students worked as a group to design the slide show's introduction and conclusion, coordinate the sequence of the slides, and select background music. Each student then recorded his or her portion of the narration against the background music.

The slide show was then shown to other classes, other schools, and many community groups, receiving wide acclaim. A foster grandparents group, for example, commented on "the excellent overall presentation" and noted that "some even learned new things about their state."

Materials, Resources, and Expenses

Human resources included the school librarian, a consultant who trained the students in the use of a 35 mm camera and copy stand, a teacher who helped them with recording, and another teacher who advised on setting moods with music.

A 35 mm camera was used by the students for photographing their activities and for copy stand work. Other equipment and supplies included the copy stand, tape recorder and cassettes, record player, slide sorter, ~~KODAK CAROUSEL Slide Projector, screen,~~ and bulletin boards. Only costs were for film and processing (\$30) and the copy stand (\$70).

Outcomes and Adaptation

Armstrong and Roderick say the project motivated students to work together to make choices and decisions to solve problems. They were as pleased by the improved attitudes and enthusiasm students displayed as by their growth in such skill areas as research, visual imagery, oral reading, and verbalization of findings.

The teachers also feel that such a project can be adapted to the skills of any age group, noting that students who cannot handle a 35 mm camera and make slides could use a simple camera and mount prints instead.

Project Title

Greek Mythology Filmstrip

Teacher Anne M. Feurer

Locale Bayard School, Wilmington, Delaware

Subject Remedial Reading

Grades 5-6

Purpose and Description of Project

Anne Feurer used Greek mythology and the making of a Greek myth slide show to motivate students with reading disabilities. Students wrote a filming script for the show, made costumes and props, and acted out the story, which was based on *Theseus and the Minotaur*.

The teacher says that preparing for and producing the slide show involved a wide range of reading and writing activities. Students read stories, plays, articles, and captioned filmstrips requiring various levels of reading ability, with the teacher stressing such skills as locating the main idea, sequencing, summarizing, and recognizing new words. Students also learned something about Greek culture and history and took part in related activities involving art, music, cooking, and athletics.

"Planning, making, and showing the slide program helped to develop better student self-esteem and team spirit," according to Feurer. Reading skills improved, she says, and while the project "did not make instant bookworms of my students, it did generate interest in outside reading."

Activities

As students took up each new story, plan, or article about Greece, the teacher introduced the characters and new vocabulary words on the chalkboard and ditto sheets. Students then read the material, using guided silent reading and oral reading methods, or the teacher read part of the story and asked students to tell her what happened next. Feurer also developed teacher-made comprehension exercises stressing factual recall, main idea, and sequencing; added new words to the weekly spelling list; and gave brief lectures on Greek culture and history.

Each student was required to do independent reading on a Greek god or goddess, write a short report, and present it to the class (extra credit was given for presenting the report while wearing a Greek costume). The covers of the reports were so attractive, says the teacher, that they were used for a class bulletin board.

Among other activities, the students learned a Greek dance and also had an instant concert when another teacher brought in a zither with easy-play cards. They made a large mural of gods and goddesses that was hung outside the school library, baked the Greek dessert called baklava, and held their own small-scale version of the Olympic Games, which included the "Theseus Discus Toss" and the "Atlanta Apple Relay."

For the slide show, teacher and students read two versions of the Minotaur story, with the teacher writing down what students felt were the most important parts of the story to serve as the basis for their script. They revised the narrative, decided on the scenes to be photographed, and worked on props and costumes. For the Minotaur, they decided on a mask and a fake-fur headpiece. For the background of a banquet scene, they used the students' mural of gods and goddesses. Most scenes, however, were shot outdoors. The narrative, credits, and special drawings were printed or drawn on art paper, attached to a fence, and photographed with a handheld camera.

When filming was complete, students and teacher put the slides in order, culling those showing such anachronisms as a digital watch. After several classes of practice, script readers were chosen, and the finished show presented to classmates and teachers.

Materials, Resources, and Expenses

Photo equipment and supplies used were a MINOLTA SRT 101 Camera, a zoom and a 135 mm lens, KODACHROME 64 Film for the slides of the narrative and drawings, and KODAK EKTACHROME 64 Film, for live scenes. Cost of film and developing was about \$30.

Outcomes and Adaptation

Feurer says that her students' reading skills showed improvement, especially in word recognition and comprehension, and that their self-esteem was boosted as well. Other positive outcomes, she reports, resulted from the fact that in order to produce the show, students "were forced to cooperate, to listen to the opinions of others, and to work as a team."

The teacher advises that this type of project is also a good alternative to a class play, saying "it involves less time and frustration, is permanent, and allows students to see themselves in their roles."

Project Title

Visual Language Arts in Special Education

Teacher Patricia Huguen

Locale Carter Park Elementary School,
Fort Worth, Texas

Subject Language Arts

Grades 1-5

Purpose and Description of Project

Huguen uses photographs in her special education resource room to help boost students' self-esteem and promote language development. Individual recognition is especially important for these students, she says, since they are as bright as other students but are not successful for reasons ranging from perceptual disabilities to a short attention span. Her goals for each child are different since each is taught on his or her own level, and, in some cases, composition of one adequate sentence can be a victory.

Pictures help Huguen do everything from keeping class attendance to stimulating student writing and preserving memorable classroom moments. She is in her fourth year of experimenting with cameras in the classroom and has concluded that photos are an effective means of motivating learning disabled children

Activities

Two major photo-based activities kick off the school year. The teacher takes close-up photos of each student, cuts each picture in a circular shape, and glues it to backing that is color keyed to the student's grade level. These photos are laminated and hung on an attendance board, and as students enter class each day, they turn over their own pictures to show that they are present. The picture color also matches the student's folder and other materials. Then Huguen takes another picture of each student in his or her favorite place at school and clips it to the student's storage area. This photo is attached to a card with the student's name, address, birth date, and phone number to help reinforce this information daily and provide students with instant recognition of their own spaces. Other activities throughout the year include:

- Pictures of holiday programs and classroom celebrations that remain on display and contribute to students' understanding of the passage of time and promote language development long after the events

- For the younger children, birthday pictures to reinforce dates and picture puzzles to improve self-image and awareness of body parts
- Pictures of each student with a friend from another class designed to encourage the writing of sentences as captions and to help the students build relationships with other children
- Group snapshots, letters, and postcards for mailing to pen pals in England
- Pictures of students' art works
- For the older students, writing projects based on photos of themselves or other subjects

Materials, Resources, and Expenses

According to Huguen, this is basically a self-contained project involving one-to-one communication between student and teacher, although she did take pictures of other school staff to help the children relate to adults in the school in a nonacademic way. Equipment used included the teacher's Sears K SX/35 mm SLR Camera with flash, film, a typewriter, and a tape recorder. She watches out for film sales and gets her film (about a roll a month after the initial attendance and folder pictures are taken) processed at the supermarket for \$5 for 24 prints.

Outcomes and Adaptation

While acknowledging the difficulty of objectively measuring the results of her project, Huguen firmly believes that it pays both personal and academic dividends. Her evaluations are done on a completely individual basis, and her goal is for each child to achieve some success in his or her own context. Some students are surprised simply by looking at their own pictures and finding themselves attractive.

The teacher believes that these activities would help other learning disabled children become more motivated but warns that the approach would probably not be workable with a large group.

Project Title

The Use of Photographed Signs to Teach Survival Words

Teacher Kay McNab

Locale Logan Avenue Elementary School,
Emporia, Kansas

Subject Learning Disabilities

Grades 1-5

Purpose and Description of Project

Kay McNab's project used photography to teach elementary learning disabled students to read "survival" words in their community—survival words being those that "appear in the environment and give information or directions that a child should be able to read to function adequately in daily life."

Teacher and students took pictures of 156 signs in such locations as the public library, a park and zoo, the community recreation center, and streets around the school. The teacher also photographed hospital and road signs. Words were initially taught in drills using the photographs as flashcards, but once the students had gained some basic knowledge of the words, practice exercises involved games, a walking tour, and a variety of other activities. Slides were also shown in small groups.

McKnab concluded that learning-disabled children respond effectively to photos and slides as vehicles for teaching vocabulary and that the photographs help build a bridge between abstract reading exercises in school and actual situations in students' lives.

Activities

While McNab took most of the pictures, all of her students took part in photographic excursions to find signs, and most of the children took the opportunity to photograph at least one sign. Once the photos were laminated, they were divided into six groups according to where they had been taken—park, zoo, library, etc.

The teacher began by showing the photos, having each child read as many of the words and abbreviations on each sign as he or she could, and recording all the words and abbreviations that were mispronounced or omitted. After each set of photos, McNab showed the ones again in that set that had presented difficulty and correctly read them to the students, giving phonetic clues or hints about the purpose of the sign in question. Two days later, photos with reading errors were presented once again to measure long-term retention.

As words and abbreviations were learned, students filled in bar graphs to chart their progress. Once all street signs could be read, for example, a representative stop sign would be completely filled in with red felt-tip marker (except for the letters).

When the students had mastered some words through drill, they practiced with a rummy-type game in which they matched pairs of photos and read the signs. They also took a walking tour, read the real signs the photographs showed, and matched photos that had been distributed among them to the corresponding sign. McNab found that being able to see why the actual sign was being used made reading comprehension much easier for the students.

Materials, Resources, and Expenses

The picture-taking involved use of a SLR 35 mm Nikkormat Camera with a 50 mm lens, a set of screw-on close-up lenses, electronic flash for indoor shots, and five rolls of KODACHROME 64 Color Film. From the slides, selections were made for 3 x 5-inch prints. McNab says each print cost about 60 cents for film, processing, printing from slides, and laminating.

Outcomes and Adaptation

McKnab reports that her nine students learned a total of 526 new words, for an average of 58.4 words per child. Equally important outcomes, she says, were increased awareness of informational signs, excitement and pride about the photography/reading project, and the sharing of photos and slides with other teachers.

The teacher notes that while her students were learning disabled, the concept of her project will transfer to most elementary school educational environments. Other teachers in her school have already found uses for her photos in their classes.

Project Title

Learning to Live: A Lesson in Social Awareness

Teacher Sandra Yuen Yee Yap
Locate Kalihi Uka School, Honolulu, Hawaii
Subject Guidance
Grade K-6 Special Education

Purpose and Description of Project

Sandra Yuen Yee Yap used photographs to help her learning disabled and mildly retarded students develop positive self images and to conceptualize and express feelings. She says that instant pictures provided the children with immediate reinforcement of learning experiences and acted as stimuli for expressing and discussing such emotions as pride, frustration, anger, loneliness, surprise, happiness, and sadness.

Students chose the subjects for picture-taking, operated the cameras, and kept individual scrapbooks which eventually contained about 30 photos each with captions. In the process of taking photos, Yap reports that the students learned to identify situations that produce specific emotions and to recognize facial expressions and body language that indicated these feelings.

Activities

The 12 students were divided into two groups, with one camera per group. The scarcity of cameras was in a way beneficial, notes the teacher, since students soon realized the necessity for sharing, taking turns, and cooperating. The groups acted as audiences, guessing what emotions were portrayed in each other's pictures.

Students and teacher first discussed the requirements for good photographs including proper lighting, pleasing composition, and a steady hand for focusing and shooting. When students had decided which shots they wanted, they obtained permission from the subjects if they were not part of the project. All students also took turns as actors and directors in the picture-taking. Playing these roles necessarily involved oral communication when children either directed others to portray certain situations or followed directions to do so themselves.

In teaching a vocabulary of emotions, Yap had students identify and photograph poses related to particular feelings being helped, for example, eliciting feelings of gratitude, having no playmates and evoking feelings of loneliness. Students were also encouraged to express orally the positive and negative emotions they experienced during a single day. These exercises sometimes took unexpected turns. For example, when

a student pointed out that the principal looked "mad," this led not only to a discussion of nonverbal signals but also to a request that the principal pose for student photographers.

To help promote positive behaviors, Yap had students photograph portrayals of these behaviors—such as taking turns speaking and raising their hands—and discussed the rule being illustrated. The photos were posted on the bulletin board, and a consequent decrease in negative behaviors was observed.

Students were also allowed to take 10 pictures of anything they wished. The limited number caused them to analyze their preferences carefully, explains the teacher. Subjects ranged from classmates to the school police officer/advisor.

The photographs also helped to lead the students toward writing. Since spelling and sentence structure skills were limited, the students responded orally to questions. Their responses were recorded so that the students could copy them into their scrapbooks. After initial discussion, all photos were also placed in the books along with captions.

Throughout the project, stresses Yap, the children were allowed to control the pacing, direction, and breadth of these activities.

Materials, Resources, and Expenses

Major human resources were Yap's educational assistant and the school's guidance counselor. Photo equipment and supplies included a POLAROID SX70 LAND Camera and a POLAROID ONE STEP Instant Camera used by the children, with 30 packs of instant film, a CANON SURE SHOT Camera and a KODAK INSTAMATIC Camera used by Yap to document the project with Kodak 110 and 135 film, and flashbars.

Outcomes and Adaptation

Yap says that all of her students progressed satisfactorily as measured by their individual education plans. Because photography was a new medium for these children, she found that it held their interest and increased their attention span. They were very proud of their scrapbooks, and the teacher used extra scrapbook work as an incentive for promptly completing academic assignments.

Project Title

Feeling Good About Yourself

Teacher Charles Kerrigan

Locale Plummer School, Falmouth, Maine

Subject Elementary Guidance

Grades K-6

Purpose and Description of Project

Kerrigan's project is designed for children who have been identified as having social adjustment problems. It uses photography to help them explore their own development from infancy on as well as to realize their importance as individuals. Growth is sought in the three general areas of friendship, leadership, and communication.

The teacher worked with the children in small groups and individually as they carried out various assignments that would become part of their final products—scrapbooks of photos, charts, and drawings that helped the students understand themselves and how they fit into the world around them. Kerrigan worked to generate positive feelings in each student based on the experiences represented in this photographic record of events and on people that had touched his or her life.

Kerrigan found the photographs particularly useful as projection devices—that is, the students could more easily talk about their feelings by assigning them to the pictures and referring to themselves in the third person. Overall, the use of photography assisted in promoting "awareness of a child's importance and self-worth through long-term global assessment of where that child had been, is now, and is going."

Activities

Each child's scrapbook was divided into six sections: Me, family, home, friends, school, and future. The "me" section included such items as a photo of the child, fingerprints, baby pictures, the front page of a newspaper from the day of his/her birth, and a chart of daily activities. Other sections included photos of the child's family, pets, friends, and classmates, a genealogy of the family, autographs, and information about the child ranging from height and weight to skills and goals.

Materials, Resources, and Expenses

Cameras used were KODAK INSTAMATIC™ Cameras and POLAROID SX70 Cameras. Primary cost was for film. Notebooks were donated.

Outcomes and Adaptation

"A final analysis of the excitement generated by the use of the camera, the emotions expressed in response to snapshots, and the pride evident as the project began to take shape can only be indicative of immeasurable success," states Kerrigan. He notes that "children who did not participate previously began clamoring for inclusion another time," that camera use for field trips became common, and that the children took very seriously the responsibility of using and returning a camera in working order. Various sociometric instruments also showed "substantial movement" by the children "away from an isolated, cast-off position toward a more positive place in the class hierarchy."

Kerrigan says that virtually any activity of this unit could be incorporated in the curriculum as a means of self-expression. Drawings lend themselves to art, height and weight charts could be used for math, genealogy can be related to history, and the writing objects are useful in language arts.

Project Title

Cameras in The Curriculum Designed for Sixth Through Eighth Graders in Special Education Programs

Teacher Diana Kellner

Locale East Grand Junior High School, Granby,
Colorado

Subject Special Education

Grades 6-8

Purpose and Description of Project

Diana Kellner used photography as an alternative and flexible method of helping disabled children to acquire and process information, develop organizational skills, learn logical and sequential thinking, and express creativity.

The four children involved in the project faced a variety of difficulties—one was auditorially disabled, one was both visually and auditorially disabled, one emotionally disturbed, and one deaf. Nevertheless, these students learned how to use cameras, demonstrated their knowledge in evaluation exercises, went on field trips, and worked on individual photo essays. One of the essays about model airplanes as a hobby so impressed a science teacher that he invited the student to make a presentation to his class.

Activities

The teacher introduced the students to photographic techniques such as silhouette shots, backlighting, and portrait shots and showed examples of each. Students then had to identify additional photographs as an example of each technique and justify their choices. They also had to research such terms as f-stop and depth of field and present definitions to the class.

Through lectures and field trips, students learned about common mistakes in photography, the steps necessary before shooting begins, and the parts of a camera. They visited a local senior high school for a demonstration of film developing and toured a local print shop. Then they began their own picture-taking with black-and-white film, after which they discussed the merits or problems of each photo and presented a listing for each, specifying subject, distance, f-stop, shutter speed, and film speed.

The most challenging phase of the program was the design of individual photographic essays. At the time Kellner reported on the project, two of the essays had been completed—one on "Cats in My Family," and one on "The Building and Enjoying of a Hobby"—and two were in the process of completion (on animals and parts of a car). The completed essays were hung in the commons area of the school.

Materials, Resources, and Expenses

A school 35 mm camera was used for classwork and the black-and-white photo exercise. Students used their own cameras for the photo essays.

Human resources included amateur photographers who gave talks, parents who helped the children with their assignments, and an interpreter for the deaf child.

Outcomes and Adaptation

Among the special advantages of camera work with children with handicapping conditions, according to Kellner, are that it allows students to key in on a specific subject, helps teach sequencing, increase confidence and self-esteem, teaches orderly work habits, increases visual awareness, and improves skills in a seemingly nondrill, nonacademic atmosphere. She found the children to be enthusiastic about the project and careful in fulfilling their responsibilities. However, she does advise those replicating the project to be sure the group is small enough for sufficient individual assistance.

Project Title

Photo Lit

Teacher Marilyn L. Huber
Locale Santa Fe High School, Santa Fe, New Mexico
Subject Remedial English
Grades 9-12

Purpose and Description of Project

Huber's project was designed to motivate remedial English students toward better reading, writing, and understanding of literature through the production of short novels in group sessions. Cameras and photographic techniques were used to illustrate the works and give students a visual comprehension of literature.

In the process of writing dialogue, narration, and description as well as setting up the basic conflicts in their mini-novels, students were drawn into reading and writing in a new and exciting context and learned to view these skills from the practical standpoint of getting their own creative ideas into production. If they wanted to get across the meaning of their own work, they had to be concerned about spelling, syntax, punctuation, editing, and just simply making sense. According to Huber, "correcting their own writing was a better learning experience than all the red marks from a hundred teachers' pencils."

Activities

Students read a series of easy novels to learn about plotting and then started working on their own story line. Huber had planned to have all six classes cooperate on one mini-novel, but the students had such definite opinions that they wound up with three. With students divided into groups that wrote various incidents within the stories, they had to learn cooperation to come up with final products. "One group," notes Huber, "killed off all the characters each time they wrote" and so clear-cut plot guidelines had to be developed.

As the groups wrote incidents, they read them aloud to each other, revised, cut, wrote again, discussed, and rewrote. But it was planning and setting up the photos to illustrate the stories that really ignited student excitement. "The power of photography was the primary motivation," the teacher stresses. "If a picture couldn't be used to display an incident, the incident was changed to fit the picture." The final results were three illustrated books—*Hyde Park Seniors*, *Gang Warfare*, and *SFHS Stories*.

Materials, Resources, and Expenses

While Huber's students learned elementary photography, the school's journalism students developed and printed all the photos. Office procedures business students typed and reproduced manuscripts. Students used the teacher's Canon AE-1 camera, along with various small cameras they brought in themselves. Film, photographic paper, and developing chemicals were bought with the NEA/Kodak grant. Total cost was about \$135.

Outcomes and Adaptation

While these students were neither school oriented nor academically inclined, according to Huber, the excitement of using photography to illustrate their own ideas revealed them to be "capable of learning, coping, and expressing themselves." The project instilled in them what was "for many a unique experience—a sense of pride in their school work," she says, adding that "considerable rivalry developed among classes and the competition produced harder work and better composition."

In evaluating students' progress, the teacher also says that she attributes the students' improvement in meeting writing requirements outside the project to their involvement in Photo Lit. She also noticed a definite decline in absenteeism.

While Huber found this project's approach especially helpful in teaching remedial students, she believes it would be effective for students of virtually any level of achievement in any grade.

Project Title

What Happened First? Second? Third?

Teacher: Loris Elizabeth Clark

Locale: Omaha Public Schools, Omaha, Nebraska

Subject: Special Education—Deaf

Grade: Ages 15-17

Purpose and Description of Project

Loris Clark's project involves the use of picture stories with captions to teach temporal and sequential relationships to prelingual, profoundly deaf students. Because such relationships are difficult for these students to grasp, explains the teacher, motivation is often a problem. In this case, however, she found that "students were enthusiastic about working with cameras and making their own stories."

Students divided into three groups, each of which developed a picture story. "The Bank Robbery," for example, progressed throughout a series of eleven photographs of gleeful student-actors planning the caper, executing it, and getting arrested and carted off to jail. Clark found that such photo stories, used later in sequencing exercises, worked much better than commercially prepared materials.

Activities

Clark introduced the concept of sequencing by scrambling the students' daily schedule on the board and asking them to properly reorder the activities and by having a student carry out an activity while the class wrote down each step.

When students were divided into working groups, they began developing story ideas, deciding what and how many photographs would be required, and assigning dramatic and photographic tasks to individuals. They also gathered or made props and scouted various appropriate locations. Actual picture-taking, including retakes, was spread over three days. Clark was especially pleased that the students noticed, without prodding, when there were gaps in the logical progression of their stories. They also noted that for uniformity in the photos, they had to wear the same clothes each day—something she hadn't thought of.

Once groups were satisfied with their pictures, they worked on captions describing the action that occurred. When the final products were ready, each group tried to properly sequence the pictures and captions from the other groups. "The stories will continue to be used," says Clark, "to expand the students' sequencing ability", although she doesn't expect them all to progress at the same rate. Some students work with pictures alone, others with both pictures and captions while transferring their skills to new stories.

Materials, Resources, and Expenses

Each group of students used a POLAROID Camera and one or two packs of film. The cameras and film were available from the school. For those interested in cost data, she says that various types of POLAROID and KODAMATIC™ Instant Cameras run from about \$20 to \$100, or up to \$180 with built-in flash. Film ranges from about \$6 to nearly \$10 for a 10-exposure pack.

Outcomes and Adaptation

Evaluation of students' progress was done according to their individual educational plan (IEP) goals, explains Clark, so generalities are difficult to make. Most students, however, did show some improvement in skills, she says, and the use of photography by students to create their own learning materials was definitely a motivator.

Clark advises that the basic idea behind her project can be adapted to any ability group and any subject matter that involves studying a sequence of activities. She particularly notes the possibilities for science classes observing plant development, hatching of eggs, or chemical reactions.

Project Title

Social Studies Community Awareness

Teachers Carol Pierce, Betty Hartley
Locale Happy Hearts School, Ashtabula, Ohio
Subject Social Studies
Grade Mentally retarded/developmentally disabled students 7-17

Purpose and Description of Project

This program is designed to teach community awareness and help students understand and become familiar with environments they will have to deal with in real life. Photographs were used to increase students' self-confidence and to reinforce what they learned from visits with a variety of "community helpers." explain Pierce and Hartley, who say that the technique was enormously successful. In fact, they declare, "this program has been one of the most successful, exciting, and rewarding teaching experiences we have had working with trainable mentally retarded students."

The teachers developed a list of the community helpers they felt their students would be most likely to encounter in daily living—including baker, carpenter, dentist, farmer, judge, fire fighter, police officer, disc jockey, minister, salesclerk, mail carrier, nurse, and veterinarian. Then teachers, students, aides, and friends who had volunteered to take the pictures headed out for four all-day field trips, visiting a total of 13 sites. The classes all went on field trips together and exercises based on the experiences and resulting photographs were carried out separately in each classroom.

Activities

The field experience gave the students a chance for personal involvement in a whole range of activities that were both fun and educational. At the bakery, for example, the students were fascinated by the use of the rolling pin, the way cream puffs were filled, and how cakes are decorated. The high point, though, was sharing a huge chocolate chip cookie.

The students also had their own opinions about what they saw, sometimes to the discomfiture of the teachers. On the trip to the jail, one girl walked up to a prisoner in a holding cell and declared, "you bad boy." The object of her remark just laughed and said she was right.

While the actual experiences were beneficial, according to the teachers, the photographs were perhaps even more valuable since they allowed repeated references. It was when the pictures were used that "the real drill, reinforcement, and learning took place," they say.

The numerous exercises developed by Pierce and Hartley included matching photographs from the same site, matching photographs to the titles of the community helpers depicted in the photos, and orally describing what the pictures showed. The students also learned to put photos in sequential order and match photocopied photos of reduced size to the actual photographs.

Materials, Resources, and Expenses

Equipment used included 35 mm cameras to take the photos and slides on the field trips, slide projectors and screens, and construction paper, tagboard, and felt-tip markers to make and implement in-class games and activities. While these teachers spent \$200 on the project, they feel it could be carried out for much less. They say that in an effort to be sure of getting good shots at all angles, they took more photos than they could really use and that the number of community helpers visited could also be reduced. They estimate that a mini-version of the project could be carried out for \$25.

Outcomes and Adaptation

Pierce and Hartley say the students improved in visual and auditory discrimination, visual and auditory association, expressive language, reading, writing, and mathematics. Even the nonverbal students, they add, demonstrated "tremendous improvement" and would "sort through the photos, find themselves and their friends, and laugh and point." On performance skill tests, they note, "the scores of most students, including the nonverbal students, increased 70 to 200 percent."

The teachers advise that the program "can easily be used by other teachers wishing to teach students about community helpers. Adaptations can be made to meet the needs of any non-disabled group of students at any age level." They stress, however, that the key is the combination of visitation with the use of photographs as the primary means of reinforcement.

Project Title

Photo Communication

Teacher Kathy Tharp

Locale Jewell B. Willoughby School,
Louisville, Kentucky

Subject Speech Therapy

Grade All Ages, severely profoundly and trainable
mentally retarded

Purpose and Description of Project

Working as a speech clinician, Kathy Tharp's primary objective is to help nonverbal students develop a functional method of communication. In this project, she used photographs of objects in the student's environment to facilitate an association between the object and its symbol so that the student could then use the picture as a mechanism for nonoral communication.

Tharp says that she has used both color and black-and-white drawings and commercially prepared photographs, but that none of these worked as well as photos of objects the students actually come in contact with. She found that students were able to make an association between a familiar object and its symbolic representation more quickly, and then go on to associate meanings with photos, for communication purposes—that is, they came to recognize that by indicating the photo in some fashion, they could express their needs or wants.

Each student progressed at a different rate, notes Tharp, who says "The important fact is that each student achieved some degree of success."

Activities

Tharp's work was carried out in individual or small group sessions, and she found demonstration, role-playing, association, matching, identification, and discrimination activities to be the most successful. Initial activities were arranged in the following sequence: selection of a nonoral vocabulary, photographing of these vocabulary objects, student matching of photo to object, student identification of object by choosing between photo and blank with object present, and student identification by choosing between photo and blank on verbal request only.

From this foundation, a student goes on to learn to discriminate between photos of two different objects and to associate a more generalized meaning with each photo (a picture of a cup would be associated with communicating a desire to drink).

Tharp also uses such commercially prepared devices as the VOXCOM, the Form-A-Phrase, a choice board, and a acrylic-plastic display stand but says that many students are using functional systems based on photographs alone.

Materials, Resources, and Expenses

Tharp worked with parents, teachers, teaching assistants, foster grandparents, physical therapists, and volunteers to help ensure carry-over of students' gains from the therapy setting to the classroom and the home.

She used a 35 mm YASHICA Camera owned by the school and says she preferred fast film because she relied heavily on close-ups. Her costs for film, development, enlargements, and duplicates are estimated at between \$100 and \$150.

Outcomes and Adaptation

Tharp says that "to date, some of my students have not progressed beyond indicating basic needs and wants. However, that does not mean they will never go further, and I feel that the ability to manipulate your environment in even a small way is better than no way at all. The important fact is that each student in this project achieved **some** measure of success. Immediate results are increased cognitive skills, better receptive language skills, and a beginning form of expression for those who previously were nonverbal."

Tharp believes that the reasonable cost of photography and the flexibility of photos makes the project adaptable to students of different functioning levels, which she thinks makes photos "a wonderful tool for any type of language program."

Project Title

Introducing . . .

Teacher Paula Klein

Locale Horace Mann Elementary School, Rapid City
South Dakota

Subject Self-Concept

Grade 3

Purpose and Description of Project

Faced with a very high rate of local unemployment resulting in turnovers of students and school personnel in the 40 percent range, Klein used photography to help create a sense of belonging and community that she felt would better foster learning.

Teacher and students discussed the problems stemming from high levels of mobility and developed a questionnaire for both students and school staff, plus a quiz game utilizing photo/information packets about each individual. They made these available to the entire school. The result, according to Klein, was that students got to know each other better, learned more about the school staff, and developed better school spirit.

Klein herself is leaving the school this year, but, she says, the project will remain for others to build on.

Activities.

Students developed a set of interview questions and tested them on each other in the classroom. Questions ranged from physical description (color of eyes and hair) to favorite colors, foods, books, music, etc. Students then learned interviewing techniques which they practiced on each other and used during a group interview with the principal. To set up their interview list, they updated the school directory of everyone who worked in the building, including teachers, aides, specialists, and custodians. Students made appointments for interviews or, if necessary, left the questionnaire to be completed and returned at the interviewee's convenience.

Throughout the interviews, pictures were being taken of each member of the class and of the school staff. Each picture was mounted in the lid of a clear plastic container with the person's name and, if an employee, the job title. Then, using information from the questionnaires, a set of paper discs, was made for each interviewee. A question and three possible answers were printed on the front of each disc, with a hole beside each answer. The correct answer was indicated on the back. All the discs for a particular person were then placed in the container showing his or her picture, along with a golf tee to be used to indicate the hole chosen by someone playing the quiz game.

When the containers were filled, a small piece of quick-release-fastener tape was placed on the back to attach to a corresponding piece on a display board titled "Introducing . . .". This allowed students and staff members to remove any container, get to know the person described, and replace it on the board.

Materials, Resources, and Expenses

An instant camera was used to take student and staff pictures. The plastic containers were discarded coverings from electrical tape used by the local electric company. Klein said the project was quite inexpensive, involving only the purchase of film.

Outcomes and Adaptation

Klein observed in class discussions that as a result of the project, students knew more about each other and about the staff of the school. When it came time to make potholders as gifts for some of the "special helpers" in the school, she notes, everyone knew what color to use for each recipient because that information was included on the questionnaire. Also, she says that when a new student or staff member arrived, "he or she was quickly made to feel welcome by having his or her picture added to our display and was encouraged to learn about the rest of us through use of the 'introducing' containers."

The program can be replicated in any community, says Klein, who states that she feels "so positive about the success of the project that I intend to implement it in the new school I move to."

Project Title

Understanding Through Exposure

Teacher Carolyn Mauer

Locale Central Elementary School,
St. Anthony, Idaho

Subject Gifted and Talented

Grades 4-6

Purpose and Description of Project

Having observed that gifted and talented (GT) students often have difficulty both in relating to other youngsters and in accepting their own giftedness, Carolyn Mauer decided to use photography to help the GT students understand the uniqueness of each individual by interacting with the school's classes for trainable mentally retarded (TMR) students in positive ways.

In the course of the project, the GT students learned all the steps of photography, from loading the film to printing enlargements, while also tutoring TMR students, photographing them in learning situations, and developing bulletin boards of the photos for the TMR classrooms. The experience was a productive and rewarding one for all involved, according to the teacher.

Activities

The five primary activities in this project were:

- Photography skills—During several class periods the GT students learned about various types of cameras, how they are similar and different, kinds of film, and the parts of a camera and their functions. They also learned how to load, focus, and set the proper exposure for a 35 mm SLR camera.
- Peer tutoring—The TMR teachers provided background about the goals of their programs, and the GT students worked with the TMR students of elementary school age on their lessons. The tutors recorded their experiences and feelings in journals and looked for examples of pictures they could take that would be representative of the goals and objectives of the TMR classroom.

- Photo sessions—On photo days, the GT students went into the TMR classroom and took pictures of the students in learning situations both with and without their GT tutors. For the older TMR students, whose curriculum focused on job skills and who work part of the day in the community, the GT students took pictures at job sites.
- Darkroom skills—The GT students used a changing bag, rolled their film into the tank, and took it through the developing process. Then they made proofsheets, chose the shots they wanted to enlarge, and made 8 x 10-inch prints.
- Bulletin boards—As a group, the GT students decided how they wanted to display their pictures, mounted the pictures with labels, and put up the boards in the TMR classrooms.

Materials, Resources, and Expenses

Students used a 35 mm SLR camera, darkroom supplies (chemicals, photosensitive paper, enlarger, etc.), film, and bulletin boards.

Outcomes and Adaptation

Mauer says that as a result of the project, her students "began to appreciate that each person is an individual and has a uniqueness of his or her own. A genuine warmth toward many of the TMR students also developed." Teachers of the TMR students reported that their students' correct work procedures were reinforced by posing for and reviewing pictures of themselves and that they were motivated to practice their work and social skills. And, finally, Mauer says her students can now carry out all the steps of photography "from buying a roll of film to producing a finished print" without assistance.

The teacher notes that the project could be replicated in any school and would have value even without involving GT and TMR students because it reinforces positive behaviors and serves as a vehicle for teaching photography.

Project Title

Picture Your Students as Certified in CPR

Teacher Karen Sue Garrison

Locale Vandever Elementary School,
Broken Arrow, Oklahoma

Subject Health

Grade 5

Purpose and Description of Project

Karen Sue Garrison used photography as an integral part of a program of instruction about the use of cardiopulmonary resuscitation (CPR) to assist victims in such emergencies as heart attack, choking, and accidents.

Students were photographed as they learned CPR procedures, and the pictures were used for self-critiques of hand and body positions. Also, slides were made of classroom activities, presentations by resource people, and field trips, and organized into a comprehensive review of the CPR course.

The final evaluation of Garrison's students involved passing both a demonstration and written tests to become certified in CPR.

Activities

Students began by discussing the importance of CPR in class, learning related terminology, and studying the CPR Student Handbook. After learning to identify the parts and functions of the respiratory system, they moved to hands-on activities, using a mannequin to demonstrate such techniques as clearing the airway and renewing breathing. Photographs of students demonstrating each activity were mounted on the bulletin board so that they could review hand placement and body position. A series of slides was made that contrasted correct and incorrect methods for administering CPR.

Next, students viewed a film, role-played rescues of drowning and heart attack victims, and met with various resource people during class presentations and on field trips. At the local hospital, they toured the emergency room, x-ray room, pharmacy, intensive care unit, laboratory, and administrative offices. They saw demonstrations of x-rays and an electrocardiogram. Students also heard from fire department paramedics and a nurse from a helicopter ambulance service. Slides of all these presentations were used for review of the CPR course before students took the written and demonstration tests.

Final activities of the project were a mini-health fair to stimulate awareness of and interest in CPR and a party to celebrate the students' CPR certification.

Materials, Resources, and Expenses

Primary human resources were the school's registered nurse, fire department paramedics, a nurse from the helicopter ambulance service, and hospital staff. CPR materials were student handbooks, tests, certification cards, film, and mannequins. Other equipment used included a camera, flashcubes, slide projector and screen, bulletin board, and movie projector. Garrison estimates the cost of photographic prints at 40 cents each (including film, flash, and developing) for a total of \$47. She says the student handbook is 60 cents per copy if the school district already has its own mannequins, or \$5 per copy for the American Heart Association Handbook, which includes rental of the mannequins.

Outcomes and Adaptation

Garrison found that the students were "very interested in learning to administer CPR and remained motivated throughout the course of instruction. Photographs were taken throughout the entire course, which made the students more conscious of performing at their best." She says that all 29 students passed the physical part of the test the first time around, and 21 of 29 passed the written test. (Those not passing were given an opportunity to retake the written test.)

Stressing the importance of CPR in saving lives, the teacher urges implementation of CPR programs "in every school across the nation."

Project Title

Communicating With Cameras

Teacher: Mary L. Balden

Location: Steamboat Springs Junior High School,
Steamboat Springs, Colorado

Subject: Throughout Curriculum

Grades: 6-8

Purpose and Description of Project

As a media specialist Mary L. Balden encouraged and assisted with a wide range of projects involving the use of photography in her junior high school's curriculum.

Activities

Projects and activities stimulated by Balden's involvement in the NEA Kodak awards program included:

- Using a KODAK EKTAGRAPHIC EF Visualmaker set up in the media center, students were able to develop slide presentations to enhance their oral reports. The slides they created became part of the center's permanent resources and can be used by others for various purposes.
- The school's music teacher and students put together a slide show as the background for one of their productions.
- Teachers have not only set up a mini-course in photography, but have photographed all their mini-courses and made displays to communicate with parents and the community about these courses.
- Teachers are gathering a library of slides to motivate creative writing and have created a slide show about the use of microcomputers in the school and presented it at a state convention.

Materials, Resources, and Expenses

Most equipment, including the EKTAGRAPHIC Visualmaker and a dissolve unit, have been borrowed. Additional KODAK CAROUSEL Projectors and slide sorters were purchased to facilitate use of slides.

Outcomes and Adaptation

The primary outcome of her project, says Balden, is "awareness more than anything else-- awareness among both teachers and students of the possibilities of using photography to enhance any subject area." She says students were more motivated to perfect their presentations because of the option of using slides to highlight their reports and that teachers became more interested in developing their own learning materials rather than purchasing them. The school's public relations also improved, she adds, as visual materials were used to promote programs or events.

Project Title

The Use of Photography To Teach Safety

Teacher Robert E. Dunkle

Locale Avon Lake High School, Avon Lake, Ohio

Subject Industrial Arts

Grades 10-12

Purpose and Description of Project

Having found that the "greatest problem in teaching safety to students in industrial arts is getting them involved past the reading and listening stage," Dunkle used photography to both generate student interest and graphically illustrate safety guidelines.

Working in teams of two, students became the writers, producers, and stars of their own slide/tape shows on the safest way to operate a particular machine or carry out a specific process. Students also developed safety tests relating to the topics of their own shows that were administered to the entire class. Thus, the students not only learned from their own projects but shared their classmates' experiences.

"With the introduction of photography," states Dunkle, "students have not only become interested in safety instruction, but through their slide presentations, they have become the instructors. Without a doubt this has been the best approach I have ever used in my 24 years of experience teaching industrial arts."

Activities

Students reviewed safety rules and selected a particular machine or process for their presentations. Then they researched their selections and decided what kind of shots would best illustrate proper precautions. After the shots were taken and the slides developed, the students arranged the slides in logical sequence on a storyboard and wrote narration. Once the script was taped, each team presented its show to the entire class along with a safety test based on the presentation.

Materials, Resources, and Expenses

Tools for this project were a 35 mm SLR camera, photoflood lights, high-speed KODAK EKTACHROME film, slide projector and screen, copy stand, die-cut letters, slide sorter, and cassette recorder and tapes. Almost all of these supplies were available from the school audiovisual department. The only costs were for film processing, and cassette tapes which ran only \$4 per student.

Outcomes and Adaptation

"The most important outcome of this project is that for the first time in this teacher's experience, safety became important from the *students'* point of view," says Dunkle. And, because each slide show was prepared by a team of two (one demonstrating, the other photographing), Dunkle adds that "they also learned the importance of working together, sharing responsibility, and planning activities to meet a fixed deadline—not to mention the personal pride each seemed to take in the final outcome."

In addition to being suitable to any industrial arts setting, Dunkle says this project could be adapted to teach procedures and processes related to science, chemistry, physical education, or home economics.

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