DOCUMENT RESUME

ED 382 814 CE 068 914

| | |
|---|---|
| TITLE | 1994 Outstanding Practices. Effective Strategies from "High Schools That Work" Sites and States in Raising the Achievement of Career-Bound High School Students. |
| INSTITUTION | Southern Regional Education Board, Atlanta, Ga. |
| PUB DATE | 94 |
| NOTE | 37p. |
| PUB TYPE | Reports - Descriptive (141) |
| EDRS PRICE | MF01/PC02 Plus Postage. |
| DESCRIPTORS | Academic Education; Classroom Techniques; Educational Improvement; Educational Innovation; *Educational Strategies; *Excellence in Education; *High School Graduates; High Schools; *Integrated Curriculum; *Noncollege Bound Students; Teaching Methods; Vocational Education |
| IDENTIFIERS | *High Schools that Work |

ABSTRACT

This publication contains descriptions of 35 outstanding practices from schools and states in the High Schools That Work (HSTW) Program. Each description is accompanied by one or more numerals corresponding to the 10 HSTW key practices listed in this booklet. The publication presents the outstanding practices gleaned from presentations at the annual HSTW staff development conference, technical assistance to HSTW sites, and recommendations from HSTW teachers, counselors, and administrators. Some of the practices described in the publication include the following: principals playing a vital role in promoting schoolwide change; English teachers holding career-bound students to high standards; developing a writing skills program that helps students succeed; holding business education students to high standards in preparation for employment; integrating physics and vocational studies; using reading strategies to improve academic achievement in a principles of technology course; benchmarking mathematics and science curricula to world standards; science and vocational teachers developing a challenging physical science curriculum; applied communication course giving life to British literature; integration projects increasing students' learning and participation; integrating word processing and a foreign language; team-building strategies for integrating the curriculum; and comprehensive guidance program improving communication with students and parents. (KC)

# 1994 Outstanding Practices

Effective Strategies from *High Schools That Work* Sites and States in Raising the Achievement of Career-Bound High School Students



HIGH SCHOOLS THAT WORK

Integrating Academic and Vocational Education

# Table of Contents

## Using Outstanding Practices to Improve Schools and Classrooms

Over 350 schools in 19 states in the *High Schools That Work* program are actively engaged in improving the math, science, reading, and technical achievement of career-bound students. To do so, they are implementing the program's 10 key practices for changing what is expected and what and how these students are taught.

This publication contains 35 noteworthy practices from *HSTW* sites. These brief accounts are a sample of the many activities taking place in our schools and states.

Networking is the key to putting these strategies to work in your school. I encourage you to read about practices that have the potential to help your school, and write or phone the contact persons for more information. You may want to visit another school or invite someone from that school to meet on-site with your teachers. The important thing is to use this book as you carry out your improvement plans.

This year's *Outstanding Practices* publication is the fourth in a series of profiles of "what works" at high schools in the program. All four publications are available through SREB. Together, they represent over 150 accounts of how high schools are making a difference in students' lives.

Outstanding practices are gleaned from presentations at the annual *HSTW* staff development conference, technical assistance visits to *HSTW* sites, and recommendations from *HSTW* teachers, counselors, and administrators. If your school is doing something you would like to share, please send us information for dissemination in the future. One of SREB's primary roles is to link teachers and schools across the region.

Thank you for your efforts to improve the preparation of career-bound youth. We hope this publication will contribute to your success.

Gene Bottoms, Director
*High Schools That Work*

## Relating Outstanding Practices to the *High Schools That Work* Key Practices

This publication contains descriptions of 35 Outstanding Practices from schools and states in the *High Schools That Work* program. Each description is accompanied by one or more numerals corresponding to the *HSTW* key practices. The numbers may not represent the only key practices these schools are implementing, but they represent the major ones highlighted.

A list of the key practices appears on page 2. If you are interested in a particular practice, simply look for its number throughout the book.

## Key Practices

**High Expectations** – Setting higher expectations and getting career-bound students to meet them;

**Vocational Studies** – Increasing access to challenging vocational studies, with a major emphasis on using high-level math, science, language arts, and problem-solving competencies in the context of modern business and technical studies;

**Academic Studies** – Increasing access to academic studies that teach the essential concepts from the college preparatory curriculum through functional and applied strategies that enable students to see the relationship between course content and future roles they may envision for themselves;

**Program of Study** – Having students complete a challenging and related program of study, including three courses in mathematics and three in science, with at least two credits in each course equivalent in content to courses offered in the college preparatory program, and having students complete at least four courses in a vocational major and two courses in related areas;

**Work-based Learning** – Providing career-bound students access to a structured system of work-based learning that is planned in collaboration with high-status school-based learning—high school and postsecondary—and that results in an industry-recognized credential and employment in a career pathway;

**Teachers Working Together** – Having an organizational structure and schedule that enable academic and vocational teachers to have the time to plan and deliver an integrated curriculum aimed at teaching high-status academic and technical content;

**Students Actively Engaged** – Having each student actively engaged in the learning process;

**Guidance** – Involving each student and his/her parent(s) in an individualized advisement system aimed at ensuring that each student completes an accelerated and coherent program of academic study with a vocational or academic major;

**Extra Help** – Providing a structured system of extra help to enable career-bound students to successfully complete an accelerated program of study that includes high-level academic content and a major;

**Keeping Score** – Using student assessment and program evaluation information to check and improve the curriculum, instruction, school climate, organization, and management.

# Using the *HSTW* Key Practices to Prepare a Diverse Population of Students


**Leto Senior High School** in Tampa, Florida, uses the *HSTW* key practices to fulfill its motto, "Soaring for the Future." The school has a diverse population of 1,800 students in grades 10-12: 47 percent white, 37 percent Hispanic, 13 percent black, and three percent other. Leto's implementation of the key practices includes:

- **Establishing high expectations** – The school eliminated general mathematics courses and required students to complete 30 laboratory hours in all science courses. Leto has schoolwide programs to strengthen reading, mathematics, and communication skills.
- **Revising vocational courses and developing new ones** – Technology studies, engineering technology, and drafting technology courses replaced industrial arts. In addition, an electronics program is offered, the child care program is being revised, a pre-vet technology program has been included in the agriculture program, and computer literacy has become part of the business courses.
- **Revising academic studies** – Applied mathematics and applied chemistry were added to the curriculum.
- **Enrolling students in a challenging program of study** – The school eliminated low-level courses and encouraged students to enroll in an upgraded academic core and a major.
- **Providing work-based learning** – In one program, business students participate in a shadowing experience at a local bank.
- **Providing extra help** – Computerized tutorial assistance is available in mathematics and communications. Special programs target students at risk of dropping out.
- **Using student assessment and program evaluation data to keep score** – The school uses a variety of surveys, tests, and evaluations to measure student achievement and program implementation.
- **Integrating academic and vocational curricula** – The school and the district conduct staff development activities aimed at integrating the curriculum. One example is the integration of criminal justice with biology and child care.
- **Engaging students actively in the learning process** – In one project, health occupations students participate in an eight-week rotation at a hospital or nursing home.
- **Providing an educational and career guidance system** – Counselors help students identify personal and professional interests and engage in career assessment and exploration.

By raising student achievement and implementing key practices, Leto became one of the *HSTW* program's most improved schools. Student scores in reading, mathematics, and science increased significantly between 1990 and 1993, and students surpassed the *HSTW* goal in mathematics. The dropout rate declined, and parental involvement increased.

---

**Contact:**
**Virginia Massey, Principal and *HSTW* Coordinator**
**Leto Senior High School**
**4409 W. Sligh Ave.**
**Tampa, FL 33614**
**(813) 872-5300**

## Principals Play a Vital Role in Promoting and Supporting Schoolwide Change


The principal and a large group of teachers at **Grove High School** in Grove, Oklahoma, are dedicated to improving the preparation of career-bound students. They believe all students should receive the essentials of the college preparatory curriculum; the difference for career-bound students should be in how a course is taught, not in what is taught. The school is raising expectations for all students, providing quality vocational studies and high-level academic studies, and creating interdisciplinary teams of teachers. Career-bound students have access to educational and career guidance services and extra help as needed to meet higher standards. High expectations are evident in a relevant, interconnected curriculum; teachers' respect for all students; administrative support for improved school and classroom practices; teachers' emphasis on instruction; and teacher input in curriculum and instructional decisions.

Changes at Grove High School include:

- Replacing the general track with a high-level curriculum for all students;
- Having students complete an upgraded academic core and an academic or vocational major;
- Reorganizing the academic and vocational curricula;
- Using instructional methods that assist students in meeting higher standards;
- Providing career-bound students with the amount of attention that college-preparatory students receive.

When Grove High School established interdisciplinary teams of teachers to improve student learning, the principal made it possible for teachers to plan together, engage in joint staff development, visit each others' classes, and solve interdisciplinary problems. In a new guidance system, teachers are given time to work with counselors in helping students and parents plan four-year programs of study.

The principal at Grove High School points to three conditions that inhibit change: beliefs, attitudes, and traditions. Administrators can help teachers become comfortable with revised beliefs, changed attitudes, and alternative educational methods. The principal listens to teachers' ideas and encourages everyone to participate in school improvement.

**Contact:**
**Rodney Dillinger, Principal**
**Grove High School**
**P.O. Box 789**
**Grove, OK 74344-0789**
**(918) 786-2207**

## English Teacher Holds Career-Bound Students to High Standards


**Howard School of Academics and Technology** is an inner-city school in Chattanooga, Tennessee, with a predominantly low-income, minority student population of 1,100 students. Attendance and poor academic performance are problems for many students. Howard is responding by making significant improvements in school and classroom practices that contribute to learning.

English teacher Thomas Randolph facilitates student success by raising expectations in his classes and demonstrating the consequences of failing to meet high standards. Accountability is a novel concept for many students who have

become accustomed to low expectations, minimal grades, and automatic advancement to the next level. Courses gain integrity—and learning improves—when students are required to earn their grades.

Students in Randolph's junior- and senior-level classes read one book during the first three weeks of each six-week grading period. All classroom and homework assignments during the period are based on the books the students read. If they do not read a book, they do not pass. Randolph has developed 17 assignments which he uses to help students improve their writing skills. These include writing a letter to an author, an obituary for a character in a book, and a newspaper article based on an interview with one of the characters. Non-written assignments may include drawing a picture, composing a rap song, or reciting a poem.

Students select the books they read, but they get a better grade for reading longer books. During the first three weeks of the 1994-95 school year, some 150 juniors and seniors demonstrated through oral reports that they had read over 34,000 pages.

Word gets around that Randolph expects more: Many more seniors than juniors fulfill the reading requirement. "I tell students that my classes are like the real world," Randolph says. "If you don't work, you're fired."

---

**Contact:**
**Thomas Randolph**
**English Teacher**
**Howard School of Academics and Technology**
**2500 S. Market Street**
**Chattanooga, TN 37408**
**(615) 757-4990**

## Developing a Writing Skills Program That Helps Students Succeed


Ninth and 10th grade students in the **New Castle County Vocational-Technical School District** in Wilmington, Delaware, participate in an intensive program designed to improve their writing skills. The program emphasizes the components of good writing—topic development, organization, sentence structure, word choice, voice, and literacy.

Students complete eight major writing assignments per year. Their work is placed in a portfolio that shows whether they met the standards for each assignment and how much their writing improves during the year.

To create the program, a group of English teachers from schools in the district brainstormed about the question, "What is good writing?" They reached agreement on the question and worked together to develop sample lesson plans.

The program began with a diagnostic assignment to determine how well 10th-graders could write. In a one-day staff development activity, all 10th-grade English teachers met to assess the diagnostic papers and develop instructional objectives. Ninth-grade teachers also reviewed the papers and planned ways to enrich their students' writing.

The English specialist from one school visits English classes at all schools in the district to assist teachers in conducting one-on-one conferences during which students ask questions about their writing.

Four methods are used to assess the effectiveness of the program:

- Students complete a final paper;
- Teachers score final papers together to confirm successes and identify weaknesses;
- Teachers share successful strategies throughout the school year;
- Portfolios demonstrate students' progress and program growth.

The district plans to expand the program to the 11th and 12th grades and to include a strong technical writing emphasis in the senior year.

The program has helped a larger percentage of New Castle County students—compared to students at many other schools in Delaware—meet or approach state writing standards. Students know what they are expected to do and can see their progress and need for improvement in their portfolios.

**Contact:**
**Kay Bach, English Specialist**
**New Castle Co. Vocational-Technical School Dist.**
**1417 Newport Road**
**Wilmington, DE 19804**
**(302) 995-8154**
**or**
**Pat Clements, English Teacher**
**Delcastle Technical High School**
**1417 Newport Road**
**Wilmington, DE 19804**
**(302) 995-8100**

## Connecting a High School and an Area Technical School through an Integrated Program of Study and Curriculum


**Topeka West High School** and **KAW Area Technical School** in Topeka, Kansas, are partners in a tech prep program designed to prepare students for continued learning in the workplace or at a postsecondary school or university. Career-bound students at Topeka West enroll in one of five curriculum clusters:

- Business Technology
- Communications/Fine Arts
- Engineering/Technical
- Health and Human Services
- Transportation

As one of the *High Schools That Work* program's 18 Advanced Integration Model (AIM) sites, Topeka is developing the transportation cluster as a national model. The cluster prepares students for careers in many transportation and transportation-related fields. Students in this cluster—whether career-bound or college preparatory—complete three units of mathematics, three units of science, and four units of English. All students in this cluster have the opportunity to take courses at the technical school.

One project for students in grades 11 and 12 focuses on the effects of shipping and receiving practices on the transportation industry. The project requires students to apply content from mathematics, science, business studies, social studies, language arts, and a foreign language to learn about merchandise warehousing and distribution.

An active advisory council is helping the Topeka schools develop the integrated transportation curriculum, introduce new technologies, measure student achievement against skills required in the industry, and evaluate the program.

**Contact:**
**Sue Schlegal**
***HSTW* Coordinator**
**Topeka Public Schools**
**Administration Center**
**624 SW 24th St.**
**Topeka, KS 66611**
**(913) 233-0313, Ext. 292**

## Integrating Drafting and Design with Challenging Academic Studies through an Academy of Design


The Academy of Design at **Vero Beach High School** in Vero Beach, Florida, was developed for students interested in careers in drafting and design technology, architectural design and construction, engineering, and surveying. The program of study combines drafting courses with high-level academic courses for students in grades 10 through 12.

Academy students are required to take high-level mathematics and science each year: geometry and physical science or chemistry in the 10th grade; Algebra II and chemistry in the 11th grade; and Analysis of Function or pre-calculus and Principles of Technology (applied physics) in the 12th grade. They take three years of related drafting and design courses. Students complete projects and organize portfolios that are used in assessing their achievement.

In learning to solve problems and adapt to changing technology in the workplace, academy students tackle projects inspired by real-world applications. For example, pairs of students designed and built scale-model bridges, used mathematics to calculate their strength, and made three-minute presentations on the merits of their designs. At the end of each major project, the students display their work for parents and business leaders at an evening exhibition at the school.

**Contact:**
**Deborah Harwell, Coordinator**
**Academy of Design**
**Vero Beach High School**
**1707 16th St.**
**Vero Beach, FL 32960**
**(407) 563-2482**

## Holding Business Education Students to High Standards in Preparation for Employment


Business education students at **Central High School** in Phenix City, Alabama, meet high academic and vocational standards and engage in realistic business experiences. The business education department—with 450 students enrolled in a wide range of business courses such as computer operations and accounting—is the school's largest vocational program. Students work on interdisciplinary assignments, complete projects for employers, write term papers, and follow a curriculum that leads to two years of postsecondary education. They also have opportunities to participate in work-based learning at local companies.

Students in each course complete challenging assignments that require the use of reading, written and oral communication, and mathematics. In one assignment, students used desktop publishing software to create a brochure, postcard, and business card for a fictitious company. The products were displayed throughout the school and were placed in students' portfolios.

Business students also write term papers which are graded by an English teacher for content and a business teacher for format. In another example of teachers working together to improve student achievement, business and English teachers developed standard formats for research reports, résumés, business letters, and memos. Posters illustrating the formats were displayed in classrooms and the media center.

Qualified seniors may enroll in work-based learning at business, professional, and government offices. The students must be recommended by their teachers, have an average

score on tests of 80 percent or better, have a good attendance record, and complete three credits in business education. Every student in the 1993-94 program received an offer of full-time employment, and several students received financial assistance from their companies to attend postsecondary schools. All but one of the students are pursuing business degrees at a two-year or four-year college.

To ensure smooth transitions for students from secondary to postsecondary education, Central High School entered into articulation agreements with two technical schools and a community college. Students completing a sequence of business courses with an average score on tests of 80 percent or better, earning a tech prep diploma, and receiving a recommendation from a business instructor can receive up to 20 hours of college credit. To develop the agreements, faculty and administrators from the high school and postsecondary levels examined course descriptions and requirements to eliminate duplication of content and skills. The Central High School business department prepared a "drawing board" of courses students must complete through grade 14; every course relates to a specialized area or prepares students for further education.

The school's advisory council is composed of eight business leaders and five business education teachers who meet twice annually. The council makes recommendations on curriculum, equipment, software upgrades, and facilities. Council members visit the school during the year to observe classes and evaluate program effectiveness.

---

**Contact:**
**Terry Daniels, Business Education Coordinator**
**Central High School**
**2400 Dobbs Drive**
**Phenix City, AL 36867**
**(205) 298-3626, Ext. 435**

## Integrated Lesson on Space and Measurement for Manufacturing Technology Students


Academic and vocational teachers and administrators from **Caddo Career Center** and **Woodlawn High School** in Shreveport, Louisiana, developed an integrated lesson on space and measurement for ninth grade students enrolled in the Manufacturing Technology curriculum. The curriculum is a four-year school-to-work program designed to prepare students for high-tech, high-wage jobs in manufacturing. To be accepted into the curriculum, students must be interested in science and technology, have mechanical and numerical strengths, and be within one year of grade level in mathematics and reading skills. They must have a good attendance record and no history of disciplinary problems. Positive parental support, computer literacy, and keyboarding skills are also helpful.

Manufacturing Technology is a school-within-a-school combining academic, technical, and work-based education and training. The curriculum is taught by a team of teachers. Students in the curriculum:

- Receive increased in-school help with their studies;
- Meet high performance standards in classes they might otherwise avoid such as high-level mathematics and science;
- Link school-based and work-based learning;
- Earn postsecondary credit;
- Engage in paid summer employment after grade 10;
- Qualify for employment and postsecondary education.

The space and measurement project requires knowledge of electronics, technology,

algebra, and language arts. Working in teams, students construct a scale model of a hard surface tennis or basketball court. They research the standard dimensions of a court, use measuring tools and scales to reduce its size, lay it out to scale with masking tape on the classroom floor, compare and contrast the standard size with the measured size, and write a report. They also present their findings and recommendations to the school tennis or basketball coach.

**Contact:**
**Gayle Flowers, Principal**
**Caddo Career Center**
**5950 Union Ave.**
**Shreveport, LA 71108**
**(318) 636-5150**
**or**
**Margaret Benjamin, Counselor**
**Woodlawn High School**
**7340 Wyngate Blvd.**
**Shreveport, LA 71106**
**(318) 686-3163**

## Integrating Physics and Vocational Studies


Teachers and administrators at **McKenzie Career Center** and **Lawrence North High School** in Indianapolis, Indiana, strive continuously to raise expectations and increase achievement among the school's 1,800 culturally and ethnically diverse students. One route to success is Physics of Technology, an applied course combining physics and vocational studies.

Offered in a three-hour block, the course is team taught by an automotive service technology teacher and a physics teacher. Together, they integrate and reinforce the content. For example, students might be asked to relate the study of force to the torque of an engine block. Another example is the application of a fluid system to engine cooling systems, automatic transmissions, and hydraulic braking systems. Using these and other strategies, students are able to make immediate, relevant connections in what they learn.

The course prepares students to 1) use physics in real world applications, 2) analyze and solve physical science problems, 3) demonstrate employability by applying technical skills in a typical work situation, 4) use science for lifelong learning, and 5) meet high standards in laboratory and classroom work.

Students enrolled in Physics of Technology in 1993-94 became so proficient with electrical concepts that they were able to make a smooth transition to advanced automotive service technology. Despite its difficulty, the course is so popular that there was not enough space for every student who wanted to enroll in 1994-95. In addition, a mathematics teacher joined forces with the team this year to focus on needed mathematics content. Based on the success of this course, plans are being made to offer physics in other vocational classes in the future.

---

**Contact:**
**Sue Kemmerer, *HSTW* Site Coordinator**
**McKenzie Career Center**
**7802 Hague Road**
**Indianapolis, In 46256**
**(317) 576-6420**

## Business Advisory Group Helps Strengthen Vocational Program


**Russellville High School** in Russellville, Kentucky, has a long-standing partnership with local business and industry in improving vocational studies. Some 5,000 career opportunities, ranging from manufacturing to banking to small business, are available in this rural community.

Educators and business leaders serve on an advisory group for the vocational program. The group:

- Donated funds for vocational equipment;
- Assisted in upgrading the curriculum;
- Serves as a resource for vocational leaders;
- Reviewed the vocational program's needs in implementing tech prep;
- Conducted a study of entry-level workers' training needs and the capacity of the high school vocational program to meet those needs.

The advisory group is based on a chamber of commerce action team of business and industry representatives organized several years ago to support vocational education in the community. School leaders began meeting with the group monthly to develop an action plan for improving the vocational curriculum. More mathematics, reading, and writing were added to the curriculum after a survey of local employers revealed that new workers need those skills.

In 1993 the advisory group recommended that the school adopt the Ford Academy of Manufacturing Sciences (FAMS) curriculum for students interested in manufacturing, engineering, or skilled trades. FAMS combines math, science, economics, statistics, and modern production strategies with a summer internship in a manufacturing plant.

As the vocational program continues to evolve, the advisory group is providing guidance and assistance in expanding and strengthening a work-based learning program for students who want to combine high-level academics with related work site experience.

**Contact:**
**Donna Preston**
**Director of District Services**
**Russellville Independent School District**
**355 South Summer St.**
**Russellville, KY 42276**
**(502) 726-8405**

## Business and Industry Representatives Help Develop a High-Tech Manufacturing Program


At **Southeastern Technical High School** in Baltimore, Maryland, business and industry representatives are heavily involved in providing a high-tech program of study to prepare students for careers in manufacturing. The Computer Integrated Manufacturing Systems (CIMS) program combines 1) the four manufacturing-related courses from the Ford Academy of Manufacturing Sciences curriculum, 2) rigorous mathematics and science courses, 3) hands-on activities in a modern, well-equipped school laboratory, and 4) experience in the workplace. The CIMS program was developed after the Maryland State Department of Education made it possible for a school team to attend a FAMS training workshop offered by the *High Schools That Work* program in 1993.

The school's board of directors, composed of local and state policy makers, business and industry representatives, postsecondary educa-

tors, parents, and students, provided strong support for the program. It is funded by the Baltimore County School System.

Companies such as Bethlehem Steel, Lever Brothers, and Aircraft Armaments, Inc., helped design the program by identifying the math, science, and technical skills needed in manufacturing. The companies provide ongoing support for teachers and students in the program.

The Regional Manufacturing Institute (RMI), composed of the chief executive officers of area businesses, welcomed the opportunity to be involved in developing the program. RMI representatives toured high-tech programs at other high schools in the nation and helped select equipment for the program laboratory. Two engineers from RMI companies visit the school several times a month to assist with the program. RMI member businesses provide workplace mentors, host field trips, and are arranging for summer internships, beginning in 1995.

The CIMS program is an academically challenging and technologically advanced program of study, including courses in statistical methods for manufacturing quality, geometry, computer information processing, electronics technical drafting, computer assisted drafting, laser and optics technology, and Principles of Technology (applied physics). The program will allow students to move seamlessly from high school to a community college, an apprenticeship, a four-year college or university, or the workplace.

Southeastern is a regional technical high school serving five high schools. Twenty-one 10th-graders are enrolled in the first year of the three-year CIS program. They will spend two years in the classroom and program laboratory and one year in the workplace preparing for careers as computer programmers, industrial engineers, accountants, electricians, manufacturing technicians, quality control technicians, tool and die makers, and production managers.

The program was developed in 10 months during 1993-94 with assistance from over 100 educators and private sector representatives. Southeastern Technical High School is the only school in Maryland offering this type of program.

**Contact:**
**Ed Parker, Principal**
**Southeastern Technical High School**
**325 Sollers Point Road**
**Baltimore, MD 21222**
**(410) 887-7075**

## Biotechnology in Agriculture Course Prepares Students for High-Tech Jobs


The contemporary career field of biotechnology is the focus of a new course created by an agricultural science teacher and a science teacher at **Lexington High School** in Lexington, Texas. The course, Biotechnology in Agriculture, teaches technical skills, related academic skills, and employability skills to 11th and 12th grade students.

Biotechnology incorporates data and techniques from engineering and technology to study and solve problems concerning living organisms. It is used in human health care, plant and animal agriculture, and energy and environmental management. The field offers many career opportunities, including administration, research, regulatory affairs, clinical research, quality control, marketing and sales, and information systems.

The major topics in Biotechnology in Agriculture include research, development, and production/manufacturing. Academic concepts from life science, mathematics, communications, and computer science are integrated into the instruction. Students taking the course learn

technical skills such as genetic manipulation of plant tissue, plant laboratory skills, ethical practices, tissue production systems, and management systems related to biotechnology. They also study safe work practices, record keeping, career exploration, and leadership.

Lexington High School invested nearly $20,000 in classroom renovation, equipment, and materials to create a laboratory that gives students realistic experiences with projects such as soil analysis and blood typing.

Biotechnology in Agriculture is taught during the spring semester. Students planning to take the course are encouraged to enroll in a new animal science course offered during the previous fall that teaches the high-level biology concepts they will need in the biotechnology course.

**Contact:**
**Donald Garrett, Principal**
**Cyril Wolf, Agricultural Science Teacher**
**Mary Satterfield Doerr, Science Teacher**
**Lexington High School**
**P.O. Box 248**
**Lexington, TX 78947**
**(409) 773-2254**


## Students Design Real Projects for Real Clients

Students in a Visual Communications course at **Delcastle Technical High School** in Wilmington, Delaware, use computer publishing to design logos, advertisements, and brochures for clients from the business community and from within the school. Clients come to the classroom to describe needed projects, return to offer feedback, and assist the teacher in selecting the best work. Projects the students have completed include:

- **An Open House Invitation** – Five students worked with an advertising agency to design an open house invitation and recruitment brochure for the school. The school district public relations specialist served as the client. The students developed the concept, text, and artwork for the project. After minor revisions and district approval, students completed advanced technical work on the project at the ad agency. The project was completed within two weeks and saved the district $6,000 in design costs.
- **A Civil War Newspaper** – The chairman of the history department at school was the client for a newspaper covering events in the year 1863. History students wrote the articles, and Visual Communications students designed the layout and prepared the camera-ready artwork. Graphic Communications students printed the newspaper.
- **A Corporate Identity Package** – Each junior in the class submitted logo and stationery designs to a client, who decided to combine the two best designs into one. After the stationery was printed, the client sent samples for the students' portfolios and made a cash contribution to the career program.

Because students see these projects as worthwhile assignments for real clients, they are serious about completing them. Other benefits include:

- Student learning through customer interaction and feedback;
- Stronger ties with the business community;
- Student access to donated materials, technology, and expertise not otherwise available.

**Contact:**
**Pete Rosacker**
**Visual Communications Instructor**
**Delcastle Technical High School**
**1417 Newport Road**
**Wilmington, DE 19804**
**(302) 995-8100**

## Technology Education Course Gives Students a Preview of Engineering and Technology Careers

The Technology Education course at **Jenkins High School** in Savannah, Georgia, received international acclaim in 1990 when it was named a program of excellence by the International Technology Education Association. Focusing on problem solving, the course consists of 31 three- or six-week stand-alone modules that students complete during four semesters. The modules focus on challenging subjects such as biotechnology, video editing, medical technology, aerodynamics, meteorology and weather, and fiber-optic communications. A house wiring module prepares students for careers as residential electrical contractors. In a module on television production, four students work in a team as they would in a real studio.

The course is open to a cross section of students in grades 9-12. Some of them come from the school's engineering robotics academy, a school-within-a-school. All of the students are interested in engineering and technology.

The Technology Education instructor—who also wrote the curriculum—guides the students, asks and answers questions, and serves as a trouble-shooter when students encounter difficulties as they complete the modules. He takes groups of students to business and industry sites where they engage in activities such as operating a flight simulator or observing air traffic controllers. The questions students ask the employees help prepare them for education and job interviews in the future.

Each module ends with a unit on career development in which students use the computerized Georgia Career Information System to analyze their suitability for the job studied in the module. As they rotate through the modules, students learn which jobs are most appropriate for them, what they need to know to perform those jobs, and how to continue their education and training.

---

**Contact:**
**Leonard Lemay, Jr.**
**Technology Education Teacher**
**Jenkins High School**
**1800 E. Derenne Avenue**
**Savannah, GA 31406**
**(912) 351-6322**

## Using Reading Strategies to Improve Academic Achievement in a Principles of Technology Course

**Winder-Barrow High School** in Winder, Georgia, is improving students' reading skills through a schoolwide emphasis on reading strategies. Teachers have agreed to stress reading, writing, and reasoning in every academic and vocational class.

The teachers are drawing on ideas from an SREB reading workshop conducted by Ray Morgan of Old Dominion University in Virginia. The workshop described the PAR framework as a primary strategy. It consists of three steps: preparation, assistance, and reflection.

Morgan's Reading to Learn course shows teachers how to:

- Help students develop reading skills and increase comprehension;
- Involve students actively in learning;
- Help students develop reasoning skills;
- Organize students into groups for effective learning;

- Help students use their background knowledge to understand new material;
- Design effective instructional experiences;
- Integrate reading and writing into course content;
- Help students set clear purposes for reading and help them monitor whether they are achieving those purposes;
- Teach study skills;
- Motivate students to read and learn.

These strategies are helping students in the Principles of Technology applied physics course at Winder-Barrow to read and understand complicated materials on topics such as pneumatics, electrical and mechanical systems, and force and resistance. Using a study technique from Reading to Learn, students find information in a book or manual and record the source. They also draw conclusions from what they read and demonstrate a conceptual understanding of the content.

The Principles of Technology teacher and other faculty members list these benefits of the Reading to Learn approach:

- Students are more actively involved in learning;
- Student comprehension has increased;
- Student test scores are higher;
- Students retain more of what they learn.

**Contact:**
**Michael L. Murray**
**Technology Instructor**
**Winder-Barrow High School**
**272 N. Fifth Avenue**
**Winder, GA 30680**
**(404) 867-2618**

## Teachers Benchmark Mathematics and Science Curricula to World Standards

3 4 9

Mathematics and science teachers at **Socastee High School** in Myrtle Beach, South Carolina, created benchmarks to help all students learn the skills necessary for success in an international economy.

To begin the project, teachers visited local businesses and industries to observe firsthand the mathematics and science skills needed for productivity on the job. Employees described training they received at work and told what they wish they had learned in high school. The team also visited public and private schools that had developed standards for their courses. After observing the industry and school models, teams of mathematics and science teachers created benchmarks that guided curriculum development.

National Council of Teachers of Mathematics standards guided mathematics teachers in developing benchmarks for the curriculum. Algebra I is now the lowest level of mathematics offered at Socastee. In a program called "Algebra for Everyone," ninth-graders take Algebra I, geometry, or Algebra II, depending on courses completed in middle school. The mathematics department encourages students to take four years of mathematics, even though only three are required for graduation. All geometry classes use the Discovery Geometry textbook, originally intended for honors classes.

The science benchmarks focus on five content areas: 1) environmental stewardship; 2) the human body; 3) earth and space; 4) energy and matter; and 5) the diversity of life. Each content area includes a number of concepts, one or more essential statements related to each concept, and a number of statements describing what students need to know. Science teachers upgraded the science laboratories to include many activities from Advanced Placement labs.

Teachers in each course teach the same content and make the same types of assignments to maintain high standards and consistency.

Students receive grades of A, B, C, or Not Yet (incomplete) on each test or unit of the mathematics curriculum. (This grading system will go into effect for the science curriculum in 1995-96.) The purpose of Not Yet is to allow students to seek extra help or extra time as needed to meet the higher standards. Teachers work hard to help students succeed. They provide extra help in tutoring sessions at school and in a summer program. The intent of the benchmarks program is to prepare students for the next level by helping them succeed at their current level.

Parents received letters explaining the new standards and urging them to enroll their children in tutoring as needed. Teachers communicate with parents regularly by letter and phone and in conferences at the school to advise them of their children's progress.

**Contact:**
**Mary Ellen Williams, Math Teacher**
**Beth C. Cox, Science Teacher**
**Socastee High School**
**4900 Socastee Boulevard**
**Myrtle Beach, SC 29575**
**(803) 293-2513**

## Science and Vocational Teachers Develop a Challenging Physical Science Curriculum


Applied Physical Science is a new physics course for ninth and 10th grade students in a four-county area of Florida. The purpose of the course is to help students relate scientific concepts to real life and increase their science achievement.

Fourteen teachers representing science and vocational fields such as electronics, agriculture, and small engine repair from **Martin, St. Lucie, Okeechobee, and Indian River** counties served on a committee to develop a challenging, relevant course that would meet the physical science requirement. The committee developed a curriculum package containing a variety of approaches to help physical science and vocational teachers motivate their students to master science. In the curriculum, teachers serve as activity coordinators, discussion facilitators, and resource liaisons rather than as traditional lecturers.

Modules focus on three areas: sailing, mapping, and small engines. Science teachers provided the academic content, and vocational teachers offered real-life techniques for teaching the content. For example, in the mapping module, students are asked to follow directions and measure distances for finding buried treasure.

The course uses performance-based assessment. For example, students may be required to repair an actual engine.

Many teachers who completed evaluation sheets after the first year asked that chemistry be included in the course. The committee responded by developing chemistry learning activities.

**Contact:**
**Gary Kirsch**
**South Fork High School**
**10205 SW Pratt Whitney Road**
**Stuart, FL 34997**
**(407) 287-9810, ext. 319**

## Applied Communication Course Gives Life to British Literature

At **Gordon Central High School** in Calhoun, Georgia, traditional British literature has been added to the Agency for Instructional Technology (AIT) Applied Communication course. The result has been to bring classic literature to life for career-bound students and to reinforce and extend concepts and skills taught in the AIT modules. Using the characters and situations created by British authors, students explore human nature by relating it to the world of work.

In Applied Communication, students use cooperative learning techniques to develop work-related skills such as:

- **Focus** – making good decisions;
- **Listening** – listening well and communicating with others based on listening techniques;
- **Reading** – finding information and enjoyment in trade journals, newspapers, magazines, novels, short stories, poetry, plays, and biographies;
- **Speaking** – reporting, debating, and responding;
- **Writing** – preparing essays, research papers, letters, memos, persuasive reports, advertisements, job applications, and résumés.

The course includes seven Applied Communication course modules and related literature assignments:

| Module | Reading Assignment |
|---|---|
| Communicating in the Workplace | *Pygmalion* |
| Gathering and Using Information in the Workplace | *Death of a Salesman* |
| Problem Solving | Arthurian legends |
| Working in Groups | *Beowulf* |
| Following and Giving Directions | *Canterbury Tales* |
| Communicating to Solve Interpersonal Conflict | *Macbeth* |
| Improving the Quality of Communication | "Ozymandias" |

Students tackle assignments that delve into the personalities of the main characters in search of traits such as leadership and cooperation. They also complete a career-related research paper. Extra help is available as needed.

With its emphasis on relating classic books and poems to real life, the course has replaced a British literature course that was meaningless to most career-bound students.

**Contact:**
**Anne Vaughn, Curriculum Director**
**Gordon County Schools**
**P.O. Box 127**
**Calhoun, GA 30703**
**(706) 629-7366**

## The Garbage Mess: Integrating Algebra and the Environment

The Garbage Mess is a study unit designed to teach higher level math through the study of municipal solid waste generated in the United States. It is appropriate for students taking Algebra I, II, and Applied Mathematics. Investigating garbage as an environmental issue, students learn mathematical functions, solve problems, and study technological applications. For example, they use data on the amount of garbage generated each year and the availability of landfill space to calculate the extent of the nation's waste disposal problem.

The success of this unit is evident in students' ability to comprehend algebraic equations in a two- to three-week period. Students in traditional mathematics classes may study algebraic equations in three different courses, but many students are unable to demonstrate mastery. Because this unit relates mathematics to the real world, students are more interested

in learning the equations that can help them understand a complex social issue such as garbage. Students who are successful in this unit develop a greater appreciation of algebra, are better prepared to move from Applied Math to Algebra II, and have a better foundation for college-level math. Similarly, students retain what they learn for a longer period of time.

The unit was developed for high school math classes by instructors at **Kennesaw State College** who use the approach successfully at the college level. **Milton High School** in Alpharetta, Georgia, is a *HSTW* site that uses the unit.

**Contact:**
**J. March Hall, Mathematics Teacher**
**Milton High School**
**86 School Drive**
**Alpharetta, GA 30201**
**(404) 740-7000**
**or**
**104 Saddlehorn Court**
**Woodstock, GA 30188**
**(404) 345-5001**
**or**
**Marlene or Stan Sims**
**Kennesaw State College**
**Mathematics Department**
**P.O. Box 444**
**Marietta, GA 30061**
**(404) 423-6327**

## Helping Students Become Better Readers and Writers


Writing and reading are natural partners. Writers turn ideas over in their minds and try to find the best combination of words to convey those ideas. Readers use previous knowledge and experiences as a frame of reference for understanding ideas conveyed in writing.

English and reading specialists in the **Mississippi Department of Education** list 43 ways to help students become better readers and writers. Their strategies include:

- Encouraging students to keep a journal of their experiences.
- Sharing what students write by reading it aloud, posting it, or publishing it.
- Requiring students to write essay answers to questions rather than fill-in-the-blank, multiple-choice, or short-answer responses.
- Challenging students to read and write stories, reports, advertisements, directions, and news articles.
- Having students read and write for a variety of purposes—for information, enjoyment, or instruction.
- Using speakers, videotapes, and demonstrations in the classroom, and having students write and read about the experiences.
- Talking about a topic, asking questions, and brainstorming with students to find out what they already know, to arouse their curiosity, and to involve them in learning.
- Using projects that join reading and writing with experiments, exploration, planning, or problem solving to show that reading and writing are natural parts of these real-world activities.
- Providing opportunities for students to reflect on what they read or write. Asking them to choose their favorite pieces, to tell why they like them, and to explain how the pieces have affected their own reading and writing.
- Talking about the process of writing, and providing time for students to think, plan, write first drafts, edit, proofread, and rewrite.
- Encouraging students to respond to what they read by retelling the story, discussing it, acting it out, role playing, debating, and writing about it.
- Providing opportunities for students to write and read a variety of material (letters, essays, stories, journals) for a variety of purposes (to inform, persuade, describe, entertain) for a variety of audiences (students, teachers, children, strangers, and businesses).

- Helping students develop details in their writing by encouraging them to anticipate what a reader will want to know about the topic. Students can list questions a reader would ask and predict what a reader might already know about the topic.
- Allowing students to make some choices about what they read and write.
- Linking reading and writing to what happens in the classroom.

These and other strategies are contained in a brochure published by the Mississippi Department of Education and endorsed by the Mississippi Council of Teachers of English and the Mississippi Reading Association. (SREB obtained permission from the authors to use excerpts from the brochure in this publication.)

**Contact:**
**Jeanne Wells Cook**
**English and Foreign Language Specialist**
**or**
**Jo Prather**
**Reading (K-12) and Early Childhood Specialist**
**Mississippi Department of Education**
**P.O. Box 771**
**Jackson, MS 39205**
**(601) 359-2328**

## Changing What and How We Teach and What We Expect of Career-Bound Students


The Total Quality Management motto, "Do the right things right," guided teachers and administrators at **Randolph County Vocational Technical Center** in Elkins, West Virginia, in making major changes in what and how they teach and what they expect of students. Their actions during the past five years included changes in the following areas:

- **Curriculum** – Low-level mathematics courses were eliminated. Now, Applied Math I and Algebra I are the lowest levels offered. Applied Mathematics, Principles of Technology, and ChemCom (applied chemistry) were added to the curriculum to make academic subjects relevant. Flexible instructional blocks of one, two, and three hours enabled teachers to integrate more mathematics and language arts into vocational courses. Language arts has been integrated with building trades and mill and cabinetmaking; science has been integrated with electricity and millworking and cabinetmaking.
- **Instruction** – Vocational teachers increased their emphasis on reading, writing, mathematics, and science. Academic teachers began using vocational laboratories to demonstrate concepts and applications. Academic and vocational teachers found more opportunities to work together. Portfolio assessment was introduced in academic and vocational courses.
- **Expectations** – The principal provided staff development, encouragement, and feedback to help all teachers raise their expectations of career-bound students. Changes were made in the curriculum to require students to complete more higher level mathematics and science courses. Students reported spending one to two hours a day on meaningful homework assignments. To increase recognition of vocational excellence, the school organized a chapter of the National Vocational-Technical Honor Society.
- **Extra Help** – The school employed a special needs resource person to provide a variety of specialized instruction and created a tutoring program to help students meet higher standards. Students participate in an occupational assessment and improvement program and a computerized reading and mathematics skills program. Summer employment opportunities exist to help students connect school-based learning and worksite experience.

- **Teachers Working Together** – Academic and vocational teachers attend *High Schools That Work* conferences and workshops as teams and collaborate in the development of integrated instruction. The West Virginia Department of Education offered training in applied mathematics, communication, and physics for teams of academic and vocational teachers.
- **Planned Programs of Study** – Eighth-graders take aptitude, interest, and ability tests and develop five-year plans that are reviewed annually with advisors and parents. Students complete career plans based on their career goals. The vocational counselor provides comprehensive services to assist students in designing their programs of study, and all vocational teachers participate in a guidance system to help students make career and educational choices.
- **Workplace Standards in the Curriculum** – As one of SREB's work-based learning planning sites, the center is developing a youth apprenticeship program in electrical contracting and other career areas. An advisory council composed of representatives of business and industry are assisting with the plan. Monongahela Power Company is an active partner with the center in curriculum development, worksite training, and student recognition programs.

The changes at Randolph have resulted in increased student achievement in reading, mathematics, and science. More students are entering postsecondary education, and fewer students are dropping out of high school.

**Contact:**
**Glen Karlen**
**Principal**
**Randolph County Vocational Technical Center**
**200 Kennedy Drive**
**Elkins, WV 26241**
**(304) 636-9195**

## County-Wide Strategy for Replacing the General Track


The **Boone County, West Virginia**, school system includes 5,500 students enrolled in three high schools of a coal-mining community located in the southern part of the state. Unlike their parents, high school students can no longer count on going directly from high school to good-paying jobs in the mines. To prepare students for new challenges in the workplace, the Boone County school system has taken bold steps to change what and how students are taught.

Beginning with the graduating class of 1998, Boone County students will complete either a tech prep, a college prep, or a combination tech prep/college prep program of study. All students will choose a vocational field of concentration. Mathematics, science, and English requirements in the programs of study are virtually the same for all students.

Boone County's system-wide strategy for replacing the general education track underscores the importance of top-level support by the superintendent and school board in addition to the extensive involvement of principals, teachers, counselors, parents, business and community leaders, and students. As in Boone County, the superintendent should be genuinely in favor of change, and the school board members should attend meetings to help plan the new curriculum. Practically every teacher in Boone County was involved in replacing the general track.

The county recognized and overcame four major roadblocks to change:

- **The belief that not all students can learn at a higher level** – Boone County used staff development to help teachers and administrators learn effective ways to motivate and assist students in a demanding curriculum.
- **Fear that course failures and dropouts would increase** – Boone County instituted

more applied teaching methods and developed a system of extra help and time to help students meet higher standards. Teachers remain after school to tutor students, and the county pays for late buses to transport students. In one approach, students check out audio tapes and tape players to review mathematics and English lessons.

- **Fear of change** – Teachers learned new instructional methods and received additional opportunities to meet and plan together. A guidance and public information subcommittee distributed materials on the new programs of study to students and parents.
- **Lack of time** – The school system extended the school day to make it possible for teachers to spend one full day a month meeting and planning together.

**Contact:**
**Richard Adkins, Assistant Superintendent**
**Boone County Schools**
**69 Avenue B**
**Madison, WV 25130**
**(304) 369-3131**

## Interdisciplinary Course Combines English, History, and Economics


Connections is an interdisciplinary course for juniors at **Fayetteville High School** in Fayetteville, Arkansas. Taught by a team of teachers from the content areas, the course combines English, world history, and economics. Computer instruction is incorporated into many of the units. Students receive three credits for the course, one each in English, history, and business. Teachers use a variety of instructional methods, including classroom demonstrations, cooperative projects, supplementary reading, and interviews with business leaders.

The course incorporates themes that cause students to think about the connections between school and the real world. Students are prompted to ask themselves the following questions:

- What makes an effective society?
- What is change?
- How do individuals balance societal needs and personal goals?
- How do you find unity in diversity?
- How do you determine cause and effect?
- Why should you examine actions and reactions?
- What makes a worker productive?
- Will the 21st century be an interdependent society?
- How does school learning connect to the real world?

For a Columbus Day Fair, students created booths and hands-on activities to teach elementary school students about the New World before and after Columbus's arrival. Teachers used authentic assessment in evaluating students on their performance.

Students are required to complete 25 experiences or assignments per semester, including at least five in each of these categories: politics and economics, literary topics, and community service. If students choose an experience of their own design, they must submit a proposal to their teachers in advance. The proposal describes the experience, tells where it will take place, offers a rationale for selecting the experience, and predicts the results. Students complete a written or oral exam on their experiences and assignments.

**Contact:**
**Laura Underwood, Business Teacher**
**Susie Stewart, Social Studies Teacher**
**Thelma Tarver, Language Arts Teacher**
**Fayetteville High School--East Campus**
**1001 Stone St.**
**Fayetteville, AK 72701**
**(501) 444-3038**

## Junior Project Increases Cooperation by Schools, Teachers, and Students


The **Franklin County Area Vo-Tech School** serves the career education needs of students from six school districts in south central Pennsylvania. These students spend three weeks at their home high schools followed by three weeks at the vo-tech school. The facts that the schools are miles apart and teachers do not see students for weeks at a time presented educators with two major challenges: how to connect the vocational and academic curricula at the various schools and how to increase high school teachers' understanding of vocational studies.

To integrate the curriculum and promote greater understanding, Franklin piloted a Junior Project during the 1992-93 school year. Students develop written research projects, create career-related projects or products, and make oral presentations on a topic in their career area. The written research project must meet specific guidelines in length, due date, and the number of information sources. The career-related project or product must be approved by a vo-tech teacher and can be completed by student teams. Students present their oral reports (lasting at least five minutes) to teachers and administrators from both the high school and the vo-tech school and to the students' invited guests.

Cooperation by teachers from the high schools and the vo-tech school makes this integrated project possible. Students discuss possible topics with their vo-tech teachers at the beginning of the school year. Teachers at the home high schools provide time for students to do research in the school library. Students gather information, make notes, and write at their home schools.

Benefits of the Junior Project include:

- Teachers' awareness of the demands of their curricula;
- Improved communication regarding student needs and student achievement;
- Increased student confidence about completing a comprehensive project and presenting findings to an audience of adults.

The project guidelines were revised during the summer of 1994 and presented to all teachers at a staff development session on integration near the beginning of the school year.

---

**Contact:**
**Roy Johnston**
**Landscaping and Horticulture Teacher**
**Roberta Johnston, Cosmetology Teacher**
**Steve Grove, Carpentry Teacher**
**Franklin Co. Area Vocational Technical School**
**2463 Loop Road**
**Chambersburg, PA 17201**
**(717) 263-9033**
**or**
**Mike Hussack, English Teacher**
**Greencastle-Antrim High School**
**300 South Ridge Avenue**
**Greencastle, PA 17225**
**(717) 597-2186**

## The House the Warriors Built: An Interdisciplinary Unit


**Gordon Central High School** serves 1,200 students in grades 9-12 in the northwest Georgia town of Calhoun. The curriculum is evenly balanced between college preparatory and tech prep courses. Teachers are committed to the *High Schools That Work* key practices and use them to develop activities to benefit all students.

In examining how to improve achievement, faculty and administrators concluded that they

needed to make instruction more relevant to students. Teachers identified a need to know more about each other's subject areas and to engage in more interdisciplinary projects.

In the fall of 1993, the principal, vocational director, and construction teacher met to discuss launching a major project: to design and build a house. The project was the largest in the school's history and ultimately involved students and teachers in 10 academic and vocational curriculum areas as well as business and community leaders. The students drew plans, ordered supplies, and built and landscaped the house. The entire school supported the project: Math students figured the amount and cost of materials; science students took soil samples to determine the suitability of the building site; and English students created a slide presentation documenting the project step-by-step. The community called the project "the house the Warriors built," referring to the school's nickname. Eventually, the house was sold to someone in the community.

The success of this project inspired several smaller projects to be implemented during the current school year. Each is designed to be interdisciplinary, to involve as many students and teachers as possible, and to increase students' awareness of the world of work.

Students who worked on the project gained skills for a lifetime. They:

- Increased their knowledge of math, science, communication, and technical studies;
- Experienced the challenge of completing a long-term project;
- Gained confidence that they can perform difficult tasks;
- Learned the value of teamwork.

---

**Contact:**
**Gary Bowman, Vocational Director**
**Gordon Central High School**
**335 Warrior Path**
**Calhoun, GA 30701**
**(706) 629-7391**

## Hoke County Excels in Integrating Academic and Vocational Studies


**Hoke County High School** in North Carolina has earned its reputation as a leader in academic and vocational integration. In addition to being one of the *High Schools That Work* program's most improved schools, Hoke is also a participant in SREB's Advanced Integration Model (AIM) project to design, implement, and refine advanced models of integrated academic and vocational learning.

The integration tradition in Hoke County began several years ago with a core group of teachers that has grown to include over 90 percent of the faculty. Teachers created a curriculum alignment guidebook identifying shared objectives across academic and vocational disciplines. They also participated in a school contest aimed at developing integration projects.

Located in a county with a vigorous textile industry, Hoke County High School has a strong textile studies program that offers many opportunities for integrated projects. In one four-week project, the textiles teacher links his class with the English department and the community. Business and industry leaders visit the school to talk with career-bound students on topics such as supervision and quality control. Students practice note-taking skills while listening to the speakers and interview skills by asking questions afterward. They are motivated because they are expected to write a one- to three-page report about the visit in class the following day. An English teacher grades the reports for writing skills, and the textiles teacher grades them for content.

In another project, textiles students join forces with a mathematics class. Working together in the textiles lab, the students solve problems such as determining the count of 100 yards of worsted yarn. The skills involved in this particular problem include operating a yarn reel, using a gram scale to weigh the sample, converting the gram weight to grains, and using a formula for determining the count.

Over 50 educators from other states visited Hoke County High School in October to learn firsthand what the school has done to raise achievement and implement the key practices.

**Contact:**
**Jeff Moss**
**Vocational Director**
**Hoke County Schools**
**P.O. Box 370**
**Raeford, NC 28376**
**(910) 875-4106**

## Integration Projects Increase Students' Learning and Participation


Teachers at **Pine Bluff High School** in Pine Bluff, Arkansas, are creating a variety of academic and vocational integration projects to upgrade student achievement. In assigning these hands-on projects, the teachers are engaging students who ordinarily participate very little in school and classroom activities.

The school integration team meets every Tuesday from 2:30 p.m. to 4:30 p.m. to plan interdisciplinary activities. Several projects combine chemistry and vocational studies. For example, students learn about solvents in chemistry class and demonstrate the effects of solvents on wood in shop class and on fabric in home economics class. In another project, students study the reactant properties of carbon dioxide in chemistry class and use soda as a reactant in making chocolate chip cookies in home economics class. For the 1994 holiday season, students from shop, mathematics, art, and English classes collaborated to produce and sell children's wooden rocking zebras. (The school mascot is a zebra.)

The team provides a special worksheet for teachers to report their integration activities. A typical worksheet looks like the following sample:

| | |
|---|---|
| Curriculum areas | Child Development and Applied Biology/Chemistry |
| Unit | Heredity and Conception |
| Time line | Two 50-minute blocks |
| Student learning | Knowledge of how the composition of cells determines the individuality of humans |
| Collaborative effort | Planning sequential lessons for two 50-minute blocks |
| Curriculum strategy | Replacing traditional instructional methods |
| Instructional strategies | Combining biology and home economics skills and instruction |
| Administrative practices | Flexible scheduling |
| Instructional results | Teacher effectiveness resulting from integration of academic and vocational studies and block scheduling; teacher creativity |

**Contact:**
**Sue Winston Smith**
**Occupational Home Economics Teacher**
**Pine Bluff High School**
**711 W. 11th**
**Pine Bluff, AR 71601**
**(501) 543-4315**

## Integrating Word Processing and a Foreign Language


Students taking French at **Staunton River High School** in Moneta, Virginia, use a bilingual word processing program to complete writing assignments aimed at improving their mastery of the language. The integrated approach also improves their computer skills.

The computer program divides the bottom one-third of the computer screen into a traditional editing screen and the top two-thirds into a reference screen. The reference screen gives students access to an index and a French dictionary for checking spelling, grammar, and conjugations. The accessibility of the information encourages students to write correctly and check their work.

This approach helps students master French more quickly and reduce errors. For example, the first draft of a written assignment receives two grades: content counts 80 percent and accuracy 20 percent. Students use the computer and textbooks to correct their errors and prepare another draft. In the second draft, accuracy counts 80 percent and content 20 percent.

**Contact:**
**Helen Pope, Foreign Language Teacher**
**Staunton River High School**
**One Golden Eagle Drive**
**Moneta, VA 24121**
**(703) 297-7151**

## School Adopts 4 + 4 Block Scheduling in Major Restructuring Effort


**Amherst County High School** in central Virginia undertook a restructuring effort known as PACE—Pride in the Amherst County Curriculum for Excellence. PACE represents the commitment of teachers and administrators to help all students reach their maximum potential. The program includes block scheduling, staff development to support the new structure, and a center where students can obtain extra help.

In response to complaints about the old seven-period day, a committee of teachers was organized to investigate alternative methods of scheduling. The group visited a number of schools in Virginia and North Carolina and created subcommittees to study considerations such as the layout of the school building, staff development, and instructional materials. The school also hosted a community forum to describe the proposed scheduling changes and allow parents to ask questions and share comments.

With approval from the school board, Amherst adopted a 4 + 4 block schedule that consists of four 90-minute instructional periods per day in two semesters. Students can earn eight credits per year. Advantages of the schedule are:

- Longer class periods;
- Better use of time;
- Fewer students per teacher;
- Fewer courses per student each semester, but more courses per year;
- More efficient use of teaching staff and textbook funds;
- Opportunities for dropouts and students who failed courses to re-enter school or make up their work;
- Fewer discipline problems.

The concentrated curriculum semester schedule enables teachers to give students individualized attention and to develop positive relationships with them in the classroom. More

projects and hands-on activities are possible in two-hour blocks of time.

To implement the new schedule, teachers participated in staff development to learn effective strategies for this type of learning environment. Topics included alternative teaching strategies and planning for extended blocks of time.

Another feature of PACE is an Advancement Center where students receive extra help. Two teachers—one experienced in English and social studies and the other in mathematics and science—assist students who need to catch up on class topics or complete make-up work.

The Amherst effort is the result of enthusiastic teacher involvement and cooperation with all levels of administration. As one teacher said, "We have finally come out of our offices and classrooms and begun to recognize in each other the dedication and professionalism that have always been there."

**Contact:**
**Karl E. Carter, Principal**
**Barbara Walsh, Vice Principal**
**Amherst County High School**
**P.O. Box 410**
**Amherst, VA 24521**
**(804) 946-9391**

## Team-Building Strategies for Integrating the Curriculum

6

Integrating the curriculum requires teamwork among academic and vocational teachers. An agriculture teacher and an English teacher from **South Fork High School** in Stuart, Florida, identified five team-building strategies that proved effective in developing an agritechnology academy at their school. The strategies include:

- **Understanding people** – Team members want to belong and need a sense of purpose. They enjoy contributing to a group, want to succeed and be recognized, and like to share their experiences. Because they have different personalities and perceptions, team members function in a variety of ways.
- **Getting to know all team members** – Team members need to become comfortable with each other on a personal level and develop trust within the group. Team leaders need to recognize individual strengths and weaknesses and encourage members to contribute their best skills. A good team leader knows how and when to get members to participate in discussions. Members should learn that criticism is directed at an idea, not an individual.
- **Building a successful team** – Members need to embrace the concept that when the team wins, each member wins. Team leaders need to establish a cooperative environment, promote confidentiality, and encourage a sense of humor. The team will benefit by attending meetings and workshops as a team and cooperating with other teams and organizations.
- **Creating consensus on goals and objectives** – Teams should set and prioritize short- and long-term goals. Members should believe in the goals and not just "go through the motions." In addition, they should make a commitment to quality in achieving the goals.
- **Encouraging creativity** – Teams should practice organized brainstorming by giving team members time to reflect on an idea and recording the idea for all to see. Members need to learn not to judge, discuss, or interrupt until the brainstorming subsides. This approach helps teams

achieve consensus on the best ideas for implementation.

The South Fork team continues to meet regularly to coordinate academy activities, which integrate mathematics, science, language arts, social studies, and agriculture for students interested in careers in agriculture.

**Contact:**
**Keith Krueger**
**Agriculture Teacher**
**Virginia Wardle, English Teacher**
**South Fork High School**
**10205 SW Pratt and Whitney Road**
**Stuart, FL 34997**
**(407) 287-9810**

## High School Finds the Key to Involving Parents in Their Children's Education


Many positive changes are taking place at **Chesterfield High School** in Chesterfield, South Carolina, as teachers and administrators implement the *High Schools That Work* program. The changes include integration of academic and vocational studies, use of applied instructional methods, and increased use of technology, all aimed at raising students' achievement. To inform parents and to enlist their support for the changes, the school scheduled a Parents' Academic and Technology Night. The event was based on an idea presented to the communication council by the chairperson of the mathematics department. During the event, parents and their children had an opportunity to tour the school, review course offerings, and see the *High Schools That Work* program in action. Incentives such as door prizes and refreshments contributed to the success of the event.

Over 650 parents and other family members attended—an exceptional turnout in a high school with only 450 students enrolled. Practically every parent, student, and teacher was involved in the open house. As a result, the school met its objective of getting families to focus on their children's education.

**Contact:**
**Allen Teal, Principal**
**Chesterfield High School**
**Route 1, Box 2**
**Chesterfield, SC 29709**
**(803) 623-2161**

## Comprehensive Guidance Program Improves Communication with Students and Parents


**Hickman County High School** is located in Centerville, Tennessee, 54 miles southwest of Nashville. It is the only high school in a county of approximately 17,000 people. HCHS was named a *High Schools That Work* demonstration site because of the increased achievement of its career-bound students and its progress in implementing the *HSTW* key practices. The school is characterized by an integrated curriculum, block scheduling, team teaching, one-on-one educational and career planning, and an articulation agreement with the area community college.

The county's educational and career planning program is comprehensive. All students in grades K-8 spend classroom time each year in career awareness and exploration. Eighth-graders take an interest/aptitude inventory in the fall, and ninth-graders participate in computerized career exploration. Tenth-grade

students take a career planning test and spend two days in career exploration. Eleventh-graders complete the Armed Services Vocational Aptitude test in addition to two days of career exploration. All juniors and seniors have an opportunity to talk with representatives of area colleges, universities, community colleges, and vocational/technical schools during the school's annual College Day.

During the summer, all incoming ninth-graders and their parents meet with a team of counselors and teachers to discuss career and educational plans and to formulate a tentative four-year program of study. Guidance counselors make appointments in the spring to help all students in grades 9-11 update their plans and choose courses for the coming year.

The school schedules 30 minutes a day for students to meet with teachers during an advisory activity period. Each teacher serves as an advisor to a group of approximately 18 students.

As a result of the school's emphasis on guidance, students and parents are better informed, student attendance has increased, and discipline problems have diminished.

**Contact:**
**Jerry Burlison**
**Vocational Director**
**Hickman County High School**
**1645 Bulldog Blvd.**
**Centerville, TN 37033**
**(615) 729-4225**

## Students Benefit When Parents Get Involved in Planning a Program of Study


**Martin County High School** is a comprehensive high school in Stuart, Florida, one of the fastest growing areas in the nation. One way the school meets the needs of 1,850 students and facilitates student success is by involving parents in planning their children's high school program of study.

Education and career counseling for MCHS students begins when high school counselors visit the three feeder middle schools in May to encourage eighth-graders and their parents to begin formulating a high school plan. When students are in ninth grade, parents attend two individual conferences with their children and a counselor, one in the fall and another in May. The purpose of the first conference is to formalize a four-year program of study and review the results of a career interest test administered to all freshmen. The second conference is for the purpose of reviewing and adjusting the plan based on the student's performance in the first few months of high school. Parents of 10th and 11th grade students meet annually with counselors to review the four-year plan. Beginning each January and continuing until June, the guidance staff reserves four hours each morning for individual 30-minute appointments with students and parents. Five counselors each spend four weeks meeting with students from each grade level and with their parents.

The benefits of this educational and career planning system include:

- Reduction in the dropout rate to less than one percent;
- Increased parent participation;
- Decreased enrollment by MCHS graduates in remedial work at the local community college.

**Contact:**
**Blanche Wells**
**Guidance Department**
**Martin County High School**
**2801 S. Kanner Highway**
**Stuart, FL 34994**
**(407) 287-0710, ext. 464**

# Using Student and Teacher Data to Improve Curriculum and Instruction

10

The **Maryland State Department of Education** has developed a process to help schools use data from the state and SREB to prepare school improvement action plans. The department encourages schools in the *High Schools That Work* program to use SREB student achievement data from reading, mathematics, and science tests; student follow-up surveys; transcript analyses; and teacher surveys to determine needs, write action plans, and assess program effectiveness. The strategic planning process includes:

- Developing a Knowledge Base
  - Acquiring Information about Students' Performance and Teachers' Professional Development Needs
  - Understanding the Process of Examining the Information
  - Analyzing the Data
  - Setting Priorities
  - Clarifying the Problem
- Developing the Plan
  - Identifying Goals and Objectives for School Improvement
  - Choosing Strategies for Improvement
- Implementing and Monitoring the Plan
  - Implementing the Plan
  - Monitoring and Assessing Results
- Keeping the Plan Moving Forward
  - Revising the Plan
  - Managing Change

SREB provides *HSTW* sites with data on their students' progress in reading, mathematics, and science in comparison to college preparatory students nationally, students at other *HSTW* sites, and the *HSTW* goals. *HSTW* sites also receive reports on what their students are doing one year after graduation and what the graduates wish the school had done differently in preparing them for the future. The teacher survey reflects the faculty's participation in the *HSTW* key practices and identifies staff development preferences. Once the action planning team gains an understanding of the need for improvement in curriculum and instruction, it can establish clear priorities for raising student achievement.

In developing an action plan, teams identify goals and objectives based on the data and choose strategies for improvement. For example, data may indicate a need for career-bound students to learn more high-level mathematics. Plans can be made for guiding students into higher level courses, integrating mathematics into occupational studies, and assigning projects that require students to use mathematics in practical applications.

The next stage is to implement and monitor the plan. Communication is crucial in this stage: Teachers need to know what is expected of them and their students. They need to know the time line for meeting those expectations and what assistance they will receive in meeting them. Frequent, consistent monitoring of activities will help the team revise and adjust the plan to eliminate barriers and ensure progress.

Finally, teams need to keep the plan moving forward. This stage includes revising the plan as needed and managing the change process.

The **Queen Anne's County** school system, which includes one comprehensive high school offering a number of career technology programs, is an example of a Maryland school that used SREB student achievement data in preparing an action plan. The data helped the school system develop growth goals that career technology students will be expected to meet.

---

**Contact:**
**Lynne Gilli, *HSTW* State Coordinator**
**Maryland State Department of Education**
**200 West Baltimore Street, Third Floor**
**Baltimore, MD 21201**
**(410) 333-2085**
**or**
**Bill Darling**
**Vocational Director**
**Queen Anne's County Board of Education**
**202 Chesterfield Ave.**
**Centreville, MD 21617**
**(410) 758-2403**

## Districts and Schools Use Performance Information to Improve What and How Students are Taught

10

**New Castle County Vocational-Technical School District** in Wilmington, Delaware, uses performance indicators to improve what and how students are taught. District leaders designed a management information system to track 10 key indicators at the district level and at each school in the district. School and district personnel use the data to evaluate progress toward goals, to compare the effects of various strategies, and to identify areas that need improvement. The indicators are:

- Student attendance;
- Discipline;
- Academic skills;
- Vocational skills;
- Market share (number of students who apply and register);
- Enrollment, retention, and graduation;
- Graduate followup;
- Staff attendance and job satisfaction;
- Customer (student and parent) satisfaction;
- Image and competitive position (students' awareness of the district or school and their reasons for choosing it).

District administrators talked with many teachers, parents, and employers in setting standards of acceptance and standards of excellence. They considered state and regional averages, the performance of respected competitors, and the past performance of schools in the district.

Each school receives a performance report after each grading period to enable principals and teachers to adjust school practices as needed.

---

**Contact:**
**Victoria Gehrt, Director of Instructional Services**
**New Castle County Vocational-Technical School District**
**1417 Newport Road**
**Wilmington, DE 19804**
**(302) 995-8167**

# Index

## *HSTW* Program

The *High Schools That Work* program is the nation's largest and fastest growing effort to raise the achievement of career-bound students. Created by the Southern Regional Education Board-State Vocational Education Consortium, the program includes over 350 school and school system sites in 19 states.

*High Schools That Work* is supported in part by a grant from the DeWitt Wallace-Reader's Digest Fund.

For more information, contact Gene Bottoms, Director, *High Schools That Work*, Southern Regional Education Board, 592 Tenth St., NW, Atlanta, GA 30318-5790. Phone: 404/875-9211.