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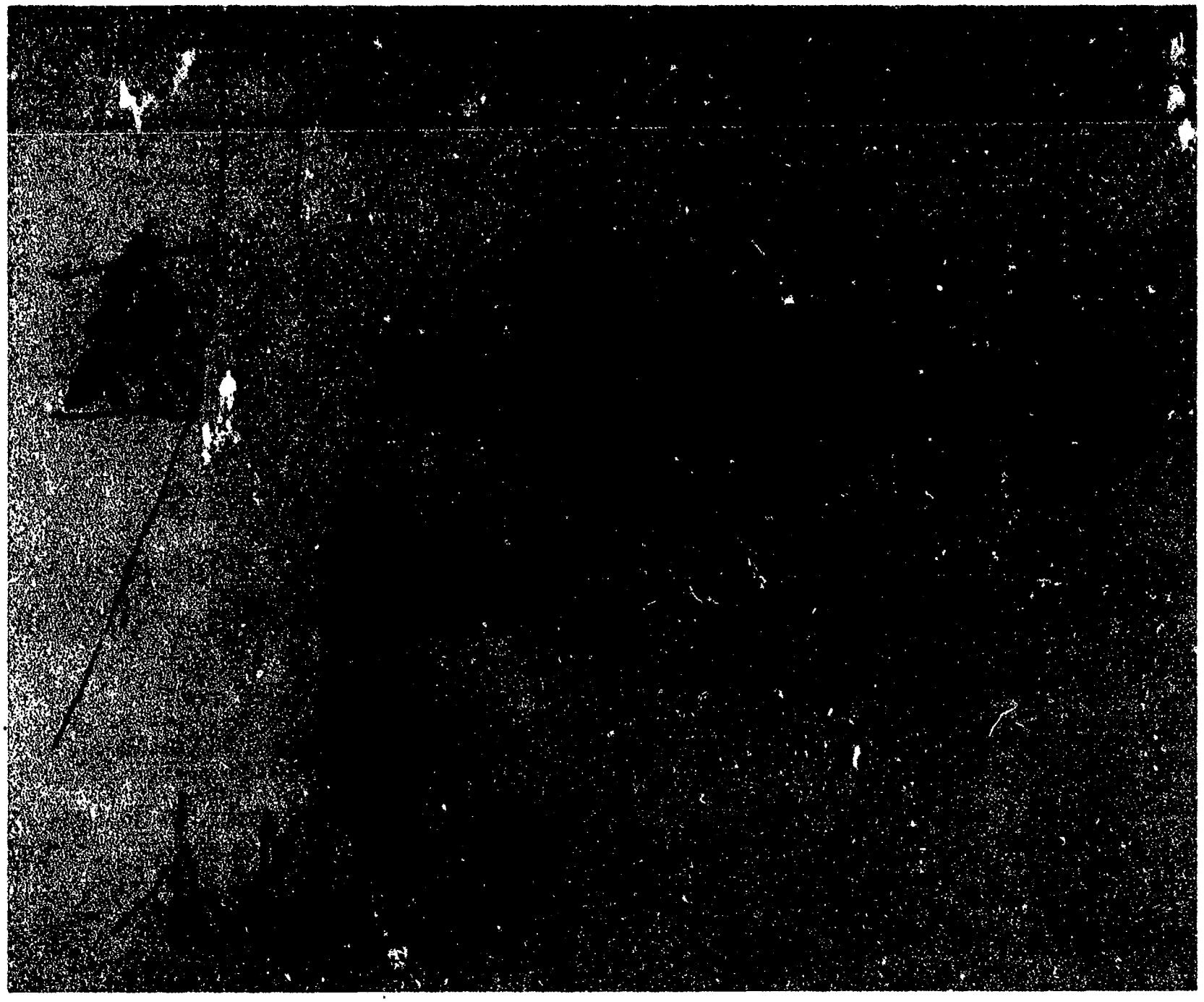
ABSTRACT

This environmental education curriculum guide was developed for teacher use at the junior high school and senior high school levels. The guide deals with the integration of environmental education into curricular areas not normally associated with environmental education. The guide is divided into the following eight units: Me and My Environment: People and Things, explores means of communication; Art and Architecture, deals with the relationship between one's personal environment and the physical environment; Music in the Environment, looks at sounds in the environment; Leisure/Work, explores leisure and work in one's environment; The Visual Reflections of our Cultural Environment, involves communication through photography; The Performing Arts, an action approach, develops skills in aesthetic and sensory perception; Leisure/Work, looks at the changes in leisure/work patterns; and Mathematics, explores math in the environment. Each unit contains an introduction, stating the purpose and background, instructional objectives, experiences, and references. The experiences of each unit are based on an objective which relates to the subject of the unit. Several activities, which reflect and reinforce the objective, are included in each experience. (Author/TK)

Other Curriculum Areas



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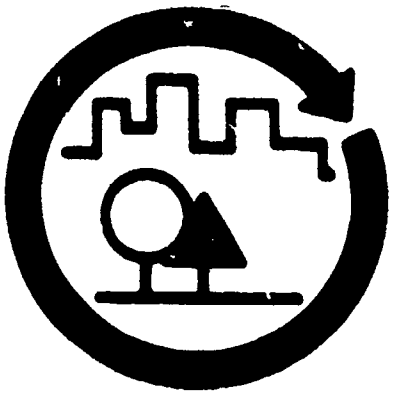

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INTRODUCTION

> Here is this vast, savage, howling mother of ours, Nature, lying all around, with such beauty, and such affection for her children, as the leopard; and yet we are so early weaned from her breast to society, to that culture which is exclusively an interaction of man on man - a sort of breeding in and in, which produces . . . a civilization destined to have a speedy limit.
>
> *Henry David Thoreau*
> (Bode, Carl (ed.), "Walking." Viking Portable Library, p. 621)

Environmental education is an integrated educational process which is only beginning to become a part of our educational institutions. What environmental studies there have been, have been relegated largely to science and elementary teachers, as ecology. The path of ecology (a word popular only since *Silent Spring*) is a noble one, but often unsuccessful in its attempts to create an environmental awareness that is vitally needed to turn our growing environmental dilemmas around. The environmental movement, if it can be called such, is already laced with comfortable cliches and a bumper sticker commerciality which is making hay while the spirit of Naderism rides high, as if taking advantage of a fleeting public fancy. Well-meaning environmental groups are experiencing financial and legislative setbacks, a result of an apathy fostered by ignorance, social-cultural pressures, and a mindless economy, spawned by the superficial concept of goodness in growth.

If environmental education is taken per se, we have been engaged in the process since our ancestral beginnings. But within a very short space of time, the lessons of the environment have been lost, or fall on ears that can no longer hear. We have been steadily engaged in a flight from our real environment to an artificial one. This has been due to a faith in technology that has been blind, and demonstrated to be without limits or qualifications. This is one important reason why environmental education should be a total interdisciplinary approach which focuses upon the means of bringing us back in touch with the real environment. It should be an education which permits the experience of feeling ourselves as an intricate, inescapable part of the web of all life. We must recognize that we function within a delicate balance that requires a caring concern for life and gentle attitudes about the earth that will make us worthy stewards of the land.

Man is a part of the environment, as is the most insignificant form of life, and must derive his basic needs from the same tenuous flow of energy which sustains our entire ecosphere. He has adapted in accordance with the great constructors of change — the environment and heredity — and has met the rigors of survival to the point where his success has become dominion. He has engaged, through his superior intelligence, in an inexorable technocracy which has removed him beyond the realm of real contact with the web of life itself. For these reasons he has altered the environment more than any other living thing.

The significance of our life-ties to the earth has been diminished with the superficiality of plastic and throw-away cultures enraptured with mindless growth. Our tin can technology is in evidence even in mid-ocean. The limits seem to be at hand and a new philosophy, armed with meaningful understanding of the problems we face, is imperative.

It is important that those who have inherited our problems will be able to take a total world view of our deteriorating environment and be able to detect and sift through the obstacles that seem to shackle our present efforts because they will inherit the responsibility of providing solutions. Environmental education can not be approached from any one discipline but must draw upon the entire spectrum of man' ability to express his feelings and throughts. Science is one means of perceiving and interpreting our environment but it is useless without confronting the political, social-economic aspects and empty without the richness of art, philosophy, poetry, and music which have spoken eloquently of man's relationship to the earth.

The Center for the Development of Environmental Curriculum has developed a set of volumes which gives the teacher an opportunity to draw from many disciplines in an effort to bring environmental education to our institutions through as many avenues of learning as possible. The CDEC curriculum volumes have been written by environmentalists and educators from as many areas of education as possible. Each unit may be utilized separately or in conjunction with other units. Although each volume represents a particular theme in a certain area and level (e.g. Earth Thoughs - Biophysical - Senior High), the entire curriculum is designed to encourage an integration of the disciplines into an inter-disciplinary approach. The volumes may be used also, as supplementary guides to activities in any area. It is hoped that the volumes can be viewed as a flexible set of ideas, activities, and opinions which will help teachers and students generate ideas and activities into meaningful educational experiences. Thev are resources which will enable those who use them to develop a way of thinking and feeling about nature, and it may provide the chance to help clarify our environmental values into sound models for action.

We are in the midst of environmental problems which leave us confused and frustrated in the maelstrom of pros and cons concerning our dilemma. That we are experiencing a steadily deteriorating environmental condition is beyond any doubt. The solutions are not easy. But if you have experienced the flow of water, fresh and cold over your body as it courses through some green mountain valley on its way to the sea, knelt in the cool, damp earth and clutched its rich smell to your face, or watched a Blue Heron in slow flight at sunset, you know it is worth saving. All the care, concern, and love for all life and its necessary place within the intimacys of our "tiny spaceship" is in those knowing moments. At those times we are in touch with the ages of all life's experience. Man is the only creature capable of contemplating his own death; only man can develop an environmental ethic that is futuristic and healing.

Ronald J. Yarian
Concerned Educator and Citizen

ME AND MY ENVIRONMENT: PEOPLE AND THINGS

A Junior High School Literature Unit

How does literature and verbal communication affect the junior high student who is at a time of growth, conflict, and questioning and who needs reassurance?

In response to the above question, this unit is designed to explore communication and to provide opportunities for the student and teacher to discover their thoughts.

Communication is the key to what's happening to you and others. Some means of communication are poems, books, other writings, and discussions. When you find a writer speaking to you, speaking of something you have expressed, the written word becomes personal. Being exposed to the works of poets and writers, the student rediscovers and verbalizes his thoughts and self. He can then experience getting in touch with himself and others, or in other words, with his personal environment.

This instructional prototype is designed to be either integrated with existing Junior High Language Arts curriculum or used as a separate, contained mini-course offering.

INSTRUCTIONAL OBJECTIVES

1. The student will explore his feelings and thoughts about himself and his relationship to his environment, and verbalize them.
2. The student will examine the values expounded by the mass media.
3. The student will examine his life and environmental values through the popular culture with which he identifies.
4. The student will explore literature for the purpose of gaining insight into his relationship with his environment.

CONTRIBUTORS TO THE DEVELOPMENT OF THIS UNIT

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EXPERIENCE #1:
PERSONAL SPACE AWARENESS AND PERCEPTIONS

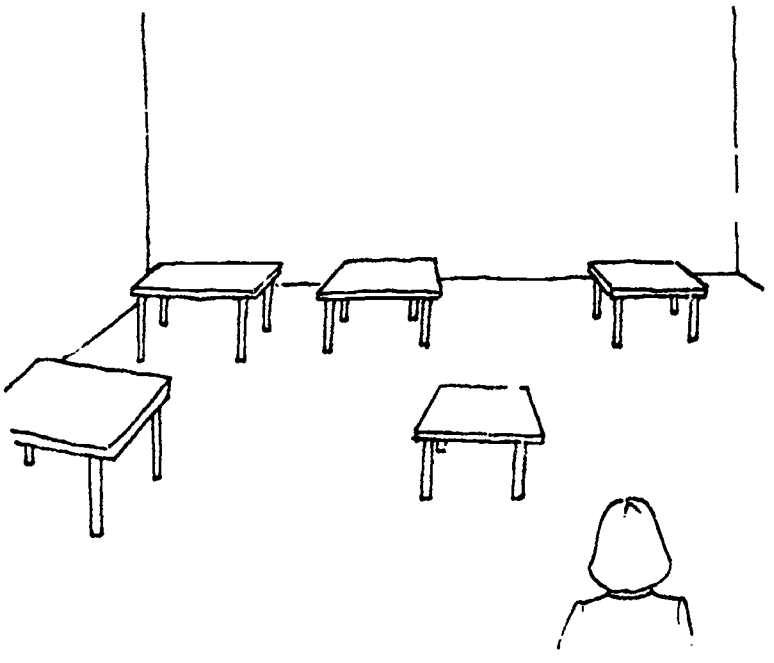
OBJECTIVES:

The student will be encouraged:

1. to see that other people are an environmental consideration.
2. to see that a spatial form might facilitate human interactions or hinder them.
3. to consider the need for privacy.
4. to notice instinctive responses to spatial problems.

ACTIVITY A:

After students enter the room as usual and sit in their usual seats, the teacher explains that a new unit is starting, one that deals with "things" in their environment and "people" in their environment. Lead a discussion of what things and people are at this moment, in this room, a part of their environment: How do the students feel about the people in this environment? How do they feel about the things in this environment? How do they feel about this *total* environment?



ACTIVITY B:

Tell the students that they may position themselves anywhere they choose in the room, rearranging the furniture if they choose, etc. The teacher should then lead a discussion with the class about why they think others chose to sit where they did, and individuals express why they chose to position themselves where they did: how do they feel *now* about the "things" and "people" in their environment?

ACTIVITY C:

Have the entire class sit together in the center of the room in the smallest amount of space realistically possible: discuss how they feel now about their present environmental situation, particularly the "comfort" of such close proximity to one another.

Then, have entire class sit as far apart from one another as possible, around perimeter of room: How do they feel now, in this new environment; are there feelings of isolation, loneliness, privacy, solitude, etc.?

ACTIVITY D:

Lead an informal discussion with the class about how much control they feel they have at this point in their lives over what "things" and what "people" are a part of their environment. Also, how do they deal with and react to both the pleasant and unpleasant "things" and "people" that are a part of their environment.

EXPERIENCE #2:
THINKING ABOUT YOURSELF AND OTHERS

OBJECTIVES:

1. The student will explore his feelings and thoughts about himself.
2. The student will explore his feelings and thoughts about other people.

ACTIVITY A: MAKE A "ME" POSTER

On a large sheet of paper, trace an outline of your body (Ask a friend to help you) or use the paper as it is.

Attach to your paper, souvenirs, pictures, words, objects, etc. which show what is important to you. This could take the form of a collage rather than a poster.

You could also make a "me" book (a scrapbook) or a memory box (shoebox with cardboard dividers) to show what is important to you.

When someone looks at your poster, collage, book, or box, he should learn something about YOU.

ACTIVITY B:

Write a description of yourself in the future. Where will you be living? Who will your friends be? What job will you hold? Will you be married? Have children? What will your hobbies be?

ACTIVITY C:

Compile lists of at least five things that make you feel the following ways:

1. happy
2. sad
3. angry
4. frightened
5. embarrassed

ACTIVITY D:

What is your special place, your hideaway where you can get away from everything and everyone? Where is it? Give a description of it and tell why you like it. What is your favorite time of day to be there? Why?

ACTIVITY E:

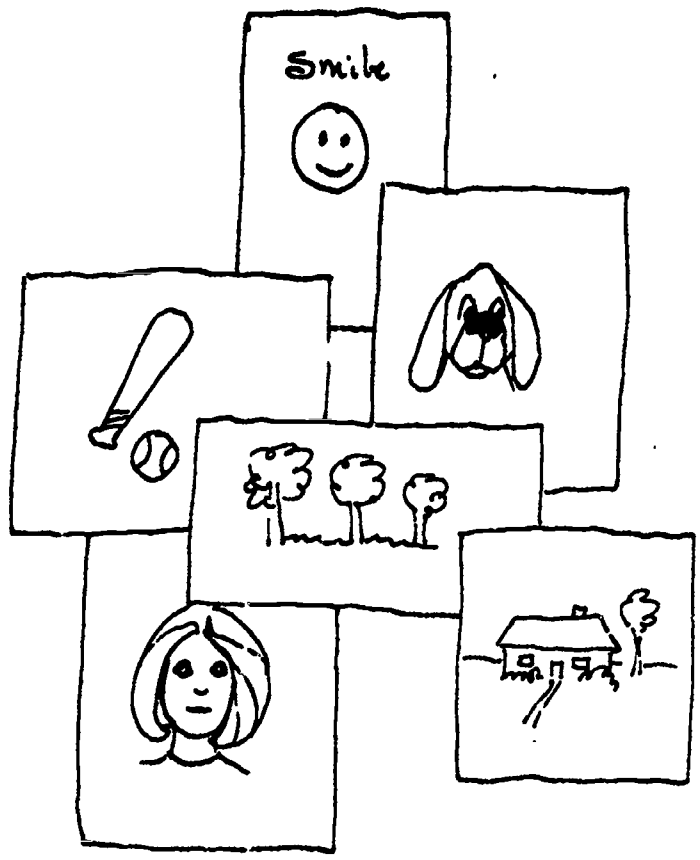
Who would you like to meet or be with if these things happened?

1. You were left in school all night.
2. You were in your favorite place.

Tell why.

ACTIVITY F:

Page through a catalogue or the Sunday supplement to the newspaper. Pick one favorite thing on each page. What do the things you picked tell you about yourself?



ACTIVITY G: PICTURES OF ME

Here is still another way to identify yourself more fully. Write or add magazine pictures to finish the sentences below as quickly as you can, without thinking too hard about them or trying to think about pleasing anyone but yourself.

What I'd most like to know is _____ .

What bugs me the most is _____ .

I really get a lot of pleasure when I _____ .

I'd like my friends to _____ .

Something I want that I haven't told anybody about before is _____ .

What I'd really like to be doing in five years is _____ .

The best way I can think of to use my spare time is _____ .

If I were President, the first thing I would do is _____ .

My idea of a good job is _____ .

If I could spend all my time in one course at school, it would be _____ .

My idea of a good place to live is _____ .

The thing I'd like people to admire me for is _____ .

After you've completed these sentences, your group should break up into groups of three. Trade papers and compare answers. Do the other two people in your group feel that you really came across in the things you've said, so that they have a better idea of who you are? They should tell you, and you should tell them, if anyone thinks the sentences aren't clear or honest. Change your sentences if you think they can really tell more about you.

(The above taken from: *Who Am I*, Education Ventures, Inc. 209 Court Street, Middletown, Connecticut 06457.)

ACTIVITY H:

Teacher's Note:
Consider the abilities, knowledge, and personality types. Depending upon the individual class situation, the teacher may substitute another personality for any person which may be objectionable.

The Fallout Shelter Game:

Divide class into small groups of four or five, role-playing the following situation:

An atom bomb will be dropped in ½ an hour. You are in a fallout shelter and outside are ten others (see list), only six of whom there is room enough for in the shelter. You, as a group, must decide in the next 30 minutes which six you want to be a part of your extremely confined environment for the six months that you will be in the shelter and who will also be the basis of the new society that you will all have to start after you leave the shelter. Give the reasons for your decisions and discuss the processes by which you made your selections.

The Fall Out Shelter Problem

Only 6 of the list of 10 may stay in the shelter.

1. A male black militant in his twenties, 2nd year medical student
2. A famous male historian-author; 42 years old
3. A Hollywood starlette, young, singer, dancer
4. A rabbi; 54 years old
5. A young male Olympic athlete, totally sports oriented
6. A policeman with a gun (they cannot be separated), thrown off the force for police brutality, over-eager and in his forties
7. A 39-year old former prostitute "retired" for four years
8. A male architect, confirmed bachelor
9. A 16 year old girl of low I.Q.; a high school dropout; pot-head; pregnant
10. A bio-chemist, atheist (doesn't believe in God)

ACTIVITY I:

1. "Beauty IS Truth," *Projection in Literature,* Glenview, Illinois: Scott, Foresman, and Company, 1967.

   Read the story with the entire class, then use it as a frame of reference for leading a discussion of how we all, as individuals, decide what we like and dislike, what we find beautiful as well as ugly.

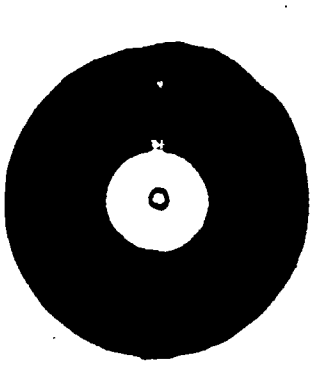
Note: Emphasize the idea that often what is ugly to one person is beautiful to another.

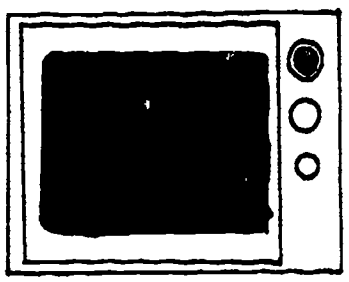
Also discuss what things most often are considered beautiful or ugly by most people.

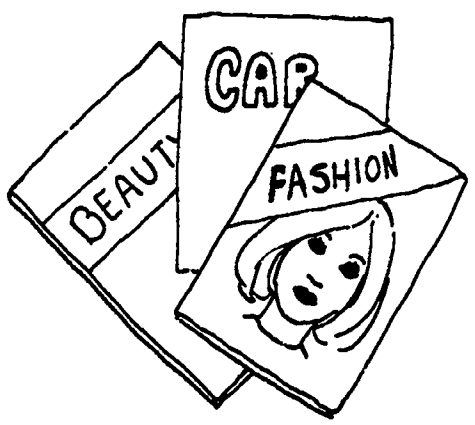
2. "The Pheasant Hunter," *Projection in Literature,* Glenview, Illinois: Scott, foresman, and Company, 1967.

   Read the story and use it in a class discussion. Talk about choosing a person to be a part of your environment on the basis of what he is like or what he has and can do for you.

Note: The above two stories are suggestions. If unavailable, please substitute appropriate stories.







EXPERIENCE #3:
THE MEDIA

OBJECTIVES:

The student will have an opportunity:

1. To examine what the popular media is saying about life and life values and discuss feelings about them.
2. To examine his life values and environmental values through the popular culture he identifies with.

Teacher's Note:
The teenagers of today like the teens of yesterday, identify with a cultural pattern of their own. The bobby socks of yesterday and the long hair of today are only two examples of an expression of life values. One of the mirrors of popular culture are the non-literary forms of expression, such as popular music, magazines, and comic books. Since the student enjoys these forms and identifies with them, he is often not aware of the real reasons he enjoys them. This experience offers the student an opportunity to examine some of his favorite pop culture media in a different light.

ACTIVITY A: TELEVISION — A SLICE OF LIFE

Why has television gained the popularity it has today? It is long past the time for the initial novelty of the black box with pictures and sound to have worn off. Why then does television play such an important part in our culture? Television is especially popular with youth. Why is this so? Does television deal with such real problems that the youth identifies with the characters? Does TV portray real life? Have your students examine their favorite TV shows. Why do they like them? Do they want to be like Ma.unix or Kojak? Or do the life styles and incidents closely match their own, such as those in *All in the Family* or *Sanford and Son, Happy Days*, etc.?

Discuss the students' reasons for watching the shows they do. Also discuss the shows they most dislike and the reasons. Take a poll of the most popular and least popular shows of the class. Write a sample TV script. Make a mock camera and shoot your TV show with props and costumes. Discuss the themes and the conflicts portrayed on television. Are these real? How would the students resolve the conflicts?

ACTIVITY B: MAGAZINES

What magazines appeal to the students of your class? Take a poll of the magazines they read, the ones they will spend money on, and the ones they keep. Why do they choose the magazines they do? Is it because it has a bright cover, deals with a hobby or subject they are interested in, or is entertaining? Using several magazines that students read the most, examine the magazines for the following characteristics:

1. Subject of magazine
2. Purpose of magazines (example: to sell products, etc.)
3. Length and price of magazine
4. Reasons for reading
5. What is the magazine's philosophy? Through the presentation of the magazine's materials what are the editors trying to convey?
6. What audience is the magazine aiming for?
7. Does reading this magazine make you a better person? Does a magazine need to do this?
8. Why and how do you identify with the magazine or the people in it?

Some magazines you may want to examine are *Mad, Hot Rod, Sixteen, Time, Glamour* or *Seventeen*. *Mad* can also be used to study parody, satire, exaggeration, etc.

ACTIVITY C: NEWSPAPERS

How many students in your class read the newspaper? Take a poll of what sections of the paper the students read. Why don't the students read the newspaper? Discuss their feelings about reading the paper. Do they associate the paper with another age group or life style? Does the paper relate to the student and can he identify with it? If not, have the students create a newspaper that speaks to them. If you want to increase the number of students reading the paper, try a few of these activities:

1. Every day or a few times a week offer the student who answers a specific question extra points. To discover the answer the student must read yesterday's paper in the back of your room. Examples: Who beat the Indians? What did the mayor say? What store has a sale?
2. Have the students write advertisements using ideas and words from copies of newspapers. Experiment with advertising one product as many different ways as you can. Discuss how an advertiser appeals to the emotions and senses. Have the students advertise something that is close to them — a book they like, a special place, or a food they enjoy.

ACTIVITY D: COMICS

What is the number one comic in your neighborhood? Which one do you like the best? Why? Do you read the newspaper funnies? Which is your favorite? Using this type of question, have the students examine their favorite comic figures. Compare the personalities of the comics: Would you rather be a Beetle Bailey or a Sarge? A Mark Trail or a Dagwood Bumstead?

Why are comics funny? Must comics exaggerate some points to draw an audience?

Design your own comic character and write a cartoon strip for him. Develop his personality through the action in the strip and his appearance. Experiment with changing his personality by his clothes, words, actions, and expressions.

Have your students discuss the worth of comics in American culture. Are all comics bad? Are any comics bad?

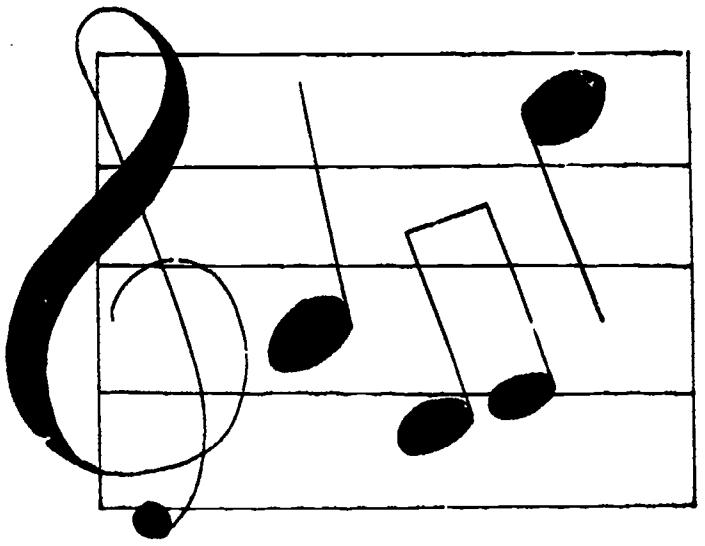
Discuss the good-guys-vs.-the-bad-guys-type comics. Have modern comics changed from the comics of your parents' youth? Are today's comic characters more realistic? Borrow a copy of the famous comic, *Buck Rogers and the 25th Century*. Why do you think this comic was so popular? Just for fun, compare the future Buck lived in with today and the predictions we are making about the future. Examine and read some of the current popular science fiction. Discuss the possibility that in one hundred years, your descendants will be reading your comics and science fiction and examining whether your predictions came true. Some current science fiction writers you could read and discuss are Asimov, Heinlein, Clarke, Bradbury, and many others.

EXPERIENCE #4:
EXPRESS YOURSELF

OBJECTIVES:

The student will have the opportunity

1. to experiment with a variety of literary and non-literary forms: poetry, haiku, graffiti, illustrations, poster design, collage design.
2. to express his viewpoint of his personal world.



ACTIVITY A:

Do persons know all about you just by looking at you? What goes on in other people's heads? How would you get inside somebody's thoughts?

Poets and songwriters clue you into their thoughts. Their words and lyrics speak of many images: friendship, struggles, young love, family, et. al. Listen to a recording of a poem or song to find particular themes, conflicts and viewpoints.

Bring in to share with your class a song or a poem which speaks to you personally or creates one of your favorite moods.

Teacher's Note:
Some suggested *lyrics are these:*

1. Beatles, "Eleanor Rigby" — loneliness
2. James Taylor, "You've Got a Friend" — friendship
3. Sly and the Family Stone, "Stand" — self pride
4. O.C. Smith, "Color Him Father" — family
5. Temptations, "Papa was a Rolling Stone" — family
6. Stevie Wonder, "For the City" — city life
7. Terry Jacks, "Seasons in the Sun" — death
8. Merle Haggard, "If We Make it Through December" — poverty

Suggested poets and books:
Langston Hughes
Robert Frost
The Me Nobody Knows
Countee Cullen
Emily Dickenson
Mason Williams Reader
E. A. Robinson

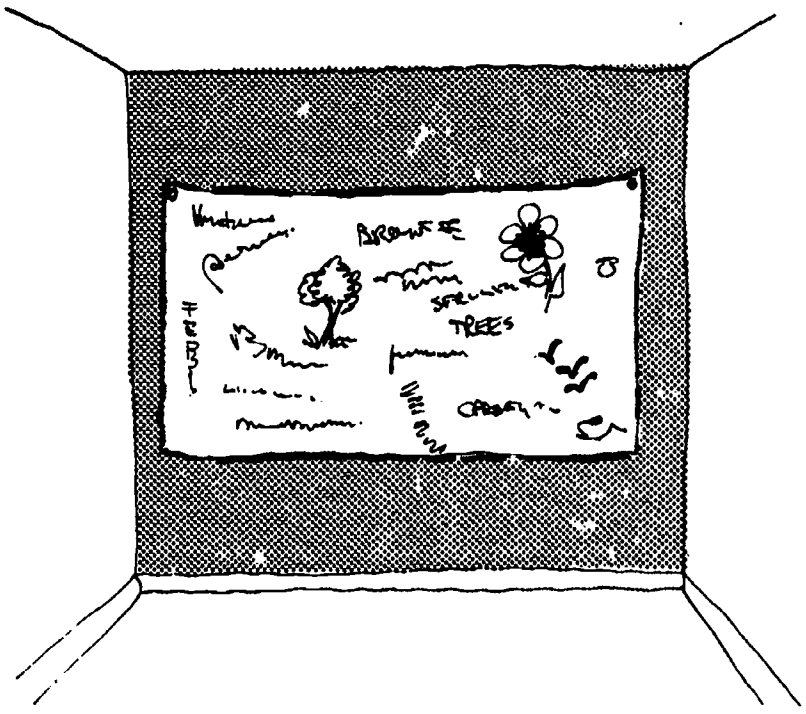
The latter's poem, "Richard Cory," has been recorded by Simon and Garfunkle on *Sounds of Silence*. (Many other poems have been similarly treated.) It is a good way to initiate a discussion of outward appearance vs. inward feeling. Ask your students: Can we always tell if a person is happy (or sad) just by looking at his outward circumstances? Kids who "turn off" to poetry may react better to familiar song lyrics.

ACTIVITY B:

Make a wall hanging of eco-graffiti, Choose a theme, an eco-idea. Cut out words and phrases from magazines, newspapers, junk mail and arrange them as phrases, slang, complete sentences, or thoughts.

OR

Create a greeting card for "Mother Earth" or for a classmate, teacher, or relative.



ACTIVITY C:

Teacher's Note:
E. A. Poe's and Vachel Lindsay's literary works lend themselves well to choral reading.

Choose a section or complete poem for a choral reading to express an eco-picture with words.

Describe either a favorite place in town or country, city or country sounds, activities in town, your leisure time, the inside of your mind.

EXPERIENCE #5:
BOOKS: AN EXTENSION OF SELF

OBJECTIVES:

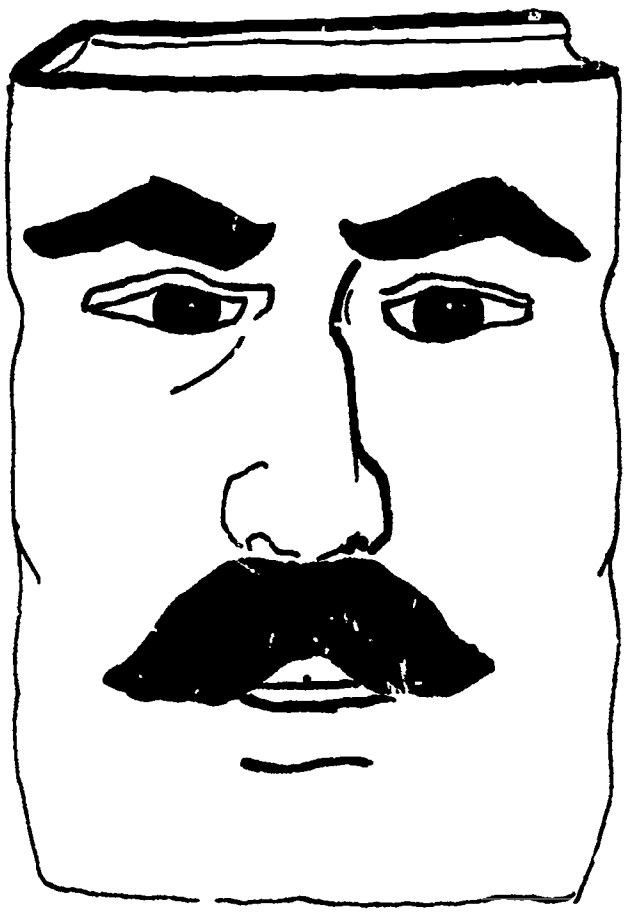
The student will explore literature for the purpose of gaining insight about his relationship to his environment.

Teacher's Note:
This experience is supplemental to the unit, or may be used as a substitution for Exp. #3 or #4, at teachers discretion on an individual or group basis.

ACTIVITY A:
BOOK TALK BY THE TEACHER

Teacher's Note:
Reading list should be compiled with the following guides in mind:

a. *Student's interests, locality, and reading ability levels should be considered*
b. *Books should not be repetitive of existing curriculum materials or trite in nature.*
c. *Books should be of broad enough variety to expose readers to urban, suburban, and rural environments.*
d. *Encourage students to select books on an interest basis and to read something for just plain enjoyment.*



1. Select four or five books with similar themes. Be aware of the interest that is generated by the title, cover, illustrations and size of print.
2. Hold the book talk in a room where students will be comfortable and not easily distracted.
3. Read selected passages from the books, putting some drama (inflection, hand gestures, etc.) in your presentation.
4. The purpose of the book talk is to sell these books to the students, to make them want to read them.
5. Following is a list of *suggested* books for junior high students with varying levels of reading ability. The books on this list deal with peers, family relationships, conflict, young love, and friendship.
6. After the talk, have the books available for examination by the students. Encourage them to try *any* book whose theme interests them (even if they only look at the pictures and perhaps read the captions).

Books which have been presented on television or in the movies are especially popular. They can also lead to discussions of the visual versus the printed genre: Did you imagine that the characters looked the way they did on TV when you read the book? etc.

Reading List:

Allen, Elizabeth, *You Can't Say What You Think and Other Stories*
Anonymous, *Go Ask Alice*
Armstrong, William, *Sounder*
Bentley, Phillis, *Forgery*
Bonham, Frank, *Durango Street*
Byars, Betsy, *The Summer of the Swans*
Canning, Victor, *The Runaways*
Carson, Mary, *Ginny, a True Story*
Clarke, John, *High School Drop Out*
Crane, Carolyn, *Stranger on the Road*
Donovan, John, *I'll Get There. It Better Be Worth the Trip*
Drdek, Richard, *The Game*
Dunne, Mary, *Reach Out, Ricardo*
Fiedler, Jean, *In Any Spring*
Harris, Marilyn, *The Runaway's Diary*
Lipsyte, Robert, *The Contender*
Maddock, Reginald, *The Pit*
Means, Florence, *It Takes All Kinds*
Merrill, Jean, *The Pushcart War*
Neville, Emily, *It's Like This, Cat*
Neufeld, John, *Lisa, Bright and Dark*
Platt, Kin, *The Boy Who Could Make Himself Disappear*
Wojciechowska, Maia, *Tuned Out*
Zindel, Paul, *My Darling, My Hamburger*

ACTIVITY B:

Select a book of interest to the class. Read it to the class for about ten minutes daily. The purpose of this activity is to generate student interest and enjoyment, so don't force discussion after the reading period. If, however, the students have questions or want to discuss the day's segment, allow them the time to do so. Books which contain intrigue and counterplots are an excellent choice for this type of activity.

ACTIVITY C:

Bring a collection of appropriate books to the classroom or take the students to the library. Allow them time to browse and select a book to read. Encourage the students to prepare a presentation about the book, or even the chapter of a book, that they have read. They could do the following:

1. Make a poster
2. Design a book jacket
3. Give a book talk
4. Prepare a book review

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ART & ARCHITECTURE

A Junior High School Art Unit

Our surroundings play an important part in how we live and what we feel is valuable. This unit will lead the students through a series of activities showing the relationship between his physical environment and his personal environment. The student will be encouraged to discover how he fits into his world. This will develop the student's sense of how his own actions do and can make a difference in the quality of the environment and therefore his life.

The list of activities is not meant to show development sequence. Instead, it provides a range of possibilities within which the teacher may select those considered appropriate to the students' environmental awareness needs. The teacher should adjust the form of any activity to one which is more fully in line with his own experience and which reinforces the students' past experiences. This will aid the students in relating to their environment and developing a positive environmental awareness.

INSTRUCTIONAL OBJECTIVES:

1. The student will be able to recognize functional aspects of his environment.
2. The student will realize that these aspects generate feeling reactions.
3. The student will explore a variety of materials and tools with regard to their innate properties and their potential for filling human needs.
4. The student will be able to understand present interpretations of man-made structures in the environment in relation to past ones.
5. The student will be able to value his power of fantasy and imagination as a source of learning about the environment.

CONTRIBUTORS TO THE DEVELOPMENT OF THIS UNIT

Author ..... Amie Albert
Editor ..... Christine Shields
Revisor ..... Susan Zella

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Teacher's Note:
The following activities might be continued throughout the entire unit, supplementing the specific activities.

1. *Each student should keep a journal in which (a) he finds connections between classroom ideas and out-of-school experiences and observations, (b) he notes where and how he spends his free time, (c) he records his general reactions to his neighborhood. This could possibly be done during the last few minutes of the class period.*
2. *The students start a list to be posted on a bulletin board of all the things they consider to be part of their environment. This list can then be added to as ideas occur. This does not necessarily have to be written additions; sketchings, clippings, etc., could be appropriate.*
3. *Homework can be assigned by giving research teams classroom ideas to test in the neighborhood.*
   a. *One member can describe a place verbally.*
   b. *One can photograph it.*
   c. *One can interview the people there and record their reactions.*

EXPERIENCE #1:
SPATIAL RELATIONSHIPS

OBJECTIVES:

1. The student will see that other people are an environmental consideration.
2. The student will see that a spatial form might facilitate human interactions or hinder them.
3. The student will consider the need for privacy.
4. The student will notice instinctual responses to spatial problems.

Teacher's Note:
Begin with Activity A before any discussion occurs. By asking the questions at the end of the Activity, a discussion of what spatial relationships are, can take place.

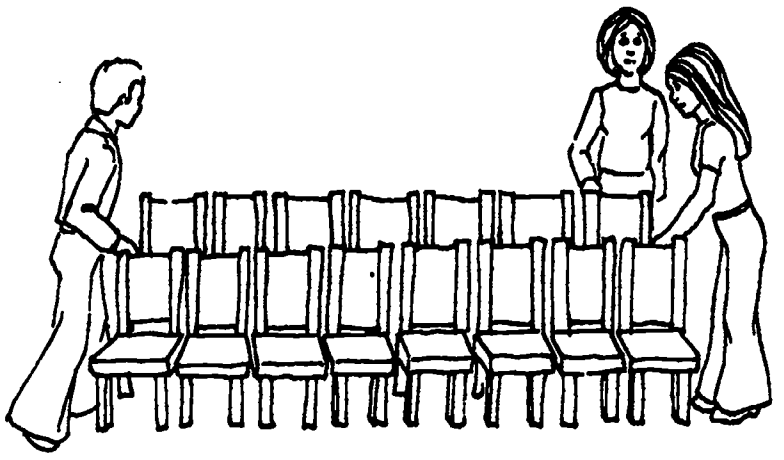
ACTIVITY A:

Before the students enter the room, a space as large as possible should be cleared in the center of the room. Furniture is accessible along the edges. The teacher sits on a chair in the space, calls the role, and announces that a new unit is beginning.

If the students have already taken chairs or sat on the floor, discuss what has happened and why. Ask the students a series of questions: How does the change in the classroom set-up affect them? Did they feel a need to still find their own seats? Why? Is this situation more or less comfortable? Why? What is the students' definition of spatial relationships? (i.e. density, unity, closeness, etc.)

ACTIVITY B:

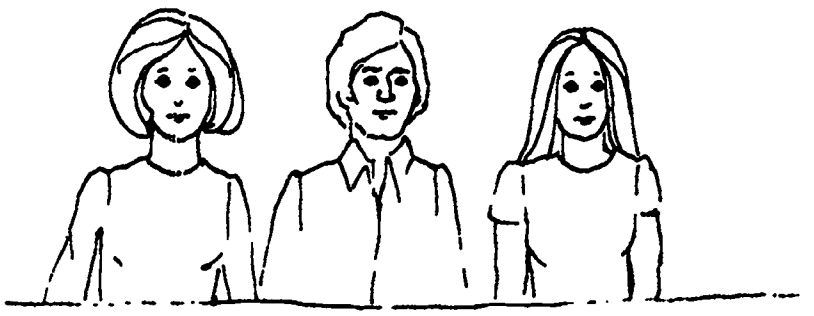
Arrange a block of chairs in the space all facing in one direction, with no space between chairs and little



between rows. The teacher sits down and motions for the class to do likewise.

Have them discuss their reactions with each other. Why is it funny or confusing, etc.? If they have already moved the chairs, analyze their reasons. Were they too crowded, etc.? Next arrange chairs in rows, with a great deal of space between rows. How does the student feel toward this change in space?

If they are uncomfortable, ask why. Ask them to arrange their chairs in the best form for a group discussion. Will one circle be better than two circles?



ACTIVITY C:

Have the group sit in as *tight a formation* as possible. Have the students take out a piece of paper and a pencil and make a list of their private thoughts, whatever comes to mind in a few minutes.

Then ask them each to find their own spot in the room, one where they feel the most complete privacy. Have the students turn the paper over and take a few minutes to make another thought list. Gather again and discuss the differences in the two experiences. Was it easier to concentrate in the group or in the "private" place? Where was it easier to write, physically? What can they learn from comparing their two lists. Do they have their "own" space at home?

ACTIVITY D:

Ask each student to turn so that he faces no other student. What could happen in such an environment? How did they feel?

ACTIVITY E:

Start the "environment" list by asking the students to name places where they would find themselves with other people. Begin individually, then go into small groups and expand the list. Finally progress to

a total class discussion of the listings. Did the student awareness of "people places" increase as the encounter group sizes increased? Open this question to class discussion.

EXPERIENCE #2: IDENTITY

OBJECTIVES:

1. The students will observe their reactions to a most intimate environmental element, one where they design everyday.
2. The students will see that the use of a place may determine its physical appearance.
3. The students will use the community as a resource and further integrate these concepts with their lives.

ACTIVITY A: PERSONAL IDENTITY

The students will decide upon a type of individual they would like to portray (i.e. a villain, a can-can dancer, a judge, etc.) and attempt, in the form of charades, to have the rest of the class identify what or who the individual is attempting to be.

The student should attempt to "become" the character he is portraying.

After each actor completes his charade, have the class analyze why or why not the actor was successful in his role and how they identify with him.

ACTIVITY B:

An expansion of Activity "A" could be to take a field trip to an "old" section of the community and attempt to characterize the portions observed in a drawing, showing how they personally identify with the area.

Was this activity as successful as Activity "A"? Why or why not?

Eventually, the teacher will ask where in the community the new "you" would be found or feel most comfortable: movies, street, store, jail, home, car, etc.

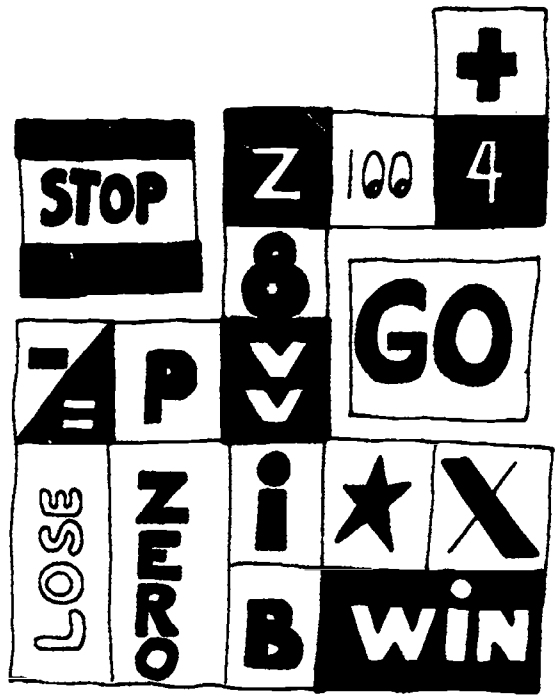
ACTIVITY C: SITE IDENTITY

Have students with cameras design a detective game for the others in the class. (An alternative media can be slide lifts.)

They will choose a familiar place in the neighborhood and make a slide portrait of it to confuse the viewers. The slides could show only details or unfamiliar parts or be shot from unusual angles.

When the slides are developed, they should be put in sequence by the photographer, with a full-view "answer" shot at the end.

He will show the slides in class and conduct the guessing. The teacher will ask leading questions about clues of construction, technique, shape, materials used, scale of detail, etc. This showing may be presented more than once in the unit.



EXPERIENCE #3: MONUMENT STUDY

OBJECTIVES:

1. The student will become familiar with the properties of materials used in his neighborhood.
2. The student will view the elements of past societies that can be determined by analysing their monuments.

Teacher's Note:

A possible means to make students bring in the materials required for different projects in this unit is to make the responsibility for supplies a portion of the ultimate evaluation.

ACTIVITY A: BUILDING A MONUMENT TO THE COMMUNITY

Each student must bring to class materials found at home or outside. They must not, of course, be in use or owned. Some things may have acquired the classification "junk." They may be natural or man-made.

The monument must be built totally from these things. Its size, shape, and strength must derive from the material's properties. The means of construction must also be determined by the character of the ingredients. The students should consider their monument's potential to mirror other qualities of their environment: density, unity, permanency, or the opposites of these. The place their monument will stand (sit, hang, roll) may also reflect the quality of the environment. It may be obvious or camouflaged, outside or inside. A discussion with slides may follow the completion of the monuments. They may consider the difference between creating a whole by collecting parts in a linear way and by moulding or carving out an entire preconceived idea. Can neighborhoods be that way? Does one way feel different than the other? Is one more efficient? Does one allow for more individuality?

As each monument is presented, have the class attempt to analyze the creator's intent before the creator explains his idea. This will aid the students in realizing other's impressions of the community.

Materials:
string, glue, hammer and nails, etc.
mortar and welding tools where possible

ACTIVITY B:
MONUMENT TO A PERSON

A possible alternative to Activity "A", conducted using the same format, could be to build a monument to a person rather than to the community.

ACTIVITY C:

An accompanying homework assignment for the students might be to survey the materials used in the construction of his own apartment or house. He must bring in as full a list as possible. He may ask a parent's or sibling's help in finding things or identifying metals and plastics, etc.

ACTIVITY D:

The teacher may also conduct a discussion of the use of monumental art forms in other cultures and the power they have in the lives of the people who made them. Slides or photos could be shown of African masks, Stonehenge, Indian totem art, pyramids, cave art, golden Buddhas, marble statues in Italy, the Eiffel Tower, the St. Louis arch and pop-art monuments. A discussion of the purpose of the monuments is important to the study of monumental art throughout history.

The students might guess what materials are prominent features in the areas where these are located and what technical achievements they reflect. They might also apply the same thoughts to these monuments that they did to their own, seeing them as reflections of the social quality.

ACTIVITY E:

The teacher might ask what happens to the students' feelings when they enter a building of monumental size and craftmanship and what scale says to them about the importance of these places. Can they discover what a society holds important by looking at the biggest, most elaborate buildings or by looking at the city skyline? Maybe they could take their journal to a bank, stadium, depot, capital, theater, movie house, etc.

EXPERIENCE #4:
THE MESSAGE OF FORM

OBJECTIVES:

1. The student will realize that the most powerful and real statement of a message is one in which the content of the message and the manner of expression are unified.
2. The student will relate this to ways in which the environment can "say" something and to ask how form determines content.

ACTIVITY A:

Set up a contest in which one half of the class judges the other half. Have the students see who can say a word the most convincingly, who really feels the experience of that word.

Each member of one group must say the word as it is assigned. The jury may ask the performers to repeat it. Some words might be *Wow! Yech! Ah!* (a sigh), *Shh! Mmmm! Scram!* or a wolf whistle. The teacher then asks the students to analyse the performance of each students use of energy, face and body action, volume of voice, etc. After Group One completes its jury task, it must then change functions with the performances. The exercise is continued so that each student has an opportunity to attempt to express form.

ACTIVITY B:

Each student chooses one word for a poster design.

The whole poster must express the meaning of the word. The medium, color, size, shape of letters, placement and use of other words (if any) must support the message.

The media may include paint, pencil, or collage, on cardboard or heavy paper.

If the students need help finding a word, the teacher may propose a list of which to choose or to inspire other choices. Such words might include *peace, jazz, power, pivot, demon, bolt, horizontal, vertical,* etc.

ACTIVITY C:

Have the students compare the verbal form of experience with the visual form. Discuss which is more successful and why? How could the less successful approach be made more successful?

ACTIVITY D:

The teacher may later introduce a discussion of what a place means. What places say the following?

"Come in, it's fun here"
"Stay away!"
"Relax, enjoy!"
"Don't move!"
"Run around!"
"Go crazy!"
"Tip-toe!"
"Careful!"

What elements express these messages and why?

EXPERIENCE #5:
FORM AND FUNCTION

OBJECTIVES:

1. The student will choose the best material for a given function.
2. The student will trust a personal interpretation of a set of requirements.
3. The student will relate his experience to geographic and functional requirements in architecture.

Teacher's Note:
See the teacher's note under Experience III for a possible means to encourage students to bring in materials.

ACTIVITY A:

Have the students choose one of the following assignments.

a. Make a container in which many small breakable objects can be transported over long distances.
b. Make a container which must also act as a support for heavy weight.
c. Make a container which can be posted in a mailbox.
d. Make a container for liquids.
e. Make a container which could also be a musical instrument.

f. Make a container which looks like an animal.
g. Make a container to hang from a thread and move in the breeze.
h. Make a clay container for a hanging plant.

They may choose to spend all the time on making one choice or less time on several.

Four possible techniques follow:
wood, hammer, and nails
paper, tape, and glue
clay
fabric, needle, and thread

ACTIVITY B:

Have a discussion, perhaps illustrated with slides, in which you consider eggs, spider webs, nests, cocoons, etc. for their natural form and functional unity. Then discuss man-made structures. Ask the students for comments about materials used, location, weather and climate, and topology. Also ask for comments about the form of the structure, it's shape, size, window space, heights, etc. Slides may be shown of a fort, pueblo, igloo, hut, tent, mansion or a row of apartments. Why do habitats vary so and are the variations realistic?

ACTIVITY C:

Have the students examine toys that young children play with. How does the form affect the function of the toy? Is there a difference in form and function for children compared to that used for adults?

EXPERIENCE #6:
ENVIRONMENTAL INTERPRETATION

OBJECTIVES:

1. The student will explore relationships of form and pictorial content.
2. The student will interpret an imaginary environment.
3. The student will look at the interpretations of artists throughout history and to try to understand the effects of their environments on their fantasies.

Teacher's Note:
It is suggested that relatively advanced students participate in Activity "A", as it takes a great deal of imagination to develop a somewhat original solution to the problem.

ACTIVITY A:

Allow the student to attempt one or more of the following:

1. Illustrate a dream state.
2. Project yourself into a fantasy setting.
3. Picture yourself as a transformed being.

Choose one of these and execute it in any size using method and materials which convey the feeling of the fantasy. Use paint, pencil, assemblage, collage, or a combination of these. Supply as many materials as possible: mirror bits, tape, magazines, spools, sequins, feathers, steel wool, etc.

ACTIVITY B:

Discuss photos or slides of works by such artists as Goya, Durer, Bosch, Blake, Klee, Dali, El Greco, Van Eyck (King of heaven), Fra Angelico, Magritte, Chagall, Klint, Escher, etc. The teacher may ask the students to put themselves into the environment of the picture and describe their reactions. What can they tell about the times in which the painters lived? Is there evidence of response to the environment through visual form?

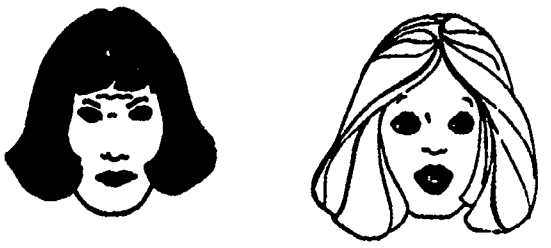
ACTIVITY C:

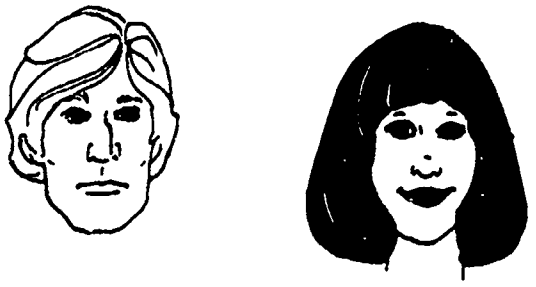
Discuss children's imagination and compare it with adults. Can an imaginary function (cartoons, Santa, etc.) have meaning for a child as well as an adult? Are supposed child-oriented fantasies always child oriented?

EXPERIENCE #7:
FUNCTIONING BODIES

OBJECTIVES:

1. The student will examine the concept of form and function as it exists in the human body.
2. The student will examine buildings for signs of form and function.





ACTIVITY A:

The teacher will ask the students to name all the things their mouth does, to consider its efficiency in these tasks, and to consider the "materials" involved: teeth (cutting and grinding), muscles (adjusting food, forming words, applying force), and glands (secreting fluids, etc.), not to mention nerve and emotional connections for sensory delights as tasting or kissing. Students may then be asked if there is another thing in the environment so efficiently multi-purposeful.

ACTIVITY B:

The students can then be asked to consider the school building as a functioning body.

They will go on a tour to find all the things "done" by the "organism" and how it is designed to do them. They could also be asked to consider how they might better design a space in order to facilitate the use of that space.

They might analyse the places of entrance and exit (orifices); the places of passage (arteries); the organizational center (the brain); the relationship of the halls to the office; places of gathering, eating,

playing, and access to each; and the service system, heating centers, and vessels.

The students return to the art room and compare their findings with a large chart of body vessels and with a large map of the city and state. They may see what the pattern says about the different areas, centers, and peripheries.

Ask what was important to the architect in designing the school and how it was dependent, ideally, on themselves: their size, their number, their activities. Compare sizes of furniture, heights of door knobs, sizes of steps, and heights of fountains in elementary schools and in high schools, if possible.

ACTIVITY C:

At another time, a tour could be arranged in which the object is to discover the feelings associated with the different positions and places enforced on the students: crowding, huge spaces, concrete, metal, street proximity, etc.

ACTIVITY D:

Another possible means of observing and discussing functioning bodies would be to take a field trip to an assembly plant or factory to observe a mechanical body. Is this plant as efficient as the human body? More? Less?

EXPERIENCE #8:
EFFECTS OF LIGHTING

OBJECTIVES:

1. The student will see how lighting changes effect the environment.
2. The student will discover the subtle properties of some materials in relation to lighting.

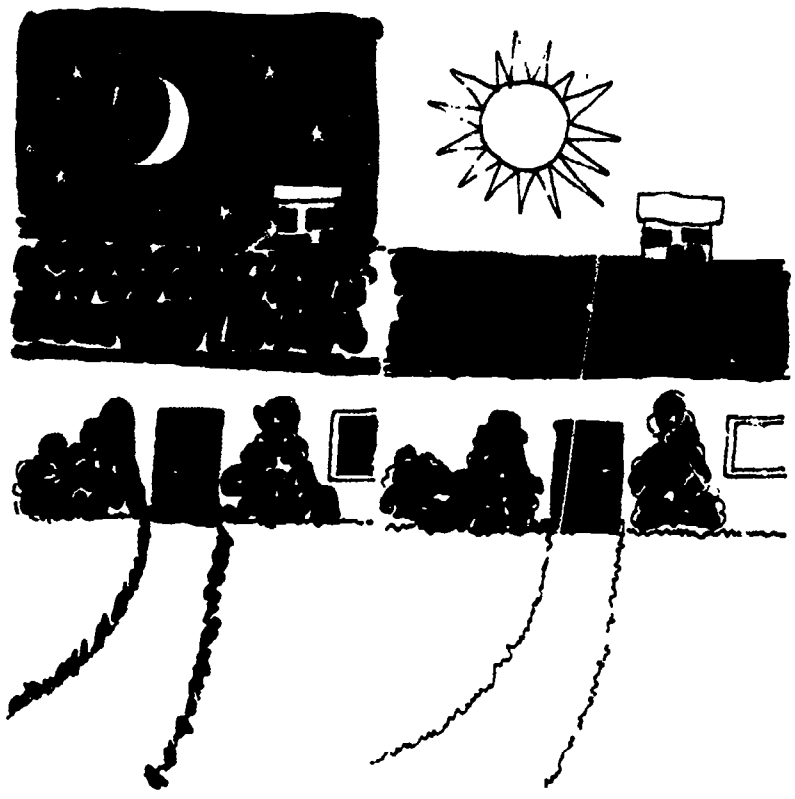
ACTIVITY A:

Availability of the material for the following activities (i.e. slide projectors, shades, etc.) is helpful in this experience.

The teacher could effect a series of lighting changes and ask the students to respond to the following possibilities:

1. pulling the shades and cutting the lights
2. shining a white light into the front of the room from a projector in the back
3. inserting a clear slide that is masked to form a narrow vertical beam
4. inserting a slide colored with deep red cellophane or a gel.
5. setting up steady pulses of white light by moving a cardboard up and down in front of the projector lens
6. inserting a blue slide and then moving the fingers of one hand, slightly spread, slowly and continually against the lens
7. cutting the projector light and lighting about a dozen candles placed throughout the front of the room

Conduct the activity for group discussion.



ACTIVITY B:

An optional journal assignment may be suggested. The students must go to a safe spot in their yard. They should take their journals and use them in any way they would like, for words, drawings or doodles. Have the students repeat the process at a completely different time of day, morning and evening or noon and night. The latter times could be used by just looking out a window. Form a group discussion and analyse the differences lighting generally makes and if it affects attitudes or feelings toward the specific areas of outdoor environment.

ACTIVITY C:

The students may be asked to invent some immediate way to set up an environment with lighting. If they want to do it with a slide, they might work with the image of the slide and light as a container or form. The feeling to be expressed is the content or function. Slides are clear and can be altered with magic marker, acetate ink, cellophane, bits of string, dust, film, glue, etc.

ACTIVITY D:

The students may later embark on a longer project. They may be asked to design to scale a way to change the classroom lighting to their liking. They must consider working with windows, ceilings, and positions of the sun in time and season. They must consider ways to alter light: filtration, blockout, reflection, or any others. They must also consider how materials can accomplish what they want: tissue, paper, mirrors, or fabric. They must consider

some possible forms: hanging screens, mobiles, shades, false ceilings, etc.

The class may want to choose one technique and work on it as a group in an ambitious, extensive way. They should decide which would be most effective: single efforts on a small scale or on a large group or entire class effort, which would increase the scale.

EXPERIENCE #9:
CREATING ENVIRONMENTS

OBJECTIVES:

1. The student will experience the creation of large-scale environments by forming real spatial situations.
2. The student will conceive of the environment as a tool for "totally" controlling the experience of others.

Teacher's Note:
Availability of storage space should be a primary consideration in this experience.

ACTIVITY A:

Ask the student to create an environment by upending tables, etc. and entering the space designed. How does this created environment affect the change in space? The space should be assembled, disassembled, and stored within the time of the class meeting.

Possible materials are these:
- corrugated cardboard panels
- rope
- refrigerator cartons
- a large roll of wrapping paper
- the furniture of the room
- tape
- string
- sheets

Then, if possible, the class will stay within the space(s) for further discussion. Does the created space change any attitudes toward the environment (i.e. is height expanding? is closeness stifling?)

How do these changes relate to monumental architecture of everyday occurrence (theatres, etc.)?

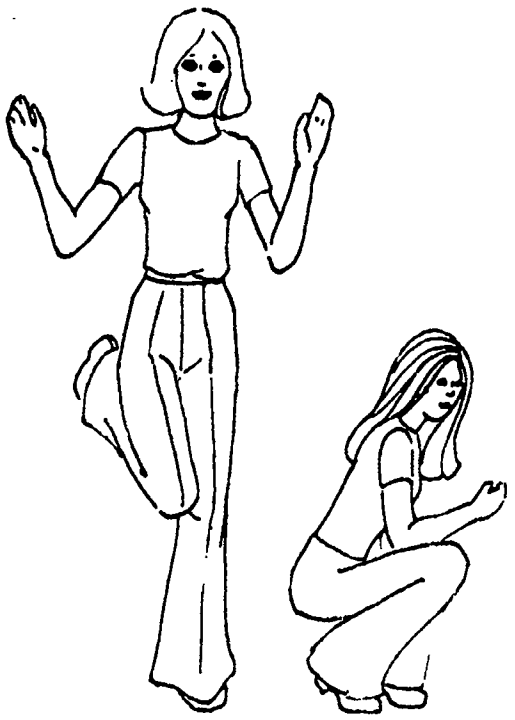
ACTIVITY B:

The teacher may then propose an experiment in which the participants may use knowledge derived from any of the other experiences or activities.

Volunteers may be requested to be either designers or subjects.

The designers or subjects: The designers will be asked to direct the actions of the subjects in special ways — but nonverbally. Their only means will be the available materials used in building the "living space." The designers may invent an action or be commissioned by the teacher to make the subject do such actions as:

1. going from point x to point y by walking and hopping on a zig-zag path
2. crawling
3. stooping and standing alternately
4. walking sideways



ACTIVITY C:

Once the students understand designing spaces for movement, the teacher will assign a big project: to design the "total" experience of any student as he enters the art room. The form must not be so extensive as to interfere with the function of the hall or the room. The students must agree on what they want the others to do, see, and feel as they pass from one space to the other. They must agree on how sturdy the forms must be and how long they should last. They may be shown techniques of scoring and bending the cardboard and curving it for a scooped wall, arch, or cylinder. They must devise a way to use the doorway to prevent people from avoiding their passage and they must suggest the treatment of the interior and extra supplies needed to suit its function, i.e., textural considerations.

They must consider the light source and safety.

ACTIVITY D:

A future project or follow up experience for an advanced student could include these:

a. Survey an area outside. Design the space for playground, parking, theater events, workshops, etc.

b. Survey a residential area. Interview the residents. Design a model for an improved residence based on the needs of tenants.

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CURRICULUM GUIDES:

Aesthetic Education Program
Cemrel, Inc.
3120 59th Street
St. Louis, Missouri, 63139

Materials designed to enhance students capacities to perceive the aesthetic qualities and values in experiences and to make informed aesthetic judgements about these.

TEACHER'S NOTES:

MUSIC IN THE ENVIRONMENT

A Junior High School Music Unit

Our environment, both natural and man-made, produces sounds. Some sounds are musical, while others are not. By considering music and the environment, one is dealing with aesthetics and values and the manner in which music relates to our personal lives.

This unit deals with some of the basics of sounds and music and with their relationship to the environment. Students become cognizant of sounds through a series of activities and knowledgeable about how sounds are produced. They also have an opportunity to construct a musical instrument and become aware of the natural resources used in commercial instruments.

The concepts presented in this unit serve as points of departure for the teacher and students to join in an aesthetic experience with the environment, using music as the focus.

INSTRUCTIONAL OBJECTIVES:

1. Students will become cognizant of sounds in their environment.
2. Students will be knowledgeable about the formation of sounds.
3. Students will be able to distinguish between sounds and music.
4. Students will be knowledgeable about the purpose of rhythm, melody, and harmony in music.
5. Students will have a greater knowledge and appreciation of musical instruments.

CONTRIBUTORS TO THE DEVELOPMENT OF THIS UNIT

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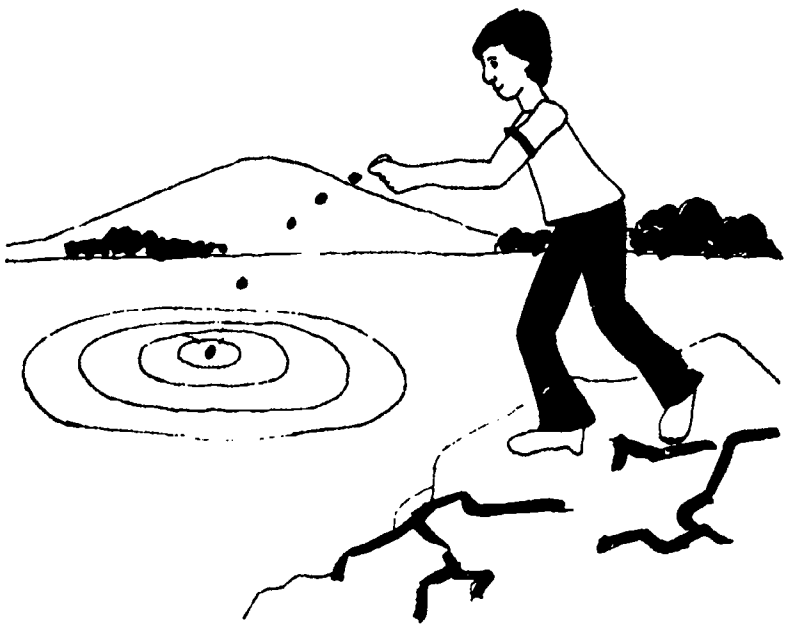
EXPERIENCE #1:
WHAT IS SOUND?

OBJECTIVES:

1. To provide the student with communicable definitions associated with sound.
2. To provide the student with positive interactions with the sounds of his environment.
3. To increase the student's awareness of otherwise unnoticed sounds.
4. To provide the student with the talent of distinguishing differences in qualities of sound.
5. To acquaint the student with the many sounds of both man and nature.
6. The student will have workable definitions regarding sound.
7. The student will have lasting experiences with the effects of sound.
8. The student will have a keener sense of listening.
9. The student will be able to estimate how far a sound has traveled.
10. The student will be aware of how sound travels.
11. The student will be able to distinguish between qualities of sound and sounds of different pitches.
12. The student will have some knowledge about how the ear works.
13. The student will have some knowledge about how the telephone works.
14. The student will be able to compare the constructions of a telephone and of the human ear.

Teacher's Note:
Music depends upon the phenomenon of sound to carry its message. Without sound, music could not be possible. Therefore, this Experience will deal with sound: its nature, characteristics and effects. The concept can and should be expanded wherever there is an inclination to do so.

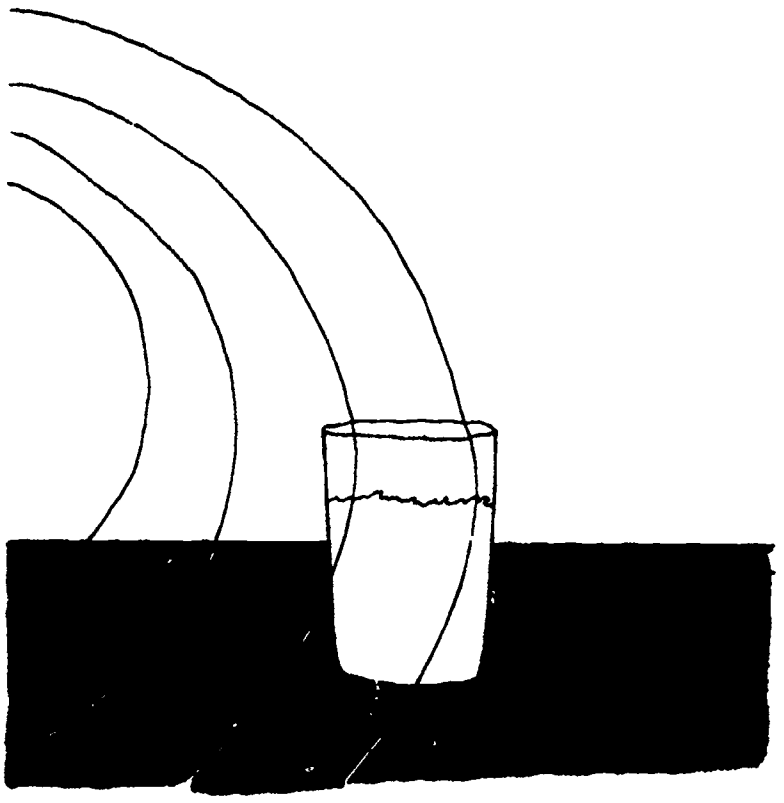


ACTIVITY A: WATER VIBRATIONS

Have students toss pebbles and stones of different sizes into a pond, a swimming pool, or a wash basin, and note how far the ripples travel and how the distance depends upon the size of the pebble. Now have the students throw, with force, stones of approximately the same sizes as before. Note the differences in the speed and the distance of the ripples when force is applied.

As demonstrated by the experiment, the ripples varied in size and distance traveled, depending upon the size of the stone and the thrust behind it. A small pebble's ripples didn't travel as far as a larger pebble's ripples. So a whisper will not be transmitted as far or as clearly as a cheer.

What woke you this morning? The sound of an alarm clock? The sound of your mother's voice? How do you know when you are late to a class or when to change classes? The sound of the bell ringing? People would be lost without sound. A man knows when his car needs work by the change in sound. A woman knows when a pot of coffee is ready by the sound that it makes. We know it's morning not only by the fact that the sun is up but the sound of birds singing. Sounds help us in many ways. Sound is anything we hear. Sound is the sensation that uses the auditory canal for its realization.



Sound is caused by an object in motion. An object set in motion is said to vibrate. When an object vibrates, it disturbs the air around it. These disturbances or vibrations set up patterns that move through the air until received by the ear, which converts the impulses of air movement into audible symbols. Some objects vibrate more rapidly than others. Objects that vibrate at rapid speeds produce sounds that are different from those of objects that vibrate at slower speeds. The difference between the two sounds produced is the difference in pitch of the two objects.

Pitch is the degree of highness or lowness of a sound. The faster the vibrations, the higher the pitch; the slower the vibrations, the lower the pitch.

Examine a piccolo and a flute. They are constructed in the same manner. However, one, the piccolo, is half the size of the flute. It vibrates faster. It produces a pitch that is twice as high as that of the flute.

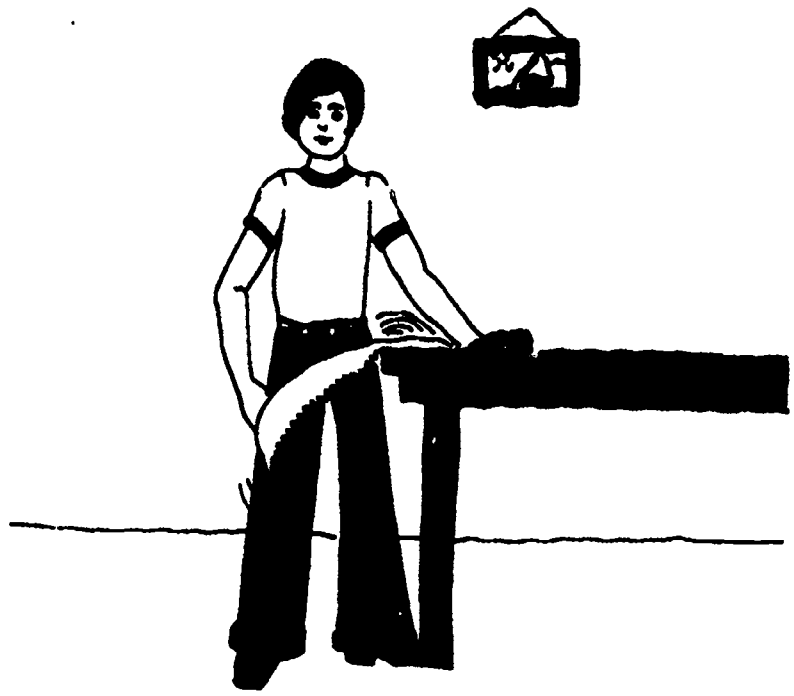
Materials:
Swimming pool, pond or wash basin filled with water
Pebbles and stones of different sizes
Piccolo
Flute

ACTIVITY B: PITCH VARIANCES

Take a clothes line of about three feet and untwist a coat hanger to the same length. Select two students. Each will carefully twirl his object, one at a time, while the class notes the differences in the sound of each.

Sound travels through the air. The traveling of sound through the air is called transmission. An object vibrates in the air. These vibrations are then transmitted through the air until they reach an object that is capable of converting these vibrations into sound. An object that converts vibrations of sound into sound is called a receiver. The human ear is such a receiver. Sound travels like ripples of water when a stone has been tossed into it.

Materials:
A clothes line or rope, three feet long
An untwisted coat hanger three feet long



Using an ordinary hack saw blade, either placed in a vice or held on the edge of a table, pluck the free end with your finger tip. By changing the length of the free end of the blade, you will be changing the frequency of oscillation. Using as much of the blade as possible to vibrate should produce a frequency of about 5 CPS (CPS is an abbreviation for "cycles per second). When the blade is held so that the free end is only two inches long, the frequency of vibration is in the neighborhood of 180 CPS. Which frequency can you hear?

Materials:
A hack saw blade

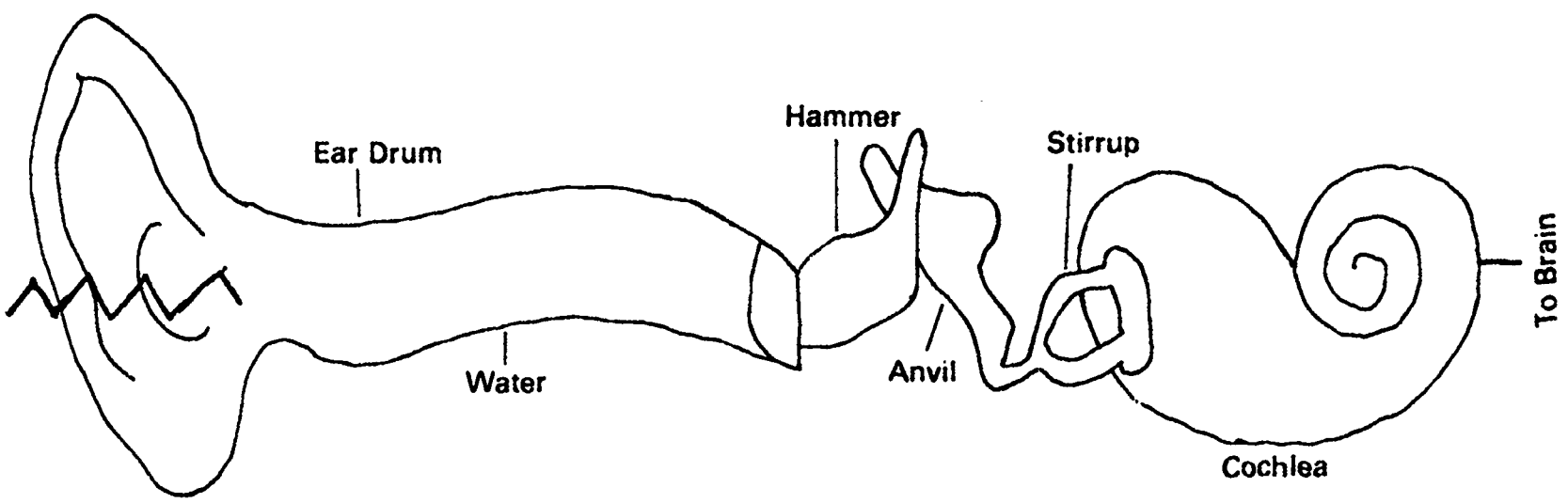
ACTIVITY C: THE FREQUENCY OF OSCILLATION

Physicists and engineers usually describe the rapidity of oscillation by giving the number of complete to-and-fro swings (or "cycles") which are made in one unit of time. This number is called the frequency of the oscillation. In an ordinary grandfather clock, the leftward and rightward swings both give rise to ticks, so that the frequency of ticking is twice the frequency of the pendulum.

ACTIVITY D: THE HUMAN EAR

A sound, after being transmitted, must have a receiver for the sound to be realized. We have been provided with a most useful and effective receiver, the human ear. The ear is so constructed as to receive vibrations and convert them into patterns of sound.

Sound vibrations enter the ear and cause the ear drum to vibrate, which causes the water sac, hammer, anvil, and stirrup to vibrate. The vibration is then transmitted to the cochlea, where it is sent along the auditory nerve to the brain. The brain then converts these impulses to sound.



ACTIVITY E:
PRINCIPLES OF TELEPHONY
(Utilization of outside resource material)

Contact the Public Relations Department of your local telephone company and request a representative to come to your school. In most areas they are more than willing to cooperate with the schools and will give a worthwhile demonstration of the telephone, discuss the principles of sound transmissions, and show the students a multitude of sound equipment. See references section for suggested books:

Benade, Arthur H. *Horns, Strings and Harmony.*

Willson, Ehret, Snyder, Herman, Renna. "Tone and Timbre." *Growing With Music, Book 7.*

EXPERIENCE #2:
WHAT ARE ENVIRONMENTAL SOUNDS?

OBJECTIVES:

1. The student will have the opportunity to experience the "rhythms of the universe."
2. The student will improve his ability to isolate the sounds of his environment.
3. The student will be better acquainted with the many sources of sound in his environment.
4. The student will become aware of many otherwise unnoticed movements and sounds of nature.
5. The student will have a keener ear for listening to specific sounds in his environment.
6. The student will have an opportunity to share his observations with other students, thereby increasing his own ability for the perception of sounds.

Teacher's Note:
This concept is activity centered. Man hears a host of sounds. He has learned to discriminate and listen to only the sounds that are relevant to his needs. Hearing is natural, listening has to be learned. In this experience we will attempt to widen the scope of our listening.

ACTIVITY A:
EXPLORING SOUNDS IN OUR ENVIRONMENT

Eliminate all external sounds. Close your eyes so that you can concentrate on the aural content of your environment.

Eliminate internal sounds. Hold your breath for as long as you can. What do you hear? What don't you hear? Is there such a thing as absolute silence?

With your eyes still closed, listen as someone drops some object. Describe the *object* from the sound alone. Listen again to the same sound; this time describe the *sound.*

As a class or in small groups make a list of all the environmental sounds you can think of. Group them into "common" and "uncommon" sounds, "man-made" sounds and "natural" sounds.

Make another list of words you can use to describe a sound.

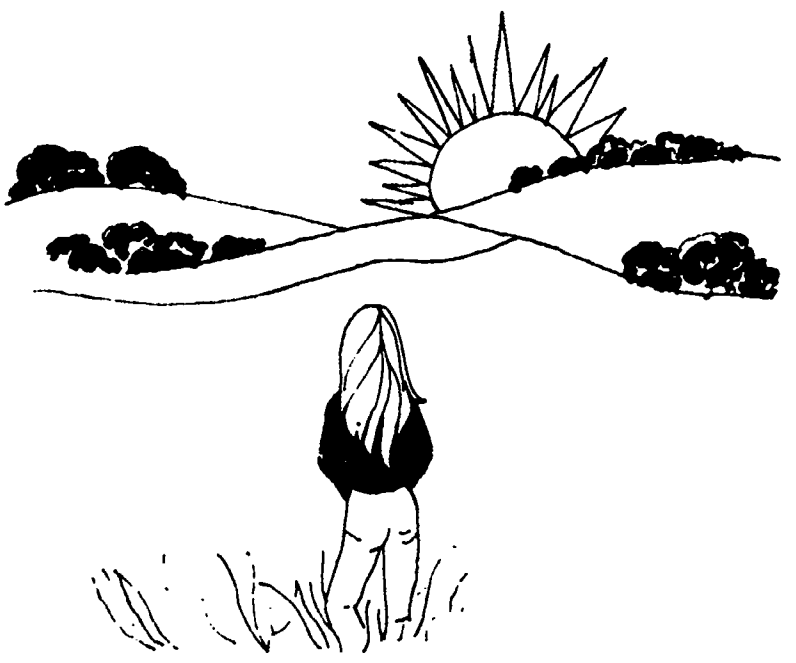
ACTIVITY B:
SOUNDS THAT POLLUTE OUR ENVIRONMENT

From the lists made in Activity A, *discuss* these:

1. Which sounds cause noise pollution or contribute to noise pollution?
2. Are all sounds valuable to someone? Examples: The sound of a chain saw may be considered by someone as a contributor to noise pollution; on the other hand, the sound of a chain saw is very valuable to the man using it, as it may be the means for his support. Can you think of any other examples such as this?
3. What is being done to combat noise pollution?
   a. By industry
   b. By government
   c. By schools

ACTIVITY C: LEVEL OF SOUNDS

Take a walking trip of a busy area, such as a shopping center or a busy store, or to other areas in the school (shop, gym, etc.). Have the students stand back a distance and look at the building or room. Then have the students move closer and listen, noting the changes in the level of the sounds. Have students work in groups of two, one student sitting and one standing. The one that is sitting will tell the one standing what is happening as deduced from what he hears. The two students should then exchange places and repeat the experiment.



ACTIVITY D: NATURE TRIP

Take a trip to a nearby recreation area. Have the students go their separate ways to be intimate with

nature, taking notes of their impressions and recording the sounds of nature. Have them return to a predetermined location for lunch. At the conclusion of lunch, separate again and have each write a simple poem about the most impressive observation made.

Materials:
Pad and pencil
Bag lunch or lunch money
Transportation
Walking the City Observable: Cleveland on the Move. Scored by Robert J. Rice.

EXPERIENCE #3: ENVIRONMENTAL SOUNDS — MUSIC OR NOISE?

OBJECTIVES:

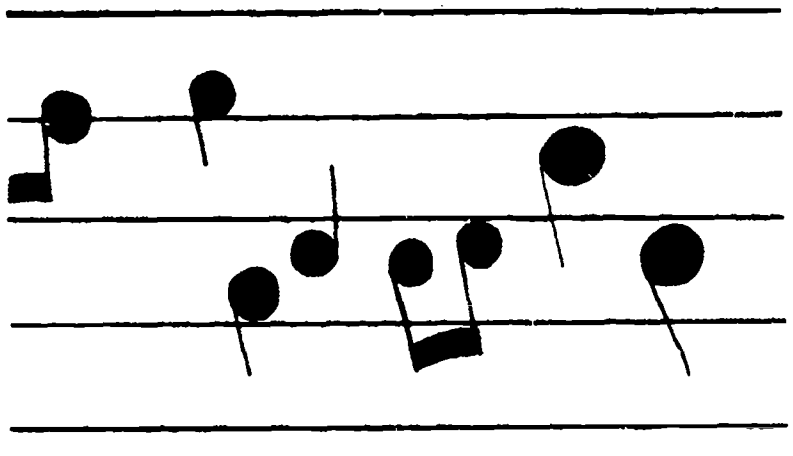
1. The student will be able to use the sounds of the environment in a creative manner.
2. The student will have a knowledge of changing noise to music.
3. The student will have an introduction to rhythm and its movement.
4. The student will have an insight about the movements of nature.
5. The student will be shown that rhythm is the basic moving force in music as well as in nature.
6. The student will be shown the relative importance of the basic elements of music: rhythm, melody, harmony.

Teacher's Note:

There are many sounds in man's environment. Most of these sounds are, if given amplification, considered noise. The contemporary definition of music is organized sound. This concept will concern itself with the sounds of our environment and how they can be modified to be called music.

All sounds are from the environment. Some are natural in origin, and others are centered in man and his existence. All sounds are of two types, music or noise.

What determines when a sound is no longer a noise and when it becomes music?



ACTIVITY A: NOISE TO MUSIC TRANSFER

When the teacher counts to three, everyone in class should begin to rap on his desk. One, two, three, rap. "Class, what would we call these sounds? Yes, noise, Now, everyone will listen to the patterns I will clap. When I am finished, you answer my clap with the same clap."

"What are these rappings? Are they music or noise?"

"Music."

"What makes them music?"

"Organization."

Then the answer to the question of when noise ceases to be noise and starts being music is when the sound has been organized. In other words, a noise is no longer noise thwn it has been subjected to organization. Music is organized sound. Noise is unorganized sound.

ACTIVITY B: RHYTHM, MELODY, AND HARMONY

Nature uses rhythms of many varying degrees to complete her expression of beauty. (Listed below are a few of the movements of nature in time. The class might like, as a further realization of the minute beauties of nature, to make a list of their own.)

1. There are twenty-four hours in a day.
2. There are seven days in a week.
3. There are twelve months in a year.
4. Each species of animal has its own gestation period.
5. The heart beats from 69 to 72 beats per minute.

To show how some musicians have used environmental sounds in musical compositions, we will listen to two different appreaches to the use of sound.

George Gershwin uses environmental sounds to create an atmospheric setting for his *Porgy and Bess*. Leroy Anderson uses environmental sounds in several of his compositions: "The Typewriter Song" and "The Syncopated Clock." If possible listen to each.

What is rhythm?
Rhythm is the movement of music in time. Rhythm is the unifying as well as the driving force in music. Without rhythm there would be no movement of sounds. The tones or sounds once made would never cease, they would never give way to other tones. To better understand the importance of rhythm as a unique aspect of musical organization, we must look at two other aspects, melody and harmony.

What is melody?
Melody is a succession of musical tones. From its definition, melody can be seen as having to move. Without rhythm, however, it would sound its initial tone and these will be in no succession.

What is harmony?
Harmony is the simultaneous occurrence of musical tones. The same holds true here; although there will be the simultaneous striking of more than one tone,

there cannot be an occurrence of the striking of subsequent tones because of the lack of movement.

Thus, we can have music (organized sound) without melody (tonal succession) and we can have music (organized sound) without harmony (simultaneous occurrence of musical sounds), but we can't have organized sound without rhythm.

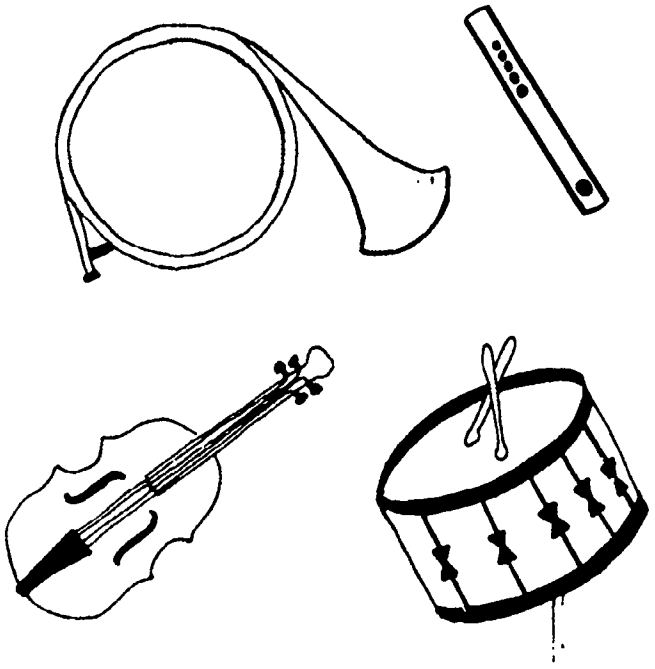
Any and all environmental sounds, if isolated, can be organized to be considered music. Rhythm is the organizer.

Materials:
Pad and pencil
Anderson, Leroy, "The Syncopated Clock" and "The Typewriter Song."
Gershwin, George. *Porgy and Bess.*

EXPERIENCE #4: MUSICAL INSTRUMENTS AND THEIR RELATIONSHIP WITH NATURE

OBJECTIVES:

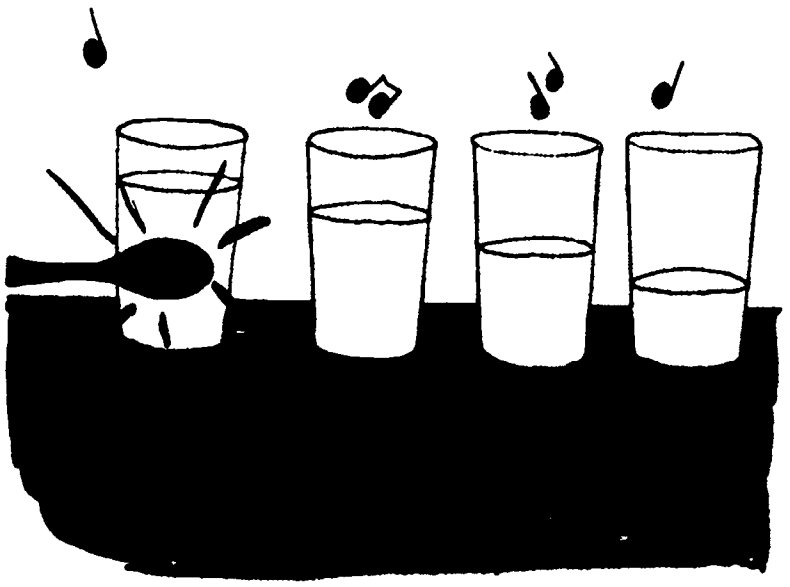
1. To provide sufficient knowledge about musical instruments that will enable the student to construct his own instrument using materials from his environment.
2. To enable the student to use his creative powers to construct this instrument.
3. To give the student a rewarding experience with an attainable goal.
4. The student will gain experience in research procedures.
5. The student will have a greater appreciation of musical instruments.
6. The student's knowledge of how man uses natural resources will be enhanced.
7. The student will develop a deeper understanding of co-existence of music and nature.
8. The student will develop a greater awareness of the value and amount of discarded materials in our environment.



ACTIVITY A: WHERE DO MUSICAL INSTRUMENTS COME FROM?

Without natural resources, musical instruments could not exist. The four families of instruments, woodwinds, brass, strings, and percussion, are all made from materials provided for us by nature. Examine as many musical instruments as you can.

As research projects: Determine what kinds of wood are used for making violins and clarinets. Are brass instruments really made *only* from brass? Why are some instruments worth $200 and some valued at $2000? Do we depend on animals for any part of musical instruments? What are clarinet reeds made from? What raw materials are phonograph records made from?



ACTIVITY B: A "DO IT YOURSELF" INSTRUMENT

From what you have learned from Activity A about instruments, having examined them and done research projects concerning them, construct your own instrument patterned after a real instrument. Use only materials readily available. (Example: discarded plywood, copper tubing, cigar boxes, coffee cans, etc.)

ACTIVITY C: THE TAPE RECORDER AS A MUSICAL INSTRUMENT USING THE SOUNDS OF NATURE

If a tape recorder is available, record as many environmental sounds as possible, both natural and contrived. (Example: birds, wind, waves, traffic, water running, a pencil sharpener, etc.)

Record the sounds at different speeds and play them back at different speeds (1⅞, 3¾, 7½). Try to disguise the original sound by changing the play back speed or vice-versa.

By organizing these sounds (Experiment 3, Activity A) through tape editing (splicing sections of tape together), you will begin to experience the ways and means of how the tape recorder is used as a musical instrument.

Two compositions of worth using this technique are obtainable on record: *Dripsody: An Etude for Variable Speed Recorder* by Hugh Le Caine and *Of Wood and Brass* by Vladimir Ussachevsky.

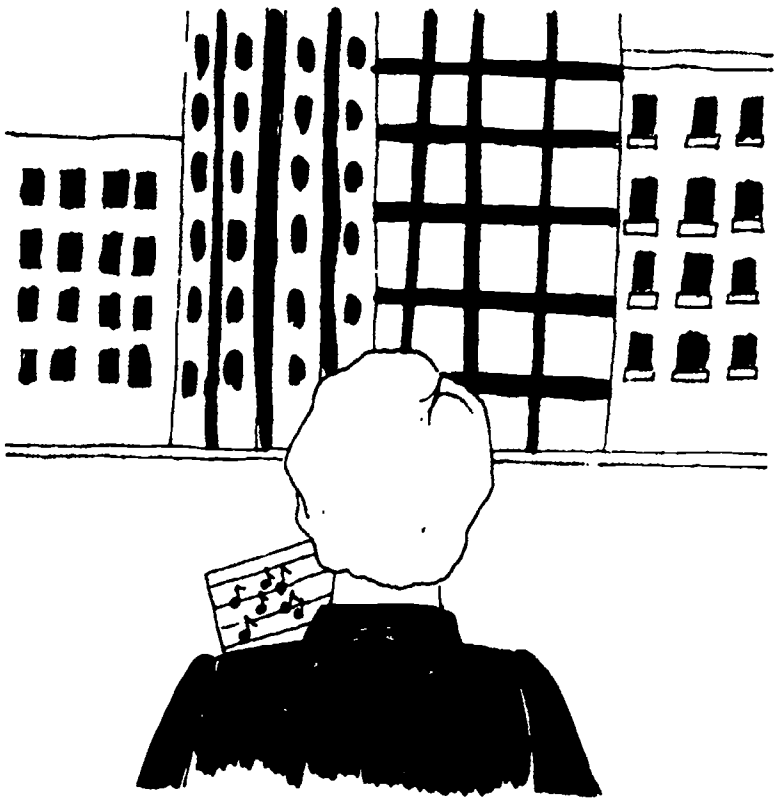
EXPERIENCE #5: WALKING DANCE TOUR

OBJECTIVES:

1. The students will become aware that their environment provides a form of music which can be detected.
2. The student will become knowledgeable of the fact that composers reflect environmental sounds in musical compositions.

Teacher's Note:
This activity is an optional experience written specifically for areas in downtown Cleveland. The intent can be followed by substituting alternative sites available in your community.

(Excerpts from Robert J. Rice's Walking the City Observable: Cleveland on the Move. *Some additions have been made to make it more relevant to your needs.)*



ACTIVITY A: MUSIC IN THE CITY

Make a score. Each person should move through the score at his own rate of speed in any order that he sees fit. However, understandably, the class will have to move together. There should be no conversation among the students until the conclusion of the tour.

There are six specific observation areas indicated within the boundaries of the map. They are Public Square, The Arcade, Euclid Avenue, Erieview Plaza, Prospect Avenue, and St. John's Cathedral. The students should take as long as they wish to make observations in any one place, even if this means that they are not able to arrive at all locations. When they arrive within the area of one of the observation locations, refer to the score for that location. Specific guidelines will be given under each location's heading. The students will be collecting a lot of data and making a lot of recordings. Make written notes or sketches as you see fit in order to take full account of your observations. Once the students get downtown, they should be instructed to listen to the sounds of the city. Ask if they can separate sounds that are natural from those that are not. They should try to decide what "music" the city is making to accompany its choreography.

Students should look at the colors of the city. How do the weather and light of the day affect the city's mood? What does it do to his mood? Do any colors attract his attention more than others? They should think of the dance of the city as being composed of all things that move: people, traffic, doors, trees, fountains, birds, etc. The student should try to feel the tempo of the city and then begin to move again *with* that tempo toward the next observation area.

Public Square
This area has much public sculpture (among others, the abundance of the Soldiers and Sailors Monument). Notice the positions of these "frozen forms." The student finds one piece (a single piece or one from part of a group) that particularly interests him. He should try to record the exact position of the piece so that he can take that position himself. He should make notes or sketches to help him remember his impressions. There is additional sculpture inside the Soldiers and Sailors Monument. The students may wish to enter the inside to experience a change of space and sound.

On the corner of Ontario Street and Rockwell Street is an historic iron lantern attached to the Society National Bank Building. Notice the movement of the iron work. How do the forms relate to nature? to fantasy? How does it hold to the building? Trace with your eyes the linear movements of the lantern from its base to the crest of the curve at the top and down the hanging lamp itself. Can these movements be translated into your own movements? Before leaving the square ask how nature is a part of this environment. How are people spaced? How wide are the streets and how is traffic being controlled by specific street directions?

Prospect Avenue
Be particularly aware of the sounds in this area. What is the pace of the movement? Is it any different than what you have experienced previously? How are people moving within the given space?

Look for one word that captures your attention in this area and remember this word. Is there anything unique about the shops in this area?

Erieview Plaza
Walk the plaza toward the building, trying to sense how you feel in relation to the scale of this giant structure. How does this feeling change as you come

closer? How are you being affected by the presence or absence of other people? What is the mood of this space?

Now enter the building and see if you still sense the scale of it from inside. How is the day of the week affecting the movement, sound, and other elements of this space?

After leaving the building, look back at it, tracing it with your eyes from the bottom to top. What kind of rhythm or music could you create by using the window patterns as your score?

The Arcade

Before entering the Arcade, find a place where you can watch others entering and exiting the doors for a while. How do the people approach the doors — with what sense of timing and speed? How do their movements relate to others who are entering and exiting? When you are ready, watch one person's speed, how he grasps the handle and his energy as he enters. Now enter yourself and notice how your feeling of space is altered according to the level you are on. How are your movements and those of others being determined by the structure of this space?

Move throughout the building, entering any shops that interest you where you have never been before.

Euclid Avenue

Select an intersection where there is a high concentration of people. Don't cross the intersection, but instead stand aside and watch others crossing. Do they travel alone? In groups? Are any holding hands or otherwise making contact with each other? What is the choreography? Cross the street, becoming part of this total sense of movement.

As you continue along Euclid Avenue, notice the objects that people are carrying, pushing, walking with or somehow in contact with. Do you notice any that surprise you? How do these objects affect *your* movements?

St. John's Cathedral

Invent your own tasks for this space. Study the structure from the outside; enter if you wish, being particularly aware of the qualities of light and space. Compare this experience with your experience of the Erieview Tower. Where is the city when you are inside the Cathedral?

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LEISURE/WORK

A Junior High School Unit

The purpose of this unit is to provide an opportunity for junior high students to explore the world of leisure/work and their environment — yesterday's, today's and the future's. After this examination, a relationship among education, work, leisure, and environment can be developed.

The choice of one's life-long work and leisure should be the result of planning and education. Because of the advancement of technology, people live longer and work shorter hours, and so they have more leisure time. For effective living, this leisure time must be rewarding as well as enjoyable.

In this country, there has developed through the years a misconception that education should prepare people for work, but that no particular preparation is necessary for leisure. Today, this type of education is only part of the total educational experience. Recent studies lead to the conclusion that leisure activities are replacing work as the main interest of a large segment of our society. It is imperative, now and in the future, for schools to accept and direct the responsibilities of developing appreciation, interest, and skills basic to the efficient and satisfying use of leisure time.

In a world where the human being is an endangered species, students should be afforded the opportunity to develop an environmental awareness. America has also moved continuously from a goods economy to a service/leisure economy. The possibility of a career in a recreational/leisure or environmental/service field should be explored. Many jobs in the next decade, related both directly and indirectly to the environment, will find their source in this new direction. It is suggested that the teacher mention the collection of career materials to the students a few weeks before beginning this unit. This gives the students an opportunity to contact group associations, societies, administrations, commissions, city, county, state and national services, and businesses to obtain information about careers in various sectors of their lives.

It is necessary to contact guest speakers, secure dates for their appearances, order films and filmstrips in advance, and arrange for equipment. Many school libraries today have developed career packets. If a school has not, the material the students order from various sources should be contributed to the library. A career resource center could be developed as the unit progresses and then presented to the library.

INSTRUCTIONAL OBJECTIVES:

1. The student will clarify his understanding of the terms JOB, WORK, LEISURE, and ENVIRONMENT.
2. The student will gain an appreciation of man's changing work/leisure wold from the days of hand-crafted products and subsistence living to the leisure/service economy of today.
3. The student will grow in awareness of world-wide work opportunities.
4. The student will realize leisure activities must be (or can be) learned and can be as varied as one's interests and work.
5. The student will propose a plan for a choice of a job, a place to live, leisure time, and an individual's contribution for community service.

CONTRIBUTORS TO THE DEVELOPMENT OF THIS UNIT

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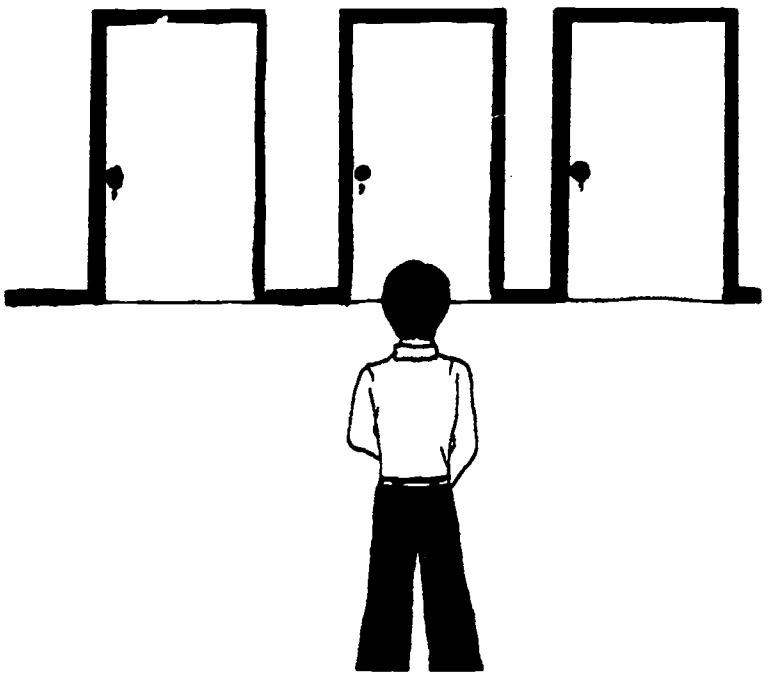
EXPERIENCE #1
A STUDENT EXPLORES THE WORLD OF CAREERS

OBJECTIVES:

The student will research a career of his choice, develop a bibliography, contact speakers, obtain films and filmstrips pertinent to his field, find material to construct visual displays, and plan field trips to visit offices and places of business or commerce. A written research paper is to be presented to the class when the unit is in process.



ACTIVITY A:

Pass out lists of career clusters given below. Discuss possible job/work opportunities under each category. Lists could be teacher-oriented, pupil-developed. Students are to choose two possible careers, first and second choice. The teacher should have suggestions for students who do not fall into these categories.

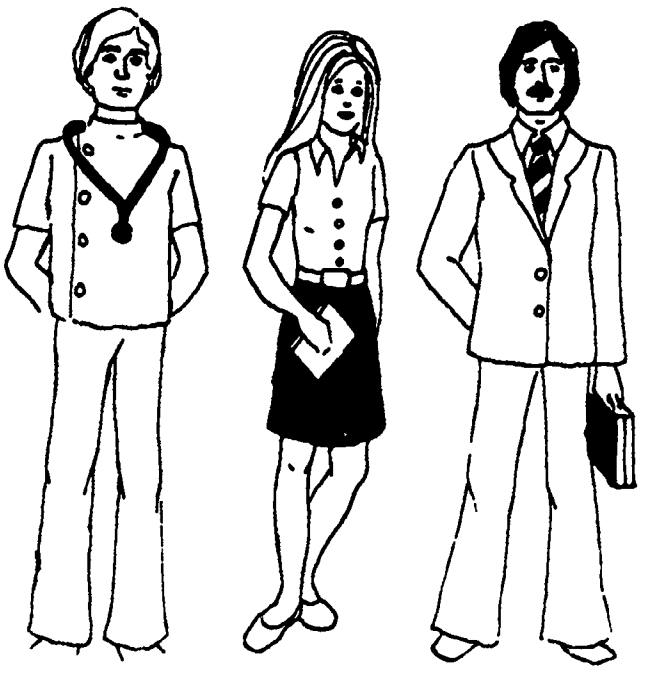
Job Clusters:
Career education is organized around fifteen job cluster defined by the United States Office of Education. The clusters are these:

1. Business and Office Occupations
2. Marketing and Distribution Occupations
3. Communications and Media Occupations
4. Construction Occupations
5. Manufacturing Occupations
6. Transportation Occupations
7. Agri-business and Natural Resources Occupations
8. Marine Science Occupations
9. Environmental Control Occupations
10. Public Service Occupations
11. Health Occupations
12. Hospitality and Recreational Occupations
13. Personal Service Occupations
14. Fine Arts and Humanities Occupations
15. Consumers and Home-making Related Occupations

ACTIVITY B:

Each student will develop a bibliography of research material for his career choice and write letters to collect further information. Letters are corrected in class.

Materials:
Students should furnish their own postage. Paper and envelopes for lettering could come from school office or career fund. Costs of telephone calls could be paid for by a collection made by the students. A map and list of places of commerce within a given radius of the school can be obtained (local telephone directory, service organizations).



ACTIVITY C:

Class chooses possible field trips. Arrangements for time and place must be made early in the year. Select a committee to telephone and write letters for permission to visit.

Materials:
Same as Activity B.

ACTIVITY D:

A cadre of speakers can be organized, for example, a pilot to speak on aviation as a business and the wise use of leisure time. Contacts are made and fees discussed. The charging of fees can limit possible speakers. Use role playing for practicing making telephone calls to possible speakers.

ACTIVITY E:

Who are the important people in the student's chosen field? Students should read bibliographical sketches, biographies, or autobiographies, and perhaps write a report. Include this report in the research paper.

EXPERIENCE #2
DEVELOPING AN UNDERSTANDING OF TERMS: JOB, WORK, LEISURE

OBJECTIVE:

The student will develop an understanding of the terms JOB, WORK, LEISURE, and ENVIRONMENT.

Teacher's Note:
Certain definitions must be understood in this activity:

job - a piece of business done ostensibly as an official duty, but really for private gains.

work - any activity engaged in, whether remunerative or not (ex. employment, occupation, calling, pursuit).

labor - physical or intellectual work involving great and often strenuous exertion.

leisure - free unoccupied time used for rest or relaxation

ACTIVITY A:

What is *labor* to one person is *work* to another. Have an open discussion on what makes the difference. Suggested topics or reasons:

1. Provides the necessities for living
2. Done for oneself, for someone else
3. Done for love: family love and love of community
4. Gives a feeling of accomplishment
5. Fulfills a human need

ACTIVITY B:

On a bulletin board, large cardboard or the blackboard, divide an area into JOBS, WORK, LEISURE, and ENVIRONMENT classifications. Have a brain-storming session for a short time in each class session. Do this for a few days so ideas can be added to each category. Pictures and drawings could be added. The terms could then be discussed to develop an understanding of the words *jobs*, *work*, *leisure*, and *environment*.

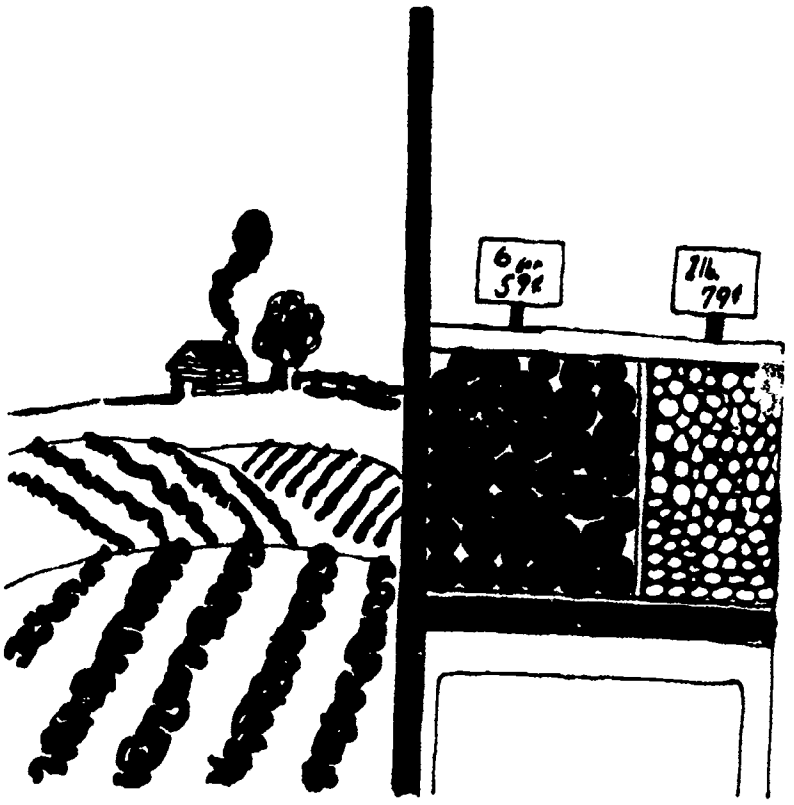
Materials:
Supply of cardboard and magazines for clipping and collecting pictures, supply of scissors, paste, thumbtacks, tape, stapler and staples.

EXPERIENCE #3

A STUDENT'S LIFE COMPARED TO THOSE OF ANCESTORS AND THE NEXT GENERATION

OBJECTIVE:

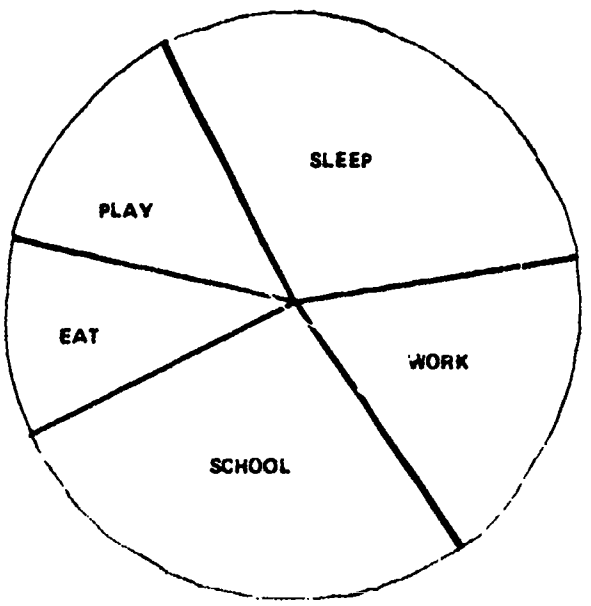
The student will understand man's changing work/leisure world from the days of hand-crafted products and subsistence living to the leisure/service economy of today.



ACTIVITY A:

Students discuss the differing activities and age variation within their family.

1. Father's responsibilities
2. Mother's responsibilities
3. Children's responsibilities
4. Other people in the family and their responsibilities
5. Housing — care needed
6. Dress
   a. How obtained
   b. Care
7. Food purchase and preparation
8. Relationships within the family
9. School day activities
10. Occupational activities
11. Leisure activities



ACTIVITY B:

Using a large graph such as a pie graph, make a display showing a student's home life. Sentences, pictures, and drawings could be used. Student could

show the percentages of time devoted to each activity.

ACTIVITY C:

Divide the class into three sections to represent three periods of time: great-grandparents' era, parents', and the early 2000's. Have each research the lifestyle of that era and write a report, create a poster, make a visual display, do a mural or a series of flash cards, construct a homemade TV, or give a demonstration (ex. soap making, quilting, candlemaking, woodworking, preserving food, etc.) of the work/leisure ideas of that era. It should include all of these:

1. Jobs/work
   a. Occupational (outside the home)
   b. In the home
2. Leisure activities
3. Environment — what the surroundings were like, general living conditions, people's attitudes toward the earth and other people.

Materials:
Supply of cardboard and magazines for clipping and collecting pictures, supply of scissors, paste, thumbtacks, tape, stapler and staples.

ACTIVITY D:

A discussion could follow on what impact each era had on changing more and attitudes toward family and environmental responsibilities.

1. Sharing of food
2. Sharing of natural resources
3. Knowledge of existing water conditions
   a. Ground water
   b. Surface water
4. Changing air quality affects the whole world

Discussions could be full class size or divided into small groups. Were people more aware of the sources of food and water, more directly involved with obtaining these, better able to see the effect of air quality?

ACTIVITY E:

Have the students investigate how work has changed since their grandparents' time. Do people work more hours now than then? What kinds of jobs are present today that weren't present in the past? What kinds of jobs that were present in your grandparents' day are no longer around? Have these jobs disappeared totally or are they coming back in the advent of new lifestyles (communes, health foods, handcrafts)?

Emphasis in the future may be on natural fibers for clothes rather than synthetic fibers made from petroleum products; soap rather than detergents that pollute the waterways; the return of agriculture to natural forms of fertilization; urban design that enables people to walk to work rather than commuting, etc.

What may be some of the jobs your children's children will be doing in the future? Discuss the possibility of a four-day work week. Read reports

about its success in places it is being tested. Discuss what time students feel a woking person should give to his job to receive enough pay to live comfortably. How has the working world changed since 1850 or 1900?

EXPERIENCE #4
STUDENTS INVESTIGATE AND REPORT ON CAREER CHOICES

OBJECTIVE:

The student will locate and use career materal and supplementary material to identify skills and training needed for th career of his choice. The student will become familiar with the particular career cluster and the people involved in that area.

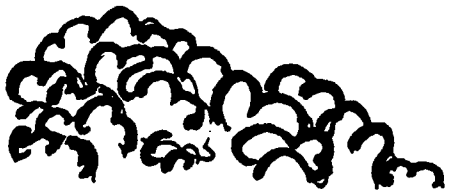
ACTIVITY A:

From the bibliography begun in Experience #1, students should develop a career and leisure bibliography. Organize collected material into packets for future research. Make lists of possible resource people. Collect posters, pictures, and articles for packets relating to a given career.

ACTIVITY B:

Following the session of discussing types of work in Experience 1, each student chooses two work categories (first and second choice). (Students may change the choices they made in Experience 1.) The student then investigates "himself" and the job.

1. Personality qualities needed
2. Motor skills needed
3. Mental aptitudes needed
4. Education and training needed
5. Cost for #4
6. Opportunities for employment



7. Salaries offered
8. Advancements offered
9. Satisfactions and rewards offered
10. Areas of employment available

Write a research paper. The paper could be presented to the class, or there could be an exchange of papers in small groups. Have students consider what salary they will need to live comfortably. What do they mean by comfortably?

ACTIVITY C:

Resource people — people in a given profession — could come into the school for lectures or interviews. Films and filmstrips could be shown.

ACTIVITY D:

Field trips (arranged in pre-unit experience) could be taken. Have a discussion of the significance of the trip. A short summary of the trip could be written and included in a written career report.

EXPERIENCE #5
LEISURE IS THE OPPORTUNITY FOR THE ENRICHMENT OF LIFE

OBJECTIVE:

The student will realize that leisure activities must be (or can be) learned and can be as varied as one's interests and work.

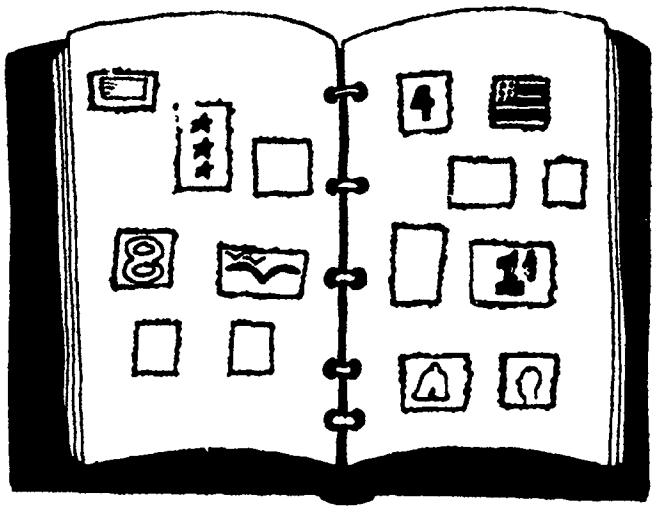
Teacher's Note:
Respect students choice of leisure activities considering his age level and maturity.

ACTIVITY A:

Students should make a list of activities their families consider leisure, the equipment needed, and an estimate of cost and time involved. Have students judge the results of leisure activities, such as vegetables and flowers raised from gardens, clothes or furniture made, etc. (Also consider relaxation, pride, and accomplishment which result.)

A possible division could be as follows:

1. Hobbies
   a. Collections
   b. Animal care
   c. Reading
   d. Drama, little theater
   e. Cultural enrichment, music, painting
2. Crafts, product-oriented
   a. Sewing
   b. Macrame
   c. Remodeling
   d. Cars and mechanical work
3. Home improvements
   a. Decorating
   b. Gardening
   c. Carpentry
   d. Appliance repair
4. Sports
   a. Spectator
      (1) Television and radio
      (2) Attending games
   b. Participation
      (1) Bowling
      (2) Baseball
      (3) Golf



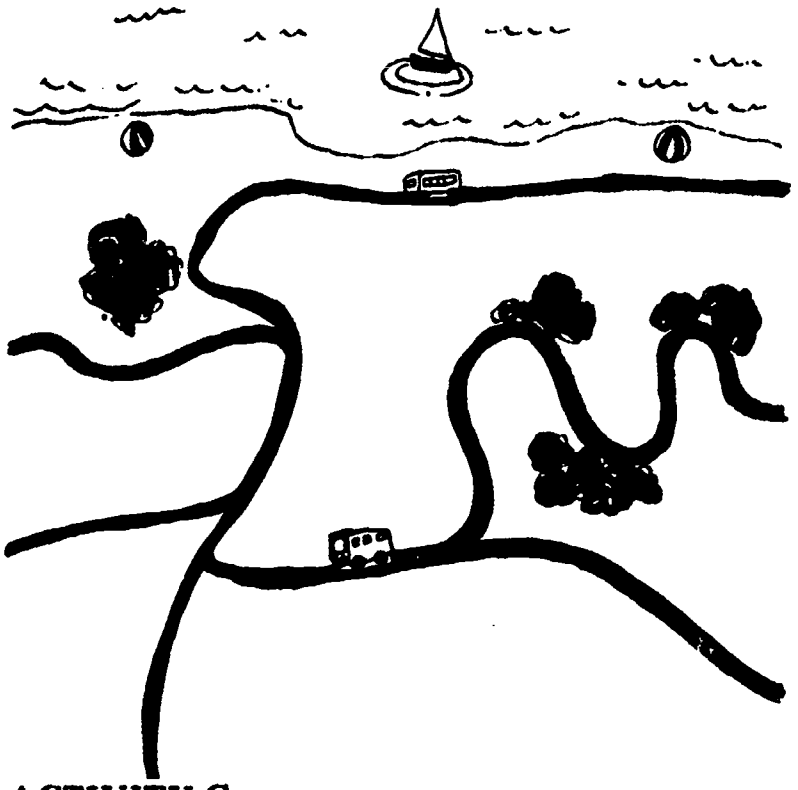
Help students become aware of the great variety of leisure activities by having them invite resource people in who have interesting or unusual hobbies and pastimes.

ACTIVITY B:

Have students map the area in which they live, locate recreational or leisure time activities, estimate travel time involved, note public transportation provided, and suggest possible places for new facilities to be created (roller skating rinks, parks, etc.).

Discuss the prolems of leisure time for junior high students.

Discuss the relationships of individual skills, location, weather, and ability to pay. (For example, golfers could discuss the availability of golf courses, greens fees, cost of clubs and equipment, and winter or rain limitations.)



ACTIVITY C:

There is a decided relationship between a good education (well-rounded one) and cultivated interests (leisure activities). The relationship between school courses and extracurricular activities and leisure time activities could be examined. Have students form seven or more groups. Each group will determine leisure time activities that could develop from the skills learned in a given field of study. Lists could be charted on large sheets of paper or cards and then explained. After the display, each group is given a chance to explain its findings or demonstrate or teach the leisure activity to the class.

1. Physical education: many types of individual and group sports.
2. Science: hobbies related to geology, medicine, biology, astronomy, and ecological interests.
3. Home Economics: cooking, hand sewing, crafts.
4. Manual Arts: woodworking, metal crafts, drawing.
5. Music: glee club, choirs, record collecting, neighborhood bands, personal pleasure.
6. English: reading, writing prose and poetry, acting.
7. Social Studies: World Affairs Club, governmental interests.

ACTIVITY D:

Have the students research the increasing types of jobs that are related to recreational careers. Discuss their findings and their predictions about the amount and type of recreational careers they can expect to see in the next fifty years. Compare their feelings about the term "work" with the possibility of their having a "recreational" career. Most careers in recreation have the worker supplying recreation for their customers. How would working with a recreational activity all day affect what the recreation worker does in his leisure time?

EXPERIENCE #6
THE RELATIONSHIP OF WORK TO STUDENTS' TOTAL ENVIRONMENT

OBJECTIVE:

The student will propose a plan for a choice of a job, a place to live, leisure time, and an individual's contribution for community service.

ACTIVITY A:

Obtain a local map from a service organization, city hall, or the local telephone directories, or draw your own map and duplicate it for students.

Have students orient themselves to these:

1. Places of employment
2. Schools
3. Churches
4. Recreational facilities
5. Transportation problems
6. Service centers
7. Governmental centers
8. Areas which could be re-developed or developed for leisure or community activities.

Materials:

A map of the local area, professionally made and teacher reproduced.

ACTIVITY B:

Each student, after he has chosen his sample profession, chooses an actual locale (or an imaginary one) and makes a map of these:

1. A place to live
2. Location of work
3. Religious activities
4. Schools, if his plan includes children
5. Recreational facilities
   a. Adult
   b. Youth
5. Opportunities for developing leisure activity facilities
   a. Sports
   b. Recreational facilities
      (1) Private
      (2) Public
7. Transportation availability
8. Uninhabited area or areas which could be converted for possible development or public recreational and leisure activity facilities.

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"Thinking About Work"
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"Thinking About Goals"
"Looking at Career Fields"
"On the Road and in the Plant"
"Other Career Fields"

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Focus on America (Regional Films)
The Northeast Region
The Nearwest Region
The South
The Midwest
The Pacific States

THE VISUAL REFLECTIONS OF OUR CULTURAL ENVIRONMENT

A SENIOR HIGH SCHOOL ART UNIT

The use of the visual image in our culture is increasing every day. This visual environment may well become the major form of communication in the near future. Every day the student is bombarded with pictures, movies, signs, books, and magazines which are all vying for his attention, time, and money. How can the student learn to cope with or perhaps escape this increasing demand on his eyes and mind? This unit attempts to help the student understand the purpose behind the use of visuals through the actual experience of creating his own pictures and using the pictures in a project for advertising or information. This unit also helps the student to examine current advertising practices and to "read" their purposes and techniques. Throughout the unit, the student will be able to use his creative and artistic abilities in the development of visual media. A concern for the effect of the increasingly visual part of the natural environment is also covered.

Because advertising plays such an influential part in the lives of Americans today via the mass media, the individual often loses sight of the underlying purposes and messages behind advertising. The student will have the opportunity to examine the role of advertising in business practice today and in the future. He will also have the opportunity to inspect individual ads to discover the purposes, messages, imagee, and the validity behind them. The questions of advertising's uses and misuses, the promoting of sales and the supporting of a cause, will be examined Finally, the student will design an advertising campaign of his own based on visual manipulation and test its effectiveness.

Because of the increasing importance of the wise use of our natural resources, the student needs to examine the environmental effects of supply and demand created through advertising.

This area of study is particularly adaptable to your local scene, using your own environment: lakes, rivers, stripmines, factories, environmental issues, farmland, etc. Its general purpose is to awaken and stimulate the student's interest in his immediate environment.

This unit is designed in two interrelated areas. The first deals with the visual environment seen by using a camera and film. In this section, the student will have the opportunity to take, develop, and use photographs. The second section of this unit investigates the effect of advertising on the public and gives an opportunity for the student to become familiar with the operations of an advertising campaign by creating one. This unit can be taught as two separate subjects or both areas can be interwoven to point out the sequence from the creative design stage to the practical application stage.

CONTRIBUTORS TO THE DEVELOPMENT OF THIS UNIT

Author ..... Louise B. Price
Editor ..... Christine L. Shields
Revisor ..... David F. Cody

TABLE OF CONTENTS

INSTRUCTIONAL OBJECTIVES:

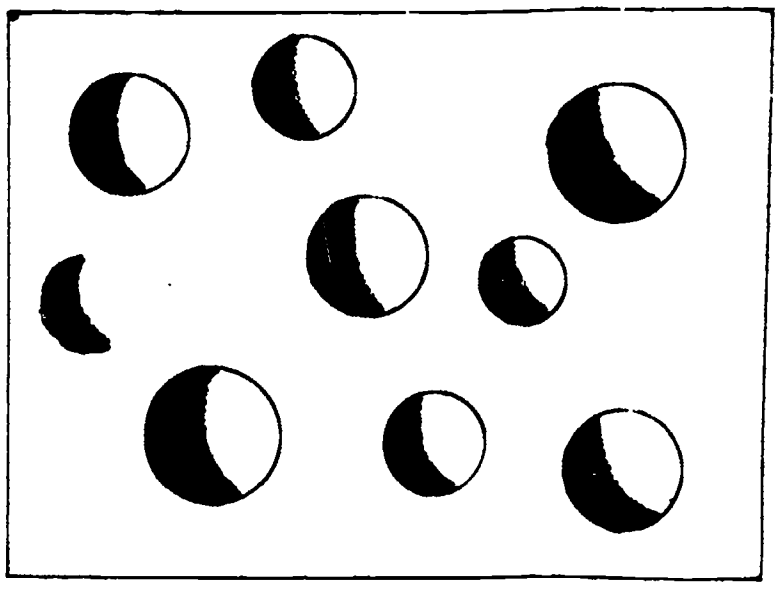
1. The student will become aware of how valuable the sense of sight is to his perception of the environment.
2. The student will learn to focus and become aware of the many components that make up his environment.
3. The student will have an opportunity to make a photograph without a camera.
4. The student will learn to compose in black and white film with value, line, texture, and shape.
5. The student will have an opportunity to see the beauty in common objects and to create surprise effects with ordinary subject matter.
6. The student will have an opportunity to examine the use and importance of visual images in our world today.
7. The student will have an opportunity to experiment with distortion in pictures and the way they can be used to interpret our environment.
8. The students will have an opportunity to learn how a camera works.
9. The students will have an opportunity to experiment with light-sensitive paper, photography, and the development of film.
10. The student will have an opportunity to use the skills of photography and visual manipulation in the betterment of his environment.
11. The student will examine and clarify the uses and purposes of advertising.
12. The student will define the message and effects of advertising.
13. The student will examine an advertisement of the student's own choice and determine the intent and effect of it.
14. The student will plan an advertising campaign to define a company's or organization's environmental image and policy thinking.
15. The student will design and develop different advertising forms for the campaign.
16. The student will examine the trends of advertising and its effects.
17. The student will predict the types and uses of advertisements in the future.

EXPERIENCE #1:
PERHAPS OUR MOST IMPORTANT SENSE

OBJECTIVE:
The student will focus upon sharpening his perception.

Teacher's Note:
Every day each of us sees millions of objects and scenes, but we are really aware of what is happening only a fraction of the time. This unit is designed to help the student learn to focus his eyes, thoughts, and feelings on the environmental stimuli bombarding his mind and to sharpen the student's awarenesss and perception of the quality of his environment.

While doing so, the student is also taught the fundamentals of photography, thereby learning a valuable skill he can use now and later in his life.



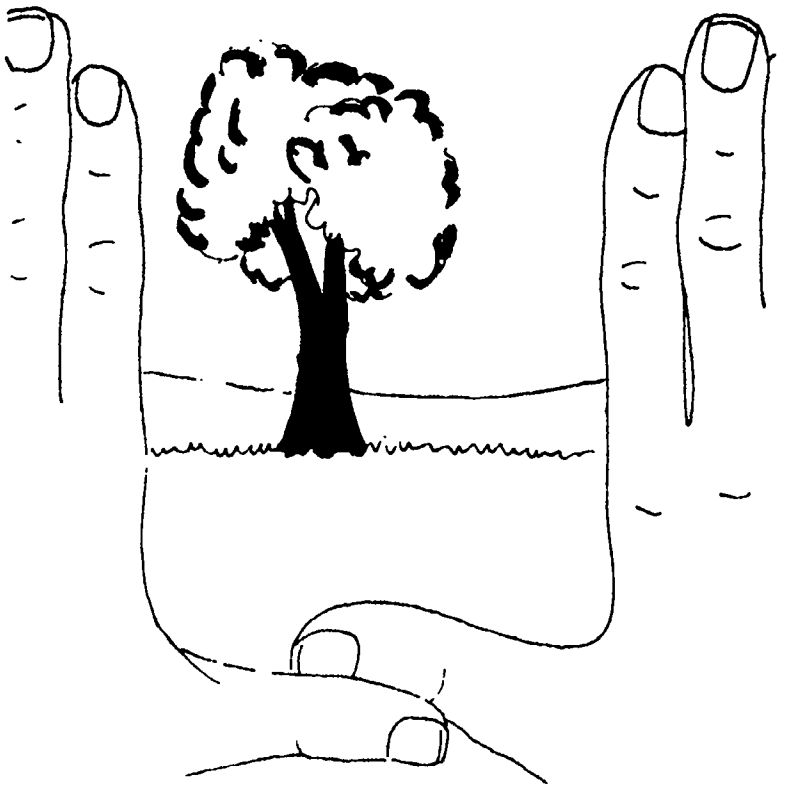
ACTIVITY A:
Very often we take for granted our sense of sight until we have to do without it. Some of us never realize how lost we would be without the use of our eyes. Through our sight, we perceive our environment and learn to relate to it. What if you were to lose your sight? How would you perceive your environment and surroundings then? Try this experiment in the classroom or on the school yard. Blindfold half of the students and use the other half as guides for the "blind" ones. Take a walk and try to determine where you are and what your surroundings are, using only your other four senses. Then exchange blindfolds and have the rest of the class try it. How did the lack of sight affect your mobility, your confidence, and your orientation? Once back in the classroom, discuss the value of sight for safety and for other reasons. Then blindfold one student in the classroom and hand him some object he is very familiar with (such as a pencil or a chalk eraser) and ask him to describe the object. How many times did he mention in his description words dealing with sight, even if he didn't actually see it? (For example, color, etc.) Next hand a student something that he is not familiar with and have him describe it to the class. How does this lack of skill (no sight) affect the student's perception of the object? Consider the old rhyme about the six blind Indians "seeing" an elephant (each perceiving a different aspect of the same entity).

Materials:
Cloth to use as blindfolds

ACTIVITY B:
Examine a poem, a short story, or a description from the newspaper and cross out all words or sections that deal with concepts that can be known to the reader only through the use of sight. What is left? Does the article or poem make any sense? Try to rewrite the article or poem using words or concepts connected not with sight but with the other senses. How does this change its meaning or your understanding of the article or poem?

EXPERIENCE #2:
FOCUSING ON THE ENVIRONMENT

OBJECTIVE:
To help the student learn to focus on and become aware of the many components that make up his environment.



ACTIVITY A:
Often when we view a scene or an object, we are so busy thinking about other things or the thing in general that we cannot see the many small components or characteristics that make up the object. This short activity is to help the student focus in on the object so that he is seeing the object not only as a whole but as the many parts that make up the object or scene. Using your index fingers and thumbs as guides, form little screens to view through, as in the drawing. Boxes or cardboard tubes can also be used. Compare what you see.

ACTIVITY B: SHOOTING MANY ANGLES OF ONE SUBJECT

How many ways can you see one object? Train your minds and eyes to see and observe; use imagination and creativity. Using any object or scene, see from how many different angles you can take pictures of it.

1. close up
2. distance
3. one area very close
4. various lighting
5. various heights

ACTIVITY C: TINY, TINY, TINY

Make a collection or collage of drawings, or photograph as many things as you can that are under five inches long, three inches long, one inch long. Were you aware that there were that many tiny things present in your environment?

EXPERIENCE #3: ONE PICTURE IS WORTH A THOUSAND WORDS

OBJECTIVES:

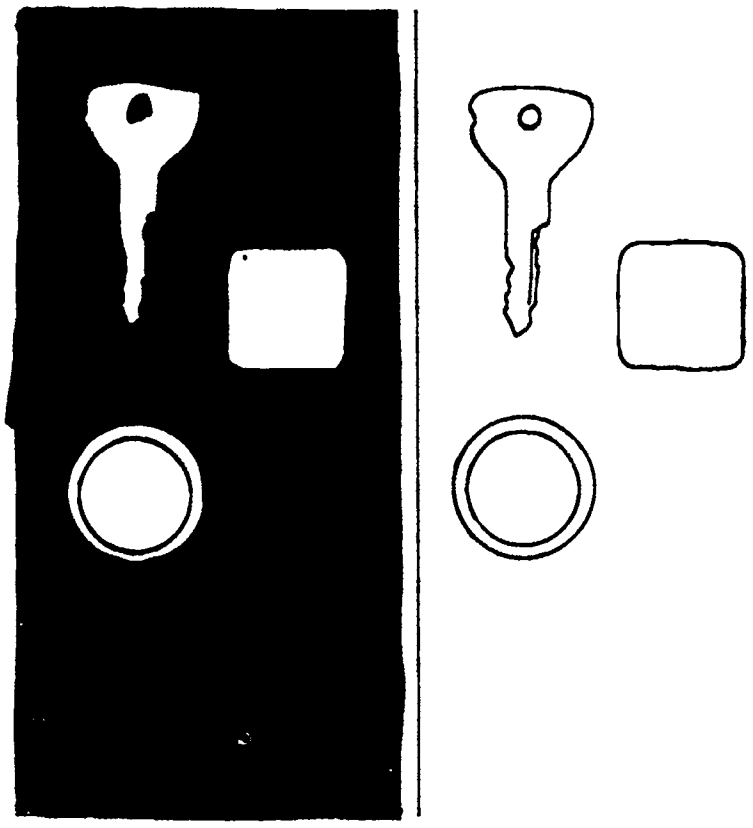
1. The student will have an opportunity to make a photograph without a camera.
2. The student will learn to compose in black and white film with line, texture, and shape.
3. The student will see the beauty in common objects and create surprise effects with ordinary subject matter.
4. The student will examine the use and importance of pictures in our world today.
5. The student will experiment with distortion in pictures and the way it is used to interpret our environment.

Teacher's Note:

Because our world is becoming more and more visual, some educators are even beginning to feel that students need no longer always turn in written reports or themes for assignments but instead turn in visual themes and essays. Whether this will be accepted will depend on the increased use of pictures in our culture. Perhaps the old saying has some merit: One picture is worth a thousand words.

ACTIVITY A:

Photographs are not only made with cameras. In fact, many close up pictures can be made using light sensitive paper and the sun. Have your students try photographing some common classroom or natural objects to form designs and messages. For more detailed instructions and other suggestions, refer to reference entry *Photography Without a Camera*, by Patra Holter.



Method:

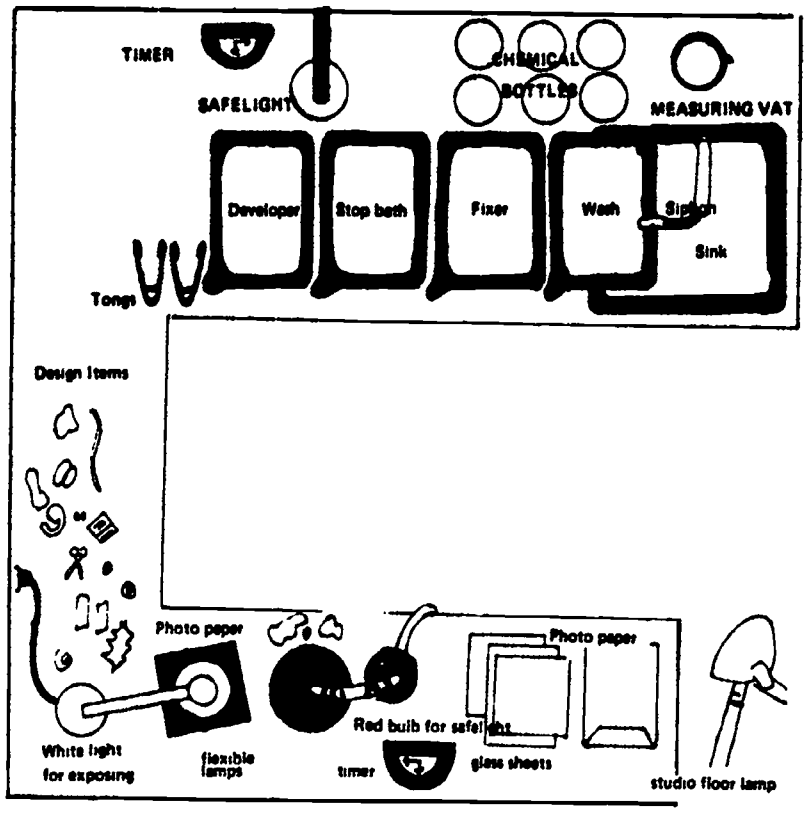
1. Expose paper for 2 minutes
2. Develop for 1½ - 2 minutes
3. Rinse for 30 seconds
4. Fix for 5 minutes
5. Wash in running water in tray for ½ hour or more
6. If hypo-eliminator is used, wash may be cut in half
7. Dry
8. Have a critique on the photograms the following day
   a. What have we learned?
   b. How do we improve?

Materials:

Equip a darkroom that is available to students most of the day. If possible, show samples of photograms found in several scholastic magazines, i.e. *School Arts* and *Arts and Activities.*

A photogram is a *LIGHT* picture. To make one, you need use no camera or darkroom, but rather light-sensitive paper with a strong lamp, 300 w. photoflood.

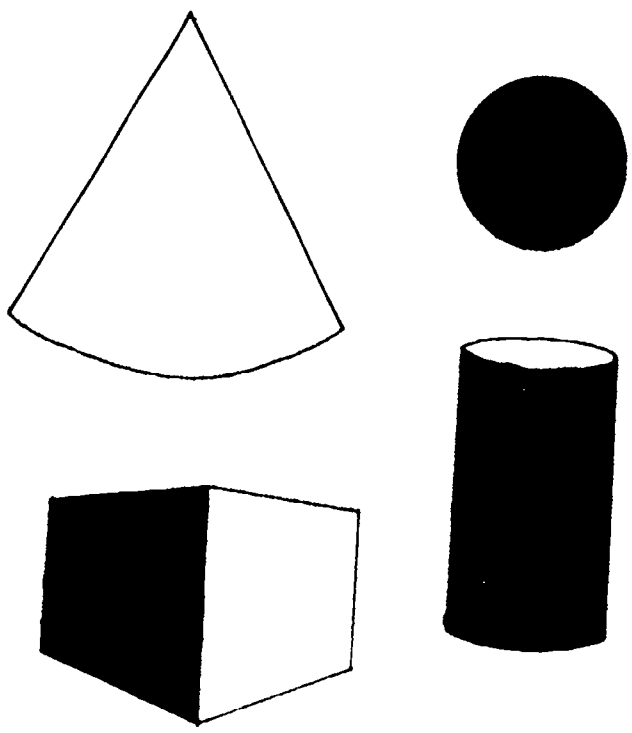
1. Cover 3 tables with plastic.
2. Get 2 photoflood lamps with clamps.
3. Use a roll of At or At-1 paper.
4. You'll need these:
   a. 5 plastic trays
   b. sink with running water
   c. glass rectangles (taped on edges) for holding paper down
   d. developer, stop bath, fix, hypo-eliminator, wash in trays
   e. paper towels
   f. lace, weeds, paper, scissors, string, wire, and any assorted objects found around art room for designs

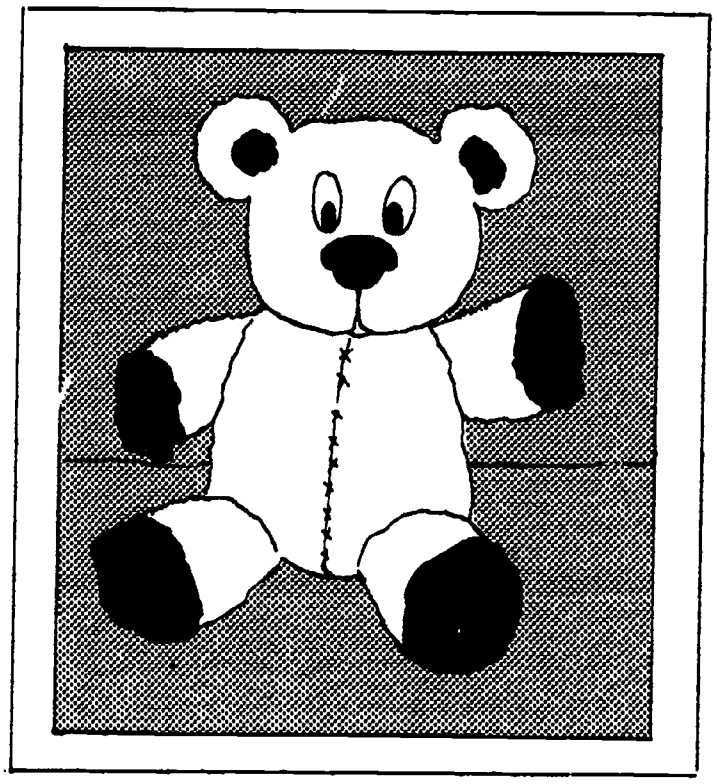


Arrangement For A
Makeshift Darkroom

ACTIVITY B:

Using black and white film, photograph many different geometric forms and patterns found in your environment. Use your photographs to form a large mural or poster. Compare your pictures of man-made objects with those of natural objects. If you can't afford much film, try doing rubbings with blank newsprint and crayons. Find as many different textures as you can in your school and outside. Using these rubbings, design pictures.





ACTIVITY C:

Go out and take pictures of ten beautiful things and ten ugly things. How do your pictures differ from those of the rest of your classmates? Do you have any things in common? Does your picture really show what you feel about the thing? If not, why not? Consider all the travel folders you have ever seen. How did the reality of the place compare with the photograph? Did the picture make the place look more glamorous than it really was? How much was this dependent on the people you were traveling with or whether you had a good time there or not?

ACTIVITY D:

Using a "thought" provoking picture or a series of action pictures with the last one excluded, have the students describe what they see in the pictures. They can write only 1,000 words or less. Have other students who have not seen the picture read the description and attempt to draw or pick out the picture.

From the description, did you expect to see or did you draw something which in actuality was not there? How much did you read into, or by association assume, to be in the "thought" provoking picture? How objective is a picture?

ACTIVITY E:

Take a picture of something in an uncommon way. Try to change the object's dimensions, size, shape, etc. Make a large thing look small, or a small thing large. How is this technique used in advertising? Is it ethical?

EXPERIENCE #4:
THE CAMERA AS AN EYE

OBJECTIVES:

1. To give the students an opportunity to learn how a camera works.
2. To give the students an opportunity to experiment with light-sensitized paper, photography, and development of film.

ACTIVITY A:
HOW TO MAKE AND USE A PINHOLE CAMERA

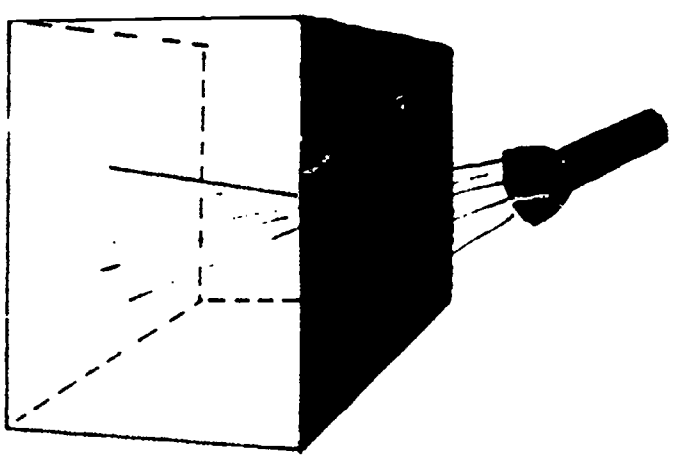
Using either as a demonstration or as examples, have your students make several pinhole cameras to use in their photographic work.

Directions:

1. Find the exact center of the bottom of a box and cut a tiny square, about ½ inch, leaving one side intact to open and close. Tape it with black tape.
2. Make a *round* hole in the center of a piece of tinfoil and paste it on to the square. Use a needle to make the hole.
3. Paint the whole inside of the box with black tempera paint.
4. Seal it with black photographer's tape, after loading it with a piece of sensitized paper.
5. You can make a u-shaped holder with a slit on the edge of the box to facilitate loading and removing paper. Tape this edge up with tape.
6. Allow these exposures:
   a. In a strong sunlight: about 30-35 seconds
   b. In hazy sunlight: about 1 minute or more
   c. In cloudy weather: more than 1 minute

   Experiment with the light and timing.
7. The image will be a negative. Make a contact print to get a positive.

Materials:
Small square box, tinfoil, black tempera paint, paint, paint brushes, knife, masking or electrical tape, film.



ACTIVITY B:
DISCUSSION OF VOCABULARY TERMS AND PARTS OF A CAMERA

Discuss and research the meaning of the following terms associated with photography: f - numbers, negative-positive; shutter and shutter speed, composition, aperture, fractions, depth of field; ASA numbers, different kinds of cameras, different papers; lens stops on enlarger; burning-in; dodging; cropping; exposure; telephoto; wide angle; rangefinder; light meter; thin negative; zoom; emulsion. Refer to reference entrys for help in defining these.

ACTIVITY C:
HOW TO USE A CAMERA

If possible, borrow as many different types of cameras as you can. Have your students carefully examine each camera for similarities and differences. Depending on your time and opportunity, have your students try using each of the cameras. Compare the results. It would be valuable if each of the students were able to have a camera to use on his own, but often it is not possible. If the students can borrow small instamatic cameras, have them do so. If not, consider purchasing small inexpensive cameras such as the Snapshooter. It uses a small lens attached to a film cartridge.

Snapshooter Camera Company, Post Office Box No. 16225, Philadelphia, Pa. 19114

COST: $1.00 plus .50 handling = $1.50 total

ACTIVITY D:
DEVELOPING A ROLL OF FILM

1. Review the procedures and precautions for using a dark room.
2. Remember that one light leakage spoils much paper and film.
3. Demonstrate mixing chemicals for developing and printing.
4. Demonstrate loading the film on a reel in a light room, and have everyone practice it. Also practice this with eyes closed.
5. You must develop in an absolutely dark room with NO lights.
6. Use a developing tank in a totally dark room.
   a. Grasp film, throwing away the paper that is around the film.
   b. Hold the reel in your left hand; if you feel the spokes going vertically, you know it's facing the right direction.
   c. The clip holds the film; film holes on the side fit into the notches; it crimps a little.
   d. Keep your fingers and fingernails off the film.
   e. Never turn the light on while film is still out of the developing tank.
   f. Chemicals are poured into the developing tank; the roll of film is developed in the tank.

g. Use developer D-76 at 68 degrees temperature. Read directions for the type of film you are developing.
h. Invert the tank every 30 seconds or so. Keep it in motion.
i. For Verichrome Pan film you need 7 minutes at 68 degrees.
j. Rinse for 30 seconds.
k. Fix for 5-10 minutes.
l. Use eliminator for 2 minutes.
m. Rinse for 20 minutes in a large pan with photo flo rinse.
n. Dry with a photoclip strung on a taut wire (as a clothes line). Weigh down with another clip.

7. On 35 mm., cut off the tail of the film.
8. Test the strip 5 seconds apart.

See reference entries for help in developing.

EXPERIENCE #5: USING IMAGES

OBJECTIVE:

To give the student an opportunity to use the skills of photography in the betterment of his environment.

ACTIVITY A:

Now that your students are somewhat familiar with the camera, photography, and development techniques, consider doing class or individual projects using photography. The following are suggestions that the class may want to undertake:

Suggested Photography Projects:

1. Air and water pollution: Trace through photographs your city's skyline, give photographic evidence of pollution, or compare amounts of pollution on different days and at different times of the day. Set up an exhibit of your pictures in a local bank, school, or shopping center. (Be sure to get permission first.) Show your pictures to a local environmental group and discuss the possibilities of forming a clean air or water campaign.
2. Photograph the evidence of litter in your town or on your school site. Display your photos where they would do the most good.
3. Find some evidences of change going on in your environment and photograph the change at several stages. Is this change for the betterment of your environment? If not, what can you do to reverse or stop the change?
4. Go out and take pictures of noise pollution and then make a tape to accompany the pictures. Take either prints or slides. Present your program to another class.
5. Using a well-known phrase or axiom, go out and take pictures to prove or disprove it.
6. Photograph a "happening" and study the evidence present in the pictures about how it began, who actively took part, who passively took part, and how it ended.
7. "Write" a photographic essay on a problem you think is present in your town. Show your essay to someone who you think can help cure this problem.
8. Photograph what you love about your environment (natural and man-made). Then, using an outline of your town, form a collage. Send your collage to someone who is dissatisfied with his environment.

See reference section for an excellent inexpensive aid for ideas from Kodak.

ACTIVITY B:

Teach someone else what you have learned about the camera and photography. Show an elementary class how they can take pictures without a camera. Take them on a photography hike.

EXPERIENCE #6: WHAT ARE ADS FOR? (WHY ADVERTISING?)

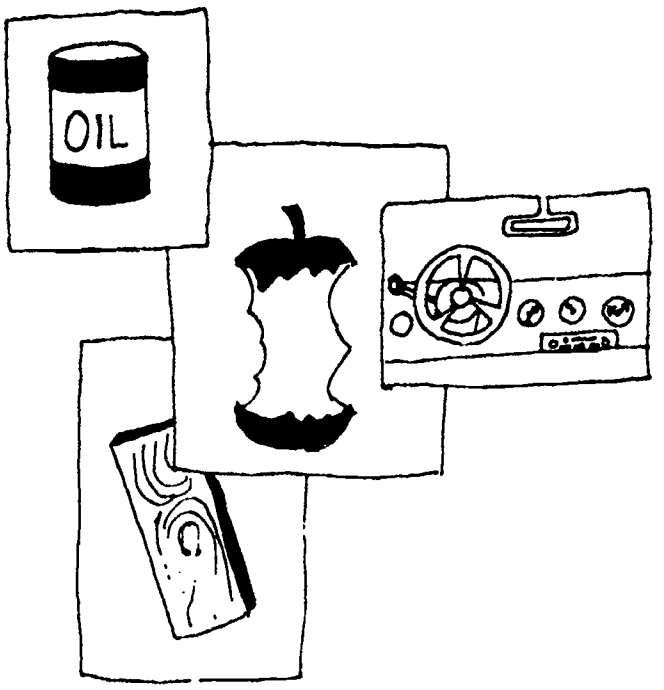
OBJECTIVE:

The student will have the opportunity to examine and clarify the uses and purposes of advertising.

Teacher's Note:

The American public is bombarded daily with so many ads that it is inconceivable that the individual will obtain or visit all the products and places he sees advertised. What then are the reasons for ads?

In this experience, the student will have the opportunity to research the reasons and some of the effective techniques utilized by advertisers.



ACTIVITY A:

Ads can be made to sell anything. The advertiser concentrates on the way the message is presented, the words used in the text, what is pictured or illustrated, and what is omitted.

Try it yourself. Make an ad to sell:

1. something
2. something ugly (chartreuse '50 Chevy)
3. a non-necessity (6 finger glove)
4. junk (and junkyard treasure — One man's junk is another man's treasure.)
5. a miracle

Be conscious of what you actually do to the ad. Ask yourself:

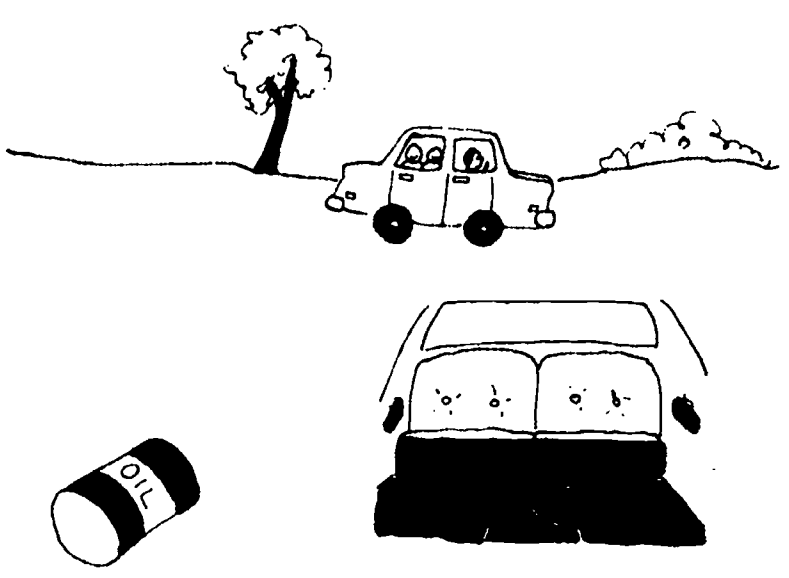
1. What decisive aspects have you omitted? Do these change the intent?
2. Are the words appealing to the intellect or the emotion?
3. Have you presented any misconceptions or made any faulty assumptions?

EXPERIENCE #7: MIRROR VS. PAINTED PICTURE

OBJECTIVES:

The student will have the opportunity to:

1. define the message and effects of advertising
2. examine an advertisement of the student's own choice and determine the intent and effect of it.



ACTIVITY A: GET THE MESSAGE?

Take three or four details of different ads, i.e.,

1. an oil can
2. the car interior
3. people touring by car
4. a place

Then change the details of the newly created ad to give the picture a second meaning.

Using the same technique, follow up this exercise by having students examine an ad with a particular theme, i.e., consumption, waste, alteration, deterioration, modernization, change, recycling, physical and mental fitness, natural food, or lifestyle, and create a change in its emphasis or meaning, i.e., switch color, texture, space orientation or scale.

ACTIVITY B:

Examine current ads for any product and try to determine their message. Try to determine what emotions or feelings they are aimed towards.

ACTIVITY C:

1. Find ads for three products you would use (cleanser, paper towels, etc.).
2. Try the experiments suggested in the ads, using any other similar product such as Brand X. Do the claims of the ad seem to be true?
3. Select any three products. Compare the claims made in their advertising with reports on these products in *Consumer Reports*.
4. Invite a speaker from the Better Business Bureau to explain how people are trapped by false advertising.
5. Do a random sample of people in your community on a certain product or products. Do they agree with the advertiser's message?
6. Sometimes the statistics in an ad can be biased in favor of a product. If you made a project in shop, took it home, and asked your family and friends for their comments, what kind of a response would you get? Could you then say that the majority of people questioned like the product? Select ads which use the "4 out of 5 doctors interviewed..." format. Show how these ads could be biased.
7. Select some ads that deal with environmental issues. How can you be sure what the advertiser is telling you is true? What sources could you check to validate what the ad was saying? Try to decide whether an ad that deals with environmental issues is accurate.

EXPERIENCE #8: YOU ARE THE ADVERTISING CONSULTANT

OBJECTIVES:

The student will have the opportunity to:

1. plan an advertising campaign to define a company's or organization's environmental image and policy thinking.
2. design and develop different advertising forms for the campaign.

ACTIVITY A:

A company's image and their positions on environmental issues reach the public daily. Just stop to think of the myriad of mailers, magazine photos

and ads, newspaper advertisements, posters, flicks, slides, and TV commercials developed to promote these messages.

Contemplate what it is these advertisements are selling. What do they promote along with the image? To focus your investigation, concentrate on the image of a utility or industrial company, an environmental regulatory agency, or a conservation organization. You could become exposed to their public relations theme by simply keeping your eyes open to the advertisements or become more involved by writing and/or visiting their public information department.

You could also become exposed by viewing an available slide presentation of local sites: space *apparently* congested or open, environments *apparently* polluted or un-polluted, or *apparent* condonements or condemnations of an environmental practice or lack of practice. In other words, show clear or cruddy streams; industrial effluents; residential development. Wonder what gives that apparent picture? Is it the persuasive advertisement?

INQUIRY: Assign each student to be an advertiser responsible for an environmental image campaign. If he needs some brainstorming, sources of inspiration may well be the local utility companies and manufacturers, conservation organizations, wildlife federations, or land development corporations. Whatever happens, encourage the student to make his own choice.

TASK: He is to be responsible for conveying the company's image. It may be one of being environmentally concerned, supportive of environmental quality, or involved with a particular environmental improvement. An alternative approach to the P.R. theme may be a campaign concentrating on defending an environmental issue.

Once the student has decided upon either a company or an issue, he will need to be familiar with its purpose, accomplishments, plans, some data, and examples of its public information, literature, and ads.

To research the data, the student may:

1. Write to obtain literature from the agency's own public information department.
2. Read other sources, for example, the Forbes Magazine World Almanac.
3. Interview by phone or personally employees, Better Business Bureau, League of Women Voters
4. Tour the agency

With his findings in mind, the student now needs to zero in upon a position and design the advertising campaign to express it.

CAMPAIGN:

Step 1: *Outline* a plan. Define the objectives, scope, intensity, and audience for the campaign.

Step 2: *Decide* on the forms of advertising to be used, the type faces, the color scheme, and the layouts of the idea, and outline the feelings intended.

Step 3: *Design* the forms. Here are some suggested advertising forms; use the ones most appropriate for your class. Create several advertisements, each utilizing a different advertising form.

a. Black and White Layout:
   1. Make several small thumbnail sketches of your ideas. Crystallize your idea, type faces, color scheme, layout, etc.
   2. Create your layout, using illustrations and text. For additional help, refer to reference section.

   Note: Using blank newsprint or recycled paper can help you cut down paper costs. Most newspaper offices will give you the ends of their newsprint rolls.

b. Mailer:

Teacher's Note:
Design the mailer, assuming it would be packaged with other advertising forms. Consider the design of the whole ad package so that your mailer is complimentary.

   1. Design a "direct-mail" advertisement which would theoretically be mailed to the audience your campaign is aimed to inform and influence. The purpose of this mailer is to inform the public of the company's position or stand on an issue.
   2. Incorporate in the design a color scheme in two or three colors. Create a "family resemblance" so as to identify the mailers with the whole campaign theme. Address and stamp the mailers.

c. Billboard:
   1. Design a billboard, tying it in with your ecology theme. Consider in the design aesthetic and environmental elements. Does the design blend, complement, or contrast with the surroundings? Ask yourself these questions: Can I incorporate the considerations of aesthetics and environmental suitability? Are these opposing forces? Are there specifications for where the billboard may be placed so as not to interfere with the area? With the natural setting? Support your reasons for the design, in view of the opposition to billboards as visual blight.
   2. Recommend and design options for the billboard form. Is there some other type of advertising which could serve the same purpose?

d. Displays:
   1. Design for a shopping mall, bank, or business office a display to advertise your position. You might include groupings of illustrations, models, magazine layouts, mailers, etc.

Materials:
Sketch paper, pens, felt markers, drawing paper, (flexible if to be folded for the mailer), rulers, T squares, triangles, protractors, and sample

brochures and advertisements from utility companies manufacturers and environmental organizations.

ACTIVITY B:
YOU ARE YOUR OWN ADVERTISEMENT

Teacher's Note:
In Activity B, numbers 5, 6, and 7. the student is asked to be honest with himself. It is very important that his privacy be respected. Not all students may want to try it, and again, a wish to pass up the activity is fine. Perhaps some students who do these sections might be willing to share some of their discoveries very generally with the rest of the class.

1. Consider the clothes you have on today and make a list of what you are wearing.
2. Compare your list with the lists of the others in your class. Is your list similar or different? Does this tell you anything about how much you want to seem like everyone else in the class?
3. Compare your list with the pictures of people in the following magazines.
   a. *The Mother Earth News or Lifestyle*
   b. *Esquire*
   c. *Seventeen, Teen, or Coed*
   d. *Redbook or Good Housekeeping*
   e. *Hot Rod* or *Popular Mechanics*
   f. *Argosy* or *True*
      (1) Which magazine has the greatest number of people who dress as you do?
      (2) What does the magazine you identified in No. 1 try to say to the public?
      (3) By dressing the way you do, what are you saying to the public?
4. For a week, keep a list of *everything* you buy. Write down the trade-name of the article and how much you paid for it.

   Go through magazines and newspapers and try to find an ad for each product you bought. Prepare a chart with all the advertisements attached.

   What else, besides the product, is the ad telling you? Is it telling you that if you buy this product, you will become more attractive, more popular, have a good time, or project a certain image?
5. List three characters on television that you would like to be like. Do a character study.
   a. How do they walk?
   b. Do they smoke? drink?
   c. Are they easily upset?
   d. Are they smart? funny? sad?
   e. Do other people like them? treat them fairly?
   f. How do they behave when someone hurts them?
6. Repeat the character study in number 5, but use the three people you admire the most. They can be friends, relatives, or famous personalities. Just make sure you're honest with yourself.
7. Do a "you" study. What are you telling people by the way you are wearing your hair, the way you dress, the places you go, your friends? Again, if you are honest with yourself, you should have a little better idea of what you are telling the world!
8. So advertise! Create an advertisement to tell the world about you: your likes, dislikes, hobbies, friends, etc. You just may make a new friend or two!

EXPERIENCE #9:
THE FUTURE

OBJECTIVES:
The student will have the opportunity to:
1. examine the trends of advertising and its effects.
2. predict the types and uses of advertisements in the future.

Teacher's Note:
What is the future of advertising? Will it disappear in fifty or a hundred years, or will there be so much that you cannot escape hearing and seeing ads every minute of the day? The following activities are designed to let the student explore the predictions and possibilities of future advertising.

ACTIVITY A:
THE THROW-AWAY SOCIETY

Read or have your students read chapter four in Alvin Toffler's book *Future Shock*. He discusses the trend of American culture toward a "throw-away" society. He feels that Americans are losing the desire for permanence in their homes, lives, and possessions. How is this "buy it, use it up, throw-it-away" attitude effecting the production, advertising, and manufacture of products? If this trend increases, how will it affect the life styles of the future? Design a "get-rich-quick, throw-away" product and decide how you would advertise it.

ACTIVITY B:

Read the short story, "The Subliminal Man," by J. G. Ballard, in the book, *Eco-Fiction*, edited by John Stadler. (see reference section.) Discuss the possibilities of this story coming true.

ACTIVITY C:

Design a future advertising campaign for a product that might be used in interplanetary travel or life on another planet. Consider the culture of the time and how you would appeal to the intellect and emotions of your public.

ACTIVITY D:

Examine the trends in time used for advertisements on TV and radio. Using a stopwatch, record the amount of advertising per each TV or radio air hour. Investigate the regulations on advertisement time and see if they have changed over the years. Investigate the creation of subliminal advertising and why it was outlawed. Discuss the possibility of a "big-brother" type system in the future and how this would affect the advertising of products. Read Orwell's *1984*. What happened to advertising and competitive business?

ACTIVITY E:

Predict some future forms of advertising, for instance, chemical substances injected into foods that create a desire for one company's product. How do your predictions affect the rights of the consumer and his free choice.

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OTHER RESOURCES

Snapshooter Camera Company, P.O. Box 16225, Philadelphia, Pennsylvania 19114.

TEACHER'S NOTES:

THE PERFORMING ARTS

A Senior High School Unit

This unit is designed as an approach to learning through aesthetic and sensory perception. It emphasizes self-image, self-discipline, flexibility, the development of skills and techniques, and evaluation, rather than "teacher's" images, tight structure, textbook design, talents *per se*, and grades.

Not aimed to be a series of detailed lesson plans and reference sources, it is a series of activities: the teacher and student are encouraged to come alive to the immediate experience of their environment. So as not to accumulate vintages of experiences, the suggested activities utilize these experiences as sources for expression: mime, drama, improvisation, dance, or any other choice from the art forms.

The activities are aimed to encourage student and teacher participation in aesthetic experiences. The forces of these is exploration. This necessitates trying new experiences. The teacher is to guide the student's performance so that the learning is always a shared awareness and enlightment.

Of major emphasis is the opportunity for the student to express himself about his environment through the art forms. This dictates polishing his self-awareness and adapting to the self-discipline of a performance. Also vital but of a secondary nature is the mastery of skills and techniques which constitute an aesthetic expression.

The study of the art forms and the masters of the arts may expand the student's appreciation for the forms themselves and for the skills and talents of those who use the aesthetic for personal expression. It is hoped that the achievement of the unit will be the student viewing himself and his relation to the natural and the manmade environment.

Performance - involvement - is the key. Take the child where he is now. Take his experience, brush it with the educator's experience, and together discover new insights - new learning for self and mankind.

This unit can start with a simple, unsophisticated exposure to the students' immediate environment and be extended into depth and complexity as far as time, interest, and need dictate.

Activities listed in the three experiences concentrate on students becoming more aware of themselves as humans, their relationship to and with others, and their traditions and heritages. In any of the first involvements in an experience, the student needs to find himself in terms of "where he is" - what experiences he has had; what level of maturity he has achieved; what sensory awareness, sensitivity, he possesses - nothing more, nothing less.

Each teacher, knowing his students, can encourage those activities that would be feasible and meaningful to the individual or class. Remember, the student must "do" - perform. Make alternatives known to the students so that they can make choices and set priorities. Let them thus discover the problems to be encountered in any human endeavor. Permit them to discover solutions to these problems. Let them learn their own capabilities and capacities. Let them grow. Vary the choices: individual performances, partners, random grouping. Use any and all of the socializing that takes places in a classroom.

Because this unit is oriented to human values and judgments, to personal expressions and experiences, the classroom must become a "theatre for learners." The educator and the student, "the performers," need to be sensitive to self and others if real learning and understanding are to occur. True knowledge is the corollary of the shared human experience.

Some of the options for the experiences hold students responsible for their actions and decisions, and they are to be assured of the teacher's trust. It will be the teacher's task to offer the situations which manifest trust.

The teacher may incorporate these activities to

1. introduce new materials into an existing curriculum
2. reinforce a previously studied unit or concept
3. develop another environmental study — aesthetic concepts
4. design classwork which encourages students to view themselves and their own environment

CONTRIBUTORS TO THE DEVELOPMENT OF THIS UNIT

Author ..... Mary A. Price
Editor ..... Christine L. Shields
Revisor ..... Pat Freese

TABLE OF CONTENTS

INSTRUCTIONAL OBJECTIVES:

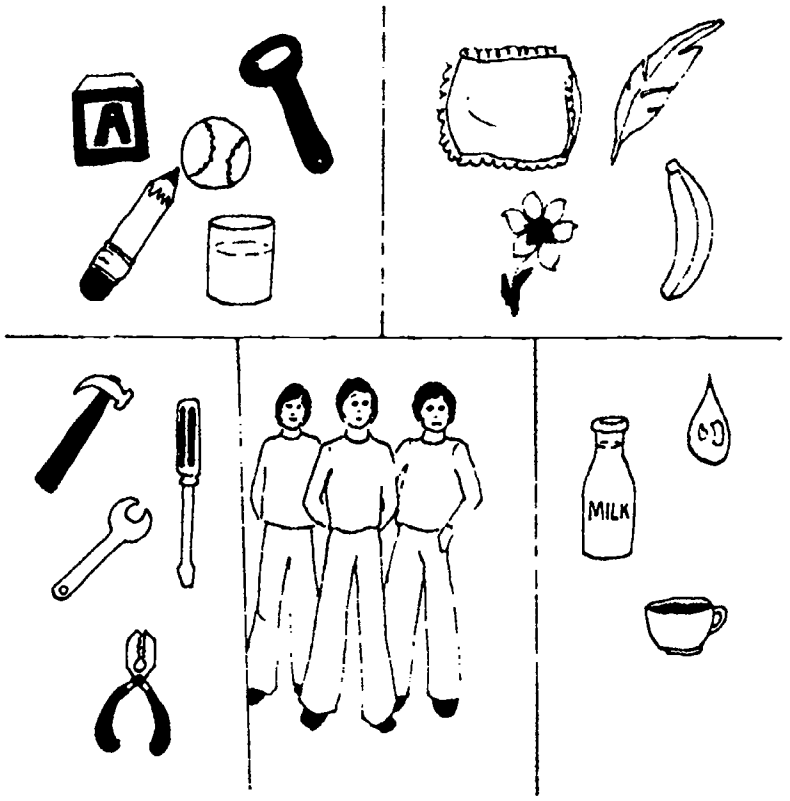
1. The student will expand and extend his sensory awareness to his environment, his creativity, and his imagination.
2. The student will increase an appreciation for aesthetic expressions and interpersonal reactions.
3. The student will increase an appreciation of and for man's uniqueness in his environment.
4. The student will explore and develop values, attitudes, and a sense of self-image and of responsibility towards himself and others.
5. The student will have had an opportunity to establish alternatives, set priorities, and make practical and ethical decisions.
6. The student will be encouraged to respect himself, others, and aesthetic expressions.

EXPERIENCE #1
AWARENESS OF THE SENSES

OBJECTIVES:

1. The student will recognize and discuss environment through the senses.
2. The student will demonstrate his skill and ability in interpreting differing attitudes.

Teacher's Note:
A discussion of childhood games dealing with the senses might be a frame of reference for this learning experience. Games such as Gossip or a rhythm change game, in which the child who has left the room must decide which person is changing the group's rhythm pattern, will stress hearing; concentration, using a tray with various objects, stresses sight, etc. For each game, you might ask directed questions. Which sense was most important? How did you win? What was the object?



ACTIVITY A:

Show the students an object such as paper. What do they perceive about it? Is it heavy? Does it have a rough surface? What can you do with it — can it be changed? They might come to such conclusions as that paper can change size and shape by folding or cutting it; you can make it into another object like an airplane; etc.

Once the students grasp the intent of the exercise, they can be divided into groups. Each group will view a collection of objects. Each collection has one characteristic: small tools, fluids, soft or hard objects, the room itself, and/or the people in the group.

Give them sufficient time to record their perceptions of the objects they find in front of them. As a check to make sure they are on the right track, have the groups one at a time, choose from the teacher's collection an object which is harmonious with their collection and one which is not. By their choice, the teacher can tell if a group needs additional direction.

To conclude, students will gather together and share their experiences. They may express themselves verbally by using short descriptive words or physically by using improvisation.

ACTIVITY B:

The teacher should present varying types of surfaces and weights to allow students to gain familiarity with the environment through touching and feeling. Students should also be encouraged to add to the list and bring into the classroom other examples in each category. Students should also be encoraged to add to the list and bring into the classroom other examples in each category. Students should be given the opportunity to touch and feel all surfaces with eyes *open and shut.* Students may use the same method, as in Activity A, to share their findings.

Differentiate between
rough and smooth surfaces
- tree bark vs. grass
- glass vs. brick

hot and cold surfaces
- classroom heater vs. ice
- hot vs. cold water

light and heavy objects
- a piece of coal vs. a feather
- a rock vs a twig

ACTIVITY C:

The students are given the opportunity to gain familiarity with their environment using their hearing via records, tapes, and other mechanical means. Students should be able to add to the list in all categories and attempt to make each noise vocally. Students may also record (using tape recorder) sounds and noises in their immediate surroundings — school, home, and community, and try to identify each other's surroundings. Sound effect records can be used by the teacher for the same purposes.

Differentiate between:
sound (music) and noise (chairs scraping)
natural (wind blowing) and man-made sounds (music)
natural (tornadoes) and man-made noises (glass breaking)
loud (class changing, bells ringing, dog barking) and soft (car door opening) sounds
loud (TV set on full volume) and soft (tapping pencil on table top) noise
harsh (train whistle) and soothing (cat purring) sound
harsh (chalk grating) and soothing (a waterfall) noise

EXPERIENCE #2
SELF-IMAGES IN NATURE

OBJECTIVE:

The student will develop values and attitudes through aesthetics.

Teacher's Note: Taking a Walk

The following are some ways to experience or sense nature in another form or from another point of view.

The development of these activities grows from the initial experience of taking a walk.

ACTIVITY A:

Teacher's Note:

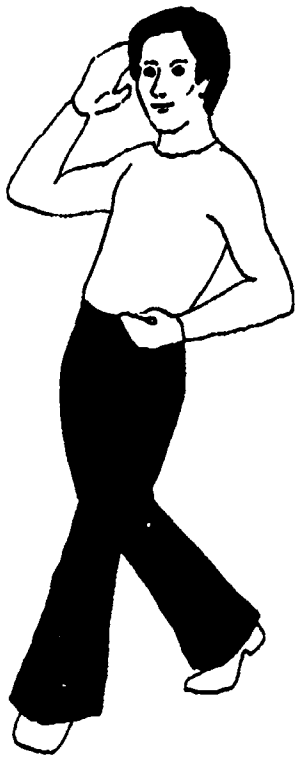
Suggested places which may be appropriate for the awareness walk could be either on the school property, on the way to school, at the student's seat, within the student's head, around the block, through the woods, down the alley, across the street, into town, to the park, by the road, over the hills, under the ground, beside a home, to the cafeteria, into the furnace room, or in the gymnasium.

The student could experience these sensory responses only in the terms of exactly how he has always responded to them, but you can remind him that he probably hasn't used his imagination for a long while. Make him s-t-r-e-t-c-h that imagination and those senses and see something he didn't expect to see.

When he sees it, you should find ways for him to get involved with what he saw, so that he can now see it with a new sensitivity, in another form, from another point of view than he had about it when he rediscovered it.

You have had more time than he to "see." So, guide him, challenge him, encourage him, love him. Together you'll open up a world full of beautiful, unbeautiful, exciting, perplexing, new, and not-so-new experiences for each other.

The students take a walk (preferable without you, to establish trust and a sense of responsibility and maturity early) to sense their environment to find out what the sky really *looks* like, what trees, concrete, soil, and steel really *smell* like, how air and water really *taste*, and what *sounds* the wind really makes. Depending upon your class and school, choose the most appropriate place: either within the students' minds, inside the classroom, or outside the classroom. If you choose to have them go out of the classroom, generate the setting. Suggest questions and *"look-fors"* during the activity. What colors would it take to make a sky collage? Of what materials or fabrics would the colors in the collage be? What forms do the colors take? What are the textures of the clouds, or of the sunlight in the sky? What movements do the clouds make? Are the sky, clouds, and sunlight warm or hot? Does the sky smile or threaten? What does sky *really* look like?



Is the tree an aromatic pine? Is there oozing wax on the bark? Is the pavement dust moist and musty? Does the brick wall smell of heat and humanity?

Do the houses smile? Are they sleepy? Do the buildings run or stand still on the horizon?

Does the soil smell of animal, plant, or man odors? Do the steel girders reek of the acetelyne gases?

What does the environment really *smell* like? How does it move?

On the return from the walk, instruct a student to assume the identity of an object and then to write the human *feelings* the object is now experiencing or has experienced in his own or in this unfamiliar environment. (Be careful, don't structure the student's thoughts too much. Let him create for himself, or rather for his "new" self.)

The next day, read and interpret orally those essays which have expressed the feelings and attitudes of the "foreigners" in the classroom.

ACTIVITY B:

Teacher's Note:
Every English, social studies, arts, and humanities teacher has undboutedly prepared the resource materials and development for many of the suggested topics. Thus, the teacher might wish only to introduce his/her unit through this sensory-awareness approach using the personified object.

Refer to Activity A. After the class has heard the students' essays about the human expressions of a non-human object's sense experiences during Activity A, have the students write short comments cyrstalizing their reactions and observations and identifying the similar human concerns or universal truths threaded through all the comments read or reviewed in class.

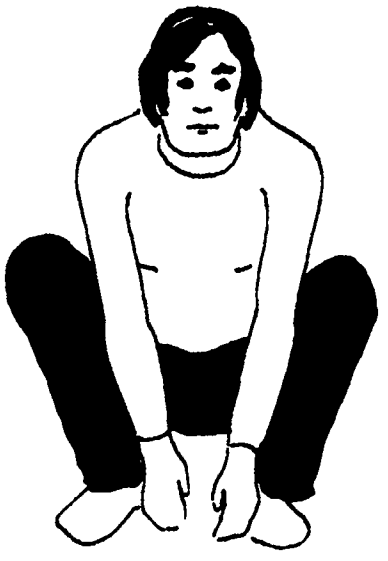
Again share these written observations with all the students so that they will gain deeper insights into their classmates' minds.

These truths or concepts may suggest a unit to develop or explore on loneliness, conformity, inhumanity, litter, pollution, beauty, humor, love, etc., to be extended now or later in English, math, social studies, physical education, and so on.

ACTIVITY C:

Some of the student feedback from the walk suggested in Activity A provides the class with additional alternatives for other aesthetic and sensory experiences. This list is not a sequence of activities; it is rather a list of suggested choices:

1. Have students look for cloud "pictures" and images.
2. Have them draw cloud "pictures" or abstract forms to music (Debussy, *Nuages).*
3. Provide students with geometric forms (triangles, circles, squares, etc.) and free-form figures. From these the students can create images or objects which they have observed on the walk and visuals which are based on these forms (aesthetic extension of math/science). Draw these forms to musical accompaniment — The Love for Three Oranges by Prokofiev, or other appropriate "geometric form music."
4. Have students find and bring back an object. (Be prepared, you'll get everything from discarded kitchen stoves to a cobweb.) Have students assume the identity or role of the object (give it human feelings and responses) and write an essay describing the object's feelings at some point in time.
5. Students can mime the experience or account of the walk.
6. They can assume the identity of the object and mime the experience of being "discovered."
7. They can improvise a dialogue or scene with another of the objects which has been brought in.



8. They can find in literature, art, sculpture, drama, music, or dance examples of other artists' expressions of or about similar objects or values.
9. They can make scrapbooks, murals, multi-media projects, junk media sculptures, or visuals of ideas, thoughts, or points of view revealed in any of the students' previous performances. Display, view, listen to, or discuss student projects in class (performance).
10. They can pretent to thrust themselves into a world devoid of *all* natural elements. Adapt, compensate, project life in a plastic, concrete, and steel world. (Awareness-Futurism is the name of this "game.")
11. They can discover, study, and develop the forms of art that exist in nature and those that man has used in mirroring nature.

ACTIVITY D:

Choose any story, poem, science laboratory experiment, drama, math problem, etc., and act it out live, physically, by textbook verbalization, or preferably, by improvisation (theatre, aesthetics, games, drama in the classroom, performance).

ACTIVITY E:

Create a collage of materials and ideas found in nature depicting such themes as time and movement, the seasons, colors, the natural life, vegetation, and recreation. Try more subtle or sensory approaches with words or ideas expressed through abstract forms — pure aesthetics.

ACTIVITY F:

Maybe the student would like to continue and develop a concept, unit, or topic utilizing one or as many art forms as he chooses. He may wish to portray in depth his own ideas and values. Suggest that he research and review examples of the expressions other artists have created about his thematic idea. The teacher's role is to listen to what the student asks. It may mean reading in between the lines. Send him to the books, the recordings, the media, the museums, the architecture, and the institutions that are available in his immediate environment.

Materials:
Inanimate objects brought in by students
Students' imaginations
Pencil and paper
Library, audio-visual resource materials or centers

EXPERIENCE #3
AWARENESS - FUTURISM

OBJECTIVES:

1. The student will develop an awarness of man's current place in his environment, in time, and in man's heritage.
2. The student will be stimulated to have an involvement in and concern for man's future and posterity.

Teacher's Note:
The development of this experience grows from the students "Taking a Walk", see Experience II, Activity A.

ACTIVITY A:

To stimulate the student's imagination and awareness, suggest that he see, feel, touch, smell, and taste nature, the environment, *move* every muscle, *extend* every nerve, *sense* every sensation.

The the return from the walk (See Experience II, Activity A), the teacher may give the following directives and questions: You have just experienced nature through your senses, nature real and natural, primitive nature, nature touched by man. Now close your eyes and imagine yourself suddenly thrust into a space of nothingness, space devoid of all that you previously sensed when thinking of an environment. What would you do to compensate for the loss of these elements?

How would you hold on to the colors, the sounds, the "feel" of nature? In what ways would you change your living patterns, your life styles, your activities, your use of environmental space? What would you suggest that man do to prevent the destruction of his natural environment and resources?

Write or jot down your ideas while you are still sensing nature. Read and discuss students' ideas in class or small groups. Or mime, dance, draw, sing, cartoon, carve (sculpture), or make a collage of these ideas and experiences. Express yourself aesthetically and share this expression in the classroom. Read, discuss, and absorb this shared experience.

ACTIVITY B:

Mime or improvise your feelings when thrust into the space of nothingness, the void.

ACTIVITY C:

Teacher's Note:
Alert the students that no idea or suggestion is too far out. Tell them to use their creativity, imaginations, intelligence . . . STRETCH themselves!

Choose and develop an in-depth exploration of Awareness - Futurism through the arts. Choose your own theme, media, or form of presentation. See Examples 1-7.

1. Develop an original multi-media presentation using slides, projections, music, photographs, tapes, movies, etc., of your thoughts and prognostications about you as man in space and nature.
2. Develop a puppet show, a mime, or an improvisational production to explain or express your ideas about ecology and the future.
3. Design or construct an ecology game on a particular theme. Examples: resource utilization, survival skills, political debates or legislation for an environmental issue, mock city planning agency, quality of life.
4. Plan and implement a field trip to an area in which special ecological programs or recreational facilities are being studied or implemented.

5. Compose a musical song and score, a ballad, or a narrative poem, or write a play, a short story, or an essay and present it in live performance.
6. Invite ecologists, specialists, and resource personnel to class to conduct a discussion and presentation of current efforts and trends in ecology controls. (Don't forget the artists in all the arts who are making us aware of our humanity.)
7. Present a panel discussion *with visuals* — with charts, diagrams, exhibits — of a study of the proposals and programs for research and implementation of an ecology project in your community or in the world community.

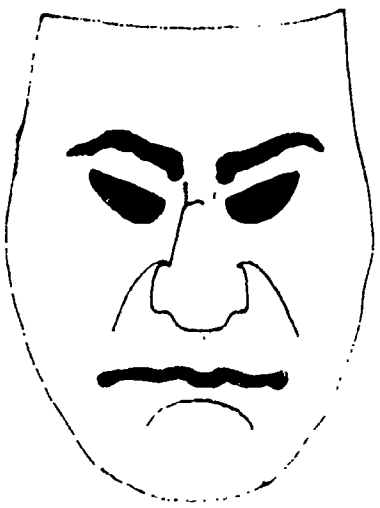
Materials:
Students' knowledge and experience library, audio-visual resource materials or center.

EXPERIENCE #4
REFLECTIONS OF DRAMA
THEATRE IN NATURE

OBJECTIVE:

The student will gain an appreciation of art forms and aesthetic expressions in man's cultural development of his environment.

Teacher's Note:
These implementations or adaptions can be elected as individual projects, developed ideas or threesomes, or enacted by large groups.



ACTIVITY A:

Teacher's Note:
Making a Mask without a Class in Mask-Making

Masks can be made of any material. They do not need to be wearable unless so desired. It's the idea and the creative experience we're exploring and developing.

Paper bags, cloth, paper-mache, cookie dough, salt dough, balloons, cartons, paper plates, ice cream buckets, plastic jars — all are usable materials.

A suggested filmstrip is Play Production *available from Educational Audio Visual, Pleasantville, New York, 10570.*

Let the student choose and develop his own media. Help him to use his imagination, his creativity, and his individuality.

1. Make a mask (see Teacher's Note) that depicts
   a. Any "faces" in nature — trees, animals, plants, etc. — observed on walk
   b. Any feelings or emotions, any sensory stimuli experienced
   c. Any ideas encountered or intellectualized
2. Develop a mime, using the mask, to extend the experience, story, or idea.
3. Add sound with instrumentation, clapping, or voice to develop a rhythm, beat, or pattern.
4. Use costumes and props in the performance to enhance aesthetic, emotional and intellectual elements.
5. Add literary forms, either student-written originals or excerpts from books, such as narration, poetry, exposition, and exhortation, to the performance.
6. Compare and relate objectives and aesthetic forms of primitive rituals and tribal behaviors to those in any period in man's cultural development. Use these same dramatic and theatre forms to explore other or contemporary periods. (Masks become changes in make-up and hair style; mime, the postures and physical movements; sound, the music, noise, speech, and dialect; costumes, the apparel or dress; literature, the language.)

ACTIVITY B:

Discuss and research with a class a trip back in time to primitive man, his environment and his place in nature, in order to discover how, when, and why he used the theatre art forms in his struggle to survive and cope.

In order to look back in time at primitive man and to understand his utilization of the art forms, as we know them today, we need to understand his behavior. To survive in and cope with his environment, primitive man used his senses and instincts. His responses to his environment were sensory responses. Gradually and with time he intellectualized his sensory responses. So the art form was born, aesthetics.

Primitive man *danced* to
   a. Propitiate his gods
   b. Explain his environment
   c. Identify himself

Primitive man wore *masks* and *costimes* to
   a. Hide his identity
   b. Assume new identities
   c. Cope with his environment

Primitive man used *color, form* and *design* to
   a. Arouse emotional response
   b. Express his feelings and ideas
   c. Satisfy his need for beauty

Primitive man used *sound* to
- a. Express his emotions
- b. Explain his environment
- c. Attract attention

Primitive man developed speech, language, and literature to
- a. Express himself more rationally, intellectually, and aesthetically
- b. Communicate more effectively with other humans
- c. Cope with and survive in his environment

Have students construct a project, choosing from one of the above art forms, to express how man (either primitive, contemporary, or future) perceives or utilizes his environment.

ACTIVITY C:

Teacher's Note:
If it is appropriate and feasible, have the students, experience a walk outside of the classroom for this activity. Any and all human action and interaction is defined as drama in the context of this program. The physical, emotional, and intellectual behavior of man is drama. Drama is excitement, suspense, conflict, happiness, tragedy, boredom, the rational as well as the irrational, the conclusive and the inconclusive.

Dramatic literature is that body of recorded manuscripts or literary verbalization known as plays or the drama which portrays human action and interaction, or life.

Have students concentrate about a walk they have previously taken or a place visited. (Perhaps Activity C could follow a field trip.) Have them think about the art forms listed below. Were any part of that walk or place? Prepare for class an expression (performance, mask, etc.) of that experience, using one or more of the art forms.

The arts of the theatre are those aesthetic forms of endeavor in which humans:
1. Act and mime to create and recreate through role playing the human experience.
2. Dance and move in time and space.
3. Compose music to express idea and thought through rhythmical sounds and patterns.
4. Paint and carve to portray the colors, the designs, and the forms of life and nature.
5. Write to express the rational, the emotional, and the intellectual thoughts and ideas of the human experience.
6. Make films, photographs, and videotapes to capture and ensnare time.

Materials:
Students' imaginations and creativity; crafts materials, utilitarian products, or junk, library, audio-visual resource materials or centers.

APPENDIX A: TEACHER ADVISORY

Whenever feasible, let the student bring materials to the classroom to work on. It's messy, but it's a great opportunity for student interaction and growth.

Allow time for a student to think, to discuss with you, to plan, to create and to evaluate his project. Time and silence are commodities we have forgotten to give our students.

Be prepared for days when nothing seems to happen. we all have voids in our creative efforts. Maybe you'll have to be more patient and resourceful at those times.

Remember, success is 10% inspiration and 90% perspiration.

APPENDIX B: EVALUATION PROCEDURES

All performances, projects, and activities should be brought "live" for individual or group response and involvement. Evaluation, observation, and reaction will come through a highly subjective and personal review. *Effort*, not grades or talent, is the criterion.

Since sensory experience is such a highly personal affective learning experience, it should be measured only within those limits. Creativity, imagination, idea and performance (the "doing") are the criteria for measurement. Experimentation, exploration, and exposure are prime considerations for evaluation. Involvement is the magic word.

Utilize the student's own evaluation, either written or oral, of such a question as, "What did I learn from this experience?" Written or spoken comment, questions, or discussion by the class or individual about some phase of the student's production is another means of evaluation. For example, consider one of the following: thematic idea, creativity, originality, medium, effort, enthusiasms.

Also, recognize the problems encountered, solved or unsolved; detours taken, and alternate routes considered; preparations necessitated; joys discovered. These are valuable feedback.

APPENDIX C: GLOSSARY OF TERMS

Aesthetic — The dictionary defines aesthetic as appreciation or responsive to the beautiful in art or nature; of or pertaining to the beautiful as distinguished from the moral and especially, the practical. But isn't the moral beautiful, and can't the practical be aesthetic when it's human experience and values that distinguish what and which is beautiful? "Is a puzzlement," sings the king in *The King and I.*

Artists — the "doers" in the fine, the visual, and the performing arts

Awareness — that state of being which all humans can always expand or extend and which is developed through perpetual involvement in our environment

Environment — all conditions surrounding and affecting an organism

Improvisation — creating by verbal and non-verbal actions and interactions the emotions, sensory responses, ideas, and values of any individual or group of individuals without planning or preparation

Mime — to act out or imitate, usually without words, but sound or words may add to the performance. Mime is non-verbal communication, sophisticated or non-sophisticated, as the performer chooses.

Performance — any and all physical, mental, or emotional response to any given stimuli is a performance. A student may read a book, answer a question, volunteer an idea, argue an opinion, research a topic, act out an observation, write a literary piece, produce a play, dance a jig, film an Academy Award film, sculpt a coliseum, or take a walk. If he has done something human or behaved for his own pleasure or edification, he has performed or given a "performance." (Pedagoguese for the intransitive verb *to do.*)

Sensitivity — that awareness of and response to life by, with, and through our senses; sensory, aesthetic, intellectual performance.

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LEISURE/WORK

A Senior High School Unit

The general purpose of this unit is to develop an awareness in the student that changes in leisure/work patterns are occurring and that these changes are resulting in increasing demands on the environmental resources of land, water, air, and energy. This objective will be reached by investigating past and present leisure/work patterns and formulating some possible strategies to prepare the individual and society to meet future changes and needs.

CONTRIBUTORS TO THE DEVELOPMENT OF THIS UNIT

Author ..... Yvonne Mather
Editor ..... Susan M. Zacher
Revisor ..... Harold B. Wilcox

INSTRUCTIONAL OBJECTIVES:

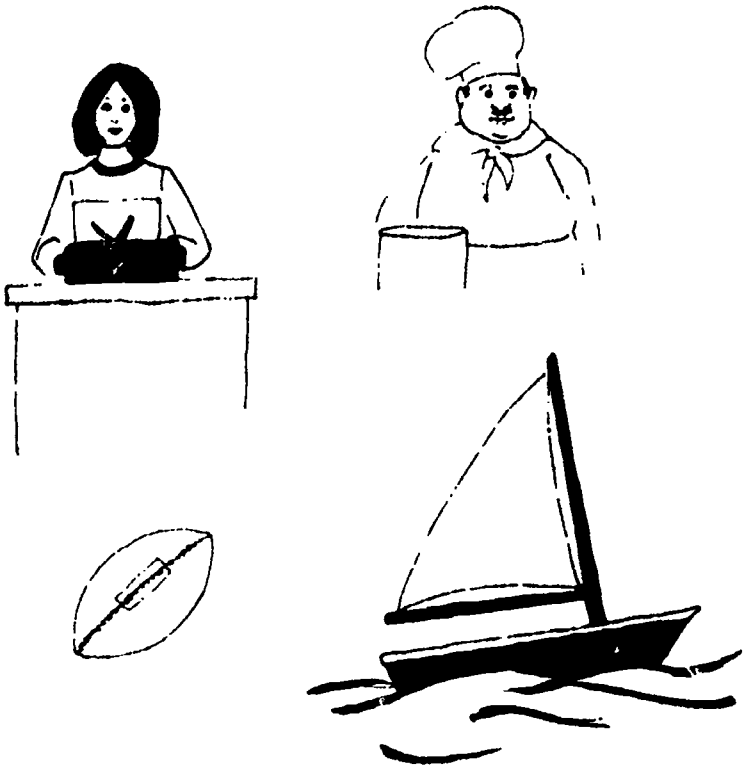
1. The student will develop a basic understanding of the concepts of *work* and *leisure.*
2. The student will recognize the prevailing trend toward an increase in leisure in industrialized countries.
3. The student will understand the causes and effects of increased leisure.
4. The student will make decisions relating to the "spare-time dilemma" caused by increased leisure.
5. The student will have opportunities to consider the effect of work/leisure patterns on the environment.
6. The student will be encouraged to propose some strategies to meet the changing needs of society in the leisure/work area.
7. The student will be aware of the value systems used in choosing work/leisure activities.
8. The student will investigate historical changes in work/leisure patterns. (This objective is optional.)

TABLE OF CONTENTS

EXPERIENCE #1
IS IT WORK OR IS IT LEISURE?

OBJECTIVES:

1. The student will develop an understanding of differences and similarities between *work* and *leisure*.
2. *The student will discover how present day interpretations of work* and *leisure* have become highly individualized.



ACTIVITY A:
WORK VS. LEISURE

The teacher might introduce this activity by showing a series of flat pictures or slides which depict work or leisure activities. These could be shown to initiate a full class discussion, having the students identify the activities in each illustration as work, leisure or both. The illustrations could also be numbered and the students could write reactions (work, leisure or both) to each one. Student answers could be charted and used as a basis for class discussion. The teacher should be prepared for a variety of opinions on most illustrations of work/leisure activity. Different opinions are not only expected but desired at this point. small groups could also be formed in an attempt to reach a *consensus decision* on each side of the illustrations. This would be an appropriate time to teach or emphasize small group dynamics and procedure. Students will become more involved if they are encouraged to help collect the illustrations to be used for this activity. Students should also, very early in the activity, note that the interpretations of *work* and *leisure* are highly individual. At this point, the class or small groups of students should be prepared to react to the following questions and statements:

Which of the activities represent work? Why?

Which of the activities represent leisure? Why?

Which of the activities represent both? Why?

What factors determine whether an activity is work or leisure?

What is meant by the statement: "Men tire themselves in pursuit of pleasure"?

What is meant by the statement: "What is one man's work is another man's pleasure"?

What is meant by the statement: "A man's work is from sun to sun but a woman's work is never done"?

What is meant by the statement: "All work and no play makes Johnny a dull boy"?

Is is possible to have too much work or too much leisure?

If it were possible for everyone to do exactly what they wanted to do, what kind of balance do you think there would be between work and leisure?

The discussion should be free flowing, for a while, but once the ideas expressed begin to show some semblance of consensus, these thoughts should be tabulated under two main topic headings. *What is WORK? What is LEISURE?*

ACTIVITY B: ENJOYMENT

Does enjoyment affect one's definition of work and leisure? Have each student prepare a list of the five activities he most enjoys and the five activities which he least enjoys. Class discussion could include a comparison of student lists and an analysis of work and leisure based on the suggested questions listed previously.

ACTIVITY C:
THE VIEWS OF OTHERS
(See Appendix A)

Recreational questionnaires could be prepared by the students (as a group) and distributed among people of different age groups for a consideration of the scope of activities which are considered work or leisure.

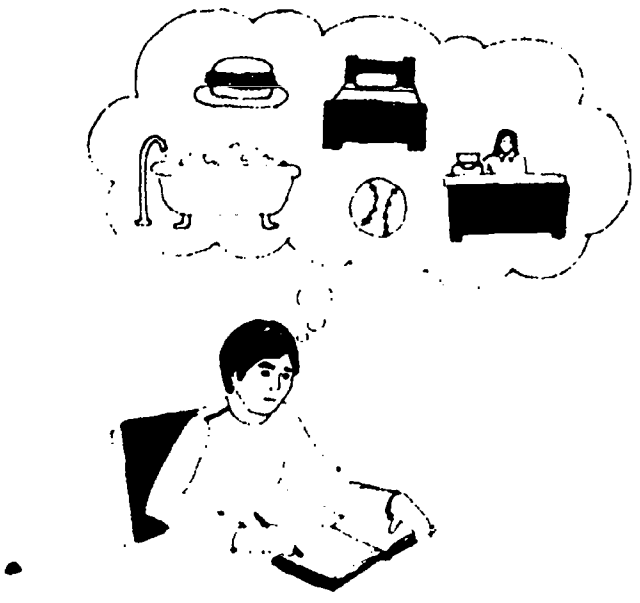
ACTIVITY D:
REVERSE SOCIAL SECURITY PROGRAM

Have the students imagine that at age 18 they go on the federal government's Social Security program, which lasts for the next 18 years. Each month they receive a government check for an amount of dollars to be determined by the class. At age 36 the government payment stops. This reverse social security program would replace the existing system which starts payment for some at age 62. Have the students, individually, develop a plan for spending these 18 years. Armed with their plans, the students should now be placed into small groups (5-7) to discuss and question each other's plans. Each group should then develop a general list of *work* and *leisure* activities which they include in their plans and then report these to the general class. At this time the *value* of any activity may be questioned and perhaps clarified.

EXPERIENCE #2
WE'VE COME A LONG WAY

OBJECTIVE:

The student will recognize the trend toward an increase in leisure time and the change in the work pattern of the industrialized world.



ACTIVITY A:
HOW I USE TIME

To introduce this activity, suggest that each student keep a log of his activities over a certain time segment, as short as a 24-hour span or as a 3-day weekend, including one school day. Suggest that the individual keeping the diary classify each activity as MAINTENANCE (eating, bathing, sleeping), WORK (or preparing for future jobs), and LEISURE. Emphasize that it is essential to this study that a careful record be kept of the *amount of time devoted to each kind of activity.*

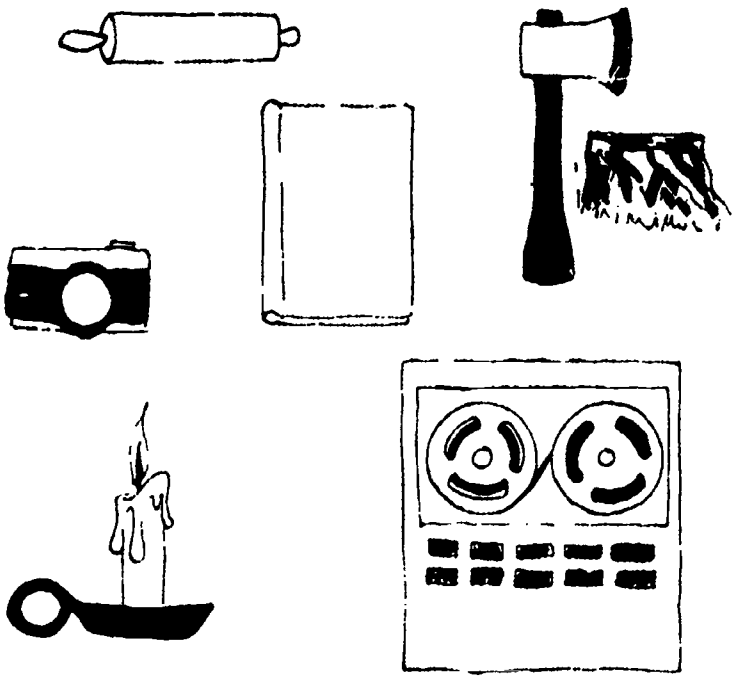
If possible, the student should discuss his completed log with a senior citizen in the community, perhaps a grandparent, for a comparison of the amounts of time given over to each of the three types of activities today and in the recent past. If this is not possible, the teacher could lead the class in a discussion of the changes brought about by technology which have resulted in increased time and affluence. The exchange of ideas could result as a "spin-off" of the items on the student lists. For example: How has technology cut down the amount of time spent in bathing, clothing, keeping warm, food preparation, houshold chores, etc? Try to have one or more "senior citizens" come into class. Another approach to this experience could be statistical. Using data tables of statistics related to working hour and consumer expenditure patterns since the turn of the century (see Appendix B), ask the students to draw conclusions or to graph the material. Some of these kinds of data can be requested by the student from the U.S. Government Printing Office. However if time does not permit, the teacher can duplicate this material from the appendix of many texts which carry this information. See resource section for recommended sources. The statistical approach should be reserved for high ability students. The teacher should allow enough time to this activity to insure that the student is convinced that there is indeed a trend toward more leisure time. Ask your students their opinions on the relevance of the term "leisure explosion." You might tie this point into the similar and related idea of "population explosion." What particular problems are created by connecting these two ideas?

ACTIVITY B:
WORK VS. ROLE

Has the role of work changed? How do people view jobs today? Is the job a necessary evil and the weekend a salvation? Or do people expect to enjoy their jobs? Also how has the traditional division of labor for the male and female changed? How has this affected the job market and the buying power of the American public? Have advertisers changed their approach? Compare some old magazine ads to today's. How is the woman pictured? the man? What products are advertised for women? for men? for youth?

ACTIVITY C:
CHANGING JOBS

What new types of jobs and professions have been created in the past year? past five years? past fifty years? What may be some possible new jobs in the future? What jobs have disappeared in the past fifty years? Consult census figures for professions for as far back as you can. What percentag of the working



population were farmers in 1850? in 1970? This activity may involve individual or group research to any extent that the teacher may desire. It may also be broken into sections for selected groups to research and report to the general class.

EXPERIENCE #3
HOW DID WE GET HERE? WHERE ARE WE GOING?

OBJECTIVE:

The student will investigate causes and effects of the "recreation explosion."

ACTIVITY A:
THE RECREATION EXPLOSION

There are several possible approaches to introducing and implementing this activity. The teacher should, of course, opt for the approach which best fits the interest and ability of the class. (Try to video-tape this activity if the equipment is available.)

More imaginative members of the class could choose to do some "role playing" in order to present information to the rest of the group in a panel session. Students should be assigned or allowed to choose among the following rules: a demographer, a city planner, an efficiency expert, a labor leader. It is most effective if the students themselves identify the expertise needed to present the topic most effectively and agree as a group who these experts shall be and how many will be needed to answer these questions:

What factors in our society have led to the "leisure explosion?"

What do you see for the future?

The general aim is to include these topics in the discussion: *population growth, technology, urbanization, city planning, changes in the kinds of jobs available,* and any *others* of interest to the group.

If there is a university near your school, you might enlist the students who are in teacher training areas to cooperate with you in preparing a video-tape of the class proceedings for later use and study. Depending on time and on where your school is located, you may wish to invite the experts to sit on the panel or to prepare a statement to be used by the students. Student interviewers may get a tape from the experts to be played during a class.

The important point is to get as many points of view as possible, so that the students are aware of these ideas:

There exists a "population explosion."

More people are the result, as well as the cause, of changes in leisure/work patterns brought about by the emergence of technology.

With changing leisure/work patterns come changing demands and needs in city planning. (Urbanization and recent trends to migration back to the rural areas.)

The student should be aware of the complexity of the total problem and the present efforts to find solutions to some of the aspects of the total problem.

ACTIVITY B:

Research the increase in use of national and state parks in the last fifty years. Federal and state statistics should be obtained. How has the increase affected the quality of the vacation experience? Why are parks now restricting the numbers of people they admit? Is this fair? What are the alternatives?

EXPERIENCE #4
TIME ON OUR HANDS

OBJECTIVE:

The student will confront the issue of the spare time dilemma.

ACTIVITY A:
SPARE TIME

If the students prepared a leisure time questionnaire in Experience #1, ask them to refer to their findings. If they have not worked on this part of the Experience, suggest that they prepare such a form at this time. The polling instrument should list as many of the possible ways which people use to enjoy their leisure as are relevant to the experience of the students involved. After the class has obtained a good sample of the most popular activities and the least popular ways to spend spare time, compile the findings and see if some agreement can be reached on the relative numbers of people interested in:

a. outdoor activities
b. indoor activities
c. group activities
d. solo activities

To continue study in each of these areas, it might be an effective strategy to divide the class into four groups, each to research one of the four classifications of activities outlined above. Ask each group to consider each leisure activity from the same sets of criteria. (If your class is highly motivated, have them suggest the criteria.) Some points which all might agree to consider might include these:

a. cost to the individual (equipment, transportation, time)
b. related needs (sites: indoor and outdoor space, lakes and woods areas, museums, stadiums, parks, playing areas, etc.)

ACTIVITY B:
PERSONAL EXPERIENCE

Invite the students to relate some experiences which they have had — touring, ski trips, a picnic — which were less enjoyable than they had expected, and be sure to analyze the reasons for the discomfort or lack of pure pleasure in the leisure activity. Lead the group into a discussion of the results of population growth, overcrowding, water pollution, lack of recreational facilities, and energy shortages which are developing simultaneously with and as a result of increase in leisure time.

Teacher's Note:
You may refer your students to the audio-text cassette, "The Struggle of Leisure," in which scholars and entertainers discuss the U.S. patterns of leisure and in which the following questions are considered.

How important is leisure time?

What is the main problem with increased leisure time?

Why do we have more leisure time now than we had in the past?

Are we educated enough to use leisure time wisely?

What is needed to promote more effective use of leisure time?

ACTIVITY C:

Investigate some of the recent cases against large recreational developments in remote or unique natural areas (Disney World in Florida and Mineral King). Discuss the views of wilderness groups like the Sierra Club. Should the wilderness be considered off-limits to all but a few people? What will be the effect of building highways through wilderness areas? Use any local developments, including parks and playgrounds. (These should be special group investigations.)

EXPERIENCE #5
HOW BIG THE COST?

OBJECTIVE:

The student will have the opportunity to consider the effects of work/leisure patters on the environment.

ACTIVITY A:

Using the same questionnaire prepared in previous activities, ask the students to expand on the idea of cost to include the cost (financial and aesthetic) of each of the recreational activities to the environment. Limit the study to the four areas of *energy requirements and cost, land use and abuse, effect on air,* and *effect on water.* Do not expect, in these initial studies of the situation, the students to be very specific about the damaging effects of some recreational activities on the environment.

(Some time during the course of this activity, you might plant the thought that unless man voluntarily changes his leisure/work patterns, these patterns may be changed for him by the results of what he has done to the environment. Do not stress the point now; let the idea develop until the final unit brings it to the general attention of the group.)

Suggest to your groups or individuals, depending on the organizational method you are using, that they research the environment area of most interest.

ACTIVITY B:

What is the effect of the new recreational vehicles on the landscape? What does it cost to buy and operate a snowmobile? What are its advantages and its disadvantages? How does it affect the land? Find out what New Jersey and other coastal states have done about the dunebuggy. Debate the pros and cons of the use of the snowmobile for hunting and the effect it has on the animal populations of an area.

ACTIVITY C:

Compare the costs (monetary costs and costs to the environment) of the use and development of more national and state parks and open spaces in metropolitan areas. Consider local recreational sites, such as the proposed Cuyahoga Valley National Park, the stadium planned for the Peninsula area, or King's Island.

ACTIVITY D:
INDIVIDUAL STUDENT RESEARCH

It is possible that you might have simultaneous research being done on some of these areas: ski slopes, skating ponds, national parks and forests, public lands, seashore resorts, picnic grounds, state parks, sports arenas, stadia, etc. Keep the research within certain parameters by setting up some guidelines for the reports and suggesting that these points be considered:

1. How many of these sites are available to the students?
2. How long will these sites be available?
3. Do the sites meet the recreational needs of the present population? How will the needs be met in another ten years?
4. Should these areas be maintained? If they are in great demand, who should use them?
5. How much do these areas cost to be maintained? Who pays for them? Who should be expected to pay for them?
6. Should use be regulated? By whom? In what ways?

Urge your students to use the media center of the school or the public library for their research. Suggest that they write to their municipal, state, and federal departments for information about the facilities most relevant to them, i.e., those in your own locality. The research segment of this activity should be followed by a large group generalizing session or two, during which a spokesman for each group summarizes his findings. The teacher should interject the possibility that man may need to change his leisure/work patterns in order to conserve the environment which makes his recreational activities possible.

EXPERIENCE #6
WHERE DO WE GO FROM HERE?

OBJECTIVE:

The student will have an opportunity to formulate some strategies in order to cope with the growing problem of leisure/work patterns.

ACTIVITY A:

Using your own locale as a starting point, choose one popular site for leisure activity and describe it completely in writing so that each student may have a complete set of data on the area chosen. The teacher might do this himself, but it would be more effective if

some class members prepared the material themselves for use in the current class or for future classes. What is suggested here is a complete study of one or more areas in your immediate vicinity: Mill Creek Park in Youngstown, Nelson's Ledges, Atwater Lake, the Serpent Mounds, etc.

Once the area is chosen, describe the facilities now available, obtain some figures on current use by the public and the cost to the maintaining group, and evaluate the present effectiveness of the area as a leisure activity site.

Once the information is compiled, present all the data to the students and ask them what suggestions they have to offer in the eventuality that:

1. the number of people wishing to use the facility doubles.
2. there is no longer available transportation to the area (gasoline shortage, etc.).
3. the facility deteriorates due to nearby industrial pollution of air and water and/or overuse.
4. with a growing inflation, the cost of using the facility and/or equipment needed becomes prohibitive to most people.

Through careful questioning and suggestion, the teacher may want to bring out, in a generalizing session, the main points that:

1. we must conserve what we have by using it more wisely.
2. we may have to reconsider our priorities.
3. we may have to change our leisure/work patterns.
4. we must consider the effect of the energy crisis.

ACTIVITY B: ACTION

To move this concept into the affective domain, discuss with your group a possible program to educate the general public about the problem and organize a group to implement the suggested plan of action by some effective presentation. The only limiting factor here is time; the possibilities for action are unlimited. Involvement with interested citizen groups is effective and includes everything from planning a land lab area for recreation on the school grounds to converting a vacant lot into additional play space. The important point is that the *students* choose the program and plan the implementation, with the teacher acting in the role of resource person and coordinator of the student efforts. Various government and volunteer agencies could be very useful for this activity. Many local, state, and national groups are seeking ways to implement this type of involvement and activity.

APPENDIX A:
SAMPLE RECREATIONAL QUESTIONNAIRE:

Name_____ Age_____ Sex_____ Occupation_____

Rate the following activities on a scale of 1 - 5

1. do as often as I can
2. do very frequently
3. do occasionally
4. seldom do
5. never do

_____ 1. bicycling
_____ 2. nature hikes
_____ 3. hunting
_____ 4. swimming
_____ 5. boating
_____ 6. horseback riding
_____ 7. water skiing
_____ 8. mountain climbing
_____ 9. sledding
_____ 10. skiing
_____ 11. ice skating
_____ 12. roller skating
_____ 13. canoeing
_____ 14. sailing
_____ 15. motor boating
_____ 16. play outdoor games
_____ 17. jogging
_____ 18. golfing
_____ 19. attending outdoor games
_____ 20. attending indoor games
_____ 21. playing indoor games
_____ 22. attending outdoor sports events
_____ 23. attending indoor sports events
_____ 24. watching sports events on TV
_____ 25. attending outdoor concerts, plays
_____ 26. attending indoor concerts, plays
_____ 27. picnicking
_____ 28. camping
_____ 29. primitive camping
_____ 30. rock collecting
_____ 31. fishing
_____ 32. walking
_____ 33. gardening
_____ 34. reading
_____ 35. touring
_____ 36. sewing or embroidering, etc.
_____ 37. handcra , woodworking
_____ 38. collecting coins, stamps, etc.
_____ 39. visiting museums

APPENDIX B:
CHANGE IN LENGTH OF WORK WEEK

TABLE 1
CHANGE IN LENGTH OF WORK WEEK FOR ALL EMPLOYED, THOSE AT WORK AND THOSE AT WORK 35 HOURS OR MORE, IN AGRICULTURE AND IN NONAGRICULTURAL INDUSTRIES, MAY OF EACH YEAR

1948-1960

(Average Weekly Hours)

Year	All Employed	At Work	At Work 35 Hours or More
	All Industries		
1948	42.1	43.4	47.7
1949	42.3	43.5	43.5
1950	41.3	42.5	47.2
1951	41.9	43.2	47.6
1952	41.1	42.6	46.7
1953	40.8	42.1	46.4
1954	40.8	41.6	46.3
1955	40.6	41.9	46.5
1956	40.3	41.6	47.0
1957	39.8	41.1	46.3
1958	39.8	41.0	46.6
1959	39.9	41.1	46.5
1960	39.5	40.8	46.4
Percentage decline, 1948-1960	6.2	6.0	2.7
	Agriculture		
1948	51.1	52.5	63.2
1949	52.5	53.3	62.6
1950	48.9	50.1	60.7
1951	52.0	52.6	62.4
1952	50.0	50.9	60.0
1953	48.1	50.0	62.5
1954	48.2	49.8	60.6
1955	48.4	49.5	59.7
1956	48.7	49.6	61.1
1957	45.1	46.3	58.1
1958	48.8	49.6	61.9
1959	47.0	47.9	59.9
1960	47.3	48.0	60.0
Percentage decline, 1948-1960	7.4	8.6	3.1
	Nonagricultural Industries		
1948	40.6	41.9	45.6
1949	40.4	41.7	45.6
1950	40.1	41.3	45.3
1951	40.6	41.9	45.7
1952	39.9	41.5	45.3
1953	39.9	41.2	44.9
1954	39.1	40.6	44.7
1955	39.5	40.9	45.1
1956	39.3	40.7	46.4
1957	39.2	40.5	45.2
1958	38.8	40.0	45.1
1959	39.1	40.1	45.2
1950	38.8	40.1	45.2
Percentage decline, 1948-1960	4.4	4.3	0.9

Sources: U.S. Bureau of the Census, average weekly hours of "all employed" and "at work" from CURRENT POPULATION REPORTS: LABOR FORCE, Series P-50, Nos. 13, 19, 31, 40, 45, 59, 67 and 72 and Series P-57, Nos. 203, U.S. Dept. of Labor, MONTHLY REPORT on the LABOR FORCE, May, 1960. Average hours for those "at work 35 hours or more" from a special tabulation.

a. Average weekly hours for all employed represents the average for those actually at work plus those with a job but not at work because of vacation, illness, bad weather, etc. The latter group is counted as having zero hours of work during the week.

APPENDIX B:
CONSUMER EXPENDITURES FOR RECREATION

TABLE 2
CONSUMER EXPENDITURES FOR RECREATION IN CURRENT AND 1959 DOLLARS AND AS PERCENT OF NATIONAL INCOME AND TOTAL CONSUMER EXPENDITURES, 1909-1959

	Amount		Per Cent of: (b)	
Year	Current Dollars	1959 Dollars (a)	National Income	Total Consumer Expenditures
1909	$ 860	$3,598	2.8	3.0
1914	1,000	3,861	2.8	3.0
1919	2,180	4,977	3.0	3.7
1921	2,055	3,952	3.8	3.7
1923	2,620	5,209	3.6	4.1
1925	2,835	5,559	3.6	4.0
1927	3,120	6,058	3.9	4.2
1929	3,340	7,356	4.4	4.9
1931	2,877	5,543	4.8	4.7
1933	1,871	3,803	4.7	4.0
1935	2,259	4,610	4.0	4.0
1937	2,940	5,731	4.0	4.4
1939	3,000	5,650	4.1	4.4
1940	3,284	6,081	4.0	4.6
1941	3,722	6,646	3.6	4.5
1942	4,100	6,997	3.0	4.6
1943	4,263	6,713	2.5	4.2
1944	4,651	6,616	2.5	4.2
1945	5,278	7,210	2.9	4.3
1946	7,639	10,104	4.3	5.2
1947	8,320	10,335	4.2	5.0
1948	8,670	10,236	3.9	4.9
1949	8,913	10,151	4.1	4.9
1950	10,018	11,489	4.1	5.1
1951	10,340	11,514	3.[illegible]	4.9
1952	10,819	11,994	3.7	4.9
1953	11,380	12,492	3.7	4.9
1954	11,730	13,004	3.9	4.9
1955	12,593	14,008	3.8	4.9
1956	13,476	14,793	3.8	5.0
1957	14,205	15,016	3.9	5.0
1958	14,845	15,066	4.0	5.1
1959	16,180	16,180	4.0	5.2

Sources: Table 7a: *National Income, 1954 Edition* (Supplement to the *Survey of Current Business*), Table 60, pp. 286-287; *U.S. Income and Output*. Tables I-1, I-8, and II-4, pp. 118-119, 126, 127, and 150-151; *Survey of Current Business*, July, 1960, Tables 1, 2, and 15, pp. 8, 9, and 16; J. Frederic Dewhurst and associates, *America's Needs and Resources: A New Survey*, Twentieth Century Fund, New York, 1955, Appendix 4-2, Table A, p. 258; *Historical Statistics of the United States, 1789-1945*, U.S. Bureau of the Census, 1949, Series L-1, p. 231 and L-47, p. 236; *Economic Indicators* (1957 Historial and Descriptive Supplement), U.S. Government Printing Office, 1957, p. 58; *Statistical Abstract, 1960*, p. 336.

(a.) Estimates in current dollars adjusted by price series computed from price indexes in sources linked in overlapping years and shifted to 1956 base.
(b) Based on expenditures and income in current dollars; estimates of national income and total consumer expenditures for 1909-1927 based on estimates in Dewhurst and associates, *loc. cit.*, adjusted to estimates for 1929 in *National Income (1954 Edition)*.

TABLE 3
AVERAGE HOUSEHOLD EXPENDITURES FOR GOODS AND SERVICES BY TYPE OF EXPENDITURE, 1956

Type of Expenditure	Amount	Per Cent
All goods and services	$4,110	100
Food, Beverages and tobacco	1,203	29
Clothing and accessories	494	12
Medical and personal care	222	5
Home operation and improvement	763	19
Home furnishings and equip.	346	9
Recreation and recreation equip.	215	5
Automotive	591	14
Other goods and services	276	7

Source: Life Study of Consumer Expenditures, Time, Inc., New York, 1957, Vol. One, pp. 17 and 20.

APPENDIX C:
AGREE-DISAGREE EXERCISE

Read each of the items below carefully and indicate your agreement or disagreement by placing an X in the appropriate line to the left.

Agree	Disagree	
_____	_____	1. The teacher ought to do all the planning in the course because he knows most about the subject matter.
_____	_____	2. Outside reading should always be handled by having each student turn in a written book report to the teacher.
_____	_____	3. Using student committees for learning and reporting is a valuable part of the course.
_____	_____	4. Lecturing by the teacher is the best way to cover the subject matter.
_____	_____	5. Teachers should allow the students to participate in planning the course work.
_____	_____	6. Stu ents can often learn more from each other than they can from the teacher.
_____	_____	7. Seats should be moved into a circle for class discussion.
_____	_____	8. Committee work wastes too much time. The teacher should do the teaching.
_____	_____	9. It is important that students in a class know each other and have a chance to talk to each other while the class is in session.
_____	_____	10. The teacher should call on people in class when they do not volunteer.

Please list several personal goals for learning.

A. _____

B. _____

C. _____

D. _____

E. _____

APPENDIX D:
SOME CHARACTERISTICS OF A WELL-FUNCTIONING WORK GROUP

The *unity* of a work group is of fundamental importance. The more the members of a group *learn to accept each other* and to work together the more they will truly function as a group.

1. The *atmosphere* which can be sensed in a few minutes of observation, tends to be *informal, comfortable,* and *relaxed.* There are not obvious tensions. It is a working atmosphere in which people are *involved* and *interested.* There are no signs of boredom.
2. There is *much discussion* in which *all participate,* yet everything discussed is *pertinent* to the task of the group. *(This is the real job of the leader, i.e. he spends most of his time keeping the group on the track.)*
3. *The task of the group is well understood and accepted by all the members.* There are many contributions given to the discussion at hand. It remains very free until at some point it is formulated in such a way that the entire group can commit themselves to it.
4. *All members listen to each other. People do not fear speaking out,* since they are assured of group acceptance regardless of how extreme their contribution.
5. *There is disagreement.* Disagreements are not suppressed or over ridden by premature group action.
6. *People are free in expressing their feelings as well as their ideas* on the problem and on the group's operation.
7. When action is taken, *clear assignments are made.*
8. The "leader" of the group, if any, does not dominate it, nor, on the contrary, does the group itself defer unduly to him. In fact as one observes the activity it is clear that the *leadership shifts from time to time* depending on the circumstances. Different members, because of their knowledge or experience, are in a position at various times to act as resources for the group.
9. The group is self-conscious *(sensitive)* about its own operations. Frequently it will stop to examine how well it is doing its job, or it may be an individual in the group whose behavior is interfering with the accomplishment of the group's objectives. Whatever it is, it gets open discussion until a solution is found.

(So few groups are like the one above since most of us have rather low expectations of group accomplishment. We also have relatively little knowledge of what is important to good group functioning. One of the most important reasons for poor group functioning is the general fear of conflict and hostility which leads us to behave in ways that hamper rather than help expression. A group like that described above requires time and effort to develop, but it can be done.)

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TEACHER'S NOTES:

MATHEMATICS

A JUNIOR AND SENIOR HIGH SCHOOL UNIT

Mathematics is an intrinsic component of the environment. Its abstractions are what lend importance to math, since these abstractions can be applied to many and varied disciplines. Its patterns, sequences and proportions are found in nature, art, music and architecture. Mathematics organizes ideas for technology, invention, and economics, and it predicts discoveries in the sciences.

People are aware of the use of numbers in their daily lives. However, there are many areas of "invisible mathematics" which also affect a person's life and lifestyle. This unit is an exploration of some of the visible and "invisible" components of the mathematical environment. Some of the activities are concerned with very familiar aspects of numbers: personal finances, consumerism, personal space, and room decoration. The remaining activities concern more specialized applications of mathematics: large numbers, time and change, architectural concepts, statistics, and suggestions for further exploration.

It is not expected that all students will evidence an interest in all the activities. Rather, it is hoped that they will feel free to explore a topic of their own choosing. These explorations could be done as a class, in small groups, or individually. For some classes it might be beneficial to explore at least one topic on a whole class basis and then to encourage the students to divide into small groups for further exploration.

Teachers need not assume they must use all of the experiences in this unit. Teachers of low and average level junior high classes may find experiences 1-5 suitable. These students may enhance learning by using the following outline form:

1. What is the problem?
2. What do I have to know to solve this problem?
3. What are the results?
4. How will I present my results?

High school students of above average ability may find experiences VI-IX suitable and may not need to follow the outline form above.

INSTRUCTIONAL OBJECTIVES:

1. The student will work toward developing an understanding of the use and effect of mathematics in his life.
2. The student will recognize some of the mathematical applications which are an intrinsic part of his environment.
3. The student will begin to appreciate the contributions mathematics has made to his quality of life.

CONTRIBUTORS TO THE DEVELOPMENT OF THIS UNIT

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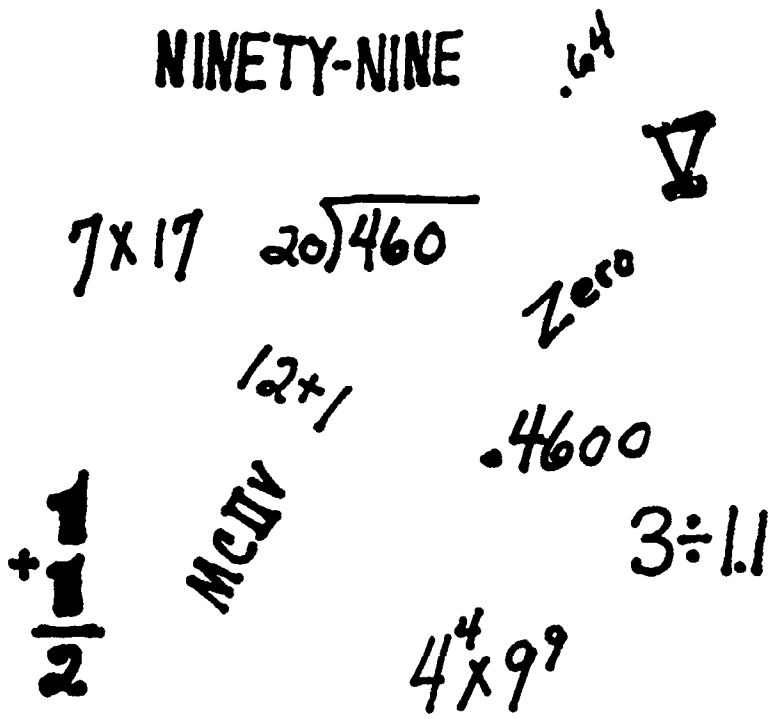
TABLE OF CONTENTS

EXPERIENCE #1:
A MATH ENVIRONMENT

OBJECTIVES:

1. The students will learn to define a math environment and list some of the components of such an environment.
2. The student will investigate some of the visible and invisible uses and effects of mathematics in his life.

Teacher's Note:
Most of us are not aware of the extent to which our daily lives are involved with and affected by the use of numbers. As an awareness of a math environment is developed, the student will learn how many of his daily activities require math in some form. As the students discuss the lists in Activity A, the teacher should set the pattern of trying to relate all items to use of numbers. For example, when we get up in the morning we look at numbers on a clock and mentally compute the time before we must be engaged in some activity; if we catch a bus, it is within a particular time limit, and we pay a fare; music is arranged mathematically in rhythmic patterns; when we shop we count, weigh, measure, and count money; when electrical appliances are used, meters are involved and we may read and set dials; bills, also, must be computed and paid; all chemicals, even water, have a mathematical formula; and tools are made to specifications. As each item on the list is considered, it should become obvious that it is very difficult to find activities that cannot be related to the use of numbers.



ACTIVITY A:
DEVELOPING AN AWARENESS OF THE USE OF NUMBERS

1. Each student should make a list of 50 activities participated in or witnessed during a specified time period.
2. Compile the lists.
3. Separate the compiled lists into activities involved with or affected by the use of numbers and those that are not.
4. Find what percentage of the activities are related to the use of numbers.
5. Write out your impressions of how your life is affected and regulated by numbers.

ACTIVITY B: SURVEY

1. Design a questionnaire to use in your school and neighborhood relevant to a math environment.
   a. Some suggested questions: How many times during the day do you use math? What mathematical operations (add, subtract, etc.) do you use? Would knowing more math make life easier for you?
   b. Emphasize that clarity and conciseness will make the questionnaire more effective.
2. Interview students.
3. Interview people in the neighborhood.
4. List any obvious differences between student and adult answers.
5. Evaluate the data gathered and prepare a report. Perhaps computation of means and a frequency distribution would be helpful.

ACTIVITY C:
DESCRIBE MEMBERS OF THE CLASS GRAPHICALLY

1. Make bar graphs for each student showing measurements for height, weight, chest, and hips.
2. Make line graphs showing height vs. weight for each student.
3. Compare the line graph with a standardized weight chart.

ACTIVITY D: CLASSIFICATION CHARTS

1. Investigate the charts and graphs used by insurance companies, credit departments, personnel offices, etc., to classify people. Obtain copies of these rating systems.
2. Do they use a point system to decide who gets the job, who can be insured, etc.?
3. Use the information you have collected to classify the students in your class, your teachers, your family.
4. Are these charts fair? Are there some factors not taken into account?
5. Present your findings to the class, to the school.

ACTIVITY E: PUBLIC OPINIONS

Teacher's Note:
As a preface to the experience, if there is not a public opinion survey company available in your area, a few students could begin by writing to Gallup or Harris Polls to find out how they determine their results. These could be contacted through a local newspaper

that publishes their results. Students could also contact a local television station to find out how they decide which "man on the street" interviews are shown on the air.

1. Contact a public opinion survey company.
2. Find out how they make predictions on specific questions.
3. How accurate are they? Check their predictions on elections, for instance.
4. What kinds of influence do these firms have (on TV shows, on public opinion, on advertising, on your thinking(?
5. Design a public opinion survey on a specific question. Use your results to influence the thinking of those around you.

ACTIVITY F: PRESENTING INFORMATION COLLECTED

1. Make a poster/collage display depicting the use of math or numbers in daily living.
2. Have an article put in the school newspaper about popular misconceptions and realities of math uses in life.
3. Prepare a citizens report on mathematics in our daily life. Distribute it to the neighborhood.
4. Make a formal report to be permanently placed in the resource section of the school library.

EXPERIENCE #2: PERSONAL SPACE

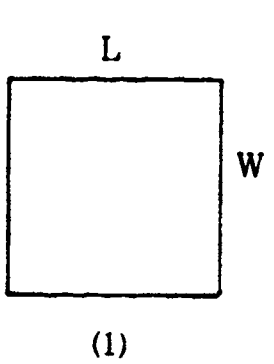
OBJECTIVE:

The students will learn that they do not have access to limitless space on this planet and that the quality of life is affected by population density.

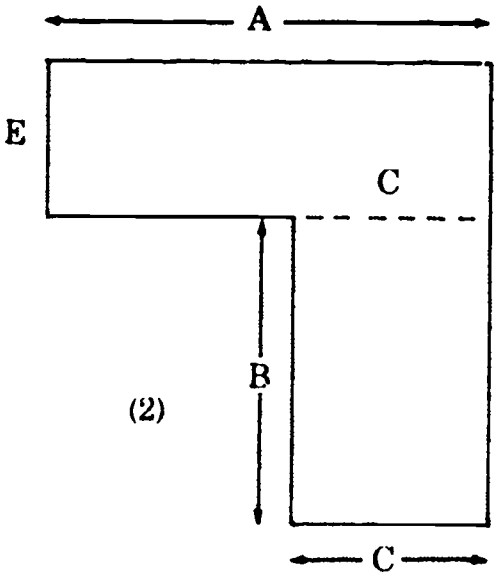
Teacher's Note:

Students not involved in environmental education have few occasions to stop and think about space being alloted to them for all activities. An awareness of a shared environment must be developed before there can be any action directed toward improving the environment. The average student and many adults assume that most people live in similar environments if they are in the same country. Many high school students are studying, in social studies classes, population control, depressed and inflationary areas, and effects of overcrowded living space. It should be an interesting and valuable activity for students to investigate their own living quarters and activity centers to find out how areas familiar to them compare with areas that they have read about. It is hoped that students will realize that the number of individuals sharing a limited area determines whether one lives in comfort and with conveniences or not.

The discussion of an environment that is overcrowded, if possible, should be based on data from the pupils experiences or from information from the social studies class. Some students will be in schools that have classes larger that ideal size, classes where the teacher cannot give needed personal attention; some will have experienced busing to relieve overcrowding. Some might feel their personal room is overcrowded because they have to share with a sibling who does not respect their privacy and personal articles. As residential buildings are considered, single homes, apartment buildings, and high rises will be among those to be discussed. The number of people who can live comfortably in a specific number of square feet will change rapidly if the ground area is the base and people per foot the variable. For measuring floor area it is accurate enough to measure to the nearest foot. To measure the floor area of an entire building, such as a school, it will be easier to measure the outside perimeter and multiply by the number of floors being considered. The following are some shapes the student might encounter.

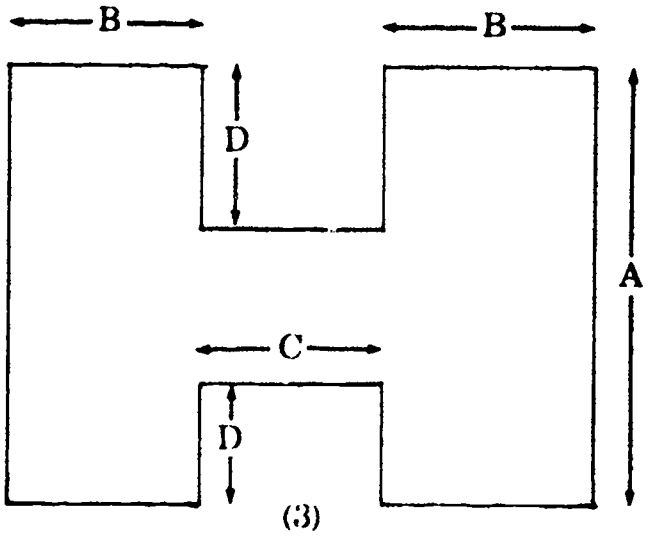


(1)



(2)

Area = (E x A) plus (B x C)

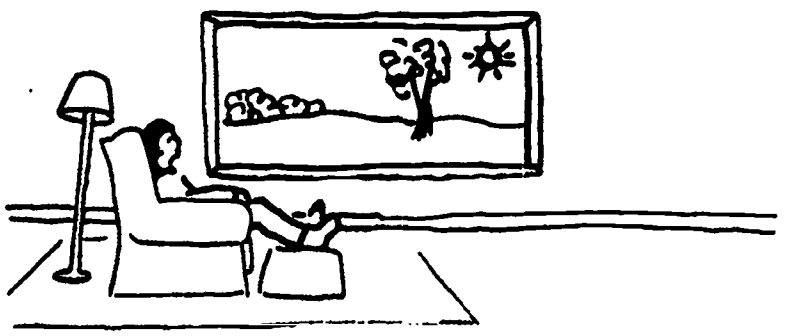


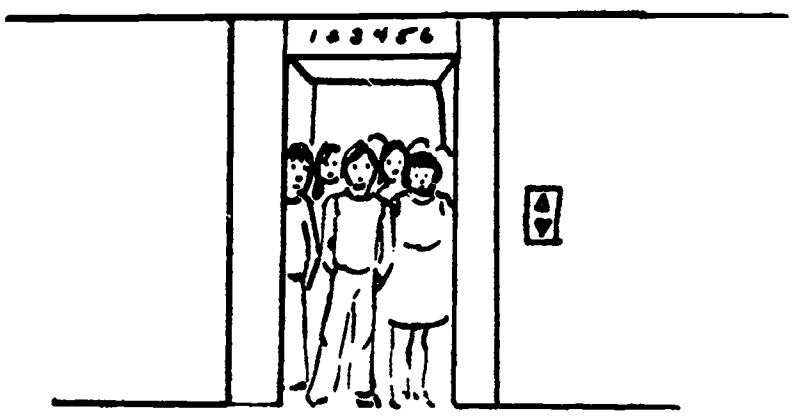
(3)

Area = 2(A x B) plus C (A - 2D)

ACTIVITY A: POPULATION DENSITIES

1. Learn to read a ruler or yard stick.
2. Learn to compute square area.
3. Learn to set up and solve proportion problems.
4. Measure and record the square feet in each room of your home.
5. Compute the area each member of your family has for specific activities.
6. Find out the square feet of area in your school.
7. Find out the number of students enrolled.
8. Compute the square feet of area available for each student.
9. Survey randomly selected classrooms to see if the student density agrees with the computed space available per student.
10. Prepare visual materials to show information from Steps 1 through 9.





ACTIVITY B: COMPARING LOCAL COMMUNITIES WITH OTHER COMMUNITIES.

1. Make contact with students in the nearest inner city, suburban, and rural areas and try to get them to do a population density study following Steps 6 through 9 of the above activity.
2. Exchange information with the other schools.
3. Prepare visual materials to show comparisons.
4. If there is more than one school in your area, find out about its students and compare it to your school.

ACTIVITY C: COMPARING UNITED STATES' POPULATION DENSITY: YESTERDAY, TODAY AND TOMORROW.

1. Do a population density survey of the United States over 15-20 year spans to find how the density has changed.
2. Go to a local cemetery and find how many head stones there are for each span. (If the class can't go as a group, a few students who live near by may be assigned this as an extra task.)
3. Compare these results. Do the cemetery results confirm your earlier findings? Why? Why not?
4. Population experts have estimated that if the population continues to grow at its present rate in the next 900 years there will be 100 persons for each square yard. Do your findings confirm this? Why? Why not?

ACTIVITY D: DISCUSSION

1. Discuss some of the things that result from an overcrowded environment.
2. Discuss any part of your environment that you consider overcrowded.
3. Discuss types of residential buildings that you have seen and tell how that particular type of structure affects population density.

ACTIVITY E: SPACE

1. From maps or year books find out the area of your local community, county, and state.
2. Find the population of your local community, county, and state.
3. Compute the area available for each person.
4. Use a map and pins with heads of three different colors to show the people per square foot for the local community, the county and state.

Materials:
Yard sticks or folding rulers
Yearbooks, almanacs
Census data (federal, state, and local)
Local area maps

EXPERIENCE #3: CONSUMER INVENTORY

OBJECTIVES:

1. The student will learn to read maps, to compute true distances from a map scale, to make graphs, picture graphs, and charts, and to compute unit costs and shop for the best buy.
2. The student will become acquainted with different kinds of stores and their characteristics and consider why those stores operate as they do.
3. The student will become aware that spending patterns of consumers are shaped by the commercial establishments in one's environment.

Teacher's Note:
Large maps can be obtained through the county engineer's office and smaller maps from most gasoline service stations and AAA Offices. City and county maps should be used so that streets will be drawn in and labeled. Within an urban area the inventory may be within a mile radius of the school. In suburban areas, where there is a more pronounced separation of residential and commercial area, the surveyed area might be the nearest commercial area or shopping center. In a rural class, the inventory might be in the nearest town or the area where their parents usually shop.

Following is a suggested list of items used in a similar survey by an inner city and a suburban teacher:

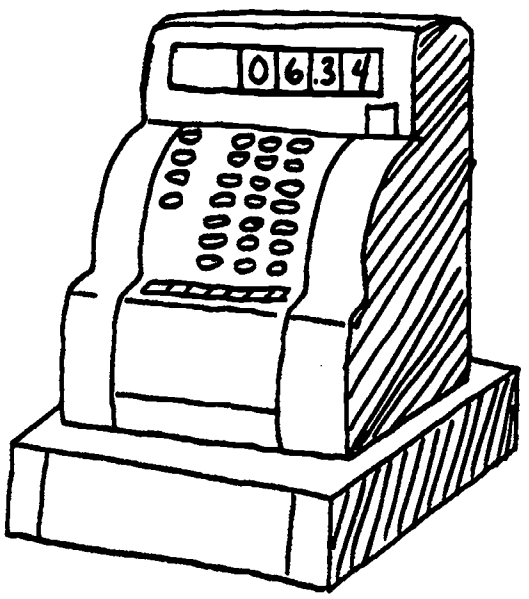
Food Items	*Non-food Items*
Bread	*Deodorant*
Eggs	*Bic pens*
Sugar	*Toothpaste*
1 lb. fruit in season	*Shampoo*
1 lb. ground beef	*Filler paper for notebooks*
Milk	*Detergent*
Flour	*Bed sheet, white, full, flat and fitted*
Wieners	*White shirt or shirt-type blouse*

Store owners are suspicious of large groups of students in stores. Be sure to contact the manager ahead of time and explain the survey and its purpose.

Be sure that students answer questions similar to the following in their written report. Which type store has the lowest prices for food items? For non-food items? Does any particular type of store seem to have a larger variety of brands, sizes and price ranges? Does any particular type seem to have an overall lower price rate when compared to the others? Can you explain the price differences on identical items in different stores? Is there a difference in the way customers are served in different types of stores (self-serve, clerk-served, cash or credit sales, familarity of customers and store personnel, etc.?) Is there a pattern to pricing? What are some of the factors effecting pricing and profit? How does the owner decide on a rate of profit? Why is there a preponderance of certain types of stores in your neighborhood?

ACTIVITY A: SURVEY OF AREA

1. Determine the area to be used in the survey.
2. Mark a large map showing the area assigned to each student and the location of stores in the area.
3. Make and record a count of all stores within the chosen area. Include and specify supermarket type and small family-run grocery stores, chain and family-type drug stores, discount houses, cut rate stores, and specialty stores like dairy stores and bakeries.
4. Make visual materials for showing data collected.



ACTIVITY B: SURVEY ONE OF EACH TYPE OF STORE FOR PRICE AND ASSORTMENT RANGES

1. Decide on food and non-food essential items to use in study.
2. Assign pupils to a store where survey is to be made.
3. Make contact with store managers to get permission to survey.
4. Visit stores and record available brands, sizes, and prices of items.
5. Analyze and compile data.
6. Make a variety of visual materials to show data.
   a. Compare variety of sizes and price ranges for identical brands at different stores.
   b. Compare identical items at different stores.
   c. Find mean price per unit for specific items at different stores.
   d. Decide on other information to be compared.
7. Prepare a written report on the survey.
   a. Characterize each kind of store.
   b. Note pricing patterns.
   c. Discuss overall price differences.
   d. Note service differences. Try to account for price differences on identical items.
   e. Find out who shops at which kind of store and why.
   f. Why does your family do most of its shopping at specific stores?
   g. Include any other interesting information.

ACTIVITY C: COMPARISON

Contact teachers and students in communities different then your own. Persuade them to do a study like Activity B. Exchange information and make a comparison of the data.

ACTIVITY D:

Survey, investigate, and characterize other components of your community, and compare these to a community much different in size.

1. Institutions of higher learning.

2. Churches.
3. Parks.
4. Places of recreation for teenagers.

ACTIVITY E: DEVELOPMENTAL NEEDS

Discuss which kinds of establishments the community lacks and needs and possible ways of developing such establishments.

Materials:
Pencil
Paper
Graph paper
Poster paper
Maps (local area)

EXPERIENCE #4: ROOM DECORATION

OBJECTIVES:

1. The student will learn to measure and express dimensions commonly used in homes and stores.
2. The student will learn to choose materials suitable for specific decorating jobs and how to buy the correct sizes and amounts for those jobs.
3. The student will examine some methods of paying for purchases after learning to compute the cost of the materials needed.

Teacher's Note:
Most adults, at some time, feel the need to change their surroundings. This is most often achieved through redecoration of living quarters. At other times, the conditions of the walls, floors, or window furnishings necessitate redecorating. For these reasons, it is of practical value for students to simulate redecorating a room. The choice and use of materials determines whether a room looks warm, inviting, and cheerful, or cold, formal, and dismal. There are at least three choices to make when redecorating is to take place: The person can select and buy materials and do all the work: the person can select materials, but have workmen do the buying and the work; the person can hire an interior decorator who will choose materials and see to it that the work is done. Whatever the choice, the individual paying for the redecoration needs to know what options are available. See the bibliography for titles of books and periodicals which may prove to be helpful in initiating this experience.

ACTIVITY A: INFORMATION AND SKILLS NEEDED

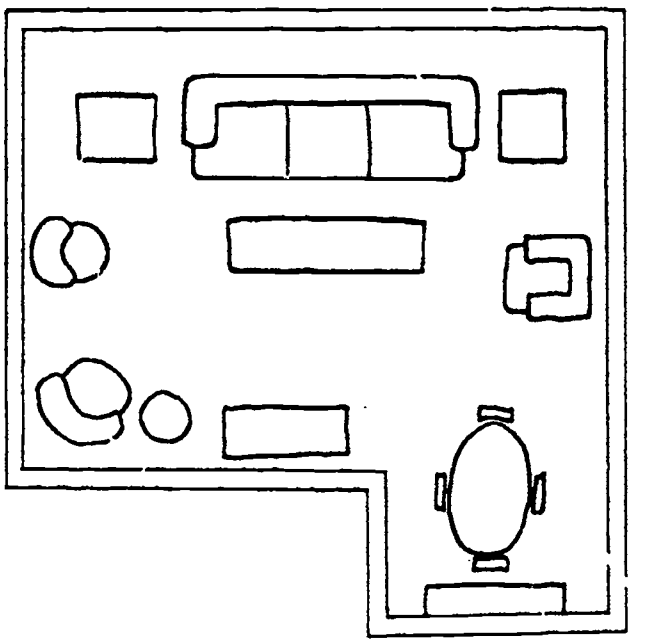
1. Look through decorating books
2. Discuss what can be done to walls, ceilings, floors, windows.
   a. Discuss how to measure the dimensions of a room and make sketches of those dimensions.
   b. Learn to compute areas and the quantities of materials or sizes needed for those areas.
   c. Familiarize yourselves with standard sizes of window furnishings.

ACTIVITY B: PLAN REDECORATION OF YOUR CLASSROOM

1. Measure and record dimensions of walls, floor, ceiling, windows, and doors.
2. Compute areas.
3. Decide as group how the room should look when the redecoration is completed.
4. Using sales and advertising papers, each student should make a plan for redecorating the room, choosing materials and computing the total cost of redecorating.
5. Make posters showing sketches, color samples, and prices of each student's plan.
6. Decide which are the five most pleasing plans for the least amount of money.

ACTIVITY C: MAKE A PLAN FOR REDECORATING YOUR BEDROOM

1. Present your plan on visual materials or make a scale model.
2. Have a class vote to choose the three favorite plans.



ACTIVITY D: DECORATING

Make a plan for decorating some room that you use, such as the student lounge, a recreation room in your church or youth center, or the student council office. Submit your plan to the class for discussion.

ACTIVITY E: BECOMING FAMILIAR WITH VARIOUS METHODS OF PAYING FOR PURCHASES

1. Why does a person choose to pay cash or use a credit plan?
2. Using information from a given list of selected family financial status descriptions, fill out various credit application forms.

3. Discuss why some credit applications are approved for some and not for others with differing financial situations.
4. Have guest speakers from various money lending organizations who will have a rap session with students.
5. Learn formulas and rules used in working problems relevant to computing interest and paying for charge purchases.
6. Discuss such topics as discounted notes, level and graduated payments, revolving charges, true interest rates, banks, credit unions, and loan companies.
7. Work some problems relevant to the above discussions.

ACTIVITY F:
PAYING THE COST OF REDECORATING THE STUDENT'S ROOM

1. From a selection of payment plans, each student will blindly choose a payment plan for the purchases made in Activity C.
2. Fill out an application for credit showing monthly payment, interest, number of payments, etc.
3. Make a larger poster showing how a statement of the transactions would look if all balances, payments, and interest entries were shown from the date of the loan until the final payment was made.
4. Make a duplicate poster showing the transactions if you had been able to choose the plan you feel would be the most economical.

EXPERIENCE #5:
LARGE NUMBERS

OBJECTIVES:

1. The student will gain an understanding and appreciation of the magnitude of large numbers.
2. The student will gain a facility in estimating, approximating, and performing arithmetic operations involving these magnitudes.

Teacher's Note:
Large numbers are an increasingly important segment of our math environment (governmental spending, industrial production, population, etc.). The following selection of activities is designed to broaden the student's comprehension of magnitudes and his mathematical skills in dealing with large numbers so that he will be better able to appreciate and understand these numbers upon encountering them in his world.

Teacher may begin by class discussion of some of the following:

1. How much money will you probably make in a lifetime?
2. How many pages of homework will you do in a school year?
3. How many feet do you walk in a week/year?
4. How many inches of lead will you use in a year?
5. How many people will you meet in a lifetime?
6. How many pounds of food will you eat in a year/a lifetime?
7. How much air will you breathe in a lifetime?
8. How many gallons of gasoline will you use in a lifetime?
9. How many hours of your life will you spend sleeping?
10. How many words will you speak in a lifetime?

Are you better at guessing or answering these? Are there exact answers?

Teacher may find that activities F, G, and H may be more suited for the better students in the class to explore individually.

ACTIVITY A: SEEING LARGE NUMBERS.

1. Display jars & containers filled with
   - dried peas
   - rice
   - macaroni
   - marbles
   - bottle caps
   - pop tops
   - toothpicks
   - beans
   - paper clips
   - stones (pebbles)
   - beads
   - staples
   - rubber bands
   - B.B.'s
   - salt
   - sugar cubes
   - nails
2. Divide into small groups and examine the jars and containers. Make a group "guess": how many are in the jar? Record the estimate of the group.
3. Count the items in your jar (one by one, by twos, etc.)
4. How close were you? Calculate your percentage of error.
5. Exchange jars and repeat procedure.
6. Which team was most accurate? How did they achieve this degree of accuracy?

ACTIVITY B: DISCUSS AND COMPILE

1. A list of things you can count.
2. A list of things you can't count.
3. Pictures of countable, uncountable things.

ACTIVITY C: COUNTING

Go out into the school, schoolyard or neighborhood and count a thousand of something, a hundred thousand.

1. How did you do it?
2. What does it mean to estimate, to approximate?
   a. Can you estimate the answer:
      (1) How many cars pass by the school in one day?

(2) How many gum balls are in a gum ball machine?
(3) How many basketballs would fit into your classroom?
(4) How many hairs on your head?
(5) How many gallons of water in Lake Erie?
If possible, have students add to this list.

b. Why can't your answers to these questions be exact?
c. How could you tell how accurate you are? (research, repeated trials, statistics, etc.)
d. When do you estimate? Give examples.
(1) How much money to take to the grocery store.
(2) When to leave so that you arrive at your destination on time, etc.
e. Find examples of estimates that are used by the government, by ecologists, by newspapers and television, etc. Can you make any statements about their accuracy? Can you support or disprove these estimates?

ACTIVITY D: METHODS OF COUNTING

How many methods can you find to count things that are impossible to count? Use as many methods as you can to count something in your environment that is too large to count one-by-one.

Examples:

1. *Taking a sample:* Count the number in a small sample, one-by-one. Multiply by the number of times the sample is contained in the whole.
2. *Volume:* Count the number of particles in one layer and multiply by the number of layers.
3. *Weighing:* Find the weight of a small number of particles, then weigh the whole to see how many particles are contained.

ACTIVITY E: NUMBERS OF NUMBERS

Explore some of the following questions in a small group, independently:

1. Is there a limit to the number things can have? Example: people on the earth, stars in the sky, floors in a building, pencils that can be manufactured, etc.
2. What do you know about infinity?
3. What is a googol, a googolplex? Has anyone ever made a googol of anything? Example: number of breaths in a lifetime, number of paper clips manufactured, etc.
4. Can you make a thousand of something? a hundred thousand? a million? Display what you've made.
5. What does it mean when it is said that something increases geometrically?

ACTIVITY F: EXPLORE THE WRITING AND ARITHMETIC OF LARGE NUMBERS

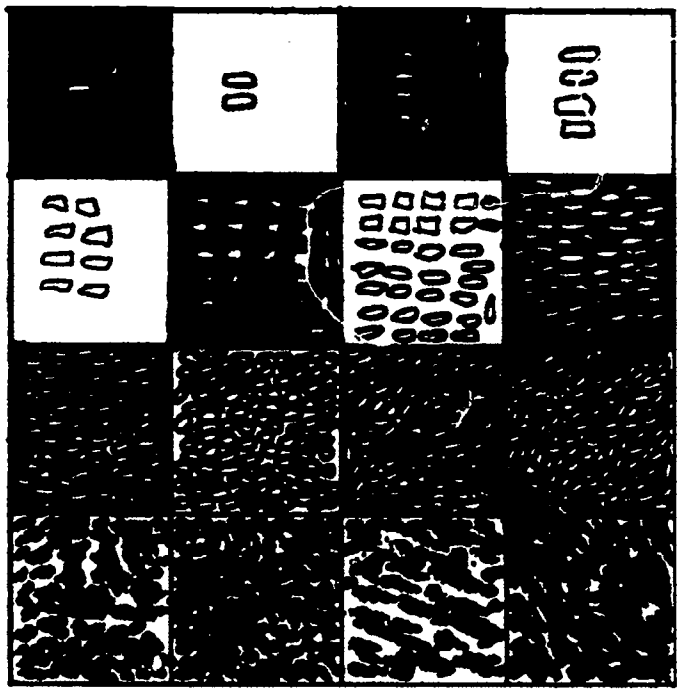
1. Scientific notation and exponents.
2. Logarithms.

ACTIVITY G: INCREASING AND DECREASING

Find something in the environment that is increasing in number, that is decreasing in number. Design a study to prove it.

ACTIVITY H: ADDITIONAL INVESTIGATION TOPICS

1. The Richter Scale (Logarithmic)
2. Table of Rice (one grain of rice on the first square of a chessboard, two grains on the second square, four on the third square, etc. — a doubling process)
3. Archimedes' Sand Reckoner.
4. Comparison of the magnitudes of the sizes of atomic particles, masses of atomic particles, etc.
5. Look up the population of India. If each Indian was shrunk so that he only occupied 1/100 sq. inch of floor space, how large a floor would you need to accomodate all the Indians?



EXPERIENCE #6 TIME AND CHANGE

OBJECTIVES:

1. The student will be able to quantify some of the changes in his environment.
2. The student will investigate some of the methods of measuring time.
3. The student will have explored the relativity of time.

Teacher's Note:
Emphasize the fact that the accuracy of time and time keeping devices derives from comparison with a standard.

Teacher may find this experience to be suited to a high school class of advanced students. Activity B may be skipped if facilities or finances are not available. An alternative may be the inexpensive camera, the Snapshooter. It is a small lens attached

to a replaceable film cartridge. These cost only $1.00 plus $.50 handling.

Snapshooter Camera Company
Division of Plastics Development
Corporation of America
Post Office Box 16225
Philadelphia, Pennsylvania 19114

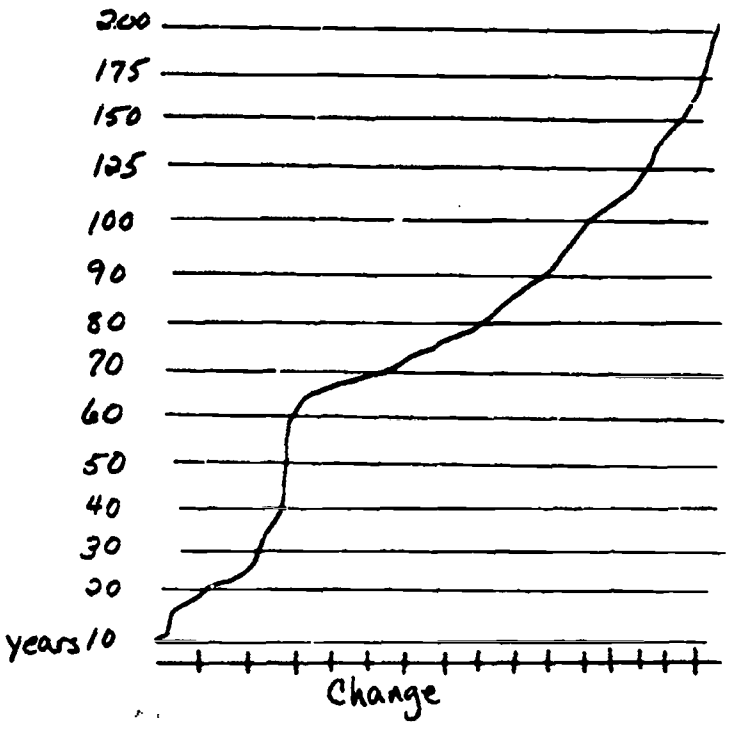
Activity K may be more suited to an interested student for individual experience.

ACTIVITY A: DISCOVERIES

1. Construct a time line to scale which indicates when major scientific discoveries, inventions, and achievements occurred.
2. From this time line, generate a graph (number of discoveries vs. a time-span).
3. Calculate the slope of segments of the line.
4. Discuss:
   a. How fast is our learning increasing?
   b. What kind of predictions can you make about the future?

ACTIVITY B: WHAT IS CHANGE?

1. Take a series of photographs, spaced at a specified time interval, of an area in the environment that is undergoing change. (construction site, street corner, etc.)
2. Observe the degree and rate of change. Can you quantify the change you have recorded? Can you construct a graph with the photographs you have taken?



ACTIVITY C: SEEING CHANGE

1. Find examples of changes you can see.
2. Find a method of measuring the change.
3. Make a decision about whether the change is good or bad.
4. Predict the size and direction of further change.

ACTIVITY D: CHANGE IN THE WEATHER

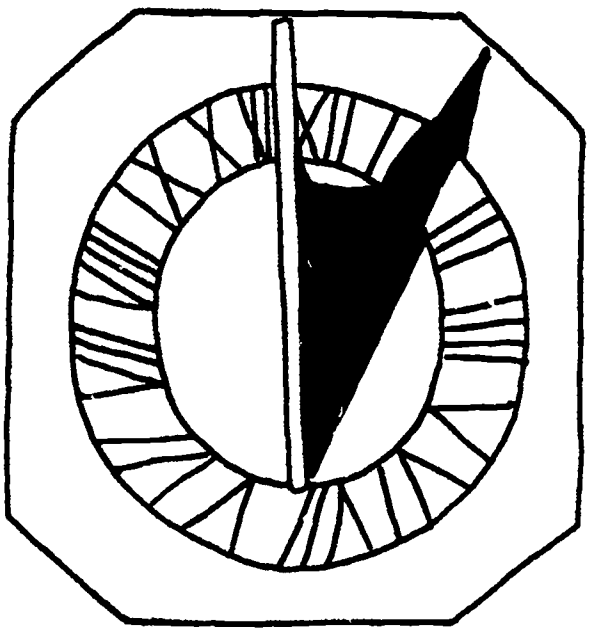
1. Measure the temperature over a month period (in both Fahrenheit and Centigrade).
   a. Record your findings.
   b. Construct a graph.
   c. Calculate the modes, median, and mean temperature for that period.
   d. Calculate the rate of change (slope) for that period, if possible.
   e. Compare your findings with almanac predictions.

ACTIVITY E: CHANGE IN ACTIVITIES

1. Make a list of the activities you engage in during a 24-hour period. Make a guess at how much time you spend on each activity.
2. Time all the activities you listed in number 1. How accurate were your guesses?
3. Prepare a graph or chart which answers the question: "Where does your time go?"

ACTIVITY F: TIME

For a period of five minutes, perform a number of different activities (sitting in silence, reading, watching TV, etc.). When did 5 minutes seem shortest? longest? Why?



ACTIVITY G: BUILD YOUR OWN TIMING DEVICES

1. Shadow clock
2. Sundial
3. Water clock
4. Candle clock
5. Sand clock
6. Mechanical clock
7. Pendulum clock

How accurate is your clock? Why can't it be more accurate? Can you determine its range of accuracy?

ACTIVITY H: MEASURE TIME

Do you have to use a clock to time an activity? How else could you measure time? Try using a metronome, a rotating spot on a turntable, your purse, etc.

What is the range of accuracy for the timing methods you discovered?

ACTIVITY I: DIFFERENT METHODS TO MEASURE TIME

Research and prepare a report on

1. Quartz and atomic clocks — their advantages in terms of accuracy.
2. Biological clocks — how many examples can be listed?
3. Pendulums — include length, weight, amplitude, and method of suspension.
4. The difference between solar time and sidereal time.
5. Compare the following calendars:
   a. Julian calendar
   b. Gregorian calendar
   c. World calendar
6. Investigate the light-year. When is the use of the light-year as a measurement of time applicable?

Make some audio-visuals to illustrate your findings. Present your report to the class or bind it and put it in the school library.

ACTIVITY J: FUNCTIONS OF TIME

Make a graph of something you select as a function of time, for instance, the number of people that have passed your classroom door since time zero or number of baskets made by your basketball team.

ACTIVITY K: MOVIES

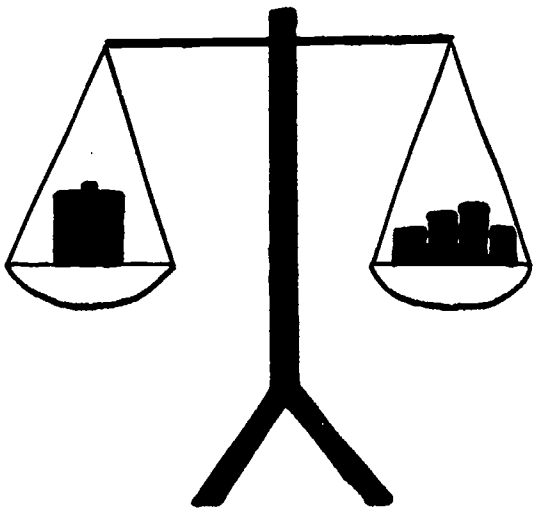
Make an animated movie. Show the charge in someone or something over a period of time by drawing or photographing each frame of your film.

EXPERIENCE #7: MATHEMATICAL APPLICATIONS IN ARCHITECTURE

OBJECTIVES:

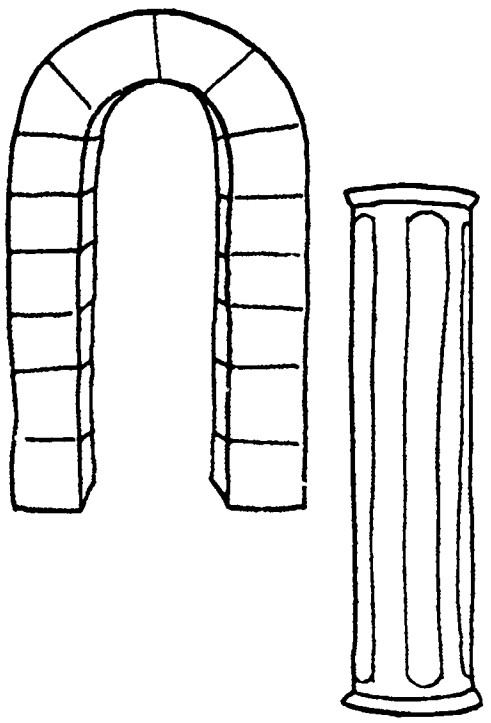
1. The student will gain an understanding the use of mathematics in the construction of man-made structures.
2. The student will experience working with some of the elements of design and construction.

Teacher's Note:
The teacher may find Architecture: A Book of Projects for Young Adults *is a useful book of reference. This experience may be suited for high school students of higher ability.*



ACTIVITY A: EXPLORE BALANCE AND SYMMETRY

1. Construct a balance using a meter stick balanced on a standard. Try attaching weights at various distances from the fulcrum. Record your findings. Does your experimentation support the physical law of d x w = d x w?
2. Analyze and define the laws of beauty geometrically, based on the proportions of a well-formed man. Check the proportions used in Greek art and architecture.
3. What is line symmetry, point symmetry? Construct some examples. Use a mirror to validate the symmetry of a design or construction.
4. Construct a mobile to demonstrate your understanding of balance and symmetry.



ACTIVITY B: SUPPORT

1. Construct columns using sugar cubes, corrugated cardboard cut in small rectangular pieces, or some similar materials. Make a single brick column, a double brick column, and a bonded column. Test each for strength and decide which type of column would support the greatest weight. Why? Consider the forces that are involved in column design.

2. Construct a graph of column height vs. thickness from the date you gatheed in Activity 1.
3. Construct a solid tube, a cylinder, a triangular support, and an I-beam. Test and compare for strength. Construct a graph of your findings.
4. Do a survey of the structures in your neighborhood. What types of support do you see? Why do you suppose these types of support were used?

ACTIVITY C: SCALE DRAWINGS

1. Select a scale for your drawings. For example, let one centimeter equal one foot.
2. Make a scale drawing of
   a. your room
   b. your house
   c. your school
   d. the route you take from home to school
   e. a friend of yours

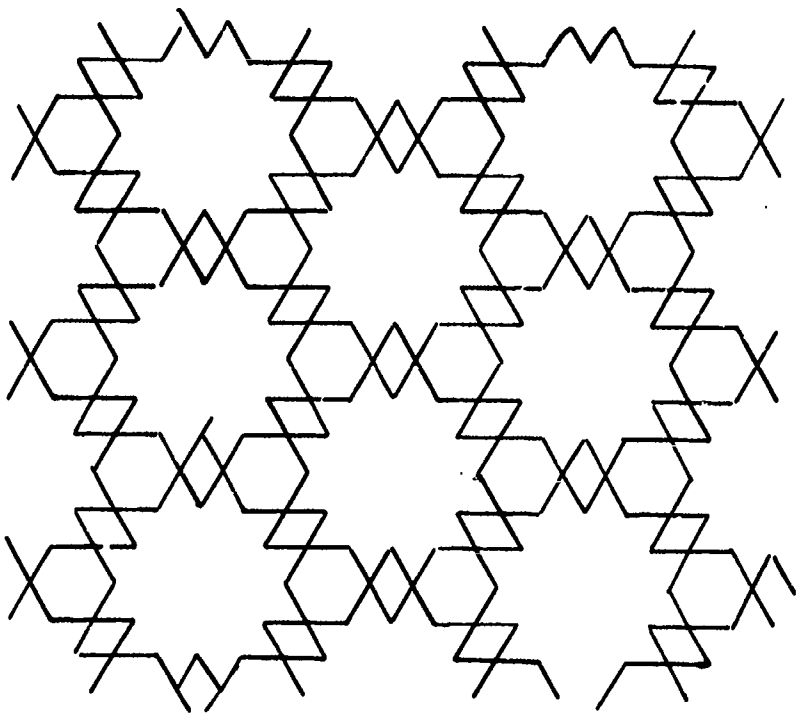
   Remember a scale drawing must be accurate.
3. Discuss what advantages scale drawings have for an architect, a construction worker. When would it be helpful for you to make a scale drawing?

ACTIVITY D: MEASUREMENT

1. What proportions are commonly used in architecture? Measure doorways, windows, room sizes, etc. Is there a pattern?
2. What is the golden section? How is it used in art? in construction? What happens when you square or double the numbers?
3. It has been said that man is the measurement of all things. The average man is taller now than he was a few centuries ago, Has this fact affected the size and proportions of our structures? Can you find supportive evidence for you position?
4. Devise a system of measurement that is proportionally accurate to the more standard systems of measurement. Is there an accuracy limit to your system?

ACTIVITY E: SPACE

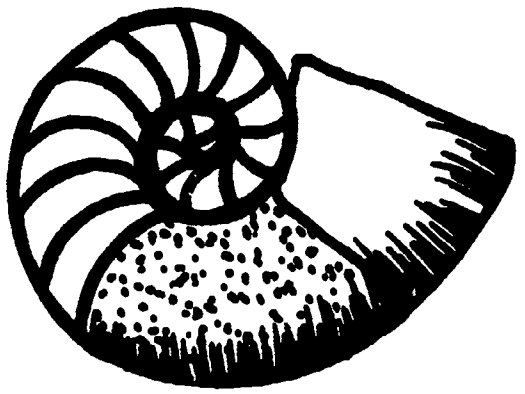
1. Move toward a friend when you are speaking. What is his reaction? Repeat this experiment with other people. What does this experiment tell you about a person's need for space?
2. Spend some time observing people in the subway, airport, bus station, etc. How do people react in crowds? Do they seem to stake out some territory for themselves? How do people behave when strangers invade their territory? Can you generalize a rule to tell how much space people need?
3. Devise some examples to illustrate the following:
   a. Repetition of elements will increase the apparent size of a surface.
   b. The use of furniture will make rooms seem larger.
   c. The use of color may give illusions of larger and smaller space.
   d. People feel larger in a room where the furniture is close to the floor.



ACTIVITY F: SHAPE

1. Make a mathematical mosaic using triangular, square, octagonal, and hexagonal shapes. For ideas, check linen and drapery patterns, ornate buildings, etc.
2. Cut out
   2 regular dodecagons
   2 regular octagons
   2 regular hexagons
   2 regular pentagons
   2 squares
   4 equilateral triangles

   Place a point on a paper and try fitting the polygons around the point. You can check the fit by adding the angles; they should equal 360°.
3. Construct models of the following solids:
   tetrahedron
   dodecahedron
   prisms: square, pentagonal, triangular, etc.
   icosahedron
   pyramids: triangular, pentagonal, hexagonal
4. Prepare a display containing the plan figures and solids you constructed and environmental examples of each (both natural and man-made).
5. For each example in number 4, calculate perimeter, area, and volume, if applicable. Use the metric system. What would happen to the area of a plan figure if each dimension were doubled? What would happen to the volume of a solid if each dimension were doubled? What happens when the dimensions are tripled?
6. Explore conics. Construct and find environmental examples of circles, ellipses, parabolas, and hyperbolas. Can you prove that these conics are what they appear to be?



7. What geometric form is present in the following:
   a. chambered nautilus
   b. grooves in a phonograph record
   c. heads of daisies
   d. elephant tusks
   e. galaxies and nebulas

   Can you make additions to the above lists?
8. Do some research and construct a geodesic dome. Try using paper soda straws.

ACTIVITY G: SCALE MODEL

Teacher's Note:
Teacher may find it helpful to have students see a scale model before they begin their own models (example: model airplanes, boats, etc.). Teacher may also have an architect come into the classroom to discuss scale models and their uses.

Construct a scale model of a structure of your own design. Remember to consider the following:
1. *the proportions of your structure to the people who are to use it.*
2. *the effects of color and space*
3. *the accuracy of your scale*
4. *the aesthetics of your structure*

Just because it hasn't been tried doesn't mean it won't work.

ACTIVITY H: DO AN HISTORICAL INVESTIGATION

1. Who built the pyramids? Why? How?
2. What is known about the constuction of the Sphinx?
3. Research the Taj Mahal.
4. Is there a support problem involving the Empire State Building? The Leaning Power of Pisa?
5. What is the Whispering Galley in the United States Capital Building? How does it work?
6. Are castles impractical?

EXPERIENCE #8: STATISTICS

OBJECTIVES:

1. The student will use statistical means to study his environment.
2. The student will use statistics to interpret the results of an investigation.

ACTIVITY A: SURVEY

1. Design a survey to answer a specific question about the environment. For instance, design a survey to assess the number of vehicles and pedestrians which pass a specific location each day. Interpret the results by means of the measure of central tendency and a frequency distribution of different time periods.
2. Design a questionnaire to interview neighborhood people on an environmental question. Discuss populations and sampling techniques. Present the gathered data in the form of a frequency table or polygon.

ACTIVITY B: AVERAGES

1. Use statistics to describe these:
   a. the average student at your school
   b. the average family in your neighborhood
   c. the average man

   Discussion of the normal curve and standard deviation might be appropriate for this activity.
2. Is there a person in your school who fits the statistical description of an average student?

ACTIVITY C: LETTERS

Calculate the frequency of the use of the letters of the alphabet. Use this information to design a cipher. Exchange ciphers with a classmate and decide.

ACTIVITY D: SAMPLING

Invite a representative from an industry in your city to visit your class. Ask him to explain the sampling process used by the quality control division of that industry.

ACTIVITY E: MEAN

Can you show that the mean of a group of figures is not always the average? Can you show how an advertisement could weigh averages to the advantage of the product being sold?

ACTIVITY F: FALSE STATISTICS

Find and display examples of statistics that don't really prove anything. Show why these statistics are biased.

EXPERIENCE #9
ADDITIONAL TOPICS FOR INVESTIGATION

OBJECTIVES:

The student will select a segment of the mathematical environment for further investig..tion.

Teacher's Note:

The following is a list of possible topics for student investigation. It is hoped that the selection of a topic will be left to the student, as well as the design of the study and the presentation of results. A contract between teacher and student, in which the student outlines what he will do and the time required, might be useful

Teacher may find it useful to have students follow an outline such as the one below.

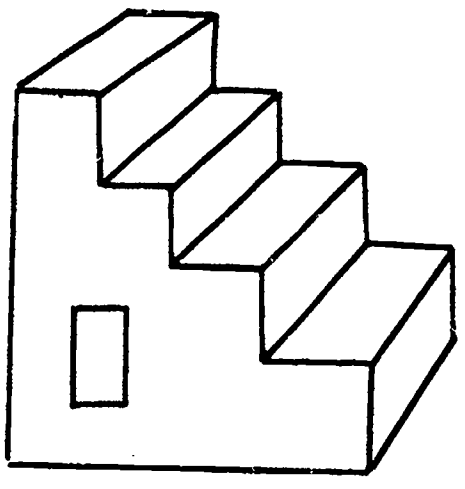
1. *What is my topic?*
2. *How will I investigate this?*
3. *What did I learn?*
4. *How will I present my findings?*

ACTIVITY A: COMPUTERS

1. The problem-solving approach used in computers
2. Preparation of a flow chart
3. The binary system
4. The influence of computers on the life of everyman

ACTIVITY B: OPTICAL ILLUSIONS

1. The work of M. Escher
2. Your own optical illusions



Are you looking at the top of these steps? Or are you looking up at them from below? Keep looking and watch them change from top to bottom.

ACTIVITY C: PROBABILITY

1. Randomness
2. The calculus of chance
3. When does playing the odds become advantageous?

ACTIVITY D: DIMENSIONS

1. Time as the fourth dimension
2. What would a two-dimensional world be like?

ACTIVITY E: GAME THEORY

1. Futile and categorical games
2. Clos .d games versus open games
3. The number of matches necessary to determine a winner among contestants

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Schools participating in the pilot program between February 1, 1974 and March 31, 1974

Akron City Schools
- Buchtel High School
- North High School
- Goodyear Junior High School
- Jennings Junior High School
- Kent Junior High School
- Perkins Junior High School

Chardon Local Schools
- Chardon High School
- Chardon Middle School

Cleveland Diocesan Schools
- Byzantine Catholic High School
- Cleveland Central Catholic
- Cathedral Latin High School
- Lake Catholic High School
- Notre Dame Academy
- St. Edward High School
- St. Joseph Franciscan School
- St. Justin Martyr
- St. Mary School
- St. Michael School
- St. Patrick School
- St. Richard School
- St. Rose School
- Trinity High School

Cleveland Heights/University Heights City Schools
- Heights High School
- Monticello Junior High School

Columbus City Schools
- Central High School
- Eastmoor Senior High School
- Linden McKinley High School
- Mohawk Senior High School
- North High School
- Eastmoor Junior High School
- Everett Junior High School
- Linmoor Junior High School
- Starling Junior High School
- Yorktown Junior High School

Euclid City Schools
- Euclid Senior High School
- Forest Park Junior High School
- Shore Junior High School

Geneva Area City Schools
- Geneva Area Senior High School
- Geneva Area Junior High School

Kirtland Local Schools
- Kirtland High School

Ledgemont Local Schools
- Ledgemont High School

Madison Local Schools
- Madison High School
- Memorial Middle School
- Red Bird Middle School

Mayfield City Schools
- Mayfield High School

Painesville Local Schools
- Riverside High School

Perry Local Schools
- Perry High School

West Geauga Local Schools
- West Geauga Junior High School

Willoughby-Eastlake City Schools
- North High School
- Kennedy Junior High School
- Willowick Junior High School

Youngstown City Schools
- North High School
- Haynes Junior High School
- Hillman Junior High School
- Princetown Junior High School

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