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ABSTRACT

This document presents the 1973-74 school year curriculum guide for the Dallas Independent School District for science and health education. Included are the rationale, program goals, overall program, course descriptions, and objectives for each grade K-12 for science education and health education. The program has eight program goals. Behavioral objectives are provided for each grade. (SL)

SCIENCE & HEALTH

Appendix B

BASELINE

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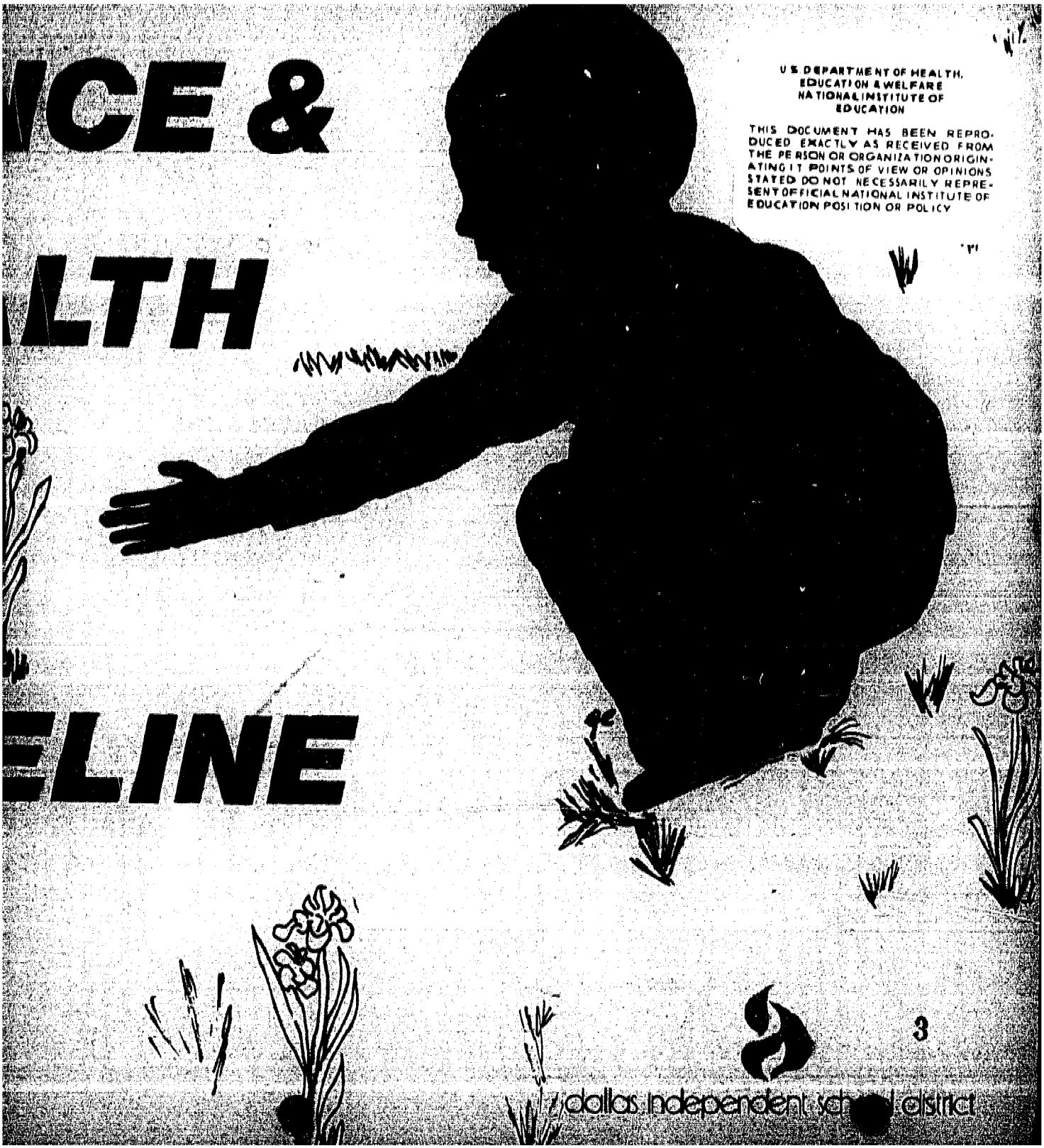
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SCIENCE AND HEALTH
BASELINE
Field Test Copy

Programs we develop and implement together in this decade will enhance life on this planet in all the tomorrows to come.

United States Environmental Protection Agency

Instructional Services Department
Dallas Independent School District
June, 1975

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FOREWORD

Nolan Estes
General Superintendent

So that parents and students may be aware of what is being taught, teachers can be guided in planning instructional programs, and administrators can provide necessary leadership, facilities and materials, this Baseline is written.

The following curriculum areas were examined during the 1973-74 school year:

Mathematics, science - health, language arts, social studies, recreative arts, and creative arts.

During the 1974-75 school year a curriculum effort was initiated to develop a K-12 educational program for Dallas. This educational continuum, called a Baseline forms the basis for instruction at each level of learning and is not a teaching manual, but a framework of learning expectations. A first step in this effort was the development of a tentative Baseline to which teachers, administrators, consultants, and community members made contributions.

The result of this input is this field test Baseline which will be implemented during the 1975-76 school year. In June, 1976 it is intended that feedback will be processed so that the Baseline framework may be improved to the extent that it may become the foundation for all instruction in the D.I.S.D. for the succeeding three years.

The field test Baseline will be followed by other publications which will state instructional objectives and activities for each learning level and area.

Nolan Estes

3700 Ross Avenue, Dallas, Texas 75204, 214/824-1620

TABLE OF CONTENTS

PART I

SCIENCE EDUCATION

SCIENCE RATIONALE

Science education is needed to provide students with experiences and skills which they can use in dealing with a world that is constantly changing. Specifically, science teaches students how to apply methods and knowledge to solve problems dealing with their environment, such as energy, drugs, and environmental pollution.

All science instruction and special programs offered in the Dallas Independent School District were designed and are being implemented because of the belief that it is the purpose of science education to develop an understanding of the individual's relationship to the environment. However, there existed a need for a deliberate plan that would coordinate the individual programs and classroom instruction with a common set of district-wide science program goals.

The K-12 Science Program designed to meet this need, follows proposed state guidelines and national trends for science education. The elementary science program emphasizes developing process skills. The secondary science program emphasizes applying science knowledge, making career choices, and studying the interrelationships of science and society.

The program is student centered in response to students of different cultural backgrounds and socio-economic needs. Activities are designed for different ability levels and areas of student interest. They allow for student choice and participation that contribute to feelings of personal worth. Investigative activities are used so that students can develop science skills and can acquire science knowledge which enable them to relate science teachings to self, to society, and to the environment.

SCIENCE PROGRAM GOALS

The program provides opportunities that enable the student to make worthy choices for the use of leisure time, choosing a career, and acting as a consumer.

The program provides mastery level objectives that enable the student to apply science concepts, principles, laws, and theories.

The program provides the type of experiences that enable the student to understand the general nature of scientific knowledge.

The program provides learning activities through minicourses (organized units of instruction) that enable the student to use basic processes of science to solve problems and make decisions.

The program provides resources that enable the student to develop skills in using basic laboratory instruments which are common to science and industry.

The program provides examples of minicourses that address current concerns, local phenomena, and interdisciplinary situations enabling the student to understand the basic relationships of science, technology, and society.

The program provides a wide variety of science experiences that enable the student to acquire values underlying science.

The program provides examples of minicourses designed for different ability levels, student interests and cultural needs that enable the student to achieve success resulting in a positive attitude toward science.

DESCRIPTION OF SCIENCE PROGRAM GOALS, K-12

Listed below are the program goals with a short description of their identified attributes. The following statements should in no way be considered definitions, and no significance should be inferred from the order in which they are listed.

GOAL I - PERSONAL DECISIONS

The program provides opportunities that enable the student to make worthy choices for the use of leisure time, choosing a career, and acting as a consumer.

a. Using leisure time - Individuals have the attitudes, skills and knowledge related to science to make wise use of their leisure time.

b. Choosing a career - Individuals have the knowledge of science careers necessary for use in selecting a career.

c. Acting as a consumer - Individuals have the attitudes and knowledge related to science necessary to make wise consumer choices.

GOAL II - CONCEPTS[1]

The program provides mastery level objectives that enable the student to apply science concepts, principles, laws, and theories. The concepts of science are:

a. Organization - Patterns that are either found in nature or invented by people. These include the various organization schemes, systems, and arrangements which express order.

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[1]The wording of several program goals and their attributes (particularly Goals II, III, IV, V, VI, VII, and IX) is close to or identical to that used in: Federation for Unified Science Education, "Program Objectives and Scientific Literacy," pre-publication draft of Prism II, Columbus, Ohio, 1974.

b. Interaction - The influences or effects of two or more things on each other.

c. Change - The process of becoming different.

d. Energy - That which enables things to be moved or changed.

e. Matter - The substance of which objects are composed.

f. Space/Time - Dimensions of the world which separate things and events.

GOAL III - NATURE OF SCIENCE

The program provides the type of experiences that enable the student to understand the general nature of scientific knowledge. The general nature of scientific knowledge is such that it is:

a. Tentative - It is subject to change and therefore does not purport to be "truth" in an absolute and final sense. This characteristic does not diminish in the value of knowledge.

b. Public - It is based on evidence that is public as opposed to personal. It is assumed that other individuals would arrive at similar conclusions when confronted with the same evidence.

c. Replicable - It is based on evidence which, at least in theory, could be obtained by other investigators working in a different place and at a different time given similar conditions.

d. Probabilistic - It enables probabilistic, as opposed to absolute, predictions and explanations when applied to real situations.

e. Empirical - Scientific knowledge is based ultimately on or is derived from observation or experiment even though theory may be a useful guide to further work. It has its origin in the real world and is dependent on sense experience.

GOAL IV - PROCESSES OF SCIENCE

The program provides learning activities through minicourses (organized units of instruction) that enable the student to use basic processes of science to solve problems and make decisions. The processes are:

a. Classifying - A systematic procedure used to impose order upon objects, events, or organisms.

b. Communicating - Any one of several procedures involving various media which carries information from one person to another.

c. Controlling variables - Identifying and managing the factors that may influence a situation or event so that the effect of a given factor may be learned.

d. Defining operationally - Producing definitions of a thing or event in terms that give a physical description.

e. Designing experiments - Planning a series of data gathering operations which will provide a basis for testing a hypothesis or answering a question.

f. Formulating models - Devising a mechanism, scheme, or structure which will act or perform as if it were a specific real object, event, or organism.

g. Hypothesizing - Stating a tentative generalization that may be used to explain a relatively large number of events but which is subject to immediate or eventual testing by one or more experiments.

h. Inferring - Explaining an observation in terms of one's previous experience.

i. Interpreting data - To find a pattern or other meaning inherent in a collection of data. It leads to stating a generalization.

j. Measuring - A procedure by which one uses an instrument to estimate a quantitative value associated with some characteristic of an object, event, or organism.

k. Observing - The most basic process of science in which a person uses the senses to obtain information about oneself or the world.

l. Predicting - Predicting what future observations will be on the basis of previous information which distinguishes it from "guessing."

m. Questioning - Raising an uncertainty, doubt or unsettled issue which may be based on the perception of a discrepancy between what is observed and what is known by the questioner.

n. Using numbers - The technique of using number systems to express ideas, observations, relationships, etc., often as a complement to the use of words.

o. Using space/time relationships - Describing spatial relationships and their change with time.

GOAL V - SKILLS

The program provides resources that enable the student to develop skills in using basic laboratory instruments which are common to science and industrial instruments such as:

a. Measuring instruments - These are instruments such as rulers, meter sticks, balances, graduate cylinders and clocks.

b. Viewing instruments - These are instruments such as hand lens, microscopes, and telescopes.

c. Common laboratory equipment - This would include equipment such as bunsen burners, ring stands, test tubes and aquaria.

d. Basic materials - This would include items such as chemicals, magnets, batteries, candles, and biological specimens.

GOAL VI - SCIENCE, TECHNOLOGY, AND SOCIETY

The program provides examples of minicourses that address current concerns, local phenomena, and interdisciplinary situations enabling the student to understand the basic relationships of science, technology, and society, such as:

a. Science/technology - There is a distinction between science and technology although they often overlap and each depends on the other for continued progress.

b. Variable positions - Scientific thought and knowledge can be used to support different positions in response to specific problems (e.g., population control, water fluoridation, etc.); thus it is "normal" for scientists/technologists to disagree among themselves.

c. Social influence on science/technology - The selection of problems investigated by scientific and technological research is influenced by the needs, interests and financial support of the larger society.

d. Ultimate value of scientific knowledge - Although scientists often seem to pursue socially irrelevant phenomena or to investigate trivial phenomena, history shows a significant proportion of these studies eventually have broad application.

e. Impact of science/technology - Scientific and technological developments have real and direct effects on each person's life.

f. Science requires "openness" - Science thrives best when there is a free flow of questions, ideas and results that are not restricted by personal, corporate, social, or national boundaries.

g. Technology controlled by society - Although science requires freedom to inquire if it is to function fully, the application of scientific knowledge is ultimately determined by the whole of society, including scientists. The latter have a special responsibility to inform the public of possible consequences of such application.

h. Public understanding gap - There has been a considerable gap between scientific knowledge and public understanding of it. Constant effort is required by both scientists, technologists, educators and the public to minimize this gap.

i. Resources for science/technology - The conduct of modern science and technology requires considerable resources of talent, time and money.

j. Limitations of science/technology - Science/technology cannot guarantee a solution to any specific problem. In fact, ultimate solution of any problem is usually impossible and a partial solution is all that is possible.

k. Scientists are human - Scientists and technologists are "people." In fact, outside of their special field, they may not exhibit all or even most of the dimensions of scientific literacy. All people, not just an elite group, can "do" science at their own level of sophistication.

l. Respect for diverse cultures - The attitudes and values of science support a respect for diverse cultures.

m. Respect for the likenesses of people - Science focuses upon the common characteristics of human beings.

GOAL VII - VALUES OF SCIENCE

The program provides a wide variety of science experiences that enable the student to acquire values underlying science. Some of these values are:

a. Longing to know and understand - Knowledge is desirable. Inquiry is a worthy investment of time and money.

b. Desire to question - Questions are prized although some are of greater value than others because they lead to further understanding through scientific inquiry.

c. Search for data and their meaning - Data are valued because they are the basis for theories which are worthwhile and because they can be used to explain many things and events. In some cases these have practical applications of value to mankind.

d. Demand for verification - This is high regard for tests suggested or conducted to validate the accuracy of a finding or assertion.

e. Respect for logic - Logic is frequently chosen as a means of arriving at a conclusion.

f. Consideration of premises - Frequent review of the basic assumptions from which a line of inquiry has arisen is prized especially as a basis for determining further action.

g. Consideration of consequences - Frequent and thoughtful review of both the direct and indirect effects resulting from pursuing a given line of inquiry or action is prized.

GOAL VIII - ATTITUDE

The program provides examples of minicourses designed for different ability levels, student interests, and cultural needs that enable the student to achieve success resulting in a positive attitude toward Science. The following factors contribute to a positive attitude:

a. Interest - The individual feels interested in science.

b. Confidence - The individual has confidence in his ability to participate in doing science and in his ability to understand science.

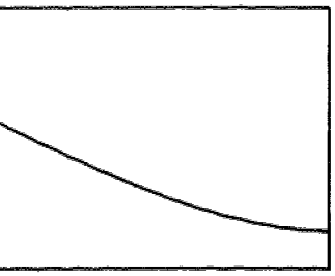
c. Values - The individual values science as a means of solving problems.

PROGRAM-AT-A-GLANCE

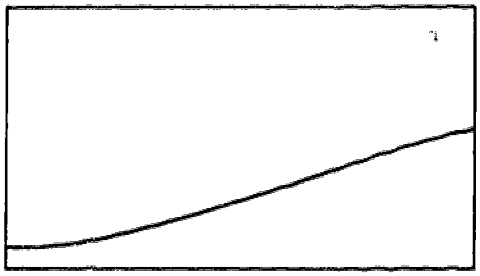
The proposed Science Program is developed basically from existing programs by incorporating those that have been successful, those which meet DISD minicourses as organized units of instruction, include development of process skills, science concepts, career awareness, and interrelationships of science, technology, and society.

The diagrams below show (1) selected areas of relative emphasis of development from kindergarten through grade 12 and (2) content areas at elementary and secondary levels.

SELECTED AREAS OF RELATIVE EMPHASIS



SCIENCE CONCEPTS



CONTENT AREAS

ELEMENTARY LEVEL

Life Science
Earth Science
Physical Science
Environmental Science
Mathematical Science

SECONDARY LEVEL

Life Science or ISCS Level I or II	Earth Science or ISCS Level I, II or III	Physical Science or ISCS Level I, II, or III	Biology	Chemistry	Physics	**Additional Science Courses**	
						Environmental Technology	Field Biology
						Advanced Physiology	Career Development Center
						CVAE Science	Advanced Science
						Aviation Education	Honors Science
							Other

SCIENCE COURSE DESCRIPTION

Program goals have been identified for Science Education. There are many alternative methods to meet these goals. Following state recommendations and DISD needs, the program reaches the goals using minicourses. The greatest emphasis in the elementary grades is given to program goals on the "processes of science." The processes of science serve not only as a foundation to the development of other program goals of science, but also aid in developing skills in reading and mathematics. The emphasis on the processes of science is also in line with the proposed guidelines of the Texas Education Agency. In the secondary grades emphasis is given to program goals which deal with concepts of science, career choices, and the interrelationships of science, technology and society.

Mastery objectives are identified outcomes for a given level and are designed to help students reach the program goals. The DISD K-12 Science Program is developed around a core of minicourses as units of instruction. These minicourses vary in format and length of time, depending upon the developmental level of the students and the content of the minicourse. Each minicourse is as self-contained as possible, providing for alternative learning styles and keyed to DISD science program goals and mastery objectives. A minicourse is a unit of study developed with a common theme and includes the following:

A description of what students should be able to do at the conclusion of the minicourse

Activities to help students learn

Resources and references

Student pretests and post-tests

ELEMENTARY COURSE DESCRIPTION

The elementary science levels, K-6 emphasize process skills as defined in the program goals section. The processes of science are identified by the following levels of emphasis and terms:

K-3 Emphasis	4-6 Emphasis
Observing	Questioning
Measuring	Defining operationally
Classifying	Hypothesizing
Using spacetime relationships	Interpreting data
Communicating	Formulating models
Using Numbers	Controlling variables
Predicting	Designing experiments
Inferring	

Science process skills are developed through the following science content areas:

Life Science
Earth Science
Physical Science
Environmental Science
Mathematical Science

An elementary science minicourse, developed for any specific content area or combined areas, is a vehicle for students to achieve science program goals and mastery objectives.

Secondary Course Description

In grades 7-9 there are primarily two approaches to accomplishing a common set of Mastery Objectives, one is the Intermediate Science Curriculum Study (ISCS) program and the other is the Life Science, Earth Science, and Physical Science Sequence. The ISCS program is a 3 year (Levels I, II, III) individualized, continuous progress approach and the Life Science, Earth Science, and Physical Science sequence, in most cases, is a class centered approach. With some exceptions the following are the courses offered in grades 7-9.

GRADE	TIME INTERVAL	SUBJECT
7th	1 quarter	Life Science or ISCS
8th*	2 quarters	Earth Science or ISCS
9th*	3 quarters	Physical Science or ISCS

* Honors Science courses are offered at these grade levels also.

In grades 10-12 mastery objectives are developed or will be developed for each course. The courses tend to be more specialized and often are offered at more than one grade level.

Available At All High Schools	Additional Courses Offered At Some High Schools
Biology	Advanced Science Courses
Chemistry	Environmental Technology
Physics	Advanced Physiology
Honors Science Courses	Coordinated Vocational Educational Education Science
*Skyline Career Development Center	Physical Science II
*Field Biology	Aviation Education

*Although offered at only one site these are available to all qualifying students.

MASTERY OBJECTIVES

Grades K-6

KINDERGARTEN

The student will:	The student can:
Describe static systems involving shape or color.	Identify and name colors of objects.
	Identify and name two-dimensional shapes.
	Construct classifications of objects based on texture, color, or shape.
	Identify objects based on color, shape, or size.
Use the senses.	Discuss how animals depend on their senses.
	Distinguish between certain food tastes as similar to or different from each other.
	Identify groups or objects as having similar or different odors.

The student will:	The student can:
	Discuss effects of not having the use of a sense(s).
Observe living things.	Identify or construct sets of objects based on his choice of characteristics.
	Identify a member of a set and name characteristics common to the members of that set.
	Match animal parents to their offspring.
Describe comparisons.	Identify and name the order position of an object or event.
	Identify as equivalent, sets which contain the same number of members.
Observe and describe himself/herself.	Identify the movement associated with each of these terms: up, forward, back, right, left.

The student will:	The student can:
	Identify right and left parts of the body.
Observe weather changes.	Identify the seasons and name their characteristics.
	Identify weather changes with clothing and human activities.
	Discuss weathermen as community helpers who inform us about the weather.
Manipulate/use levers.	Identify objects which may be used as levers.
	Manipulate a board (s), block (s) of wood and objects to be lifted to make the objects go up.
	Name uses of levers in the home.
	Talk about different "community helpers" who may use levers-such as movers, gardeners, etc.

The student will:	The student can:
Observe the attracting and repelling forces of a magnet.	Identify magnets and iron or steel objects.
	Demonstrate the attracting and repelling forces of magnets using two magnets and some iron or steel objects.
	Name ways in which magnets may be used.
LEVEL ONE	
Classify observations.	Distinguish an object or event from others that are similar and identify how they are similar or different.
	Contruct a classification of objects based on physical characteristics-texture, weight, size, shape, and color.
	Construct a classification of objects based on function of objects or feeling associated with the objects.
Observe himself/herself.	Identify the following: ears, nose, eyes, mouth and its inner parts, ankles, knees, elbows, torso.

LEVEL ONE

The student will:	The student can:
	Identify and demonstrate symmetry in himself/herself and/or in objects.
	Identify and name characteristics common to a group.
Observe living things.	Identify the activities of living things.
	Describe living plants.
	Describe a living or non-living object according to several of its characteristics.
	Demonstrate a separation of inanimate objects or living organisms commonly found in an aquarium into sets and subsets.
	Construct and demonstrate the use of a simple classification system (a key).
	Classify animals according to habitat.
	Observe differences and similarities in an many cultural groups as possible.

The student will:	The student can:
Use the senses.	Classify objects according to smell, taste, touch, sight, and sound.
	Identify the sense or senses used in examining as given object.
Observe the source of energy of a moving object.	Name the source of energy for items such as the following: toy sailboat, egg-beater, can opener, wind-up toy animal, automobile (show pictures).
	Identify several kinds of energy-wind, water, electricity, etc.
	Make an experiment using a source of energy.
	Identify man's source of energy.
	Make inferences about the effects of not having sources of energy.
Identify gravity as a force pulling toward the center of the earth.	Use a globe and toy items to demonstrate how gravity pulls objects toward the center of the earth.

LEVEL ONE

The student will:	The student can:
	Infer why people living in location don't fall off the earth.
Observe non-living things.	Describe the characteristics of non-living things.
	Classify wood, metal, and plastic objects according to the type of material.
	Observe and state whether a given object floats or sinks in water.
	Make a collection of non-living things.
	Identify the presence of air in an object.
Describe static systems involving shape.	Draw the following simple shapes: square, circle, triangle, etc.
	Construct and name the following two dimensional shapes: triangle, circle, square, rectangle, and ellipse.

LEVEL ONE

The student will:	The student can:
	Identify and/or Construct the following three dimensional shapes: sphere, cube, ellipsoid, cylinder, pyramid, and cone.
Describe static systems involving color.	Name and recognize the primary colors.
	Classify objects by color.
	Make a creative picture using colors.
	Experiment with colored tempra to "create" new colors.
Manipulate/use wheels or rollers to move heavy objects.	Show how the custodian uses wheels to help him on his job.
	Given the problem of a heavy load, the student will suggest the use of wheels or rollers.
	Name things which move with the help of wheels or rollers- automobiles, scooters, toys, etc.
	Infer what would happen if wheels and rollers were not available.

The student will:	The student can:
Observe that the surface of the earth is changed by wind, water, ice and temperature.	Describe the surface of the earth. Infer and name some reasons why the earth is constantly changing. Identify fast and slow changes on the earth's surface. Make an experiment to demonstrate how weather changes the earth's surface. Select/find pictures that illustrate changes on the earth's surface.
Describe how energy from the sun provides the earth with heat and light.	Observe and describe how shadows are made. Measure and record the length, shape, and location of shadows at different times. Experiment with different items such as rocks, water, dirt, etc., to show that sunlight is changed into heat when absorbed by matter.

LEVEL ONE

The student will:	The student can:
Describe how rocks differ in size, shape, make-up, and hardness.	Use senses to describe a variety of rocks with respect to shape, size, color, and texture. Collect rocks from the environment and make a collection for the classroom or school. Weigh rocks. Make an art activity using rocks/pebbles. Name uses of rocks.

LEVEL TWO

The student will:	The student can:
Quantify observation or measures.	Demonstrate how many times a measuring stick can be laid end to end along a given length that is to be measured.
	Identify or name comparison in volume or area for a set of objects.
	Distinguish between pictures or models of things that are life size or not.
Describe interaction or organisms with their environment.	State how soil helps animals.
	Explain how rock can be broken down to become soil.
	Identify and describe interaction of things in an aquarium which keep a natural balance.
	Infer and describe interaction on the basis of observed changes in objects.
	Infer and describe interaction of people with each other and their environment.

LEVEL TWO

The student will:	The student can:
	Describe plant and animal responses to changes in their environment.
Describe static systems of color.	Recognize natural and artificial sources of light.
	Identify objects as either translucent or opaque.
	Describe how white light can be transformed in to the color spectrum using a prism.
Identify simple machines.	Identify definitions of a simple machine.
	Name and identify the following simple machines: pulley, screw or wheel.
	Recognize the above simple machines and their uses in the home.
	"Invent" a simple machine.

The student will:	The student can:
Classify objects.	Classify and describe groups of objects according to shape, color, size, texture, weight, and origin-man made or natural.
	Classify rocks by size, color, kind, weight, origin, hardness, and label.
	Classify animals according to regions.
	Classify people according to regions.
Identify himself/herself.	Identify, and describe the functions of body organs and structures such as the heart, lungs, stomach, teeth, and appendages.
	Make drawings to depict themselves.
	Describe themselves in detail-personal characteristics, cultural background, etc.
	Take height and weight measurements.
	Tell of future career aspirations.

The student will:	The student can:
Observe and describe changing events.	Describe changes caused by seasons.
	Categorize humans according to physical changes.
	Distinguish temperature intervals with or without the use of a thermometer.
	Identify a correct time or temperature using a record or chart.
	Make an experiment to produce change.
	Describe changes in objects and their surroundings.
	Identify the causes of change.
	Identify and name the order position of an object or event.
Identify living things.	Identify the following characteristics of animals: how they grow, eat, change, move, and reproduce.

LEVEL TWO

The student will:	The student can:
	Name the parts of a plant and describe the changes of a growing plant.
	Describe animals' skin covering and body parts.
	Describe and recognize needs and characteristics of humans-use different cultural groups.
	Describe and recognize needs and characteristics of reptiles.
	Describe and recognize needs and characteristics of birds.
	Recognize the stages of an insect-adult, eggs, larva, and pupa stages.
	Describe the needs of living things.
	Catagorize or classify living things according to habitats.
Describe comparisons.	Observe and describe liquids when poured into containers of various shapes and poured or dripped onto a flat surface.

LEVEL TWO

The student will:	The student can:
	Identify liquids in groups of solids and liquid materials.
	Compare and describe pairs of liquids on the basis of transparency, odor and ability to dissolve salt or sugar.
	Describe comparisons of solids.
	Compare and describe himself/herself with other members of the class.
	Compare and describe the work of the farmer and the grocer.
Recognize that water changes the earth's surface.	Show a way in which water has changed the earth's surface.
	Take a walk to observe how water may have changed the immediate environment.
	Suggest ways in which erosion may be prevented.
	Know some dangers of erosion.

LEVEL TWO

The student will:	The student can:
Recognize that weather conditions may change rapidly.	Observe and describe weather conditions in the immediate area.
	Illustrate and describe the above weather conditions.
	Keep a weather calendar.
	Make simple weather predictions.
	Name natural weather phenomena in his environment which may bring rapid weather changes-tornadoes, thunder storms, etc.
	Recognize weather symbols.
	Listen to a weather report-T. V. or radio.
	Recall which precautions to take during inclement weather.
	Recall where to get help, if necessary.
	Infer about weathermen.
	Learn time/temperature phone number.

LEVEL THREE

The student will:	The student can:
Communicate skills through graphs and charts.	Collect information or record observations for a graph.
	Construct a graph.
	Construct a prediction from a graph.
	Construct a map based on a scale or key.
	Identify and name distances or position on a map.
Describe living things.	Classify familiar animals according to whether they eat meat, plants, or both.
	Observe and compare growth stages of classroom organisms.
	Observe, record, and compare growth rates of plants and animals (pets).
	Compare maximum growth reached by different types of plants and animals.

LEVEL THREE

The student will:	The student can:
	Predicts plant and animal responses to environmental changes.
Identify cyclic changes.	Identify the life cycle of a frog-adult, egg, or tadpole stage.
	Identify the elements of the water cycle.
	Recognize the effects of the rotation and revolution of the earth.
	Describe the rotation and revolution of the moon.
	Describe the changes in an objects shadow during a 12 hour day period.
Examine the interaction of objects.	Select and arrange objects necessary to produce an interaction.
	Identify the objects essential to a specific interaction as a system.
	Construct an electrical circuit and state why it is a system of interacting objects.

LEVEL THREE

The student will:	The student can:
	Identify definitions and examples of subsystems.
	Classify and name systems on the basis of the type of interaction.
	Use models for investigating the interaction of systems.
Identify properties which materials can have.	Identify chemical and physical changes of different materials.
	Identify water in different forms.
	Identify whether an object produces or reflects light.
	Recognize the heavier of two objects when they are placed on a scale.
	Describe basic properties of a given object such as color, weight, material, shape and texture.
	Identifies solid materials that can be separated from water by filtering and those that cannot.

LEVEL THREE

The student will:	The student can:
Describe the interaction of organisms with their environment.	Identifies populations in illustrations, i.e. social insects.
	Compares properties of individual organisms with properties of groups of organisms of the same kind.
	Prepares classroom populations of fruit flies, plants, and molds.
	Matches pictures or descriptions of habitats with pictures or descriptions of animals.
Identify the sources of energy.	Describe the size, shape, color, and temperature of the sun and the earth.
	Identify the sun as a source of energy which can be changed to heat.
	Name the sources and simple properties of common forms of energy.

LEVEL FOUR

The student will:	The student can:
Use books for ideas or information.	Collect and compile needed knowledge for investigations.
	Identify acceptable definitions of terms used in science.
	Describe how discoveries were made in the past.
Identify and use available scientific instruments and materials.	Identify and manipulate a thermometer, simple microscope, bunsen burner and glassware.
	Demonstrate a procedure for finding the length of an object in centimeters, decimeters or meters.
	Identify temperature degrees in Celsius and Fahrenheit scale units.
Distinguish between observations and explanations.	Distinguish between observations (evidence) and inferences (explanations).

LEVEL FOUR

The student will:	The student can:
	Construct inferences from observations.
	Construct a prediction about an event based on observations of that event.
	Construct a prediction about an event based on data from a graph.
	Describe how precipitation is formed.
	Identify the forms of precipitation.
	Describe how thermometers operate.
	Read a thermometer and name the kinds and uses of thermometers.
	Describe basic cloud types, cumulus, cirrus, and stratus.
	Name factors that determine climate.
	Observe, describe, and record weather in terms of sky condition, wind, precipitation, and relative temperature.

The student will:	The student can:
	Identify what materials a magnet will or will not attract.
	Identify and name the poles on a magnet ends.
	Describe a magnetic field.
Describe the functions of sense organs and identify their operating parts.	Describe the function of each sense organ.
	Identify the parts of the skin, nose, tongue, eye and ear.
Describe conditions that affect animal and plant growth in their environment.	Name conditions which promote changes in living and non-living materials.
	Describe conditions to investigate and measure properties of living things and non-living materials.
	Demonstrate the techniques for handling living things correctly.
	Name consequences of human interactions with other organisms.

The student will:	The student can:
	Describe the activities of microorganism (e.g. bacteria, protozoa, viruses), state whether the activities are helpful or harmful to humans.
	Observe animal and plant cells using a microscope. Identify and draw the cell structure of each.
Observe the air.	Identify the properties of air as colorless, odorless, tasteless, takes shape of the container it fills, and has weight.
	Demonstrate and describe the presence of air in soil, water, and porous materials.
	Identify wind as moving air.
	Describe the effects of decreasing or increasing air pressure.
	Describe how a plane takes off and climbs.

The student will:	The student can:
Describe the universe.	Identify the members of the solar system.
	Describe a solar eclipse and lunar eclipse.
	Describe the cause of color differences in stars.
	Find the north star in the sky.
	Describe the Milky Way.
Sense the question.	Name the forces necessary to cause objects to move.
	Describe relative positions of stationary and moving objects.
	Identify the stimulus and the response in the observed behavior of animals.
	Identify data which support or do not support a hypothesis.
	Construct a hypothesis given a set of data.
	Contruct a two-dimensional representation of a three-dimensional object.

The student will:	The student can:
	Identify substances according to the states of matter, solid, liquid, or gases.
	Construct and demonstrate the use of a system for classifying substances that are solids, liquids or gases.
	Describe the conditions needed for making and hearing sounds.
Identify the main constituents and variations in the composition of soil and the earth.	Name the earth's layers using a model or picture.
	Collect and observe rocks.
	Examine sand through a magnifying glass.
	Identify forces that shape and change the earth.
	Distinguish between top-soil and subsoil.
	Name and identify the kind of soils.

The student will:	The student can:
	Describe ways to reduce soil erosion.
	Name fuel minerals which are conservation problems.
	Identify and describe the oceans of the earth.
	Describe the water table.
LEVEL FIVE	
Manipulate tools and materials.	Operate all available viewing instruments.
	Use metric measuring instruments.
	Handle basic science materials safely.
	Construct simple apparatus.
Use text and other reference materials.	Identify the meaning of new words and use them correctly.
	Describe some discoveries and inventions by famous scientists.
	Use library material for identifying living and non-living things.

LEVEL FIVE

The student will:	The student can:
Define terms and variables.	Construct and demonstrate the use of a classification system based on observable characteristics or changes in plants, animals, rocks, and soils.
	Classify plants into one of these major groups: (1) simple plants, (2) mosses, (3) ferns, or (4) seed plants.
	Classify common animals as belonging to one of the following groups: (1) worms, (2) insects, (3) shellfish, (4) fish, (5) amphibians, (6) reptiles, (7) birds, or (8) mammals.
	Identify an unknown plant, animal or rock using a classification system.
Interpret the history of the earth.	Identify the source (rocks) in which the history of the earth is recorded.
	Name and describe the six geologic eras in the life of the earth.
	Collect and observe fossils.

The student will:	The student can:
	Construct models and display dinosaurs with pertinent information.
	Demonstrate how plants may be preserved or make a leaf imprint.
	Identify petrified wood and describe how it was formed.
Interpret results of objects.	Describe observed changes in the position of objects relative to a specified position.
	State and apply the rule that the speed of an object is the distance moved per unit of time, i.e. car or bike wheels.
	Describe and demonstrate how to measure the rate of revolution of a revolving object in revolutions per unit of time, i.e. satellites or phonographs.
	Distinguish between revolution and linear speed.

The student will:	The student can:
	Construct vectors to represent forces and changes in motion related to force.
	Identify forces causing motion.
	Demonstrate the use of the standard metric unit for measuring forces--a newton.
	Identify forces involved in flying a plane and helicopter.
	Draw or make a model of a multistage rocket and explain the function of each stage in getting the rocket into space and orbit.
	Match listed causes of air, water, and land pollution to related forms of prevention.
	Identify variables in an experiment which are held constant and those which are manipulated such as water, food, air supply and light on plants or animals.

The student will:	The student can:
	Construct an operational definition of an event so that the effect of a manipulated variable can be clearly identified such as those involving magnetic fields and north based on shadows.
	Name a conclusion based on an inference made from observational evidence.
	Demonstrate the use of an operational definition.
	Examine critically the results of their own and others work.
Identify selective human body systems, their parts and functions.	Identify parts on a model or in drawings of the skeleton, digestive, respiratory, and circulatory systems.
	Describe the functions of the above body systems.
Interpret results.	Construct a force diagram to illustrate balanced and unbalanced forces acting on objects which may be moving or which may be at rest using a spinning top or similar object.

LEVEL FIVE

The student will:	The student can:
	Apply the rule for measuring the distance a wheel rolls given the circumference and number of rotations or turns.
	Apply the rule of circumference and diameter of a circle.
Interpret results of repeat events, a pattern.	Identify and name a relationship between two variables.
	Construct a graph to show the relationship between two variables.
	Construct predictions based on graphs.
	Describe the positions of the earth and sun which causes the year, day and night on earth.
	Describe the lunar month and identify the phases of the moon.
	Construct an electric circuit.
	Identify and construct series and parallel circuits.

The student will:	The student can:
	Construct an operational definition for each circuit.
	Construct an inference or an hypothesis given a set of observations involving circuits.
	Identify the electrical component represented by a given symbol.
	Demonstrate circuits constructed by symbol drawings.
	Match electronic components with its symbol and describe the function of each component, i.e. diode, capacitor, resistor, transistor, coil, and fuse.
LEVEL SIX	
Use simple scientific equipment and instruments.	Use representational models for investigations.
	Construct scale models for investigations.
	Demonstrate the degree of accuracy for measurements taken during investigations.
	Select appropriate instruments available for investigations.

The student will:	The student can:
Select relevant information from books or other reference materials.	Identify the essential steps in approaching a problem scientifically.
	Draw conclusions and make generalizations.
	Write a formal report of findings.
	Describe the significance of the work and ideas of some famous scientists.
	Extend methods and information used in science activities to other fields of experience.
	Identify and name three types of variables in an experiment--constant, manipulated, and responding.
	Describe a pattern found in data.
	Construct a hypothesis based on patterns of data.
Test explanations.	Demonstrate a test of the effect of a manipulate variable such as removing one of the reactants from the photosynthesis reaction in green plants.

LEVEL SIX

The student will:	The student can:
	Identify data which support or do not support a hypothesis.
	Construct operational definitions for basic machines such as levers, wheels and axles, pulleys, inclined planes, wedges, and screws.
	Identify compound machines observed daily.
	Describe the function of an engine and the kinds of engines that have been invented.
Identify selective human body systems, their parts and functions.	Identify parts on a model, or in drawings of the muscular, excretory, nervous and endocrine system.
	Describe the functions of the above body systems.
Identify the nature and variations in basic life processes.	Identify the activities of living things.
	Identify the materials that cells require to maintain life.

The student will:	The student can:
	Describe the ways in which substances move through cell membranes.
	Observe plant and animal cells.
	Identify from drawings, parts of animal cells and plant cells that are, (1) common to each, (2) possessed only by the plant cell, and (3) possessed only by the animal cell.
	Describe the interrelationships and identify the structures that exist among the cell, tissue, organ, system, and organism. Base the identification on the degree of complexity of their organization.
	Identify the fruit and the main parts (roots, stems, leaves, flowers) of a flowering plant and state the function of each part.
	Identify the parts of a flower and describe the function of each.

The student will:	The student can:
	Distinguish between complete and incomplete metamorphosis.
	Identify sequential stages in the life cycle of the following animals: (1) frog, (2) fish, (3) turtle, (4) chicken, (5) dog and (6) human.
	Infer that similar life stages of different organisms manifest similar adaptations.
	Identify adaptations at each stage of growth in plants, animals, and humans.
Recognize the interrelationships between plants and animals in their environment.	Identify the parts of a carbon cycle and describe the functional interrelationships among the parts of the cycle.
	Distinguish between a food chain and a food web.
	Infer food-web relationships select organisms and environments for ecosystems.

The student will:	The student can:
	Compare ecosystem survival and their causes.
	Identify sources of pollutants.
	Predict organisms response to specific growing conditions.
	Observe and record changes in decomposing matter.
	Classify animals according to feeding behavior.
	Construct food chains.
	Identify human interactions with other organisms.
Emphasize the tentativeness of conclusions and probability.	Identify a series of weather maps as a weather model.
	Read and use basic weather instruments such as rain gauge, barometer, anemometer, hygrometer and thermometer.
	Associate weather symbols with weather conditions.

LEVEL SIX

The student will:	The student can:
	Predict the probability of precipitation within a 12-hour period after studying weather maps taken from the daily newspaper and repeating this process of prediction several times.
	Describe and classify climate found in different areas of the earth.
	Identify factors that control temperature and rainfall yearly in Texas.
Describe the structure of matter.	Identify an acceptable definition of the terms, matter, molecule, atom, electron, neutron and proton.
	Identify and name examples of the three states of matter.
	Identify physical and chemical properties of common materials.
	Match early theories on matter with the following scientist who furthered it, i.e. Dalton, Boyle, Democritus and Empedodes.

LEVEL SIX

student will:

The student can:

Classify common substances as elements or compounds when given symbols or formulas.

Identify origins of common materials.

Separate mixtures by use of paper chromatography.

Construct a model of an element.

Make a simple tester to measure the density of liquids.

Observe liquids for such properties as thickness, color, stickiness, and transparency.

Identify a variety of materials by describing their physical properties such as size, shape, color, texture, density, odor, taste and solubility in water.

Describe the relative motion of the molecules and the relative distances between the molecules in the solid, liquid and gaseous phases of matter.

The student will:	The student can:
	Distinguish between scientific definitions of heat and temperature.
	Demonstrate the effects of heat on matter by observing the freezing and boiling points when water temperature changes.
Estimate and compare using the metric system.	Name the estimated lengths and volume of common objects and substances in metric units.
	Estimate and compare the temperature of liquids in degrees Celsius.

MASTERY OBJECTIVES

Grades 7-9

The following list of mastery objectives is tentative and incomplete. It is anticipated that additional objectives will be added for Goal I-Personal Decisions, Goal IV-Processes and Goal VI-Science, Technology and Society. Mastery Objectives are not at this time anticipated for Goal III-The Nature of Scientific Knowledge, Goal VII-Values and Goal VIII-Attitude, although the selection or development of appropriate program evaluation instruments for these areas is anticipated.

The Mastery Objectives are listed in the left column. The right column contains examples, the mastery of which, indicate the achievement of the Mastery Objective. The examples are not to be taken as a complete list, but rather a representative list.

The student will:	The student can:
Understand the characteristics and functions of plant and animal cells.	Explain the interrelationship that exists among the following structures: cell, tissue, organ, system, organism.
	Identify the materials that cells require to maintain life.
	Describe differences between plant and animal cells.
	Match cell structures represented in pictures or diagrams with the name of the structure.
	Give descriptions of the ways in which substances move through cell membranes.

The student will:	The student can:
Understand selected principles of Ecology	Explain the difference between a food chain and a food web.
	Trace the flow of energy through a given example of a food chain and identify organisms when involved as producer, consumer, saprophyte, and predator.
	Describe the functional relationship between parts of cycles such as the Carbon Cycle and Nitrogen Cycle.
	List factors which function as controls on the size of populations.
Understand that characteristic traits are inherited by offspring in definite predictable patterns	Match terms and symbols used in genetics with their definition (i.e., phenotype, genotype, hybrid, x, y, etc.)
	Discuss the principle, development, and application of chromosome theory.
	Design experiments involving test crosses which will reveal genotypes of parental organisms.

The student will:	The student can:
	Discuss moral, ethical and legal issues involved in the possible use of genetic engineering.
Understand how to use appropriate instruments to measure	Identify the proper MKS unit to measure distance, area, volume, mass, force, electrical potential, amperage and temperature.
	Select and use the appropriate instrument to measure distance, area, volume, mass, force, electrical potential, amperage and temperature.
Understand how to use instruments which extend the senses	Demonstrate how to carry and store a microscope.
	Set up, adjust and focus a microscope.
	Prepare a wet mount slide.

GRADES 7-9

The student will:	The student can:
Know the composition of the earth's interior.	List the main layers of the earth such as crust, mantle, outer core, and inner core. Describe characteristics of interior layers such as chemical composition, state of matter, and relative thickness. Give examples of ways in which data about the earth's interior are collected.
Know the structural characteristics and be able to name common minerals.	Identify by name common minerals. Describe properties of common minerals. Use keys to classify common minerals. Give examples of the uses of common minerals.
Know the major catagories of rocks, their origins and interrelationship.	List the major catagories of rocks. Describe the origins of rocks in the major catagories. Identify examples of rocks by name and catagory.

student will:	The student can:
	Explain the interrelationship of rocks from the different catagories.
Know the earth is in a constant state of change.	Discuss the relationship of phenomena such as vulcanism, earthquakes, faults and continental drift to the plate tectonics model.
	Describe the evidence which support the theory of plate tectonics.
	Explain the effect of different change processes such as weathering, erosion, and deposition.
Understand man's impact on the land and water supply.	List and describe basic hydrological processes.
	Discuss the need for land use planning.
	Describe mans effect on the water supply.
	List ways man improves the quality of the land, the water supply and air.

The student will:	The student can:
Understand the fundamental principles that relate to weather.	Describe the structure of the atmosphere, including gaseous composition, temperature, zones, and layers.
	Tell how heating and cooling relate to weather.
	Identify how water-cycle processes of condensation, sublimation, precipitation and melting are dependent upon energy transfer.
Understand processes and in weather forcasting.	List basic instruments, and what they measure in weather forcasting.
	Predict weather conditions from data relating to air temperature, pressure and wind.
	Interpret symbols used on a weather map.
	Discuss how man alters the weather and the implications for the future.
Understand the relative positions of various astronomical bodies and the nature of the forces among them.	Identify the relative position stars, planets, our solar system, our galaxy, asteriods, meteoroids and comets.

The student will:	The student can:
	Describe the forces of interaction among astronomical bodies.
	Relate the earths motion to the apparent motions of stars, planets, the sun and moon.
	Contrast the Ptolemaic and Copernicum models of the solar system.
Understand the results of the space program.	Identify the scientific laws, principles and theories upon which satellite research and space travel are based.
	List the uses of man-made satellites.
	Contrast the benefits of the space program with its cost.
Understand basic principles of historical geology.	Discuss basic principles such as uniformitarianism and evolution.
	Relate in a general manner the development of life on earth during specific time periods.
	Describe principles and procedures upon which geological time scales are based.
	Discuss some of the major geological events in the history of Dallas County.

The student will:	The student can:
Understand basic terms related to matter.	Identify an acceptable definition of the terms matter, element, compound, molecule, atom, mixture, acid, base, salt, electron, neutron, proton.
	List three states of matter.
Understand the atomic theory of matter.	Classify common substances as elements, compounds, or mixtures when given symbols, formulas or models.
	Identify the elements and the number of atoms of each element represented by the molecular formula of a given molecule.
	Sketch a Bohr model of an atom identifying the nucleus and electrons.
	Identify the charge of electrons, protons and neutrons.
Understand the basic arrangement of the periodic table.	Recall that each element consists of atoms which have the same atomic number.

The student will:	The student can:
	Describe the relationship of the elements in the periodic table in terms of order and atomic number and characteristics and period.
Understand that during chemical changes atoms are rearranged in molecules, in a predictable manner.	Relate that as a result of a chemical reaction, the atoms which make up the product molecules are those which were present in the reactant molecules.
	State the Law of Definite Proportions.
	Interpret a simple chemical equation.

The student will:	The student can:
Understand the basic principles of dynamics.	Recognize examples of inertia shown in experiments.
	Identify common units of force.
	Match each of the following terms with its correct definition: Weight, mass, friction, force, inertia.
	Predict which of several objects will accelerate most when given the mass of the objects and the size and direction of the net force.
Understand the relationship of work, power, and energy.	Determine the amount of work done in physical situations.
	List some units of energy.
	Account for the various energy forms in a physical situation.
	Distinguish between energy and power.
	Distinguish between objects in a state of potential energy and those in a state of kinetic energy.
Understand the principles related to simple machines.	Describe the function of simple machines (i.e. transform energy, transfer energy, multiply force, change direction of force, etc.)

The student will:	The student can:
	Solve problems when given any three of the following: (1)distance to the load (2) distance to the effort (3) amount of load (4) amount of effort.
	Calculate theoretical and actual mechanical advantage.
Understand basic principles of electricity.	Differentiate between static and current electricity.
	Distinguish between conduction and insulation.
	Match a given definition with the following terms: Ampere, Volt, Ohm, Watt.
	Interpret a diagram of a circuit telling (A) whether it is open or closed (B) if it is series or parallel (C) what the components are.
	Describe what should be done to remedy a hazardous situation involving electricity in the home.
Understand the wave nature of sound and light.	Describe how sound is able to travel from one place to another.
	Compare a longitudinal wave to a transverse wave.

The student will:	The student can:
	Determine the distance traveled by a sound in air when given the number of seconds it took to reach the hearer.
	List wave properties of light.
	Predict the angle at which light will be reflected from a flat surface, when given the angle at which it strikes the surface.
	Recognize a diagram that correctly illustrates how while light is bent as it passes through lenses, prisms and water.
	Discuss the relationship of frequency of light and color.
	Design an experiment to show that an opaque object is a certain color because of the color of the light it reflects.
Understand the phases or states of matter in terms of molecular structure and activity.	Describe a solid, liquid and gas in terms of definite or indefinite volume and shape.
	Explain the relative motion and the relative distance between molecules in the solid, liquid and gaseous state.

The student will:	The student can:
	Identify the points of phase change and describe the processes involved.
	Explain how plasma differs from solids, liquids and gases.
Understand basic principles of heat and temperature.	Explain the difference between the scientific definitions of heat and of temperature.
	Identify the boiling and freezing points of water on both the Fahrenheit scale and the Celsius scale.
	Read a thermometer to the nearest degree in either ^{o}F or ^{o}C.
	Describe the effect of heat on the volume of a substance and on the speed of its molecules.
	List instruments used to measure temperature and describe the physical property which changes with temperature for each.

The student will:	The student can:
Know the major sources of energy, and the need for conservation of energy, and the development of new sources.	List the major sources of energy used today. Describe the relative abundance of known reserves in the United States and in the world. Analyze projected energy needs, and current supplies of energy, and formulate possible options.

BIOLOGY I

These Mastery Objectives are for the basic progam. Additional sets of Mastery Objectives, which serve to extend the program to a years course of study are being developed.

The student will:	The student can:
Understand some of the major historical contributions to biology.	Discuss the historical contribution to biology of one person, including information about the person, their contribution and its significance.
	Match the names of contributors to biology with a statement of their contribution.
Understand basic laboratory techniques.	Explain the safety rules for the biology laboratory.
	Demonstrate how to carry, use, store and maintain the microscope.
	Select and use appropriate MKS units and appropriate instruments to measure length, mass, volume, temperature, and time.
Understand the interrelationship between cellular structure and function.	Recognize basic cell structures and their functions.
	Differentiate between mitosis and meiosis.
	Recognize various types of cells.

BIOLOGY I

The student will:	The student can:
	Discuss characteristics of viruses.
	List characteristics of living things.
Understand basic chemical relationships of living things.	Differentiate between organic and inorganic molecules.
	Explain the relationships among CO_2, O_2, H_2O, energy and carbohydrates with respect to photosynthesis and respiration.
	List and discuss factors in protein synthesis (i.e. enzymes, amino acids, ribosomes and RNA).
	Explain the role of enzymes in chemical reactions.
Understand fundamental principles of genetics.	Predict the probable ratio of genotypes and phenotypes of the offspring, when given the genotypes of the parents.

The student will:

The student can:

Explain the relationships between DNA, gene and chromosome.

Distinguish between gene and chromosome mutation.

List examples of how people have applied genetics to the development of new varieties and species.

Discuss the issues involved in genetic counseling.

The student will:	The student can:
Be able to use basic laboratory equipment.	Identify basic laboratory equipment.
	Cut, bent and fire polish glass tubing.
	Set up a filtration apparatus.
	Select and use instruments and metric units to measure length, volume, mass, temperature, and pH.
	List basic safety rules.
Understand basic mathematical skills necessary for chemistry.	Write a number using scientific notation.
	Record and display results of a laboratory procedure in tabular and graphic forms.
	Analyze and discuss data graphically expressed.

The student will:	The student can:
Differentiate between forms of matter and chemical and physical change.	Classify properties and changes in matter as either physical or chemical.
	Contrast the properties of mixtures, and compounds.
	Recognize the differences among an element, compound and a mixture.
Use the periodic chart to predict characteristics of elements.	Identify the following on a periodic chart of the elements: group, period, transition elements, halogens, and noble gases.
	Relate the following periodic properties to the elements in the groups and series on the periodic chart; size of the atom; ionization energy; and electron affinity.
Understand how chemical equations describe chemical reactions.	Write the names of selected compounds when given their chemical formula.
	Define molecular and structural formula.
	Write a correctly balanced chemical equation, when given the names of the reactants, products and a periodic table.

The student will:	The student can:
Understand and be able to use the mole concept.	Calculate the formula weight and gram formula weight of a compound using the periodic table.
	Calculate the percent of a particular element or radical in a compound, using the period table.
Understand kinetic molecular theory.	Convert temperature from Celsius to Kelvin scale.
	Identify some factors that affect the vapor pressure of a pure liquid.
	State three basic assumptions of the kinetic molecular theory.
	Explain four properties of gases on the basis of kinetic theory.
Understand basic gas laws.	Solve problems using Boyles law. Solve problems using Charles law.
	Define molar volume and state its numerical value for an ideal gas at standard temperature and pressure.

The student will:	The student can:
	Calculate the gram-molecular weight of a gas when given its density and volume at STP.
Understand basic properties of states of matter.	Compare and contrast properties of gases, liquids and solids using the kinetic theory.
	Predict the direction of shift of a system which is at equilibrium, when conditions are changed.
Understand the differential behavior of solutions.	Identify three factors which affect the rate at which a solid will dissolve in a liquid.
	List three factors which affect the solubility of a solid in a liquid.
	Calculate the weight of a substance needed to prepare a given volume of solution having a given molarity.
	Experimentally determine which solutions will conduct electricity.

The student will:	The student can:
Understand basic properties of acids, bases and salts.	Compare and contrast properties of acids and bases.
	Determine the pH of an acid or base solution, when given proper instruments or indicators.
	Perform a titration to determine normality and/or molarity of an acid.
	Balance given ionic equations or empirical equations that represent the reactions of acids and/or bases.
Understand fundamentals of the oxidation-reduction process.	Identify an empirical equation as either a redox or nonredox equation.
	Label cathodes and anodes on diagrams of electrolytic and electrochemical cells and indicate where oxidation occurs and where reduction occurs.
	Write half-cell equation to describe desirable and undesirable redox reactions.

The student will:	The student can:
Understand fundamental properties of organic compounds.	Identify, from a random list of properties, those that are characteristic of organic compounds.
	Recognize either the name or structural formula of selected organic compounds.
	Describe the processes of fractional distillation, polymerization and cracking.
	List five petroleum products and tell how they are prepared and used.
Understand basic nuclear reactions.	Solve problems involving half-life.
	Balance nuclear reaction equations.
	Discuss benefits and drawbacks of nuclear fusion and fission.

PHYSICS I

The student will:	The student can:
Be able to use basic laboratory equipment.	Describe basic safety procedures for the physics laboratory.
	Identify basic laboratory equipment.
	Select and use instruments to measure length, volume, mass, temperature, voltage, amperage, time, force, etc.
Understand basic skills of measurement necessary for physics.	Write numbers using scientific notation.
	Use the proper MKS units of measure to express common quantities.
	Record and display data in tabular and graphic forms.
	Analyse and interpret data which is graphically displayed.
	Convert units within the metric system.

The student will:	The student can:
Understand fundamental principles of Kinematics.	Define units of motion.
	Describe the relationship of displacement, speed, velocity and acceleration.
	Solve problems involving displacement, velocity, acceleration and time.
	Distinguish between scalar and vector quantities.
Understand basic principles of Dynamics.	Describe relationships between force and motion.
	Describe forces with vectors.
	Resolve vectors by the graphical method.
	Define the units of force in MKS system.
	Describe the requirements for an equilibrium of forces.
	Relate the law of Conservation of Momentum to everyday occurrences.

The student will:	The student can:
Understand the fundamentals of Mechanics.	Describe the relationship between work, energy and power.
	Find the quantities of kinetic energy given to an object from the amount of work performed on the object.
	Find the amount of potential energy stored in an object that is elevated.
	Solve problems involving everyday occurrences using the laws of conservation of momentum and conservation of energy.
Understand the Kinetic Molecular Theory.	Use the kinetic theory of matter to describe molecular motion of the different states of matter.
	Describe the basic properties of the states of matter.
	Perform calculation involving density and specific gravity of solids and liquids.

The student will:	The student can:
	Describe qualitatively the effects of changes in temperature, volume and pressure on an ideal gas.
Understand the fundamentals of the Laws of Thermodynamics.	Describe the relationship between heat and temperature.
	Convert temperature readings from one scale (Fahrenheit, Celsius, and Kelvin) to another.
	Solve problems concerning the amount of heat energy in given bodies at various temperature.
	Solve problems concerning the exchange of heat between various bodies.
	Describe modes of heat transfer (conduction, convertion, radiation.)
	Give examples of everyday situations which illustrate the laws of thermodynamics.
Understand basic characteristics and relationships of Wave Phenomena.	Describe the relationship between frequency, period, wavelength, and velocity of waves.

The student will:	The student can:
	Draw diagrams illustrating the superposition principle of waves.
	Differentiate between transverse, longitudinal and torsional waves.
	List wave properties of sound and light.
Understand basic principles of optics.	Solve problems utilizing the Law of Reflection.
	Differentiate between the various types of images.
	Solve problems involving the passage of light through the interface between two media, using Snell's law and index of refraction.
	Recognize diagrams of various types of lenses and describe their properties.
	Draw ray diagrams for mirrors and lenses.
	Explain the dispersion of sunlight by a prism, using the relationship of color, frequency and refractive index.

The student will:	The student can:
	Describe, in general terms, the photoelectric effect.
Understand selected principles and relationships of Electrostatics and Electric Current.	Describe the change in force between two changed bodies as the distance between the bodies is changed.
	Explain how an electroscope can be used to demonstrate induction.
	Describe how an object becomes charged.
	Solve problems using Ohm's Law.
	Solve problems involving series, parallel and series-parallel circuits.
	For a current in a magnetic field, calculate the direction of the force exerted on the current relative to the direction of the current and the magnetic field.

The student will:	The student can:
Understand selected relationships in Atomic and Nuclear Physics.	Identify fundamental sub-atomic particles.
	Relate, in general terms, the spectrum of hydrogen to the Bohr model of the atom.
	Compare and contrast nuclear fission and fusion.
	Recognize the properties of alpha particles, beta particles and gamma rays.

PART II

HEALTH EDUCATION

"A Sound Mind in a Sound Body is a short but full description of a happy state in this world."

John Locke

RATIONALE

Current health problems facing today's youth, for example: their use of drugs, including tobacco and alcohol and their nutritional practices, can be controlled only if individuals become involved; and these individuals must understand the problems and their causes and must assume personal responsibility for preventing or correcting them.

Healthy individuals are essential for an effective society. To achieve optimal health, every individual should have sufficient knowledge about health. However possession of the facts does not necessarily lead to intelligent action. Motivation is needed to apply that knowledge to daily living.

The overall aim of health education is self-responsibility for health behavior. This means helping people learn how to make sound decisions about their own health.

In order to achieve this aim health education must focus upon the learner as well as upon health information and methods of transmitting it.

The DISD Program includes emphasis on providing opportunities for pupils to acquire facts to develop proper attitudes, to explore career choices and to develop an understanding of those areas that contribute to personal, family and community healt.

When students complete the DISD Health Education Program, they have knowledge to develop attitudes and habits necessary for a healthy life.

Thus they are equipped to make worthy decisions in pursuing a career, acting as a consumer, and using leisure time.

PROGRAM GOALS

The Program provides opportunities for the student to gain knowledge, develop attitudes and behaviors appropriate to achieve and maintain optimal health.

The Program provides opportunities for critical review of social problems in order for the student to gain an understanding of the causes and preventative measures available to each individual.

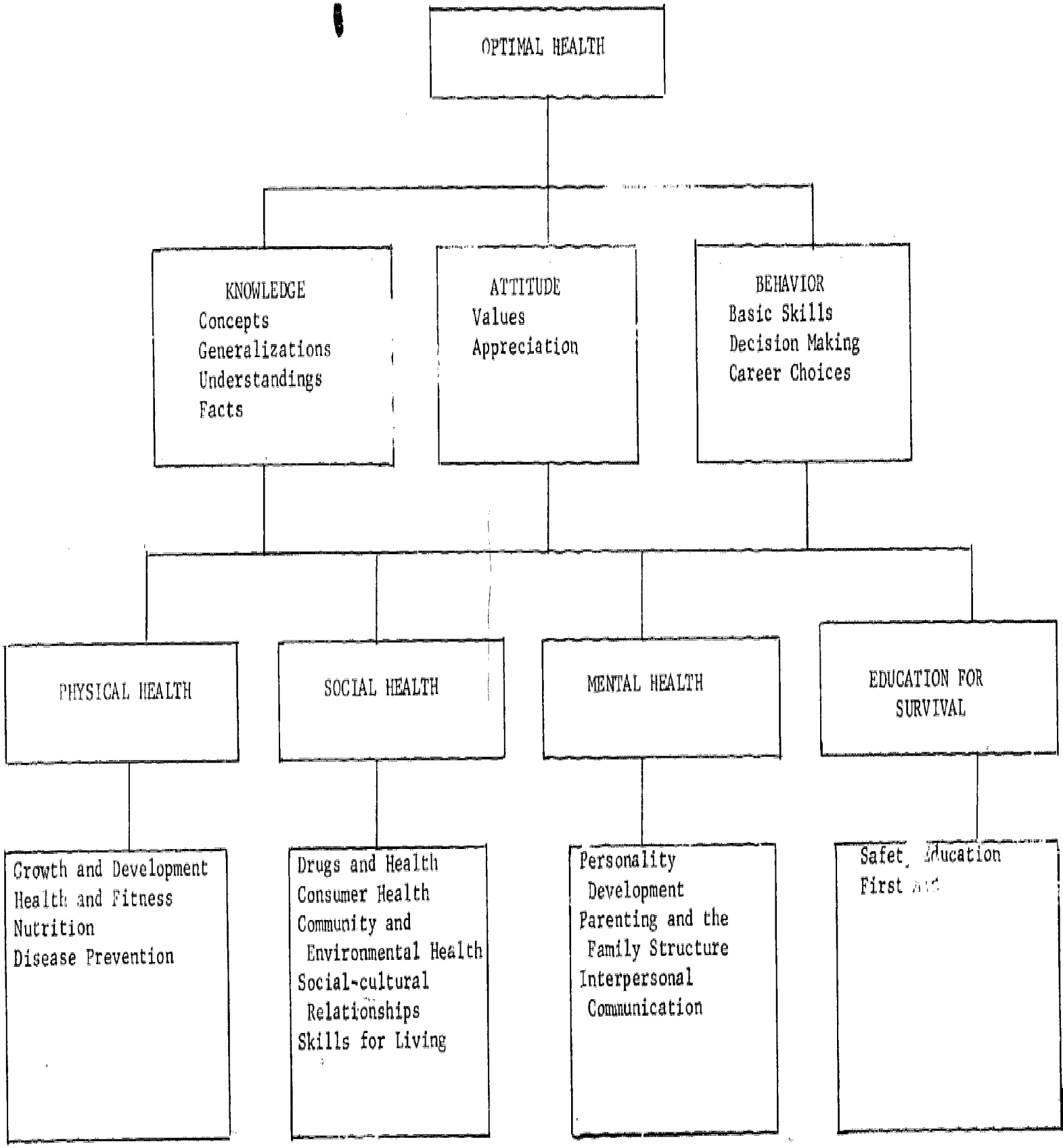
The Program provides various alternative methods for presenting health related materials that focus on the learner as an individual.

The Program provides opportunities for students to make informed choices regarding health behaviors and to encourage personal responsibility for the consequences.

The Program offers an opportunity for students to utilize decision making skills related to leisure time, choosing a career, and consumer choices.

The Program offers opportunities for students to examine attitudes, values and beliefs that they personally hold and those held by other students and society, and to examine the processes through which they are acquired and the ways in which they can affect health.

PROGRAM ELEMENTS



HEALTH COURSE DESCRIPTIONS

Health Education is part of the DISD curriculum both in elementary and secondary schools. At the elementary level health continues to be integrated into the Science program. At the secondary level separate health classes are conducted. The Health Education program follows the current guidelines of the Texas Educational Agency and those developed by the DISD. The school nurse serves as a resource person to the classroom teacher.

The greatest emphasis at the elementary grades is building concepts relevant to healthful living.

In the secondary grades the emphasis focus the individual on preparing to make appropriate choices regarding personal health, careers, and relationships of individuals and society. Health education is presented in a classroom setting with the standard teacher/student ratio.

A Elementary - Health Education continues to be integrated during the school year into science curriculum at all elementary grade levels. It is recommended that one-third of the school year emphasize health and two-thirds science.

B Seventh grade Program - 1 quarter of health education is required.

C Eighth grade Program - 1 quarter elective is offered in the 1975-76 school year. It will be required for the 1976-77 school year.

D Health Education I Tenth grade Program - Health Education is offered in a 2 quarter course. This is an elective during the 1975-76 school year and required for graduation in the 1976-77 school year.

E Health Education II - Health Education is offered as a 1 quarter course elective in the 1976-77 school year.

11 Chart for Health Education Courses

Grade Level		1975-76	1976-77
K-6	Part of Science	Health emphasized 1/3 of school year	Same
Grade Seven	1 quarter	Required	Required
Grade Eight	1 quarter	Elective	Required
Grade Ten (Health Education) I	2 quarters	Elective	Required for graduation
Grades 10-12 (Health Education) II	1 quarter	Elective	Elective

ELEMENTARY COURSE
DESCRIPTION

A. Grades K-3; the program in health for the primary school students should be based upon the following:

1) Positive health habits

2) food and nutrition

3) growth and development

4) prevention and control of illness and disease

5) safety

6) adjustments to school life

7) care of teeth, eyes, and ears

8) becoming acquainted with health professionals

9) career awareness

B. Grades 4-6; the program in health for students in the intermediate grades should be based on the following:

1) a balanced day of work, rest and play

2) nutrition and growth rates

3) body structure and function

4) personal cleanliness and grooming habits

5) mental, emotional and social health

6) use and effects of tobacco, alcohol and other drugs

7) indications of illness

8) individual's interaction with the environment

9) career orientation

10) community health services

11) personal safety habits

12) consumer choices

SECONDARY COURSE
DESCRIPTION

A. Grade 7-8; health education is an action-centered program emphasizing individual responsibility for optimum growth and is based on:

1) body changes, body function and personal adjustments

2) drug use and abuse

3) advertising and consumer choices

4) prevention and management of accidents and illness

5) introduction to concepts of community health

6) relating food selection to life style

7) career choices

8) personality development

9) environmental health and safety

B. Grade 10; the course in health education is planned to:

1) provide the student with a functional understanding of health maintenance including physical, emotional, and social aspects of growth and development.

2) build on concepts of community health including health care delivery system

3) stimulate health career awareness

4) relate food selection to health

C. Grades 11-12; a consumer oriented course dealing with human ecology (proposed as elective):

1) the changing patterns of daily life

2) appreciation for diversity of cultural values and health practices

3) relationship between life styles and longevity

4) parenting and family structure

MASTERY OBJECTIVES

Kindergarten

The student will understand that one's health is protected by the community by identifying agencies and individuals that are involved in protecting one's health.

The student will understand the importance of good health habits by reciting practices that are important to good health.

The student will understand that there are many different kinds of foods by classifying a variety of foods into several broad categories.

The student will understand how behavior while eating can influence one's enjoyment of the meal by demonstrating behaviors that are acceptable.

The student will understand and recite procedures to follow to avoid hazards in our environment.

First Grade

The student will understand the difference between illness and well being by identifying ways to determine illness.

The student will understand the relationship between communicable disease and immunization by identifying various diseases that have been controlled through immunization.

The student will cite examples of how students are consumers.

The student will understand that living things grow and reproduce by describing the characteristics of growing.

The student will understand the difference in drug use and abuse by identifying common drugs and legitimate sources for their administration.

Second Grade

The student will understand that controlling emotions is helpful in getting along with others by identifying behaviors and attitudes that affect one's relationship with others.

The student will understand the relationship of proper nutrition to growth and development by identifying foods that are necessary to continue growth.

The student will identify ways everyone works together to keep home and school safe.

The student will understand that protection of our environment is everyone's job by identifying ways that the community health is affected by the actions of all people.

Third Grade

The student will understand the effects of mass media on consumer purchasing by identifying various techniques used by television, radio, etc., to influence consumer choices in the market place.

The student will identify ways in which people are alike and ways in which they differ.

The student will identify the hazards inherent in self-diagnosis and self-medication.

The student will understand that a variety of foods is needed to have a nutritionally balanced meal by identifying components that make a complete meal.

Fourth Grade

The student will understand the role of the individual in preserving our environment by listing the reasons for regulation of pollution.

The student will identify the components of the body's natural defense system.

The student will cite the factors involved in maintaining physical and mental fitness.

The student will understand that growth and development are dynamic processes that follow predictable, yet unique patterns by identifying the various reasons for different growth patterns.

The student will understand that food selection influences growth and development by identifying foods that are important for a growing child.

The student will understand the importance of a pleasant mealtime atmosphere by identifying reasons for maintaining certain behaviors at mealtime.

Fifth Grade

The student will cite examples of the relationship between safety practices and the reduction of accidents.

The student will understand that the individual is responsible for the wise use of one's resources in selection of goods and services by identifying the influences which affect one's choices of products and service.

The student will list the factors involved in caring for the body.

The student will identify some basic decision-making techniques that are useful in adapting to our varying roles in society.

The student will understand that growth and development occur unevenly for body parts and functions by describing how these differences affect us.

The student will understand that a variety of mood and behavior-modifying substances exist by identifying these substances and alternatives to their use.

The student will understand the necessity for an adequate daily intake of proper nutrients by selecting a complete day's nutrients and dividing them into meals and snacks that fit one's individual social, cultural and economic life style.

Sixth Grade

The student will understand the roles of various health care organizations by describing their contributions to community health.

The student will understand the individual's role in environmental protection by identifying ways the individual and society as a whole can protect our environment.

The student will understand the importance of preventative medicine by identifying the reasons for periodic physical examinations before illness occurs.

The student will understand that government regulations and education of the individual provide protection for the consumer by identifying agencies and educational programs that are available to assist the consumer.

The student will identify the biological and psychological changes that affect relationships with peers, family and society.

The student will understand the relationship between self-acceptance and growth and development by identifying factors within self and others that contribute to one's development.

The student will list the physical and psychological effects of abusing mood and behavior modifying substances.

The student will understand that food technology has made a valuable contribution in providing a variety of foods year round by listing the various processing techniques that have made this variety possible.

The student will understand the relationship between growth and nutrient intake by interpreting the results of controlled animal feeding experiments.

7th - 8th Grade

The student will understand that early adolescence is a period of rapid physical change by identifying areas of change, and the factors that influence difference in growth rates.

The student will identify the factors that influence personality development.

The student will understand the relationship between personality, behavior and accidents by listing those attitudes and activities that tend to prevent accidents.

The student will understand that a basic knowledge regarding consumer choices is fundamental to the development of sound buying practices by identifying legitimate courses of consumer information both scientific and non-scientific.

The student will understand that knowing the nature of communicable disease is fundamental to controlling them by identifying sources and mode of transmission of the communicable diseases.

The student will understand that health professionals are of value to society by listing their contributions to the community.

The student will list ways of achieving and maintaining fitness.

The student will understand that attitudes and practices regarding food effect the total being by listing the factors that influence eating habits.

The student will understand that the individual's nutritional needs may be met by many different combinations of food by selecting a balanced diet from the foods available that are compatible with the individual's life style.

The student will understand that drugs, tobacco and alcohol are significant health and social issues in our society by identifying the factors that cause them to be of a social concern.

The student will understand that the nature of the individual's environment and one's relationship to it are important to one's health by identifying the factors in this relationship.

Tenth Grade

The student will understand that consumer decision making depends upon the ability to apply criteria to selections by identifying critical techniques to use in evaluating the many influences upon the individual.

The student will understand that many career opportunities exist in the health field by identifying the major career areas and listing the qualifications for each.

The student will understand that although some preventable communicable diseases have been controlled, others remain a major health problem to man by identifying ways the individual can comply with control measures.

The student will understand that controlling chronic and degenerative diseases depends upon the individual's knowledge and response to early symptoms by identifying the symptoms of the major chronic and degenerative diseases.

The student will list major environmental health problems in the community.

The student will understand the interrelationship between the physical, mental, emotional, and social aspects of growth and development by identifying the influencing factors between these areas.

The student will understand that the individual is responsible for developing and maintaining one's own level of fitness by identifying effective methods in health maintenance.

The student will understand that various aspects of food selections and eating patterns influence one's total health by identifying the many factors involved in planning and selecting appropriate foods.

The student will understand that the use of tobacco, alcohol, and drugs results from and leads to health and social problems by identifying the psychological and sociological problems involved.

The student will describe the influences, pressures and conflicts that arise from the individual's interaction with others that help one establish an effective personal value system.