DOCUMENT RESUME

ED 309 091 SE 050 747

TITLE Curriculum Mapping: End of Eighth Grade. Science Education: Common Curriculum Goals.
INSTITUTION Oregon State Dept. of Education, Salem.
PUB DATE 9 Sep 88
NOTE 59p.; For related documents, see SE 050 745-750. Small print may not reproduce well.
PUB TYPE Tests/Evaluation Instruments (160)

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS *Course Objectives; *Curriculum Evaluation; Educational Assessment; *Evaluation Criteria; Evaluation Methods; *Grade 8; Instructional Material Evaluation; Junior High Schools; Middle Schools; Program Evaluation; Science Curriculum; *Science Education; *Secondary School Science
IDENTIFIERS *Oregon

ABSTRACT

Curriculum mapping activities can be useful in analyzing curriculum goals and planning curriculum revision. This document is specifically designed using the Science Education Curriculum Goals articulated by the State of Oregon for grade 8. The goal areas include concepts, processes, manipulative skills, interests, values, interactions and characteristics. Information gathered using this document include: (1) amount of instruction; (2) degree to which instruction is included in course goals; (3) adequacy of texts and supplementary materials; and (4) adequacy of teacher training for each goal. The instrument is organized as a grid. (CW)

SCIENCE EDUCATION

Common Curriculum Goals

Curriculum Mapping

End of Eighth Grade

Oregon Department of Education
700 Pringle Parkway SE
Salem, Oregon 97310-0290

USE OF THIS DOCUMENT

This document is provided for your convenience. Curriculum mapping is not a required activity. However, you will find that information obtained in this process will be helpful in analyzing your current curriculum in terms of the Science Education Common Curriculum Goals and planning for curriculum revision.

INSTRUCTIONS

Use of this document to gather information

1. Decide on questions to be asked. Some questions are provided in the column headings. You may wish to add or delete column headings.

2. Items underlined are unique to the Science Education Common Curriculum Goals or indicate that a change has occurred in the wording of an Essential Learning Skill.

3. Determine who will respond to the survey and under what conditions.

4. Reproduce the document and provide staff orientation and training.

5. Clarify intent of column headings and numeric scores.

Amount of Instruction:

Considerations here include amount of time and quality of instruction and feedback provided to students on the skill. Practice or application by instruction.

Included in Course Goals:

To be considered here is the degree to which the current local course goals reflect a particular common curriculum goal.

Adequate Materials:

Considerations here include the quality and the quantity of instructional equipment and apparatus. Also, the quality and quantity of teacher resources available for teachers planning. Concerns about sufficient materials for each student or teacher should be reflected in the comment section and in the score.

Ratings: 0 = absence or a complete lack of the item specified in the column heading.
1 = a low or inadequate amount or quality of the specified item.
2 = a moderate or reasonably satisfactory amount or quality of the specified item.
3 = a high or substantial amount or quality of the specified item.

Adequate Teacher Training:

Considerations here include teacher preservice, inservice, college courses, workshops, personal reading and experiences which provice the teacher with the necessary skills to teach toward the specified goals.

Blank Column:

This column is provided for questions that you would like to add.

Comments:

Encourage teachers to use this section to clarify their ratings or express related concerns.

Use of this document to tally results

Results can be tallied in the space provided above numeric scores on an unmarked form. Consideration should be given to tallying by grade level or course title.

Use of this document to analyze results

An additional unmarked document can be used to display results across grades or courses for analysis and decision-making. Data could be displayed in a numeric average, as a compilation of all ratings, with a word descriptor (such as low, medium, high), or symbolically, using color coding.

SCHOOL: _____

ASSIGNMENT: 6 ___ 8 ___ 7 ___ Course _____ End of Eighth Grade	Amount of Instruction	Included in Course Goals	Adequate Materials: Basal Text	Adequate Materials: Supplementary	Adequate Teacher Training		COMMENTS
1.0 Concepts. Students apply an understanding of fundamental concepts on which science is based.							
STUDENTS WILL BE ABLE TO:							
1.1 Demonstrate CAUSE AND EFFECT: Related series of two or more events that lead one to believe that nature is predictable (e.g., acid rain affecting plant growth, changing the temperature of a material, chemical reactions)*							
a State a hypothesis using a cause and effect relationship	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
b Demonstrate an understanding of factors involved in a cause and effect relationship by predicting the outcome of interacting events	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
c Identify relationships and regularities from which a general statement can be made about the effects of change (e.g., time increase increases reaction rate)	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
1.2 Demonstrate CHANGE: The process of things becoming different over time (e.g., aging, growth, metamorphosis, fire, mountains breaking up) (ELS 6.1)**							
a Demonstrate physical and chemical changes	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
b Explain how things or ideas can change when interacting with others	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	

0 = absence 2 = moderate
1 = low 3 = high

*Items changed from, or not included in, Essential Learning Skills.

End of Eighth Grade	Amount of Instruction	Included in Course Goals	Adequate Materials: Basal Text	Adequate Materials: Supplementary	Adequate Teacher Training		COMMENTS
c Describe linear and non-linear rates of change	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
d Distinguish between physical and chemical changes	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
1.3 Demonstrate CYCLE: A pattern in which events or conditions repeat at regular or irregular intervals (e.g., day and night, seasons, reproductive cycles, nitrogen and carbon cycles)							
a Use cycles to explain relationships in the environment	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
c Investigate ideas of recurrence and predictibility	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
1.4 Demonstrate ENERGY-MATTER: Mutually convertible equivalents ("stuff") from which the universe is made. Matter contains energy in many forms (e.g., states of matter are determined by energy in motion, nuclear energy comes from the nucleus when atoms split or fuse)							
a Describe and demonstrate how technology utilizes the scientific tenets of the relationship between energy and matter (e.g., nuclear medicine, nuclear energy for producing electricity, electric motor)	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
b Define energy and matter	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	

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End of Eighth Grade	Amount of Instruction	Included in Course Goals	Adequate Materials: Basal Text	Adequate Materials: Supplementary	Adequate Teacher Training		COMMENTS
c Recognize that the interaction of energy and matter determine the nature of the environment	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
d Describe the difference between renewable and non-renewable resources	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
1.5 Demonstrate ORGANISM: A system living or once living characterized by the processes of life (e.g., plants and animals; unicellular/bacteria)							
a Determine an understanding of the effect that one of the life processes (e.g., ingestion of food) has on another process (e.g., growth as a result of ingesting food)	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
1.6 Demonstrate POPULATION: A group of structural or functional units that have specific or common characteristics (e.g., organisms)							
a Describe how interaction and change affect individuals in populations and the populations themselves	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
1.7 Demonstrate EQUILIBRIUM: A state of balance of equality between opposing forces (e.g., seesaw, diffusion of molecules from high to low concentration) after rates reach a balanced state							

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End of Eighth Grade	Amount of Instruction	Included in Course Goals	Adequate Materials: Basal Text	Adequate Materials: Supplementary	Adequate Teacher Training		COMMENTS
[a] Distinguish between static and dynamic forms of equilibrium	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
[b] Demonstrate a state of equilibrium (e.g., a boat floating, hot air balloon in flight)	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
1.8 Demonstrate EVOLUTION: A series of changes that can be used to explain how something has become the way it is or to predict what it might become (e.g., simple animal and plant forms to more complex forms)							
[a] Illustrate and experiment with different ways that things/objects (e.g., organisms, technology, automobile styles, geological features) change over time	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
1.9 Demonstrate FORCE: A push or pull against resistance which causes action, inaction or change (e.g., catapult, gravity, change the speed or direction of motion, stop motion)							
[a] Predict and explain the outcome of situations where forces interact (e.g., isometric exercises, isotonic solutions)	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	

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End of Eighth Grade	Amount of Instruction	Included in Course Goals	Adequate Materials: Basal Text	Adequate Materials: Supplementary	Adequate Teacher Training		COMMENTS
1.10 Demonstrate FUNDAMENTAL ENTITIES: Units of structure and function useful in explaining phenomena (e.g., organism in populations, methods of measurements)							
[a] Use basic units which make up objects and systems	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
1.11 Demonstrate INTERACTION: Two or more things influencing each other (e.g., population/food, hot/cold, acid/base, force/movement, volume/pressure)							
[a] Use interactions to predict an outcome	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
1.12 Demonstrate ORDER: The tenet that there is order in nature or that order can be described in the various schemes or patterns of nature (e.g., periodic table, tides, sunrise/sunset)							
[a] Order a given group of objects or common events by using one or more criterion	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
1.13 Demonstrate QUANTIFICATION: A number and unit resulting from a measurement of some real or abstract thing, situation or event (e.g., distance, time, mass, metric system (meter/second/gram), density, solubility, probability)							

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End of Eighth Grade	Amount of Instruction	Included in Course Goals	Adequate Materials: Basal Text	Adequate Materials: Supplementary	Adequate Teacher Training		COMMENTS
[a] Create a pictorial or graphic representation of data	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
1.14 Demonstrate SYSTEM: A set of parts that function together as a whole. The parts can be discussed or studied individually for more effective learning (e.g., parts of a flower, digestive system of the body, electric motors)							
[a] Identify interactions between/among parts of a system	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
[b] Identify input and output in a system	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
[c] Diagram and explain the interrelationships of the components of common systems	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
1.15 Demonstrate THEORY: A plausible or scientifically acceptable explanation made up of models, concepts, and principles of some observed thing, phenomenon or thought (e.g., development of earth, atom, universe)							
[a] Recognize that theories are tentative	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
[b] Recognize examples of theories	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	

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1.16 Demonstrate FIELD: A region around something that influences some other thing often without touching (e.g., magnetic, electrical, gravitational)							
[a] Identify and describe a force field (e.g., magnetic field)	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
1.17 Demonstrate GRADIENT: A situation in which the intensity of something increases or decreases in a more or less regular pattern (e.g., temperature changes as distance from heat source is varied, stream flow, light intensity changes as distance from light source is varied)							
[a] Describe the variations in a gradient	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
1.18 Demonstrate INVARIANCE: A characteristic of an object or a situation which stays constant even though other characteristics may change (e.g., number of protons in nucleus, life (time related), total mass in chemical reaction)							
[a] Recognize and describe invariance in biological and physical systems	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	

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End of Eighth Grade	Amount of Instruction	Included in Course Goals	Adequate Materials: Basal Text	Adequate Materials: Supplementary	Adequate Teacher Training		COMMENTS
1.19 Demonstrate MODEL: Proposed idea of the composition and relationships present in something that cannot be observed directly (e.g., black box, black hole)							
a Use models to explain natural systems (e.g., plate tectonics)	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
b Identify characteristics of all models	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
1.20 Demonstrate PERCEPTION: The mind's interpretation of sensory input (e.g., illusions, use of sensory limitations to extend perception of scientific equipment)							
a Describe things that change perception	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
b Explain how perception may differ from person to person	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
1.21 Demonstrate PROBABILITY: An expression of the likelihood that a situation or event will occur (e.g., flipping coins for heads or tails, cards, numbers, genetics, types of organisms, earthquakes, electron orbits)							
a Use data to recognize difference in predicted and actual outcomes	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	

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b Explain the difference between high probability and certainty	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
1.22 Demonstrate REPLICATION: Repeating the same condition in expectation that the same results will be produced (e.g., same soil condition produces same size plant, same ingredients in same product)							
a Describe the importance of replication in experiments	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
1.23 Demonstrate SCALE: The understanding that characteristics may change as a system's dimensions are increased or decreased (e.g., maps, globes, models of cars or planets, or houses)							
a Explain the limitations of scale models used to represent natural phenomena (e.g., atom, solar system)	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
1.24 Demonstrate SYMMETRY: Structurally balanced (e.g., snowflakes, airplane body, right and left side of human body, sphere)							
a Relate types of symmetry to function in natural systems	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	

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n, Essential Learning Skills.

End of Eighth Grade	Amount of Instruction	Included in Course Goals	Adequate Materials: Basal Text	Adequate Materials: Supplementary	Adequate Teacher Training		COMMENTS
1.25 Demonstrate TIME-SPACE: The timing of an event moving from point A to point B (e.g., mph or km/h, automobiles separated by space of 3 seconds, velocity or vector, speed of nerve impulse)							
a Recognize and explain scales in measuring time and space	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
b Demonstrate ability to use time and space to describe events (e.g., speed, relative position)	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	

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2.0 Processes. Students apply problem solving and inquiry processes. STUDENTS WILL BE ABLE TO:							
2.1 OBSERVE: Make accurate observations of objects and events using the senses or instruments to aid the senses* (ELS 4.1)**							
a Distinguish the properties of objects directly or by manipulating or changing objects to observe their properties	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
b Use appropriate instruments to repeat and verify qualitative and quantitative observations in order to establish consistency	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
2.2 MEASURE: Use measuring devices to collect data (ELS 1.7)							
a Select and use the appropriate instrument for measurement in metric and English (U.S. Customary) units	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
b Measure and record the properties (e.g., length, weight, mass, volume, temperature, time) of an object or event	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
2.3 USE NUMBERS: Use number/ numeric figures, letters, words, symbols and visuals to count, compute and communicate quantitative data (ELS 1.4)							

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End of Eighth Grade	Amount of Instruction	Included in Course Goals	Adequate Materials: Basal Text	Adequate Materials: Supplementary	Adequate Teacher Training		COMMENTS
[a] Use mental, manual, calculator and computer processes to perform grade-level mathematical operations in reporting scientific information and conducting scientific investigations	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
[b] Interpret and construct graphs, charts, and tables of scientific data (ELS 1.6)	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
2.4 RELATE TIME-SPACE: Describe spatial relationships and their change with time (ELS 1.6)							
[a] Describe the location of an object relative to another object (e.g., reading and giving map directions)	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
2.5 INFER: Recognize, construct and draw inferences concerning relationships among things and ideas (ELS 6.1)							
[a] Develop a list of observations of an object or event and make logical inferences based on the observations (ELS 1.6)	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
2.6 CLASSIFY: Use the characteristics of objects or events to group them by ordering similarities (ELS 6.1)							

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End of Eighth Grade	Amount of Instruction	Included in Course Goals	Adequate Materials: Basal Text	Adequate Materials: Supplementary	Adequate Teacher Training		COMMENTS
[a] Using a given scheme, classify objects or ideas according to patterns/multiple characteristics (ELS 1.6)	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
[b] Identify and sequence (seriate) data by value (ELS 1.6)	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
2.7 DEFINE OPERATIONALLY: Use the common characteristics of sets of objects or events observed or experienced to develop definitions of those objects or events							
[a] Observe related events (e.g., attraction between magnets and objects) and develop a definition for the concept shown (e.g., field)	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
2.8 QUESTION: Identify problems and develop testable questions relating to the problems (ELS 6.3)							
[a] Identify a problem and generate information necessary to understand the problem	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
[b] Develop testable questions designed to clarify the problem (ELS 2.3)	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	

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2.9 HYPOTHESIZE: Use information and questions to generate statements that describe expected results of investigation (ELS 6.2)							
a Use information and questions to generate statements that describe expected results of investigations	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
2.10 DESIGN EXPERIMENTS: Plan and conduct data gathering operations to test hypotheses or answer questions (ELS 6.3)							
a Gather and organize data that may be used in testing a hypothesis	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
b Solve problems using appropriate strategies such as guessing and checking, making a systematic list, looking for patterns, making or drawing a model, eliminating possible answers or solving a simpler problem	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
c Engage in cooperative problem solving and compare alternative solution strategies	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
d Use summative (final) data to determine if the problem-solving approach was successful, and if not, how it should be modified	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	

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2.11 CONTROL VARIABLES: Identify and manage factors that may influence an experiment (ELS 3.1)							
a Distinguish between controlled variables and variables which are being tested in an experiment	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
b Draw logical conclusions from information presented	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
2.12 INTERPRET DATA: Find patterns or meanings in experimental results (ELS 3.1, 6.2, and 6.4)							
a Use the results of analyzing data (e.g., classifying, inferring, using numbers) to interpret the meaning and significance of an investigation (ELS 6.2)	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
b Compare the results of experiment data analysis to the expected results and determine the reasons for the differences (ELS 6.4)	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
c Draw logical conclusions from information presented (ELS 3.1)	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	

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2.13 PREDICT: Use information and data to generate and test predictions (ELS 1.6 and 6.2)							
[a] Use quantitative measurement as a means of improving accuracy of predictions (ELS 1.6)	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
2.14 FORMULATE MODELS: Use problem solving and questioning skills to develop mental models that explain phenomena (ELS 6.3)							
[a] Create verbal and visual representations of an object, system or event which cannot be directly observed (e.g., interior structure of the earth)	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
2.15 COMMUNICATE: Use a variety of techniques to share the results of investigations (ELS 1.6 and 2.3)							
[a] Share information about investigations through oral, written, and visual (e.g., graphs, charts) communication skills (ELS 1.6 and 2.3)	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	

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End of Eighth Grade	Amount of Instruction	Included in Course Goals	Adequate Materials: Basal Text	Adequate Materials: Supplementary	Adequate Teacher Training		COMMENTS
3.0 Manipulative Skills. Students use a variety of materials and equipment in a safe and scientific way.							
STUDENTS WILL BE ABLE TO:							
3.1 CONSTRUCT: Set up, shape or build the equipment and apparatus necessary for scientific activities (e.g., grid squares, microscope slides, glassware)*							
a Select, assemble, or construct equipment or apparatus to conduct a science activity	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
3.2 HANDLE MATERIALS: Demonstrate the proper safe use and maintenance of laboratory equipment and materials (e.g., pointed scissors, safety glasses, microscopes, chemicals, power tools, living materials, models, measuring devices)							
a Use proper techniques when handling equipment and disposing of hazardous materials	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
b Use appropriate safety equipment (e.g., clothes, eye protection, fire control equipment	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
c Demonstrate proper technique for common laboratory skills (e.g., heating, filtering, using a balance)	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	

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3.3 PRACTICE BEHAVIOR: Practice appropriate and positive health behaviors to enhance learning (ELS 7.4)**							
[a] Evaluate the effects of substance use on physical and mental performance (e.g., recording accurate measurements during an investigation)	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	

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4.0 Interests. Students develop interest in science.							
STUDENTS WILL BE ABLE TO:							
4.1 Develop vocational and avocational interests in science by using many sources (e.g., media, organizations, conducting own research activity in and beyond the classroom)* (ELS 7.2)**							
a Locate and use reference materials (e.g., books, periodicals, newspaper, observations of nature, television, museums, exhibits, personal interviews, computer accessed data bases)	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
b Use library classification system and services to locate specialized resources (e.g., people with expertise, print and nonprint, places of interest and information)	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
c Identify aspects of science which relate to vocational and avocational interests	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
4.2 Recognize words and symbols commonly used in written materials (ELS 1.1)							
a Recognize common words and symbols found in written materials	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	

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End of Eighth Grade	Amount of Instruction	Included in Course Goals	Adequate Materials: Basal Text	Adequate Materials: Supplementary	Adequate Teacher Training		COMMENTS
4.3 Determine meaning of unknown words and symbols commonly used in instructional materials (ELS 1.2)							
a Use concrete (hands-on) experiences as a basis for determining meaning of terms	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
b Use dictionaries, glossaries, media, and other reference materials to find word and symbol meanings	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
c Utilize affixes and root words in understanding meaning of scientific and technological terms	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
4.4 Use instructional materials as basis for gaining knowledge and improving comprehension (ELS 2.2)							
a Use table of contents, index, summaries, charts, graphs and illustrations to locate information needed	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
b Use organization of materials (summaries, headings and review questions) for preview and review	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
c Use current technology (e.g., video tape, computer accessed data bases, video discs) to locate information needed	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	

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5.0 Values. Students apply the values that underlie science.							
STUDENTS WILL BE ABLE TO:							
5.1 Recognize that seeking knowledge and understanding is a worthy investment of time and resources* (ELS 6.2 and 6.3)**							
a Recognize the importance of securing and evaluating information	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
b Evaluate the worth of information needed to make decisions	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
c Interpret differences between two explanations (ELS 6.2)	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
5.2 Question information and ideas by determining their significance and accuracy as presented in written, oral, aural and visual communications (e.g., listening, reading, viewing, evaluating presentations of mass media) (ELS 4.4 and 6.4)							
a Distinguish between relevant and irrelevant information used to draw conclusions	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
b Analyze information obtained through personal experience	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
c Analyze information obtained by others	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	

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d Evaluate whether a conclusion is based on evidence or opinion (ELS 6.4)	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
e Listen, read and view critically	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
f Recognize elements and identify influences of mass media upon self and society (ELS 4.4)	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
g Critically evaluate mass media influences (ELS 4.4)	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
h Identify appropriate types of information (e.g., qualitative, quantitative) that should be included in simple forms of communication	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
i Evaluate whether a simple written or oral conclusion is consistent with known facts	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
j Recognize persuasion techniques found in audio and visual communications (ELS 4.4)	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
5.3 Recognize the importance of systematically acquiring and ordering data as the basis for scientific explanations and theories (ELS 6.4)							
a Distinguish between scientific and nonscientific explanations	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	

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5.4 Recognize that scientific explanations must be replicable (e.g., supporting evidence obtained by other investigators working in different places at different times under similar conditions) and made public in order to be accepted as valid (ELS 5.3)							
a Verify data collected from other students by replicating an investigation and comparing the results	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
5.5 Apply logic by reflecting upon and improving own reasoning (ELS 6.6)							
a Use inductive and deductive reasoning given problems and data specific to each form of logic	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
b Explain personal biases	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
5.6 Recognize the importance of considering the consequences (e.g., possible, actual) of investigations and actions before deciding to continue, change, or stop the process							
a Trace consequences of human intervention in natural cycles	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	

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6.0 Interactions. Students describe interactions among science, society, technology and earth's environment.							
STUDENTS WILL BE ABLE TO:							
6.1 Describe how society influences science and technology*							
a Recognize demands of society which influence science and technology	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
b Recognize that society controls science and technology through the allocation of resources	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
6.2 Describe how science and technology influence society							
a Recognize how scientific knowledge influences societies' attitudes	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
b Recognize how individual wants and needs are positively and negatively influenced by technology	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
c Identify scientific and technological developments which have positively and negatively affected society	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
6.3 Recognize the limitations as well as the usefulness of science and technology in advancing human welfare							

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a Recognize the physical factors that limit science (e.g., things that cannot be measured or observed)	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
b Identify social problems which can and cannot be solved by scientific and technological advances (e.g. vaccines to prevent disease, human greed)	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
6.4 Describe and predict the effects of science, society and technology on the earth's environment and its ability to support all forms of life							
a Describe how specific scientific and technological advances have affected the earth's environment and its ability to support life (e.g., sewage treatment plants, automobile exhaust, pesticides)	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
b Compare the effects of specific scientific and technological advances which have changed the earth's environment (e.g., automobiles, fertilizers)	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
6.5 Evaluate the explanations by scientists, needs of society and possible impacts on the earth's environment to make responsible personal decisions regarding the uses of technology (ELS 6.4 and 6.5)**							

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[a] Describe the applications of technology and the decisions entailed in its use	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
[b] Identify reliable sources of scientific and technological information and use these sources in deciding a course of action	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
[c] State societal criteria for deciding whether to engage in or support a particular activity (ELS 6.4)	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
[d] Take a position on an issue based on available information (ELS 6.5)	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
[e] Support another person's position on an issue (e.g., through role playing, structured controversy techniques) (ELS 6.5)	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	

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7.0 Characteristics. Students describe the characteristics of scientific knowledge.							
STUDENTS WILL BE ABLE TO:							
7.1 Describe the tentativeness of scientific knowledge (i.e., notion that it is subject to change, not truth in an absolute and final sense)*							
a Identify examples of historic changes in environmental, scientific and technological knowledge	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
b Identify new circumstances that could interfere with or change scientific explanations	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
7.2 Explain the importance of objectivity and subjectivity in scientific thought, including similarity of conclusions reached by different individuals from the same information							
a Analyze an experiment or set of rules for the subjective and objective aspects	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	0 1 2 3	
7.3 Analyze scientific predictions and explanations for their probability (i.e., science permits reasonable but not certain predictions and explanations)							

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