DOCUMENT RESUME

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| TITLE | Curriculum Mapping: End of Third Grade. Science Education: Common Curriculum Goals. |
| INSTITUTION | Oregon State Dept. of Education, Salem. |
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| DESCRIPTORS | *Course Objectives; *Curriculum Evaluation; Educational Assessment; *Elementary School Science; *Evaluation Criteria; Evaluation Methods; *Grade 3; Instructional Material Evaluation; Primary Education; Program Evaluation; *Science Curriculum |
| 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 3. The goal areas include concepts, processing, 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)

## 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.

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SCHOOL: _____

| ASSIGNMENT:<br>6 ___ 8 ___<br>7 ___ Course _____<br>End of Third 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.<br><br>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 possible causes for an observable 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 | |
| b Identify the relationship between a cause and an effect | 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 a physical change with simple objects | 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
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|---|---|---|---|---|---|---|---|
| 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 Recognize a cycle | 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 Arrange parts of a cycle | 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 Relate cycle to 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 Identify states of matter and energy (e.g., solid, liquid, gas) | 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 List characteristics of organisms that distinguish them from nonliving 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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|---|---|---|---|---|---|---|---|
| 1.6 Demonstrate POPULATION: A group of structural or functional units that have specific or common characteristics (e.g., organisms)<br>[a] Identify characteristics which define and limit a given population (e.g., set of objects with exclusive characteristics) | 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 | | | | | | | |
| 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) | | | | | | | |
| 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) | | | | | | | |

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|---|---|---|---|---|---|---|---|
| | | | Basal Text | Supplementary | | | |
| 1.10 Demonstrate FUNDAMENTAL ENTITIES: Units of structure and function useful in explaining phenomena (e.g., organism in populations, methods of measurements) | | | | | | | |
| 1.11 Demonstrate INTERACTION: Two or more things influencing each other (e.g., population/food, hot/cold, acid/base, force/movement, volume/pressure) | | | | | | | |
| 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) | | | | | | | |
| 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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|---|---|---|---|---|---|---|---|
| | | | Basal Text | Supple-mentary | | | |
| 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) | | | | | | | |
| 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) | | | | | | | |
| 1.16 Demonstrate FIELD: A region around something that influences some other thing often without touching (e.g., magnetic, electrical, gravitational) | | | | | | | |
| 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) | | | | | | | |

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|---|---|---|---|---|---|---|---|
| 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) | | | | | | | |
| 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) | | | | | | | |
| 1.20 Demonstrate PERCEPTION: The mind's interpretation of sensory input (e.g., illusions, use of sensory limitations to extend perception of scientific equipment) | | | | | | | |
| 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) | | | | | | | |

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|---|---|---|---|---|---|---|---|
| 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) | | | | | | | |
| 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) | | | | | | | |
| 1.24 Demonstrate SYMMETRY: Structurally balanced (e.g., snowflakes, airplane body, right and left side of human body, sphere) | | | | | | | |
| 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) | | | | | | | |

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|---|---|---|---|---|---|---|---|
| 2.0 Processes. Students apply problem solving and inquiry processes.<br><br>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 Describe physical properties of objects observed by using the senses | 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 simple instruments to enhance qualitative observations (e.g., hand lens, stethoscope) | 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 Compare objects to an arbitrary measuring device (e.g. comparing sticks of a varying length to one of a given length) | 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 measurable properties (e.g., length, weight, mass, volume) of a given object | 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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|---|---|---|---|---|---|---|---|
| a Use mental, manual, or calculator processes to perform grade-level arithmetic 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 | |
| 2.4 RELATE TIME-SPACE: Describe spatial relationships and their change with time (ELS 1.6) | | | | | | | |
| 2.5 INFER: Recognize, construct and draw inferences concerning relationships among things and ideas (ELS 6.1) | | | | | | | |
| 2.6 CLASSIFY: Use the characteristics of objects or events to group them by ordering similarities (ELS 6.1) | | | | | | | |
| a Identify general characteristics of objects which make them similar or different from another | 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 Sequence (seriate) objects using one variable (e.g., smallest to largest, gradation of a color) (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 | |

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| 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 | | | | | | | |
| 2.8 QUESTION: Identify problems and develop testable questions relating to the problems (ELS 6.3) | | | | | | | |
| [a] Identify problems that need a solution | 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 alternative solutions to a simple 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] State questions relating to an object or event (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 | |
| 2.9 HYPOTHESIZE: Use information and questions to generate statements that describe expected results of investigation (ELS 6.2) | | | | | | | |
| 2.10 DESIGN EXPERIMENTS: Plan and conduct data gathering operations to test hypotheses or answer questions (ELS 6.3) | | | | | | | |
| [b] Solve problems using strategies such as guessing and checking, using concrete objects, making models, generating a pattern or drawing a picture | 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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|---|---|---|---|---|---|---|---|
| [c] Engage in cooperative problem solving and common alternative solution strategies | 0 1 2 3 | 0 1 2 3 | 0 1 2 3 | 0 1 2 3 | 0 1 2 3 | U 1 2 3 | |
| [d] Develop new suggestions or approaches if problem is not solved | 0 1 2 3 | 0 1 2 3 | 0 1 2 3 | 0 1 2 3 | 0 1 2 3 | 0 1 2 3 | |
| 2.11 CONTROL VARIABLES: Identify and manage factors that may influence an experiment (ELS 3.1) | | | | | | | |
| 2.12 INTERPRET DATA: Find patterns or meanings in experimental results (ELS 3.1, 6.2, and 6.4) | | | | | | | |
| [a] State similarities in observations of several identical demonstrations or investigations (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 | |
| 2.13 PREDICT: Use information and data to generate and test predictions (ELS 1.6 and 6.2) | | | | | | | |
| [a] Use observations already made, to predict new observations (e.g., If a candle flame is extinguished when covered by a jar 3 times, it should go out when covered a fourth time.) (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 | |

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| 2.14 FORMULATE MODELS: Use problem solving and questioning skills to develop mental models that explain phenomena (ELS 6.3) | | | | | | | |
| 2.15 COMMUNICATE: Use a variety of techniques to share the results of investigations (ELS 1.6 and 2.3) | | | | | | | |
| [a] Share information orally and pictorially about investigations (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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| 3.0 Manipulative Skills. Students use a variety of materials and equipment in a safe and scientific way.<br><br>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] Build model parts of the environment (e.g., trees, mountains, buildings, school playground) | 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] Describe cause and effect relationships in safety procedures | 0 1 2 3 | 0 1 2 3 | 0 1 2 3 | 0 1 2 3 | 0 1 2 3 | 0 1 2 3 | |
| 3.3 PRACTICE BEHAVIOR: Practice appropriate and positive health behaviors to enhance learning (ELS 7.4)** | | | | | | | |

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|---|---|---|---|---|---|---|---|
| 4.0 Interests. Students develop interest in science.<br><br>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) | 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) | | | | | | | |
| 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 | |

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| 4.4 Use instructional materials as basis for gaining knowledge and improving comprehension (ELS 2.2) | | | | | | | |
| [a] Use table of contents to locate general and specific 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 | |

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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 Share information and understanding 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 | |
| b Explain the importance of 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 Explain the importance of information obtained from 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 | |
| 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) | | | | | | | |
| 5.3 Recognize the importance of systematically acquiring and ordering data as the basis for scientific explanations and theories (ELS 6.4) | | | | | | | |

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| 5.4 Recognize that scientific explanations must be replicable (e.g., supporting evidence obtained by other investigators working in differnt places at different times under similar conditions) and made public in order to be accepted as valid (ELS 5.3) | | | | | | | |
| 5.5 Apply logic by reflecting upon and improving own reasoning (ELS 6.6)<br>[a] Describe in simple terms how a solution was reached | 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 | | | | | | | |

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| 6.0 Interactions. Students describe interactions among science, society, technology and earth's environment.<br><br>STUDENTS WILL BE ABLE TO:<br><br>6.1 Describe how society influences science and technology* | | | | | | | |
| 6.2 Describe how science and technology influence society<br><br>[a] Identify technology that is used and how it helps 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 | | | | | | | |
| 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<br><br>[a] Identify the basic environmental needs of humans and other organisms (e.g., plants, animals) | 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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|---|---|---|---|---|---|---|---|
| | | | Basal Text | Supple-mentary | | | |
| 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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|---|---|---|---|---|---|---|---|
| | | | Basal Text | Supplementary | | | |
| 7.0 Characteristics. Students describe the characteristics of scientific knowledge.<br><br>STUDENTS WILL BE ABLE TO:<br><br>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)* | | | | | | | |
| 7.2 Explain the importance of objectivity and subjectivity in scientific thought, including similarity of conclusions reached by different individuals from the same information | | | | | | | |
| 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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