



**MISSOURI**  
**Science Grade Level Expectations**  
**Scope and Sequence Grade 8**  
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STANDARDS	PAGE REFERENCES
<b>Standard 1: Properties and Principles of Matter and Energy</b>	
1. Changes in properties and states of matter provide evidence of the atomic theory of matter	
<p>A. Objects, and the materials they are made of, have properties that can be used to describe and classify them</p> <p>a. Recognize that elements (unique atoms) and compounds (molecules or crystals) are pure substances that have characteristic properties</p> <p>b. Describe the physical and chemical properties (e.g. magnetic attraction, conductivity, melting point and boiling point, reactivity) of pure substances (elements or compounds) (e.g. copper wire, aluminum wire, iron, charcoal, sulfur, water, salt, sugar, sodium bicarbonate, galena, quartz, magnetite, pyrite) using appropriate senses and tools</p>	<p>SE: 434-440, 441-447, 448-452, 464-471, 472-480  <i>Lab</i> 453, 454-455, 481, 482-483</p> <p>TWE: Teacher FYI 67            Discussion 405, 474            Tie to Prior Knowledge 464</p> <p>TR: Transparency Chapter 15 Section 1            Transparency Chapter 15 Section 2            Transparency Chapter 15 Section 3            Transparency Chapter 16 Section 1            Transparency Chapter 16 Section 2            Examview Pro Chapter 15            Examview Pro Chapter 16</p>
<p>C. Properties of matter can be explained in terms of moving particles too small to be seen without tremendous magnification</p> <p>a. Describe evidence (e.g., diffusion of colored material into clear material such as water; light reflecting off of dust particles in air; changes in physical properties and reactivity such as gold hammered into foil, oil spreading on the surface of water, decay of organic matter, condensation of water vapor by increased pressure) that supports the theory that matter is composed of moving particles too small to be seen (atoms, molecules)</p>	<p>SE: 464-471, 475, 476-477</p> <p>TWE: Activity 646, 679            Daily Intervention 475            Differentiated Instruction 476            Identifying Misconceptions 464            Quick Demo 476            Teacher FYI 477</p> <p>TR: Transparency Chapter 16 Section 1            Transparency Chapter 16 Section 2            Examview Pro Chapter 16</p>

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<p>D. Physical changes in the state of matter that result from thermal changes can be explained by moving particles (The kinetic theory of matter)</p> <p>a. Using the kinetic theory model, illustrate and account for the physical properties (i.e., shape, volume, malleability, and viscosity) of a solid, liquid, or gas in terms of the arrangement and motion of molecules in a substance</p> <p>b. Use the kinetic theory model to explain changes in the volume, shape, and viscosity of materials in response to temperature changes during a phase change</p> <p>c. Predict the effect of transfer on the physical properties of a substance as it changes to or from a solid, liquid, or gas (i.e., phase changes that occur during freezing, melting, evaporation, boiling, condensation)</p>	<p>SE: 492, 502-505, 509, 608-609, 611-615, 619, 637, 645  <i>Applying Math</i> 126  <i>Design Your Own Lab</i> 624-625  <i>Lab</i> 618  <i>Science and History</i> 512  <i>Science and Society</i> 626</p> <p>TWE: Inquiry Lab 613</p> <p>TR: Probeware Lab Manual 71-74  Reading and Writing Skill Activities 35-36  Examview Pro Chapter 17  Examview Pro Chapter 21</p>
<p>F. The periodic table organizes the elements according to their atomic structure and chemical reactivity</p> <p>a. Recognize that more than 100 known elements (unique atoms) exist that may be combined in nature or by man to produce compounds that make up the living and nonliving substances in the environment (Do not assess memorization of Periodic Table)</p>	<p>SE: 434-440</p> <p>TR: Transparency Chapter 15 Section 1  Examview Pro Chapter 15</p>
<p>I. Mass is conserved during any physical or chemical change</p> <p>b. Provide evidence that mass is conserved during a chemical change in a closed system (e.g. vinegar + baking soda, mold growing in a closed container, steel wool rusting)</p> <p>c. Explain that the amount of matter remains constant while being recycled through the rock cycle</p> <p>d. Explain that the amount of matter remains constant while being recycled through food chains and food webs</p>	<p>SE: 496  <i>Lab</i> 498</p>
<p>2. Energy has a source, can be transferred, and transformed into various forms but is conserved between and within systems.</p>	
<p>A. Forms of energy have a source, a means of transfer (work and heat) and a receiver</p> <p>a. Recognize examples of chemical energy that is stored in chemical compounds (e.g., energy stored in and released from food molecules, batteries, nitrogen explosives, fireworks, organic fuels)</p>	<p>SE: 137-138</p> <p>TR: Transparency Chapter 5 Section 3  Examview Pro Chapter 5</p>

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<p>F. Energy can change from one form to another within systems but the total amount remains the same</p> <p>a. Identify the evidence of different energy transformations (e.g., explosion of light, heat, and sound, temperature change, electrical charge) that may occur as chemical energy is released during a chemical reaction</p>	<p>SE: 136-137, 619</p> <p>TR: Transparency Chapter 5 Section 3 Examview Pro Chapter 5</p>
<b>Standard 3: Characteristic and Interactions of Living Organisms</b>	
1. There is a fundamental unity underlying the diversity of all living organisms	
<p>A. Organisms have basic needs for survival</p> <p>a. Recognize that most plants and animals require food and oxygen (needed to release the energy from that food)</p>	<p>SE: 106-107, 136-139</p> <p>TWE: Daily Intervention 139 Differentiated Instruction 137 Fun Fact 108 Tie to Prior Knowledge 106 Use Science Words 107 Visual Learning 109</p> <p>TR: Transparency Chapter 4 Section 3 Transparency Chapter 5 Section 3 Examview Pro Chapter 4 Examview Pro Chapter 5</p>
<p>D. Plants and animals have different structures that serve similar functions necessary for the survival of the organism</p> <p>a. Contrast the structures of plants and animals that serve comparable functions (e.g., taking in water and oxygen, support, response to stimuli, obtaining energy, circulation, digestion, excretion, reproduction)</p>	<p>SE: 68, 70 <i>National Geographic</i> 69 <i>Lab</i> 72</p> <p>TWE: Visual Learning 68 Use an Analogy 70</p>
2. Living organisms carry out life processes in order to survive	
<p>A. The cell contains a set of structures called organelles that interact to carry out life processes through physical and chemical means</p> <p>a. Recognize that the cell membrane helps regulate the transfer of materials in and out of the cell</p> <p>b. Recognize that the function of the chloroplast is photosynthesis</p>	<p>SE: 68 <i>Lab</i> 72</p> <p>TWE: Inquiry Lab 68 Use an Analogy 70</p>

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<p>B. Photosynthesis and cellular respiration are complementary processes necessary to the survival of most organisms on Earth</p> <p>a. Recognize that photosynthesis is a chemical change with reactants (water and carbon dioxide) and products (energy-rich sugar molecules and oxygen) that takes place in the presence of light and chlorophyll</p> <p>b. Recognize that oxygen is needed by all cells of most organisms for the release of energy from nutrient (sugar) molecules (Do NOT assess the term cellular respiration)</p> <p>c. Describe the importance of the transport and exchange of oxygen and carbon dioxide to the survival of the organism</p>	<p>SE: 76, 106, 108, 123, 124 <i>Lab 135</i></p>
<p>C. Complex multicellular organisms have systems that interact to carry out life processes through physical and chemical means.</p> <p>a. Identify and give examples of each level of organization (cell, tissue, organ, organ system) in multicellular organisms (plants, animals)</p> <p>b. Illustrate and explain the path water and nutrients take as they move through the transport system of a plant</p> <p>c. Explain the interactions between the circulatory and digestive systems as nutrients are processed by the digestive system, passed into the blood stream and are transported in and out of the cell</p> <p>d. Compare and contrast the processes of mechanical and chemical digestion and their role in providing materials necessary for survival of the cell and organism</p> <p>e. Identify the importance of the transport and exchange of nutrient and waste molecules to the survival of the cell and organism</p> <p>f. Explain the interactions between the circulatory and respiratory systems in exchanging oxygen and carbon dioxide between cells and the atmosphere (when oxygen enters the body, passes into the blood stream, and is transported into the cell; carbon dioxide is transported out of the cell, passes into the blood stream, and exits the body)</p> <p>g. Explain the interactions between the nervous and muscular systems when an organism responds to a stimulus</p>	<p>SE: 70-71, 73-79 <i>Design Your Own Lab 82-83</i> <i>Launch LAB 63</i></p> <p>TWE: Assessment 81 Content Background 84 Discussion 78 Daily Intervention 71 Fun Fact 77 Visual Learning 70</p> <p>TR: Transparency Chapter 3 Section 1 Transparency Chapter 3 Section 2 Examview Pro Chapter 3</p>

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<p>F. Cellular activities and responses can maintain stability internally while external conditions are changing (homeostasis)</p> <p>a. Predict the response the body may take to maintain internal balance during an environmental change (e.g., shivering when cold, slowing metabolism when food supply decreases or when dehydrated, adrenaline rush when frightened)</p>	<p>SE: 79-81 <i>Design Your Own Lab</i> 82-83</p> <p>TR: Examview Pro Chapter 3</p>
<p>G. Life processes can be disrupted by disease (intrinsic failures of the organ systems or by infection due to other organisms)</p> <p>a. Explain the cause and effect of diseases (i.e. AIDS, cancer, diabetes, hypertension) on the human body</p> <p>b. Identify some common diseases (i.e., cold, influenza, strep throat, dysentery, fungal infections) and their causes (bacteria, viruses, protists, fungi)</p> <p>c. Explain the difference between infectious and noninfectious diseases</p> <p>d. Explain the role of antibiotics and vaccines in the treatment and prevention of diseases</p>	<p>SE: 8, 75</p>
<p>3. There is a genetic basis for the transfer of biological characteristics from one generation to the next through reproductive processes</p>	
<p>A. Reproduction can occur asexually or sexually</p> <p>a. Compare and contrast the processes of asexual and sexual reproduction, including the type and number of cells involved (one body cell in asexual, two sex cells in sexual), and the number of gene sets (body cell has 2 sets, sex cells have 1 set each) passed from parent(s) to offspring</p> <p>b. Identify examples of asexual reproduction (i.e., plants budding, binary fission of single cell organisms)</p> <p>c. Compare and contrast the reproductive mechanisms of classes of vertebrates (i.e., internal vs. external fertilization)</p> <p>d. Explain how flowering plants reproduce sexually</p>	<p>SE: 42, 46, 48</p>

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<p>C. Chromosomes are components of cells that occur in pairs and carry hereditary information from one cell to daughter cells and from parent to offspring during reproduction</p> <p>a. Identify chromosomes as cellular structures that occur in pairs that carry hereditary information in units called genes</p> <p>b. Recognize that when asexual reproduction occurs, the same genetic information found in the parent cell is copied and passed on to each new daughter cell (Assess only the concept – not the term or process of mitosis)</p> <p>c. Recognize that when sexual reproduction occurs, genetic material from both parents is passed on and combined to form the genetic code for the new organism (Assess only the concept - not the term or process of meiosis)</p>	<p>SE: 39, 46</p>
<p>D. There is heritable variation within every species of organism</p> <p>a. Recognize that when asexual reproduction occurs, the daughter cell is identical to the parent cell (assuming no change in the parent genes)</p> <p>b. Recognize that when sexual reproduction occurs, the offspring is not identical to either parent due to the combining of the different genetic codes contained in each sex cell</p>	<p>SE: 44-48, 52 TR: Transparency Chapter 2 Section 2 Examview Pro Chapter 2</p>
<b>Standard 4: Changes in Ecosystems and Interactions of Organisms With Their Environments</b>	
1. Organisms are interdependent with one another and with their environment	
<p>D. The diversity of species within an ecosystem is affected by changes in the environment which can be caused by other organisms or outside processes</p> <p>b. Explain the beneficial or detrimental impact that some organisms (i.e., viruses, bacteria, protists, fungi) may have on other organisms (e.g., diseases, antibiotics, breakdown of waste, fermentation)</p>	<p>SE: 39-42, 44-46, 49-53 <i>Applying Math 47</i> <i>Lab 43, 54-55</i></p> <p>TWE: DI 48 TPK 38</p> <p>TR: Transparency Chapter 2 Section 2 Transparency Chapter 2 Section 3 Examview Pro Chapter 2</p>
<p>B. Matter is recycled through an ecosystem</p> <p>a. Illustrate the recycling of matter in the oxygen/carbon dioxide cycles</p>	<p>SE: 106-107, 124-125, 132- 133, 136-139 <i>National Geographic 134</i></p> <p>TWE: DIN 137</p> <p>TR: Examview Pro Chapter 4 Examview Pro Chapter 5</p>
<b>Standard 5: Processes and Interactions of the Earth’s Systems (Geosphere, Atmosphere and Hydrosphere)</b>	
1. Earth’s Systems (Geosphere, Atmosphere and Hydrosphere) have common components and unique structures	

STANDARDS	PAGE REFERENCES
<p>A. The Earth's crust is composed of various materials including soil, minerals, and rocks with characteristic properties</p> <p>a. Differentiate between minerals and rocks (which are composed of different kinds of minerals)</p> <p>b. Describe the distinguishing properties that can be used to classify minerals (i.e., texture, smell, luster, hardness, crystal shape, streak and reaction to magnets and acids)</p> <p>c. Classify rocks as sedimentary, igneous, or metamorphic</p>	<p>SE: 182-188, 190-199, 210-224, 226-231 <i>Lab</i> 189 <i>National Geographic</i> 193, 216 <i>Science and History</i> 234</p> <p>TWE: Activity 184 Differentiated Instruction 198 Discussion 188 Make a Model 196, 197 Quick Demo 183 Science Content Background 180E-F Teacher FYI 184, 197, 212 Tie to Prior Knowledge 210</p> <p>TR: Chapter Resources Fast File <i>Plate Tectonics</i> Chapter Resources Fast File <i>Earthquakes and Volcanoes</i> Cultural Diversity 47-48 Home and Community Involvement 39 Reading and Writing Skill Activities 21-22 Transparency Chapter 8, Section 1 Transparency Chapter 8, Section 2 Transparency Chapter 8, Section 3 Transparency Chapter 8, Teaching Transparency and Assessment Transparency Transparency Chapter 9, Section 1 Examview Pro Chapter 8 Examview Pro Chapter 9</p>
<p>2. Earth's Systems (Geosphere, Atmosphere and Hydrosphere) interact with one another as they undergo change by common processes</p>	
<p>B. There are internal processes and sources of energy within the geosphere that cause changes in Earth's crustal plates</p> <p>a. Explain that convection currents are the result of uneven heating inside the mantle resulting in the melting of rock materials, convection of magma, eruption/flow of magma, and movement of crustal plates</p> <p>b. Explain how rock layers are affected by the folding, breaking, and uplifting of rock layers due to plate motion</p> <p>c. Describe how the movement of crustal plates can cause Earthquakes and volcanic eruptions that can result in mountain building and trench formation</p>	<p>SE: 94, 122-128, 130-131, 154-161 <i>Launch Lab</i> 121 <i>Cultural Diversity</i> 155</p> <p>TWE: Discussion, 127 Inquiry Lab 125 Integrate Earth Science 160 Teacher FYI 126, 131</p> <p>TR: Chapter Resources Fast File <i>The Nonliving Environment</i> Critical Thinking/ Problem Solving-Earth Science 13 Critical Thinking/ Problem Solving-Life Science 12 Home and Community Involvement 41, 47 Mathematic Skills Activities 42, 49 Probeware Lab Manual 57-62 Reading and Writing Skill Activities 3-4, 13-14, 19-20, 45-46 Transparency Chapter 7, Section 1 Examview Pro Chapter 5 Examview Pro Chapter 6</p>

STANDARDS	PAGE REFERENCES
<p>C. Continual changes in the Earth’s materials and surface that result from internal and external processes is described by the rock cycle</p> <p>a. Explain how heating and cooling in the mantle layer leads to the formation of metamorphic rocks and some igneous rocks</p> <p>b. Make inferences about the formation of igneous and metamorphic rocks from their physical properties (e.g., crystal size indicates rate of cooling, air pockets or glassy texture indicate volcanic activity)</p> <p>c. Explain and diagram the external and internal processes of the rock cycle (e.g., weathering and erosion, sedimentation, compaction, heating, recrystallization, and resurfacing due to forces that drive plate motion)</p>	<p>SE: 94, 122-128, 130-131, 154-161 <i>Launch Lab</i> 121 <i>Cultural Diversity</i> 155</p> <p>TWE: Discussion, 127 Inquiry Lab 125 Integrate Earth Science 160 Teacher FYI 126, 131</p> <p>TR: Chapter Resources Fast File <i>The Nonliving Environment</i> Critical Thinking/ Problem Solving-Earth Science 13 Critical Thinking/ Problem Solving-Life Science 12 Home and Community Involvement 41, 47 Mathematic Skills Activities 42, 49 Probeware Lab Manual 57-62 Reading and Writing Skill Activities 3-4, 13-14, 19-20, 45-46 Transparency Chapter 7, Section 1 Examview Pro Chapter 5 Examview Pro Chapter 6</p>
<p>D. Changes in the Earth over time can be inferred through rock and fossil evidence</p> <p>a. Describe the methods used to estimate geologic time and the age of the Earth (e.g., techniques used to date rocks and rock layers, presence of fossils)</p> <p>b. Use rock and fossil evidence to make inferences about the age, history, and changing life forms and environment of the Earth (i.e., changes in successive layers of sedimentary rock and the fossils contained within them, similarities between fossils in different geographic locations, fossils of organisms indicating changes in climate, fossils of extinct organisms)</p>	<p>SE: 94, 122-128, 130-131, 154-161 <i>Launch Lab</i> 121 <i>Cultural Diversity</i> 155</p> <p>TWE: Discussion, 127 Inquiry Lab 125 Integrate Earth Science 160 Teacher FYI 126, 131</p> <p>TR: Chapter Resources Fast File <i>The Nonliving Environment</i> Critical Thinking/ Problem Solving-Earth Science 13 Critical Thinking/ Problem Solving-Life Science 12 Home and Community Involvement 41, 47 Mathematic Skills Activities 42, 49 Probeware Lab Manual 57-62 Reading and Writing Skill Activities 3-4, 13-14, 19-20, 45-46 Transparency Chapter 7, Section 1 Examview Pro Chapter 5 Examview Pro Chapter 6</p>
<p><b>Standard 7: Scientific Inquiry</b></p>	
<p>1. Science understanding is developed through the use of science process skills and scientific knowledge in combination with scientific investigation, reasoning, and critical thinking</p>	

STANDARDS	PAGE REFERENCES
<p>A. Scientific inquiry includes the ability of students to formulate a testable question and explanation and to select appropriate investigative methods in order to obtain evidence relevant to the explanation</p> <p>a. Formulate testable questions and hypotheses</p> <p>b. Recognize the importance of the independent variable, dependent variables, control of constants, and multiple trials to the design of a valid experiment</p> <p>c. Design and conduct a valid experiment</p> <p>d. Evaluate the design of an experiment and make suggestions for reasonable improvements or extensions of an experiment</p> <p>e. Recognize that different kinds of questions suggest different kinds of scientific investigations (e.g., some involve observing and describing objects organisms, or events; some involve collecting specimens; some involve experiments; some involve making observations in nature; some involve discovery of new objects and phenomena; and some involve making models)</p> <p>f. Acknowledge that there is no fixed procedure called “the scientific method”, but that some investigations involve systematic observations, carefully collected, relevant evidence, logical reasoning, and some imagination in developing hypotheses and other explanations</p>	<p>SE: 13-23  <i>Lab</i> 28-29, 54-55, 82-83, 112-113, 140-141, 170-171, 200-201, 232-233, 262-263, 294-295, 326-327, 360-361, 392-393, 424-425, 454-455, 482-483, 510-511, 540-541, 570-571, 598-599, 624-625, 656-657, 684-685, 714-715</p> <p>TWE: Activity 15  Differentiated Instruction 13, 15  Discussion 18  Lab Demonstration 14  Quick Demo 17  Teacher FYI 13, 16  Tie to Prior Knowledge 12  Visual Learning 17</p> <p>TR: Chapter Resources Fast File <i>The Nature of Science</i>  Home and Community Involvement 11-20, 23-49  Laboratory Activities Manual This objective is met throughout this book  Science Inquiry Lab Manual This objective is met throughout this book  Study Guide and Reinforcement 1-2  Transparency Chapter 1, Section 2  Teaching Transparency  Examview Pro Chapter 1</p>

STANDARDS	PAGE REFERENCES
<p>B. Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations</p> <ul style="list-style-type: none"> <li>a. Make qualitative observations using the five senses</li> <li>b. Determine the appropriate tools and techniques to collect data</li> <li>c. Use a variety of tools and equipment to gather data (e.g., microscopes, thermometers, analog and digital meters, computers, spring scales, balances, metric rulers, graduated cylinders, stopwatches)</li> <li>d. Measure length to the nearest millimeter, mass to the nearest gram, volume to the nearest milliliter, force (weight) to the nearest Newton, temperature to the nearest degree Celsius, time to the nearest second</li> <li>e. Compare amounts/measurements</li> <li>f. Judge whether measurements and computation of quantities are reasonable</li> <li>g. Calculate the range and average/mean of a set of data</li> </ul>	<p>SE: 13-23  <i>Lab</i> 28-29, 54-55, 82-83, 112-113, 140-141, 170-171, 200-201, 232-233, 262-263, 294-295, 326-327, 360-361, 392-393, 424-425, 454-455, 482-483, 510-511, 540-541, 570-571, 598-599, 624-625, 656-657, 684-685, 714-715</p> <p>TWE: Activity 15  Differentiated Instruction 13, 15  Discussion 18  Lab Demonstration 14  Quick Demo 17  Teacher FYI 13, 16  Tie to Prior Knowledge 12  Visual Learning 17</p> <p>TR: Chapter Resources Fast File <i>The Nature of Science</i>  Home and Community Involvement 11-20, 23-49  Laboratory Activities Manual This objective is met throughout this book  Mathematic Skills Activities 19-22  Science Inquiry Lab Manual This objective is met throughout this book  Study Guide and Reinforcement 1-2  Transparency Chapter 1, Section 2  Teaching Transparency  Examview Pro Chapter 1</p>

STANDARDS	PAGE REFERENCES
<p>C. Evidence is used to formulate explanations</p> <ol style="list-style-type: none"> <li>Use quantitative and qualitative data to construct reasonable explanations (conclusions)</li> <li>Use data to describe relationships and make predictions to be tested</li> <li>Recognize the possible effects of errors in observations, measurements, and calculations on the formulation of explanations (conclusions)</li> </ol>	<p>SE: 13-23  <i>Lab</i> 28-29, 54-55, 82-83, 112-113, 140-141, 170-171, 200-201, 232-233, 262-263, 294-295, 326-327, 360-361, 392-393, 424-425, 454-455, 482-483, 510-511, 540-541, 570-571, 598-599, 624-625, 656-657, 684-685, 714-715</p> <p>TWE: Activity 15  Differentiated Instruction 13, 15  Discussion 18  Lab Demonstration 14  Quick Demo 17  Teacher FYI 13, 16  Tie to Prior Knowledge 12  Visual Learning 17</p> <p>TR: Chapter Resources Fast File <i>The Nature of Science</i>  Home and Community Involvement 46-48  Laboratory Activities Manual This objective is met throughout this book  Science Inquiry Lab Manual This objective is met throughout this book  Study Guide and Reinforcement 1-2  Transparency Chapter 1, Section 2  Teaching Transparency  Examview Pro Chapter 1</p>
<p>D. Scientific inquiry includes evaluation of explanations (hypotheses, laws, theories) in light of scientific principles (understandings)</p> <ol style="list-style-type: none"> <li>Make predictions supported by scientific knowledge/explanations</li> <li>Analyze whether evidence (data) supports proposed explanations (hypotheses, laws, theories)</li> <li>Evaluate the reasonableness of an explanation (conclusion)</li> </ol>	<p>SE: 13-23  <i>Lab</i> 28-29, 54-55, 82-83, 112-113, 140-141, 170-171, 200-201, 232-233, 262-263, 294-295, 326-327, 360-361, 392-393, 424-425, 454-455, 482-483, 510-511, 540-541, 570-571, 598-599, 624-625, 656-657, 684-685, 714-715</p> <p>TWE: Activity 15  Differentiated Instruction 13, 15  Discussion 18  Lab Demonstration 14  Quick Demo 17  Teacher FYI 13, 16  Tie to Prior Knowledge 12  Visual Learning 17  Tie to Prior Knowledge</p> <p>TR: Chapter Resources Fast File <i>The Nature of Science</i>  Home and Community Involvement 48  Laboratory Activities Manual This objective is met throughout this book  Science Inquiry Lab Manual This objective is met throughout this book  Study Guide and Reinforcement 1-2  Examview Pro Chapter 1</p>

STANDARDS	PAGE REFERENCES
<p>E. The nature of science relies upon communication of results and justification of explanations</p> <p>a. Communicate the procedures and results of investigations and explanations through:</p> <ul style="list-style-type: none"> <li>⇒ oral presentations</li> <li>⇒ drawings and maps</li> <li>⇒ data tables</li> <li>⇒ graphs (bar, single line, pictographs)</li> <li>⇒ equations and writings</li> </ul> <p>b. Interpret data in order to make and support conclusions</p>	<p>SE: 13-23 <i>Lab</i> 28-29, 54-55, 82-83, 112-113, 140-141, 170-171, 200-201, 232-233, 262-263, 294-295, 326-327, 360-361, 392-393, 424-425, 454-455, 482-483, 510-511, 540-541, 570-571, 598-599, 624-625, 656-657, 684-685, 714-715</p> <p>TWE: Activity 15 Differentiated Instruction 13, 15 Discussion 18 Lab Demonstration 14 Quick Demo 17 Teacher FYI 13, 16 Tie to Prior Knowledge 12 Visual Learning 17</p> <p>TR: Chapter Resources Fast File <i>The Nature of Science</i> Home and Community Involvement 49 Laboratory Activities Manual This objective is met throughout this book Science Inquiry Lab Manual This objective is met throughout this book Study Guide and Reinforcement 1-2 Examview Pro Chapter 1</p>
<b>Standard 8: Impact of Science, Technology and Human Activity</b>	
1. The nature of technology is advanced by and can advance science as it seeks to apply scientific knowledge in ways that meet human needs	
<p>A. Designed objects are used to do things better or more easily and to do some things that could not otherwise be done at all</p> <p>a. Identify and evaluate the physical, social, economic, and/or environmental problems that may be overcome using science and technology (e.g., the need for alternative fuels, human travel in space, AIDS)</p> <p>b. Explain how technological improvements such as those developed for use in space exploration or by the military have led to the invention of new products that may improve our lives here on Earth (e.g., materials, freeze-dried foods, infrared goggles, Velcro, satellite imagery, robotics)</p>	<p>SE: 30, 56, 114, 172, 202, 234, 328, 426, 456, 484, 512, 572, 600, 626, 658, 686</p> <p>TWE: Activity 222 Cultural Diversity 322 Discussion 140 Science Journal Teacher FYI 322 Tie to Prior Knowledge 321 Visual Learning 322</p> <p>TR: Reading and Writing Skill Activities 33</p>

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<p>B. Advances in technology often result in improved data collection and an increase in scientific information</p> <p>a. Identify the link between technological developments and the scientific discoveries made possible through their development (e.g., Hubble telescope and stellar evolution, composition and structure of the universe; the electron microscope and cell organelles; sonar and the composition of the Earth; manned and unmanned space missions and space exploration; Doppler radar and weather conditions; MRI and CAT-scans and brain activity)</p>	<p>SE: 25, 172, 572, 600, 626, 658</p>
<p>C. Technological solutions to problems often have drawbacks as well as benefits</p> <p>a. Describe how technological solutions to problems can have both benefits and drawbacks (e.g., storm water runoff, fiber optics, windmills, efficient car design, electronic trains without conductors, sonar, robotics, Hubble telescope)</p>	<p>SE: 9, 87, 134, 140, 211, 222-223, 234-235, 321-323, 423, 590, 708, 733-734</p> <p>TWE: Activity 222 Cultural Diversity 322 Discussion 140 Science Journal Teacher FYI 322 Tie to Prior Knowledge 321 Visual Learning 322</p> <p>TR: Critical Thinking/ Problem Solving-Physical Science 14, 17, 19, 20 Reading and Writing Skill Activities 11-12</p>
<p>2. A historical perspective of scientific explanations helps to improve understanding of the nature of science and how science knowledge and technology evolve over time</p>	
<p>A. People from various cultures, races, and of different gender have contributed to scientific discoveries and the invention of technological innovations</p> <p>a. Describe how the contributions of scientists and inventors have contributed to science, technology and human activity (e.g., George Washington Carver, Thomas Edison, Thomas Jefferson, Isaac Newton, Marie Curie, Galileo, Albert Einstein, Mae Jemison, Edwin Hubble, Charles Darwin, Jonas Salk, Louis Pasteur, Jane Goodall, Tom Akers, John Wesley Powell)</p>	<p>SE: 50, 61, 218-219, 221, 238, 291, 298, 307, 336-338, 356, 381, 392, 426, 524, 690</p> <p>TWE: Activity 524 Cultural Diversity 42, 74, 182, 188, 278 Curriculum Connection 130, 248, 293, 726 Differentiated Instruction 92, 228, 294 Discussion 392, 524 Identifying Misconceptions 335 Science Journal 336, 382 Teacher FYI 219 Tie to Prior Knowledge</p> <p>TR: Critical Thinking/ Problem Solving-Earth Science 23 Cultural Diversity This objective is met throughout this book</p>

STANDARDS	PAGE REFERENCES
<p>B. Scientific theories are developed based on the body of knowledge that exists at any particular time and must be rigorously questioned and tested for validity</p> <p>a. Recognize the difficulty science innovators experienced as they attempted to break through the accepted ideas (hypotheses, laws, theories) of their time to reach conclusions that are now considered to be common knowledge (e.g., Darwin, Copernicus, Newton)</p> <p>b. Recognize that explanations have changed over time as a result of new evidence</p>	<p>SE: 14, 15, 334-335, 690</p> <p>TWE: Discussion 691 Identifying Misconceptions 335 Tie to Prior Knowledge 334</p> <p>TR: Chapter Resources Fast File <i>The Nature of Science</i> Reading and Writing Skill Activities 17 Study Guide and Reinforcement 1-2</p>
<p>3. Science is a Human Endeavor</p> <p>B. Social, political, economic, ethical, and environmental factors strongly influence and are influenced by the direction of progress of science and technology</p> <p>a. Describe ways in which science and society influence one another (e.g., scientific knowledge and the procedures used by scientists influence the way many individuals in society think about themselves, others, and the environment; societal challenges often inspire questions for scientific research; social priorities often influence research priorities through the availability of funding for research)</p>	<p>SE: 80, 140, 204, 322-323, 426, 573-576, 732</p> <p>TWE: Content Background 80, 140, 426 Discussion 80, 140, 204, 426 Integrate Environment 322</p> <p>TR: Critical Thinking/ Problem Solving-Earth Science 2, 10 Critical Thinking/ Problem Solving-Physical Science 14, 17 Cultural Diversity This objective is met throughout this book Reading and Writing Skill Activities 43-44, 47-48</p>
<p>C. Technological solutions to problems often have drawbacks as well as benefits</p> <p>a. Identify and evaluate the environmental costs and benefits of scientific or technological solutions to a given problem (e.g., damming a river for flood control, using pesticides to eliminate mosquitoes)</p>	<p>SE: 9, 87, 134, 140, 211, 222-223, 234-235, 321-323, 423, 590, 708, 733-734</p> <p>TWE: Activity 222 Cultural Diversity 322 Discussion 140 Science Journal Teacher FYI 322 Tie to Prior Knowledge 321 Visual Learning 322</p> <p>TR: Critical Thinking/ Problem Solving-Earth Science 2 Critical Thinking/ Problem Solving-Physical Science 14, 17, 19, 20 Reading and Writing Skill Activities 9, 11-12, 51-52</p>