

## Sixth Grade Science Curriculum

December 1999

Unit	Learning Objectives	Activities	Assessment Strategies	Resources
<p><b><u>Astronomy</u></b></p> <p>Essential Questions</p> <p>λ How do scientists believe our solar system has formed and how is it changing?</p> <p>λ What is the process that a star goes through as it evolves and how does this relate to our solar system?</p> <p>λ Explain the relationship between forces of inertia and gravity and tell how their relationship affects the balance of our solar system.</p>	<p>a. Define what a solar System is.</p> <p>b. Compare distance between each planet and the sun and the distance between the Earth and sun.</p> <p>c. Describe similar characteristics of the four planets nearest the sun.</p> <p>d. Compare and contrast the characteristics of the five outer planets including size, composition and temperature.</p> <p>e. Define asteroid, meteor, and comet.</p> <p>f. Understand the history of learning about our solar system.</p> <p>g. Describe spiral, elliptical, irregular and light year galaxies.</p> <p>h. Utilize the speed of light to calculate a “light year.”</p> <p>i. Develop an understanding of current theories regarding the formation of the universe.</p> <p>j. Describe how stars might form from clouds of gases and dust in space.</p> <p>k. Describe how mass effects the life cycle of a star.</p>	<p style="text-align: center;"><b>Students Will:</b></p> <ol style="list-style-type: none"> <li>1. Engage in inquiry based learning activities that focus on the essential questions for this unit.</li> <li>2. Cooperative Learning Jigsaw Activity: groups of students will research and report on the different classifications of stars in the universe.</li> <li>3. Collaboratively generate an Alien Project that requires students to research planets of the solar system and determine which planet their alien is best suited to live on and why.</li> <li>4. Construct murals of nebulae and supernovas.</li> </ol> <p><b>** Challenge Activity</b> Students will research the theories of two astronomers regarding the formation of the Universe. Students will then compare and contrast the astronomer’s theories. For the conclusion of this project students will defend one of the theories researched and support their case with valid research information gathered during completion of the project.</p>	<ul style="list-style-type: none"> <li>• Rubrics for each student / teacher generated project.</li> <li>• Student science journals</li> <li>• Teacher observations (individual and group participation.)</li> <li>• Unit quizzes and tests.</li> <li>• Students’ self evaluation of learning.</li> </ul>	<ul style="list-style-type: none"> <li>◆ Prentice Hall <u>Exploring the Universe</u></li> <li>◆ Classroom Resource Books: <u>Our Universe</u>, Roy Galant <u>The Universe</u>, Time-Life Peterson First Guides: <u>Solar System</u> <u>Astronomy</u></li> <li>◆ HotLinks, <u>Solar System</u></li> <li>◆ Videos National Geographic “Exploring Our Solar System” TLC “The Universe” TLC “The Universe, stars, galaxies &amp; planets” Astronomy 101</li> <li>◆ Laser Disks Voyager Gallery – Optical Data Corp. Solar Systems The Universe The Great Space Rescue – Tom Snyder Pub.</li> <li>◆ E-Z Cosmos – Future Trends Software, Astro- Soft, Inc.</li> <li>◆</li> </ul>

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<b><u>Geology</u></b>		<b>Students Will:</b>		
<p>Essential Questions</p> <p>λ How has the Earth changed and how does it continue to change?</p> <p>λ Why is it important to learn about the dynamic Earth?</p>	<p>a. Define what a geologist does.</p> <p>b. Identify the principal layers of the Earth's interior and describe the properties of each.</p> <p>c. Understand the fundamentals of Tectonic Plate Theory.</p> <p>d. Understand subduction, translation, and spreading and how they relate to the occurrences of volcanoes, earthquakes and mountain ranges.</p> <p>e. Define what a "seismograph" is and how it works, including the Mercalli and Richter scales.</p> <p>f. Identify those locations in the world that are more prone to earthquakes and volcanic activity.</p> <p>g. Define the terms: earthquake and volcano.</p> <p>h. Describe the three major types of volcanoes.</p> <p>i. Identify the three types of rocks (sedimentary, igneous, and metamorphic) and describe the properties of each.</p> <p>j. Understand the balance between the forces that</p>	<p>1. Engage in inquiry based , problem solving activities based upon the question, "How has the Earth changed and how does it continue to change?"</p> <p>2. Cooperative Learning Jigsaw Activity: groups of students will research and report on the layers of the Earth's interior and describe the functions of each.</p> <p>3. Collaboratively generate a Volcano Brochure describing a specific volcano including: type, rate of eruption, current eruption data, historical significance, and purpose for studying volcano.</p> <p>4. Act as seismologists and volcanologists, collecting data and mapping earthquake and volcanic activity from around the world.</p> <p>5. Act as a geologist identifying minerals using the Moh's scale of hardness, streak test, color and luster.</p> <p><b>**Challenge Activity</b> How Well Are They Prepared? Compare the cities of Tokyo, Japan and Seattle, Washington. What</p>	<ul style="list-style-type: none"> <li>• Rubrics for each student / teacher generated project.</li> <li>• Rubrics for student lab work.</li> <li>• Student generated Rubric for Volcano Brochure.</li> <li>• Teacher observation of individual / group participation.</li> <li>• Unit quizzes and tests.</li> <li>• Students' self evaluation of learning.</li> </ul>	<ul style="list-style-type: none"> <li>◆ Prentice Hall Science <u>Our Dynamic Earth</u></li> <li>◆ <u>HotLinks Volcanoes</u></li> <li>◆ Rock Collections: Metamorphic Igneous Sedimentary Minerals</li> <li>◆ Filmstrip: "The Earth's Rocks and Minerals"</li> <li>◆ Peterson Fist Guides <u>Rocks and Minerals</u></li> <li>◆ Speaker: Dr. Thorson University of Connecticut Geology Department.</li> <li>◆ Videos National Geographic: "Our Dynamic Earth" National Geographic: "Splendid Stones" "Volcanoes" National Geographic: "The Mystery of Vesuvius"</li> <li>◆ Laser Disk "Gems and Minerals" - Smithsonian</li> <li>◆ WWW Resources-</li> </ul>

	<p>breakdown the Earth's surface and those that build it.</p>	<p>preparations has each city made to withstand an earthquake of 7.2 on the Richter scale. Project is to include a graph illustrating earthquake activity in the two cities for the last 50 years. Project should also include research data that identifies plans made by engineers to ensure the stability of tall structures in each city so they are able to withstand an earthquake of high magnitude.</p>		
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<p><b>Systems of the Human Body</b></p> <p><b><u>Digestive System</u></b></p> <p><b><u>Respiratory System</u></b></p> <p><b><u>Circulatory System</u></b></p> <p><b><u>Nervous System</u></b></p>	<p>a. Trace the path of food through the Digestive system.</p> <p>b. Explain the function of each digestive organ.</p> <p>a. Explain the function of each organ of the Respiratory system.</p> <p>b. Describe the pathway of oxygen through the Respiratory system.</p> <p>a. Explain the function of each organ in the Circulatory system.</p> <p>b. Describe the pathway of oxygen through the Circulatory system.</p> <p>a. Describe the structures and functions of the Nervous system (cerebrum, cerebellum, medulla, oblongata, and spinal cord).</p> <p>b. Understand the Nervous system is divided into the Central and Peripheral systems.</p> <p>c. Understand stimulus response</p>	<p style="text-align: center;"><b>Students Will:</b></p> <ol style="list-style-type: none"> <li>1. Engage in inquiry-based learning activities that focus on the functions of the digestive, respiratory, circulatory, and nervous systems.</li> <li>2. Complete Cooperative Jigsaw Learning Activities in which groups of students will research and report on the following topics: the function of organs in the digestive, circulatory, respiratory and nervous systems through power point presentations.</li> <li>3. Dissect and analyze cow's eyeballs and pig's hearts and determine similarities and differences to human eyes and human hearts.</li> </ol> <p><b>**Challenge Activity</b></p>	<ul style="list-style-type: none"> <li>• Rubrics for each student/teacher generated project</li> <li>• Student science journals</li> <li>• Rubrics for student lab work</li> <li>• Teacher observations (individual &amp; group participation)</li> <li>• Unit quizzes and tests</li> <li>• Students' evaluation of learning.</li> </ul>	<ul style="list-style-type: none"> <li>◆ Prentice Hall <u>Human Biology and Health</u></li> <li>◆ Classroom Body Charts</li> <li>◆ Models of internal organs</li> <li>◆ Model of human skeleton</li> <li>◆ Videos</li> <li>◆ Lab Materials: Cow's Eyeballs Pig Hearts</li> </ul>

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<u>Light</u>	<ul style="list-style-type: none"> <li>a. Understand that light travels in waves.</li> <li>b. Describe the components of the electromagnetic spectrum (visible and invisible)</li> <li>c. List the colors of the visible spectrum.</li> <li>d. Understand how color affects absorption and reflection.</li> <li>e. Distinguish between transparent, translucent, and opaque.</li> <li>f. Explain what happens when light is reflected off rough and smooth surfaces.</li> <li>g. Define refraction.</li> <li>h. Illustrate light refraction through concave and convex lenses.</li> <li>i. Distinguish between a real and virtual image.</li> </ul>	<p style="text-align: center;"><b>Students Will:</b></p> <ul style="list-style-type: none"> <li>1. Students will complete inquiry-based learning activities where they observe the physical properties of light.</li> <li>2. Create murals of the visible spectrum indicating order of colors.</li> <li>3. Complete Cooperative Learning Jigsaw Activity: groups of students will research the following topics: light as a source of energy, Speed of light, the electromagnetic spectrum, and materials through which light cannot pass. Students will share their discoveries with the class.</li> <li>4. Distinguish the difference between the spectrums of black light; candle light and “white” light.</li> </ul> <p style="text-align: center;"><b>**Challenge Activity</b></p>	<ul style="list-style-type: none"> <li>• Rubrics for each student/teacher generated project.</li> <li>• Rubrics for student lab work</li> <li>• Student science journals</li> <li>• Teacher observations (individual &amp; group participation)</li> <li>• Unit quizzes and tests</li> <li>• Students’ self evaluation of learning.</li> </ul>	<ul style="list-style-type: none"> <li>◆ Handbook for Optics, Exp#35</li> <li>◆ Video National Geographic, “Light Fantastic”</li> <li>◆ Light Materials: Black light kit Mirrors Prisms</li> </ul>

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<p><b><u>Nutrition</u></b></p> <p><b><u>Food Components</u></b> Protein, carbohydrate, fats</p> <p><b><u>Vitamins, Minerals &amp; their importance</u></b></p> <p><b><u>Four basic food groups</u></b> Their function for a healthy body</p> <p><b><u>Planning nutritionally balanced meals</u></b></p>	<p>a. Explain what nutrition is and why it is important.</p> <p>b. Explain what nutrients are and identify the seven classes of nutrients.</p> <p>c. Identify the nutrients in each of the classes and explain their function.</p> <p>a. Explain the importance of vitamins and minerals.</p> <p>b. Indicate the functions and source of six of the essential vitamins.</p> <p>a. Explain the following terms: Balanced diet, Four basic food groups.</p> <p>a. Compare calorie intake with activity “burn.”</p> <p>b. Explain “empty calories.”</p> <p>c. Plan nutritionally balanced meals.</p>	<p style="text-align: center;"><b>Students Will:</b></p> <ol style="list-style-type: none"> <li>1. Engage in inquiry-based learning activities that focus on the following topics: food components, vitamins &amp; minerals, Four basic food groups, and importance of planning balanced meals.</li> <li>2. Collaboratively create balanced meal menus.</li> <li>3. Construct student food logs and evaluate student logs after one week.</li> <li>4. Cooperative Jigsaw Learning Activities on the following topics: food components, four basic food groups and deficiency diseases.</li> <li>5. Develop nutritional plans for success.</li> <li>6. Compose stories that follow a food item through the digestive system.</li> </ol> <p><b>**Challenge Activity.</b></p>	<ul style="list-style-type: none"> <li>• Rubrics for each student/teacher generated project.</li> <li>• Student science journals</li> <li>• Rubrics for student lab activities.</li> <li>• Teacher observation (individual &amp; group participation)</li> <li>• Unit quizzes and tests</li> <li>• Students’ self evaluation of learning</li> </ul>	<ul style="list-style-type: none"> <li>◆ Prentice Hall <u>Human Biology and Health</u></li> <li>◆ Food Pyramid – chart</li> <li>◆ <u>How Your Body Uses Food</u>. Dairy Council of California.</li> <li>◆ Videos</li> <li>◆ Materials: Food Your Choice, a nutritional learning system. Dairy Council.</li> </ul> <p>Labels for reading fat, vitamin content, and sugar</p>



	<ul style="list-style-type: none"><li>d. Complete an electric unit.</li><li>e. Distinguish between parallel and series connections.</li><li>f. Analyze the relationship between magnets and electricity. State the law of magnetism.</li><li>g. Define the terms: battery, generator, insulator, and transformer and identify their purpose.</li></ul>			
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<u>Trees</u>		<b>Students Will:</b>		
<b>Types of Trees</b>	a. Distinguish between coniferous, deciduous, and evergreen trees. b. Identify at least ten specimens.	1. Engage in inquiry-based learning activities on the following topics: structure & function of trees, economic importance of trees, interrelationships between plants and animals and effects environment has on tree growth. 2. Cooperative Learning Jigsaw Activities in which groups of students will research and report on the economic and environmental affects of clear cutting and slash and burn deforestation around the world. 3. Collaboratively generate power point presentation on tree types. 4. Create tree identification journals. 5. Write journal entries from the point of view of a tree that is being effected by changing environmental conditions. 6. Research the economic importance of trees.	<ul style="list-style-type: none"> <li>• Rubrics for each student/teacher generated project.</li> <li>• Student science journals</li> <li>• Teacher observations (individual &amp; group participation)</li> <li>• Unit quizzes and tests</li> <li>• Students' self evaluation of learning.</li> </ul>	<ul style="list-style-type: none"> <li>◆ Prentice Hall <u>Parade of Life</u></li> <li>◆ Tree identification books: <u>A Golden Book</u> (Guide to Trees)</li>   <li><u>Important Trees of Eastern Forests</u></li>   <li><u>Shrub &amp; Tree Identification Books</u></li>   <li><u>Trees of the Eastern and Central United States and Canada.</u></li>   <li><u>Peterson Field Guide to Trees</u></li>   <li>Audubon – <u>Field Guide To North American Trees</u></li>   <li>Audubon – <u>Field Guide to Winter Trees</u></li> <li>◆ Filmstrip: “Trees” Coronet</li> </ul>
<b>Structure &amp; Function</b>	a. Label tree structures and their functions b. Describe the process of photosynthesis. c. Write the equation for photosynthesis. d. Write the equation for respiration. e. Analyze the relationship between cellular respiration and photosynthesis.			
<b>Economic Importance</b>	a. Identify some uses for trees and recognize the importance of tree products throughout different world regions.			
<b>Interrelationships Between Plants and Animals</b>	a. Describe the interdependence between plants and animals.			
		<b>**Challenge Activity</b>		

<b>Effects of the Environment</b>	a. Recognize how environmental conditions effect tree growth.			
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