

# Grade 6 Science Curriculum Guide

## Big Understandings Life Science Cluster (5 – 8)

- The growth and survival of organisms depend upon the physical and biological conditions of the environment.
- Body tissues and organs are made up of different kinds of cells.
- The human body and other organisms function as systems

<p><b>Content Standards</b> Students will understand:</p> <p><b>A. Classifying Life Forms</b> Students will understand that there are similarities within the diversity of all living things</p>	<p><b>B. Ecology</b> Students will understand how living things depend on one another and on non-living aspects of the environment</p>	<p><b>C. Cells</b> Students will understand that cells are the basic units of life</p>
<p><b>Performance Indicators</b> Student will be able to:</p> <ol style="list-style-type: none"> <li>1. Compare systems of classifying organisms including systems used by scientists</li> <li>2. Decipher the system for assigning a scientific name to every living thing</li> <li>3. <b>Describe some structural and behavioral adaptations that allow organisms to survive in a changing environment (Foss: Populations and Ecosystems)</b></li> </ol> <p><b>A. Classifying Life Forms</b></p>	<p><b>Note: Bold indicators will be assessed</b></p> <ol style="list-style-type: none"> <li>1. Describe in general terms the chemical processes of photosynthesis and respiration</li> <li>2. <b>Analyze how the finite resources in an ecosystem limit the types and populations of organisms within it (Foss: Populations and Ecosystems)</b></li> <li>3. <b>Describe succession and other ways that ecosystems can change over time (Foss: Populations and Ecosystems)</b></li> <li>4. <b>Generate examples of the variety of ways that organisms interact</b></li> </ol> <p><b>B. Ecology</b></p> <p><b>(Foss: Populations and Ecosystems)</b></p> <ol style="list-style-type: none"> <li>5. Describe various mechanisms found in the natural world for transporting living and non-living matter and the results of such movements</li> </ol>	<ol style="list-style-type: none"> <li>1. Compare and contrast human organ systems with those of other species</li> <li>2. Prepare and examine microscope slides of single-celled and multi-celled organisms</li> <li>3. <b>Describe the structure and function of major organs in human systems (MAP: I am a Cheeseburger)</b></li> <li>4. Identify the causes and effects of diseases, explain their transmission, and identify prevention strategies</li> <li>5. <b>Describe how body systems work together (MAP: I am a Cheeseburger)</b></li> </ol> <p><b>C. Cells</b></p>

<p><b><u>Knowledge / Skills</u></b></p> <ul style="list-style-type: none"> <li>➤ Understand adaptations and how plants and animals use them to survive.</li> </ul>	<ul style="list-style-type: none"> <li>• Understand cause and effect of living and non-living relationships</li> <li>• Understand how populations vary according to resources</li> </ul>	<ul style="list-style-type: none"> <li>• Describe how organs work together and separately</li> <li>• Describe the functions of each organ</li> </ul>
<p><b><u>Assessment</u></b></p> <ul style="list-style-type: none"> <li>• <b>Foss: Populations and Ecosystems Assessment</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Foss: Populations and Ecosystems Assessment</b></li> <li>• Classroom Assessment</li> <li>• Classroom Project</li> </ul>	<ul style="list-style-type: none"> <li>• <b>MAP: I am a Cheeseburger</b></li> <li>• Classroom Assessment</li> <li>• Classroom Project</li> </ul>
<p><b><u>Resources</u></b></p> <p>Foss Kit: Populations and Ecosystems Prentice Hall – <u>Earth’s Living Resources</u></p>	<ul style="list-style-type: none"> <li>• Foss Kit: Populations and Ecosystems</li> <li>• Prentice Hall – <u>Earth’s Living Resources</u></li> </ul>	<ul style="list-style-type: none"> <li>• Foss</li> <li>• Prentice Hall - <u>Human Body</u></li> <li>• Bill Nye Videos</li> </ul>
<p><b><u>Instructional Strategies</u></b></p> <ul style="list-style-type: none"> <li>• Journals</li> <li>• Observations</li> <li>• Constructed Response</li> <li>• Graphic Organizers</li> </ul>	<ul style="list-style-type: none"> <li>• Journals</li> <li>• Observations</li> <li>• Constructed Response</li> <li>• Graphic Organizers</li> </ul>	<ul style="list-style-type: none"> <li>• Observations</li> <li>• Dissection</li> <li>• Constructed Response</li> <li>• Graphic Organizers</li> <li>• Models</li> </ul>

## **Big Understandings Physical Science Cluster (5 – 8)**

- Matter is made up of tiny particles called atoms.
- Atoms are in constant, random motion.
- When a substance goes through a chemical change, the atoms are rearranged and a different substance with new properties is produced.
- Energy cannot be created or destroyed, only changed from one form to another (Law of Conservation).
- Motion can be described mathematically.

<b>E. Structure of Matter</b> Students will understand the structure of matter and the changes it can undergo	<b>H. Energy</b> Students will understand concepts of energy	<b>I. Motion</b> Students will understand the motion of objects and how forces can change that motion
<ol style="list-style-type: none"> <li>1. Predict and test whether objects will float or sink based on a qualitative and quantitative understanding of the concepts of density and buoyancy</li> <li>2. Describe the evidence that matter consists of particles called atoms that are made up of certain smaller particle</li> <li>3. Use the periodic table to group elements based on their characteristics</li> <li>4. Describe how a substance can combine with different substances in different ways depending on the conditions and the properties of each substance</li> </ol> <p><b>E. Structure of Matter</b></p> <ol style="list-style-type: none"> <li>5. Describe how the motion of the particles of matter determines the state of the matter and vice versa</li> <li>6. Explain how the relatively small number of naturally occurring elements can result in the large variety of substances found in the world</li> <li>7. Investigate the similarities and differences between elements, compounds, and mixtures</li> <li>8. Demonstrate the law of conservation of matter</li> </ol>	<ol style="list-style-type: none"> <li><b>1. Analyze the benefits and drawbacks of energy conversions (Natural Resources)</b></li> <li>2. Demonstrate that energy cannot be created or destroyed but only changed from one form to another</li> <li>3. Compare and contrast the ways energy travels</li> <li>4. Describe the characteristics of static an current electricity</li> </ol> <p><b>5. Categorize energy sources as renewable or non-renewable and compare how these sources are H. Energy used by humans (Natural Resources)</b></p> <ol style="list-style-type: none"> <li>6. Describe how energy put into or taken out of a system can cause changes in the motion of particles in matter</li> </ol>	<ol style="list-style-type: none"> <li>1. Describe the motion of objects using knowledge of Newton’s Laws</li> <li>2. Use mathematics to describe the motion of objects</li> <li>3. Describe and quantify the ways machines can provide mechanical advantages in producing motion</li> </ol> <p><b>I. Motion</b></p>

	<ul style="list-style-type: none"> <li>• Understand and categorize energy sources as renewable or non-renewable</li> </ul>	
	<ul style="list-style-type: none"> <li>• <b>Teacher Generated Assessment: Natural Resources</b></li> <li>• Classroom Assessment</li> <li>• Classroom Project</li> </ul>	
	<ul style="list-style-type: none"> <li>• Foss Kit: Solar Energy</li> <li>• Prentice Hall – <u>Earth's Natural Resources</u></li> <li>• Various Videos</li> </ul>	
	<ul style="list-style-type: none"> <li>• Constructed Response</li> <li>• Graphic Organizers</li> <li>• Observation</li> <li>• Journals</li> <li>• Maps</li> </ul>	

## **Big Understandings Earth and Space Sciences Cluster (5 – 8)**

- Environmental and physical conditions on earth continue to change over time.
- Fossils can be used to trace the history of a species.
- The universe is all encompassing; it includes galaxies, planets, moons, meteors, comets, and asteroids.
- Our knowledge of the universe is dependent upon observation, exploration, and changes in our technology.

<p><b>Content Standards</b> Students will understand: <b>D. Continuity and Change</b> Students will understand the basis for all life and that all living things change over time</p>	<p><b>F. The Earth</b> Students will gain knowledge about the earth and the processes that change it</p>	<p><b>G. The Universe</b> Students will gain knowledge about the universe and how humans have learned about it, and about the principles upon which it operates</p>
<p><b>Performance Indicators:</b> Student will be able to:</p> <ol style="list-style-type: none"> <li>1. Describe how fossils can be used by scientists to trace the history of a species</li> <li>2. Explain how scientists use fossils to prove that life forms, climate, environment and geological features in a certain location are not the same now as they were in the past</li> <li>3. <b>Provide examples of the concept of natural and artificial selection and its role in species changes over time (Foss: Populations and Ecosystems)</b></li> <li>4. <b>Compare how sexually and asexually reproducing species transfer genetic information to offspring (Foss: Populations and Ecosystems)</b></li> </ol> <p><b>D. Continuity and Change</b></p>	<ol style="list-style-type: none"> <li>1. Demonstrate how the earth's tilt on its axis results in the seasons</li> <li>2. Describe how soils are formed and why soils differ from one place to another</li> <li>3. Explain the evidence scientists use when they give the age of the earth</li> <li>4. Describe factors that can cause short-term and long-term changes to the earth</li> <li>5. Classify and identify rocks and minerals based on their physical and chemical properties, their composition, and the processes which formed them</li> <li>6. Describe the many products used by humans that are derived from materials in the earth's crust</li> </ol> <p><b>F. The Earth</b></p> <ol style="list-style-type: none"> <li>7. Demonstrate factors effecting the flow of groundwater</li> </ol>	<ol style="list-style-type: none"> <li>1. Compare past and present knowledge about characteristics of stars and explain how people have learned about them</li> <li>2. Describe the concept of galaxies, including size and number of stars</li> <li>3. Compare and contrast distances and the time required to travel those distances on earth, in the solar system, in the galaxy and between galaxies</li> <li>4. Describe scientists' exploration of space and the objects they have found</li> <li>5. Describe the motions of moons, planets, stars, solar systems, and galaxies</li> </ol> <p><b>G. The Universe</b></p>
<p><b>Knowledge / Skills</b></p>		
<p><b>Assessment</b></p> <ul style="list-style-type: none"> <li>• <b>Foss: Populations and Ecosystems Assessment and Teacher generated Assessment</b></li> </ul>		
<p><b>Resources</b></p> <ul style="list-style-type: none"> <li>• Foss Kit: Populations and Ecosystems</li> <li>• Prentice Hall: Earth's Living Resources</li> <li>• TIME LIFE videos</li> </ul>		
<p><b>Instructional Strategies</b></p>		

## Big Understandings Nature and Implications of Science Cluster (5 – 8)

<p><b>J. Inquiry and Problem Solving</b> Students will apply inquiry and problem-solving approaches in science and technology</p>	<p><b>K. Scientific Reasoning</b> Students will learn to formulate and justify ideas and to make informed decisions</p>	<p><b>L. Communication</b> Students will communicate effectively in the application of science and technology</p>	<p><b>M. Implications of Science and Technology</b> Students will understand the historical, social, economic, environmental, and ethical implications of science and technology</p>
<p>1. Make accurate observations using tools and units of measure</p> <p>2. Design and conduct scientific investigations which include controlled experiments and systematic observations. Collect and analyze data and draw conclusions fairly</p> <p>3. Verify and evaluate scientific investigations and use the results in a purposeful way</p> <p>4. Compare and contrast the processes of scientific inquiry and the technological method</p> <p><b>J. Inquiry and Problem Solving</b></p>	<p>1. Examine the ways people form generalizations</p> <p>2. Identify exceptions to the proposed generalizations</p> <p>3. Identify basic informal fallacies in arguments</p> <p>4. Analyze means of slanting information</p> <p>5. Identify stereotypes</p> <p>6. Support reasoning by using a variety of evidence</p> <p>7. Show that proving a hypothesis false is easier than proving it true and explain why</p> <p>8. Construct logical arguments</p> <p>9. Apply analogous reasoning</p> <p><b>K. Scientific Reasoning</b></p>	<p>1. Discuss scientific and technological ideas and make conjectures and convincing arguments</p> <p>2. Defend problem solving strategies and solutions</p> <p>3. Evaluate individual and group communication for clarity, and work to improve communication</p> <p>4. <b>Make and use scale drawings, maps, and three-dimensional models to represent real objects, find locations and describe relationships (Foss: Solar Energy and MAP: I am a Cheeseburger)</b></p> <p>5. Access information at remote sites using telecommunications</p> <p><b>L. Communication</b></p> <p>6. Identify and perform roles necessary to accomplish group tasks</p> <p>7. Discuss scientific and technological ideas</p>	<p>1. Research and evaluate the social and environmental impacts of scientific and technological developments</p> <p>2. Describe the historical and cultural conditions at the time of an invention or discovery and analyze the societal impacts of that invention</p> <p>3. Discuss the ethical issues surrounding a specific scientific or technological development</p> <p>4. <b>Describe an individual's biological and other impacts on an environmental system (Foss: Natural Resources)</b></p> <p>5. Identify factors that have caused some countries to become leaders in science and technology</p> <p><b>M. Implications of Science and Technology</b></p> <p>6. Give examples of actions which may have expected or unexpected consequences that may be positive, negative or both</p> <p>7. Explain the connections between industry, natural resources, population and economic development</p> <p><b>8. Recognize scientific</b></p>

			<b>an technological contributions of diverse people including women, different ethnic groups, races and physically disabled (Foss: Populations and Ecosystems)</b>
<ul style="list-style-type: none"> <li>• Make observations, measure and categorize resources and organisms</li> </ul>			<ul style="list-style-type: none"> <li>• Understand the workings of the digestive system and how it works with other systems</li> </ul>
<ul style="list-style-type: none"> <li>• Classroom Assessments</li> <li>• Classroom Projects</li> </ul>	<ul style="list-style-type: none"> <li>• <b>MAP: I am a Cheeseburger</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>MAP: I am a Cheeseburger</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Foss: Solar Energy Assessment</b></li> <li>• <b>Foss: Populations and Ecosystems Assessment</b></li> <li>• Classroom Project</li> </ul>
<ul style="list-style-type: none"> <li>• Foss Kit: Populations and Ecosystems</li> <li>• Prentice Hall – <u>Earth's Living Resources</u></li> </ul>		<ul style="list-style-type: none"> <li>• Foss kit: Solar Energy</li> </ul>	<ul style="list-style-type: none"> <li>• Foss Kits: Solar Energy</li> <li>• Populations and Ecosystems</li> <li>• Human Body Systems</li> <li>• Prentice Hall – <u>Human Body and Health</u></li> <li>• Bill Nye Videos</li> </ul>
<ul style="list-style-type: none"> <li>• Graphic Organizers</li> <li>• Drawings / Diagrams</li> <li>• Journals</li> </ul>			<ul style="list-style-type: none"> <li>• Graphic Organizers</li> <li>• Diagrams</li> <li>• Posters</li> <li>• Projects</li> <li>• Constructed Response</li> </ul>

