

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><u>Content Standards</u> Students will understand:</p> <p>A. Classifying Life Forms Students will understand that there are similarities within the diversity of all living things</p> | <p>B. Ecology Students will understand how living things depend on one another and on non-living aspects of the environment</p> | <p>C. Cells Students will understand that cells are the basic units of life</p> |
| <p><u>Performance Indicators</u> Student will be able to:</p> <ol style="list-style-type: none"> 1. Compare systems of classifying organisms including systems used by scientists 2. Decipher the system for assigning a scientific name to every living thing 3. Describe some structural and behavioral adaptations that allow organisms to survive in a changing environment <p>A. Classifying Life Forms</p> | <p>Note: Bold indicators will be assessed</p> <ol style="list-style-type: none"> 1. Describe in general terms the chemical processes of photosynthesis and respiration 2. Analyze how the finite resources in an ecosystem limit the types and populations of organisms within it 3. Describe succession and other ways that ecosystems can change over time 4. Generate examples of the variety of ways that organisms interact 5. Describe various mechanisms found in the natural world for transporting living and non-living matter and the results of such movements <p>B. Ecology</p> | <ol style="list-style-type: none"> 1. Compare and contrast human organ systems with those of other species 2. Prepare and examine microscope slides of single-celled and multi-celled organisms (LAD2: Microscopes in the Lab) 3. Describe the structure and function of major organs in human systems 4. Identify the causes and effects of diseases, explain their transmission, and identify prevention strategies 5. Describe how body systems work together <p>C. Cells</p> |
| <p><u>Knowledge / Skills</u></p> <ul style="list-style-type: none"> • Understand diversity of life • Be able to classify systems | | <ul style="list-style-type: none"> • Understand that cells are the basic units of life • Learn how to use a microscope |
| <p><u>Assessment</u></p> | | <ul style="list-style-type: none"> • LAD2: Microscopes in the Lab |
| <p><u>Resources</u></p> <ul style="list-style-type: none"> • Foss: Diversity of Life • Glenco <u>Life Science</u> • Prentice Hall: <u>Microorganisms</u> | | <ul style="list-style-type: none"> • Microscopes • Foss: Diversity of Life • Glenco <u>Life Science</u> • Prentice Hall: <u>Cells</u> |
| <p><u>Instructional Strategies</u></p> <ul style="list-style-type: none"> • Journals • Observation • Experiments (Labs) • Graphic Organizers • Constructed Response • Structured Response | | <ul style="list-style-type: none"> • Journals • Observation • Experiments • Graphic Organizers • Constructed Response |

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.

| <p>E. Structure of Matter Students will understand the structure of matter and the changes it can undergo</p> | <p>H. Energy Students will understand concepts of energy</p> | <p>I. Motion Students will understand the motion of objects and how forces can change that motion</p> |
|--|---|---|
| <p>1. Predict and test whether objects will float or sink based on a qualitative and quantitative understanding of the concepts of density and buoyancy</p> <p>2. Describe the evidence that matter consists of particles called atoms that are made up of certain smaller particle</p> <p>3. Use the periodic table to group elements based on their characteristics</p> <p>4. Describe how a substance can combine with different substances in different ways depending on the conditions and the properties of each substance</p> <p>E. Structure of Matter</p> <p>5. Describe how the motion of the particles of matter determines the state of the matter and vice versa</p> <p>6. Explain how the relatively small number of naturally occurring elements can result in the large variety of substances found in the world</p> <p>7. Investigate the similarities and differences between elements, compounds, and mixtures</p> <p>8. Demonstrate the law of</p> | <p>1. Analyze the benefits and drawbacks of energy conversions</p> <p>2. Demonstrate that energy cannot be created or destroyed but only changed from one form to another</p> <p>3. Compare and contrast the ways energy travels</p> <p>4. Describe the characteristics of static an current electricity</p> <p>5. Categorize energy sources as renewable or non-renewable and compare how these sources are used by humans</p> <p>6. Describe how energy put into or taken out of a system can cause</p> <p>H. Energy</p> <p>changes in the motion of particles in matter</p> | <p>1. Describe the motion of objects using knowledge of Newton’s Laws</p> <p>2. Use mathematics to describe the motion of objects (Foss: Levers and Pulleys)</p> <p>3. Describe and quantify the ways machines can provide mechanical advantages in producing motion (Foss: Levers and Pulleys)</p> <p>I. Motion</p> |

| | | |
|------------------------|--|--|
| conservation of matter | | |
| | | ➤ Create formulas for solving problems |
| | | • Foss: Levers and Pulleys Assessment |
| | | • Foss Kit: Levers and Pulleys |
| | | |

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>Content Standards Students will understand: D. Continuity and Change Students will understand the basis for all life and that all living things change over time</p> | <p>F. The Earth Students will gain knowledge about the earth and the processes that change it</p> | <p>G. The Universe Students will gain knowledge about the universe and how humans have learned about it, and about the principles upon which it operates</p> |
| <p>Performance Indicators: Student will be able to: 1. Describe how fossils can be used by scientists to trace the history of a species 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 (MAP: Revealing Fossil Secrets) 3. Provide examples of the concept of natural and artificial selection and its role in species changes over time 4. Compare how sexually and asexually reproducing species transfer genetic information to offspring D. Continuity and Change</p> | <p>1. Demonstrate how the earth's tilt on its axis results in the seasons 2. Describe how soils are formed and why soils differ from one place to another 3. Explain the evidence scientists use when they give the age of the earth 4. Describe factors that can cause short-term and long-term changes to the earth (MAP: Revealing Fossil Secrets) 5. Classify and identify rocks and minerals based on their physical and chemical properties, their composition, and the processes which formed them 6. Describe the many products used by humans that are derived from materials in the earth's crust F. The Earth 7. Demonstrate factors effecting the flow of groundwater</p> | <p>1. Compare past and present knowledge about characteristics of stars and explain how people have learned about them 2. Describe the concept of galaxies, including size and number of stars 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 4. Describe scientists' exploration of space and the objects they have found 5. Describe the motions of moons, planets, stars, solar systems, and galaxies G. The Universe</p> |
| <p>Knowledge / Skills ➤ Understanding change over time</p> | <p>➤ Understanding change over time</p> | |
| <p>Assessment • MAP: Revealing Fossil Secrets</p> | <p>• MAP: Revealing Fossil Secrets</p> | |
| <p>Resources MAP: Revealing Fossil Secrets</p> | <p>MAP: Revealing Fossil Secrets</p> | |
| <p>Instructional Strategies ➤ Models ➤ Journals ➤ Graphic Organizers ➤ Selected Response</p> | <p>➤ Models ➤ Journals ➤ Graphic Organizers ➤ Selected Response</p> | |

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

| <p>J. Inquiry and Problem Solving Students will apply inquiry and problem-solving approaches in science and technology</p> | <p>K. Scientific Reasoning Students will learn to formulate and justify ideas and to make informed decisions</p> | <p>L. Communication Students will communicate effectively in the application of science and technology</p> | <p>M. Implications of Science and Technology 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 (LAD2: Microscopes in the Lab)</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>J. Inquiry and Problem Solving</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>K. Scientific Reasoning</p> | <p>1. Discuss scientific and technological ideas and make conjectures and convincing arguments (MAP: Revealing Fossil Secrets)</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. Make and use scale drawings, maps, and three-dimensional models to represent real objects, find locations and describe relationships (MAP: Revealing Fossil Secrets)</p> <p>5. Access information at remote sites using telecommunications</p> <p>L. Communication</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. Describe an individual's biological and other impacts on an environmental system</p> <p>5. Identify factors that have caused some countries to become M. Implications of Science and Technology leaders in science and technology</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>8. Recognize scientific an technological</p> |

| | | | |
|---|--|---|---|
| | | | contributions of diverse people including women, different ethnic groups, races and physically disabled |
| <ul style="list-style-type: none"> • Use a microscope to make accurate observations | | <ul style="list-style-type: none"> ➤ Create drawing or models | |
| <ul style="list-style-type: none"> • LAD2: Microscopes in the Lab | | <ul style="list-style-type: none"> • MAP: Revealing Fossil Secrets | |
| <ul style="list-style-type: none"> • Microscopes | | | |
| <ul style="list-style-type: none"> ➤ Models ➤ Journals ➤ Graphic Organizers ➤ Selected Response | | <ul style="list-style-type: none"> ➤ Models ➤ Journals ➤ Graphic Organizers ➤ Selected Response | |