

Sixth Grade

Lakewood City Schools

Course of Study For **Science**

September, 2005

SIXTH GRADE

Scope and Sequence

Students in grade six continue to conduct investigations and begin to apply mathematical skills in evaluating and analyzing variables of data. They identify basic skills of the scientific inquiry process, such as how thinking scientifically is helpful in daily life and how technological advances affect the quality of life. Students research how men and women of other countries and cultures contribute to science. Sixth-grade students identify rocks, their distinct properties and formation and characteristic properties of the minerals that form them. They learn to recognize that a cell continually divides to create new cells, reproduction of cells occur, similar cells have special functions, and characteristics of an organism are a result of inherited traits. Students acquire knowledge of the uses, properties and chemical processes of the small particles that compose matter. They learn the renewable and nonrenewable sources of energy as part of the grade six indicators.

**Sixth grade teachers will cover pollution in the lithosphere, hydrosphere and atmosphere. (Grade 7 Earth Science, Benchmark C, Indicators 2 and 4)*

The Lakewood City Schools Science Standards-Based Course of Study is aligned with the Ohio Department of Education’s Academic Content Standards.

Standard 1: Earth and Space Science

Standard 2: Life Science

Standard 3: Physical Science

Standard 4: Science and Technology

Standard 5: Scientific Inquiry

Standard 6: Scientific Ways of Knowing

} (*Nature of Science*)

Academic Content Standards, Benchmarks, and Indicators are reflected at each grade level in this document.

A list of Teaching Resources is included for each Unit of Study. Lakewood sixth grade units are entitled: Nature of Science, Chemistry, Rocks and Minerals, Energy Resources and Cells/Heredit. All sixth grade Benchmarks and Indicators are covered within these units.

Sub-objective activities are included to meet indicators for each unit for teacher planning.

Prentice Hall Textbook Modules: The Nature of Science; Chemistry of Matter; Ecology: Earth’s Living Resources; Ecology: Earth’s Natural Resources; Dynamic Earth; Heredit: The Code of Life; Cells: Building Blocks of Life

Science Standards

Standard 1: Earth and Space Sciences

Students demonstrate an understanding about how Earth systems and processes interact in the geosphere resulting in the habitability of Earth. This includes demonstrating an understanding of the composition of the universe, the solar system and Earth. In addition, it includes understanding the properties and the interconnected nature of Earth's systems, processes that shape Earth and Earth's history. Students also demonstrate an understanding of how the concepts and principles of energy, matter, motion and forces explain Earth systems, the solar system and the universe. Finally, they grasp an understanding of the historical perspectives, scientific approaches and emerging scientific issues associated with Earth and space sciences.

Standard 2: Life Sciences

Students demonstrate an understanding of how living systems function and how they interact with the physical environment. This includes an understanding of the cycling of matter and flow of energy in living systems. An understanding of the characteristics, structure and function of cells, organisms and living systems will be developed. Students will also develop a deeper understanding of the principles of heredity, biological evolution, and the diversity and interdependence of life. Students demonstrate an understanding of different historical perspectives, scientific approaches and emerging scientific issues associated with the life sciences.

Standard 3: Physical Sciences

Students demonstrate an understanding of the composition of physical systems and the concepts and principles that describe and predict physical interactions and events in the natural world. This includes demonstrating an understanding of the structure and properties of matter, the properties of materials and objects, chemical reactions and the conservation of matter. In addition, it includes understanding the nature, transfer and conservation of energy; motion and the forces affecting motion; and the nature of waves and interactions of matter and energy. Students demonstrate an understanding of the historical perspectives, scientific approaches and emerging scientific issues associated with the physical sciences.

Standard 4: Science and Technology

Students recognize that science and technology are interconnected and that using technology involves assessment of the benefits, risks and costs. Students should build scientific and technological knowledge, as well as the skill required to design and construct devices. In addition, they should develop the processes to solve problems and understand that problems may be solved in several ways.

Standard 5: Scientific Inquiry

Students develop scientific habits of mind as they use the processes of scientific inquiry to ask valid questions and to gather and analyze information. They understand how to develop hypotheses and make predictions. They are able to reflect on scientific practices as they develop plans of action to create and evaluate a variety of conclusions. Students are also able to demonstrate the ability to communicate their findings to others.

Standard 6: Scientific Ways of Knowing

Students realize that the current body of scientific knowledge must be based on evidence, be predictive, logical, subject to modification and limited to the natural world. This includes demonstrating an understanding that scientific knowledge grows and advances as new evidence is discovered to support or modify existing theories, as well as to encourage the development of new theories. Students are able to reflect on ethical scientific practices and demonstrate an understanding of how the current body of scientific knowledge reflects the historical and cultural contributions of women and men who provide us with a more reliable and comprehensive understanding of the natural world.

LAKWOOD UNIT: Nature of Science

2 week unit – includes Science and Technology, Scientific Inquiry, and Scientific Ways of Knowing

Science and Technology Standard (ST)

Students recognize that science and technology are interconnected and that using technology involves assessment of the benefits, risks and costs. Students should build scientific and technological knowledge, as well as the skill required to design and construct devices. In addition, they should develop the processes to solve problems and understand that problems may be solved in several ways.

Ohio Benchmarks 6-8

Grade Level Indicators

Teaching Resources

<p>A. Give examples of how technological advances, influenced by scientific knowledge, affect the quality of life. (ST-A)</p>	<p><u>Understanding Technology</u></p> <ol style="list-style-type: none"> 1. Explain how technology influences the quality of life. (ST-6-1) 2. Explain how decisions about the use of products and systems can result in desirable or undesirable consequences (e.g., social and environmental). (ST-6-2) 3. Describe how automation (e.g., robots) has changed manufacturing including manual labor being replaced by highly-skilled jobs. (ST-6-3) 4. Explain how the usefulness of manufactured parts of an object depend on how well their properties allow them to fit and interact with other materials. (ST-6-4) 	<p>Teaching Resources: <u>Prentice Hall Science Textbook:</u></p> <ul style="list-style-type: none"> • The Nature of Science <p>Science Process Skills Packet –</p> <ul style="list-style-type: none"> • Egg (How strong is a sphere?) • Dissecting Worm (candy) • Prentice Hall Labs <p>Current Events: Magazines/Newspapers</p>
<p>B. Design a solution or product taking into account needs and constraints (e.g., cost, time, trade-offs, properties of materials, safety and aesthetics). (ST-B)</p>	<p><u>Abilities To Do Technological Design</u></p> <ol style="list-style-type: none"> 5. Design and build a product or create a solution to a problem given one constraint (e.g., limits of cost and time for design and production, supply of materials and environmental effects). (ST-6-5) 	

LAKWOOD UNIT: Nature of Science (continued)

Continue 2 week unit – includes Science and Technology, Scientific Inquiry, and Scientific Ways of Knowing

Scientific Inquiry Standard (SI)

Students develop scientific habits of mind as they use the processes of scientific inquiry to ask valid questions and to gather and analyze information. They understand how to develop hypotheses and make predictions. They are able to reflect on scientific practices as they develop plans of action to create and evaluate a variety of conclusions. Students are also able to demonstrate the ability to communicate their findings to others.

Ohio Benchmarks 6-8

Grade Level Indicators

Teaching Resources

<p>A. Explain that there are differing sets of procedures for guiding scientific investigations and procedures are determined by the nature of the investigation, safety considerations and appropriate tools. (SI-A)</p>	<p><u>Doing Scientific Inquiry</u> 1. Explain that there are not fixed procedures for guiding scientific investigations; however, the nature of an investigation determines the procedures needed. (SI-6-1) 2. Choose the appropriate tools or instruments and use relevant safety procedures to complete scientific investigations. (SI-6-2) 3. Distinguish between observation and inference. (SI-6-3)</p>	<p>Video: “American Wildlife” – shown without sound (students observe and infer) and then show with sound to check their inferences.</p>
<p>B. Analyze and interpret data from scientific investigations using appropriate mathematical skills in order to draw valid conclusions. (SI-B)</p>	<p>4. Explain that a single example can never prove that something is always correct, but sometimes a single example can disprove something. (SI-6-4)</p>	

LAKWOOD UNIT: Nature of Science (continued)

Continue 2 week unit – includes Science and Technology, Scientific Inquiry, and Scientific Ways of Knowing

Scientific Ways of Knowing Standard (SK)

Students realize that the current body of scientific knowledge must be based on evidence, be predictive, logical, subject to modification and limited to the natural world. This includes demonstrating an understanding that scientific knowledge grows and advances as new evidence is discovered to support or modify existing theories, as well as to encourage the development of new theories. Students are able to reflect on ethical scientific practices and demonstrate an understanding of how the current body of scientific knowledge reflects the historical and cultural contributions of women and men who provide us with a more reliable and comprehensive understanding of the natural world.

Ohio Benchmarks 6-8

Grade Level Indicators

Teaching Resources

<p>A. Use skills of scientific inquiry processes (e.g., hypothesis, record keeping, description and explanation). (SK-A)</p>	<p><u>Nature of Science</u> 1. Identify that hypotheses are valuable even when they are not supported. (SK-6-1)</p> <p><u>Ethical Practices</u> 2. Describe why it is important to keep clear, thorough and accurate records. (SK-6-2)</p>	<p><u>Multicultural Science and Math Connections</u>, Lumpkin & Strong. (Willing to pass around and share – Sandi Thompson, Harding Middle School)</p>
<p>B. Explain the importance of reproducibility and reduction of bias in scientific methods. (SK-B)</p>	<p><i>No indicators present for this benchmark (grade 7).</i></p>	
<p>C. Give examples of how thinking scientifically is helpful in daily life. (SK-C)</p>	<p><u>Science and Society</u> 3. Identify ways scientific thinking is helpful in a variety of everyday settings. (SK-6-3)</p> <p>4. Describe how the pursuit of scientific knowledge is beneficial for any career and for daily life. (SK-6-4)</p> <p>5. Research how men and women of all countries and cultures have contributed to the development of science. (SK-6-5)</p>	

LAKWOOD UNIT: Chemistry

8 week unit

Physical Sciences Standard (PS)

Students demonstrate an understanding of the composition of physical systems and the concepts and principles that describe and predict physical interactions and events in the natural world. This includes demonstrating an understanding of the structure and properties of matter, the properties of materials and objects, chemical reactions and the conservation of matter. In addition, it includes understanding the nature, transfer and conservation of energy; motion and the forces affecting motion; and the nature of waves and interactions of matter and energy. Students demonstrate an understanding of the historical perspectives, scientific approaches and emerging scientific issues associated with the physical sciences.

Ohio Benchmarks 6-8

Grade Level Indicators

Teaching Resources

<p>A. Relate uses, properties and chemical processes to the behavior and/or arrangement of the small particles that compose matter. (PS-A)</p>	<p><u>Nature of Matter</u></p> <ol style="list-style-type: none"> 1. Explain that equal volumes of different substances usually have different masses. (PS-6-1) 2. Describe that in a chemical change new substances are formed with different properties than the original substance (e.g., rusting, burning). (PS-6-2) 3. Describe that in a physical change (e.g., state, shape and size) the chemical properties of a substance remain unchanged. (PS-6-3) 4. Describe that chemical and physical changes occur all around us (e.g., in the human body, cooking and industry). (PS-6-4) 	<p>Teaching Resources: <u>Prentice Hall Science Textbook:</u></p> <ul style="list-style-type: none"> • Chemistry of Matter <p>Suggestion: <u>Teaching Chemistry with Toys</u>, Sarquis, Williams.</p>
<p>B. In simple cases, describe the motion of objects and conceptually describe the effects of forces on an object. (PS-B)</p>	<p><i>No indicators present for this benchmark (grade 8).</i></p>	

LAKWOOD UNIT: Chemistry (continued)

8 week unit

Physical Sciences Standard

Students demonstrate an understanding of the composition of physical systems and the concepts and principles that describe and predict physical interactions and events in the natural world. This includes demonstrating an understanding of the structure and properties of matter, the properties of materials and objects, chemical reactions and the conservation of matter. In addition, it includes understanding the nature, transfer and conservation of energy; motion and the forces affecting motion; and the nature of waves and interactions of matter and energy. Students demonstrate an understanding of the historical perspectives, scientific approaches and emerging scientific issues associated with the physical sciences.

Sub-Objective Activities to Meet Indicators
<p>Physical and Chemical Changes</p> <ul style="list-style-type: none"> • Identify information about an atom from the Periodic Table of Elements, including: <ul style="list-style-type: none"> ◦ Name of the element ◦ Symbol ◦ Atomic number ◦ Atomic mass ◦ Metal/Nonmetal ◦ Number of protons and neutrons ◦ M & M Lab ◦ Sugar ◦ Rainbow Milk ◦ Physical/Chemical Review Game • Compare and contrast elements, mixtures, and compounds. • Identify properties of matter, including: <ul style="list-style-type: none"> ◦ Color ◦ Luster/Shininess ◦ Temperature ◦ Shape ◦ Magnetic/Nonmagnetic ◦ Texture ◦ Size ◦ Float/Sink ◦ Weight/Mass ◦ Malleability/Flexibility ◦ Density • Explore states of matter (i.e., solids, liquids, gases, and plasma) through experimenting, modeling, and interpreting.

- Analyze and explore the states of matter and model the molecular differences in states (e.g., lots of molecules moving slowly/solid).
- Design experiments to explore matter and its physical and/or chemical changes.
- Create a list of characteristics of simple physical changes, including:
 - Observable change in size, shape/configuration, or state of matter of a substance
 - More easily reversible
 - Do not involve permanent changes in the properties of a material
- Create a list of characteristics of simple chemical changes, including:
 - Observable change in size, shape/configuration, or state of matter of a substance
 - Difficult to reverse
 - Involve change in the properties of the material
 - Often give off heat on their own
- Compare and contrast simple physical changes versus chemical changes.
- Examine the characteristics of something before and after an event to decide whether a change is chemical or physical (e.g., cold packs, heat packs, physical changes caused by water, chemical changes involving water and other elements).
- Measure and/or describe the rate or nature of physical and/or chemical changes that are taking place.
- Measure pH of acids and bases.
- Conduct experiments to neutralize a substance from an acid to a base.
- Compare and contrast solutions, saturated solutions, and suspensions.

LAKWOOD UNIT: Rocks and Minerals

8 week unit

Earth and Space Sciences Standard (ES)

Students demonstrate an understanding about how Earth systems and processes interact in the geosphere resulting in the habitability of Earth. This includes demonstrating an understanding of the composition of the universe, the solar system and Earth. In addition, it includes understanding the properties and the interconnected nature of Earth’s systems, processes that shape Earth and Earth’s history. Students also demonstrate an understanding of how the concepts and principles of energy, matter, motion and forces explain Earth systems, the solar system and the universe. Finally, they grasp an understanding of the historical perspectives, scientific approaches and emerging scientific issues associated with Earth and space sciences.

Ohio Benchmarks 6-8

Grade Level Indicators

Teaching Resources

<p>A. Describe how the positions and motions of the objects in the universe cause predictable and cyclic events. (ES-A)</p>	<p><i>No indicators present for this benchmark (grade 8).</i></p>	<p>Teaching Resources: <u>Prentice Hall Science Textbook:</u> <ul style="list-style-type: none"> • Dynamic Earth <u>Stories in Stones Book</u> (GEMS) – Kit with rock and mineral samples</p>
<p>B. Explain that the universe is composed of vast amounts of matter, most of which is at incomprehensible distances and held together by gravitational force. Describe how the universe is studied by the use of equipment such as telescopes, probes, satellites and spacecraft. (ES-B)</p>	<p><i>No indicators present for this benchmark (grade 8).</i></p>	<p>(Carolina Biological) – Rocks and Minerals Hands-on Kit</p>

<p>C. Describe interactions of matter and energy throughout the lithosphere, hydrosphere and atmosphere (e.g., water cycle, weather and pollution). (ES-C)</p>	<p><i>No indicators present for this benchmark (grade 7).</i></p>	
<p>D. Identify that the lithosphere contains rocks and minerals and that minerals make up rocks. Describe how rocks and minerals are formed and/or classified. (ES-D)</p>	<p><u><i>Earth Systems</i></u></p> <ol style="list-style-type: none"> 1. Describe the rock cycle and explain that there are sedimentary, igneous and metamorphic rocks that have distinct properties (e.g., color, texture) and are formed in different ways. (ES-6-1) 2. Explain that rocks are made of one or more minerals. (ES-6-2) 3. Identify minerals by their characteristic properties. (ES-6-3) 	
<p>E. Describe the processes that contribute to the continuous changing of Earth's surface (e.g., earthquakes, volcanic eruptions, erosion, mountain building and lithospheric plate movements). (ES-E)</p>	<p><i>No indicators present for this benchmark (grade 8).</i></p>	

LAKWOOD UNIT: Rocks and Minerals (continued)

8 week unit

Earth and Space Sciences Standard

Students demonstrate an understanding about how Earth systems and processes interact in the geosphere resulting in the habitability of Earth. This includes demonstrating an understanding of the composition of the universe, the solar system and Earth. In addition, it includes understanding the properties and the interconnected nature of Earth’s systems, processes that shape Earth and Earth’s history. Students also demonstrate an understanding of how the concepts and principles of energy, matter, motion and forces explain Earth systems, the solar system and the universe. Finally, they grasp an understanding of the historical perspectives, scientific approaches and emerging scientific issues associated with Earth and space sciences.

**Sub-Objective Activities
to Meet Indicators**

- Identify relative hardness of a mineral using scratch tests and Moh’s Scale of Hardness.
- Describe in comparative terms (e.g., oldest, youngest) the age of disturbed or undisturbed rock layers.
- Explain how fossils provide important evidence of how life and environmental conditions have changed.
- Create a dichotomous key to classify rocks as igneous, sedimentary or metamorphic according to the way they were formed.
- Determined the water-holding capacities of a variety of rocks
- Summarize how the following factors affect the development of different soil types:
 - Climate
 - Plants and animals
 - Land surface features
 - Time
 - Type of parent material (origin of soil)

LAKWOOD UNIT: Energy Resources

8 week unit – includes Physical Sciences and Earth and Space Sciences *[Pollution Unit Only]*

Physical Sciences Standard (PS)

Students demonstrate an understanding of the composition of physical systems and the concepts and principles that describe and predict physical interactions and events in the natural world. This includes demonstrating an understanding of the structure and properties of matter, the properties of materials and objects, chemical reactions and the conservation of matter. In addition, it includes understanding the nature, transfer and conservation of energy; motion and the forces affecting motion; and the nature of waves and interactions of matter and energy. Students demonstrate an understanding of the historical perspectives, scientific approaches and emerging scientific issues associated with the physical sciences.

Ohio Benchmarks 6-8

Grade Level Indicators

Teaching Resources

<p>C. Describe renewable and nonrenewable sources of energy (e.g., solar, wind, fossil fuels, biomass, hydroelectricity, geothermal and nuclear energy) and the management of these sources. (PS-C)</p>	<p><i>Nature of Energy</i></p> <p>5. Explain that the energy found in nonrenewable resources such as fossil fuels (e.g., oil, coal and natural gas) originally came from the sun and may renew slowly over millions of years. (PS-6-5)</p> <p>6. Explain that energy derived from renewable resources such as wind and water is assumed to be available indefinitely. (PS-6-6)</p> <p>7. Describe how electric energy can be produced from a variety of sources (e.g., sun, wind and coal). (PS-6-7)</p> <p>8. Describe how renewable and nonrenewable energy resources can be managed (e.g., fossil fuels, trees and water). (PS-6-8)</p>	<p>Teaching Resources: <u>Prentice Hall Science Textbook:</u></p> <ul style="list-style-type: none"> • Ecology: Earth’s Living Resources • Ecology: Earth’s Natural Resources <p>Energy Review Game</p> <p>Review Cards / OPT for Success</p>
<p>D. Describe that energy takes many forms, some forms represent kinetic energy and some forms represent potential energy; and during energy transformations the total amount of energy remains constant. (PS-D)</p>	<p><i>No indicators present for this benchmark (grade 7).</i></p>	

LAKWOOD UNIT: Energy Resources (continued)

8 week unit – includes Physical Sciences and Earth and Space Sciences *[Pollution Unit Only]*

Earth and Space Sciences Standard (ES) *[Pollution Unit Only]*

Students demonstrate an understanding about how Earth systems and processes interact in the geosphere resulting in the habitability of Earth. This includes demonstrating an understanding of the composition of the universe, the solar system and Earth. In addition, it includes understanding the properties and the interconnected nature of Earth’s systems, processes that shape Earth and Earth’s history. Students also demonstrate an understanding of how the concepts and principles of energy, matter, motion and forces explain Earth systems, the solar system and the universe. Finally, they grasp an understanding of the historical perspectives, scientific approaches and emerging scientific issues associated with Earth and space sciences.

Ohio Benchmarks 6-8

Grade Level Indicators

Teaching Resources

<p>C. Describe interactions of matter and energy throughout the lithosphere, hydrosphere and atmosphere (e.g., water cycle, weather and pollution). (ES-C)</p>	<p><i>(7th grade indicators) [Pollution Unit Only]</i></p> <p><u>Earth Systems</u></p> <p>2. Explain that Earth's capacity to absorb and recycle materials naturally (e.g., smoke, smog and sewage) can change the environmental quality depending on the length of time involved (e.g. global warming). (ES-7-2)</p> <p>4. Analyze data on the availability of fresh water that is essential for life and for most industrial and agricultural processes. Describe how rivers, lakes and groundwater can be depleted or polluted becoming less hospitable to life and even becoming unavailable or unsuitable for life. (ES-7-4)</p> <p><i>*Note: These indicators will also be taught in grade 7 Weather.</i></p>	<p>Teaching Resources:</p> <p><u>Prentice Hall Science Textbook:</u></p> <ul style="list-style-type: none"> • Ecology: Earth’s Living Resources • Ecology: Earth’s Natural Resources <p>Energy Review Game</p> <p>Review Cards / OPT for Success</p>
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LAKWOOD UNIT: Energy Resources (continued)

8 week unit – includes Physical Sciences and Earth and Space Sciences

Physical Sciences Standard

Students demonstrate an understanding of the composition of physical systems and the concepts and principles that describe and predict physical interactions and events in the natural world. This includes demonstrating an understanding of the structure and properties of matter, the properties of materials and objects, chemical reactions and the conservation of matter. In addition, it includes understanding the nature, transfer and conservation of energy; motion and the forces affecting motion; and the nature of waves and interactions of matter and energy. Students demonstrate an understanding of the historical perspectives, scientific approaches and emerging scientific issues associated with the physical sciences.

Earth and Space Sciences Standard (7th grade indicators) [Pollution Unit Only]

Students demonstrate an understanding about how Earth systems and processes interact in the geosphere resulting in the habitability of Earth. This includes demonstrating an understanding of the composition of the universe, the solar system and Earth. In addition, it includes understanding the properties and the interconnected nature of Earth’s systems, processes that shape Earth and Earth’s history. Students also demonstrate an understanding of how the concepts and principles of energy, matter, motion and forces explain Earth systems, the solar system and the universe. Finally, they grasp an understanding of the historical perspectives, scientific approaches and emerging scientific issues associated with Earth and space sciences.

**Sub-Objective Activities
to Meet Indicators**

Impacts of Human Activity on Ecosystems

- Describe and analyze how human actions or activities can affect the earth’s ecosystems and its plant and animal species in terms of:
 - Air, water, and soil pollution
 - Conservation of natural resources, including preservation of land and species of plants and animals
 - Change of maintenance of habitats for particular plant or animal species
 - Erosion
 - Soil fertility
- Use and/or production of different sources of energy

LAKWOOD UNIT: Cell Biology

10 week unit

Life Sciences Standard (LS)

Students demonstrate an understanding of how living systems function and how they interact with the physical environment. This includes an understanding of the cycling of matter and flow of energy in living systems. An understanding of the characteristics, structure and function of cells, organisms and living systems will be developed. Students will also develop a deeper understanding of the principles of heredity, biological evolution, and the diversity and interdependence of life. Students demonstrate an understanding of different historical perspectives, scientific approaches and emerging scientific issues associated with the life sciences.

Ohio Benchmarks 6-8

Grade Level Indicators

Teaching Resources

<p>A. Explain that the basic functions of organisms are carried out in cells and groups of specialized cells form tissues and organs; the combination of these cells make up multicellular organisms that have a variety of body plans and internal structures. (LS-A)</p>	<p><u>Characteristics and Structure of Life</u></p> <ol style="list-style-type: none"> 1. Explain that many of the basic functions of organisms are carried out by or within cells and are similar in all organisms. (LS-6-1) 2. Explain that multicellular organisms have a variety of specialized cells, tissues, organs and organ systems that perform specialized functions. (LS-6-2) 3. Identify how plant cells differ from animal cells (e.g., cell wall and chloroplasts). (LS-6-3) 	<p>Teaching Resources: <u>Prentice Hall Science Textbook:</u></p> <ul style="list-style-type: none"> • Cells: Building Blocks of Life • Heredity: The Code of Life (Chapter 1) Story About Mendel: Green Pea, Yellow Pea <p>Build a 3-system organism starting single cells</p> <p>Purchased and constructed animal/plant cells</p> <p>Web site: Cells Alive</p>
<p>B. Describe the characteristics of an organism in terms of a combination of inherited traits and recognize reproduction as a characteristic of living organisms essential to the continuation of the species. (LS-B)</p>	<p><u>Heredity</u></p> <ol style="list-style-type: none"> 4. Recognize that an individual organism does not live forever; therefore reproduction is necessary for the continuation of every species and traits are passed on to the next generation through reproduction. (LS-6-4) 5. Describe that in asexual reproduction all the inherited traits come from a single parent. (LS-6-5) 6. Describe that in sexual reproduction an egg and sperm unite and some traits come from each parent, so the offspring is never identical to either of its parents. (LS-6-6) 7. Recognize that likenesses between parents and offspring (e.g., eye color, flower color) are inherited. Other likenesses, such as table manners are learned. (LS-6-7) 	<p>Prentice Hall: <u>Cells – Cell Theory</u> (GSMERRRF: growth, secretion, movement, excretion, respond, respiration, reproduction, food getting)</p> <p>Microscope – cheek – ELODEA cells (some years)</p> <p>Prentice Hall Book</p> <ul style="list-style-type: none"> • Hydras • Microscope labs • Prepared cells • Sand/Water • Models • Mobiles

<p>C. Explain how energy entering the ecosystems as sunlight supports the life of organisms through photosynthesis and the transfer of energy through the interactions of organisms and the environment. (LS-C)</p>	<p><u><i>Diversity and Interdependence of Life</i></u> 8. Describe how organisms may interact with one another. (LS-6-8) <i>(By agreement, this indicator is taught in grade 7.)</i></p>	
<p>D. Explain how extinction of a species occurs when the environment changes and its adaptive characteristics are insufficient to allow survival (as seen in evidence of the fossil record). (LS-D)</p>	<p><i>No indicators present for this benchmark (grade 7).</i></p>	

LAKWOOD UNIT: Cell Biology (continued)

10 week unit

Life Sciences Standard

Students demonstrate an understanding of how living systems function and how they interact with the physical environment. This includes an understanding of the cycling of matter and flow of energy in living systems. An understanding of the characteristics, structure and function of cells, organisms and living systems will be developed. Students will also develop a deeper understanding of the principles of heredity, biological evolution, and the diversity and interdependence of life. Students demonstrate an understanding of different historical perspectives, scientific approaches and emerging scientific issues associated with the life sciences.

**Sub-Objective Activities
to Meet Indicators**

- Identify the cell as the basic unit of life.
- Describe the characteristics of living things through observation (e.g., excretion, reproduction, growth and change, ingestion, responding, respiration).
- Observe cellular characteristics with a microscope.
- Identify and describe the levels of organization (i.e., cells, tissues, organs, and organ systems).
- Describe the requirements and functions of cells and organisms.
- Investigate how a cell takes in nutrients to provide energy for the cell to grow and reproduce (e.g., asexual reproduction, phases of mitosis, diffusion, osmosis, active transport).
- Describe the process of cellular division (mitosis).
- Recognize relationships between the work of Gregor Mendel and the laws of genetics.
- Compare and contrast dominant and recessive traits of an organism.
- Describe the Law of Segregation (meiosis).