

Seventh Grade

Lakewood City Schools

Course of Study

For

Science

September, 2005

SEVENTH GRADE

Scope and Sequence

Students learn to describe interactions of matter and energy throughout the lithosphere, hydrosphere and atmosphere. They continue to develop skills of scientific inquiry, explain how matter can change forms and describe how energy is potential or kinetic and takes many forms. Students apply math skills to evaluate and analyze variables and data from investigations as they draw conclusions from scientific evidence. Seventh-grade students are able to recognize that technology can create environmental and economic conflicts, affect the quality of life, and that science and technology cannot answer all questions and cannot solve all human problems. Students access knowledge to explain how energy entering the ecosystems, such as sunlight, supports the life of organisms through photosynthesis and the transfer of energy through the interactions of organisms and the environment. *Students will investigate the great variety of body plans and internal structures found in multicellular organisms.*

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 seventh grade units are entitled: Nature of Science, Weather, Interdependence of Life/Ecology and Energy Transformation. All seventh 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: Ecology: Earth’s Natural Resources; Exploring Earth’s Weather; Ecology: Earth’s Living Resources

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

9 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 needs, attitudes and values influence the direction of technological development in various cultures. (ST-7-1) 2. Describe how decisions to develop and use technologies often put environmental and economic concerns in direct competition with each other. (ST-7-2) 3. Recognize that science can only answer some questions and technology can only solve some human problems. (ST-7-2) 	<p>Teaching Resources: <u>Your World Biotechnology & You</u> GM Foods, 2000, 2004, Vol. 13, Issue 2 “Industrial and Environmental Technology”</p> <p>Constructing spaghetti towers: 36 pieces of spaghetti 60 cm. masking tape repeat 3 – 4 x during school year</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"> 4. Design and build a product or create a solution to a problem given two constraints (e.g., limits of cost and time for design and production or supply of materials and environmental effects). (ST-7-4) 	

LAKWOOD UNIT: Nature of Science (continued)

Continue 9 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></p> <ol style="list-style-type: none"> 1. Explain that variables and controls can affect the results of an investigation and that ideally one variable should be tested at a time; however it is not always possible to control all variables. (SI-7-1) 2. Identify simple independent and dependent variables. (SI-7-2) 3. Formulate and identify questions to guide scientific investigations that connect to science concepts and can be answered through scientific investigations. (SI-7-3) 4. Choose the appropriate tools and instruments and use relevant safety procedures to complete scientific investigations. (SI-7-4) 	<p>Teaching Resources: Prentice Hall/Science Explorer – Inquiry Skills Activity – <u>Truth About Science</u> Video: “Dragonfly TV” Safety Quiz at start of year Safety Contract signed by student & parent General safety rules lesson with each lab Safety Banners Sugar cube lab [SI-7-1] “Science Boxes” – <u>Truth About Science</u> [SI-7-3]</p>
<p>B. Analyze and interpret data from scientific investigations using appropriate mathematical skills in order to draw valid conclusions. (SI-B)</p>	<ol style="list-style-type: none"> 5. Analyze alternative scientific explanations and predictions and recognize that there may be more than one good way to interpret a given set of data. (SI-7-5) 6. Identify faulty reasoning and statements that go beyond the evidence or misinterpret the evidence. (SI-7-6) 7. Use graphs, tables and charts to study physical phenomena and infer mathematical relationships between variables (e.g., speed and density). (SI-7-7) 	<p>GEMS – Bubble labs / sugar cube lab [SI-7-4] Throughout year – homework, bell work, class work [SI-7-7] Sub-Objective Activities to Meet Indicators: Measure length, mass, temperature, density, weight, etc. in SI Units.</p>

LAKWOOD UNIT: Nature of Science (continued)

Continue 9 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><i>No indicators present for this benchmark (grade 7).</i></p>	<p>Teaching Resources: Ongoing</p> <p>Inquiry Skills Activity Book – Prentice Hall</p> <p>Science Fair Packet (Emerson 7th Grade Teachers)</p> <p>Video – Teacher’s Video Co. “Scientific Method” “October Sky”</p> <p>Current Events: Magazines/Newspapers</p>
<p>B. Explain the importance of reproducibility and reduction of bias in scientific methods. (SK-B)</p>	<p><u>Ethical Practices</u></p> <ol style="list-style-type: none"> 1. Show that the reproducibility of results is essential to reduce bias in scientific investigations. (SK-7-1) 2. Describe how repetition of an experiment may reduce bias. (SK-7-2) 	
<p>C. Give examples of how thinking scientifically is helpful in daily life. (SK-C)</p>	<p><u>Science and Society</u></p> <ol style="list-style-type: none"> 3. Describe how the work of science requires a variety of human abilities and qualities that are helpful in daily life (e.g., reasoning, creativity, skepticism and openness). (SK-7-3) 	

LAKWOOD UNIT: Weather

9 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>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>C. Describe interactions of matter and energy throughout the lithosphere, hydrosphere and atmosphere (e.g., water cycle, weather and pollution). (ES-C)</p>	<p><u>Earth Systems</u></p> <ol style="list-style-type: none"> 1. Explain the biogeochemical cycles which move materials between the lithosphere (land), hydrosphere (water) and atmosphere (air). (ES-7-1) 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) 3. Describe the water cycle and explain the transfer of energy between the atmosphere and hydrosphere. (ES-7-3) 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) 5. Make simple weather predictions based on the changing cloud types associated with frontal systems. (ES-7-5) 6. Determine how weather observations and measurements are combined to produce weather maps and that data for a specific location at one point in time can be displayed in a station model. (ES-7-6) 7. Read a weather map to interpret local, regional and national weather. (ES-7-7) 8. Describe how temperature and precipitation determine climatic zones (biomes) (e.g., desert, grasslands, forests, tundra and alpine). (ES-7-8) 9. Describe the connection between the water cycle and weather-related phenomenon (e.g., tornadoes, floods, droughts and hurricanes). (ES-7-9) 	<p>Teaching Resources: <u>Prentice Hall Science Textbook:</u></p> <ul style="list-style-type: none"> • Exploring Earth's Weather <p><u>Project Earth Science: Meteorology</u>, Smith & Ford [ES-7-2]</p> <p>Bill Nye Videos: Atmosphere/Heat/Pressure</p> <p>Web site: Class Zone</p> <p>GEMS: Convection (water) and candle (air) labs</p> <ul style="list-style-type: none"> • Students keep high and low temperature graph for Cleveland for one month • Students gather weather measurements daily for 10 days • Model for water cycle <p>Eyewitness Video: Weather</p> <p>Great Labs in Meteorology – hands on activities</p> <p>Nova “Supertwisters”</p> <p>National Geographic Videos: “Storm of the Century” and “Eyewitness Weather”</p> <p>NSTA Meteorology (lab resource)</p> <p>NEO Science Exploring the Weather</p>
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<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.</p>	<p><i>No indicators present for this benchmark (grade 6).</i></p>	
<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).</p>	<p><i>No indicators present for this benchmark (grade 8).</i></p>	

LAKWOOD UNIT: Weather

9 week unit (continued)

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.

**Sub-Objective Activities
to Meet Indicators**

- Diagram and illustrate earth cycles, including water and weather cycles.
- Create diagrams, illustrations, charts, maps, graphs, and tables to explain weather and climate, ocean currents, and convection currents.
- Compare and contrast convection currents on land, in water and in air.
- Describe the layers of the atmosphere.
- Provided with the appropriate key, identify various kinds of clouds and their relationship to types of weather.
- Given various weather maps, identify weather symbols and predict weather patterns.
- Describe how geological features affect weather and climate (e.g., bodies of water, deserts, mountains, valleys, plains).
- Recognize relationships between freezing, melting, and boiling points (e.g., heat of fusion, heat of vaporization, phase changes).

LAKWOOD UNIT: Interdependence of Life/Ecology/Diversity and Evolution

9 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> 1. Investigate the great variety of body plans and internal structures found in multicellular organisms. (LS-7-1)</p>	<p>Teaching Resources: GEMS: Life Through Time Video: Form and Function – Cell function taught Book: <u>Parade of Life</u> – Chapter 1 Labs from Prentice Hall & from Natural History Museum</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 • Weather [ES-7-8] <p>Web site: Class Zone [ES-7-1]</p> <p>Photosynthesis – explained under Plant Cells [LS-7-7]</p> <p>NASA Greenhouse Effect article</p> <p>Prentice Hall lab Manual & Activity Book</p> <p>Lab-Aiols – Natural Selection Game</p> <p>Current Events: Magazines/Newspapers</p> <p>National Geographic Videos: “America’s Endangered Species” and “A Home for Pearl”</p>
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<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>Evolutionary Theory</u> 8. Investigate the great diversity among organisms. (LS-7-8)</p>	
<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>Diversity and Interdependence of Life</u> 2. Investigate how organisms or populations may interact with one another through symbiotic relationships and how some species have become so adapted to each other that neither could survive without the other (e.g., predator-prey, parasitism, mutualism and commensalism). (LS-7-2) 3. Explain how the number of organisms an ecosystem can support depends on adequate biotic (living) resources (e.g., plants, animals) and abiotic (non-living) resources (e.g., light, water and soil). (LS-7-3) 6. Summarize the ways that natural occurrences and human activity affect the transfer of energy in Earth's ecosystems (e.g., fire, hurricanes, roads and oil spills). (LS-7-6) 7. Explain that photosynthetic cells convert solar energy into chemical energy that is used to carry on life functions or is transferred to consumers and used to carry on their life functions. (LS-7-7)</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><u><i>Diversity and Interdependence of Life</i></u></p> <p>4. Investigate how overpopulation impacts an ecosystem. (LS-7-4)</p> <p>5. Explain that some environmental changes occur slowly while others occur rapidly (e.g., forest and pond succession, fires and decomposition). (LS-7-5)</p>	
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LAKWOOD UNIT: Interdependence of Life/Ecology/Diversity and Evolution (continued)

9 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.

Sub-Objective Activities to Meet Indicators
<ul style="list-style-type: none"> • Compare and contrast the differences among primary and secondary producers, consumers, and decomposers in food chains, food webs and energy pyramids. • Illustrate and label diagrams of land and water food webs. • Explain how energy is gained directly or indirectly from the sun (process of photosynthesis), energy is stored in chemical bonds in food, energy is transformed as organisms consume food, and energy is diminished in usefulness when lost as heat. • Trace the energy transformation in food chains, food webs, and energy pyramids, illustrating the way it is always conserved. • Describe the great diversity of life forms. • Describe classification schemes. • Discuss the great variety of body plans and internal structures of organisms. • Describe competition for limited resources in the environment. • Discuss the implications of species introduced into a new environment. • Describe survival strategies of various species. • Compare and contrast living and nonliving environmental changes and their effect on ecosystems, including: <ul style="list-style-type: none"> ◦ Changes in biotic factors ◦ Changing seasons ◦ Weather catastrophes on the local and global scale, such as flood, drought, hurricanes, tsunamis ◦ Air, water and soil pollution • Describe the factors involved with the extinctions of species. • Discuss the concept of geologic time. • Use trees of life (evolutionary trees) to show the relationship between species. • Describe the five statements of natural selection and apply them to common examples: <ul style="list-style-type: none"> ◦ All organisms have a natural variation in genes and traits ◦ All organisms reproduce in excess ◦ All organisms compete for available resources ◦ The fittest survive, those with a trait that gives an advantage ◦ The offspring of those fittest to pass this trait on to their offspring and it results in a higher percentage of it in future generations • Compare and contrast convection currents in magma, air and water.

LAKWOOD UNIT: Energy Transformation

9 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> 1. Investigate how matter can change forms but the total amount of matter remains constant. (PS-7-1)</p>	<p>Teaching Resources: Bill Nye Videos: “Energy” Science Plus / Teacher Resource – Force & Motion Chapter 5 Teacher Generated Labs such as: <ul style="list-style-type: none"> • Ice cream lab • Magazine picture of energy transformation • Transformation of energy apparatus Set up stations with examples of energy transformations – plant to use Rube Goldberg structures this year</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>	
<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>No indicators present for this benchmark (grade 6).</i></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><u>Nature of Energy</u></p> <ol style="list-style-type: none"> 2. Describe how an object can have potential energy due to its position or chemical composition and can have kinetic energy due to its motion. (PS-7-2) 3. Identify different forms of energy (e.g., electrical, mechanical, chemical, thermal, nuclear, radiant and acoustic). (PS-7-3) 4. Explain how energy can change forms but the total amount of energy remains constant. (PS-7-4) 5. Trace energy transformation in a simple closed system (e.g., a flashlight). (PS-7-5) 	
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LAKWOOD UNIT: Energy Transformation (continued)

9 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
<ul style="list-style-type: none"> • Identify examples of heat transfer, including insulation, conduction, and convection. • Demonstrate, through experimentation, the transformation and conservation of various forms of energy, including heat, light, chemical, mechanical, and electrical energy. • Apply the Laws of Conservation of Matter and Energy to everyday situations. • Describe examples (situations) of various types of energy being converted or transformed from one specific form to another. • Investigate how energy is conserved in a situation. • Conduct experiments to verify how energy can be used in converting matter (e.g., photosynthesis, burning substances, combustion). • Compare and contrast the five main forms of energy: <ul style="list-style-type: none"> ○ Electrical ○ Mechanical ○ Chemical ○ Thermal (Heat) ○ Nuclear • Define operationally (through experimentation) the laws of conservation of matter and energy.