

7<sup>th</sup> Grade Science Curriculum Objectives

**Organization of Living Things**

*K-7 Standard L.OL: Develop an understanding that plants and animals (including humans) have basic requirements for maintaining life which include the need for air, water and a source of energy. Understand that all life forms can be classified as producers, consumers, or decomposers as they are all part of a global food chain where food/energy is supplied by plants which need light to produce food/energy. Develop an understanding that plants and animals can be classified by observable traits and physical characteristics. Understand that all living organisms are composed of cells and they exhibit cell growth and division. Understand that all plants and animals have a definite life cycle, body parts, and systems to perform specific life functions.*

**L.OL.M.5 Producers, Consumers, and Decomposers- All animals, including humans, are consumers that meet their energy by eating other organisms or their products. Consumers break down the structures of the organisms they eat to make the materials they need to grow and function. Decomposers, including bacteria and fungi, use dead organisms or their products to meet their energy needs.**

<b>L.OL.06.51</b>	Classify organisms (producers, consumers, and decomposers) based on their source of energy for growth and development.
<b>L.OL.06.52</b>	Distinguish between the ways in which consumers and decomposers obtain energy.

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### Ecosystems

**K-7 Standard L.EC:** *Develop an understanding of the interdependence of the variety of populations, communities and ecosystems, including those in the Great Lakes region. Develop an understanding of different types of interdependence and that biotic (living) and abiotic (non-living) factors affect the balance of an ecosystem. Understand that all organisms cause changes, some detrimental and others beneficial, in the environment where they live.*

**L.EC.M.1 Interactions of Organisms-** **Organisms of one species form a population. Populations of different organisms interact and form communities. Living communities and nonliving factors that interact with them form ecosystems.**

<b>L.EC.06.11</b>	List examples of populations, communities, and ecosystems including the Great Lakes region.
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**L.EC.M.2 Relationships of Organisms-** **Two types of organisms may interact with one another in several ways: They may be in a producer/consumer, predator/ prey, or parasite/host relationship. Some organisms may scavenge or decompose another. Relationships may be competitive or mutually beneficial. Some species have become so adapted to each other that neither could survive without the other.**

<b>L.EC.06.21</b>	Describe common patterns of relationships between and among populations (competition, parasitism, symbiosis, predator/prey).
<b>L.EC.06.22</b>	Explain how two populations of organisms can be mutually beneficial and how that can lead to interdependency.
<b>L.EC.06.23</b>	Predict how changes in one population might affect other populations based upon their relationships in the food web.

**L.EC.M.3 Biotic and Abiotic Factors-** **The number of organisms and populations an ecosystem can support depends on the biotic (living) resources available and abiotic (nonliving) factors, such as quality of light and water, range of temperatures and soil composition.**

<b>L.EC.06.31</b>	Identify the living (biotic) and nonliving (abiotic) components of an ecosystem.
<b>L.EC.06.32</b>	Identify the factors in an ecosystem that influence changes in population size.

**L.EC.M.4 Environmental Impact of Organisms-** **All organisms (including humans) cause change in the environment where they live. Some of the changes are harmful to the organism or other organisms, whereas others are helpful.**

<b>L.EC.06.41</b>	Describe how human beings are part of the ecosystem of the Earth and that human activity can purposefully, or accidentally, alter the balance in ecosystems.
<b>L.EC.06.42</b>	Predict possible consequences of overpopulation of organisms, including humans, (for example: species extinction, resource depletion, climate change, pollution).

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### **Solid Earth**

***K-7 Standard E.SE:** Develop an understanding of the properties of earth materials and how those properties make materials useful. Understand gradual and rapid changes in earth materials and features of the surface of Earth. Understand magnetic properties of Earth.*

**E.SE.M.1 Soil- Soils consist of weathered rocks and decomposed organic materials from dead plants, animals, and bacteria. Soils are often found in layers with each having a different chemical composition and texture.**

<b>E.SE.06.11</b>	Explain how physical and chemical weathering lead to erosion and the formation of soils and sediments.
<b>E.SE.06.12</b>	Explain how waves, wind, water, and glacier movement, shape and reshape the land surface of the Earth by eroding rock in some areas and depositing sediments in other areas.
<b>E.SE.06.13</b>	Describe how soil is a mixture, made up of weather eroded rock and decomposed organic material.
<b>E.SE.06.14</b>	Compare different soil samples based on particle size and texture.

**E.SE.M.4 Rock Formation- Rocks and rock formations bear evidence of the minerals, materials, temperature/pressure conditions, and forces that created them.**

<b>E.SE.06.41</b>	Compare and contrast the formation of rock types (igneous, metamorphic, and sedimentary) and demonstrate the similarities and differences using the rock cycle model.
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**Earth in Space and Time**

*K-7 Standard E.ST: Develop an understanding that the sun is the central and largest body in the solar system and that Earth and other objects in the sky move in a regular and predictable motion around the sun. Understand that those motions explain the day, year, moon phases, eclipses and the appearance of motion of objects across the sky. Understand that gravity is the force that keeps the planets in orbit around the sun and governs motion in the solar system. Develop an understanding that fossils and layers of Earth provide evidence of the history of Earth's life forms, changes over long periods of time, and theories regarding Earth's history and continental drift.*

**E.ST.M.3 Fossils- Fossils provide important evidence of how life and environmental conditions have changed in a given location.**

<b>E.ST.06.31</b>	Explain how rocks and fossils are used to understand the age and geological history of the earth (timelines and relative dating, rock layers).
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**E.ST.M.4 Geologic Time- Earth processes seen today (erosion, mountain building, and glacier movement) make possible the measurement of geologic time through methods such as observing rock sequences and using fossils to correlate the sequences at various locations.**

<b>E.ST.06.41</b>	Explain how Earth processes (erosion, mountain building, and glacier movement) are used for the measurement of geologic time through observing rock layers.
<b>E.ST.06.42</b>	Describe how fossils provide important evidence of how life and environmental conditions have changed.

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### Energy

***K-7 Standard P.EN:*** Develop an understanding that there are many forms of energy (such as heat, light, sound, and electrical) and that energy is transferable by convection, conduction, or radiation. Understand energy can be in motion, called kinetic; or it can be stored, called potential. Develop an understanding that as temperature increases, more energy is added to a system. Understand nuclear reactions in the sun produce light and heat for the Earth.

**P.EN.M.3 Waves and Energy-Waves have energy and transfer energy when they interact with matter. Examples of waves include sound waves, seismic waves, waves on water, and light waves.**

<b>P.EN.07.31</b>	Identify examples of waves, including sound waves, seismic waves, and waves on water.
<b>P.EN.07.32</b>	Describe how waves are produced by vibrations in matter.
<b>P.EN.07.33</b>	Demonstrate how waves transfer energy when they interact with matter (for example: tuning fork in water, waves hitting a beach, earthquake knocking over buildings).

***P.EN.M.4 Energy Transfer-*** Energy is transferred from a source to a receiver by radiation, conduction, and convection. When energy is transferred from a source to a receiver, the quantity of energy before the transfer is equal to the quantity of energy after the transfer.

<b>P.EN.07.43</b>	Explain how light energy is transferred to chemical energy through the process of photosynthesis.
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**P.EN.M.6 Solar Energy Effects-** Nuclear reactions take place in the sun producing heat and light. Only a tiny fraction of the light energy from the sun reaches Earth, providing energy to heat the Earth.

<b>P.EN.07.61</b>	Identify that nuclear reactions take place in the sun, producing heat and light.
<b>P.EN.07.62</b>	Explain how only a tiny fraction of light energy from the sun is transformed to heat energy on Earth.

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### Properties of Matter

**K-7 Standard P.PM:** *Develop an understanding that all matter has observable attributes with physical and chemical properties that are described, measured, and compared. Understand that states of matter exist as solid, liquid, or gas; and have physical and chemical properties. Understand all matter is composed of combinations of elements, which are organized by common attributes and characteristics on the Periodic Table. Understand that substances can be classified as mixtures or compounds and according to their physical and chemical properties.*

**P.PM.M.1 Chemical Properties- Matter has chemical properties. The understanding of chemical properties helps to explain how new substances are formed.**

<b>P.PM.07.11</b>	Classify substances by their chemical properties (flammability, pH, acid-base indicators, reactivity).
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**P.PM.M.2 Elements and Compounds- Elements are composed of a single kind of atom that are grouped into families with similar properties on the periodic table. Compounds are composed of two or more different elements. Each element and compound has a unique set of physical and chemical properties such as boiling point, density, color, conductivity, and reactivity.**

<b>P.PM.07.21</b>	Identify the smallest component that makes up an element.
<b>P.PM.07.22</b>	Describe how the elements within the Periodic Table are organized by similar properties into families (highly reactive metals, less reactive metals, highly reactive nonmetals, and some almost completely non-reactive gases).
<b>P.PM.07.23</b>	Illustrate the structure of molecules using models or drawings (water, carbon dioxide, salt).
<b>P.PM.07.24</b>	List examples of physical and chemical properties of elements and compounds (boiling point, density, color, conductivity, reactivity).

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**Changes in Matter**

***K-7 Standard P.CM:** Develop an understanding of changes in the state of matter in terms of heating and cooling, and in terms of arrangement and relative motion of atoms and molecules. Understand the differences between physical and chemical changes. Develop an understanding of the conservation of mass. Develop an understanding of products and reactants in a chemical change.*

**P.CM.M.2 Chemical Changes-** Chemical changes occur when two elements and/or compounds react and produce new substances. These new substances have different physical and chemical properties than the original elements and/or compounds. During the chemical change, the number and kind of atoms in the reactants are the same as the number and kind of atoms in the products. Mass is conserved during chemical changes. The mass of the reactants is the same as the mass of the products.

<b>P.CM.07.21</b>	Identify evidence of chemical change through color, gas formation, solid formation, and temperature change.
<b>P.CM.07.22</b>	Compare and contrast the chemical properties of a new substance with the original after a chemical change.
<b>P.CM.07.23</b>	Describe the physical properties and chemical properties of the products and reactants in a chemical change.