

## Grade 6 Science

### **Describe and illustrate changes in state, in terms of the arrangement and relative motion of the atoms or molecules.**

- Illustrate and explain how substances are composed of extremely tiny particles called atoms and molecules.
- Relate the properties of solids, liquids and gases to the arrangement and motion of atoms and molecules in solids, liquids and gases.
- Explain how we know that ice, water and water vapor are the same substance.
- Explain how mass is conserved as a substance changes from state to state in a closed system.
- Describe and illustrate how heat energy is needed to change the state of a substance.

### **Explain and illustrate how energy can be transferred and transformed.**

- Identify kinetic or potential energy in everyday situations (for example: stretched rubber band, objects in motion, ball on a hill, food energy). Demonstrate the transformation between potential and kinetic energy in simple mechanical systems (for example: roller coasters, pendulums).
- List and explain everyday examples of conduction and convection of heat.
- Explain why the transfer of sound through air or electricity through wires is an example of conduction.
- Know that radiation from the sun or from a campfire is an example of heat energy being transferred from a source to a receiver without needing a medium to transfer it.
- Know that in transfers and transformations of energy, no energy is lost or gained.

### **Define and classify producers, consumers and decomposers based on their source of food (energy and building materials) in ecosystems.**

- Give examples of producers, consumers and decomposers (bacteria, fungi).
- Illustrate and explain the relationships in food webs of producers, consumers and decomposers.

### **Explain various relationships between organisms in an ecosystem using specific examples.**

- Relationships include predator/prey, parasitic, symbiotic, mutually beneficial, competitive.

### **Identify how living and non-living components impact the balance of an ecosystem.**

- Identify the living and non-living component of an ecosystem.
- Identify and describe examples of populations, communities, and ecosystems in the Great Lakes region and other places in the United States.
- Predict how changes in one population might affect other populations based upon their relationships in the food web.
- Identify the factors in an ecosystem that influence changes in population size. Predict possible consequences of overpopulation of organisms, including humans. Describe how humans are part of ecosystems and how human activity can purposefully, or accidentally, alter the balance of ecosystems (possible consequences: species extinction, resource depletion, climate change, pollution)

### **Illustrate, explain and provide evidence for changes in the solid Earth over time (erosion and deposition, earthquakes, volcanoes, mountain formation)**

- Describe the processes of weathering and erosion and explain what causes them.
- Explain where soil comes from and why soil differs from region to region.
- Understand that the Earth has layers (crust and upper mantle, lower mantle and core), and its center is hot and malleable.
- Using plate tectonics, explain volcanoes, earthquakes and mountain formation.
- Explain how rock can change between sedimentary, metamorphic and igneous.
- Explain how rocks and fossils are used to understand the age and geological history of the Earth (timelines and relative dating, rock layers).
- Explain how Earth processes (erosion, mountain building, and glacier movement) are used for the measurement of geologic time through observing rock sequences and embedded fossils.
- Describe how fossils provide important evidence of how life and environmental conditions have changes.

**Also in 6<sup>th</sup> grade:**

- Describe the Earth as a magnet and compare the magnetic properties of the Earth to that of a natural or manufactured magnet.
- Explain how a compass works using the magnetic field of the Earth, and how a compass is used for navigation on land and sea.