Utah Science with Engineering Education (SEEd)

Grade 6

Adopted 2017

Structure and Motion within the Solar System	1. **Develop and use a model of the Sun-Earth-Moon system to describe the cyclic patterns of lunar phases, eclipses of the Sun and Moon, and seasons.** 6.1.1
	2. **Develop and use a model to describe the role of gravity and inertia in orbital motions of objects in our solar system.** 6.1.2
	3. **Use computational thinking to analyze data and determine the scale and properties of objects in the solar system.** 6.1.3
Energy Affects Matter	1. **Develop models to show that molecules are made of different kinds, proportions and quantities of atoms. Emphasize understanding that there are differences between atoms and molecules, and that certain combinations of atoms form specific molecules.** 6.2.1
	2. **Develop a model to predict the effect of heat energy on states of matter and density. Emphasize the arrangement of particles in states of matter (solid, liquid, or gas) and during phase changes (melting, freezing, condensing, and evaporating).** 6.2.2
	3. **Plan and carry out an investigation to determine the relationship between temperature, the amount of heat transferred, and the change of average particle motion in various types or amounts of matter. Emphasize recording and evaluating data, and communicating the results of the investigation.** 6.2.3
	4. **Design an object, tool, or process that minimizes or maximizes heat energy transfer. Identify criteria and constraints, develop a prototype for iterative testing, analyze data from testing, and propose modifications for optimizing the design solution. Emphasize demonstrating how the structure of differing materials allows them to function as either conductors or insulators.** 6.2.4
Earth's Weather Patterns and Climate	1. **Develop a model to describe how the cycling of water through Earth's systems is driven by energy from the Sun, gravitational forces, and density.** 6.3.1
	2. **Investigate the interactions between air masses that cause changes in weather conditions. Collect and analyze weather data to provide evidence for how air masses flow from regions of high pressure to low pressure causing a change in weather.** 6.3.2

	3. **Develop and use a model to show how unequal heating of the Earth's systems causes patterns of atmospheric and oceanic circulation that determine regional climates. Emphasize how warm water and air move from the equator toward the poles.** 6.3.3
	4. **Construct an explanation supported by evidence for the role of the natural greenhouse effect in Earth's energy balance, and how it enables life to exist on Earth.** 6.3.4
Stability and Change in Ecosystems	1. **Analyze data to provide evidence for the effects of resource availability on organisms and populations in an ecosystem. Ask questions to predict how changes in resource availability affects organisms in those ecosystems.** 6.4.1
	2. **Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems. Emphasize consistent interactions in different environments, such as competition, predation, and mutualism.** 6.4.2
	3. **Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem. Emphasize food webs and the role of producers, consumers, and decomposers in various ecosystems.** 6.4.3
	4. **Construct an argument supported by evidence that the stability of populations is affected by changes to an ecosystem. Emphasize how changes to living and nonliving components in an ecosystem affect populations in that ecosystem.** 6.4.4
	5. **Evaluate competing design solutions for preserving ecosystem services that protect resources and biodiversity based on how well the solutions maintain stability within the ecosystem. Emphasize obtaining, evaluating, and communicating information of differing design solutions.** 6.4.5