SAU 15
Auburn, Candia, Hooksett
Grade 7
POWER STANDARDS
Science

EARTH

Environmental Impact

- **Students will examine the cause of pollution and global warming and identify methods of reducing environmental impact.**
  - **S:ESS1:8:7.1** Describe how water flows into and through a watershed, falling on the land, collecting in rivers and lakes, soil, and porous layers of rock, until much of it flows back into the ocean
  - **S:ESS1:8:7.3** Explain the processes that cause cycling of water into and out of the atmosphere and their connections to our planet's weather patterns
  - **S:ESS4:8:3.3** Explain how technologies can reduce the environmental impact of natural disasters
  - **S:ESS4:8:3.4** Identify the potential impact of converting forested land to uses such as farms, homes, factories, or tourist attractions

Technology

- **Students can describe the ways in which technology has increased our understanding of the world around us.**
  - **S:ESS1:8:4.1** Describe how catastrophic changes that have taken place on the Earth's surface can be revealed by satellite images
  - **S:ESS2:8:4.1** Explain how technological advances have allowed scientists to re-evaluate or extend existing ideas about the Solar System
  - **S:ESS4:8:1.1** Describe ways in which technology has increased our understanding of the world in which we live
  - **S:ESS4:8:1.2** Recognize the importance of technology as it relates to science, for purposes such as: access to space and other remote locations, sample collection and treatment, measurement, data collection, and storage, computation, and communication of information
  - **S:ESS4:8:2.3** Describe how man uses land-based light telescopes, radio telescopes, satellites, manned exploration, probes and robots to collect data
  - **S:PS4:8:2.1** Demonstrate appropriate use of tools, such as rulers, calculators, balances, and graduated cylinders to measure and calculate volume and mass

Energy

- **Students will identify the sun as a primary energy source while evaluating the use of natural and alternative resources.**
  - **S:ESS1:8:1.2** Identify and describe the impact certain factors have on the Earth's climate, including changes in the oceans' temperature, changes in the composition of the atmosphere, and geological shifts due to events such as volcanic eruptions and glacial movements
  - **S:ESS1:8:5.3** Explain the role of differential heating or convection in ocean currents, winds, weather and weather patterns, atmosphere, or climate
  - **S:ESS2:8:2.1** Describe the Sun as the principle energy source for phenomena on the Earth's surface
  - **S:ESS4:8:3.1** Provide examples of how creative thinking and economic need has shaped the way people use natural materials, such as the use of metal ores, petroleum, and fresh water
  - **S:ESS4:8:3.2** Explain how to test natural materials to measure and compare their properties

PHYSICAL

Gravity and Motion

- **Students can identify net forces applied to objects.**
  - **S:PS3:8:1.1** Explain that the force of gravity gets stronger the closer one gets to an object and decreases the further away one gets from it.
  - **S:PS3:8:1.2** Recognize the general concepts related to gravitational force
  - **S:PS3:8:1.3** Use data to determine or predict the overall (net) effect of multiple forces (e.g., friction, gravitational, magnetic) on the position, speed, and direction of motion of objects
  - **S:PS3:8:2.1** Explain that an object in motion that is unaffected by a force will continue to move at a constant speed and in a straight line.
  - **S:PS3:8:2.2** Explain how the motion of an object can be described by its position, direction of motion, and speed; and illustrate how that motion can be measured and represented graphically

PHYSICAL (CONT.)

Forms of Energy

- **Students can identify different forms of energy and their interrelatedness.**
  - **S:PS2:8:1.5** Given a real-world example, show that within a system, energy transforms from one form to another (i.e., chemical, heat, electrical, gravitational, light, sound, mechanical).
  - **S:PS2:8:2.1** Explain the law of conservation of energy.
  - **S:PS2:8:3.1** Differentiate between kinetic energy, which is the energy of motion and potential energy, which depends on relative position.
  - **S:PS2:8:3.5** Recognize that most chemical and nuclear reactions involve a transfer of energy
  - **S:PS2:8:3.6** Use data to draw conclusions about how heat can be transferred (convection, conduction, radiation).

LIFE

Technology

- **Students can explain ways in which technology has influenced the course of history as it relates to agriculture, environment, sanitation and medicine.**
  - **S:LS5:8:1.1** Explain how technology has influenced the course of history, and provide examples such as those that relate to agriculture, sanitation and medicine.
  - **S:LS5:8:1.2** Provide examples of ways technology is used to protect the environment, such as using bacteria to clean water
  - **S:LS5:8:2.1** Recognize and provide examples of how technology has enhanced the study of life sciences, as in the development of advanced diagnosing equipment improving medicine
  - **S:LS5:8:3.1** Explain the necessity of and purpose for the proper disposal of medical products.
  - **S:LS5:8:3.2** Give examples of how increased understanding of biology has led to improvements in biotechnology, such as scientific methods for increasing the yield or the pest-resistance of important food crops.
  - **S:LS5:8:3.3** Describes ways biotechnology helps humans, including improved health and medicine

Ecosystems and Environments

- **Students can recognize that in any given environment, organisms depend on abiotic and biotic factors.**
  - **S:LS1:8:1.2** Describe or compare how different organisms have mechanisms that work in a coordinated way to obtain energy, grow, move, respond, provide defense, enable reproduction, or maintain internal balance (e.g., cells, tissues, organs and systems).
  - **S:LS1:8:2.5** Using data and observations about the biodiversity of an ecosystem, make predictions or draw conclusions about how the diversity contributes to the stability of the ecosystem
  - **S:LS2:8:1.3** Using data and observations, predict outcomes when abiotic/biotic factors are changed in an ecosystem
  - **S:LS2:8:2.2** Given a scenario, trace the flow of energy through an ecosystem, beginning with the sun, through organisms in the food web, and into the environment (includes photosynthesis and respiration).
  - **S:LS2:8:3.6** Given an ecosystem, trace how matter cycles among and between organisms and the physical environment (includes water, oxygen, food web, decomposition and recycling, but not carbon cycle nor nitrogen cycle).
  - **S:LS3:8:3.5** Cite examples supporting the concept that certain traits of organisms may provide a survival advantage in a specific environment and therefore, an increased likelihood to produce offspring.

HEALTH