General Supplies for the New 2020 4th Grade SEEd Science Core

(The bolded word(s) in the standard is the **Science and Engineering Practice**)
(The brown, underlined word is the Crosscutting Concept)
(The bullets are supplies that could be used for that standard)
(The capital letters at the end of the standard is the NGSS standard(s) it is connected to.)
(*Any sentences in italics are for engineering.*)

Stand 4.1 Organisms Functioning in Their Environment

Standard 4.1.1

Construct an explanation from evidence that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction. Emphasize how structures support an organism's survival in its environment and how internal and external structures of plants and animals vary within the same and across multiple Utah environments. Examples of structures could include thorns on a stem to prevent predation or gills on a fish to allow it to breathe underwater. (LS1.A)

- Pictures of animals that show structures of animals that function to support survival.
- Pictures of plants that show structures of animals that function to support survival.
- Pictures of environments to show how plant and animal structures support the survival of plants and animals to live in those environments.

Standard 4.1.2

Develop and use a model of a system to describe how animals receive different types of information from their environment through their senses, process the information in their brain, and respond to the information. Emphasize how animals are able to use their perceptions and memories to guide their actions. Examples could include models that explain how animals sense and then respond to different aspects of their environment such as sounds, temperature, or smell. (LS1.D)

- Pictures of animals to notice the senses they have to process information from their environment to physically respond to this information

Standard 4.1.3

Analyze and interpret data from fossils to provide evidence of the stability and change in organisms and environments from long ago. Emphasize using the structures of fossils to make inferences about ancient organisms. Examples of fossils and environments could include comparing a trilobite with a horseshoe crab in an ocean environment or using a fossil footprint to determine the size of a dinosaur. (LS4.A)

- All types of fossils or pictures of fossils (mineral replacement, impression, trace, preserved, cast) to show stability and change in organisms and environments from long ago.

Standard 4.1.4

Engage in argument from evidence based on patterns in rock layers and fossils found in those layers to support an explanation that environments have changed over time. Emphasize the relationship between fossils and past environments. Examples could include tropical plant fossils found in Arctic areas and rock layers with marine shell fossils found above rock layers with land plant fossils. (ESS1.C)

- Pictures of fossils in rocks
- Pictures of dated rock layers

Strand 4.2 Energy Transfer

Standard 4.2.1

Construct an explanation to describe the cause and effect relationship between the speed of an object and the energy of that object. Emphasize using qualitative descriptions of the relationship between speed and energy like fast, slow, strong, or weak. An example could include a ball that is kicked hard has more energy and travels a greater distance than a ball that is kicked softly. (PS3.A)

- Balls of sorts for throwing, kicking, and hitting

Standard 4.2.2

Ask questions and make observations about the changes in energy that occur when objects collide. Emphasize that energy is transferred when objects collide and may be converted to different forms of energy. Examples could include changes in speed when one moving ball collides with another or the transfer of energy when a toy car hits a wall. (PS3.B, PS3.C)

- Balls or cars for colliding

Standard 4.2.3

Plan and carry out an investigation to gather evidence from observations that energy can be transferred from place to place by sound, light, heat, and electrical currents. Examples could include sound causing objects to vibrate and electric currents being used to produce motion or light. (PS3.A, PS3.B)

- Drums, tone bells, tin cans for the transfer of sound energy converted to motion energy
- Battery operated cars, animals, flashlights, etc. for the transfer of electrical energy to motion energy
- Battery operated flashlights for the transfer of electrical energy to light energy
- Heating unit to show the transfer of heat energy to motion energy

Standard 4.2.4

Design a device that converts energy from one form to another. *Define the problem, identify criteria and constraints, develop possible solutions using models, analyze data from testing solutions, and propose modifications for optimizing a solution*. Emphasize identifying the initial and final forms of energy. Examples could include solar ovens that convert light energy to heat energy or a simple alarm system that converts motion energy into sound energy. (PS3.B, PS3.D, ETS1.A, ETS1.B, ETS1.C)

- Gather materials together for an engineering project that converts energy from one form to another.

Strand 4.3 Wave Patterns

Standard 4.3.1

Develop and use a model to describe the regular patterns of waves. Emphasize patterns in terms of amplitude and wavelength. Examples of models could include diagrams, analogies, and physical models such as water or rope. (PS4.A)

- Small tub for water such as a tote tray to show ripples as waves
- Jump rope
- Slinky

Standard 4.3.2

Develop and use a model to describe how visible light waves reflected from objects enter the eye causing objects to be seen. Emphasize the reflection and movement of light. The structure and function of organs and organ systems and the relationship between color and wavelength will be taught in Grades 6 through 8. (PS4.B)

- Lamp with light bulb to turn on and off in a dark room
- Small mirrors and flashlights to show reflection onto your body (not into the eye)

Standard 4.3.3

Design a solution to an information transfer problem using wave patterns. *Define the problem, identify criteria and constraints, develop possible solutions using models, analyze data from testing solutions, and propose modifications for optimizing a solution.* Examples could include using light to transmit a message in Morse code or using lenses and mirrors to see objects that are far away. (PS4.C, ETS1.A, ETS1.B, ETS1.C)

- Gather materials together for an engineering project that can transfer information using wave patterns.

Strand 4.4 Observable Patterns in the Sky

Standard 4.4.1

Construct an explanation that differences in the apparent brightness of the Sun compared to other stars is due to the relative distance (scale) of stars from Earth. Emphasize relative distance from Earth. (ESS1.A)

- Flashlights to show how different distances show a different brightness
- Meters sticks (or yard sticks) for measuring distances of flashlights

Standard 4.4.2

Analyze and interpret data of observable patterns to show that Earth rotates on its axis and revolves around the Sun. Emphasize patterns that provide evidence of Earth's rotation and orbits around the Sun. Examples of patterns could include day and night, daily changes in length and direction of shadows, and seasonal appearance of some stars in the night sky. Earth's seasons and its connection to the tilt of Earth's axis will be taught in Grades 6 through 8. (ESS1.B)

- Lamp with a light for the sun
- 10-inch diameter Earth globes to orbit the lamp and to see half the Earth lit and the other half dark. (You can buy "beachball" type globes from Oriental Trading, 12 for about $15.00 www.orientaltrading.com).
- Flashlights (another way for the light of the sun shining on the "beachball" Earth as it is spinning—one student holds the flashlight while—to see half the Earth lit and half not)
- Meter sticks or yard sticks to measure the changes in the length of a flag pole's shadow through the day
- Charts of the night sky stars/constellations seen at night at the same time each month. See below how each student can get one free without copyright restrictions.

For your students to have a lot of fun finding the seasonal constellations, use Uncle Al's Constellation Star Wheel by clicking on the link below that can be printed out free without copyright restrictions. Once you are on the page, go to Northern Hemisphere and click on "English – Northern Hemisphere Star Wheel".
http://www.lawrencehallofscience.org/do_science_now/starwheels