General Supplies for the New 2020 5th 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 5.1 Characteristics and Interactions of Earth's Systems

Standard 5.1.1

Analyze and interpret data to describe patterns of Earth's features. Emphasize most earthquakes and volcanoes occur in bands that are often along the boundaries between continents and oceans while major mountain chains may be found inside continents or near their edges. Examples of data could include maps showing locations of mountains on continents and the ocean floor or the locations of volcanoes and earthquakes. (ESS2.B)

- Maps showing locations of mountains on continents and the ocean floor
- Maps showing the locations of volcanoes and earthquakes

Standard 5.1.2

Use mathematics and computational thinking to compare the quantity of saltwater and freshwater in various reservoirs to provide evidence for the distribution of water on Earth. Emphasize reservoirs such as oceans, lakes, rivers, glaciers, groundwater, and polar ice caps. Examples of using mathematics and computational thinking could include measuring, estimating, graphing, or finding percentages of quantities. (ESS2.C)

- Maps of regions in the world showing various reservoirs of saltwater and freshwater of oceans, lakes, rivers, glaciers, groundwater, and polar icecaps
- Calculators
- Graph paper

Standard 5.1.3

Ask questions to plan and carry out investigations that provide evidence for the effects of weathering and the rate of erosion on the geosphere. Emphasize weathering and erosion by water, ice, wind, gravity, or vegetation. Examples could include observing the effects of cycles of freezing and thawing of water on rock or changing the slope in the downhill movement of water. (ESS2.A, ESS2.E)

- Pictures showing the results of the weathering processes (breaking down of rocks): ice wedging (water freezes in cracks of rocks), water abrasion (rock hitting each other in a stream), wind abrasion (sand blowing in the air hitting against other rock structures), gravity (rocks falling and hitting rocks below), and vegetation (roots growing down into the cracks of rocks)
- Pictures showing the results of erosion (soil movement from one place to another): water running downhill (form deltas), glaciers moving down mountains (form moraines), ocean waves (form beaches), rocks falling from cliffs (form rock piles, wind blowing (form dunes)

Weathering experiments:

- Ice wedging experiment: (weathering)
  - Materials: 1 ½ inch diameter water balloons, 3 oz cup, water, Plaster of Paris, craft stick
  - Directions: Put the water balloon in the cup. Pour the liquid plaster on top of the balloon about ¾ full (so when the balloon is pushed down, the liquid plaster won't run over the top). Push the balloon to the bottom of the cup with the craft stick. Put it in the freezer for 12 hours or more.
  - Results: The water in the balloon to expand and break the plaster in the cup.
- Wind experiment: (weathering)
  - Materials: Half-pint jars, salt, sidewalk chalk
  - Directions: Pour about a ½ inch of salt into the jar. Stir the salt with the chalk.
  - Results: The salt change color to the color of the chalk.
- Gravity experiment: (weathering)
  - Materials: Big, hard rocks (like granite), small, soft rocks (like sandstone), tarp, safety goggles
  - Directions: Outside with safety googles on (possibly even the students) put three or four sandstone rocks on the tarp and drop the big rocks on them. Have the students stand ten feet back in a circle.
  - Results: The rocks will break apart.
- Vegetation experiment: (weathering)
  - Materials: 3 oz cup, beans, Plaster of Paris, craft stick
  - Directions: Put about ½ inch of beans at the bottom of the cup. Pour the liquid plaster on top of the beans nearly to the top. Stir the beans around with the craft stick so they are spread out in the plaster. Set the cup aside for a least 24 hours. It is best if the cups are put in a pint Baggie.
  - Results: The beans (like roots) will expand in the plaster and break the plaster apart.

Erosion experiments:

- Water running downhill experiment: (erosion)
  - Materials: water, sand, tote tray, pouring cups, strainer
  - Directions: Put the sand in a tray at least two inches deep. With both hands pushing on both sides of the sand, push to make a mountain. Pour water into the strainer (this makes it more like rain) over the mountain top, going back and forth along the ridge. (This can only be done twice. If done more time, the sand becomes too saturated and completely goes flat.)
  - Results: Water will flow like a stream down the side and create canyons in the sand and deltas where the rests at the bottom of the mountain.
- Wind experiment: (erosion)
  - Materials: sand, shoe box, straw, gallon Baggie
  - Directions: Put the sand in a shoebox at least two inches deep. Slide the shoebox into a gallon Baggie but don't seal it. Through the hole of the open baggie, blow across the top of the sand with a straw for five minutes or so.
  - Results: The sand will move with the wind and create sand dunes.
- Ocean waves experiment: (erosion)
  - Materials: tote tray, sand, water

    - Directions: Put the sand in a tote tray at least two inches deep. With one hand push all the sand on one side of the tray to the other side to form a cliff. Put water (represents an ocean) on the empty side of the tray about two inches deep. With your hand, push on the water several times to make waves hitting against the cliff.
    - Results: The cliff eventually goes away. As water hits the cliff, it breaks the sand apart and catches the water going back to the ocean. Finally, a beach is formed with most of the cliff gone.
- Glacier experiment: (erosion)
    - Materials: tote tray, sand, ice, hair drier
    - Directions: Put the sand in a tote tray at least two inches deep. With both hands pushing on both sides of the sand, push to make a mountain. Pack ice on the mountain sides. Push the ice down with your hand (the push of your hand acts like gravity, pulling the ice down the mountain) to the bottom of the mountain making sure you take some sand with it. With a hair drier, melt the ice at the bottom of the mountain.
    - Results: After the ice has melted, there will be a pile of sand, called a moraine, at the bottom of the mountain just like what a real glacier does at is slowly moves down the mountainside pulled by gravity.

Standard 5.1.4

Develop a model to describe interactions between Earth's systems including the geosphere, biosphere, hydrosphere, and/or atmosphere. Emphasize interactions between only two systems at a time. Examples could include the influence of a rainstorm in a desert, waves on a shoreline, or mountains on clouds. (ESS2.A)

- Videos/pictures
    - Rainstorms in a desert
    - Waves on a shoreline
    - Clouds around mountains

Standard 5.1.5

Design solutions to reduce the effects of naturally occurring events that impact humans. *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 that humans cannot eliminate natural hazards, but they can take steps to reduce their impacts. Examples of events could include landslides, earthquakes, tsunamis, blizzards, or volcanic eruptions. (ESS3.B, ETS1.A, ETS1.B, ETS1.C)

- Gather materials together for an engineering project to reduce the effects of naturally occurring events that impact humans.

Strand 5.2 Properties and Changes of Matter

Standard 5.2.1

Develop and use a model to describe that matter is made of particles on a scale that is too small to be seen. Emphasize making observations of changes supported by a particle model of matter. Examples could include adding air to expand a balloon, compressing air in a syringe, adding food coloring to water, or dissolving salt in water and evaporating the water. The use of the terms atoms and molecules will be taught in Grades 6 through 8. (PS1.A)

- Balloons, syringe, food coloring, salt

Standard 5.2.2

Ask questions to plan and carry out investigations to identify substances based on patterns of their properties. Emphasize using properties to identify substances. Examples of properties could include color, hardness, conductivity, solubility, or a response to magnetic forces. Examples of substances could include powders, metals, minerals, or liquids. (PS1.A)

- Minerals, magnets, different metals, powders of sorts, liquids of sorts

Standard 5.2.3

Plan and carry out investigations to determine the effect of combining two or more substances. Emphasize whether a new substance is or is not created by the formation of a new substance with different properties. Examples could include combining vinegar and baking soda or rusting an iron nail in water. (PS1.B)

- Vinegar, baking soda, iron nails
- Materials used in the former 5th grade matter standard

Standard 5.2.4

Use mathematics and computational thinking to provide evidence that regardless of the type of change that occurs when heating, cooling, or combining substances, the total weight of matter is conserved. Examples could include melting an ice cube, dissolving salt in water, and combining baking soda and vinegar in a closed bag. (PS1.A, PS1.B)

- Vinegar, baking soda, salt, water, ice
- Materials used in the former 5th grade matter standard

Strand 5.3 Cycling of Matter in Ecosystems

Standard 5.3.1

Construct an explanation that plants use air, water, and energy from sunlight to produce plant matter needed for growth. Emphasize photosynthesis at a conceptual level and that plant matter comes mostly from air and water, not from the soil. Photosynthesis at the cellular level will be taught in Grades 6 through 8. (LS1.C)

- Photosynthesis chart
- Seeds, soil, water, cups, heat lamps

Standard 5.3.2

Obtain, evaluate, and communicate information that animals obtain energy and matter from the food they eat for body repair, growth, and motion and to maintain body warmth. Emphasize that the energy used by animals was once energy from the Sun. Cellular respiration will be taught in Grades 6 through 8. (PS3.D, LS1.C)

- Food chart of the different types of food groups
- Chart of what the different types of vitamins needed for our body
- Chart of what the different vitamins and minerals for different body parts
- Chart that tells what foods have the different vitamins and minerals
- Chart for energy needed for body repair, growth, motion, and body warmth

Standard 5.3.3

Develop and use a model to describe the movement of matter among plants, animals, decomposers, and the environment. Emphasize that matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die. Examples could include simple food chains from ecosystems such as deserts or oceans or diagrams of decomposers returning matter to the environment. Complex interactions in a food web will be taught in Grades 6 through 8. (LS2.A, LS2.B)

- Chart describing the movement of matter among plants, animals, decomposers, and the environment
- Food chain charts from decomposers to the highest tertiary level
- Food chain charts of different ecosystems around the world
- Chart of the role of decomposers returning matter to the environment

Standard 5.3.4

Evaluate **design solutions** whose primary function is to conserve Earth's environments and resources. *Define the problem, identify criteria and constraints, analyze available data on proposed solutions, and determine an optimal solution.* Emphasize how humans can balance everyday needs (agriculture, industry, and energy) while conserving Earth's environments and resources. (ESS3.A, ESS3.C, ETS1.A, ETS1.B, ETS1.C)

- Gather materials together for an engineering project to conserve Earth's environments and resources showing that humans can balance everyday needs while conserving Earth's environments and resources.