

## Fifth Grade Science Tasks

### Earth Science

#### **S5E1.**

- A) Draw a before and after picture and label an example of a constructive force and a destructive force showing the effects of the forces.
- B) Make a model of constructive processes to explain the cause and effect of these forces and to demonstrate how these processes build up the earth. Models could include examples of volcanoes, faults, earthquakes, and/or deposition. Models can be produced individually or in small groups.
- C) Produce or obtain a brochure about some of the landforms (surface features) of Georgia that are examples of a constructive force. Explain why these are called constructive forces according to how the constructive force changed the surface of the earth.
- D) Make a model of destructive processes to explain the cause and effect of these forces and to demonstrate how these processes break down the earth. For example, put sand at the top of a paint tray. Pour water over the sand or blow over the sand through a straw to show erosion. Wear goggles to protect eyes when blowing sand. Generate waves of water to show beach erosion. Repeat the activity using sod, or soil with pine straw over it. Write down your conclusions based on your observations.
- E) Produce a presentation to explain the cause and effect of destructive processes. Research landforms of Georgia to locate any examples of these destructive forces. Explain why these are called destructive forces according to what happens to the earth.
- F) Categorize a minimum of five major Georgia landforms formed by either constructive, destructive or a combination of both. Mark the locations on a map of Georgia and color-key them. Explain your conclusions based on your observations. (Fifth graders have learned major landforms in third grade social studies and will now use what they know to determine the processes forming the landforms in Georgia\*.)
- G) Choose a convenient location for observation throughout the year. A plot on the playground is a good location to show the effects of human impact. Map the area and color key the map to show where there are organisms, landforms, and evidence of erosion, weathering, etc.
- H) Document periodically on one of the class maps events providing evidence of the effects of constructive and destructive forces in Georgia. Events include major storms, tremors, drought, etc. Evidence includes media reports of an event, observation, weather reports, interviews, etc. At the end of the year, write an article about how your area is changing, what processes cause the most change, and how your area could deal with the changes.

\*Some Georgia landforms include

Stone Mountain	Emerson Fault	Tallulah Falls
Providence Canyon	Appalachian Mountains	Soapstone Ridge
Fall Line	Sand Mountain	lime sinks
Okefenokee Swamp	Pine Mountain	Altamaha River system
Barrier islands	Amicalola Falls	Cohutta Mountains
Beaches	Brasstown Bald	Brevard fault zone
Cumberland Plateau	Lookout Mountain	Trail Ridge
Blue Ridge Mountains	Chattahoochee River	

## Physical Science

### **S5P1.**

- A) Gather different kinds of assembled toys that can be taken apart and reassembled such as Legos, jigsaw puzzles, Lincoln logs, model cars, etc. Weigh the assembled toy and record the measurements. Take the toy apart and weigh all of the parts, record the measurements and add them. Compare with the weight of the whole toy. Reassemble the toy and weigh the parts again. Draw conclusions about the sum of the weight of the parts and the whole toy. Apply this knowledge to what happens to a toy when it is taken apart and to a mixture when it is separated. Test to see if this is true of mixtures. Apply your thinking to packaging materials for shipment and total costs of package, tape, and materials shipped.
- B) Use a magnifier such as a hand lens or microscope to observe items such as soil particles, salt and sugar crystals, pond water, etc. Sketch what you see. Compare your sketches to other students' sketches. Discuss and explain similarities and differences.
- C) Identify the difference between synthetic materials and natural materials, such as a synthetic sponge and a sea sponge. Explain what magnification shows about the differences by sketching what you see through a magnifier.

Teacher Note: While natural and synthetic materials are different chemically, careful comparative examinations will sharpen student observational skills and can help students see that some physical differences result from material composition differences.

- D) Explain how magnification has changed what scientists could do historically and how improvements to magnification can help scientists in the future.
- E) Research ways scientists use magnification to solve problems.

### **S5P2.**

- A. Separate mixtures such as salads, iron filings and sand, evaporation of water from a salt water solution, separating inks and food colors using paper chromatography, and filtering a pepper and water mixture by pouring it through a paper towel or coffee filter.
- B. Compare and contrast the physical attributes of a sample before and after a physical change. Explain what you have found out about physical changes.
- C. Here are some examples of chemical reactions: oxidation such as rusting iron filings or an iron nail, oxidation of apple slices, oxidation of potato slices, oxidation of banana slices, combining vinegar and baking soda, Effervescent tablet in water, cooking food such as an egg, compost and decaying matter, chewing a piece of cracker, etc. Choose one. Record the materials used, and observations of the materials before, during and after the reaction.
- D. Observations could include:
  - Temperature change
  - Gas given off (Hint: collect gas in a balloon fastened over the container or combine ingredients in an airtight bag.)
  - pH (acidic, neutral, and basic)
  - Measurement
  - Physical attributes such as color, texture, odor, etc.
- E. An example of a chemical change experiment: Separately weigh the following materials: soda bottle, balloon, 1 tablespoon of baking soda, and one table spoon of vinegar. Find the sum of the weights. Put the vinegar in the soda bottle. Put the baking soda in the balloon. Carefully place the balloon over the mouth of the soda bottle. Spill the baking soda into the vinegar to see the chemical reaction. Do not take the balloon off the bottle to weigh the end

product. You can repeat the experiment to collect additional information on temperature change, pH differences, differences in physical attributes, etc.

- F. Explain by producing a chart or graphic organizer of how materials can change physically and chemically and how you can tell the difference.

### **S5P3.**

- A. Investigate static electricity and its relationship to magnetism. Demonstrate static electricity to show attraction and repulsion. To charge a balloon, rub the balloon in your hair or rub it with a paper towel. See if it will attract common materials by holding it close to items such as the hair on your arm, pieces of paper, thread, salt, aluminum foil, paper clips, tissue, etc. Record if and how the objects you tested are affected.
- B. Investigate attraction and repulsion by using two charged balloons. Tie each with a string and bring them close to each other. Note the effects. Put your hand or a piece of paper between the charged balloons. Relate what you observe to what you know about magnetic forces. Charge a balloon with rice cereal inside. What happens to the rice when you put your hand on the outside of the balloon? Compare and contrast how static electricity is similar to or different from magnetic force.
- C. Try other materials to investigate static electricity such as plastic wrap rubbed with a paper towel, a plastic comb combed through your hair, etc. Scuff your shoes on the carpet and touch something metal like a door knob. Try charging the balloon, towel or comb with a piece of nylon or wool. Record what happens. Hold a charged comb next to a trickle of water from a faucet. What happens? Produce a poster of the effects of static electricity on common objects.
- D. Research the relationship between static electricity and lightning.
- E. Build an electromagnet and use it to demonstrate how a material that has been electrically charged pulls on other materials. Use insulated wire to coil around an iron nail several times. Connect each end of the wire to the two ends of a 1.5 volt battery. Test a variety of materials to determine the kind of materials attracted or not attracted by an electromagnet. Increase or decrease the number of coils and note the resulting force. Explain how the construction of an electromagnet links magnetism and electricity.
- F. Research how to build a simple motor using wire and a magnet. OR Interview an appliance repairman or auto mechanic about the magnets in the motors they repair. Use what you find out to explain the role a magnet plays in producing the energy.
- G. Determine the necessary components for completing an electric circuit. Try different ways using two wires, a small (1.5 Volt) bulb, and a battery (D cell or C cell). Try different ways to get the light bulb to light. Design and diagram an electric circuit with an energy source (such as a battery), wires, and light bulb. Test other designs to see which ones light the bulb. Modify designs that did not light the bulb and explain what modifications were necessary for the bulb to light. Compare your designs with others in the class.
- H. Extend your understanding by trying more than one battery, additional wires or bulbs. Make a display of designs that work. Include your observations and conclusions about differences in the brightness of the bulb.
- I. Use an electric circuit to test different common materials to see if they conduct electricity. For example, make a complete circuit that lights a bulb. Put an object (a square of aluminum foil, a penny, a pencil eraser, a plastic tab, or a paper clip, etc.) between one of the wires and the bulb. If the object is a conductor, the bulb will still light. Gather several objects and predict whether they are conductors of electricity or insulators. Test using a basic circuit to

see if your predictions are correct. Draw a conclusion about the attributes of a conductor or an insulator.

- J. Generate a list of other electric circuits and uses for current electricity in your home and classroom. Compare their design with the design you used.
- K. Use batteries, wires and selected devices (like a flashlight bulb or buzzer) to make an electric circuit to produce light, heat and/or sound.
- L. Interview people to find out how the use of electricity has changed over time.
- M. Recall a time you had to live without electricity such as when you were camping, a storm caused a power failure, a fuse blew, or a circuit breaker tripped. Write a story about the experience.
- N. Produce a list of rules for being safe with electricity and consequences of carelessness when using electricity. In small groups make a presentation of your rules such as a poster, Power Point, video, or brochure.
- O. Invite a guest speaker from your local electric company to talk with the class about electricity and safety (i.e. Power Town).

## **Life Science**

### **S5L1.**

- A. Use common objects such as peanuts in the shell. Choose one and draw a picture of it or write a description of it. Mix the peanut back in with the others. Try to locate it by using the picture you drew or description you wrote. Explain how it is different from the other peanuts. Note the physical attributes that made recognition more accurate. How did you determine if you retrieved the correct peanut? Make changes to your description or drawing to improve accuracy. With classification of organisms, there is a method for determining accuracy of descriptions. Relate how writing a description of a peanut is what a scientist does when he classifies an organism based on physical attributes. (Note: Any fruits, vegetables, rocks, etc. can be used to do this activity.)
- B. Pretend you are the curator of a new display. You must put separate major groups of organisms according to features. Sort pictures or drawings of organisms by physical attributes into groups. Compare and contrast features of each group and explain why you made those choices. Share your grouping strategy with other students. Compare the similarities and differences of how the organisms are grouped by different students.
- C. Research how scientists classify organisms into groups. Compare the similarities and differences between how scientists group and how you grouped. Sort the pictures or drawings into categories according to scientific classification of groups. Create a presentation or display that would teach someone how to classify an organism. Presentations could include multimedia presentation, picture collage, drawing and sketching, diorama, or research report.

### **S5L2.**

Teacher note: Be sensitive to this topic since biological parents may be unavailable.

- A. Brainstorm a list of inherited traits, such as eye color. Create a survey for students to gather information about those with or without each trait. (Fourteen people in the class have brown eyes; twelve people have blue eyes, etc.) Organize data into a table or graph. Graphing tools include tally charts, spreadsheets or graphing software.

- B. Make a list of learned behaviors, such as habits, table manners, mannerisms, etc. Observe others to view those learned behaviors. (When I watched you drink from a tea cup, you always put your little finger in the air.) Compare and contrast inherited traits and learned behaviors. Using what you learned, write a story about who you are and why you became who you are. Add a conclusion about how you could improve your learned behaviors.
- C. Identify how characteristics are transferred in cells. Discuss what a gene is and the role genes play in the transfer of characteristics. Put different traits on craft sticks (brown eyes, blue eyes, green eyes, freckles, no freckles, curly hair or fur, straight hair or fur, pink fur, brown scales, etc.) Have students randomly choose different sticks and draw a cartoon of their organism.
- D. Research methods plant scientists in Georgia (Contact your local agriculture departments, county extension agents, 4-H leaders, and UGA Experiment Stations.) use to transfer characteristics of plants to produce such plant products as drought-resistance, varied rose color, azaleas that bloom at different times of the year, Vidalia onions, juicier apples, faster growing evergreen trees, etc.

### **S5L3.**

- A. Observe cells with magnifiers such as microscopes or hand lenses to find out about the structure of cells. Ideas of cells for viewing include onion skin, leaf cell, hay infusion, pond water organisms, budding yeast, tail of a fish, butterfly wing, animal skin or muscle (chicken wing), etc. Sketch what you see.
- B. Compare and contrast the structure and function of plant and animal cells by drawing and labeling each.
- C. Explain the various roles of cells in multi-celled organisms. Include in the explanation how the cells vary in appearance and what they do for the organism. Determine that in a multi-celled organism, a cell makes up the tissue of an organ.
- D. Determine how the basic needs of cells are met by researching the structure of a cell. Draw and label parts of a plant cell and an animal cell needed for the cell to function. Include such parts as membrane, cytoplasm, nucleus, etc. Use your drawings to explain how plant cells are similar to and different from animal cells.
- E. Explain how cells are similar and different in structure and function in
  - Single-celled organisms
  - Cells in multi-celled organisms

### **S5L4.**

- A. In a small group, choose a microorganism to research. Produce a diorama, research paper, or multimedia display to show the structure of the microorganism, where it is found, information about the microorganism and whether it benefits or harms the environment.
- B. Pretend you are a scientist working in the food industry. Explain what skills you must have to study the effects of microorganisms on your product.

Resources include doctors, microbiologists, food scientists, botanists, and online sites such as Centers for Disease Control: <http://www.cdc.gov> and Food and Drug Administration: <http://www.fda.gov> , etc.

Some impacts of microorganisms include:

Decay and composting

Improper cleaned fruits and vegetables

Fermentation of cheese

Algae and Plankton as food sources

Protists as food sources

Bacteria in digestion

Microorganisms damaging the skin

Spoiling foods

Susceptibility to parasites

Yeast in baking

Viruses in disease

Bacteria in diseases