

## GRADE 4 SCIENCE EXPLORATIONS TO DO AT HOME

One of the three core principals of [Each Child, Our Future](#), Ohio's strategic plan for education, is partnerships. The plan recognizes the collaboration between teachers and parents as the most important partnership. This document provides activities for students to complete in a home environment, allowing parents to be more closely involved in each child's mastery of science concepts. The investigations are written for a home setting using limited resources and are specifically targeted to each of [Ohio's Learning Standards for Science](#).

The resources listed in this document are provided to enhance planning, instruction and learning about science. They are not mandatory. Local districts are responsible for establishing the local curriculum and identifying appropriate instructional resources. The at-home projects are intended to provide activities that can be used by teachers to assign as homework or share with parents to supplement classroom instruction. Teachers should feel free to adapt the activities to align with the local curriculum. The projects are designed with the intent that technology is not necessary; although in many cases, the activities could be extended with additional components. When possible, data can be shared in small groups or with the entire class, analyzed and discussed to deepen understandings that students uncover during these activities.

It is important to build a strong foundation in science in the early elementary years so students are prepared for understanding more complex material in the intermediate and middle grades. It is equally important to continue students' science instruction by offering more advanced courses at the high school level. This allows students to be better prepared to compete for admission to college or other postsecondary programs, as well as for increasingly technical jobs. Advanced science courses in high schools also help produce a more scientifically literate public.

### **4.ESS.1 Earth's surface has specific characteristics and landforms that can be identified.**

**Outside option:** Examine the yard or a nearby field, stream or forest for examples of erosion, weathering and/or deposition. Take pictures with a device, if possible. Look up similar images and information about these processes if the internet is available. Write a paragraph or multi-paragraph description that includes details about the site. Include your hypothesis for how the feature formed and why it occurred where it did. What evidence from your pictures supports your claim?

**Inside option:** Build a model of a landform (hill, mountain, mountain range, island) in a waterproof tub or container using household supplies (clay, toys, kitty litter, craft or pantry items) or natural materials (dirt, sand and grass). Pour water over the model to investigate how water moves and settles around the landform. Record your findings using drawings or a video taken with a device. Describe the ways your model is similar to, and different from, the real landform.

### **4.ESS.2 The surface of Earth changes due to weathering.**

**Outside option:** Examine driveways, sidewalks and buildings for cracks in cement, bricks, stone and other building materials. Document the things you find with pictures or drawings. For each site, try to determine what caused the material to weather (breakdown). Common causes are wind, water, freeze-thaw cycles and plant growth.

**Inside option:** Fill a container with water to a certain mark. Freeze it and see what happens to the size of the ice cube. Explore how freezing and thawing affects materials. Use an ice cube tray or plastic container to repeatedly freeze and thaw various wet materials such as rocks, pieces of cement or chunks of wood. Take before and after pictures. Write descriptions of the changes.

**4.ESS.3 The surface of Earth changes due to erosion and deposition.**

**Outside option:** Pour or squirt water on various types of Earth materials (sand, soils, rocks, gravel). Determine which materials are easiest to erode (move). Experiment with the effect of changing the amount of water or the height you pour it from. Make a graph or chart showing your findings.

**Inside option:** The outside option can be done small scale in a container or bathtub. If you can't get outside to find materials, items around the house (clay, baking soda, pencil shavings, kitty litter) could be tested to see which erode most easily.

**4.PS.1 When objects break into smaller pieces, dissolve, or change state, the total amount of matter is conserved.**

**Outside option:** Place a large clod of dirt, piece of clay or another breakable object into a container on your bathroom scale. Record the weight. Break the object into small pieces, being careful to keep all of it in the container. What happens to the weight? What happens to the space (volume) that it takes up in the container?

**Inside option:** Think of ways to demonstrate that mass (the amount of material) stays the same during changes. Two ideas to get you started could be to dissolve salt in water and then try to get it back to salt or use Legos to demonstrate different shapes you build still use the same Legos. Try to think of other demonstrations of the conservation of mass.

**4.PS.2 Energy can be transferred from one location to another or can be transformed from one form to another.**

**Outside option:** On a sunny day, place equal-sized ice cubes in various locations. Time how long it takes each to melt. Create a graph or other visual summarizing the results. Write a description of what you discovered, including your explanation for why they melted at different rates.

**Inside option:** Choose a household object that runs on electricity, such as a lamp. Have an adult help you list all the energy changes that took place to make the bulb light. Find out how the electricity in your location is produced. Was it from coal? Wind? Sunlight? Nuclear sources? See if you can trace the energy lighting your light bulb all the way back to the sun.

**4.LS.1 Changes in an organism's environment are sometimes beneficial to its survival and sometimes harmful.**

**Outside option:** Look for evidence that an environment has changed. Is there evidence that plant species are changing? Is erosion present in the area? How is this affecting plants or animals at the erosion site?

**Inside option:** Research the history of Ohio's environment for your location. Were their glaciers? When? Was your area covered by water? Have local rivers shifted course? Were there forests that have been cleared for fields or construction? Create a timeline of the environment for your county. The timeline also supports social studies grade 4, standard 1.

**4.LS.2 Fossils can be compared to one another and to present-day organisms according to their similarities and differences.**

**Outside option:** Look carefully at rocks in your environment to check for fossil evidence. Sources of rocks could be stream beds, gravel parking lots or driveways, road cuts, plowed fields and landscaping. If you find fossils in your local area, describe how they look similar to or different from plants and animals that live here now.

**Inside option:** Think about the area where you live. What are the current seasonal weather conditions? What would happen if there was a sudden shift and it was significantly warmer or colder all the time? What if it rained constantly, everything flooded and the water levels did not recede? How would the change impact the living things in the environment? Which organisms could survive? What traits would help them survive?