# GRADE 5 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.

**5.ESS.1 The solar system includes the sun and all celestial bodies that orbit the sun. Each planet in the solar system has unique characteristics.**

**Outside option:** Explore the force that makes planets orbit the sun and makes moons orbit planets by tying a string or rope to a soft object. Swing the object in a circle above your head. What keeps the object moving in a circle? What happens when you let go? Describe how this is similar to planets and moons. Think of another way to model the cause of circular motion.

**Inside option:** Make a model of the solar system using dough or household materials. Attach labels with information about each of the celestial objects. Does your model include the sun, planets, moons, comets, asteroids and other solar system objects? List ways you could improve on your model to make it a more accurate representation of the solar system.

**5.ESS.2 The sun is one of many stars that exist in the universe.**

**Outside option:** Measure an object using your hand(s). Place it on the ground, fence or table. Walk a few feet away and use your hand to measure it (hold up your thumb and first finger to match the top and bottom). Walk further away and measure again. Repeat at several distances. What happens to the "height"? Did the height of the object really change? Make a graph (scatterplot) of the height vs. distance. What conclusions can you make from your graph?

**Inside option:** Create a book for younger children explaining why the sun looks so much larger than the other stars. Illustrate your book. If you don't know why the sun looks so large, ask a teacher or a family member. You also can use your science book or other resources.

**5.ESS.3 Most of the cycles and patterns of motion between the Earth and sun are predictable.**

**Outside option:** On a sunny day, place a stick in the ground (or observe a pole or other object that is already there). Each hour, record where the shadow ends with a stick in the ground or mark with chalk. Be sure to label the times. What patterns do you see as the day goes by? Try checking the shadow at a certain time each day or each week. How does the shadow change as a month passes?

**Inside option:** From a window, watch the night sky. Take a picture or make a sketch of what you see. Return in an hour and see how your picture has changed. Check each hour until bedtime. If you wake up before dawn, check to see if things have changed. Be sure to look out the same window each time. This also can be done outside, making sure to use the same location and direction.

**5.PS.1 The amount of change in movement of an object is based on the mass of the object and the amount of force exerted.**

**Outside option:** Design an investigation to see how changing the mass of a sled, wagon or other toy affects how easy it will be to push or pull the toy. Think about how you can change the mass (what objects or material you can add) and how you will measure or describe how hard it is to push or pull. Describe some things you need to keep the same to conduct a fair test.

Have a dog? Play a game of tug-of-war with your dog and a rope toy. **Note:** Only do this if you have a dog that likes tug-of-war. Identify times when the forces on the rope are balanced and when they are unbalanced. What evidence (movement, direction) shows the force was balanced? Unbalanced?

**Inside option:** Use something such as a ruler to flick an object across an open floor space or down a hallway. Record how far the object travels when you pull the ruler back different amounts. Think about the best way to organize your data. Is there a pattern? How do things change if you slide it on different surfaces (carpet, tile, wood)?

**5.PS.2 Light and sound are forms of energy that behave in predictable ways.**

**Outside option:** Take various objects outside and explore whether light can pass through them. If you leave the objects in the sun, what happens to their temperatures? Do all the objects heat up at the same rate? Look for patterns in which objects warm the fastest. Does the material it is made of make a difference? Does color make a difference? Summarize what you observe.

**Inside option:** Use household objects to make a homemade musical instrument. Observe the motion of different parts of your instrument as it is played. Explore ways to change the pitch of your instrument. What changes make a difference in the pitch?

**5.LS.1 Organisms perform a variety of roles in an ecosystem.**

**Outside option:** Go on an ecosystem scavenger hunt. Look in your backyard or neighborhood to find examples or evidence of producers, consumers, decomposers, mutualism, commensalism, parasitism, predator-prey, invasive species, herbivores, carnivores and omnivores. Take a photograph or make a drawing of each item that you find. Could you find them all? What other ecosystem components can you identify?

**Inside option:** Print or draw pictures representing a variety of plants, animals and other organisms found in your neighborhood. Watch out the window for ideas of things you may have forgotten or never noticed. If you have internet or other resources, look up information about the organisms. Organize the pictures into a food web.

**5.LS.2 All of the processes that take place within organisms require energy.**

**Outside option:** Carefully observe your yard or an outdoor area. Which plants grow in the sun? Which prefer shade? What are the first signs of spring? What time of year do plants under large trees grow best? What about those in open areas? What are some characteristics of plants that prefer shade? What birds and other animals are out and about? Does that change from month to month? What differences do you observe between daytime and evening?

**Inside option:** Think about a change that has happened to a local ecosystem. Has there been new construction or demolition nearby? Was a farm field abandoned? A yard landscaped? Logging in a nearby forest? If you have access to Google Earth or other online tools, you can look at before and after images of ecosystems in other parts of the world. Choose one ecosystem and write about it; describing changes observed, causes of the changes, positive and negative consequences of the changes and what could have been done to prevent the changes. If applicable, tell how the ecosystem could be improved or restored?