

Dear Parents and Caretakers,

Here are some ideas for things you can do to support your students with their science learning. I have laid out ideas for each grade level. We aligned all the activities with the Michigan Science Standards and the ScienceStrong curriculum the Institute supports. In addition to the ideas provided for each grade level, encourage your student to ask questions and investigate things they are interested in. Asking good, answerable questions is a skill that develops with practice, as many questions are interesting, but not all questions are answerable. Learn about different scientists and inventors, reading about how they asked questions and solved problems.

When talking to students, use the following types of productive questions to guide your interactions and get students thinking*:

- Attention questions: These questions help students focus on what is happening. These include, “What do you see/smell/hear/feel happening? What do you notice?”
- Measuring questions: These questions help students to quantify what they are seeing. These could include things like, “How many birds did you see? How much salt did we add? How heavy is the bag now?”
- Comparison Questions: These questions verbalize, analyze, and classify different objects. They could include: “Can you put them in order by size? Which is larger or smaller? How are they the same and how are they different?”
- Action Questions: These questions help students to learn to make predictions and think about the order of events. They could include: “What would happen if the ball hits the pile of blocks? What do you think will happen next?”
- Problem-posing questions: These questions help students to learn to plan and think about how to solve problems. These questions could include: “How could we build a nest that is big enough for this egg? How could we get the rock from the tree to the sidewalk?”
- Reasoning questions: These questions help students think about what they learned or new ideas they might have. These could include questions like, “Why do you think that happened that way? Can you explain to me what happened? Can you tell me about what happened?”

We appreciate your help in fostering a love of science and the natural world. Keep up the good work in engaging your students in learning.

Kind Regards,

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*Adapted from <https://littleredbus.wordpress.com/2008/09/15/productive-questions-to-foster-scientific-thinking/>, https://www.perpetualpreschool.com/dlc_play/Productive%2520Questions.pdf, and Martens, M. L. (1999) . Productive questions: Tools for supporting constructivist learning. Science and Children, 53, 24-27.

Young Kindergarten and Preschool

- Five Senses
 - Talk with your student about things you notice when you are out, such as the smell of the flowers, the crunch of their cereal in the morning, or the texture of the sand in the sandbox.
 - Listen to different kinds of music or sounds, and talk to your student about what they hear.
 - Visit a garden store, greenhouse, or a natural area with flowers to have your student compare the smells of different kinds of plants and flowers.
 - Ask your student what flavors they like best or do your own taste test to try different kinds of foods.
 - Read books related to the five senses.
 - Come up with your own scavenger hunt or play hide and seek to help your student look for things around them.
 - Try candies that use your senses, like Pop Rocks or Beanboozled Jelly Belly Beans.
- Healthy Habits
 - Talk with your student about the habits your family has, such as how you might enjoy being active by going for a walk or that you relax by taking a warm bath.
 - When you are cleaning at home, take time to explain to your student why you wash the dishes or wash the table after meals.
 - Involve your student when you go shopping, having them help you choose foods and taking time to look through some of the different foods in the produce aisle.
 - Take time to do active things as a family, such as playing outside or going for a walk.
 - Read books related to healthy habits.
 - Take time with your student to help them with brushing and flossing their teeth, and talk to them about your experiences with your teeth.
- Living and Non-Living
 - Talk with your student about the animals and plants that are a part of your life. Be sure to discuss how those plants or animals grew or changed as they got older.
 - Visit older relatives and ask them about what they were like when they were little. If possible, ask to see pictures of older relatives when they were children and adults, and have them talk about how they have changed as they have gotten older.
 - Find a park near your house and look for living and non-living things in the park.
 - Take this opportunity to grow a plant. If possible, start your plant from a seed.
 - Read books related to plants and animals.
 - Take time with your student to visit the different parts of the grocery store and talk about the different plants and animals that your family eats.

Kindergarten

- Weather
 - Share your own weather stories with your student.
 - Ask your student what kind of weather they like best.
 - Remind your student of how you decide what to wear based on the weather outside, and have them check the weather outside as a part of the process of getting dressed.
 - Check out the weather forecast with your student and use that as a start of a plan for what they can do during different kinds of weather.
 - Read books related to weather.
 - Watch weather-related movies like “Cloudy with a Chance of Meatballs,” “Frozen,” or Sid the Science Kid’s “Weather Kid Sid.”
- Forces and Motion
 - Share your own experiences with pushes and pulls with your student.
 - Go to the park and work with your student to try and figure out which playground equipment involves pushing, which involves pulling, and which involves both pushing and pulling.
 - Remind your student of things they might see in their everyday life that might involve pushes (carts, strollers, etc.) and that might involve pulls (wagons, trailers, etc.).
 - Play with your student using toys you can push or pull, such as cars and trains.
 - Read books related to pushes and pulls.
 - Watch movement-related movies such as “Cars,” “Turbo,” and “Thomas the Train.”
- Life Science (Needs of Living Things)
 - Share your own experiences with animals and plants with your students.
 - Go to the park as a family and try to find the plants and animals that make their homes there.
 - Read stories or watch movies about particular animals with your student and discuss where those animals live and what they need to survive.
 - Buy or make a bird feeder or bird baths where you can watch birds and talk about what they need to survive.
 - Plant a garden with your student and talk about what plants need to survive.
 - Read books related to plants and animals.
 - Watch animal and plant-related nature documentaries and movies like “Happy Feet,” “Finding Nemo,” and “A Bug’s Life.”

First Grade

- Light and Sound
 - Explore sounds inside and outside. How do they sound different indoors vs. outdoors?
 - Try making your own instruments at home using pots, pans, containers, and kitchen utensils. See what sort of sounds you can make.
 - Practice tracing your shadows using sidewalk chalk outside.
 - Use a flashlight to make hand shadows at home. Where are you able to create the darkest shadows?
 - Watch a video of an orchestra and listen to the sounds from different kinds of instruments.
 - Read books related to light and sound.
- Space Science
 - Explore the sky when you are outdoors. Be sure to talk to your students about objects in the sky, especially the moon, sun, and stars.
 - Visit one of the local planetariums with your student, and learn about our solar system as a family.
 - Watch the sun rising and setting with your student. Make observations about how the time when the sun is up changes throughout the year.
 - Take the time to check out the stars in the evening when the sky is clear, and look for constellations with your child.
 - Read books related to the earth, moon, stars, and the solar system.
- Life Science (Parental Care and Behavior)
 - Take your student to see animal parents and offspring. Compare how the adults are similar to, but slightly different from, the offspring.
 - Try growing your own seeds at home. Watch how the seeds change to shoots and eventually start to look more like their parent plants.
 - Check out some of the web cameras online that watch bird nests. Let your student make observations for how the parent birds take care of their offspring.
 - When you are doing something to help your student, take the time to explain how what you are doing helps them to survive, stay healthy, learn, or grow.
 - Read books related to animal and plant traits as well as books on parents and offspring.

Second Grade

- Earth Science
 - Take your students to visit Lake Michigan, the Thornapple River, and other local water bodies.
 - Talk about why lakes and rivers are important to Michigan and your family.
 - Have an older person explain how the area they live in has changed over time.
 - While you are out walking or driving with your student, take time to notice changes in the landscape. Be sure to point out landscape features like hilly areas, flat sections, low sections near rivers, etc.
 - Practice making landscape features in a sandbox or beach with your student.
 - Talk to your student about where your water comes from (city water, groundwater, etc.).
 - Read books related to Earth Systems and Water.
- Properties of Matter
 - Explore materials that you have in your house and try to sort the materials by colors, hardness, shape, etc.
 - Try and experiment during bath time to classify materials based on whether they can float or not.
 - Practice building materials with Legos or other building materials.
 - Read books related to matter and construction.
 - Try making snacks that involve multiple states of matter, like root beer floats (which have liquid, gas, and solid materials) and soup (solids and liquids), or snacks that change states (like icy-pops and eggs).
- Life Science (Habitats, Diversity, and Life Cycles)
 - Visit a greenhouse or a farmer and ask about how they take care of the needs of the plants.
 - Look for seeds when you are outside, and look for different ways the seeds are dispersed (especially those that use animals to disperse their seeds by sticking to clothes).
 - Practice counting the different number of animals and plants in a particular area with your student.
 - Look at flowers together and notice how some flowers look different from others, and imagine what sort of pollinator might like to visit each particular flower.
 - Read books related to plants and animals.

Third Grade

- Weather and Climate
 - Explore the weather outside your home.
 - Talk to your students about how the weather changes throughout the year.
 - Try making your own rain gauge at home using a clear cup and a ruler. Check the rain gauge daily, and see how much rain you are able to collect over a week.
 - Watch the weather forecast with your student, and talk about how the weather in Michigan is different than the weather in other places.
 - Visit the library to check out books related to weather and climate.
 - Share stories of extreme (or memorable) weather with your student.
- Forces and Motion
 - Explore motion both inside and outside with your student.
 - Ask questions about how objects move, and try to see if there any patterns in the movement. This can be as simple as noticing that sleds normally slide down a hill or swings swing back and forth.
 - Use the magnets available in your home to have your student sort objects based on whether magnets will stick to them.
 - Have your student help with taking laundry out of the dryer, and talk with your student about the static electricity that can sometimes make clothes stick together.
 - Play a game of tug of war with your student and their friends, and see if you can form teams that are balanced. Ask your student what will happen if the teams are not balanced.
 - Read books related to forces, motion, and magnets.
- Life Science (Change over Time, Heredity, Life Cycles)
 - Talk to your student about the traits they inherited from their family. Discuss how they are similar to and different from other people in their family.
 - Go on a hunt for fossils, and learn about the different plants or animals that may have lived in the past. Learn about Michigan's state fossil, the Petoskey stone.
 - Construct a timeline of life for an older friend or family member using pictures. Include pictures of the person as a baby, small child, teenager, adult, and older person. Talk to your students about how people change over the course of their lifetime.
 - Read books related to fossils, plants, animals, and the environment.

Fourth Grade

- Earth Science
 - Consider planning a real or virtual trip to explore rocks and rock formations that are found in Michigan. Head north to find Michigan's state rock, the Petoskey stone, visit Pictured Rocks National Lakeshore, or visit the rock formations at Fitzgerald Park in Grand Ledge.
 - Go out with your student to look for rocks in the areas around you, including fossils and rocks that show layering.
 - Read maps with your student and show them some of the landforms around the United States and the world.
 - Look on the internet to learn more about recent earthquakes and volcano eruptions around the world.
 - Read books related to rocks, fossils, volcanoes, and earthquakes.
- Life Science (Structure and Function)
 - Consider planning a family trip to Frederik Meijer Gardens to see the different kinds of plants and see the unique features of plants that live in different environments.
 - Go out with your student to look for plants and animals in the areas around you. Discuss the features that allow this animal or plant to live in Michigan.
 - Read books together about the different kinds of plants and animals that live in different habitats.
 - Look on the internet to learn more about the plants and animals of Michigan.
 - Read books related to plants, animals, habitats, and the five senses.
- Energy and Waves
 - Consider planning a real or virtual trip to Lake Michigan or another large lake so students can observe patterns in waves in the water.
 - Experiment with different musical instruments with your students. Explore how different kinds of instruments make sounds using vibrations.
 - Show the students where the energy that powers their house comes from, and look at your electric company's website to find out what kinds of energy the company uses.
 - Read books together about the different kinds of energy that people use, including wind, coal, hydropower, solar, biomass, and nuclear energy.
 - If you know people who use different forms of energy to power or heat their house, reach out to those people so they can share what kind of energy they use and where it comes from.

Fifth Grade

- Earth Science
 - Consider planning a family trip to explore the natural resources around West Michigan, including the many lakes, creeks, and rivers found here.
 - Build a terrarium with your student, including soil, water, plants, and air in your system.
 - Read maps with your student and show them some of the rivers and lakes around the United States and the World.
 - Learn more about how your family can help to conserve natural resources by researching in books or on the internet.
 - Read books related to the Earth, rivers, lakes and natural resources.
- Space Science
 - Consider planning a real or virtual trip to a planetarium to learn more about stars and the universe.
 - Go outside at night as a family to look at the moon and stars.
 - Read books or look online with your students to learn about astronauts and the space program.
 - Do research online to learn about the what it is like working for the National Aeronautics and Space Administration (NASA).
 - Read books or online articles, or watch videos, related to the gravity, the Moon, stars, astronauts, and space science.
- Matter and Energy in Ecosystems
 - Consider planning a family trip to a natural area to investigate the plants, animals, and decomposers that live there.
 - Sort different kinds of materials based on their properties, like color, shape, size, weight, density, etc.
 - Grow plants with your child and talk with them about how the plants grow and what they need to live.
 - Read books with your students about matter and energy.
 - Visit websites like <https://www.generationgenius.com/ecosystems-for-kids/> to learn more about ecosystems.