Science Inquiry at Home

An Introduction to Science Inquiry at Home – Fourth Grade

These exploration suggestions are designed to support parents and students explore science content at home. Each suggestion starts with a question to answer. Included here are suggested materials and activities to help answer each question and suggestions on ways to communicate the findings.

Consider creating a science journal to record observations, take notes, and reflect on your learning. The science journal may be on paper or on a computer. You could choose to use a spiral notebook or a composition book. You could have a journal for each topic, each quarter, or one for the whole year.

What is my child learning in science?	Materials to support hands-on science activities at home	Questions to ask my child as we are exploring science at home
create a model or diagram illustrating the parts of a plant in terms of obtaining energy; explain the role of roots, stems, and leaves (4.2 a, b)	Science journal Drawing materials, camera or cell phone with camera, computer	**Why are there different parts to a plant?** Explore plants around the home. Draw or take pictures of parts of several plants. Choose a smaller plant and gently pull it out of the ground. What is the role of each part of the plant? Draw or take pictures of the plant you pulled out of the ground and label the root, stem, and leaves. If taking pictures, transfer the pictures to a computer program and label. Keep your observations in your science journal.
plan and conduct an investigation to determine how the amount of sunlight	Science journal Two house plants (of the same kind) Or	**How much sunlight do plants need to grow?** Grow some seeds in a small cup and dirt, or on a damp paper towel in a plastic bag. When planting the seeds, use two or three seeds per container (cup or

What is my child learning in science?	Materials to support hands-on science activities at home	Questions to ask my child as we are exploring science at home
a plant receives affects plant growth (4.2 b)	One house plant Small cup Dirt Paper towels Plastic bag	bag). You will want two set-ups with seeds so that you can compare growth of plants in the dark and in the light. Try putting some seeds in the dark and some in a window or near a source of light. Check the plants every day and draw or write what you notice happening. Keep these observations in a science journal. An alternative is to observe the leaves of a house plant that is growing well in your house for one month, then, place it in a closet and observe the effects after one month. Be sure to keep other factors such as the amount of water and growing conditions (aside from the amount of light) constant.
create and explain a model of a flower, illustrating the parts of the flower and its reproductive processes (4.2 c)	Science journal Drawing materials, camera or cell phone with camera, computer Flowering plants	**How do plants make more plants?** Explore flowered plants around the home. Draw or take pictures of the flowers. If taking pictures, transfer the pictures to a computer program. Identify and label the petals, stamen (male reproductive structure) and the pistil (female reproductive structure). Determine the role of the flower parts in creating seeds for reproduction. Can you create a story of the life cycle of the plant using drawings or pictures? Record your observations in your science journal.
• research animals and plants in a local environment and describe interrelationships	Science journal Drawing materials or computer program	**What makes up the ecosystem that is around me?** Identify at least 6 plants and/or animals around your home. Draw or take a picture of each of the plants and animals and record it in your science journal. Draw lines between them to show connections and write about why you made the connection between the plants and animals that you chose. These

What is my child learning in science?	Materials to support hands-on science activities at home	Questions to ask my child as we are exploring science at home
among these organisms (4.3 b)		connections may be related to food, shelter, or some other relationship. Can you make connections between all 6?
analyze a food web and explain how changes in one part of the food web would affect other organisms (4.3 c)	Science journal Drawing materials or computer program	**How does a change in one part of the ecosystem impact other areas?** Look at the drawing that you made from the 6 plants and animals you identified from around your home. If you took one of the animals or plants out, what would be the impact on the other organisms you chose? Can you think of other plants and animals that should be included in your drawing? Add a picture of the sun to your drawing. How does the sun fit into your ecosystem?
use a simple dichotomous key to classify organisms (4.3 d).	Science journal A tree leaf	**What tree is that?** Take a walk around your neighborhood and find a tree. Carefully observe a leaf from the tree. You can draw it, photograph it, or bring it into the home to begin to identify the tree it came from. Use the key at the following website to determine the type of tree: https://dendro.cnre.vt.edu/forsite/key/intro.htm. Record your observations in your journal. Describe what characteristics you observed to help you identify the type of tree. *Note: you will need to observe how the leaves are arranged on a branch. Some trees have leaves that come in pairs, while other tress have leaves that alternate down the branch.
analyze and report data on temperature and	Science journal Thermometer Rain Gauge	**How can collecting information about weather lead to weather predictions?** Scientists use a variety of tools to collect weather data. Over time, they can observe patterns and use these patterns to predict weather. Weather tools that

What is my child learning in science?	Materials to support hands-on science activities at home	Questions to ask my child as we are exploring science at home
precipitation (4.4 a) use weather instruments (thermometer, barometer, rain gauge, anemometer) and observations of sky conditions to collect, record, and graph weather data over time; analyze results and determine patterns that may be used to make weather predictions (4.4 a)	Bottle Ruler Tape <u>Anemometer</u> 5 small cups Pencil 2 straws	scientists use include thermometers which measure the temperature, barometers which measure the air pressure, rain gauges which measure the amount of rain or other precipitation, and anemometers which measure the speed and direction of the wind. Temperature changes throughout the day, and this data can be collected using a thermometer. If you don't have a thermometer, you might be able to use a thermometer app on a cell phone. Rain gauges and anemometers can be constructed at home. Rain gauges are used to collect information about the amount of precipitation over a period of time. Anemometers are used to determine the direction of wind. A barometer measures the air pressure. Changes in the air pressure can predict changes in the weather. Collect data daily on weather conditions in your area. You may collect data at certain times throughout the day or once a day at the same time. If you can't collect the data, you can find the weather data by going to https://www.weather.gov and typing in your city or zip code. In your journal, create a chart to use for recording the data. Graph changes in temperature or precipitation over the month. What do you notice about the patterns in the data? If you want to collect precipitation (rain) data or wind data yourself, you can make your own rain gauge or anemometer. Directions for making a rain gauge can be found at https://www.youtube.com/watch?v=MLmVaiSEF9w Directions for making an anemometer can be found at

What is my child learning in science?	Materials to support hands-on science activities at home	Questions to ask my child as we are exploring science at home
		https://sercc.com/education_files/anemometer.pdf . https://knowledge.growobservatory.org/wp-content/uploads/2019/04/Example-of-How-to-Make-a-Rain-Gauge.pdf https://www.youtube.com/watch?v=Af0LB3abBsk
• differentiate among cloud types (i.e., cirrus, stratus, cumulus, and cumulonimbus clouds) and the weather associated with each (4.4 a)	Science journal Drawing materials	**How do clouds differ with different weather?** Observe clouds and draw the clouds in your science journal (notebook) or photograph for a computer program. What weather is happening during the day? Record in your journal the kinds of clouds and the weather associated with the cloud. Do you notice any relationship between the type of clouds and the weather?
• discuss the importance of monitoring weather data to make weather predictions (4.4 a)	Science journal	**How does weather affect me?** Think about a time when it was important for you to know the weather. Write in your journal how you found out about the weather and what difference it made to your plans.
research and analyze the effects of extreme	Science journal Internet or books	**What are some effects of extreme weather?**

<table>
<tr><th>What is my child learning in science?</th><th>Materials to support hands-on science activities at home</th><th>Questions to ask my child as we are exploring science at home</th></tr>
<tr><td>weather events on the environment (4.4 b)</td><td>on severe or extreme weather</td><td>Research an extreme weather type of your choice. Extreme weather might include high winds, tornadoes, hurricanes, lightning storms, hail, rain downpours, droughts, blizzards, and extreme temperatures.

What was the effects of extreme weather? You might want to include drawings, pictures, and/or videos to show the effects of the extreme weather. Have you had an extreme weather event in your community? Write about the impact that the weather event had on your community. What actions did your community take to lessen the effects of the event? What other actions might be taken in the future?</td></tr>
<tr><td>create a model that demonstrates the differences between rotation and revolution (4.5 a)</td><td>Science journal
Toy such as a spinning top or a string tied to a small object</td><td>What is rotating and revolving in my neighborhood?
Can you <u>slowly</u> twirl (spin) around, staying in the same spot on the floor? Be careful and don’t spin so that you get dizzy. Can you think of any toys or other objects that can twirl in a similar way? This motion is called rotation.

Put a chair in the center of a room. Walk around the chair in a circle. This is called a revolution. Can you think of anything that does both—rotates and revolves around something?

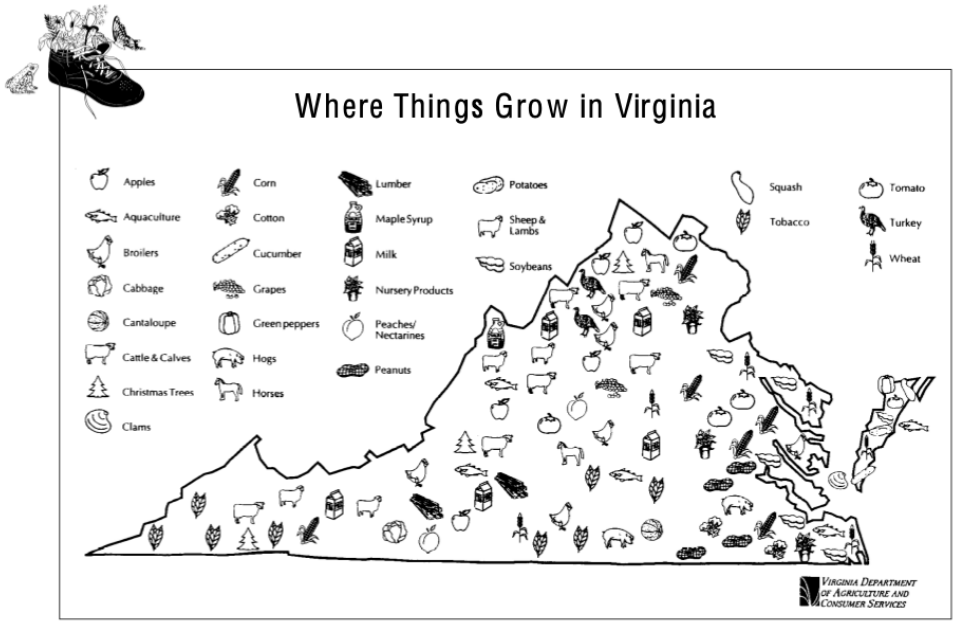
In your journal, draw a line down the middle. At the top of each column, write “Things that Rotate” on one side and “Things that Revolve” on the other side. Explore your home and neighborhood and list things you see that rotate and revolve in your science journal.

<table><tr><th>Things that Rotate</th><th>Things that Revolve</th></tr><tr><td></td><td></td></tr></table></td></tr>
</table>

What is my child learning in science?	Materials to support hands-on science activities at home	Questions to ask my child as we are exploring science at home
• research the planets and communicate basic characteristics of each, including whether each is terrestrial or a gas giant, and its relative location in the solar system (4.5 b)	Science journal Internet or book on our solar system	**How do the planets differ in our solar system?** There are eight planets in our solar system. Each planet has different characteristics including size, distance from the sun, temperature, number of moons, and composition. Pick one of the planets in our solar system. Research your planet using books, the internet, or television programs. What are the characteristics of your planet? How far is your planet from the sun? How does this distance impact the temperature of the planet? Share your planet characteristics with others in your family. You may choose different ways to share the information including building a model, creating a picture, or creating a digital product. You can find information about the planets at this website: https://solarsystem.nasa.gov/planets/overview/
• construct and interpret a simple model to show the location and order of planets in relation to the sun in our solar system (4.5 b)	Science journal Internet or book on our solar system	**What is the order of the planets from the sun?** Do you know the names of all the planets in our solar system? In your journal, draw a diagram that shows where the planets are in reference to the sun. If 1,000,000 km were drawn as 1 cm, how many centimeters would each planet be from the sun? https://solarsystem.nasa.gov/planets/overview/

What is my child learning in science?	Materials to support hands-on science activities at home	Questions to ask my child as we are exploring science at home
• compare the relative sizes of the planets to each other as well as to the sun (4.5 c)	Science journal Internet or book on our solar system	**How big are the planets compared to the sun?** Are all the planets the same size? Do some research and take notes or make drawings that shows the relative size of the planets. Is the order of the planets from the sun the same as the order of the planets in size? Here are two websites that you may find interesting to explore and will give you more information about the planets. If you could visit a planet other than Earth, which planet would you choose to visit, and why? Write about your thought in your science journal. https://solarsystem.nasa.gov/resources/686/solar-system-sizes/ https://www.jpl.nasa.gov/infographics/infographic.view.php?id=10749
create and interpret a model of a watershed (4.8 a) use evidence to explain the statement, “We all live downstream.” (4.8 a)	Science journal Piece of paper Spray bottle for water Water soluble markers Baking sheet	**Where does the water flow?** Take a piece of paper and crumple it up. Try to open it and smooth it out, but don’t smooth it out all the way. Your paper should have some high points and low points. Use a marker (NOT a permanent marker) and draw along the high folds. Then take the paper and place it on a baking sheet or another flat surface that can get wet. Using a spray bottle with water, spray water on the paper. If you don’t have a spray bottle, you can use your hands to sprinkle water on the paper. Observe what happens, and write your observations in your science journal. Your paper is a model of a watershed. What do the high points represent? What do the low points represent? Why did you use a marker on the high folds? What happened to the marker color? Why did you spray or sprinkle water on the paper?

What is my child learning in science?	Materials to support hands-on science activities at home	Questions to ask my child as we are exploring science at home
		Consider rain falling at your home. Where does that water go? Think about the phrase "we all live downstream." What are you downstream from?
research a Virginia mineral, ore, and/or rock and communicate its use in everyday applications (4.8 c)	Science journal Mineral Resources of Virginia Map	**What minerals can be found in Virginia?** Look at the map of Virginia (https://www.dmme.virginia.gov/DGMR/mineralreso.shtml) which shows the rocks and minerals that are mined in Virginia. What patterns do you notice? Write those patterns in your journal. How are these rocks and minerals used?
• describe a variety of important land uses in Virginia, including natural and cultivated forests (4.8 d)	Science journal State Forest Map; Map of Where Things Grow in VA	**How is the land used in Virginia?** Do you live near a state forest? Go to http://dof.virginia.gov/stateforest/list/index.htm and see if you can find a state forest near you. Use the information on the web site and write in your journal about what you can do in that state forest. Why are forests important? Can you find where you live on this map? What is grown in the area where you live? How is that important to your family and others? Explain your thinking in your science journal.

What is my child learning in science?	Materials to support hands-on science activities at home	Questions to ask my child as we are exploring science at home
		 http://www.doe.virginia.gov/instruction/environmental_literacy/va-natural/docs/vnreg-ag-resource.pdf
investigate the school yard or local ecosystem to identify questions, problems, or issues that affect a natural resource in that area and determine a	Science journal	**How healthy is my ecosystem?** Take a walk around your neighborhood and use your observation skills. Some questions to think about include: • Which has more area—places where there is grass or trees, or places where there are buildings, sidewalks, and roads? • What animals do I see? • Is there evidence of pollution in my neighborhood?

What is my child learning in science?	Materials to support hands-on science activities at home	Questions to ask my child as we are exploring science at home
possible solution to an identified problem (4.8 a, b, c, d).		• Are there places where the run off from water has caused the possibility of a dangerous situation? In your science journal, draw a simple map of your neighborhood and put your observations on the map. Have you identified any problems? Can you think of some ways to solve those problems? Record your thoughts in your science journal.