

LEARNING AT HOME

Welcome to Learning at Home Bingo: Explore your world this week thinking like a scientist. Future weeks will encourage you to notice and wonder as you think like an artist, a health and physical fitness expert, a mathematician, a historian, a computer scientist, and literacy and media expert.



Do not gather materials without permission. Ask for help from a grown-up.

Curriculum provided by the San Diego County Office of Education. For more, go to <https://covid-19.sdcoe.net/>

<h1>B</h1>	<h1>I</h1>	<h1>N</h1>	<h1>G</h1>	<h1>O</h1>
Baking and beyond Kitchen science	Indoors The science of toys	Nature Environmental interactions	Gadgets Science in everyday things	Outside Science, engineering all around us
<p>Melting ice</p> <p>Materials needed:</p> <ul style="list-style-type: none"> • Ice cubes • Cups made from different materials such as plastic, ceramic, glass, metal, paper (at least two different types) • Clock with a timer • Paper and something to write with to record your thinking <p>Step 1: Place the cups on a table or level surface. Place two ice cubes in each cup.</p> <p>Step 2: Record the start time. Use a clock on a kitchen appliance or a cellphone to set the timer for 10 minutes.</p> <p>Step 3: Observe the cups. Record and discuss your initial thinking. Continue setting the timer for 10-minute intervals.</p>	<p>Motion and movement</p> <p>Materials needed:</p> <ul style="list-style-type: none"> • Toy in your house that has moving parts • Paper and something to write with to record your thinking <p>Step 1: Why did you choose this toy?</p> <p>Why is this toy important to you? Draw a picture of your toy.</p> <p>Step 2: Play with the toy for 2 minutes.</p> <p>Explore how the toy works.</p> 	<p>Animals up close</p> <p>Materials needed:</p> <ul style="list-style-type: none"> • An animal to observe — a family pet, a small outdoor animal, an animal on a live animal cam from a zoo or on a TV show. • Drawing paper, pencil, colored pencils or crayons, note paper <p>Step 1: Choose your animal, one you can watch for a while.</p> <p>Step 2: Look at the animal. What do you notice? What do you wonder? Write your questions down. Share your answers. Are your observations similar to others'?</p> <p>Step 3: Sketch the animal. Draw your animal realistically using the ABCDEs of scientific sketching.* Fill the page. Use the colors you see. Include details and words to explain what you can't draw.</p>	<p>There's science in my gadget!</p> <p>Materials needed:</p> <ul style="list-style-type: none"> • Any household gadget, something simple like a stapler or a can opener, or something more complex like a cellphone or a remote control. • Paper and something to write with to record your thinking <p>Step 1: What is the gadget? Why did you choose it?</p> <p>Step 2: Observe your gadget. What do you notice? What is its function? How does it work? Write and draw what you see.</p> <p>Step 3: Try out some of its features. What does it do? What do you wonder about it? Write any questions you have. If someone else is observing it, discuss your observations. Did they notice things you did not notice?</p>	<p>Scavenger hunt</p> <p>Materials needed:</p> <ul style="list-style-type: none"> • A place to walk and/or make observations of an outdoor environment • Optional: camera, bag or small container • Paper and something to write with to record your thinking <p>Step 1: Decide what you want to search for on your outside scavenger hunt.</p> <p>Step 2: Create a data table to record your observations.</p> <p>Step 3: Walk around the area and make observations; record them on your paper. Optional: Bring a camera to take pictures of interesting things you notice. Bring a bag or small container to collect interesting items.</p>
<p>Grades K-3</p> <p>What do you notice? What do you wonder?</p> <p>Record (write and draw) your thinking and/or talk with a buddy.</p> 	<p>Grades K-3</p> <p>What do you notice? What do you wonder?</p> <p>Record (write and draw) your observations. How does your toy move?</p> <p>Share your thinking with others. What do they think? How does your thinking compare to theirs?</p> <p>How many parts does your toy have? Count the parts.</p> <p>What parts does your toy have? Label the parts on your drawing.</p>	<p>Grades K-3</p> <p>What did you like most about the animal you observed? Do you notice any patterns in the animal? (stripes, dots, colors, etc.) Can you describe the pattern you notice? What other types of animals would you like to observe?</p> 	 <p>Grades K-3</p> <p>Take a closer look at your gadget. Many gadgets are made from a combination of human-made materials and natural resources. What material(s) is your gadget made of? How many different materials can you see?</p>	<p>Grades K-3</p> <ul style="list-style-type: none"> • Search for different colored things. Pick one or two colors. • Search for things of different textures like smooth, rough, bendable/flexible, hard/rigid. Pick one or two textures. • Select a shape to search for. Common shapes you might see outside are straight lines, circles, triangles, quadrilaterals. Each time you find the shape, observe the object and state how you know it is that shape.
<p>Grades 4-8</p> <p>What do you notice? What do you wonder?</p> <p>Record (write and draw) your thinking and/or share your thinking with others.</p> <p>What do they think? How does your thinking compare to theirs?</p> <p>In which cup does the ice seem to start melting first?</p> <p>How much time did it take for the ice to melt in each cup?</p> <p>Did the type of cup affect the rate at which the ice cubes melted? If so, what do you think causes this? What science ideas can help to explain your observations?</p>	<p>Grades 4-8</p> <p>What do you notice? What do you wonder?</p> <p>Record your observations. Share your thinking with others. What do they think? How does your thinking compare to theirs?</p> <p>Think of your toy as a system. What are the parts (components) of the system? How are the components within the system interacting (working together)?</p> <p>Can you identify any subsystems in the toy system? If so, describe one subsystem.</p> <p>Share your thinking with others. What do they think? How does your thinking compare to theirs?</p>	<p>Grades 4-8</p> <p>What environment does the animal live in? How is the animal interacting with its surroundings? Observe the animal's behavior for 10 minutes. Record what the animal does. What did you notice? What do you wonder?</p> 	 <p>Grades 4-8</p> <p>Think of your gadget as a system. What are the parts (components) of the system? How do the parts (components) of the system work together to perform the function your gadget is designed to perform? Do you have to interact with the gadget to get it to perform its function? How so? What material(s) is your gadget made of? How do you think the gadget is made?</p>	<p>Grades 4-8</p> <ul style="list-style-type: none"> • Search for things by shape. Name the shape. Look for similar shapes. Look for congruent shapes. • Search for living and nonliving things. • Search for natural and human-made objects. 
<p>Grades 9-12</p> <p>What do you notice? What do you wonder?</p> <p>Record (write and draw) your thinking and/or share your thinking with others. What do they think? How does your thinking compare to theirs?</p> <p>Did the type of cup affect the rate at which the ice cubes melted? If so, what do think causes this? What science ideas can help to explain your observations? What's happening on the molecular level? Draw a model that explains your observations.</p> 	<p>Grades 9-12</p> <p>What do you notice? What do you wonder?</p> <p>Record your observations. Share your thinking with others. What do they think? How does your thinking compare to theirs?</p> <p>Think of your toy as a system. What are the parts (components) of the system? How are the components within the system interacting (working together)?</p> <p>How are the components interacting with components outside the system? What forces are acting on the system? What energy flows into and out of the system? Draw a picture that shows how energy is flowing into, within and out of the system. Share your thinking with others. What do they think? How does your thinking compare to theirs?</p>	<p>Grades 9-12</p> <p>How is the animal interacting with the environment? Observe the animal's behavior for 10 minutes. Record what the animal does.</p> <p>Is the animal interacting with humans? Does the animal rely on humans for its survival? If so, in which ways? What did you notice? What do you wonder?</p> 	 <p>Grades 9-12</p> <p>Think about the input/output of a function. What is the relationship between what you do to the gadget (input) and what it does in response (output)?</p> <p>What material(s) is your gadget made of? How do you think the gadget was manufactured? Think about the carbon footprint of the manufacturing process. Where did the materials come from? Where was the gadget manufactured? How did the gadget get to you?</p>	<p>Grades 9-12</p> <ul style="list-style-type: none"> • Search for natural and human-made objects. • Search for geometry hidden in nature and human-made structures. Search for mathematical patterns such as fractals, spirals, or tessellations. • If you have a mobile device, download the Seek by iNaturalist app and identify the living things that are native and nonnative to your neighborhood. 
<p>Extension activities</p> <p>Repeat the experiment using two cups/water bottles made of the same material; one single-walled and one double-walled (sometimes called insulated). These are often made of plastic, metal or ceramic. Which one keeps the ice frozen longer?</p> <p>Repeat the experiment, placing ice cubes in different liquids.</p> <p>Water versus soda? Water versus iced tea? Water versus fruit punch?</p> <p>What's going on?</p> <p>Note: The type of cup can greatly affect the rate of your melting ice. This is because the cup acts as an insulator. Some materials are better insulators than others. Heat energy from the surrounding air flows toward the ice cube. The ice cube absorbs the energy from air that has a temperature warmer than freezing. Adding heat can cause ice (a solid) to melt to form water (a liquid). The thermal conductivity of a material determines how good an insulator it is. Thermal conductivity is the ability to conduct heat. The best materials for insulation are the ones with the lowest thermal conductivity.</p>	<p>Extension activities</p> <p>You cannot observe the inside of the device. Using your observations of the external parts, predict what the internal parts of the system might be. Draw a labeled diagram of your prediction. Discuss your predictions.</p> <p>What's going on?</p> 	<p>Extension activities</p> <ul style="list-style-type: none"> • Focus on one part of the animal, like a foot or an ear. Make close observations of just that body part. What do you notice and wonder when you make close observations that you didn't notice when you were observing the whole animal. • Try it again. Choose another living thing to draw. Find an animal or even a plant this time. Use the ABCDEs of scientific sketching to record your observations. • Turn your scientific sketch into art; research a style of art such as pop art, impressionist, surrealism, etc. and draw your animal again using the style and technique of your chosen art style. • Observe how the animal moves. Mimic the animal's movements. Think about what muscles your body is using to move like your animal. Are they the same muscles you use to walk? <p><i>*Accurate, big, colorful, detailed and explained.</i></p>	<p>Extension activities</p> <ul style="list-style-type: none"> • You cannot observe the inside of the gadget. Using your observations of the external parts, predict what the internal parts of the system might be. Draw a labeled diagram of your prediction. • Find a gadget that is no longer functioning. Ask a parent if you can take the gadget apart. Make detailed observations about the construction or composition of the gadget. This process is often called reverse engineering and can help determine how a gadget works. • Many household items are made from natural resources, such as plants, animals, rocks, and fossil fuels. Go on a search around your house and record all the household items you see that are made of each type of natural resource. 	<p>Extension activities</p> <ul style="list-style-type: none"> • Turn your outside adventuring into a scavenger hunt for someone else. Make a list of 10 items likely to be observed in your area. Exchange your list with someone else. See how long it takes for them to find all of the items. If you are short on time, set the timer for 10 minutes and see how many items they can spot. • Go on a sound hunt. When we make observations, often focus on the things we can see. Making observations in science includes using all of your senses. • Challenge yourself to go on a geometry hunt. Search for angles hidden in nature and human-made structures. Look for examples of symmetry in nature and human-made structures. • After your outside scavenger hunt, look back at the data you collected. What do you notice? What did you observe the most? The least? What do you wonder? Share your thinking with others.