

K-12 Science Family Guide

The state of Wisconsin sets expectations, or standards, for what every student will know and be able to do in school. This guide is designed to help you understand those standards and partner with teachers to support your child's learning in grades kindergarten through twelfth. If you have questions about this information or your child needs extra help, please talk to your child's teacher.

Science

Making sense of the world around us and solving problems

Ideas of What I Might Learn and Do in Grades K-2 (progressing in difficulty)

I can...

Observe the weather each day. and write basic words and draw pictures to describe it on the same paper or notebook. [Engage in weather related media.](#)

Write ideas, draw pictures, or discuss how parent animals help their young survive. Observing outside or watching videos ([like of these live penguins](#)) might provide ideas.

Investigate (safely) and sort the trash each day to see what can and can't be recycled (unsoiled paper, hard plastic, & glass = ok).

Experiment with flashlights in the dark. When can or can't you see something? Where does light come from? [This page has more ideas.](#)

Use common objects or a ruler to measure objects and distances - whole inches are fine. Discuss [Sid the Science Kid's work with measuring.](#)

Create different things [using the same few number of LEGOS](#) or other building materials. Give evidence that a few materials can make lots of different things.

Look at and draw the moon each day or evening, or help take a picture of it. Continue for a few weeks to a month. Discuss patterns you see with someone.

Make a [terrarium](#) from outside plants and other materials in a bottle, jar, or other container. Share what plants need to survive. Design an experiment that gives evidence of what plants need to survive..

Make sounds with a variety of things around the house. Feel them as they make sound. Feel your throat as you make sounds. What do you notice? [Make a string phone](#) and experiment with it.

Investigate different ways to make ice melt faster or slower. Design a method to make it melt as slowly as possible, even outside in the sun.

Questions to Support Learning

- What do you notice? What do you wonder?
- Does it happen again? Is there a pattern you see?
- What do you think caused that?
- Why do you think that? What evidence do you have to support your idea?
- How does that connect with other things around it?
- What if it was a lot bigger? What if it was a lot smaller?
- What parts of the _____ help it to _____?

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Ideas of What I Might Learn and Do in Grades 3-5 (progressing in difficulty)

I can...

Use evidence from photos at home (or in books [or online](#)) to say that people [or animals](#) are part of the same family. List similarities and differences.

Go on a rock hunt and place them in categories based on their properties (that you decide or [ideas here](#)). Use evidence [to determine rock types](#).

Rolls balls or [cars down a ramp](#) (cardboard, wood), measure how far they go, and predict how far they will go if the ramp is at a different angle.

Write observations (first) of a little vinegar* and either [baking soda](#), a [penny](#), [chalk](#), or [an egg](#). Put them together and make observations of what happens and the materials afterward [egg will take a day]. Use evidence to support a claim that you now have new materials. *Make sure to have parent help.

Go outside or use videos to study and compare how body structures of mammals ([squirrel](#)), birds ([eagle](#)), or insects ([grasshopper](#)) help them do important things in life. Play a game to design an alien [with special structures for a different world](#).

Drop a variety of objects from a high (safe) location. Make observations of what falls quickly or slowly. Look for patterns for how things fall. This can be tricky - [does heaviness matter](#)? Compare a crumpled up vs. flat piece of paper to see.

Fill up a sink or a tub with water and experiment with making waves of different sizes. What causes higher or wider waves? [Put in a floating object](#). Investigate and describe whether it moves or stays in the same place with waves and why.

Make [a model of moon phases](#) with a small ball for the moon, larger one for the earth, and a light source for the sun. Imagine you're tiny and on that earth; what phase of the moon do you see with the other ball? Draw it. Move the moon, draw again.

Make and write down observations of food on a plate using all five of my senses. If you had hot food and touched it, draw a model that shows how the signal goes from the skin, to your brain, to your arm muscles to move your hand away.

Research and solve a problem in your community for people or animals. It might involve how people get around safely or where animals can live, like in [this SciGirls Episode](#).

Questions to Support Learning

- What do you notice? What do you wonder?
- Does it happen again? Is there a pattern you see?
- What do you think caused that?
- Why do you think that? What evidence do you have to support your idea?
- How does that connect with other things around it?
- What if it was a lot bigger? What if it was a lot smaller?
- What parts of the _____ help it to _____?
- What has changed? What has stayed the same?

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Making sense of the world around us and solving problems

Ideas of What I Might Learn and Do in Grades 6-8

I can...

Investigate which hand washing methods are the best by using a powder from the kitchen on my hands. [Watch a short video](#) and [another short video](#) for further details on handwashing and describe how it kills germs.

Investigate a [match before and after it burns](#) (with parent supervision) and water before and after freezing. Use evidence from properties before and after to explain whether or not a chemical reaction occurred in each case.

Brainstorm a few reasons that some organisms in a species might be better able to survive and reproduce than other organisms. Use that as evidence to explain why evolution occurs over generations. [Use this simulation for further ideas.](#)

[Build a model of a landfill](#) in a bin using clay, dirt, cloth, and or other materials for the bottom layer and a wall midway. Add clean garbage and then colored liquid (kool aid, food coloring). Observe over time and improve if color seeps through to the other side of the wall or below.

Review [the parts of a cell](#). Write an analogy of cell organelle functions with the functions of parts of a home, school, city, farm, or something else from life.

Watch the weather report on the TV news or internet and use the information to draw a Midwest region [weather map](#) for two weeks, writing details on what weather is like in your community. Analyze patterns in your weather in relation to the larger map.

Draw a [diagram showing the forces on a paper airplane](#) in flight. Make and alter a paper airplane so it flies right, then so it flies left. Show in your force diagram how those forces cause it to move right or left.

Using balls of different sizes or paper cut-outs, safely make a solar system scale model in your community. A map could help, [as well as this NASA resource](#). Compare that to the [scale of the universe](#).

Make observations as you put a sealed, empty water bottle in ice water and in hot water. Use evidence to describe how temperature affects gas. Explore patterns [in this simulation](#) for further evidence.

Look around in your community and [figure out what problems exist](#). Where are there opportunities [to learn while serving](#)? Are there problems requiring science and engineering skills? Talk to your local city government for ideas. Design and implement a solution.

Questions to Support Learning

- What do you notice? What do you wonder?
- Does it happen again? Is there a pattern you see?
- What do you think caused that?
- Why do you think that? What evidence do you have to support your idea?
- How does that connect with other things around it?

- What if it was a lot bigger? What if it was a lot smaller?
- What parts of the _____ help it to _____?
- What is energy or matter doing in this situation?
- What has changed? What has stayed the same?

Science

Making sense of the world around us and solving problems

Ideas of What I Might Learn and Do in Grades 9-12

I can...

<p>Look at some real data in bodies of water near where I live or in wells (or use my own home data) and observe/analyze patterns. Analyze whether pollution is getting worse or better and research causes and solutions. As possible, enact a solution in your home or community.</p>	<p>Design, build, and improve a device that will transfer energy. Draw a model of that energy transfer. Devices could include a Rube Goldberg machine, solar oven (time to squishify a marshmallow or melt ice), or wind turbine.</p>
<p>Investigate patterns of antibiotic resistance and review current research on this problem. Create a public service announcement (or other graphic) to share why antibiotics should not be used to treat viral infections (such as coronaviruses).</p>	<p>Create a simulation of motion, forces, and acceleration of objects of different masses in an online program like Scratch, or by spelling out mathematical parameters and key variables on paper to model what a simulation could look like.</p>
<p>Repeat a movement until a muscle feels a little sore. Hypothesize why that's happening. Gather information from resources on why this happens and how it can be helped or prevented.</p>	<p>Investigate how nuclear power works, gather resources to explain the pros and cons of both fusion and fission reactions, and draw models of each. Make a claim with evidence about whether fission power will be possible at a practical level.</p>
<p>Investigate factors that speed up or slow down a chemical reaction (with parent supervision). Record results. Use household materials with eye protection and ventilation (vinegar, baking soda, effervescent tablet, match, candle, baking, juice, styrofoam, nail polish remover, etc.). In each case, describe the molecules that make up the reactants and products.</p>	<p>Go out at night with another person and a lightsource (flashlight). Get as far away as possible while still seeing the lightsource and being safe. Then, try to yell and still hear each other. Draw a model of the light waves and sound waves that answers why it's easier to see the light (electromagnetic radiation) than hear the sound (mechanical wave).</p>
<p>Look around in your community and figure out what problems exist. Where are there opportunities to learn while serving? Are there problems requiring science and engineering skills? Talk to your local city government for ideas. Design and implement a solution.</p>	<p>Find multiple articles from different types of sources on a current topic where there are popular and scientific viewpoints that might not mesh (ideas include Covid-19, climate change, dam removal, alternative energy, etc.). Evaluate the articles for bias.</p>

Questions to Support Learning

- What do you notice? What do you wonder?
- Does it happen again? Is there a pattern you see?
- What do you think caused that?
- Why do you think that? What evidence do you have to support your idea?

- How does that connect with other things around it? What are the important parts of the system?
- What if it was a lot bigger? What if it was a lot smaller?
- What parts of the _____ help it to _____?
- What is energy or matter doing in this system?
- What has changed? What has stayed the same?