Classroom Connections

Water Connections: Have students each think of a Minnesota-related object—any object—and write it down or draw a picture of it. After they have made their choices, have them brainstorm (and research, as appropriate for your circumstances) how water has affected that object, and how that object might affect water.

Water Stories: Water is a common theme in literature. Has your class read a book or short story set in Minnesota? How was water part of the story—in concrete or metaphorical terms? See some examples at www.mndnr.gov/projectwet/waterways.

Map Scavenger Hunt: Minnesota is all about water! Our state's name comes from a Dakota term meaning "sky-tinted water." Hand out state highway maps, and challenge students to find as many communities as they can with water-related names.

Water Poetry: Invite students to imagine where the water inside them has been. Have them draw pictures or write a story or poem that illustrates their imaginings.

Where is Water Droplet? Invite younger students to build a story together of the adventures of a water droplet. Hold a cutout of a water droplet in your hand, and start the story by describing the fall of a water droplet named Drip from the sky during a rainstorm. Pass the cutout to a student, and invite him or her to describe what happened next. Keep passing the cutout until everyone has had a chance to add to the story. Does Drip go into animals or plants and out again? Does Drip end up back in the air? At the bottom of a lake? There is no end to the places a drop called Drip can go!

Frozen Cars: Explore with very young students how water behaves differently under different circumstances by freezing small toy cars into a few of inches of water in two identical containers. Remove the car-ice blocks from the containers and put them side by side in a larger container. Add salt to one of the blocks. Talk about what might happen. Give students the opportunity to return to the display over the course of the day so they can observe melting in action.

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Watershed Address: Use a map to figure out your watershed address—starting at your school, show the path that a drop of rain would take on its way to the ocean. If it makes it all the way, how far does it travel? Invite students to think about what might happen to that drop of water along the way. In the spirit of *Paddle-to-the-Sea,* invite them to write stories describing the droplet's imaginary adventures as it journeys to the ocean.

Wet Calculations: Use water as a way to explore the application of mathematics concepts you are teaching. Are students practicing multiplication? Ask them to figure out how many water molecules are in a teaspoon, Converting units of measurement? Have them figure out how many liters of water are in Lake Superior.

Water Moving Mountains: Give younger students a chance to play with water and sand. If you pour a little bit of water onto of a mountain of sand, where does it go? If you pour a LOT of water onto a mountain of sand, then where does it go? With enough water and sand you can make rivers, lakes, groundwater, and even oceans of your own!

What's in a Name? Research the origin of the name of a lake or river near you. When did it get its name? Who named it, and why did they give it that name? Has it had other names?

Map Investigation: Distribute road maps of Minnesota to pairs of students. Ask each pair to think of a question about Minnesota's lakes or rivers they could answer using the map. Then have them use the map to find the answer to the question. Examples: Are there more lakes in northeastern Minnesota or in southwestern Minnesota? In which direction does the Mississippi River flow? How many cities and towns have the word "Lake" or "River" in their names? What proportion of the state's border is formed by water?

Roots of Water Words: Explore the ancient Latin and Greek roots of water-related terms and how those roots link them to other English, French, or Spanish words. What is the common connection between sinuosity, sinus, and sine? How about agua and aquifer? Hydrology and hydrant? Sediment and sedentary? Lac, laguna, and lagoon?

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Charting Wetland Types: Work in small groups or as a class to develop "compare and contrast" charts for various wetland types. Based on research, have students identify traits that wetlands share, and traits that distinguish them from one another. Make observations on how and why they vary.

How Much Water Can it Hold? Use sponges to demonstrate the water-holding capacity of a wetland. Provide groups of students with a dry sponge on a plate and a water dropper. (Use a variety of sponges with different characteristics if possible.) Invite students to add water drop by drop to the sponge until it begins to pool on the plate. How many drops were they able to add before the sponge's capacity was reached? Where was the water? Why did it stay there instead of flowing through onto the plate? (Review traits of water from Chapter 1.)

Local Groundwater: Ask your local watershed district or soil and water conservation district for information about aquifers in your area. Is there an aquifer under your school? What is its name? What kind of aquifer is it? Where does it get its water? Where does water go when it leaves the aquifer?

Pore Space: Fill jar with rocks and ask students how much space is left. Pour in sand to fill up the spaces between the rocks and ask the same question again. Then pour in water, to show there is still pore space available. Help students see that groundwater exists in pore spaces between soils and rocks.

Where Does it Flow? Ask students where they think the water that lands on your school ultimately flows: into the Red River of the North, the Great Lakes, the Mississippi River, or the Missouri River. Use maps to figure out the correct answer.

Water Observations: For very young students, take a variety of items, such as a piece of plastic, a wooden plank, a pan with some rocks, and a pan with soil. Add a cup or two of water to each sample and have the students observe what happens to the water—does it run off? Form puddles? Soak in? Erode the objects? Have the students continue to observe changes for a day or two.

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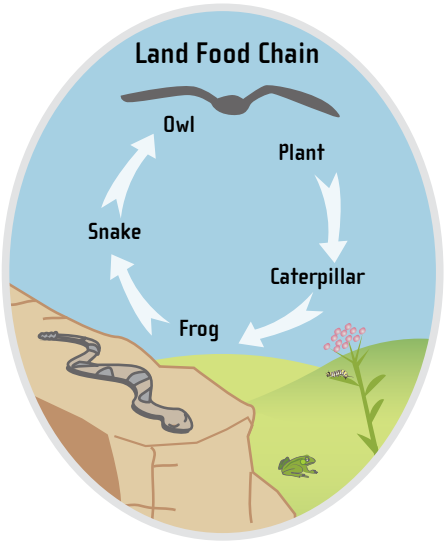
Comparing Aquatic Communities: Compare and contrast plant and animal communities in various bodies of water, including major types of creatures: producers, consumers, decomposers. What are the common ones in each?

Food Chains: Compare land and water food chains. Which are longer and more complex? Why?



Simple Aquatic Plant and Animal Identification: Show very young students large pictures of a variety of well-known Minnesota aquatic animals and plants and ask "Who am I?" types of questions for each. Follow this up by learning more about each animal or plant and its habitat. See "Nature Snapshots" on the DNR website for species background information.

Class Pet: Help very young students appreciate the importance of water to life by keeping a fish, toad, or other animal in your classroom. How does it use water?

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Community Roots: Invite students to research the history of water in your community or another community with significance to them. How were local lakes and rivers used in the past? What body or bodies of water sustain people and businesses there today? How do they do so?

What are Ecosystem Services? Have older students identify and explore an ecosystem service provided by water that moves through the water cycle in your community. If water were not available to perform that service, how would the service be provided, and what would it cost? Some ideas: irrigating farm fields, washing streets, filtering sediments and nutrients from runoff before it gets to lakes or rivers, providing cooling water for power plants, cooling the air through evaporation, providing shade (in the form of clouds), transporting cargo up and downstream, providing recreational opportunities.

Calculate Your Water Footprint: Students can get a sense for their own water footprint. Help them identify the source of the water they use at school and at home. Then have them keep track of how much water they use for a week. Do a web search for "personal water use" and "water footprint calculator" for some guidelines on numbers to use for brushing teeth, flushing the toilet, washing dishes, etc.

School Water Use: Talk to your school's facilities management staff to determine how much water is used at school each day—inside and out. What are the biggest users of water: restrooms, swimming pool, sprinkler systems? How much money does you school spend on water each year? How could you help reduce water use?

Sharing Water Stories: Invite very young students to share stories of fun they've had with water—playing in a puddle, swimming in a pool, washing dishes, watering the garden, riding in a boat, walking in the rain, splashing in the tub.

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Research and Protect: Choose a body of water near you. Research past, present, and anticipated future threats. Explore what people have done/are doing to protect it. If there is a need, consider taking it on as a class project. Write an article for the school or local newspaper about the project. Younger students could collect trash around the school grounds to keep it from collecting in local water bodies.

Local Scene? Have students contact city or county environmental staff, soil and water conservation district staff, or watershed district staff to learn what each office is working on and find ways the class or any citizen can become involved in the needs of the community.

How big of a problem is urban runoff? Practice math skills by calculating the amount of water prevented from soaking in by some familiar impervious spaces—your school building, a typical city street, or the parking lot at the mall. A house with a 1,000-square-foot footprint, for example, sheds more than 600 gallons of water during a one-inch rainstorm.

Drinking Water Reports: Water suppliers that serve the same people year-round must prepare annual water quality reports (consumer confidence reports) for their customers. The reports tell where drinking water comes from, what's in it, and how you can help protect it. Water suppliers send out CCRs to homes and some post them online, however, citizens can request a copy from their local water utility. Have your students contact your local water supplier to get a copy of the local Consumer Confidence Report and learn about their tap water.

Observing Water Samples: For younger students, brainstorm a list of six places you can find water in your community (including running out of the faucet). On your own, reuse plastic peanut butter jars to collect samples of water for each and put the jars on display in your classroom. How do the samples differ? Are some cleaner than others? If so, why?

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Local Laws: Choose a body of water near your school. Find out what laws protect it, and in what way. Find out what public agencies are responsible for caring for it.

Tragedy of the Commons: Why are water laws necessary? Read Garrett Hardin's classic article The Tragedy of the Commons (Science 162 (3859): 1243-48, readily accessible online). Present the concept to your students and discuss it with them in an age-appropriate way.

Create a Law: Invite students to propose a law they would like to see put in place to protect Minnesota's waters. Introduce the basic principles of debate, then allow students to participate in a formal debate of the proposed law.

Officer in the Classroom: Invite a conservation officer to your classroom to talk about laws that protect water and hear some amazing stories of how people break them.

Local Water Issues: Have students identify a water issue that is important in your community. After researching the issue, have them contact the appropriate elected representatives to express their opinion about it.

Water Law Lineup: Make a human timeline of water laws and milestones in class to get the group moving on a difficult and abstract subject.

How Can You Protect it? Ask young students if they were in charge of a lake or river, how would they protect it from harm? Students of any age can help brainstorm a set of rules to help keep a body of water in or near your community healthy.