

Water(sheds), Water(sheds) Everywhere

“Do unto those downstream as you would have those upstream do to you.” –Wendell Berry

Background Information:

Bin Information

This lesson is the second in a series on water. The purpose of this activity is to teach students more about watersheds and the interconnectedness of the water around us. It is preceded by “Water Cycle Whirl,” where students travel through the water cycle as droplets, and followed by “The Great Groundwater Debate” where students will learn more about groundwater and discuss how to treat it as a resource.

Information for Instructors

What is a watershed?

Watersheds, also called drainage basins or catchments are land areas that all drains into the same outlet. There is a watershed for every body of water, varying in size. Large watersheds contain many smaller watersheds.

When precipitation falls, the watershed that it falls on determines where it will flow. Most will find its way to the outpoint, and some will stay in the watershed, infiltrating pervious surfaces and either enter the flow of water through seepage or sink deeper and be groundwater.

Why are watersheds important?

It is important to understand watersheds, because they are key in identifying how connected the water cycle is. What happens in one area will carry over to the rest. In a watershed, when water picks up pollutants in one area, it will carry them to the outpoint.

Lakeville’s watersheds:

Watersheds nest inside each and can be more and more specifically defined the smaller that you go.

Minnesota can be broken up into 80 major watersheds. Of these, Lakeville is divided between the Lower Minnesota River watershed, and the Mississippi River-Lake Pepin watershed.

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Themes:

Exploration, Watersheds, Impervious surfaces, Stormwater

Estimated Duration:

45 minutes

Audience Identified:

3rd-5th Grade

Location:

Classroom or outdoors

Goal:

Students will be introduced to the concept of watersheds and understand that what happens in one part of the watershed effects the whole.

Objectives:

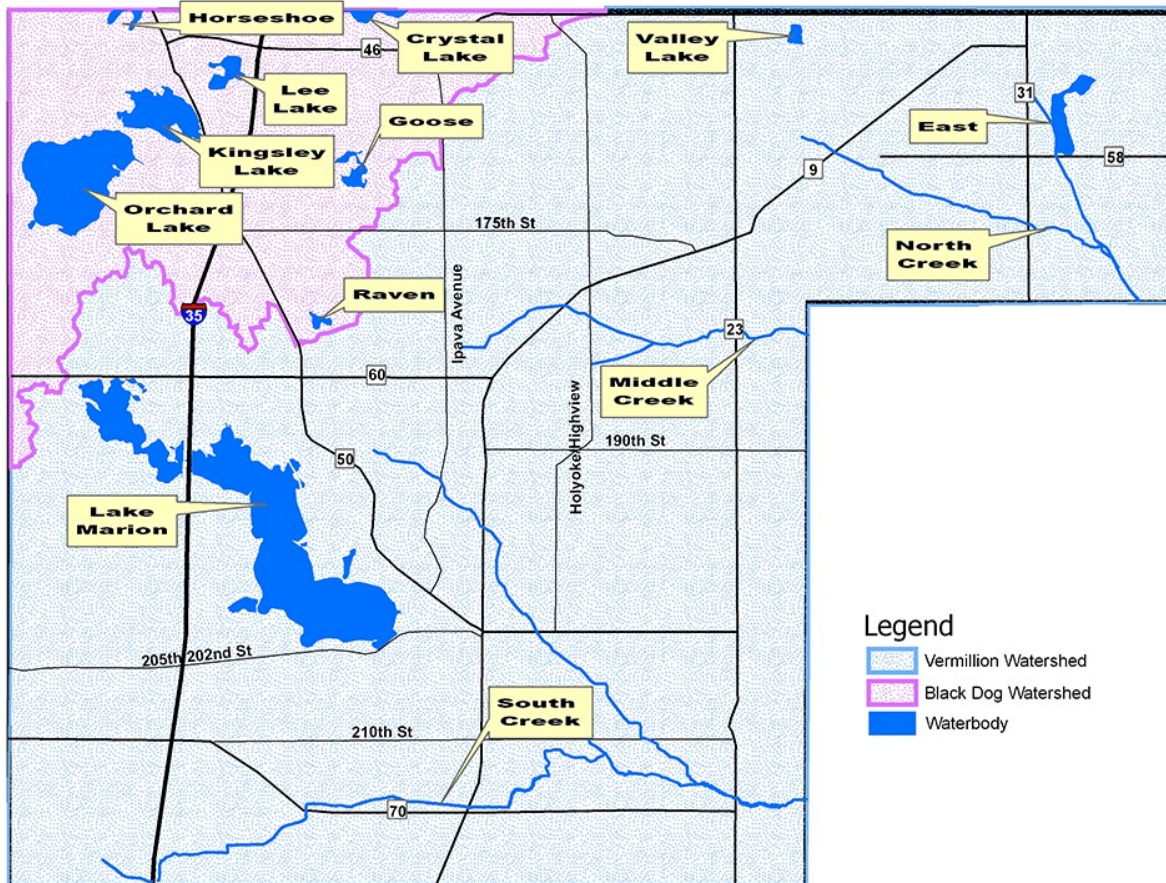
Students will be able to define ‘watershed.’

Students will know the difference between impervious and pervious surfaces and give examples of each.

Students will apply the elements of the watershed model to the real world.

The above two watersheds, and Lakeville, also fall in the Mississippi watershed, which is the largest in the United States.

Lakeville also is split between the [Vermillion Watershed](#) and the [Black Dog Watershed](#).



Vocab:

- **Precipitation:** Liquid and solid water particles that fall from clouds. Rain, snow, hail, and sleet are all types of precipitation. Fog is not.
- **Pervious Surfaces:** A surface that water can infiltrate.
- **Impervious Surfaces:** A surface that water cannot infiltrate.
- **Surface Water:** Lakes, streams, reservoirs, and wetlands.
- **Groundwater:** Water held underground in the soil or in pores and crevices in rock.
- **Drainage Divide:** Ridges and hills that separate two watersheds

Materials and Set-Up:

This kit includes:

- Watershed Model
- Spray bottle
- Cut sponge pieces

- Food coloring

You will need:

- White board or large piece of paper
- Marker

Set-Up:

- Set out the watershed model where it will be easy to gather a group around.
- Fill the spray bottles with water.

Introduction:

Estimated Duration: 10 minutes

Attention Getter:

The instructor calls out “All together!”

The students start with their hands apart and draw them down and together to symbolize a funnel to recall that in a watershed all of the water either ends up or exits in the same spot. As they do so, they should call back “Watershed!”

Warm Up:

Start the lesson by defining what a watershed is and assessing prior knowledge. On a whiteboard or large sheet of paper, write “WATERSHED” in large letters. Ask students in the group if they have heard of a watershed before or have an idea of what it might be. Give students time to approach the board or paper and write or draw on it what they think a watershed is, or put down ideas that they think are related to it.

If students need prompts, break the word into its two parts ‘water’ and ‘shed’ and work from there. (What happens when a dog sheds? The fur comes off...what could that mean when talking about water?)

After students have had time to share and think, share the definition of a watershed as ‘a land area that channels rainfall and snowmelt to creeks, streams, and rivers, and eventually to outflow points such as reservoirs bays and the ocean’ (NOAA). Or you can use the definition ‘an area where all of the water eventually flows to a common point is a watershed.’

Take a few minutes to go through student definitions and which parts were right and which were wrong. Ensure that everyone has a basic preliminary understanding of a watershed. At this point, introduce the attention getter if desired.

Content and Methods:

Estimated Duration: 20 minutes

- Gather around the watershed model as a group and have a few students point out some of the features on it. You may also make connections to real-world features.

- Tell students that the water that washes off of the land after a rainstorm is known as stormwater. Ask them where they think the stormwater will go if there is rain over the watershed.
- Once students have shared their thoughts, pass around the spray bottle and have students take turns spraying once or twice over the model to make it rain. Observe where the water gathers and where it runs. Use this to reiterate what a watershed is. Determine what the largest watershed on the model is, and then look to see if there are any smaller watersheds contained within it.
- Wipe down the watershed model with the towel.
- Ask students to think of some ways that this model of a watershed is different than a real watershed. Share the vocab words 'impervious' and 'pervious' surfaces, and explain that currently all of the surfaces in this model are impervious and water cannot penetrate through it. Come up with some examples of impervious surfaces around them, such as parking lots. Add the sponge pieces in a few spots and repeat the rain event to see how it changes.
- Wipe down the watershed model with the towel.
- Remind students that all the water in the watershed is connected. Talk for a little bit about what that means practically; have students share their thoughts. Ask what might happen if something bad gets in the water in one place; will it stay there? Use the food coloring or gelatin to mark points of pollution entering the watershed and have students make it rain while observing what happens to the pollution. Wipe down the model.
- You may choose to repeat the last step several times to test different areas, or have students come up with specific examples of what is happening to cause the pollution.
- Wipe down the watershed model with a towel when finished.

Conclusion:

Estimated Duration: 5 minutes

Have students pair up to talk about the following questions:

- Does your school (or house, park, etc.) have more pervious or impervious surfaces? Do you think that it has changed over time?
- Did watching the water flowing on the model remind you of any ways that you have seen water flow in real life?
- What is an example of pollution that you could help clean up before it is spread into the watershed by stormwater?

Reflection and Evaluation:

Estimated Duration: 10 minutes

Reflection

Give each student a piece of paper, and have them fold it in half to create a line down the middle. On one half of the paper, have them write the word watershed, and like the intro activity, add words and drawings of things that define or are related to a watershed.

On the other half of the paper, students can draw a location that they are familiar with such as a place in their home, school, or a park. On this drawing have them label the following (you may choose to write these out on the board to help students remember):

- A pervious surface
- An impervious surface
- A source of water
- A place where water collects or flows to
- Arrows marking the flow of water

Evaluation

Collect or walk around and check off the word cloud and drawings assigned above to check for understanding of the objectives.

Extensions:

Distance Learning Option

In case of distance learning, students can make their own model of a watershed at home to observe. They will need a plastic bag, and a variety of small objects. All they will need to do is arrange the items to make a topography with ridges and valleys and place the bag over the top. Then they can spray down the surface to watch where the water runs and use that experience to answer prompts from their instructor.

A shortened version of this lesson is available on Seesaw here:

https://app.seesaw.me/pages/shared_activity?share_token=Rh8syCmTQXGU8cZ-yRXPtW&prompt_id=prompt.8b2f3684-9832-48a5-8b89-3a791b37ec22

Big River Journey Online

Created by the Mississippi National River and Recreation Area in collaboration with the Center for Global Environmental Education through Hamline University, the Big River Journey features videos and interactive activities that all relate to the Mississippi watershed. These activities can be used to supplement the activity bin in person or as part of a distance learning experience. The materials are free to use and can be found at bigriverjourneyonline.org

Adopt-A-Drain

For a hands on application after the lesson, your group can adopt a drain by going to www.adopt-a-drain.org and committing to 15 minutes twice a month to clean a storm drain near you. This is a great way to reinforce that what happens in one part of the watershed effects the rest, to show how impervious surfaces change the way that water flows and so we must adjust how we act around it, and is a very easy community service opportunity.

Reference Materials:

City of Lakeville. (n.d.). Lakes, Watersheds & Wetlands: Lakeville, MN. Retrieved from <https://www.lakevillemn.gov/202/Lakes-Watersheds-Wetlands>

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