

4th-5th Grade SCIENTISTS ON THE GO

Discover Your Watershed

What watershed do you live in? A watershed is an area where all the water on that land drains to one place. Imagine a bathtub as one watershed. All of the water in the bathtub goes down one single drain. Watersheds are all shapes and sizes. The Amazon River watershed is the largest in the world where over one third of South America, 2.7 million square miles, drains into the river. In Washington, the Nisqually River watershed that starts at Mt. Rainier drains water from 258 thousand square miles of land.

► Use the map on page two to answer the following questions. Explore your watershed even more by visiting mywaterway.epa.gov.

1. What town and county do you live in?

Town _____ County _____

2. How are rivers and water bodies shown on the map? Describe the shape or color.

3. Trace the rivers or streams that connect to the largest water body on the map, Puget Sound, the southern part of the Salish Sea. Name two creatures that live in the Salish Sea.

4. How many watersheds do you see on the map? _____

5. Find the general area that you live in and mark it with a star. What watershed do you live in?

6. Your home and school are in a watershed! Circle everything below that is also in your watershed.



Pets



Satellites



Dinosaurs



Gardens and Farms



Cars



Wild Animals

We'd love to see your finished activity!

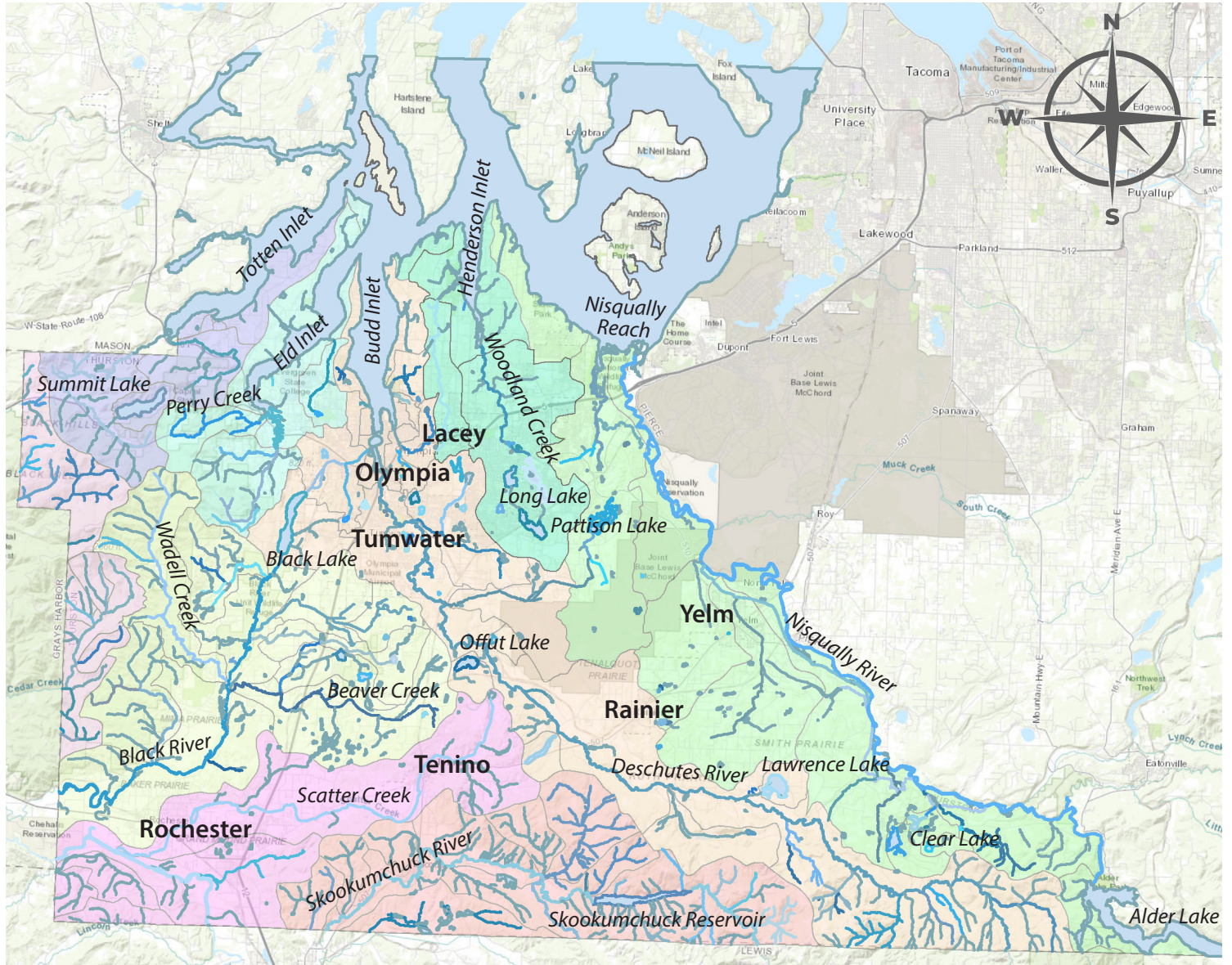
Email a photo to info@wetsciencecenter.org and receive a prize.












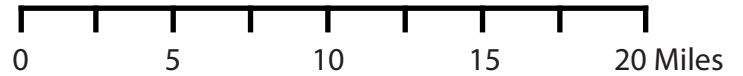
Thurston County Watershed Map

We all live in a watershed! Watersheds encompass all land and cross many political borders, like cities, states, and even countries. Some watersheds on this map extend beyond the Thurston County border, but are not shown here. For example, the Nisqually River Watershed extends to the other side of the river and all the way to Mount Rainier!

► Use this map of Thurston County to explore our watersheds with the questions on page one.



WATERSHED MAP KEY	
	Henderson Inlet
	Black River
	Budd/Deschutes
	Chehalis River
	Eld Inlet
	Nisqually River
	Skookumchuck River
	Totten Inlet
	West Capitol Forest



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGU, GAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL., Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstop, OpenStreetMap Contributors, and the GIS User Community

Make a Paper Watershed



How does water move over land? In a watershed, runoff is water that doesn't soak into the ground, but keeps flowing over land until it reaches a water body. Where it goes depends on the topography of that land. Topography is the study and description of physical features of land like mountains, hills, and valleys.

► **Create a model watershed and rainstorm to observe how water travels over land.**

Build and Test Your Model

1. Gather your supplies. Fill up your spray bottle.
2. Crumple your paper into a ball. Carefully unfold the paper, but don't flatten it all the way! The ridges and wrinkles are the topography of your watershed.
3. Place your paper watershed on your tray or cookie sheet.
4. Use a **brown marker** to trace and connect all the highest points on your paper. The lines represent mountain ridges that direct water into different watersheds.
5. Fill in the lowest points on the paper with a **blue marker**. These represent areas that water runoff will drain to, like rivers, lakes, wetlands, Puget Sound, and the ocean.
6. Use a **red marker** to draw several places on the map to represent human structures, like schools, apartments, houses, shops, parks, and farms.
7. Write what will happen when it rains on question one of "Reflect on Your Watershed" below.
8. Make it rain. Use your spray bottle, or water bottle with holes poked in the lid, to spray the entire watershed for 10 seconds or until your markers start to bleed. This represents rain and snowstorms.
9. Where does the water flow? Answer the reflection questions to record your results.

Supplies

Washable markers (brown, blue, red)
Spray bottle (or bottle with holes poked in lid)
Baking tray or shallow dish
Sheet of paper



Step 4: Draw ridge lines.



Step 5: Color areas with water.



Step 6: Draw human structures.

Reflect on Your Watershed

1. Predict: What do you think will happen when it rains in the watershed and where will the water go?

2. Results: Describe where the water flowed when it rained on your watershed model.

3. Why did the runoff flow and create pools in different places in your model?

4. What is the color of the water? What does the color tell you about how water flows over land?

Infiltration Investigation

What happens to water on different outdoor surfaces? When water soaks into the ground through the cracks and pores in soil, that process is called infiltration. Stormwater is runoff from rain and snow that does not soak into the ground and keeps flowing because it landed on a surface that does not let water infiltrate, like pavement, parking lots, and roofs.

► **Test how quickly water infiltrates through different outdoor surfaces.**

Experiment

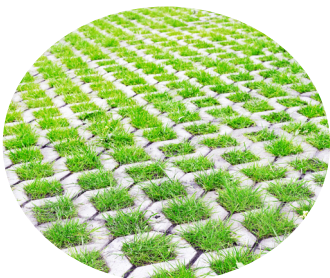
1. Gather the supplies: two cups with about the same amount of water and a timer (a phone or stopwatch).
2. Go to a safe area outside and find two different surfaces: one surface that is similar to pavement or cement and another that is soil, grass, or gravel.
3. Describe both surfaces below in the Infiltration Results Table, and record your prediction.
4. Pour one glass of water onto Surface One. Time in seconds how long the water takes to soak into the ground and disappear through infiltration. If the water remains on the surface after 60 seconds, record your time as greater than 60 seconds (>60 seconds). Record the results for Surface One in the results table.
5. Repeat step 4 for Surface Two.

Infiltration Results Table

Surface One Describe the appearance:	Surface Two Describe the appearance:
Prediction: What will happen when you pour water on the surface?	Prediction: What will happen when you pour water on the surface?
Results: How long did it take for the water to infiltrate and disappear? How much water soaked into the ground? (Circle one) <i>All Some Very Little None</i>	Results: How long did it take for the water to infiltrate and disappear? How much water soaked into the ground? (Circle one) <i>All Some Very Little None</i>

Engineering to Protect the Environment

When designing towns and buildings, engineers have to think about where the water will go when it rains or snows. Stormwater can cause floods and carry pollution to local waterways. We can reduce stormwater by building and preserving surfaces that allow water to infiltrate into soil. Circle the two surfaces that would best allow water to absorb and infiltrate into the ground, thereby reducing stormwater runoff.



Pervious Pavement with Grass



Pavement or Asphalt



Asphalt Shingle Roof



Rooftop Garden, Green Roof

Play Nutrient BINGO

What is a nutrient? Nutrients are a substance needed by all living things for healthy growth and function. We get nutrients from eating food, and plants get nutrients from sunlight and soil. A healthy balance of nutrients are an important part of a healthy watershed.

► Search for nutrient sources with your bingo card and mark what you find. How many nutrient sources can you find on a hike or neighborhood walk? Buddy up for a competition!



Nutrient Overload

Nature naturally recycles nutrients over and over again through decomposition. In this process, decomposers like worms, bacteria, and mushrooms break down dead plants and animals into nutrients and smaller parts. Unfortunately, human activity can disrupt nature's work. When humans use too many chemical fertilizers or do not pick up pet waste, there can be a nutrient overload! Extra nutrients on land can end up in bodies of water and can hurt animals living there. This is when nutrients become a pollutant, something that can harm the environment. Fortunately, we have the power and ability to protect our watershed by taking the right actions!

Watershed Steward Checklist

Your watershed needs you! This checklist will help you be a watershed steward. A watershed steward looks after and takes care of the people, animals, and plants in their watershed by keeping it clean and conserving water.

▶ **Check off the actions you'll take. Then dive deeper by answering the questions after each action.**

- Use slow-release or natural fertilizers like compost & manure.** Chemical fertilizers release nutrients faster than natural fertilizers, which means they produce more pollution in stormwater. Explore natural yard care tips at growsmartgrowsafe.org. *What is fertilizer for?*



- Always put pet poop in the trash.** A pea size piece of dog poop has over 26 million bacteria (germs), twice as much as human poop! That is a lot of bacteria that could end up in our bodies of water. *What is your dream pet's name?*

- Take a shorter shower.** Can you take a 5 minute shower? Or shower for 5 minutes less? A 15-minute shower uses over 30 gallons of water! Keep track of the time by listening to music. *What's your favorite song or artist?*



- Only launder full loads.** A washing machine uses an average of 20 gallons of water per load. If the washing machine isn't full, add in some towels or someone else's laundry before running it. *Do you do your own laundry or does an adult help you?*

- Check the septic tank for leaks.** Human waste has a lot of nutrients and bacteria that can hurt the environment if it is not treated properly. Septic tanks should be inspected by professionals every 3 years. *Ask an adult if where you live is on septic or sewer. Share your answer here.*

- Check for car leaks & repair when possible.** Oil and other fluid leaks from a car can pollute stormwater, nearby water bodies, and soil. Find resources and free leak inspections at fixcarleaks.org. *With an adult, place a piece of cardboard under the car overnight then check in the morning to see if the cardboard caught any leaks. What did you find?*



- Only flush the 3 P's: Pee, Poo, & (Toilet) Paper.** "Flushable" wipes and other trash don't break down in water so they can clog pipes, cause sewer overflows, and problems at wastewater treatment plants. *Why is it important that we clean wastewater before sending it into the environment?*

- Keep learning and tell others what you know.** The more we know, the more we can protect and care for our water. Sharing your knowledge makes your impact stronger by helping others become watershed stewards. *What is one thing you learned that you want other people to know?*



- What is another idea you have to be a watershed steward? I will be a watershed steward by...**

Words of a Watershed

► Find and circle the watershed vocabulary words. They are up, down, diagonal, and backwards.



Decomposition – the process of decomposers like worms, bacteria, and mushrooms breaking down dead plant and animal material into nutrients and smaller parts.

Watershed – an area where all the water on that land drains to one place.

Topography – the study and description of physical features of land, like mountains, hills, and valleys.

Stormwater – runoff from rain or snow, often carrying pollutants, that flows over surfaces which do not allow water to infiltrate.

Watershed Steward – a person who looks after and takes care of the people, animals, and plants in their watershed by keeping it clean and conserving water.

Infiltrate – water soaks into the ground through the cracks and pores in a surface.

Runoff – water that does not soak into the ground, but keeps flowing over land.

Fertilizer – a natural or artificial material applied to soil or plants to give plants nutrients essential to their growth.

Pollutant – something that can hurt the environment or make it unhealthy.

Nutrient – a substance that is needed in proper amounts for healthy growth and function.

