

**Time:**

(2) 30 minute classroom sessions

**Level:**

Grades K-2  
Standards selected for grade 1

**Goals:**

This lesson will provide students with an opportunity to become familiar with aspects of a healthy watershed, and the effects that human activities can have on watersheds.

**Objectives:**

After 2 lessons on watersheds, students will be able to:

1. Identify and list at least 2 attributes of a naturally healthy watershed. (*Stream*)
2. Identify and list 2 possible environmentally degrading pollutants/factors in a human-developed watershed. (*Stream*)

*Materials listed with each individual lesson plan.*

# A Watershed Community

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**Correlations to Core Curriculum:**

## First Grade

- Standard 2: Earth and Space Science. Students will gain an understanding of Earth and Space Science through the study of earth materials, celestial movement, and weather.
  - Objective 1: Investigate the natural world including rock, soil and water.
    - Indicator b: Identify and describe a variety of natural sources of water, including streams, lakes, and oceans.

**Background Information:**What is a Watershed?

A watershed is an area of land that drains to a common outlet. A watershed is typically drained by a river or stream and its tributaries, and is sometimes called a drainage basin.

Water is an essential element for sustaining life. Rivers, streams, lakes, and wetlands are the "lifeblood" of our environment. When our water is polluted, the system is in need of repair. When watersheds are healthy, the environment can support a diversity of plant and animal species. If water is the "lifeblood" of environment, the land that surrounds that water is the "muscles and bones" of the environment. Together, land and water make a watershed, a whole system. A "watershed" is the term describing an area of land united by the flow of water, nutrients, pollutants and sediments, moving down slope to the lowest point, through a network of drainage pathways that may be underground or on the surface.

Watersheds can be large or small. Every stream, tributary, or river has an associated watershed, and small watersheds aggregate together to become larger watersheds.

[http://education.nationalgeographic.com/education/encyclopedia/watershed/?ar\\_a=1](http://education.nationalgeographic.com/education/encyclopedia/watershed/?ar_a=1)  
[http://www.freedrinkingwater.com/water\\_quality/quality1/1-define-healthy-watershed.htm](http://www.freedrinkingwater.com/water_quality/quality1/1-define-healthy-watershed.htm)

What is a Healthy Watershed?

Many different attributes are needed to maintain a high quality, functioning watershed. The following characteristics are critical for a healthy watersheds:

## Did you know?

A watershed is the area of land where water drains to an outlet. Watersheds come in all shapes and sizes. They cross county, state, and national boundaries. In the continental US, there are 2,110 watersheds; including Hawaii Alaska, and Puerto Rico, there are 2,267 watersheds.

<http://water.epa.gov/type/watersheds/whatis.cfm>

- Riparian habitat and protected banks
  - Riparian areas, areas along stream banks, are covered by transitional vegetation and act as buffers between a waterway and the surrounding area. These grasses, forbs, and trees reduce bank erosion by anchoring the soil. These buffer areas also function as a wildlife corridor and enable safer and more efficient wildlife migrations.
- Good water quality
  - Good watersheds usually function best with low turbidity, minimal suspended sediment in the water, and infrequent shifts in water levels. Frequency and intensity of fluctuating water levels are also very important considerations.
- Adequate shade
  - A riparian canopy provides structure and shade, which decreases the amount of penetrable sunlight. This decrease results in less extreme temperature gradients of the surface and sub-surface water. Cooler water can hold more oxygen for aquatic species to use.
- Meanders
  - Meanders in a river are turns in the banks that result in a winding course for the waterway. These meanders slow the water down and allow for deposition of sediment and other suspended material on their banks. As healthy rivers and streams age, they will naturally form more meanders.
- Biological Diversity
  - Biodiversity is extremely valuable to both the natural order of the system and human recreation and non-consumptive uses. Different types of internal habitat and structure diversity, such as pool and riffle sequences and vegetation, also help to diversify the system and provide for increased stability.

<http://tycho.knowlton.ohio-state.edu/shed.html>

### Human Effects on Watersheds:

We all live in a watershed and everything we do on our property can have a negative impact. The land drains into tributaries and these streams or creeks flow into larger rivers. As this water flows downhill it moves over the soil. Along the way, the water picks up many different particles of debris (leaves or soil particles), sediments that can have negative impacts on the water quality. Water can pick up as it flows: motor oil, fertilizers, pesticides and eroded soil. Driving a car that's leaking oil or antifreeze, fertilizing your pasture or lawn, or not picking up after your pet can pollute the watershed you live in. Each of us can have a positive or negative difference on your watershed.

[http://education.nationalgeographic.com/education/encyclopedia/watershed/?ar\\_a=1](http://education.nationalgeographic.com/education/encyclopedia/watershed/?ar_a=1)  
[http://www.freedrinkingwater.com/water\\_quality/quality1/1-define-healthy-watershed.htm](http://www.freedrinkingwater.com/water_quality/quality1/1-define-healthy-watershed.htm)

## Materials:

### Supplies –

- Long strip of butcher paper or large poster (white)
- Markers/crayons, scissors, tape/magnets (enough for each student)
- Watershed Definition Sheet (attached at the end of the lesson plan)
- Watershed Icons (downloadable PDF, 1 picture per student, download at [www.utahnatureexplorers.org](http://www.utahnatureexplorers.org))

### Equipment--

- Whiteboard, bulletin board, or wall where poster can be displayed

## Did you know?

Healthy wildlife and plant populations are strong indicators that the watershed supporting them is also healthy.

<http://oldmanbasin.org/watershed-info/benefits-of-a-healthy-watershed/>

## Lesson Plans and Activities:

### Day 1 (30 minutes) --

Introduce the concept of a watershed. Give the definition of a watershed, and display the definition in a prominent place in the classroom (whiteboard, science bulletin board, etc.).

Explain that a stream is an important part of a watershed. There are many different things that help our watershed to be healthy. It is important to have a healthy watershed so that we can get the water that we need, and so plants and animals everywhere can also get the things they need to continue living a healthy life.

Explain that, as a class, we will be creating a healthy stream for our watershed. Every part of the stream is important to the health and happiness of our stream and its inhabitants.

Draw an outline of a stream on a long strip of butcher paper or a large poster board and display it in classroom. The whiteboard area is a perfect place to display your 'stream.' *(You may want to draw this in advance and simply display it for students at this point.)*

Discuss important attributes of a healthy natural watershed with students, and allow students to give ideas as to what would help the watershed's health.

After attributes are identified (wildlife, fish, trees, etc.) distribute the 'Healthy Watershed Icon' (trees, birds, fish, etc.) images to students. Each student should have at least one picture.

Assign students to color their picture. Remind them to use good coloring, as this will help our watershed look neat and clean.

After coloring, have students cut out the picture.

After students have completed the art portion, have them place (via magnet or tape) their image on the large poster board. *(You may choose to have students do this as soon as they are finished, at their own pace, or to make it a classroom activity, where one or two people can come and place their icon on the 'stream' at a time. The latter option may provide a more natural setting for a class discussion about each element of the healthy stream.)* Discuss why each element is so important to a healthy watershed.

Wrap up with oral review of the importance of a healthy watershed.

**Materials:****Supplies –**

- Watershed poster
- Markers/crayons, scissors, tape/magnets (enough for each student)
- Watershed Icons (downloadable PDF, 1 picture per student, download at [www.utahnatureexplorers.org](http://www.utahnatureexplorers.org))

**Equipment--**

- Whiteboard, bulletin board, or wall where poster can be displayed

**Day 2 (30 minutes) –**

Once again, display the class 'stream' on the whiteboard (or another location of your choice). This time, the students should see the pictures they added the previous day to make a healthy watershed. Briefly review the aspects and importance of a healthy watershed.

Tell students that not all streams look like the stream on the board; humans have developed (or changed) the areas around many streams.

Discuss changes that might be made as humans develop the area around a watershed.

After students have identified possible human developments distribute the other watershed images (houses, barn, domestic animals, roads, boats, etc.).

Following the previous day's procedure, have students color and cut out their given icon. After students have colored and cut out images, have them place them on the watershed display.

Discuss possible changes to the watershed by human development. This can be kept simple, such as cars putting pollution into the environment, houses taking up space that used to have trees (therefore, taking away the homes for many animals), and yard or farm fertilizers and pesticides causing pollution to the groundwater.

Discuss what we can do to keep our watersheds healthy and clean, and why keeping our watersheds this way is so important.

**Assessment:**

The assessment for these lesson plans should be based on the following:

- Overall class participation in oral discussion of a healthy watershed
- Individual participation in placement of environmental icons on poster board display
- Each student will list 2 attributes of a healthy watershed
- Each student will list 2 human-caused degradations to watersheds

In order to assess whether or not students know the attributes of a healthy watershed and human-caused problems to a watershed, you may choose to have them draw a picture of each attribute, report each attribute to a teacher or aide, or do an overall class assessment in which students can answer your

questions aloud.

#### Extensions:

- Give each student a 'Thirstin's Wacky Water Adventures' packet. This packet has been made for grades K-3 by the Environmental Protection agency, and includes work searches, mazes, coloring, and more, to help children learn about how to protect and conserve water. You can download the PDF of the packet at the following link: [http://www.epa.gov/safewater/kids/pdfs/activity\\_grades\\_k-3\\_activitybook.pdf](http://www.epa.gov/safewater/kids/pdfs/activity_grades_k-3_activitybook.pdf)
- Read the children's book, *All the Water in the World*, by George Ella Lyon. Discuss the concepts within with your class. Talk about how important water is as a resource, and what we can do to protect it. Relate this discussion back to what they learned earlier about what makes a healthy watershed.

#### Resources:

##### Books

- *Utah Master Naturalist Watersheds Textbook* [http://extension.usu.edu/utahmasternaturalist/files/uploads/UMNP\\_Watersheds\\_Text.pdf](http://extension.usu.edu/utahmasternaturalist/files/uploads/UMNP_Watersheds_Text.pdf)
- *All the Water in the World* by George Ella Lyon
- *Keeping Water Clean* by Helen Frost
- *Why Should I Save Water* by Jen Green

##### Websites

- Water Conservation Tips/Facts -- <http://environment.nationalgeographic.com/environment/reshwater/water-conservation-tips/>
- How are Watersheds Impaired? [http://water.epa.gov/type/watersheds/outreach/upload/2001\\_10\\_25\\_protecting\\_chap2.pdf](http://water.epa.gov/type/watersheds/outreach/upload/2001_10_25_protecting_chap2.pdf)
- Importance of Healthy Watersheds -- <http://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/indiana/journeywithnature/watersheds-101.xml>
- Watershed Information -- <http://water.epa.gov/type/watersheds/whatis.cfm>

### Did you know?

*Why do we need healthy watersheds?*

Watersheds sustain life, in more ways than one.

According to the Environmental Protection Agency, **more than \$450 billion in foods, fiber, manufactured goods and tourism depend on clean, healthy watersheds.** That is why proper watershed protection is necessary to you and your community.

<http://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/indiana/journeywithnature/watersheds-101.xml>

# Watershed:

A watershed is an area of land that drains to a common point

