

Arthur Carhart National Wilderness Training Center's
Wilderness Investigations
High School

Wilderness Applications/Lesson 5
Wilderness Protects Watersheds
(3 of 3 Wilderness and Water lessons)

Goal: Students will understand how Wilderness areas protect watersheds.

Investigation Objectives:

Audience: 9-12 Grades

- Students will understand which watershed they inhabit and how Wilderness areas protect the quantity and quality of water within a watershed. (Behavior)
- Students will be shown a series of maps in order to understand which watershed they inhabit and the general location of the location of Wilderness areas within watersheds. (Condition)
- Students will make observations about where they live within their watershed, the location of Wilderness areas within watersheds, and how Wilderness areas protect Watersheds. (Degree)

Common Core Standard Connections

NOTE: See Common Core Standards sections to see listed objectives for this and other lessons/activities.

Time Requirement: 50 minutes

Materials/Resources Needed and Pre-Investigation Tasks

- Map of Wilderness Preservation System
 - www.wilderness.net
- Map of United States broken into regional watersheds
 - <http://water.usgs.gov/GIS/regions.html>
- Map of local watershed
 - Check with your local State or Federal water quality agency

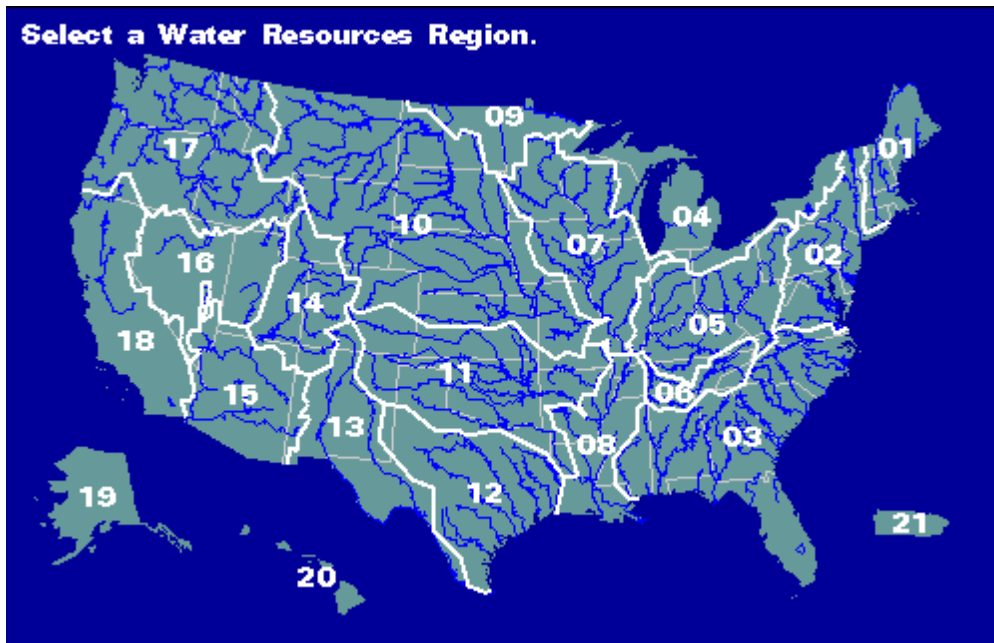
Teacher Background

Teachers should be familiar with a map of the United States divided by watershed and the watershed in which they inhabit.

Step-by-Step Presentation Instructions

Optional Pre-Investigation (Engage): Give students a blank map of the United States and have them draw in (to the best of their knowledge) the main mountain ranges and rivers. This could be used as an engagement piece as well as a point of departure for the watershed discussion.

Activity #1: Students will look at a map of the United States divided by watershed and make observations and write down answers to the following questions on a spare sheet of paper:

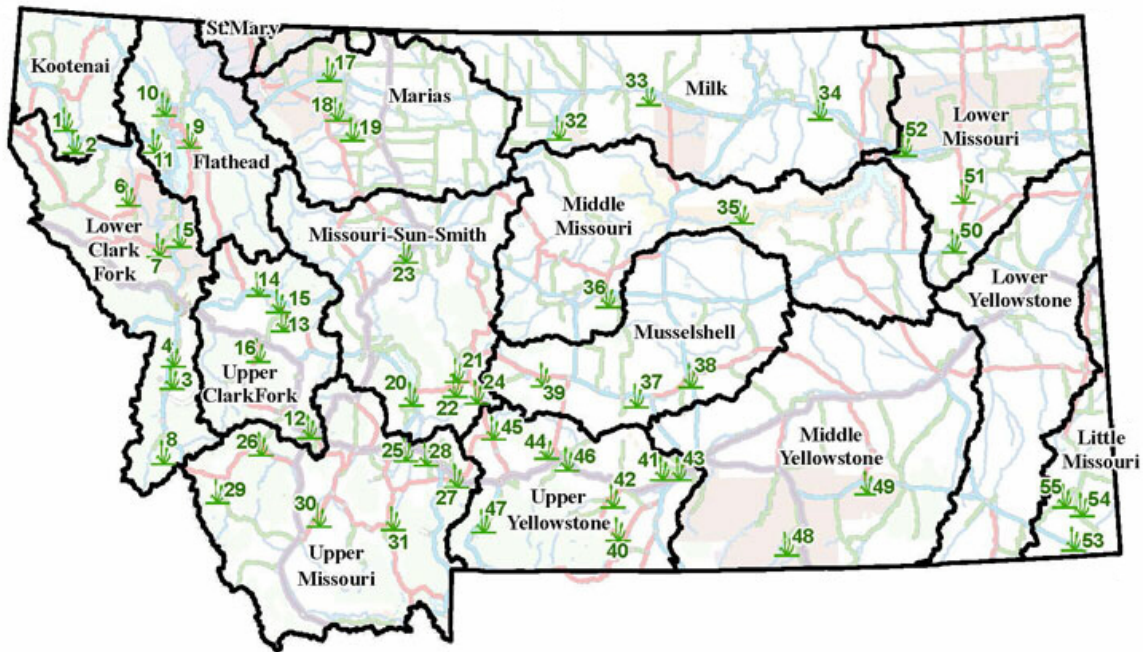


Source: <http://water.usgs.gov/GIS/regions.html>

Questions:

- 1.) How many watersheds does the United States appear to be divided into in this map?
- 2.) Where are the main mountain ranges? And, how do mountain ranges shape watersheds? (Have students refer to a map showing major landforms of the U.S.)
- 3.) To which ocean is water from (name a state) ultimately going?
- 4.) Which watershed region do you currently live in? Have you lived or visited any other watersheds? If so, describe the difference between the climate and vegetation between the two different watersheds in which you have spent time.

Students will be shown a map of their state divided by watershed.
Example:



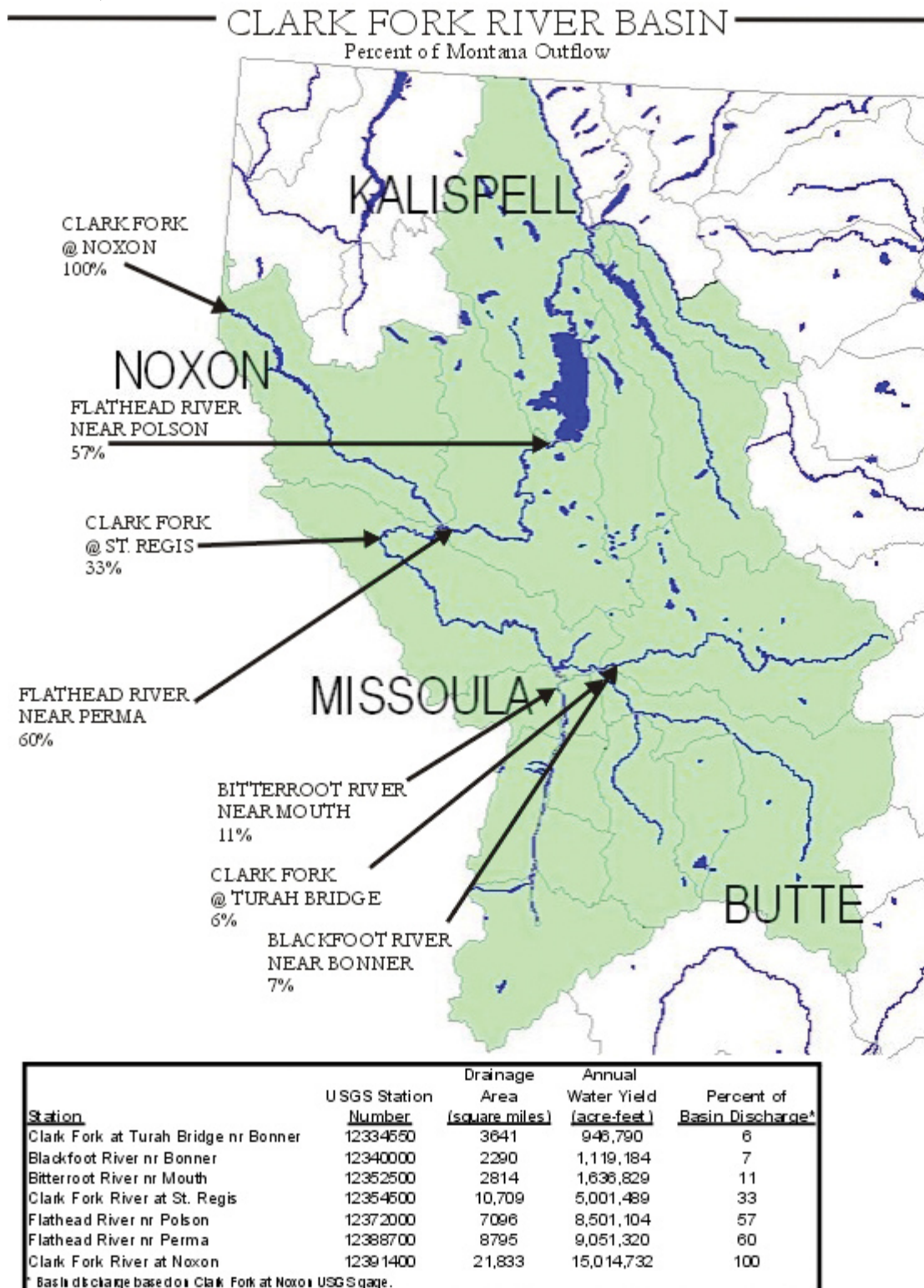
Source: <http://www.mdt.mt.gov/publications/datastats/wetlands.shtml>

-Ask:

- Which watershed do you inhabit?
- Can you name the main rivers within your watershed?
- Can anyone draw a rough map of the main rivers within their watershed?



Students will then be shown a map of their watershed: (See example that follows):



Source: http://dnrc.mt.gov/wrd/water_mgmt/clarkforkbasin_taskforce/

Students will then compare and contrast the map of the United States divided by watershed with the map of the United States National Preservation System:



Source: www.wilderness.net

Assessment Activity: Written Reflection

Students will write responses to the following questions:

- 1.) Make observations on where the majority of Wilderness areas located on the map of the United States are?
- 2.) Select a watershed and list which (if any) Wilderness areas are located within your chosen watershed?
- 3.) Examine the watershed closer. Where in the watershed is the Wilderness area located? Is it near the origin, middle, or bottom?
- 4.) How does the Wilderness area help the quality and quantity of water within the watershed? Let's consider:
 - a. What activities are prevented from occurring within the Wilderness area that could pollute the water within the watershed?
 - b. How could fish, wildlife, and plants benefit from Wilderness areas that are within watersheds?

Evaluation:

	Excellent	Good	Fair	Poor
Questions: geography of watersheds.	Student made a great effort to	Student made some effort to	Student made little effort to	Student made no effort to

	answer questions accurately.	answer questions.	answer questions.	answer questions.
Class participation: +/- influences on water.	Student was highly engaged in class discussion.	Student was somewhat interested in class discussion.	Student was not entirely focused on class discussion.	Student was not paying attention to class discussion.
Reflection: How Wilderness areas project watersheds.	Student thought critically on the topic and wrote a well-constructed and articulate journal entry.	Student answered the reflection question in a paragraph.	Student answered the reflection question, but seems to be confused with the subject.	Student did not exhibit an effort to engage with the reflection question.
Other:				

Grading Scale:

	excellent	good	fair	poor
Questions	4	3	2	1
Class Participation	4	3	2	1
Reflection	4	3	2	1
Other				

Journal Idea: Students will be asked to journal and share recreational stories from within their watershed—these stories could be activities/events that have done in the past or activities/events that they would like to do in the future. Remind students to include details on the type of aquatic animals, plants, fish, etc. that they observed during their time in a specific part of the watershed.

Resources for a More In-depth Topic Exploration:

Teachers could organize a day of watershed restoration in which their students spend the day near a river or tributary that could benefit from trash removal. At the end of the day the class could take a photograph with all of the trash that they removed and make observations about how their actions benefited the quality of water within their watershed.