



Where does the water go?

Target audience – Grade 4

Time required – 15 minutes

Activity

Investigate regional and local watersheds and the effect that elevation plays on the movement of rainwater through the watershed.

Standards

NGSS: 4-ESS2-2. Analyze and interpret data from maps to describe patterns of the earth's features.
C3: D2.Geo.3.3-5. Use maps of different scales to describe the locations of cultural and environmental characteristics.

Learning Outcomes

- Students will identify within which watersheds their school is located.
- Students will describe how elevation has an effect on the shape of watersheds.

Map URL: <http://esriurl.com/fourgeoinquiry8>



Engage

Where does river water come from?

- Click the map URL link above to open the map, or type it into your Internet browser.
- The map shows the boundaries of all the major watersheds in the U.S.
- ? Ask students, have you ever wondered where the water comes from in a river? How does the water get there? *[Responses may include rainfall, streams, runoff, and storm drains.]*
- Make a list of student responses on the board.
- Explain watersheds are areas of higher elevation (ridges) that determine the direction water flows.



Explore

Where does water in my area go?

- Explore the map. Note that more detail appears as you zoom in. Don't forget Alaska and Hawaii.
- ? Where are the largest watersheds located in the U.S.? *[Alaska and Missouri]*
- ? Where are the smallest watersheds located? *[Hawaii and Puerto Rico]*
- Find your school's location and click once on the watershed.
- ? In what major watershed is your school located? *[Answers will vary by the major watershed chosen.]*
- ? Is there a body of water with the same name nearby? *[Students should discover that the major watersheds are typically named for the large body of water in the region.]*
- Zoom in just enough to the area of your school that the map changes. Click where your school is located.
- ? In what sub-watershed is your school located? *[Answers will vary, but they should represent the area surrounding the next largest body of water in that area.]*
- Continue zooming in until you locate your school.
- ? What watersheds can you identify? *[Answers will vary, but they should include the major watershed region plus three other sub-watersheds.]*

Explain

What defines a watershed?

- ? What helps define a watershed? *[Watersheds are a collection of water from all sources into a major body of water. Rivers, streams, and creeks collect water and are where water flows through to get to larger bodies of water. Water collects in these bodies of water because of elevation changes.]*
- ? Why do you think there is more than one watershed? *[Elevation features—such as mountains or valleys—divide the landscape and direct the flow of water.]*

Elaborate

How does a watershed relate to elevation?

- Click the button, Show Contents Of Map.
- Click the checkbox to the left of the layer named, Watershed Profiles.
- Click several Watershed Profile lines, which will contain pictures of elevation profiles along the Watershed Profile lines.
- ? What do you notice about elevation across watersheds? *[The elevation generally decreases from one end to another, with the lowest elevation located at the larger body of water.]*
- ? Does this happen across all watersheds? *[Yes]*
- ? What is the relationship between elevation and watersheds? *[Water flows from higher elevations to a body of water within the watershed.]*

IDENTIFY A MAP FEATURE

- Click a feature on the map, and a pop-up window will open with information.
- Links and images in the pop-up are often clickable.
- An arrow icon in the upper-right of the window indicates that multiple features have been selected.
- Click the button to scroll through the features.

TURN A MAP LAYER ON OR OFF

- Make sure that the Details pane is selected, and click Show Contents Of Map.
- To show individual map layers, select the check boxes next to the layer names. Hint: If a map layer name is light gray, zoom in or out on the map until the layer name is black. The layer can now be turned on.

Next Steps

DID YOU KNOW? ArcGIS Online is a mapping platform freely available to U.S. public, private, and home schools as a part of the White House ConnectED Initiative. A school subscription provides additional security, privacy, and content features. Learn more about ArcGIS Online and how to get a school subscription at <http://connected.esri.com>.

THEN TRY THIS...

- Save the watersheds map, and then click Share.
- In the Share dialog box, click Create A Web App.
- On the Configurable Apps tab, scroll down and select the Elevation Profile web app.
- Let students investigate elevation profiles throughout different watersheds.
- Explore the Chesapeake Bay watershed with this story map: <http://esriurl.com/Geo41114>.

TEXT REFERENCES

This GIS map has been cross-referenced to material in sections of chapters from these texts

- *Science: A Closer Look* by Macmillan/McGraw-Hill — Chapter 6
- *Exploring Science All Around Us (Level 4)* by Five Ponds Press — Chapter 8