

A Watershed Moment: Focus on Arizona

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Grade Level	4
Duration	1 class period

National Standards

GEOGRAPHY

Element 1: The World in Spatial Terms

1. How to use maps and other geographic representations, geospatial technologies, and spatial thinking to understand and communicate information

Element 3: Physical Systems

7. The physical processes that shape the patterns of Earth's surface.

AZ Standards

ELA

Writing

Text Types and Purposes

4.W.2. Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

d. Use precise language and domain-specific vocabulary to inform about or explain the topic.

Speaking and Listening Standards

Comprehension and Collaboration:

4.SL.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.

d. Review the key ideas expressed and explain their own ideas and

SCIENCE

Earth and Space Standards

4.E1U1.6 Plan and carry out an investigation to explore and explain the interactions between Earth's major systems and the impact on Earth's surface materials and processes.

Arizona Social Science Standards

The use of geographic representations and tools help individuals understand their world.

4.G1.1 Use and construct maps and graphs to represent changes in the Americas over time.

Key concepts include but are not limited to human and physical features of the Americas, trade and exploration routes, the location of civilizations and societies in the Americas including indigenous peoples, and settlement patterns including the development of the Southern, Middle, and New England Colonies

Examining human population and movement helps individuals understand past, present, and future conditions on Earth's surface.

4.G3.1 Explain how the location and use of resources affects human settlement and movement.

Key concepts include but are not limited to theories about the peopling of the Americas, the Columbian Exchange, treatment of indigenous people, triangular trade, searches for trade routes to Asia that led to exploration and settlement of the Americas

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SIOP Elements		
Preparation Adapting content Linking to background Linking to past learning Strategies used	Scaffolding Modeling Guided practice Independent practice Comprehensible input	Grouping Option Whole class Small groups Partners Independent
Integrating Processes Reading Writing Speaking Listening	Application Hands on Meaningful Linked to objectives Promotes engagement	Assessment Individual Group Written Oral

Arizona English Language Proficiency Standards

Grade 4 and 5

Basic

Speaking and Writing

Standard 3 By the end of each language proficiency level, an English learner can speak and write about grade appropriate complex literary and informational texts and topics.

B-1: deliver short oral presentations that include some details to develop a topic.

B-3 compose informational text that includes details to develop a topic while using appropriate conventions.

B-5: use examples of precise language and domain-specific vocabulary within informative texts.

Overview

What is a watershed? A watershed is an area of land that drains fresh water to a lower point. Students will look at the state of Arizona and how Phoenix gets its freshwater from a watershed.

Purpose

In this lesson, students will have an opportunity to create a model of a watershed and verbally identify its parts and the flow of water while making connections to the state of Arizona.

Key Vocabulary

city: a place where many people live; it may include roads, buildings, and landmarks

valley: a long, low area often between hills or mountains

ridge: a raised area of land that is narrow and long

watershed: an area of land that drains fresh water to a lower point

Materials

- *Arizona Water Story: What is a Watershed and Why is it Important to the Phoenix Water Supply?*
<https://www.youtube.com/watch?v=AhtuiUKimJE>
- Computer and Projection Device
- Arizona's Topography and Rivers
<https://geoalliance.asu.edu/sites/default/files/maps/AZTOPO.PDF>
- Plain White Paper (8.5 X 11)
- Spray Bottles
- Water
- Washable Markers (blue, brown, and purple)
- Science Notebooks
- Vocabulary Cards
- Vocabulary Test

Objectives

Students will be able to:

- Explain how rainwater flows in a watershed.
- Explain how water flow can impact human settlement.

Procedures

Engage:

1. Begin the lesson with these questions:

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- How important is water to our everyday lives?
- Where does water come from?

Ask students to think, pair, and share their answers with a partner. (**Preparation: Linking to background & past learning**)

2. Project the YouTube video: *Arizona Water Story: What is a Watershed and Why is it Important to the Phoenix Water Supply?*
<https://www.youtube.com/watch?v=AhtuiUKimJE>
Discuss with the class what they learned from the video, and specifically discuss and define what a watershed is. (See Key Vocabulary)
3. Project the Arizona's Topography and Rivers
<https://geoalliance.asu.edu/sites/default/files/maps/AZTOPO.PDF> Point out where the Salt River, Verde River, and different valleys are located. Introduce and define the words: city, valley, and ridge. Project the Vocabulary Cards to give students some visual input. Put Vocabulary Cards on Word Wall.
4. Point out how elevation can be determined by the gray coloration on the map. (**Scaffolding: Comprehensible input, Integrated Processes: Listening and Speaking**)

Explore:

5. Distribute markers and one sheet of 8.5 X 11 white paper to each student. Ask students to crumple the paper into a ball. Then ask students to gently open up the paper and flatten it out; however, it should still be a bit crumpled.
6. Ask students to imagine that this paper is a section of Arizona's land and to find the ridgelines. (Refer students to the Word Wall if needed.) Using their brown marker, they will shade along them (along the upfold).
7. Using their blue marker, ask students to shade the valleys (along the downfold).
8. Then, using their purple marker, students will pick three locations on their land to draw a circle to represent a city.
9. After a few minutes, bring out the spray bottle. Inform the students that a rainstorm is on its way. As you walk by each desk, create a rainstorm by spraying water on the crumpled paper watershed. (**Application: Hands on and Promotes Engagement**)
10. Ask students to watch how the rainwater moves and write down their observations in their science notebooks. Tell students to pay particular attention to the pathways where the excess rain travels. Then should also answer the question: Did any of your cities receive rainwater? (**Integrating Processes: Listening and Writing**)

Explain:

11. Have various students share what they noticed and wrote in their journals. Some examples might be:
 - I noticed is that the color of the marker ran when I sprayed water on it.
 - This model allows us to prove that water moves from a high point to a low point.
 - Water collects in the low points forming rivers and lakes.
 - I could see that the water all went into the edges of the paper because it was the lowest elevation.
 - My cities didn't get any water. My cities got a lot of rainwater.
12. Have students study their models and think about what they have learned about watersheds after hearing what other students wrote. Have students add ideas to the science journal. (**Integrating Processes: Listening and Speaking; Application: Linked to objectives**)

Elaborate:

12. Ask them to consider possible ways that watersheds may impact people, animals, and their environment. List their ideas on the whiteboard.
13. Project the Arizona's Topography and Rivers
<https://geoalliance.asu.edu/sites/default/files/maps/AZTOPO.PDF> again. Have students look at the highest elevations and the rivers. Which Arizona cities are near a river or near areas of high elevation where they might get water?
14. Distribute the Vocabulary Cards to students. Ask students to lay their vocabulary cards on their model and match each word and its definition to its location on the model. Have students check each other's work and correct any misplaced cards. (**Grouping Option: Partners**)
15. Have students present their watershed model to their peers. During their presentations, students should explain their water shed and its parts using the key vocabulary learned. Sentence frames can be used to support their explanations.
 - On my model you can see _____, _____, and _____.
 - When it rains, water flows from _____ to _____ creating a _____ here.
 - The watershed supports the people living _____.

(Integrating Processes: Speaking & Listening)

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Assessment

ELA, Science and Geography

Science Journals can be assessed for completeness and accuracy. Mastery will be considered a score of 80% or higher.

Oral presentations where students share their models and explain how a watershed form and work can be graded using the following: 1) Used key vocabulary of the lesson (10 pts); 2) Identified observations shown by the investigation (10 pts) and 3) Identified how human settlement and other living things depend on the watershed (10 pts). Mastery will be a score of 24 points or higher.

Vocabulary acquisition can be assessed using the Vocabulary Test. Mastery will be considered a score of 95% or higher. **(Assessment: Individual, Oral, Written)**

Extensions

The teacher can further discuss pollution and human activity occurring in Arizona's watershed areas.

Students can do further study of Arizona watersheds and identify the watershed for their community by looking at the Arizona's Watersheds map found at: <https://geoalliance.asu.edu/sites/default/files/maps/A>

[Z Watersheds COLOR.pdf](#) A follow up might be to explore what other sources of water their community is using.

Sources

YouTube video: *Arizona Water Story: What is a Watershed and Why is it Important to the Phoenix Water Supply?*

<https://www.youtube.com/watch?v=AhtuiUKimJE>

Colored Topographical map of Arizona with no placenames:

<https://geoalliance.asu.edu/sites/default/files/maps/arizonaRelief.gif>

Clip Art:

Image #1: Ridge

https://commons.wikimedia.org/wiki/File:Delancy_Ridge_7228%27.jpg

Image #2: Valley

https://www.wikiwand.com/en/Val_Ferret

Image #3: Watershed

<https://www.flickr.com/photos/timmeko/5854534463>

Image #4: City

<https://www.dreamstime.com/royalty-free-stock-photo-aerial-view-south-manhattan-new-york-city-urban-photography-showcasing-cityscape-its-buildings-skyscrapers-th-image35808955>