

Arizona Project WET 5E Lesson Six

Prepared By: Michael Spaeth

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LESSON 6.1 A DROP IN THE BUCKET

PROJECT WET WATER LITERACY PRINCIPLES

Water Is a Natural Resource	a. All life on Earth uses water. b. The available freshwater supply on Earth is limited and must sustain multiple users. c. Water is not distributed equally across the Earth—there are arid regions and wet regions.
Water Resources Are Managed	a. Multiple users of water resources creates diverse and sometimes conflicting demands, which require water resource management practices. b. Management decisions involve distribution of water resources and protection of acceptable water quality and quantity. c. Management of water quality is critical for the health of humans and ecosystems. d. Individuals, communities, and industries have unique water footprints that impact water resources.
Water Resources Exist within Social Constructs	a. Over time, societies develop water management systems and practices to meet the needs of diverse water users. b. Political and economic systems affect equal access by all to water with geopolitical impacts. c. Communities do not have equal access to water quantity or quality. d. People's values, attitudes, and beliefs about water are shaped by their experiences. e. Individual and community water conservation efforts impact water availability on a local level.
LESSON SUMMARY	Based on percentages of water in various locations on Earth, students measure water using beakers or measuring cups to see what proportion of one liter represents potable water.

MATERIALS	• 1 Liter of water per group (or for class, if doing class demo) • Small measuring cup of at least 30 mL per group • Globe or world map • 100 mL measuring cup or container per group • 10 mL measuring cup or container per group • Eye dropper (optional) per group • Metal Bucket or small bowl per group • ADropintheBucket_Foundations_Copy-Pages.pdf • 26-27-AWF-Lesson-6-Slides.pptx • LESSON-6_STUDY-NOTES-SUSTAINABILITY-STEWARDSHIP_FITB-NOTES_QUIZ-WITH-KEY.pdf
TIME	45 minutes (can be done quicker as class demo if needed)
GUIDING QUESTIONS	How much water on Earth is available for our use? What is potable water? Does everyone have access to potable water?
LESSON PLAN	AWF-Unit-Lesson-Plan-6.1-A-Drop-in-the-Bucket.pdf
ARIZONA STATE STANDARDS ADDRESSED IN LESSON	
SCIENCE	4.E1U2.10 Define problem(s) and design solution(s) to minimize the effects of natural hazards (in the context of droughts and water scarcity).
MATH	4.NF.B.3 Build fractions from unit fractions by applying and extending previous understanding of operations on whole numbers.
ELA	*4.W.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly. a. Introduce a topic clearly and group related information in paragraphs and sections; include formatting (e.g., headings), illustrations, and multimedia when useful to aiding comprehension. b. Develop the topic with facts, definitions, concrete details, quotations, or other information and examples related to the topic. c. Link ideas within categories of information using words and phrases (e.g., another, for example, also, because). d. Use precise language and domain-specific vocabulary to inform about or explain the topic. e. Provide a concluding statement or section related to the information or explanation presented.

Social Studies (Elaborate)	G2.1 Compare the different ways people or groups of people have impacted, modified, or adapted to the environment of the Americas. Key concepts include but are not limited to disease, farming, family structure, housing, cultural assimilation, cultural amalgamation, climate, transportation, domestication of animals, clothing, recreation, and utilization of renewable and non-renewable natural resources.
CTE (Elaborate)	Explore jobs, occupations, and careers to understand the value of all careers to society. Lesson 4 Sum of the Parts Career Connections.
ENGAGE	
Students define the term water footprint and begin to create and describe their personal water footprint. Students interpret a population growth graph and water usage over time graph, and brainstorm solutions (both behaviors and technologies) that can help to conserve and protect water.	
EXPLAIN	
Students interpret a population growth graph and water usage over time graph and share conclusions about what the graph means.	
VOCABULARY	
EXPLORE	
Participating in a full-body game students role-play out different water use scenarios.	
ELABORATE	
U.S. Geological Survey. Water Use in the United States – information on how different states use water and their average water use - https://www.usgs.gov/mission-areas/water-resources/science/water-use-unitedstates#overview - https://www.usgs.gov/staff-profiles/national-water-use-science	
EVALUATE	
Students brainstorm solutions (both behaviors and technologies) that can help to conserve and protect water.	
REFLECT	

CONTENT KNOWLEDGE AND SUGGESTED READING FOR TEACHERS
• <u>County Water Fact Sheet</u>

LESSON 6.2 WATER WEB

PROJECT WET WATER LITERACY PRINCIPLES

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Water Resources Are Managed	a. Multiple users of water resources creates diverse and sometimes conflicting demands, which require water resource management practices. b. Management decisions involve distribution of water resources and protection of acceptable water quality and quantity. c. Management of water quality is critical for the health of humans and ecosystems. d. Individuals, communities, and industries have unique water footprints that impact water resources.
Water Resources Exist within Social Constructs	a. Over time, societies develop water management systems and practices to meet the needs of diverse water users. b. Political and economic systems affect equal access by all to water with geopolitical impacts. c. Communities do not have equal access to water quantity or quality. d. People’s values, attitudes, and beliefs about water are shaped by their experiences. e. Individual and community water conservation efforts impact water availability on a local level.
LESSON SUMMARY	Students define direct and indirect water use and explore how they use water in their daily lives. Students explore local industries in Arizona to see how they use water. Then students model a “water web” to illustrate their dependence on water and the interdependence among water users, producers and people in the community.

MATERIALS	• Direct and Indirect Water Use worksheet (below) • Arizona Water Resources and Users (below) • Copy of Water Users Cards (enough for each group)(below) • 2 – one-gallon empty milk jugs filled with water – label one “groundwater” and one “surface water” tied together with yarn. • 1 ball of yarn • Enough Dixie cups for one per student • Lesson-6.2-Arizona-Water-Indirect-Water-Users-Worksheet.pdf • Lesson-6.2-Arizona-Water-Resources-and-Users-by-Water-Festival-and-Location.pdf • Lesson-6.2-Water-User-Cards.pdf • 2025-26-AWF-Lesson-6.pptx • 2025-26 AWF Lesson 6 (Google Slides)
TIME	50 minutes
GUIDING QUESTIONS	How do I use water both directly and indirectly? What are the water sources and who are the water users in my community?
LESSON PLAN	AWF-Unit-Lesson-Plan-6.2-Water-Web.pdf
ARIZONA STATE STANDARDS ADDRESSED IN LESSON	
SCIENCE	4.E1U2.10 Define problem(s) and design solution(s) to minimize the effects of natural hazards (in the context of droughts and water scarcity).
MATH	4.MD.B.4 Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$). Solve problems involving addition and subtraction of fractions by using information presented in line plots.
ELA	*4.W.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly. a. Introduce a topic clearly and group related information in paragraphs and sections; include formatting (e.g., headings), illustrations, and multimedia when useful to aiding comprehension. b. Develop the topic with facts, definitions, concrete details, quotations, or other information and examples related to the topic. c. Link ideas within categories of information using words and phrases (e.g., another, for example, also, because). d. Use precise language and domain-specific vocabulary to inform about or explain the topic. e. Provide a concluding statement or section related to the information or explanation presented.

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CTE (Elaborate)	Explore jobs, occupations, and careers to understand the value of all careers to society. Lesson 4 Sum of the Parts Career Connections.
ENGAGE	
Students discuss and identify the difference between direct and indirect water use. In groups students examine local industries in Arizona to see how they use water.	
EXPLAIN	
Give students a chance to ask questions about everything they have seen so far and do your best to answer their questions. If you don't know the answer to a good question, tell them you will find out and share what you learn.	
VOCABULARY	
EXPLORE	
Participating in a full-body activity, students model a “water web” to simulate their dependence on water and the interdependence among water users, producers, and people in the community.	
ELABORATE	
Math connection: Make a line plot to display a data set of measurements using Water Consumption Food Facts based on a meal each student would like to have for lunch. Solve problems involving addition and subtraction of fractions by using information presented in line plots.	
EVALUATE	
Students have a group discussion about what they witnessed during the activity demonstrating they can see the connection between multiple water users. Students brainstorm and share ways communities and different users can use less water.	

REFLECT
CONTENT KNOWLEDGE AND SUGGESTED READING FOR TEACHERS
• County Water Fact Sheet

LESSON 6.3 MY WATER FOOTPRINT

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LESSON SUMMARY	Students learn what a water footprint is by constructing their own actual footprint, simulating water use and conservation through a group role play and identifying ways to conserve water through individual best practices.

MATERIALS	• 2 sheets of 8 1/2 x 11 paper per student • Pencils and optional art supplies (markers, colored pencils, crayons) • Scissors • Lesson-6.3-Student-Water-Use-Roles.pdf • Lesson-6.3-Teacher-Lesson-Resources.pdf • My-Water-Footprint-Daily-Use-Meter.pdf • Lesson-6.3-Student-Water-Sustainability-Worksheets.pdf • Lesson-6.3-Teacher-Water-Sustainability-Worksheets.pdf • 2025-26-AWF-Lesson-6.pptx • 2025-26 AWF Lesson 6 (Google Slides)
TIME	50 minutes
GUIDING QUESTIONS	How much water do I use daily? Why is water use called a water footprint? How can I be a better water steward?
LESSON PLAN	AWF-Unit-Lesson-Plan-6.3-My-Water-Footprint.pdf
ARIZONA STATE STANDARDS ADDRESSED IN LESSON	
SCIENCE	4.E1U2.10 Define problem(s) and design solution(s) to minimize the effects of natural hazards (in the context of droughts and water scarcity).
MATH	4.MD.B.4 Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots.
ELA	*4.W.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly. a. Introduce a topic clearly and group related information in paragraphs and sections; include formatting (e.g., headings), illustrations, and multimedia when useful to aiding comprehension. b. Develop the topic with facts, definitions, concrete details, quotations, or other information and examples related to the topic. c. Link ideas within categories of information using words and phrases (e.g., another, for example, also, because). d. Use precise language and domain-specific vocabulary to inform about or explain the topic. e. Provide a concluding statement or section related to the information or explanation presented.

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EXPLAIN	
Students interpret a population growth graph and water usage over time graph and share conclusions about what the graph means.	
VOCABULARY	
EXPLORE	
Participating in a full-body game students role-play out different water use scenarios.	
ELABORATE	
Math connection: Make a line plot to display a data set of measurements using the following Water Footprint Calculator . Solve problems involving addition and subtraction of fractions by using information presented in line plots.	
EVALUATE	
Students brainstorm solutions (both behaviors and technologies) that can help to conserve and protect water. Standards-based assessment: 4.EIU2.10 Define problem(s) and design solution(s) to minimize the effects of natural hazards (in the context of droughts and water scarcity).	
REFLECT	

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