

EED 480

Water Conservation K-2



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Objective

Students will discuss water resources and water conservation concepts. Along with predicting the amount of water they use in a 24-hour period and calculating the amount of water they use at home, both before and after the implementation of water conservation practices.

Big Idea

How much water do you truly use a day? What changes can you implement in your life to conserve water?

Setting the Stage: Students need to understand that water is crucial for survival and everyday needs. The students will also understand the different ways in which water is used for domestic purposes, water used for both indoor and outdoor household purposes, in their daily life. Water can be either “public supplied” or “self supplied”. Students will understand that the infrastructure, both the water and waste-water treatment plants, water storage tanks, pipes, and employees all cost money which is usually paid by the consumer.

Next Generation Science Standards

The lesson focuses on 5-ESS3-1, Obtain and combine information about ways individual communities use science ideas to protect the Earth’s resources and environment.

Science and Engineering Practices in the Next Generation Science Standards

This lesson address SP 1: Mathematical and computational thinking in 3–5 builds on K–2 experiences and progresses to extending quantitative measurements to a variety of physical properties and using computation and mathematics to analyze data and compare alternative design solutions.

Structure and Function

Adapted from Water Audit in Project WET Foundation

In this lesson, the students understand that we use water for various purposes in our daily routine and life, and that managing and filtering water costs money. This is important for students to know because they learn the importance of conserving water for both environmental and financial reasons. In addition, from prior knowledge they understand that water is recycled and reused through the water cycle and that water has a unique property.

Background Knowledge:

Students have already learned the process of the water cycle; evaporation, condensation, precipitation, and collection. They know that water is needed in order to keep us alive and thriving. Students will collaborate in groups using the science process skills (observe, infer, form a hypothesis, predict, draw conclusions, and communicate). Additionally, I have established safety rules, procedures, and expectations for all science investigations. Also, the class has had practice working with their classmates on group projects.

Materials:

Copies of *Water Audit Data Sheet I – Personal and Family Water Use Table 1* (x2 per student)

Copies of *Keys to Flow Rates Chart*

Copies of *Water Conservation Data Chart*

Whiteboards

Pencil and notepad

Calculator

Internet access

iPads/ laptops

Roles:

Materials Manager

Checker

Recorder/Reporter

Observer

Encouragers

I will begin this activity by grouping my students into groups of 5. I will select groups by having students line up based on their knowledge of the water cycle. Then, I will assign the

materials manager, checker, recorder/reporter, observer. The materials managers will pick up all required materials from the kidney table. I will also introduce a noise level chart which we will be using throughout the lesson. The noise level chart will help students understand how loud or soft they should be speaking throughout the lesson.

THE 5-E FRAMEWORK

ENGAGE

CHECKER

5 MINUTES

The recorder of the group will be writing down all the ways they have used water today on a whiteboard. Have students estimate/predict how many gallons of water they consume a day. Additional, have students recall the process of the water cycle to assess their prior knowledge

EXPLORE

15 MINUTES

Developing Questions

Tell the students they will conduct an *investigation*: "How does your daily use of water tally up? What water conservation strategies can we implement to reduce water use?" Allow students to collaborate in groups.

Observe and ask questions- *What questions do they have about the material?* **RECORDER**

Record questions and answers on the board. All the groups will share their questions and the rest of the class can answer if they have the response. The questions and answers will be displayed on the board so the students can see and refer back to during the investigation.

Form and record the hypothesis- Problem-posing, "How much water does the entire group use daily? How can you reduce the amount of water used daily?" Have students write their hypothesis using an *"IF and Then"* statement. Provide students an example of a possible hypothesis.

5 MINUTES: Timed so students can stay focused on completing the task.

EXPLAIN

ALL

Plan a fair test

Adapted from Water Audit in Project WET Foundation

10 MINUTES

Students are asked: *What information will you need in order to test your hypothesis? What steps will you take to do the investigation?* **Explain how to step to the experiment.** Once students have repeated the steps of the investigation, I will explain the copies of *Water Audit Data Sheet I – Personal and Family Water Use Table 1* and *Keys to Flow Rates Chart*.

30 MINUTES

Experiment (part 1): Have each member of the group complete the *Water Audit Data Sheet I – Personal and Family Water Use Table 1* using the information on the *Keys to Flow Rates Chart*. After, students will add up the total amount of water used by all the members of the group. During this time, I will walk around and answers questions and help those groups that need additional support.

Experiment (part 2): Ask student, if you apply water conservation strategies, what do you think will happen to the amount of water used? Allow the students to share with their group. I will inform the students that the investigation will require that they apply water conservation strategies and calculate the amount of water they would save daily.

ELABORATE

ALL

15 MINUTES

Have each group share some of the water conservation strategies they applied to their daily water use and explain how much water they saved daily. Additionally, have students elaborate why these solutions work in conserving water. Record student's responses on the board.

EVALUATE

ALL

10 MINUTES

Draw conclusions. Communicate result. Ask students to explain water conservation strategies were most effective in saving water. Allow each member of the group to share at least one. Have students transfer their finding on the *Water Conservation Data Chart*.

Formative assessment: As a group, students will write a paragraph report on their observations and findings from the experiments. In the report, they will write which water conservation strategies they found to be most effective and why. Additionally, they will write the total amount of water they were able to save as a group when implementing water conservation strategies.

Cooperative Learning Rubric

Student Name	Job assigned during the investigation	Worked well with the group members	Additional Comments

Processing the Water Conservation Experiment

National Science Teaching Standards Met by the Water Conservation Investigation

Students need to understand that we need water in order to survive. Additionally, we use water to complete daily tasks. “Public supplied” water is delivered to our home. The water department charges money for delivery of water to our home because of the cost that goes into water storage, purifying, and delivering water. In this lesson, students learn how much water they use daily for drinking and other purposes. They will also investigate strategies we can implement daily to conserve water.

DISCIPLINARY CORE IDEAS

The **Science** lesson focuses on **NGSS 5-ESS3-1**, Obtain and combine information about ways individual communities use science ideas to protect the Earth’s resources and environment. The students need to understand the different ways we use water in our daily lives in order to investigate ways to conserve water.

SCIENCE AND ENGINEERING PRACTICES

This lesson addresses SP 1: Mathematical and computational thinking in 3–5 builds on K–2 experiences and progresses to extending quantitative measurements to a variety of physical properties and using computation and mathematics to analyze data and compare alternative design solutions. During the investigation, students will compare the amount of water used before and after applying water conservation strategies.

CROSS-CUTTING CONCEPTS

Cause and Effect

In this lesson, the students understand that applying water conservation strategies to our daily life can effect the amount of water used daily. This is important for students to know because they learn that saving water is important for the environment.

Background (Prior) Knowledge:

Before leading this lesson, the students have already learned the stages of the water cycle and what occurs at each of these stages. They know that water is used for various reasons throughout their daily routine. Throughout the lesson students collaborate in groups using the scientific method to investigate how to conserve water. I created a safe environment for students to express their ideas freely. Also, I created safety procedures and applied them throughout the lesson.