

OVERVIEW

Grades:

Grades K- 1; adaptable to all grade levels (see Adaption Suggestions)

Subjects:

Science, Ecology, Visual Art

Duration:

Two, 45-minute sessions

Lesson synopsis:

How do you create a water-saving shower timer from recyclable materials? Students will think about ways to save water in their homes and create a shower timer to help reduce the shower time for them and their family.

Museum Connection:

Connect the Drops



This lesson can be explored solely in the classroom but is best supported with an accompanying field trip to The New Children's Museum to view *Eureka!*, an exhibition about the state of California and the ideas that come from it. Among its installations, *Eureka!* includes the work, *Connect the Drops*, a partnership with The Ecology Center in which practical solutions that will help reduce our "water footprint" are shared in water drop symbols located throughout the building. Visit the *Connect the Drops* installation with your students and discuss the information in it.

LEARNING OBJECTIVES

Students will:

- o better understand the scarcity of water in the state of California.
- o consider ways to conserve water both in their classroom and at home.
- o be able to give examples of ways to conserve water.
- o apply their new knowledge about water conservation into a creative activity.
- o use recyclable materials to create a work of art.
- o share their new knowledge about water conservation with their families

HOW-TO

Materials Needed:

- o Salt or sand for filling shower timers (*16 ounces per student*)
- o Electrical tape and Scotch tape (*several rolls for the class; to be shared*)
- o Hole punches (*3 – 4; to be shared*)
- o Scissors (*one pair per student*)
- o Assorted color Sharpies (*enough for class; to be shared*)
- o Small plastic cups (*one per student*)
- o 16-ounce water bottles (*two per student; be sure they are well-dried*)
- o 1-gallon water container for illustrating shower water usage
- o stop watches for recording showering activities and the flow time of the sand/salt (*one per pair of students*)

Vocabulary:

water scarcity – the lack of sufficient available water resources to meet the demands of water usage within a region.

water conservation – the preservation and careful management of water resources

recyclable materials – materials that have been set apart from the trash so that they can be recycled (e.g. water bottles, cardboard tubes, egg cartons, etc.)

reduce (as it applies to water conservation) – to bring down the amount of water used

reuse (as it applies to water conservation) – to use water again for a new purpose

STEPS

Pre-Class Prep:

- o Arrange a visit to The New Children's Museum to view Eureka!, which includes the installation Connect the Drops.
- o Set up a collection for all recyclable materials. It is recommended to do this well in advance of the project. Encourage students and colleagues to bring in their supplies (cereal boxes, paper tubes, plastic containers, etc.).
- o Introduce the concept of water conservation in the classroom prior to or in conjunction with this lesson. Explain to students why it is important to save water.

Motivation:

As a group, brainstorm and record ideas about how students use water in their homes (showers, brushing teeth, washing dishes, watering the garden, washing clothes). Then, in groups, discuss different ways that students can reduce the amount of water they use when doing these activities. If necessary, prompt them to think about shorter showers for themselves or their family members.

Ask the question: How much time do you need in the shower?

Students can act out the things they need to do in the shower and time how long they need. Discuss the information from the Home Water Works website (See Resources).

Shower Water Saving Tips (courtesy of the Home Water Works website):

- o Pay attention to the length of time spent in the shower. Try taking a shorter shower of around 5 minutes.
- o If your shower is equipped with an on-off switch, use it while you are soaping and shampooing.
- o If you have to wait a period of time for the hot water to reach the shower, try collecting the normally discarded cold water in a bucket for watering plants.

The average shower is 8 minutes long and uses 17.2 gallons of water. Illustrate how much water this is by showing students a one gallon water jug. Have them imagine how much water that would be for everyone in the school or for everyone in the country. That's a lot of water!

Introduce the project. Each student will create a shower timer to help reduce their shower time and their family's shower time by half (from 8 minutes down to 4 minutes per person). Demonstrate the process of creating the shower timer, and have students work together to create them.

Process:



Cut the bottom out of the plastic cups and trace a circle the size of the top of the water bottle on the bottom of the cup. Cut this circle out.



Use a hole punch to punch a hole in the circle.

Use tape to secure the circle over the top of one of the bottles. Make sure not to



Use a funnel to fill the other bottle with sand or salt. Sugar is not recommended.



Put the empty bottle on top of the full bottle so that the tops line up.

Use tape to secure the circle over the top of one of the bottles. Make sure not to



Use a stop watch to time how long the sand / salt takes to move from one bottle to the other. It should take roughly 4 minutes. As the stopwatch reaches each minute mark, students should use a sharpie to mark each minute.

Sharing Session:

Display all finished shower timers and talk about them. Discuss with students ways that they are going to go use less water at home. Encourage students to share their ideas with each other and at home with the family members.

ADAPTATION SUGGESTIONS

For older students (Grades 4 – 5):

Challenge students to work individually or in teams to invent their own water saving device. As a class, brainstorm water saving needs and have students design their own devices for conserving water. Have them sketch out their idea on paper and then create their prototype using recyclable materials.

For middle and high school students (Grades 6 -12):

Challenge students to work individually or in teams to invent their own water saving device. Have students research water conservation techniques and needs. Have them sketch out their ideas on paper and then create their prototype using recyclable or other building materials. Have students present their ideas to their classmates.

For student with special needs:

This project can be challenging for students with fewer fine motor skills. Consider pairing up all students to assist one another with cutting the smaller circles, applying the tape, and connecting the bottles together. Help students keep track of the remaining time that they have to work on their project.

EXTENSION ACTIVITY

Spreading the Word

Have students create posters about water conservation that encourage other students not to waste. Place the posters around the school.

STANDARDS

CALIFORNIA STATE STANDARDS

Visual and Performing Arts Standards

Grade K

2.2 Demonstrate beginning skill in the use of tools and processes, such as the use of scissors, glue, and paper in creating a three-dimensional construction.

2.7 Create a three-dimensional form, such as a real or imaginary animal.

3.1 Describe functional and non-utilitarian art seen in daily life; that is, works of art that are used versus those that are only viewed.

4.1 Discuss their works of art, using appropriate art vocabulary (e.g. color, shape/form, texture).

4.3 Discuss how and why they made a specific work of art.

Grade 1

2.3 Demonstrate beginning skill in the manipulation and use of sculptural materials (clay, paper, and papier-mâché) to create form and texture in works of art.

4.2 Identify and describe various reasons for making art.

4.3 Describe how and why they made a selected work of art, focusing on the media and technique.

Science Standards

Grade K

3.c Students know how to identify resources from Earth that are used in everyday life and understand that many resources can be conserved.

COMMON CORE STANDARDS

W K.2 Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic.

SL K.1 Participate in collaborative conversations with diverse partners about kindergarten topics and texts with peers and adults in small and larger groups.

SL 1.1 Participate in collaborative conversations with diverse partners about grade 1 topics and texts with peers and adults in small and larger groups.

SL K.5 Add drawings or other visual displays to descriptions as desired to provide additional detail.

SL 1.5 Add drawings or other visual displays to descriptions when appropriate to clarify ideas, thoughts, and feelings.

RESOURCES

RESOURCES FROM THE SAN DIEGO PUBLIC LIBRARY

Save water (2008), by Kay Barnham

J 333.9116 BAR

This book explains where water comes from and why the supply of drinking water is declining around the world, and describes how readers can conserve water.

The water-wise home: how to conserve, capture, and reuse water in your home and landscape

(2015), by Laura Allen

628.162 ALL

This book explains how to use water smartly and efficiently.

WEB RESOURCES

How Water Works website:

<http://www.home-water-works.org/indoor-use/showers>

Water Use It Wisely website:

<http://wateruseitwisely.com/kids/lesson-plans/>

Ecology Center (San Juan Capistrano) website:

<http://www.theecologycenter.org/>

Information on the installation, *Connect the Drops*, created in collaboration with the Ecology Center, and currently on view at The New Children's Museum:

<http://www.thinkplaycreate.org/exhibition/eureka/connect-drops>