



The logo features the text "OERB" in blue, "Virtual" in green, and "CLASSROOM" in red. To the left of "Virtual" is an icon of a calculator and a yellow triangle with a plus sign. To the right is an icon of a microscope and a division symbol. The letter "O" in "CLASSROOM" is replaced by a red circle with a white play button symbol.

# OERB<sup>®</sup> Virtual CLASSROOM

Clean Water For All Lesson Guide

## Lesson Guide | Description

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Instructor: Brooke Caldwell

Grade Level: 2 - 5

Subject: STEM, Engineering Design

Students will learn why clean water is so important and test different household products to create their own filtration system.

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### Wonder How:

Have you ever wondered why clean water is important? Have you ever wondered how to build and test your own filtration system?

### Goal:

Students will design and build their own filtration system and test how well their system works.

### Lesson Guide Agenda:

- ❖ Vocabulary
- ❖ Materials List
- ❖ The Water Princess by Susan Verde
- ❖ Activity Instructions
- ❖ Challenge!
- ❖ Additional Resources
- ❖ Oklahoma Academic Standards

## Lesson Guide | Vocabulary

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**Water Filter** – A porous device for removing impurities or solid particles from a liquid passing through it.

**Water Well** – A pit or hole sunk into the earth to reach a supply of water.

**Pollution** – The action of polluting especially by environmental contamination with man-made waste. The three types are water, air, and land.



# Clean Water For All

## Materials Needed:

Container of water

Dirt or potting soil

Rubber band

Paper towels

Measuring scoop

Filters (coffee filter, paper towels, tissue paper, tissues, toilet paper, dryer sheets, or baby wipes)

Clear cup or container

The Water Princess book by Susan Verde – link in Lesson Guide

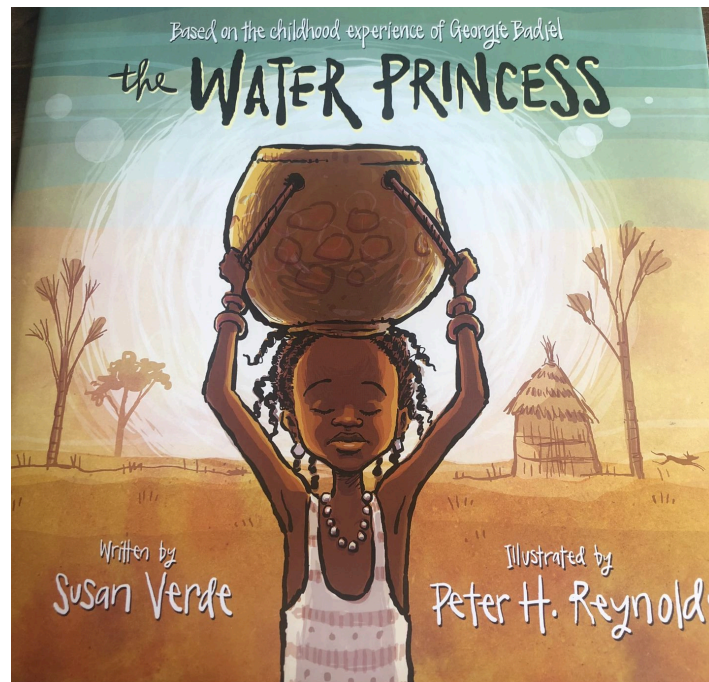
Worksheet #1 – Experiment 1

Worksheet #2 – Experiment 2

Note: Worksheets 1 and 2 are located on the HomeRoom website

Before beginning this lesson, be sure to click the link below to read [The Water Princess](#) by Susan Verde.

### The Water Princess



**Watch the “Clean Water For All” video before continuing to the challenge!**

**Be sure to print Worksheet 1 for Experiment 1  
and Worksheet 2 for Experiment 2 from  
HomeRoom!**

**If you have any questions throughout this lesson,  
please email [teachers@oerb.com](mailto:teachers@oerb.com).  
We would love to hear from you!**

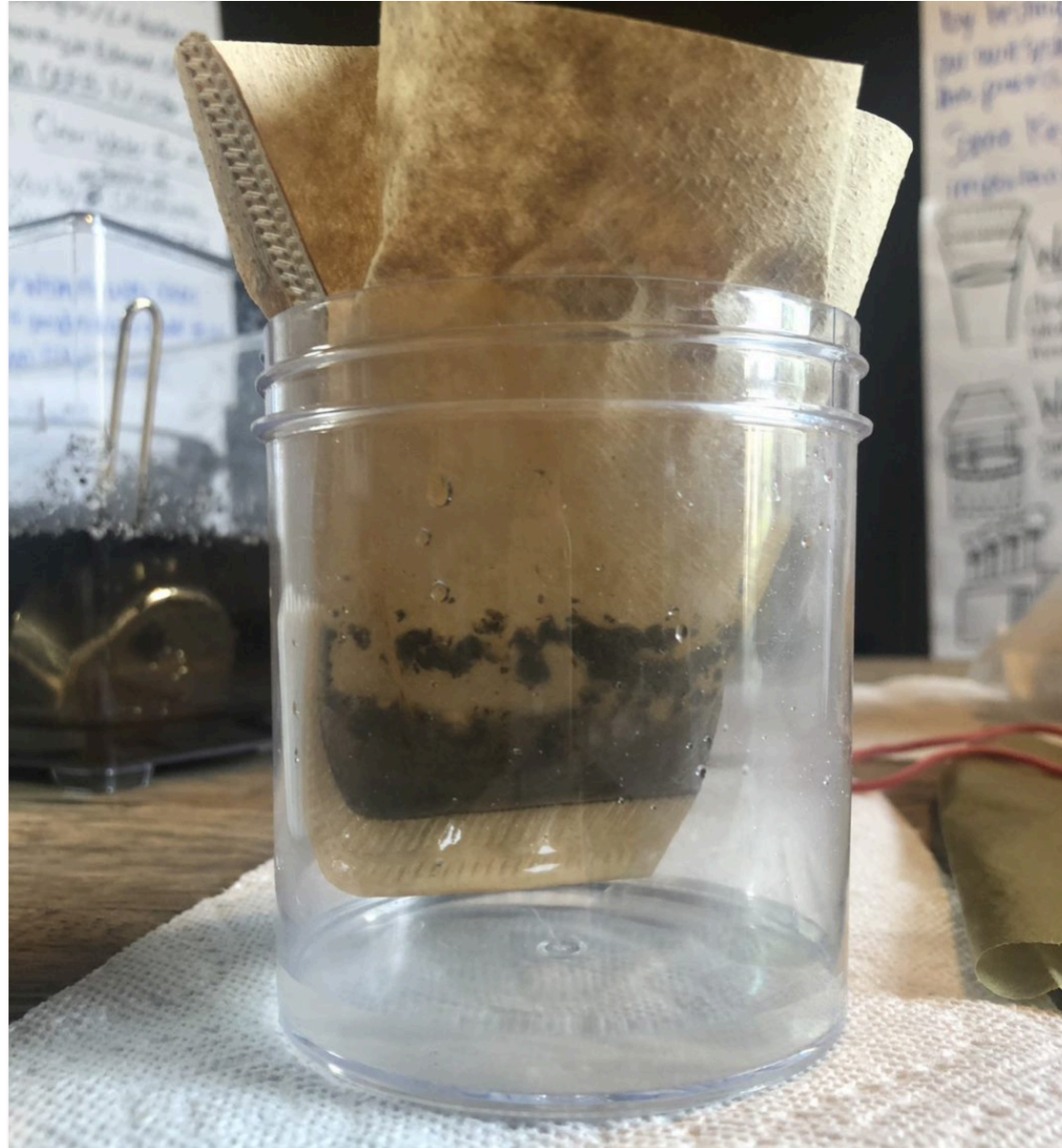
### Experiment 1:

1. Read the book *The Water Princess* by Susan Verde or the background information located at the back of the book.
2. Create a mixture of dirty water in the container. In the video, the presenter used some leftover potting soil and water.
3. Place the filter over the top of the clear cup.
4. Secure the filter with a rubber band.
5. Pour one scoop of the dirty water over the top of the filter.
6. Observe the condition of the water after it passes through the filter.

### Experiment 1:

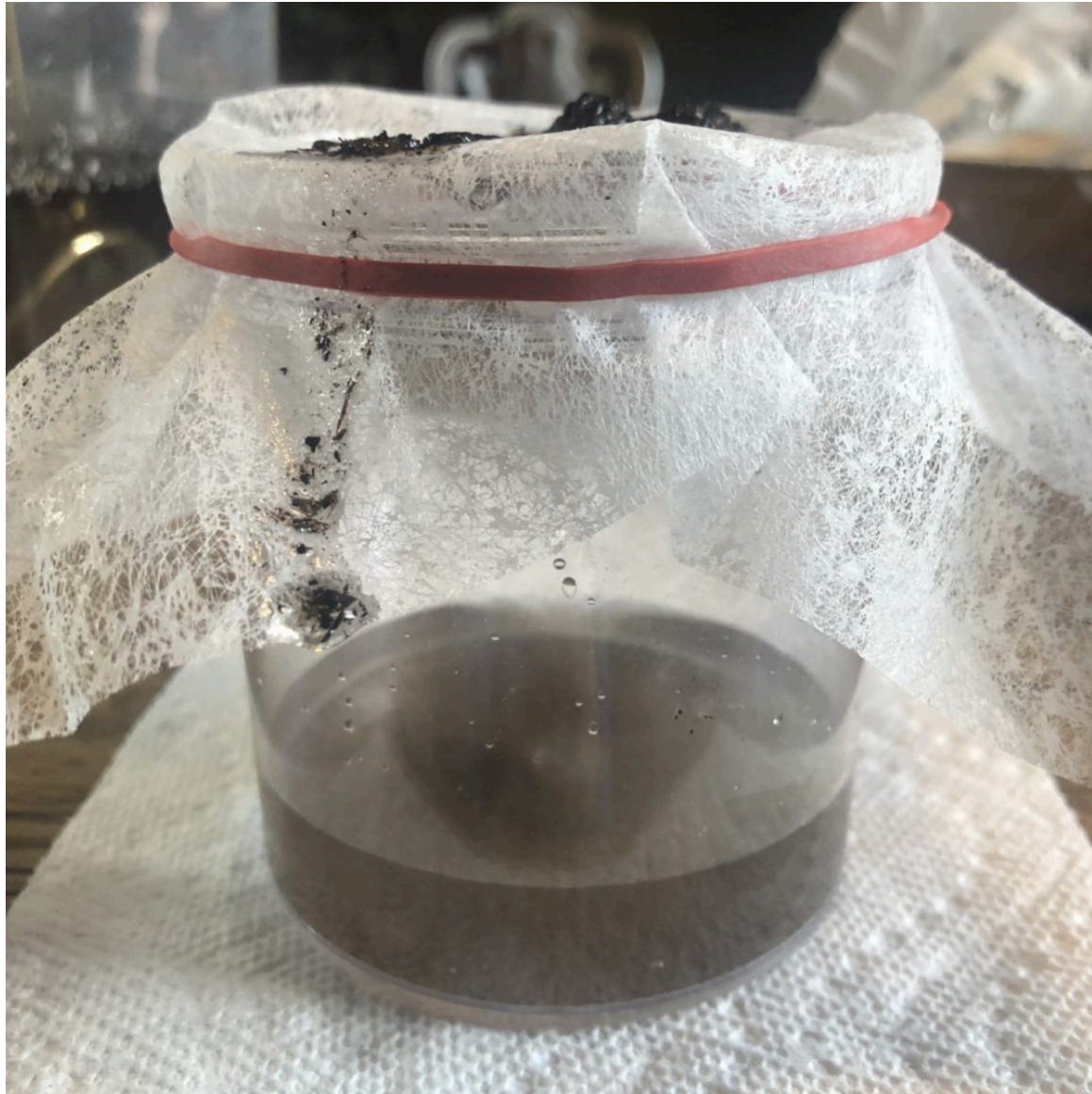
7. Record the type of filter and observations on Worksheet #1.
  - a. Did the sediment or dirt stay on top of the filter?
  - b. What color is the water?
  - c. Is there any sediment in the water?
  - d. In the video, the presenter tests 3 items – brown coffee filter; dryer sheets; white coffee filter.
8. Repeat steps 3-7 with each of the filters you have chosen from your home.
9. Test all materials and record observations.

# Brown Coffee Filter

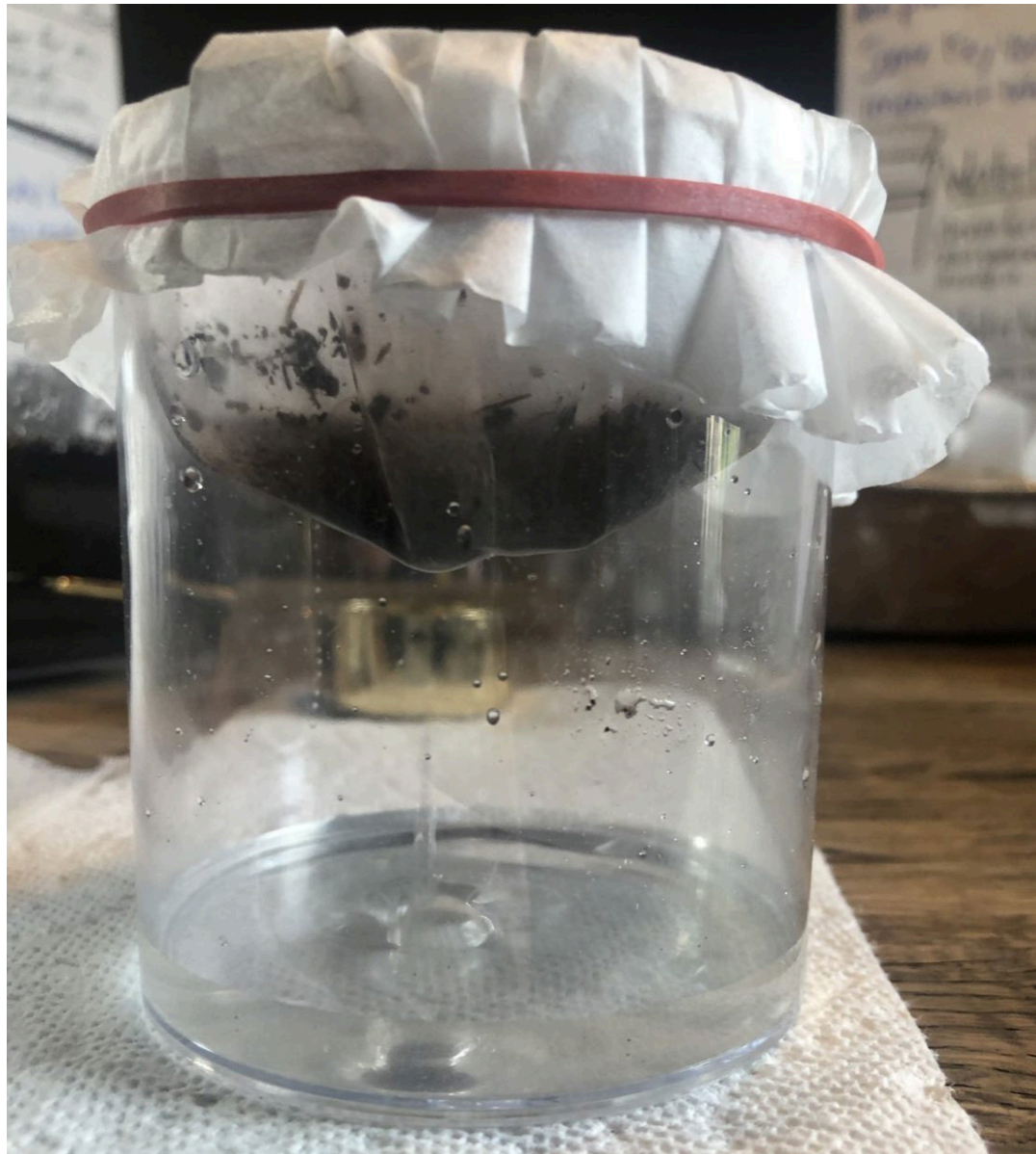




# Dryer Sheet



# White Coffee Filter





# Worksheet #1

Clean Water for All

Link to youtube reading of the book:

The Water Princess, By: Susan Verde

<https://youtu.be/4uUvXLv5go0>

Directions: Record each material you use and test the material for its effectiveness in filtering dirty water. Write down your observations

Material	Observation
Brown Coffee Filter	Water is pretty clean. Very little sediment or contaminants.
Dryer Sheet	Quite a bit of sediment came through.
White Coffee Filter	Separated most of the contaminants.

### Experiment 2:

1. Using the Engineering Design Process on Worksheet #2, build your own water filtration system by layering different materials and testing the effectiveness.
  - a. ASK – What is the problem?
  - b. IMAGINE – What is the best way to solve this problem?
  - c. PLAN – Plan and sketch your idea.
  - d. CREATE – The water filtration system.
  - e. EXPERIMENT – Does this system work?
  - f. IMPROVE – What could you do to improve the design?

# Challenge!

Test your remaining materials and create your own filtration system!

Remember, you can make more than one system.  
Try to determine which one is the best!

If you have any questions about this challenge,  
please email [teachers@oerb.com](mailto:teachers@oerb.com).  
We would love to hear from you!

### **WANT TO WIN A PRIZE?**

Share pictures of your filtration system with us by emailing [teachers@oerb.com](mailto:teachers@oerb.com) and on Facebook/Instagram by tagging us @oerbok.

Be sure to include your name, grade, school, and teacher!

The teacher with the most student submissions will win a \$100 Amazon Gift Card!

# Check out these additional resources!

1. Oklahoma State Department of Education | Oklahoma Academic Standards  
<https://sde.ok.gov/oklahoma-academic-standards>

## Lesson Guide | Oklahoma Academic Standards

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**K-ESS2-2** Students who demonstrate understanding can: Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.

**Vocabulary-4.2** Use new vocabulary and language in own speech and writing.

**Speaking-2.1** Share information and ideas speaking in clear, complete, coherent sentences

**Group Interaction-3.0** The student will use effecting communication strategies in pair and small group context.

1. Show respect and consideration for others in verbal communication.
2. Show respect and consideration for others in physical communications.

**Research and Information-8.1** Accessing Information– The student will select the best source for a given purpose.

**K-ESS3-1** Students who demonstration understanding can: Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live.

**Visual Literacy-1.1** Interpret Meaning – The student will interpret and evaluate various ways visual image-makers including graphic artists, illustrators, and news photographers represent meaning.

**Data Analysis-5.1** Data Analysis B) Develop abilities to collect, describe, and record information through a variety of means including discussion, drawings, maps, charts, and graphs. C) Describes similarities and differences between objects. D) Collects and analyze information about objects and events in the environment.

## Lesson Guide | Oklahoma Academic Standards

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**2-PS1-2** Students who demonstrate understanding can: Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purposes.

**3-LS3-2** Students who demonstrate understanding can: Use evidence to support the explanation that traits can be influenced by the environment.

**3.R.2** Students will ask and answer questions to seek help, get information, or clarify about information presented orally through text or other media to confirm understanding.

**3.3.W.2** Students will express an opinion about a topic and provide reasons as support.

**3.7.W.1** Students will create multimodal content that communicates an idea using technology or appropriate media.

**3.7.W.2** Students will create presentations using video, photos, and other multimedia elements to support communication and clarify ideas, thoughts, and feelings.

## Lesson Guide | Oklahoma Academic Standards

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**3-PS2-1** Students who demonstrate understanding can: Plan and conduct investigations on the effect of balanced and unbalanced forces on the motion of an object.

- Science & Engineering Practices: Planning and carrying out investigations
  - Planning and carrying out investigations to answer questions or test solutions to problems in 3-5 builds on K-2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions.
- Crosscutting Concepts: Cause and Effect
  - Cause and effect relationships are routinely identified.

**4.1.R.2** Students will ask and answer questions to seek help, get information, or clarify information presented orally through text or other media to confirm understanding.

**4.3.W.3** Students will express an opinion about a topic and provide fact-based reasons as support.

**4.7.W.1** Students will create multimodal content that effectively communicates and idea using technology or appropriate media.

**4.7.W.2** Students will create presentations using video, photos, and other multimedia elements to support communication and clarify ideas, thoughts, and feelings.



## Lesson Guide | Oklahoma Academic Standards

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**5.1.R.2** Students will ask and answer questions to seek help, get information, or clarify about information presented orally through text or other media to confirm understanding.

**5.1.W.1** Students will give formal and informal presentations in a group or individually, organizing information and determining appropriate content for audience.

**5.2.W.1** Student will create multimodal content that effectively communicates an idea using technology and appropriate media.

**5.7.W.2** Students will create presentations that integrate visual displays and other multimedia to enrich the presentation.

**5-LS1-1** Students who demonstrate understanding can: Support an argument that plants get the materials they need for growth chiefly from air and water.

If you would like to explore more Oklahoma Academic Standards for click [here](#).