

# “A-Reservoiring” We Will Go

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**Strand** Earth’s Patterns, Cycles and Changes

**Topic** The water cycle

**Primary SOL** 3.9 The student will investigate and understand the water cycle and its relationship to life on Earth. Key concepts include  
a) there are many sources of water on Earth;  
d) water is essential for living things.

**Related SOL** 3.1 The student will demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations in which  
l) models are designed and built.

## Background Information

Approximately 97% of the water is found in the oceans and the other 3%, which is fresh water, is found in glaciers, icecaps, rivers, lakes, underground, and in the atmosphere. Of this 3%, only 1% is suitable for drinking. Water continuously circulates between Earth’s surface, the air, and underground. This circulation is driven by the sun’s energy. As the sun warms the surface of oceans and other water sources, the movements of water molecules increase until some molecules change state from liquid water to gaseous water (water vapor). When energy is lost, the water vapor condenses, forming liquid water again. When the droplets get large enough, they fall back to Earth as precipitation. Major water sources for a community include rivers, reservoirs, and wells.

## Materials

Per student or group of students:

- Clear plastic box
- Pebbles
- Soil
- Sand
- Leaves
- Spray bottle with water
- Two paper towel tubes
- Two toilet tissue tubes
- Straws
- Toothpicks
- Wooden skewers
- Small milk carton
- Scissors
- Glue
- Markers
- Tape

## Vocabulary

*reservoir, water treatment plant, well*

## Student/Teacher Actions (what students and teachers should be doing to facilitate learning)

### Introduction

1. Divide the class into groups of three to four students.
2. Explain that they are going to build a reservoir. Discuss why a reservoir might be important to a community.

### Procedure

Students or groups of students will follow the directions below:

1. Line the bottom of the clear plastic box with small pebbles. Slope the pebbles so that they are higher on the sides (4–5 cm deep) and lower in the middle (1–2 cm deep). This middle area will become the new reservoir.
2. Add a layer of sand, following the same sloping pattern created in step 1.
3. Repeat step 2 with soil.
4. On top of the soil, place leaves around the outer edges (Diagram 1).

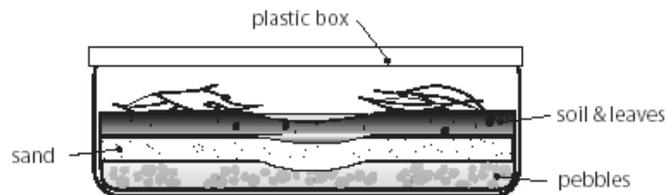


Diagram 1

5. Using a spray bottle, carefully spray water on the four corners of the model until the soil mixture is saturated and the water has seeped through to the reservoir.
6. In your group, discuss how a reservoir is formed, and write a brief paragraph describing the process.
7. On a flat surface, place the reservoir at one end of the large piece of paper or cardboard.
8. To create a water treatment plant, turn a milk carton on its side, and stand a small toilet tissue tube on end so as to trace its circumference on the side of the milk carton.
9. Use scissors to cut out the circle.
10. Repeat steps 8 and 9 on the opposite side of the milk carton (Diagram 2).

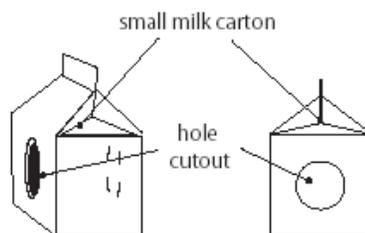
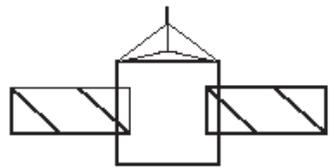


Diagram 2

11. Connect the water treatment plant to the reservoir by using a small toilet tissue tube in each of the cutout holes (Diagram 3).



milk carton with toilet tissue tubes  
sticking from holes

**Diagram 3**

12. Brainstorm ideas on how a pipe system works to get water from the reservoir to the water treatment system and finally to the homes and businesses in a community. (There are four different sizes of pipes to use in the system.)
13. After reaching a consensus, draw a design for the pipe system in your science journal. Be sure to consider which size pipe should be used for each level of the pipe system, and explain why.
14. Following your design, use cardboard tubes, straws, wooden skewers, and toothpicks to create your pipe system for a community of homes. If necessary, use scissors to cut pipes to length.
15. Use glue or tape to secure the system together and in place.
16. Connect your system to the reservoir.
17. Draw houses and businesses on the cardboard.

#### *Conclusion*

1. Discuss how water gets into the reservoir and then to your house. Trace its path, and record the path in your science journal. Illustrate the path.

#### **Assessment**

- **Questions**
  - How does water get in a reservoir?
  - Why is a reservoir important to water systems?
- **Journal/writing prompts**
  - You are water in the reservoir. Describe your journey to a faucet in a home.
  - You are an engineer hired to improve the local reservoir system. Describe some changes you would make and why.
- **Other**
  - Read student journals and analyze models to check for understanding.

#### **Extensions and Connections (for all students)**

- Have students research reservoir systems in different parts of the United States and evaluate systems. Then have the students design a system they believe would work best. Students will create a 3-D model of this new system.

### **Strategies for Differentiation**

- Use an overhead or project Diagrams 1 & 2 for the class or provide a copy of the diagrams for each group.
- Model each step of constructing the reservoir and water treatment plant.
- For the water treatment plant, pre-trace or cut circles on the milk cartons.
- Provide pipe template to trace in journal.
- In lieu of journal prompts, ask students to list the path of water from the reservoir to the water treatment plant and beyond.
- Use presentation software to illustrate the steps/path for the water to follow from the reservoir to the treatment plant.
- Use pictures to sequence the order/path of the water to follow from the reservoir to the treatment plant.
- Invite a public utilities person who works at a reservoir or water treatment plant to discuss the process of water treatment.
- Visit a reservoir.