



# TEXAS COMMISSION ON ENVIRONMENTAL QUALITY Lesson Plans for Teachers

[www.tceq.state.tx.us/assistance/education.html](http://www.tceq.state.tx.us/assistance/education.html)

## Making a Water Filter

### Grade level:

- Fifth grade

### Sample TEKS for 5th grade:

#### Science:

- 5.2A - E
- 5.3A, C, D, E
- 5.4A, B

#### Social Studies:

- 5.7B
- 5.11B
- 5.19A

### Objectives:

The student will interpret written information to a realistic mode; evaluate the effectiveness of different variables; and be able to draw logical conclusions about preferred materials in a water filter system.

### Materials:

- 2-liter soda bottles filled with sludge water (dirt, pebbles, sand, food coloring, etc.)
- coffee filters
- cheesecloth
- paper towels
- sand
- gravel
- soil
- different size containers
- rubber bands

### Background:

The water on our earth has been here for millions of years and must be used over and over again. Most people today get their water from public utility companies that get water from a natural source. Some of our water comes from surface water such as lakes and rivers. Other utility companies get water from underground sources (rock, clay, sand, gravel) called an aquifer. Public utility companies must clean this water to make it safe. This process is called water treatment.

**Procedure:**

Show a bottle of the prepared sludge water. Would they like to drink it? Discuss where it came from and how it is different from the water that comes out of the tap. Ask questions about the water source identified for their community. Could it have things in it that you would not like to come out of the tap? Like what? Water utility companies must clean the water that comes from the source. Introduce the book: *The Magic School Bus Visits the Waterworks*. Read the book and discuss.

Your utility company must find a way to clean the water that will travel through the pipes. Using the system outlined in the book, students will observe the materials provided on the table. They may use any of these or any others in the room. After a group discussion, students will draw a plan that they think will clean the sludge in the jar. Have students construct the treatment system they designed, take a bottle of sludge to the system and try it out, writing down what happened. If not happy with the results, have students evaluate the treatment plant. What could be wrong? What changes could have been made? Have students make the changes and try again. When the group is satisfied that the water will be sufficiently clean, draw a model of the treatment system and label carefully.

**Extension:**

**Language:** Write a sequence story of the steps water goes through in your treatment plant. Use the Internet to find names of water utility companies in Texas. Record the searching process you went through. Write a letter to the residents of your community to convince them of the safety of your water. Stage a debate over the benefits and problems associated with fluoride.

**Math:** Use a timer to record the amount of time required for all the sludge water to make it through your water treatment system. Compare with other groups. Using a ruler, draw a scaled model of your treatment plant. Make up story problems about situations in the water treatment plant.

**Social Studies:** Visit a nearby water treatment plant. Make a list of safety rules to be followed around a water treatment plant. Construct a Venn Diagram comparing uses for clean water versus untreated water.

**Health:** Use a magnifying glass to determine the content of your treated water. What could possibly be left in the water? Investigate the benefits and problems with the chlorine and fluoride that is added to treated water.

**Art:** Construct a class mural showing the steps the class experienced at the waterworks. Divide jobs between the students.

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