

LESSON: Water Pollution**GRADE: 3****OBJECTIVES:****Science as Inquiry-****S.3-5.SI.3 Plan and conduct scientific investigations.**

- Students should engage in systematic observation, making accurate measurements, and identifying and controlling variables.

MATERIALS & RESOURCES:

- Water
- Food coloring
- Large clear containers
- Small clear cups
- Dirt
- Cooking oil
- Access to these links:
- Planet Patrol, Water Usage - Iowa DNR
<http://www.youtube.com/watch?v=iPZs-1GFkVs>
- Water Science for Schools- <http://ga.water.usgs.gov/edu/waterquality.html>
- Stirrers
- Coffee filter or other filtering system
- Towels for cleanup
- Science journal for observations

PRESENTATION:

Only a small percentage of the Earth's water is freshwater, the water we use every day. Every time we dump something down the drain, in the grass, in rivers, and even send pollution into the air, we are polluting our freshwater resources. If we are not careful now, we may end up with water that could be potentially harmful later.

DIRECTIONS:

1. Have water stations set up with water, cups, pollutants, and towels where a small number of students can work at one station while the whole class goes through the demonstrations. Food coloring can represent pesticides, wastewater, or ground water seepage.
2. *What is water pollution?* Discuss this question with the students. When the students think they have a good answer, have them write it in their science journal.

3. Mix water and a scoop of dirt in a cup. *Would you drink this?* A little dirt isn't harmful, but some of the stuff that gets into our water could be very harmful.
4. *What kinds of things cause water pollution?* Show a picture of how water can get contaminated (see usgs.gov links above). Wastewater from factories, pesticides from farms, and oils and chemicals washing off of surfaces and into ground water can be very harmful.
5. Have the students look at the materials at their station. Describe any of the pollutants, ie: food coloring is a pesticide from a near-by field. Have the students write a list of the pollutants in their journal.
6. *What would happen if these items were added to water?* Students write in their journal what they predict would happen. As a group, each student takes 1 small cup and fills it half way with water (or have cups prepared).
7. *What does the water look like? Write this in your journal.*
8. Demonstrate how each student should add the contaminant (add two drops of food coloring). Students follow by adding the food coloring to the water. *Write in your journal what you are noticing about the water now. This is the rivers, lakes, and streams that get contaminated with chemicals. Would you drink this now?*
9. Have students pour their cups into the container at each station that is half filled with water. *What do you notice about the big water container after everyone's small cups are poured in?* The food coloring should be diluted. *When the water that is polluted goes into a larger body of water, it is still polluted, but there is less pollution compared to water. But you still wouldn't want to drink this because look at how much chemical is still in the water!*
10. Repeat the water pollution demonstration with any remaining pollutants. Dump everything into the big container at each station, each time getting more and more polluted. Have students write in their journals what they observe each time something is added to the big container.
11. Finally, the teacher can show the students how water can be filtered by the ground or purification of urban drinking water by pouring the contaminated water through a water filter into another clear container. Students should observe what is in the new container and what is left behind in the filter.
12. Wrap up by asking the students what they can do to prevent water pollution and how they felt about the water pollution exercise.

TIME:**45 min**

PROCESSING THROUGH THE SIX PILLARS:

WHAT HAPPENED?

- How did water get polluted in this activity?
- What happened when polluted water in a cup was poured into the big container?

SO WHAT?

- How can good Citizens help keep pollutants out of fresh water?

NOW WHAT?

- How can you help other people know about water pollution?