

Teacher/School: Laura Sherley and Gitona Rogers

Unit Title: Water Pollution

Grade Level: Third Grade

Subject/Topics:

The topic is water pollution. We will incorporate the iRespond, science journals and concept mapping from the MSP workshops.

Time Needed: 40 minutes

Learning Objectives: What will students learn?

- Students should be able to describe, record, and explain how water pollution affects the earth, their family, and themselves.
- Students should be able to compare, evaluate, and revise their observations through discussing what they learned at the various science stations with their partner.
- Students will be able to distinguish the difference between water, land, and air pollution.

Sunshine State Standards

SC.D. 2.1- The student understands the need for protection of the natural systems of earth. The student understands that people influence the quality of life of those around them.

SC.G. 2.1- The student understand the consequences of using limited natural resources. The student knows that the activities of humans affect plant and animals in many ways.

MA.B.I.2- The student measures quantities in the real world and uses the measure to solve problems.

MA.B.I.2- The student selects and uses appropriate units and instruments for measurements to achieve the degree of precision and accuracy required in real-world situations.

LA.A.2.2- The student constructs meaning from a wide variety of texts.

LA.C.2.2- The student uses viewing strategies effectively

Materials/Supplies

Individual lap tops for each student

The students will have to access two Internet websites. It is possible that they can share computers if there are not enough computers.

Clear plastic cups (one for each student at each station)

Two of the stations involve mixing different materials; therefore for the students to see the experiment clearly the cup must be clear.

Feathers (any color, one for each student)

During one of the stations the students will dip a feather in a cup of oil and water to see the consequence oil can have on birds or any other animal that has feathers.

Cooking oil (2 48 oz. Bottles for a class of 25)

The students will have to mix oil and water at one station

Liquid Detergent (any brand)

The students will mix detergent with water at one of the stations.

Coffee Stirrers

The students will have to mix both the oil and water, and the detergent and water. Coffee stirrers

can be replaced with any object that will stir these items without interfering with the reaction.

Science Journal

The students will have to record their reactions to the experiments, and they need to write down what they observed during the experiments. They do not have to have a journal, and any type of notebook paper is a good replacement.

Concept Mapping Sheet

iRespond (one per student)

Pre-requisite Skills

Water pollution is enough harmful material in the water to damage its quality. It has become a huge problem over the years. The main source of water pollution is sewer and storm drainage. Runoff from the sewers can become trapped in the water table or in lakes and streams. Storm drainage can contain harmful chemicals. This water runs off into the water table. When oil is placed in water, the two liquids do not mix. The oil will sit on top of the water. This is what happens when any oil based product is mixed with water. Even in the environment the oil will sit on top of the water, such as in an oil spill. Much of the same happens when washing detergent mixes with water. When we wash our clothes with detergent the dirty water runs into the sewer. After sitting for a period of time the detergent settles. Laundry 1 detergent does not dissolve in the water. The Exxon Oil Spill occurred on March 23, 1989 in the Prince William Sound of Alaska. Approximately 11 million gallons of oil spilled out over 1,300 miles of the ocean. The spill killed thousands of animals, including whales, seals, otters, and bald eagles. Even after sixteen years there is still oil that has not been cleaned out of the ocean.

Instructional Procedures: What will the teacher be doing? What will the students be doing?

1. The teacher should ask the students what different types of pollution there are (they should say land and air, because they do not know about water pollution yet).
2. Then the teacher should introduce the third type of pollution, water pollution.
3. As a class, students and teacher will complete Concept Map (See attached)
4. She/He should have a proper definition of water pollution ready for the students after they made their inferences.
5. Now that the students are introduced to the topic the teacher should split them into groups of four (in the groups of four they should also be divided into pairs in order for them to pair and share at the end of the lesson)
6. Since the students are ready for the stations the teacher will show on the board, transparency, power point, etc. the questions she/he expects the students to answer at each station (What did you see? What did you learn? What did know?) They will answer these questions in their Science Journals.
7. The first 2 groups of four will be placed at the water and oil station. There they will be expected to mix oil and water. Then they will put a feather in the mixture to see the results the solution has on the feather. In addition, there will be a line on the cup that indicates how much oil should be added (the students will record the answers to the questions, and any personal thoughts they have, however they only have 3 and half minutes so encourage them to move quickly).
8. The next 2 groups will be placed at the water and detergent station. There they will be expected to mix detergent and water. Like the oil and water station there will be a line on the cup that indicates how much detergent should be added (the students will record the answers to the questions, and any personal thoughts they have, however they only have 3 and half minutes so encourage them to move quickly).
9. Another group of eight will be placed at the first laptop station. At this station the students will examine a website that shows them a real life virtual neighborhood that has pollution hazards, <http://www.epa.gov/OWOW/NPS/kids/whatwrong.htm> They will have to point the mouse at potential hazards, and read about what they could do to prevent the previous pollution hazards (the students will record the answers to the questions, and any personal thoughts they have, however they only have 3 and half minutes so encourage them to move quickly).
10. The final group of eight will be placed at the second laptop station. At this station the students will examine a website that shows them pictures of an oil spill, <http://www.evostc.state.ak.us/facts/photos.html> They will probably relate this station with the station about oil, water, and the feather (the students will record the answers to the questions, and any personal thoughts they have, however they only have 3 and half minutes so encourage them to move quickly).
11. Once the students have completed each station and recorded their thoughts they will go back to their original tables.
12. Now that they are back at their tables they will divide into pairs. In the pairs they will share what they observed at the stations (this way they are communicating what they saw and possibly learning new facts about water pollution).
13. They will then be assessed on their knowledge of water pollution with a short quiz using the iRespond devices.

Differentiated Instruction

This is a hands-on learning experience. This will help the ESE students to better understand the concept. They will be able to see, touch and perform their own experiments.

Assessment

Students will be assessed using the iRespond devices. They will take the short quiz on water pollution and submit it through iRespond.

1. Water pollution occurs when a toxic substance enters

- a. the air
- b. lakes, streams, rivers, oceans, and other bodies of water
- c. the landfill
- d. the backyard pool

2. Water pollution affects

- a. ground water
- b. people
- c. aquatic ecosystems
- d. all of the above

3. Agricultural run-off contains

- a. vitamins
- b. leaves and branches
- c. fertilizers and pesticides
- d. both b and c

4. When water is unsuitable for drinking, recreation, agriculture, and industry, it is

- a. too hot
- b. polluted
- c. salty
- d. all right to use

5. Who can escape the effects of water pollution?

- a. nobody
- b. animals
- c. people
- d. both a and b

6. What causes air pollution?

- a. smoke from cars, buses, and scooters
- b. smoke from factory chimneys
- c. cigarette smoke
- d. all of the above

7. Acid rain is mainly caused by toxic substances that are released into the air. Its effects are harmful to

- a. only aquatic plants and animals
- b. forests and crops
- c. land animals
- d. all of the above

8. Where does land pollution occur?

- a. toxic substances that are released into the air
- b. toxic substances that are released into the water
- c. household garbage
- d. agricultural run-off

9. What can I do to reduce solid waste?

- a. reuse, recycle, reduce
- b. referee, retire, rehire
- c. reread, rewrite, redo
- d. rehearse, redirect, recite

10. To reduce household garbage, my family and I can

- a. reuse items instead of throwing them away
- b. recycle aluminum, paper, and plastic
- c. reduce unnecessary waste by shopping wisely
- d. all of the above

1. b 2. d 3. c 4. b 5. a 6. d 7. d 8. c 9. a 10. d