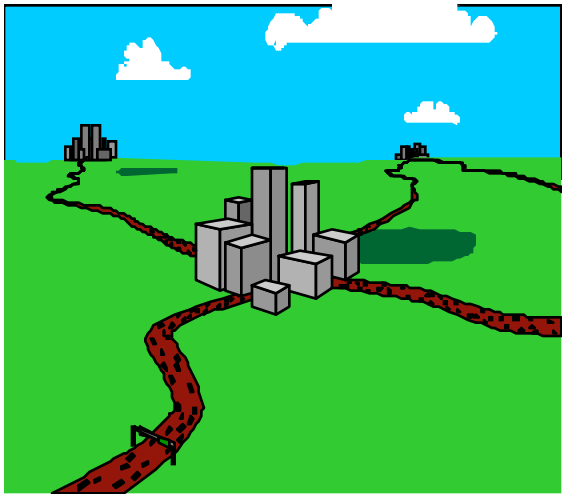
MYSTERIOUS POLLUTER

Objectives:
Students will:

- identify several common pollutants and
- identify the difference between point source and non-point source pollution.

Materials:



- Plastic box and lid (approximately 9x14x6)
- 1 lb sand
- Water
- 1 quart container for water
- Two 10cc syringes (without needle)
- Baking soda
- Vinegar
- Small cup for vinegar
- Teaspoon
- Eyedropper
- Ice cube tray
- Colored toothpicks or Monopoly game houses
- Food coloring (not yellow)
- Spray bottle of water

Background:
Review the two kinds of pollution, point source and non-point source. Point source comes from a specific source like a discharge pipe at a factory. These sources are relatively easy to locate. Non-point source pollution is associated with sources not easy to locate, surface water runoff from streets after rain or snow or runoff from fields tainted such as animal wastes, pesticides, etc.

Procedure:
To keep the pollution location a secret steps 1-4 should be completed without student involvement.

1. Fill the plastic box about 1/3 full of sand and wet it until completely damp
2. Make the sand high at one end and low at the other.
3. Secretly bury a teaspoon of baking soda in the hill end, but not too deep, and mark it with a toothpick or house to represent a house with a well.
4. Add 4 or 5 other houses to the surface.
5. Have a student read the story on the next page.
6. Have the students test the water by using the syringe to draw water out at each house. Place a few drops from the test well in an ice cube tray then, using an eyedropper add a few drops of the "pollution indicator" (vinegar) to each test area.
7. When the vinegar makes the water fizz, you have found the pollutant.

8. Ask the students how they could clean up the pollutant and how they would keep the neighborhood water from being polluted again.

Discussion questions:

- Which type of pollution did they just find?
- Which type is easier to fix?
- What is the best way to prevent these types of pollution? (Education)
- Since you know your groundwater is polluted and where it is coming from, where will you choose to put your well?
- What if you are using a municipal system, where will you get water?
- How will you decide?
- Can you clean the water in your area?
- Can you clean it in your well?
- Will you have to truck water into your area?
- How will you work to solve this problem – would you have to create an emergency response plan that was presented to the city council – what would you recommend?

To provide an example of point source pollution, have the students perform a second experiment. Add 5 drops of food coloring to one end of the box and, using a spray bottle, lightly mist the colored area. Watch the water spread through the box. It should fan out as point source pollution would.

The Story

The people in your town have asked you to help them. Someone has been dumping some leftover chemicals in their backyard. This is beginning to pollute a whole neighborhood's water supply. Several people have already gotten sick from drinking the polluted water. Because of this, no one can use any water until there is no more pollution or until the pollution levels dramatically decrease. Although the town residents have been trying to clean up the water, they can't be completely successful until they have found the source of the pollution. Since no one in the town will admit to being the source, the town has called you in to do some environmental detective work. You must test the water near each of the houses by taking a sample from each well. Put the sample in the mixing tray and add the "pollution indicator" to it. If the water by that house is polluted, your sample will fizz.