

Materials:

Sand	Water	Plastic Spoon	Model Bottle	Collection Bottle
Liquid Dish Soap	Dropper	Food Coloring	Clear Plastic Drinking Straw	
Clear Plastic Cup				

Background:

Pollution takes many forms and it affects us in many ways. Pollution can be caused by contaminants released into the **groundwater**. Septic tanks, cess pools, and injection wells intentionally empty substances into **groundwater**. If an underground oil or fuel pipeline broke, then fuel would accidentally be released into **groundwater**. When you fertilize your lawn, some of those fertilizers go into **groundwater**. If someone had a gas station that closed, but there was still some fuel in the underground tanks, those tanks could rust and leak fuel into the **groundwater**. When a contaminant gets into the **groundwater** it will produce what is called a *plume*, an area of the water which is contaminated. A plume's shape is determined by what the contaminant is and the conditions around it. In this activity we will create a contaminant plume and diagram its shape.

Procedure:

1. Put the screen into the model bottle.
2. Fill the model bottle with sand to the 1,000 milliliter mark.
3. Place the model bottle into the collection bottle.
4. In the clear plastic cup mix about one teaspoon of liquid dish soap and five drops of food coloring.
5. Add water to the model bottle until all the sand is wet. If the sand were an aquifer, what condition does this represent?
6. Fill a drinking straw about half way with the soap/food coloring mixture.
7. Keeping your finger over the straw hole, insert it into the sand near the edge of the bottle.
8. Tip the model bottle so that the sand the straw is in is higher than the rest of the sand (see diagram).
9. Wait 10 to 15 minutes.
10. Scrape out a 100 ml layer of sand with a plastic spoon and then draw the "contaminant plume" by looking at the sand left in the bottle. (Label this line by the volume from the side of the bottle.)
11. Scrape out another 100 ml of sand and add this shape to your drawing.
12. Continue scraping out 100 ml volumes of sand and adding to your drawing until you can no longer see the plume.
13. Clean up.

