

Michael Urbas – Lakeview Junior High School (6th grade)

Pollution from Ground Sources

Apply Scientific Inquiry and Scientific Habits of Mind

Students will apply the concepts, principles and processes of scientific inquiry within classroom investigations accordingly.

Illinois Learning Standards:

- ILS 11A: Understand the concepts, principles and processes of scientific inquiry (Knowledge).
- ILS 13A: Apply the appropriate scientific habits of mind when investigating science concepts (Application).
- ILS 13B.E: Incorporate scientific technologies and the processes of scientific inquiry into classroom investigations and reports (Communication).

Note to teacher: These concepts could be embedded into scientific inquiry investigations. Suggested activities for standards 12 B and E and 13A at stage E incorporate many of the performance descriptions for Standard 11A.

This activity is designed to show how pollution can be introduced from sources that are not completely visible to the observer. In this activity, students will discover that water in the form of rain can carry contaminants to the underground water below. This activity is primarily designed to show how underground tanks can leak and pollute groundwater. The lesson can also be expanded to show how pesticides from golf courses or farm fields do basically the same thing.

Materials:

Plastic film vials or small plastic bottles for each lab station
Small pebbles to simulate soil layers
Kool-Aid
Plastic 1-liter bottles
Beakers

Teacher Preparation:

It is necessary to prepare “tanks” to simulate gasoline storage tanks at local service stations or anywhere tanks are buried for the storage of liquids. This can be accomplished by using film canisters or small plastic drink containers and poking holes in them to simulate leaks in tanks. The tanks are filled with a small amount of a substance to serve as “pollution” (Kool-Aid powder or something similar). As the water flows into the tanks, the pollution is released, and students notice the problem quite quickly.

The plastic bottles must be cut off at the bottom to allow the water to be poured in, simulating precipitation and allowing it to be collected in the beaker below it. The idea is to show how water enters the water table, but this introduces a new variable with the

addition of pollution from an unseen source. The activity can be used with multiple soils, and each lab station will require enough materials to perform the activity. Different soils can also be used to measure porosity and to determine which soils hold more or less water. Students should be encouraged to think about what occurred and why; in addition, they can propose solutions to the problem.