SCIENCE NORTH SCIENCE NORD
SUDBURY, ONTARIO, CANADA

Make a Watershed **Grade 8 - Water Systems**

Post Activity

Assessment: Discussion
Cross-curricular: Geography

Big Ideas
50 minutes

Water is an important resource that needs to be managed sustainably.

Water is crucial to life on Earth.

Specific Expectations
Demonstrate an understanding of the watershed as a fundamental geographic unit, and explain how it relates to water management and planning (3.2)

Explain how human and natural factors cause changes in the water table (e.g., lawn watering, inefficient showers and toilets, drought, floods, overuse of wells, extraction by bottled water industry) (3.3)

Assess the impact on local and global water systems of a scientific discovery or technological innovation (1.3)

Use appropriate science and technology vocabulary, including water table, aquifer, polar ice cap, and salinity, in oral and written communication (2.6).

Description
Students will make their own watershed and test them to see where water and pollution will flow.

Materials
- Cookie sheets or rectangular cake pans
- Plastic wrap or garbage bags (clear)
- Spray bottle or watering can
- Masking tape
- Food colouring or sparkles
- Newspaper/modeling clay/rocks
- Water
- Various objects from around the classroom
- Permanent markers
- Sponges

Introduction

1. Discuss what the students remember about watersheds from the Planetarium show.
2. Key ideas:
    a. The water in a watershed eventually all flows to one place.
    b. What happened upstream will affect downstream.
    c. The students will make model watersheds to see how pollution flows from upstream to downstream.

Action

1. Divide the class into groups of 4-5 students, with one cookie sheet or cake pan per group each.
2. The students will make a landscape on their cookie sheet using scrunched up newspaper or they can use modeling clay/rocks to mimic the natural landscape. If using newspaper, have the students tape and cover the landscape with the plastic wrap or garbage bag. Push down the plastic so that it takes the shape of the objects underneath.
3. Have students predict how water will flow in their model.
4. Spray the model with water and observe where the water flows and collects, identify lakes, rivers and mountains. Is this watershed open or closed?
5. Students place 3 dots in permanent marker on the watershed to represent communities and a dot of food colouring to show a factory/mine/industrial plant. Spray the model again, the food colouring will show where pollution would travel.
6. Challenge students to find the best locations for industry to be built for the different communities and for the environment. Remember that people from the communities would work at the factory/mine/industrial plant, so it is important to factor in distance between the communities and the factory.

Consolidation/Extension

Students present their watersheds and discuss what factors they considered when placing communities and industries. It is very important for city planners to think about the effects of industries on the local environment and human population. Their job is not an easy one because it is often difficult to choose between human and environmental impact.

This activity can be extended by adding other sources of pollution to the model in different colours. Pollution from agricultural runoff, untreated sewer water, or runoff from the communities could all affect water quality.

Alternatively, the students can add different types of surfaces to their model to better understand how surface type can change the way that water flows through a watershed. For instance, the garbage bag or plastic wrap is a great model for the pavement, concrete and other hard surfaces we find in our cities and towns. Sponges act as a model for a wetland. By adding a sponge in specific

locations, students will be able to see how these important ecosystem factors help to hold pollutants before they run downstream.

Lead a discussion with the students on how important wetlands are within our ecosystems. They not only capture and filter pollutants but they also help to reduce sediment, which can cause waterways to become clogged. Plus, wetlands provide excellent habitat for many animal species, from invertebrates to vertebrates.

Building a model out of soil, small plants, and other materials that mimic the natural environment can extend this activity. By adding soil to the model, students will gain a better understanding of how water can cause erosion in a watershed. There are many types of native plants that are actively used in municipalities to control erosion, such as ivy or lupins, which have deep roots and create a mat across the area needing the control.