

# **Dirty Downstream**

## **5<sup>th</sup> Grade**

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### **References:**

Pennsylvania League of Angling Youth  
Columbus Metroparks SEED Program

### **Benchmarks:**

LS 6: Diversity and Interdependence of Life - Analyze how all organisms, including humans, cause changes in their ecosystems and how these changes can be beneficial, neutral or detrimental

ST 1 - Investigate positive and negative impacts of human activity and technology on the environment.

ES 6 - Investigate ways Earth's renewable resources (e.g., fresh water, air, wildlife and trees) can be maintained

### **Objectives:**

Students will demonstrate their understanding of detrimental dynamics added to a watershed. They should be able to predict what the outcome of this experiment will be and whether it is beneficial, neutral, or detrimental. They should also be able to make the connection to the real geological implications of pollution and how a dynamic can affect a large area of the environment.

### **Materials**

Chocolate syrup  
Trash bag (s)  
Small pieces of trash paper  
Food coloring  
Cocoa  
Salt  
Detergent (laundry or dishwasher or soap)  
Motor Oil  
Spray bottle containing water

### **Initial Observation:**

Students will view a map of the central Ohio area and determine where highlands and valleys exist. They will also need to notice the location of lakes, rivers and streams. In this experiment, students will create a model of Ohio's landscape.

### **Target Observations:**

Students should observe that pollutants flow very far away from their original sources. They should also see that the water at the bottom of the watershed has become polluted with several different pollutants.

### **Procedure:**

The watershed will be created by laying newspapers flat on the ground as well as making hills and mountains by crumpling up the papers. The trash bags will be laid on top of the landscape. Each student in a group will select a "place to live" (designate a small area on the trash bag) and will play a different role (mechanic, trash collector, Laundromat owner, painter, snowplower). Each person will have a certain kind of waste that they dispose of around their area. For example, the mechanic will pour motor oil on its plot of land; the trash collector will dump shredded paper in his or her area; the painter spills food coloring (paint); the snowplower spreads salt all over the roads, etc. After all of the dynamics are added to the landscape, each student should observe the start of mixing pollutants.

Ask the students if they think it is a good thing to have this waste near their homes and water sources. Continue to discuss the beneficial, neutral, or detrimental affects. Ask the students what will happen when it "rains". To represent rain, spray water from a spray bottle or dump water slowly from a cup. The rain begins to wash all of the pollution downstream.

### **Discussion/Summary:**

The students will find that every source of pollution has made its way down to the river at the bottom of the watershed. They should be able to make the connection between pollution and groundwater pollution. They should be able to list at least three reasons why we should properly dispose of waste.