

# PERCOLATOR

## Learning Objective:

Students will be able to describe how soils **filter pollutants** from water.

## Background:

As water passes through soil, suspended particles are filtered out. The makeup of the soil determines how well it will act as a filter. For instance, a sieve with large holes will trap only particles that are larger than the holes. A coffee filter which has very tiny pore spaces will filter out very fine particles. Likewise, finer textured soil with small pore spaces will trap more sizes of "pollutants" than course-textured, loosely packed soil. If flowing water is slowed, it is more likely to penetrate the surface of the ground and **percolate** down through the soil. The more slowly water percolates, the greater the filtration. Soil covered by plants and trees will slow water speed. Vegetation helps to filter pollutants through absorption and **transpiration**. Bare soil either **erodes** with rain water, or becomes so hard that water cannot penetrate it. Buffer zones, or planted strips of land alongside waterways, help to filter pollutants from rain water before it drains into the water body.

## Materials:

|                                                    |             |           |
|----------------------------------------------------|-------------|-----------|
| Pebbles                                            | top soil    | duct tape |
| Coarse sand                                        | fine sand   | bucket    |
| An airtight plastic lid                            | plastic cup | scissors  |
| Coffee can, both ends open                         |             | ruler     |
| A piece of window screen to fit the lid of the can |             |           |

## Procedure:

Carefully cut a square hole in the middle of the plastic lid.

Cut a round piece of the screen to fit the lid.

Fasten the lid to the bottom of the can.

Add one inch of pebbles to the can.

Add coarse sand on top of the pebbles until the can is half full.

Add fine sand on top of the pebbles until the can is full.

Mix two tablespoons of soil into a cup of water.

Holding the can over a bucket, slowly pour the water into the can.

Observe the slow percolation process. Notice the clean bucket water.

Discuss with students their observations. Have students speculate based on their observations where percolation takes place most effectively. Wetland areas serve as effective percolation areas.

## Extension:

Allow students to research wetlands and the effects that filtered pollutants have on wetlands and its inhabitants.

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Resources: Mississippi Department of Environmental Quality, Environmental Protection Agency, USDA Soil Conservation Service