Lesson Plan

Grade: Elementary/Middle

Title: Enviroscape

Supplies in the resource kit:

- Enviroscape
- Spray Bottles
- "Pollutant" Supplies
- Farm Animals
- Buildings
- Fences
- Paper Towels

Supplies needed:

- Water
- Copies of handouts

Key Terms

- *Water Cycle* - An endless cycle that has no starting or ending point that shows how water can travel throughout the earth and its atmosphere
- *Watershed* - An area of land and all waterways that drain into a particular body of water
- *Stormwater runoff* - Water that travels over the roof tops, streets and driveways on its way to the storm drain.
- *Pollution* - Harmful materials that enter into the environment
- *Point Source* - A single identifiable source of pollution, like a factory, pipe or ship
- *Nonpoint Source* - Pollution that is not from one specific location. Usually caused by different human activities on land
- *Best Management Practice (BMP)* - Effective and practical practice as a means of preventing or reducing pollution

Objectives

- Explain the parts of the water cycle and understand the importance of water
- Illustrate a watershed
- Investigate sources of water pollution
- Brainstorm ways to reduce water pollution
- Compare and Contrast Point source and nonpoint source pollution

Modifications/Ideas for implementation

This model can be used to both help explain the different parts of the water cycle, as well as watersheds and pollution sources. This lesson can be used as an entire class or in a smaller group setting

Lesson Plan

Grade: Upper Elementary/Middle

Title: Dirt Shake

Fun Facts:

- Pollution is one of the biggest global killers, affecting over 100 million people.
- Over 1 million seabirds and 100,000 sea mammals are killed by pollution every year.
- Approximately 40% of the lakes in America are too polluted for fishing, aquatic life, or swimming.
- Each year 1.2 trillion gallons of untreated sewage, stormwater, and industrial waste are dumped into US water.

https://www.dosomething.org/us/facts/11-facts-about-pollution

Interest Approach:

Start a conversation about water and pollution with your students. Ask the following questions to build interest.

- What do you think a watershed is? *An area of land and all waterways that drain into a particular body of water*
- How do you see pollution in your watershed/community? *Encourage them to think beyond trash on roadsides*
- Who do you think pollution hurts? *Plants, Animals, and Humans*

Getting Started

Notes:

- Make sure the stopper in the basin or "lake" is secure when starting the lesson, you do not need to press very hard to make it secure.
- Make sure the collection tub is underneath the stopper prior to beginning the lesson.
- Rinse off and dry all pieces prior to putting the model away and returning it to its case.
- Please let the Delaware SWCD know if you use the last of one of the pollutant examples (i.e. salt, cocoa)

General Directions:

Add the pollution to the proper areas of the enviroscape board *(salt on the roads, pet waste near a dog, fertilizer in the farm field, sediment in the construction zone)*, you can do this or you can have student volunteers help. Integrate the Guided Learning page into the discussion, unless you would rather do it at the end of the activity phase. Once all the pollution has been added, use the spray bottles to simulate a rain storm. The pollutants should generally start mixing together and collecting in the water basin/lake. The water will look polluted and gross. As you're re-examining the board, discuss the BMPs on how to keep the water clean as well as the effects of pollution.

Pollution	Example	BMP
Road Salt	Table Salt	Only use on roads/as necessary/previous pavement
Fertilizer	Green Jello	Test the soil to prevent over use
Pesticide	Red Jello	Use environmentally friendly pesticides
Animal Waste	Tiny Rocks/Brown Sprinkles	Fence livestock out of waterbodies
Pet Waste	Coffee	Pick up after your pets
Sediment	Cocoa Powder	Silt fences at construction sites, plant grass and trees in bare spots
Litter	Paper Pieces	Responsibly dispose of trash, use trash bags
Clorine	Blue Water	Keep adults informed so they can make sure companies are being responsible

Optional Discussion Questions:

- Why are some pollution sources easier to find and stop than others?
- How does pollution in one area effect other parts of the country and world?

ENVIROSCAPE *Guided Learning*

Complete the page based on your learning activity using the enviroscape

Pollution	Point Source/ Nonpoint Source	BMP
Only Rain  Down the Drain!		Storm drains flow directly to our streams and lakes; no filter, no treatment

ENVIROSCAPE Guided Learning

Complete the page based on your learning activity using the enviroscape

ANSWER KEY

Only Rain

Down the Drain!

Pollution	Point Source/ Nonpoint Source	BMP
Road Salt	Nonpoint Source	Only use on roads/as necessary/previous pavement
Fertilizer	Nonpoint Source	Test the soil to prevent over use
Pesticide	Nonpoint Source	Use environmentally friendly pesticides
Animal Waste	Nonpoint Source	Fence livestock out of waterbodies
Pet Waste	Nonpoint Source	Pick up after your pets
Sediment	Nonpoint Source	Silt fences at construction sites, plant grass & trees in bare spots
Litter	Nonpoint Source	Responsibly dispose of trash, use trash bags
Clorine	Point Source	Keep adults informed so they make sure companies are being responsible

Storm drains flow directly to our streams and lakes; no filter, no treatment

ENVIROSCAPE *Guided Learning*

Complete the page based on your learning activity using the enviroscape

What is a watershed?

_____ is the movement of soil by wind or water.

_____ is the water flow which occurs when soil is infiltrated to full capacity and excess water (from rain or snowmelt) flows over the land. This becomes a problem when it carries pollutants with it.

_____ pollution comes from many different sources. This pollution is caused by rainfall or snowmelt runoff moving over and through the ground. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into lakes, rives, wetlands, coastal waters, and even our underground sources of drinking water.

Examples

_____ pollution is a single identifiable localized source of air, water, thermal, noise or light pollution.

Examples

What is the problem with soil erosion washing soil in the streams?

What is one thing you can do to keep pollution out of your watershed?

ENVIROSCAPE Guided Learning

Complete the page based on your learning activity using the enviroscape

ANSWER KEY

What is a watershed?

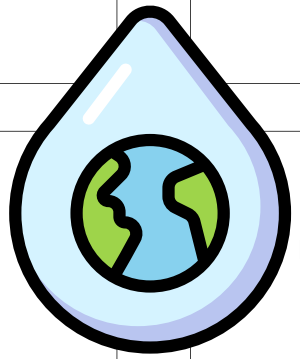
A land area that channels or drains rainfall and snowmelt into the same body of water (stream, lake, river or ocean). Everyone lives in a watershed.

Erosion

is the movement of soil by wind or water.

Flooding

is the water flow which occurs when soil is infiltrated to full capacity and excess water (from rain or snowmelt) flows over the land. This becomes a problem when it carries pollutants with it.



Nonpoint source

pollution comes from many different sources. This pollution is caused by rainfall or snowmelt runoff moving over and through the ground. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into lakes, rives, wetlands, coastal waters, and even our underground sources of drinking water.

Examples

Animal Waste and Manure, Fertilizers, Pesticides, Sediment/Soil, Road Salt

Point source

pollution is a single identifiable localized source of air, water, thermal, noise or light pollution.

Examples

Industrial Plant, Sewage Treatment Plant, and Storm Drains (Point sources carrying non-point source pollution)

What is the problem with soil erosion washing soil in the streams?

Makes water murky and adds excess nutrients and pollution to the water which can be damaging to fish, insects, frogs, and salamanders that live in streams.

What is one thing you can do to keep pollution out of your watershed?

Don't dump anything down a storm drain, wash cars at a car wash or on the grass, pick up after pets, fence livestock away from water sources, teach parents about fertilizers, pesticides and salt.