

Project Build:

Clean Up Our World

Activity Station Signs

WHO DIRTIED THE WATER?

- How did you feel throughout this activity?
- What local bodies of water have been polluted?
- Is all pollution equally dangerous?

BUILD A WATERSHED

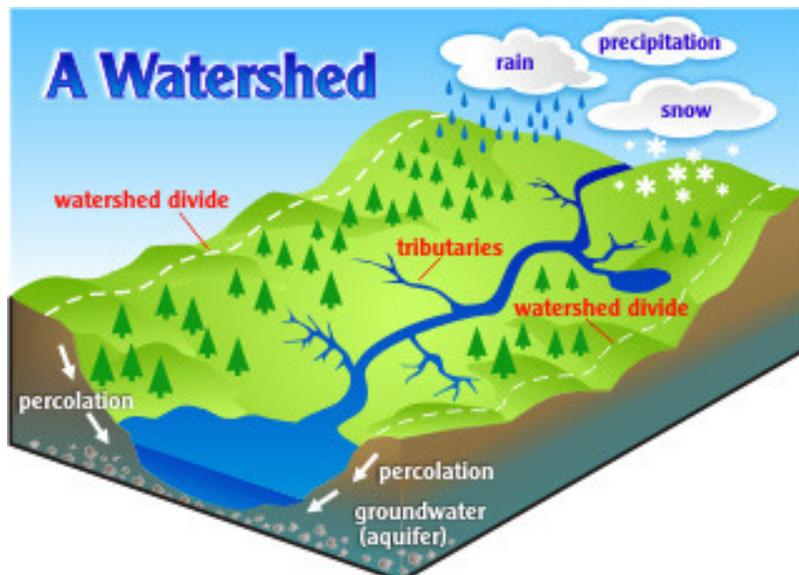
THINGS TO THINK ABOUT:

What are some things that affect rivers or streams?

(Landforms, precipitation, pollution, life, or human structures, etc.)

What problems might an engineer address in a watershed?

(Flooding, navigation, pollution, etc.)



INSTRUCTIONS

1. Arrange the supplies on a tray to make interesting topographical features, such as mountains, valleys, plateaus, and so on.
2. Cover the tray with a trash bag or plastic sheet and gently mold it to the objects underneath. Tape it down as needed.
3. Predict what will happen to rainwater that falls on your landscape. Will it all go to the same place? How will it flow?
4. Spray with water and observe. Share your results.

RELEVANT TERMINOLOGY

Watershed: An area of land where surface water from rain or melting snow comes together to drain into another body of water.

Pollution: Substances that make land, water, or air dirty and not safe or suitable to use.

Point source pollution: Pollution that can be traced back to a single source or event, such as an oil spill.

Nonpoint source pollution: Pollution that cannot be traced back to a single point or event such as agricultural runoff.

Topography: The physical features of an area, both natural and artificial.

WHAT IS THE SCIENCE?

Do you think you live in a watershed? In fact, everyone on Earth does! Every drop of rain eventually drains into a body of water that leads to a bigger body of water and ultimately empties into a very large body of water.

Watersheds are typically named for the body of water that precipitation (rain or snow) drains into. For example, Pittsburgh, Pennsylvania, is part of the Ohio River Watershed because all the water that falls in that region ends up in the Ohio River.

Pollution in a watershed comes from many sources. While some pollution refers to toxic chemicals that are dangerous to people and animals, a lot of pollution is simply too much of something in the water that is usually safe. For example, dirt is not usually toxic, but if too much gets into the water from construction or farming, it makes the water cloudy and kills aquatic plants. Aquatic plants are one of nature's filters—so the water gets even dirtier without them.

ENGINEERING CONNECTIONS

People use water for drinking, washing, cooking, farming, landscaping, swimming, fishing, and so much more.

Engineers try to make sure that there's enough water for all of these purposes by managing its flow, and working to direct and store water. Some of the earliest engineers designed aqueducts to help transport water to ancient civilizations. Aqueducts are channels that carry water from one place to another. You can still see ancient aqueducts in places such as Rome and Jerusalem. Today, engineers use dams, canals, levees, pumps, and pipelines to manage water movement and storage in a watershed.

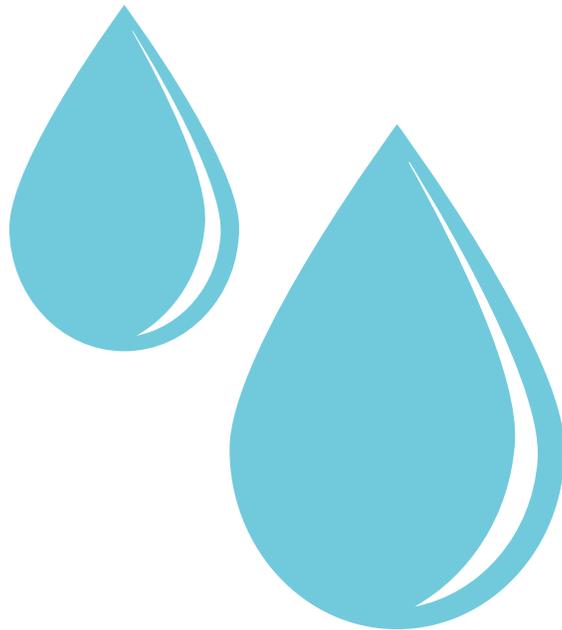
Engineers also help us to keep our water clean. They design and construct sewage treatment plants to clean the water that goes down our drains. They have also figured out how to clean up oil spills and other forms of water pollution.

QUESTIONS TO ASK:

- Where did the water go when you sprayed your watershed?
- What happened when you introduced the pollution source to your watershed?
- If there were a lot of buildings in your watershed, how do you think they'd affect where the water goes?
- In a rainstorm, how might a watershed with mountains act differently from one that's pretty flat?
- If you were an engineer, what solutions would you try to keep the pollution from spreading throughout your watershed?

LOW-TECH WATER FILTER FOR HIGH- IMPACT CLEAN

Goal: Using the available materials, try to build the most effective water filter.



ENGINEERING CONNECTIONS

Access to clean water is just as important at a community park as it is at home and in communities around the world. To get water clean, contaminants like dirt, leaves, insects, algae, and zooplankton (and even microscopic components, like bacteria and chemicals) must be removed. Engineers use technology-- including everyday materials, such as sand, gravel, activated charcoal, and cloth-- to provide people with clean water.