

# What is a Watershed? (Small Group Activity)

## Description:

Working in small groups, students create a working model of a watershed to view its different parts, to understand how rainfall travels and collects, and to recognize human and natural impacts on this living, working, natural landscape.

## Objectives:

- To introduce students and teachers to the concept of watersheds
- To understand how natural and human forces influence watersheds and water quality
- To engage students and teachers in learning about the source of New York City's drinking water and our relationship to watersheds

## Vocabulary:

Absorption, bedrock, cohesion, gravity, molecules, pollutants, precipitation, reservoirs, vapor, valley, watershed, water pressure, weathering

## Recommended for:

4<sup>th</sup> – 12<sup>th</sup> grade students

## Materials:

For each group of 4-6 participants:

- A plastic or metal tray (at least 4" deep)
- A spray bottle filled with water
- Six sheets of newspaper
- One large sheet of plastic
- Two paper towels
- Food coloring (optional)
- [New York City water supply map](#) (optional)

## Method:

- Introduce the activity by explaining that students will create a landscape in their tray that looks very much like the area that collects New York City's drinking water.
- Show students the water supply map and discuss landforms, geography, scale, water bodies, water cycle, etc.
- Ask students to work cooperatively within their groups and to discuss their observations.

### Part I

- Instruct participants to create a mountainous landscape in the basin using pieces of newspaper. Mold the newspaper into mountains and place them in the tray.
- Give each group a piece of plastic to cover the newspaper. Make sure that it is molded to the contours and tuck ends inside the box.
- Using the fine mist from the spray bottle, explain to students that they are to rain on the landscape. Pay careful attention to what the water drops are doing: "How are they moving?" [*Downhill*] "Are they collecting?" [*Forming puddles and/or streams*] "What might the puddles represent?" [*lakes and reservoirs*] "Did these lakes form simply by spraying directly over them?" [*They formed by streams feeding them with water*] After the landscapes have been sprayed, discuss these questions. Ask someone from each group to speak to the class about the observations their group made.
- Discuss what physical feature of the watershed the plastic wrap represents. Encourage students to explore how the water moved over the plastic. What in nature might this represent? [*The bedrock of the mountains and the rocky surface*]

## Part II

- Hand out paper towels to each group. Mold to the landscape.
- Rain and observe how water moves through the landscape.
- Pose questions: “Is the water flowing in the same manner as when it rains on the plastic, or rocky surface?” [*It spreads out, does not move as quickly, still it flows downhill*] “What does the paper towel represent?” [*soil and vegetation*] “Why?”
- Discuss the role vegetation plays in the natural landscape. Trees and grasses for example help to regulate the flow of water and help to prevent flooding and erosion.

## Part III (Optional)

- Add a few drops of food coloring to each landscape and rain again. Pretend the color represents a chemical (or other form of pollution) that accidentally seeped into the soil.
- What observations can you make? How does rain affect the movement of pollutants? [*It is mixed with the water and pollutes the reservoirs; it soaks into the soil*]

- “What does this mean to our water supply?” [*It is very important to protect our water supply and our watershed from pollutants, and to ensure clean water*]

## Discussion:

- You have just created a watershed. Can you describe it? Why is watershed protection important to New York City?
- Can you now describe how our drinking water is collected in the watershed? Share this important information with your family and friends.
- What happens when there is not enough precipitation in the watershed? What do you do to conserve water at home and school?
- Why is watershed protection important to New York City? How do you think the natural landscape helps to maintain water quality? How else can we make sure our water is clean?
- Have your students create a “rainstorm” inside their classroom. This [activity](#) will demonstrate the cycle of water, from watershed to New York City tap.

### For more information contact:

New York City Department of Environmental Protection

[educationoffice@dep.nyc.gov](mailto:educationoffice@dep.nyc.gov)

Also visit DEP’s website at:

[www.nyc.gov/dep](http://www.nyc.gov/dep)

# What is a Watershed? (Class Activity)

## Description:

In this class activity, students create a working model of a watershed to view its different parts, to understand how rainfall travels and collects, and to recognize human and natural impacts on this living, working, natural landscape.

## Objectives:

- To introduce students and teachers to the concept of watersheds
- To understand how natural and human forces influence watersheds and water quality
- To engage students and teachers in learning about the source of New York City's drinking water and our relationship to watersheds

## Vocabulary:

Absorption, bedrock, cohesion, gravity, molecules, pollutants, precipitation, reservoirs, valleys, vapor, watershed, water pressure, weathering

## Recommended for:

4<sup>th</sup> – 12<sup>th</sup> grade students

## Materials:

- Backpacks, coats, (anything lumpy)
- Large tarp or sheet
- Large white beads (rain)
- Large red beads (pollution)
- Blue paper (reservoirs)
- Green paper or leaves (vegetation)
- Straws (aqueducts)
- Blue ribbon/ shoelaces (rivers and streams)
- Labels/pictures representing watershed
- [NYC water supply system map](#)

## Method:

- Introduce the activity by explaining that students will create a landscape that will look very much like the area that collects New York City's drinking water.
- Show students the water supply map or a map of NY State to explore landforms, water bodies, scale, communities, etc.
- Ask students to share their observations.

### Part I

- Instruct participants to put their backpacks and other items in a pile.
- Cover with large tarp or sheet. Ask students: *What kind of landscape do you think this represents? Do we have mountains in our water supply system? Can you name them? How would you guess these mountains are important to our water supply system? What do you observe?*
- Have a few students add green construction paper/ leaves to their mountain range. Ask students: *What do you think this represents? How does vegetation impact water quality and our water supply system?* Discuss the role vegetation plays in the natural landscape. Trees and grasses, for example, help to regulate the flow of water and help to prevent flooding and erosion.
- Add other objects or labels to represent the different watershed features, representing this living, working, natural landscape.
- Using the beads, "rain" on the landscape. Pay careful attention to what the "water drops" are doing. Ask students: *"How are they moving?" [Downhill] "Are they collecting? What might the collections of beads represent?" [lakes and reservoirs] "Did these collections of beads form simply by dropping beads directly over these areas?" [They formed where there were valleys in our mountain range].*

- After the beads have been added to the landscape, ask someone to share their observations and label where they think the reservoirs are located with the blue paper or reservoir labels.
- Ask another student to label where the rivers and streams are located using the ribbon or shoelaces. *How did you know where to place the blue ribbons/ shoelaces?*
- Ask students how they imagine water travelling the more than 100 miles from the mountains to their schools.
- Lastly, ask a student to add straws to represent aqueducts. *What is an aqueduct? Where does it come from and where does it go? \*Make sure that the aqueducts eventually meet\*. Why do they have to eventually meet?*

#### **Part II (Optional)**

- Add some red beads to the landscape.
- Pretend these beads represent a chemical that was accidentally poured into the soil.
- What observations can you make? How does the pollution mix with the clean water (white beads)?

- What does this mean to our water supply? *[It is very important to protect our water supply and our watershed from pollution]*

#### **Discussion:**

- You have just created a watershed. Can you describe it?
- Can you now describe how our drinking water is collected in the watershed? Share this important information with your family and friends.
- What happens when there is not enough precipitation in the watershed? What do you do to conserve water at home and school?
- Why is watershed protection important to New York City? How do you think the natural landscape helps to maintain water quality? How else can we make sure our water is clean?
- Show the New York City water supply map and discuss features similar to those created in your watershed.
- Have your students create a “rainstorm” inside their classroom. This [activity](#) will demonstrate the cycle of water, from watershed to New York City tap.

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