

Water & Watersheds



Department of
Environmental
Conservation

Topics: Water cycle, watersheds, water usage

GRADE LEVEL: 4-5

Big Ideas:

- The water cycle is a complex, multi-step process.
- Most of the water on Earth is not available for humans to drink.
- Water is essential to everything on earth.
- Everyone lives in a watershed.
- Watersheds provide critical environmental services and drinking water for many people.
- Water is one of the major sources of change in our land.
- Water transports material through the watershed.

Learning Objectives: *students will be able to...*

- Develop a model of a watershed.
- Describe the movement of water within the water cycle.
- Identify the forms water takes in the three states of matter and discuss how water transitions between these states.
- Identify shapes and kinds of land and bodies of water in their area.
- Observe how water changes the land.

New York State Science Learning Standards:

4-ESS2-1. Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.

ESS2-2. Analyze and interpret data from maps to describe patterns of Earth's features.

ESS2-1. Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.

5-ESS2-2. Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.

5-PS2-1. Support an argument that the gravitational force exerted by Earth on objects is directed down.

Key Understandings:

- Water is essential to everything on earth.
- Maps show the shapes and kinds of land and water in a particular area.
- Water transports material through the Hudson River watershed and estuary.
- Rainfall and erosion shapes the landscape.
- Earth's processes continuously cycle water. Water is made up of particles whose properties determine its observable characteristics.

Essential Questions:

- When rain falls to the ground around your home or school, where does it go?
- How does the water cycle work? What is a watershed?
- How does geography influence a particular watershed?
- What factors influence the quality of water in the watershed?
- What makes the Hudson River Watershed so unique?
- How can people reduce their impacts on their water supplies and watersheds?

Students will know...

- Most of Earth's available water is in the ocean. Most fresh water is in glaciers or found underground.

Vocabulary:

- Matter: anything that takes up space.

- Only a small percentage of Earth's fresh water is found in streams, lakes, wetlands and the atmosphere.
- Key vocabulary terms.
- How water moves throughout the earth.
- The steps of the water cycle.
- What a watershed is.
- Where water is found on earth, and in their everyday lives.
- Humans cannot eliminate natural hazards but can take steps to reduce their impact.
- Erosion: the wearing away of land surfaces by forces such as wind, water and ice.
- Estuary: a body of water in which fresh and saltwater meet.
- Fresh water: water that is not salty.
- Gravity: the gravitational attraction of the mass of the earth, the moon, or a planet for bodies at or near its surface.
- Salt water: seawater or other water that contains salt.
- Water cycle: continuous circulation of water from water bodies and the land to the sky and back again.
- Watershed: the area of land from which water drains into a body of water.
- Weathering: the physical disintegration and chemical decomposition of earth materials at or near the earth's surface.

Learning Plan: We recommend doing these lessons in sequential order; however they can be done as individual lessons. Lessons have multiple links (videos, songs, diagrams, activities) that can be used at the teacher's discretion depending on class time.

Pre-assess: Use K-W-L to assess students' prior knowledge, have students write or draw in response to the essential questions. Have students draw what they think a watershed is or write down anything they want to know about the Hudson River's watershed.

Progress Monitoring: Formative assessment and teacher feedback should be ongoing throughout the lessons. Teachers should develop assessments based on their individual class needs. Think-pair share, exit tickets, interactive discussions, questions and listening, informal observations, quizzes and student work samples can all be used.

Lesson 1: All the Water on Earth? Students identify the different forms of water found on Earth, demonstrate the amount of the Earth's water that is available for use, and calculate their own water usage.

- Video: [The Basics of Freshwater: Crash Course Kids 14.1](#)
- All the Water on Earth [Student Activity](#) & [Presentation](#)
- Extended Activity - [What's your Water Footprint?](#)

Lesson 2: Water Seekers- Students watch a video, then explore where water exists inside and outside of their school and create a class bar graph of their data.

- [Save Water with Aqua Video](#)
- Water Seekers [Student Activity](#)

Lesson 3: The Water Cycle- Students watch a video about where water comes from, create their own water cycle in a bag, listen to a story about the water cycle and then write their own water cycle journey. Finish the activity with a water cycle song.

- Video: [Where Does Water Come From?](#)
 - [Water Cycle Diagram](#)
 - The Incredible Journey [Interactive Game](#)
 - Extension: [Water Cycle Reading and Writing Activity](#)
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Lesson 4: What is a Watershed? - Students watch a video about what a watershed is and create their own model of a watershed.

- Video: [What is a Watershed?](#)
 - [Hudson River Watershed Map](#)
 - Build a Watershed [Student Activity](#)
 - Extension - [Online Watershed Interactive](#)
 - Extension - [What's a Watershed \(reading\)](#) & [Reflection Questions](#)
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Lesson 5: Watershed Address- Students watch a video, then use maps to become familiar with their local waterways and illustrate how they are connected to their local environment.

- Video: [What is a Watershed?](#)
 - Watershed Address [Lesson](#) & [Presentation](#)
 - River Runner: [Online Interactive](#)
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Lesson 6: Create A Water Filter- Students turn “polluted” water clean using various resources and tools.

- [Build Your Own Water Filter](#)
 - [Online Watershed game](#) - In this interactive game, learn about different ways that humans impact their watershed and explore ways to help clean it up.
 - Video: [Where Does Our Water Come From and Where Does it Go?](#)
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Lesson 7: Trees, Plants, and Other Buffers- Students are introduced to nature’s filtration systems and the role trees play in watershed protection.

- Trees, Plants and Other Buffers [Student Activities](#) (pg. 20-21)
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Teachers: Would you like to visit us at Norrie Point environmental education center, or have an educator visit your classroom in-person or virtually? Contact us to schedule a program: hrteach@dec.ny.gov

Resources:

Children’s books:

- [The Water Dance](#) by Thomas Lochner
- [We are Water Protectors](#) by Carole Lindstrom
- [The Water Cycle at Work](#) by Rebecca Jean Olien
- [I Am the Rain: Science Book for Kids about the Water Cycle and Change of Seasons](#) by John Paterson
- [A Drop Around the World](#) by Barbara McKinney
- [Water, Water Everywhere](#) by Berger, Melvin and Gilda
- [All the Water in the World](#) by George Ella Lyon and Katherine Tillotson
- [Rain Rain Rivers](#) by Uri Shulevitz
- [The Magic School Bus At The Waterworks](#) by Joanna Cole and Bruce Degen

Websites:

- [Waters and Watersheds \(NYSDEC\)](#)
- [Clean Water for the Hudson River Estuary](#)
- [NYC-DEP-Education Curriculum Guide](#)
- [NYC-DEP Education Resources](#)
- [Discover Water: The Role of Water in our Lives National Geographic](#)
- [The Blue Traveler: A Trip Through the Water Cycle \(Project WET\)](#)
- [Precipitation Education \(NASA\)](#)
- [The Water Cycle \(National Oceanic and Atmospheric Administration\)](#)
- [Water Websites for Kids](#)
- [River Runners](#)
- [River of Words](#) - annual international poetry and art contest for K-12
- [River Rangers Toolkit](#)