

RESOURCE LIBRARY
ACTIVITY : 50 MINS

Earth's Water Cycle

Students work together to illustrate the water cycle as a class. Each student writes an imaginary story about the journey of one drop of water going through the water cycle. Then students discuss some of the reasons why our ocean is important.

GRADES

3 - 5

SUBJECTS

Earth Science, Oceanography, English Language Arts, Geography, Physical Geography

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OVERVIEW

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For the complete activity with media resources, visit:

<http://www.nationalgeographic.org/activity/earths-water-cycle/>

DIRECTIONS

1. Discuss how much water the ocean contains.

Display the MapMaker Interactive and make sure students can all identify which areas are land and which are ocean. Ask: *Does the Earth have more land, or more ocean?* Students should notice that there is more ocean than land. Explain that the ocean covers almost three-quarters of Earth's surface and is very deep. It contains almost all the water on Earth—about

97%. That's a lot of water!

2. Introduce the water cycle.

Ask: *Do you think all that water stays in the ocean? Where do you think rain comes from?*

After students' share their ideas, explain that they are going to draw an illustration that shows how Earth's water moves from place to place in different forms in what we call the water cycle.

3. Have the class draw the water cycle as they learn about its three stages.

Tape a large sheet of chart paper to the board. Have one student use a marker to draw the ocean. Have another student draw the sun shining above.

- Stage 1: Evaporation—Explain that sunlight hitting the surface of the ocean causes liquid water on the surface to change to water vapor, becoming part of the air. This process is called evaporation. Have a student illustrate this, draw an arrow representing water evaporating, and label it.
- Stage 2: Condensation—Explain that as water vapor cools it can become liquid water droplets. Because air cools as it rises, this rising air can form more and more droplets, which become clouds. Have a student draw a cloud over the ocean. Explain that this process is called condensation, and add that label.
- Stage 3: Precipitation—Ask: *Do clouds stay in one place?* When students answer no, explain that clouds move as wind moves. Have one student draw an area next to the ocean representing land, and have another draw an arrow showing the cloud moving over the land. Explain that as the air cools and more and more droplets form, they clump together and form increasingly heavy droplets, which eventually fall to Earth as rain—or, if it's very cold, as sleet, hail, or snow. Explain that this is called precipitation and add that label. Have students draw different forms of precipitation falling from the cloud.

Discuss what happens to rain and snow on Earth. Most falls back into the ocean. Some falls into rivers that flow into the ocean. Some falls on land, sinks into the ground, and drains slowly back into the ocean. It may take thousands of years, but eventually all water returns to the ocean. Have students draw a river emptying into the ocean and water sinking underground and draining into the ocean. Tell students their illustration of the water cycle is now complete. Project the USGS water cycle diagram and have the class compare the two and add additional details to their illustration, if needed.

4. Ask students to make connections to their location.

Have students personalize the water cycle by connecting it to where they live. Project the provided MapMaker Interactive: World—Population Density. Zoom in on your city or town. Slowly zoom out and have students look for nearby mountains, lakes, and rivers. Have students explain how these features connect to the nearest ocean. Point out to students how most large cities are located near sources of water, and explain that humans have historically settled near water sources.

5. Have students work independently to each write a story about one water drop's journey.

Tell students that they are now going to write a story about the experiences of one water drop as it travels through the water cycle. Have them write from the drop's point of view. You may want to assign students water drops that began their journeys in different places, such as a puddle on a farm, a mountain lake, a stream in a meadow, or a large ocean. Encourage students to use what they just learned, as well as their imaginations, to tell an interesting story. To spark imaginations, prompt students with these questions:

- *Where did the water drop go on its journey?*
- *What did it see? What adventures did the drop have?*
- *How did it feel at different times?*
- *Did the drop meet any plants, animals, or people? If so, how did the water drop help them?*
- *How long did the drop's trip take?*
- *Where does the water drop want to go on its next journey?*

6. Discuss students' stories and the importance of oceans.

Invite volunteers to share some of the adventures they wrote about in their stories. Ask: *Why are oceans important?* Discuss how they are not only the source of most of the water we use, but also a place where many animals live. If we want to keep our planet healthy, we must take good care of the oceans.

Modification

Pre-teach some of the vocabulary—including evaporation, condensation, and precipitation—to help students, especially English language learners, identify words, place them in context, and remember them.

Informal Assessment

Assess students' comprehension by evaluating the stories students wrote and their discussion contributions afterward.

Extending the Learning

Conduct a simple science experiment so students can see firsthand how water evaporates, condenses, and precipitates. Fill a plastic cup halfway with water, place it inside a re-sealable plastic bag, close the bag, and set it on a sunny windowsill. Ask students to imagine that the water in the cup is the ocean, and have them check it daily to observe what happens. As students make observations, connect their observations to the processes of evaporation, condensation, and precipitation. Explain to students that each day the water level gets lower as water evaporates. The top of the bag gets cloudy as water condenses. And eventually water drops appear on the side of the bag and at the bottom as the water precipitates.

OBJECTIVES

Subjects & Disciplines

Earth Science

- [Oceanography](#)
- English Language Arts

Geography

- [Physical Geography](#)

Learning Objectives

Students will:

- recognize that most of the Earth's water is in the ocean
- describe how drops of water move in an ongoing cycle through the processes of evaporation, condensation, and precipitation
- identify some ways in which humans benefit from the water cycle
- explain why humans have tended to settle near sources of water
- summarize the importance of preserving the ocean and its water

Teaching Approach

- Learning-for-use

Teaching Methods

- Brainstorming
- Discovery learning
- Discussions
- Writing

Skills Summary

This activity targets the following skills:

- 21st Century Student Outcomes
 - Information, Media, and Technology Skills
 - Information Literacy
 - Learning and Innovation Skills
 - Creativity and Innovation
- Critical Thinking Skills
 - Analyzing
 - Creating
 - Remembering
 - Understanding
- Geographic Skills
 - Organizing Geographic Information

National Standards, Principles, and Practices

IRA/NCTE STANDARDS FOR THE ENGLISH LANGUAGE ARTS

- Standard 12:

Students use spoken, written, and visual language to accomplish their own purposes (e.g., for learning, enjoyment, persuasion, and the exchange of information).

NATIONAL COUNCIL FOR SOCIAL STUDIES CURRICULUM STANDARDS

- **Theme 7:**

Production, Distribution, and Consumption

NATIONAL GEOGRAPHY STANDARDS

- **Standard 1:**

How to use maps and other geographic representations, geospatial technologies, and spatial thinking to understand and communicate information

- **Standard 3:**

How to analyze the spatial organization of people, places, and environments on Earth's surface

NATIONAL SCIENCE EDUCATION STANDARDS

- **(5-8) Standard B-1:**

Properties and changes of properties in matter

- **(K-4) Standard D-1:**

Properties of earth materials

- **(K-4) Standard D-2:**

Objects in the sky

- **(K-4) Standard D-3:**

Changes in earth and sky

OCEAN LITERACY ESSENTIAL PRINCIPLES AND FUNDAMENTAL CONCEPTS

- **Principle 1f:**

The ocean is an integral part of the water cycle and is connected to all of the earth's water reservoirs via evaporation and precipitation processes.

- **Principle 6a:**

The ocean affects every human life. It supplies freshwater (most rain comes from the ocean) and nearly all Earth's oxygen. It moderates the Earth's climate, influences our weather, and affects human health.

Preparation

What You'll Need

MATERIALS YOU PROVIDE

- Chart paper
- Markers
- Pencils
- Transparent tape
- Writing paper

REQUIRED TECHNOLOGY

- Internet Access: Required
- Tech Setup: 1 computer per classroom, Projector

PHYSICAL SPACE

- Classroom

GROUPING

- Large-group instruction

BACKGROUND & VOCABULARY

Background Information

Our ocean contains 97% of the Earth's water, most of which has been on Earth since the ocean formed more than four billion years ago. This water is in constant motion—evaporating into the air, condensing and precipitating onto land or water, and traveling back to the ocean where the never-ending water cycle begins again. Understanding the water cycle and the ocean's role in it can help increase students' appreciation for the planet's ocean.

Prior Knowledge

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Recommended Prior Activities

- None

Vocabulary

| Term | Part of Speech | Definition |
|---------------|----------------|--|
| cloud | <i>noun</i> | visible mass of tiny water droplets or ice crystals in Earth's atmosphere. |
| condensation | <i>noun</i> | process by which water vapor becomes liquid. |
| evaporation | <i>noun</i> | process by which liquid water becomes water vapor. |
| gas | <i>noun</i> | state of matter with no fixed shape that will fill any container uniformly. Gas molecules are in constant, random motion. |
| liquid | <i>noun</i> | state of matter with no fixed shape and molecules that remain loosely bound with each other. |
| ocean | <i>noun</i> | large body of salt water that covers most of the Earth. |
| precipitation | <i>noun</i> | all forms in which water falls to Earth from the atmosphere. |
| vapor | <i>noun</i> | visible liquid suspended in the air, such as fog. |
| water cycle | <i>noun</i> | movement of water between atmosphere, land, and ocean. |

For Further Exploration

Websites

- [National Geographic Kids: Green Scene—I Am the Ocean](#)
- [National Geographic Environment: The Ocean](#)
- [NOAA: Water Cycle](#)

FUNDER

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