



The Water Cycle

9_A

Note: Introducing the Read-Aloud may have activity options which exceed the time allocated for this part of the lesson. To remain within the time periods allocated for this portion of the lesson, you will need to make conscious choices about which activities to include based on the needs of your students.

Introducing the Read-Aloud

10 minutes

What Have We Already Learned?

10 minutes

Ask students to explain what a cycle is. Next, ask them to describe the cycles they have learned about: seasonal, plant, tree, chicken, frog, and butterfly. You may wish to show students Cycles Posters 1–6 as a review of these cycles.

What Do We Know?

5 minutes

Ask students what comes to mind when they hear the word *water*. Have students share what they know about water. You may prompt discussion with the following questions:

- Where can you find water?
- Is there more water or land on the surface of the earth?
- How do you use water?
- What other living things need water besides people?
- Why did ancient civilizations develop around water?
- Why is it important to conserve water?
- When is water a liquid, a solid, or a gas?

Essential Background Information or Terms

10 minutes

Explain to students that all things on Earth can be described as being solid, liquid, or gas. Explain that if something is a solid, it keeps its shape. Tell students that if you pick up a book and hand

it to someone else, it will still keep its same shape. It keeps its shape because the book is a solid.

Explain that if something is a liquid, it can be poured. It doesn't keep its shape, but takes on the shape of its container. Show students two differently shaped, clear containers. Have students watch as you pour water from one container to another. Tell students that water is a liquid because it takes the shape of whatever container it is in.

Explain that if something is a gas, it is often hard to see. Explain that the air around us is a gas. It is not solid because it does not keep its shape, and it is not liquid because it cannot be poured.

Explain that heat can change things from solids to liquids to gases. Tell students that an ice cube is the solid form of water. When heated, an ice cube can melt and become water. When we boil water, it heats up and becomes water vapor, which is a gas.

Vocabulary Preview

5 minutes



Evaporation

← Show image 9A-3: Evaporation, condensation, precipitation

1. In today's read-aloud we will learn about three stages in the water cycle. One of the stages is called *evaporation*.
2. Say *evaporation* with me three times.
3. Evaporation happens when liquid, such as water, changes into a gas, such as water vapor, when the temperature becomes warmer.
4. A puddle on the ground disappears and becomes water vapor because of evaporation.
5. Which one of these three pictures shows us evaporation? Can you see evaporation happening in this picture? What does evaporation do? (Evaporation changes a liquid into a gas.) [You may wish to tell students that oftentimes evaporation cannot be seen, for example, the disappearance of a puddle after a rainy day.]



Condensation

← **Show image 9A-3: Evaporation, condensation, precipitation**

1. In today's read-aloud we will learn about another stage in the water cycle called *condensation*.
2. Say *condensation* with me three times.
3. Condensation happens when a gas, such as water vapor, changes into a liquid, such as water droplets or clouds in the sky, when the temperature becomes cooler.
4. It is difficult to see out the car window when there is condensation.
Condensation causes clouds to form in the sky.
5. Which one of these pictures shows us condensation? Have you ever seen condensation on a window before? What does condensation make in the sky? (clouds) What does condensation do? (Condensation changes a gas into a liquid.)

Purpose for Listening

Explain that the water on Earth goes through a cycle as well, and that this is called the water cycle. Tell students to listen carefully to learn about the main topic of the read-aloud—the water cycle—and to find out how important the water cycle is to our planet.



The Water Cycle

← Show image 9A-1: Water

Every day, all around you, an extraordinary natural cycle is happening. It is called the water cycle. Most of the water that has ever existed on our planet is still here and is being moved from one place to another. It moves from the oceans and land to the sky above us, and it moves from one part of the world to another. It has done this for millions and millions of years. The rain that falls on you has been recycled many, many times over many millions of years.



← Show image 9A-2: Water states

Water is the main source of life. More than two-thirds of Earth's surface is covered with water. That's a good thing, because all living things need water to survive. Approximately ninety-seven percent of the water on Earth is in the oceans.¹ The rest is in lakes, rivers, streams, ponds, beneath the ground, or in its frozen state in the form of glaciers and polar ice. There is also water that you cannot see in the air around you, called water vapor. Therefore, water not only moves from place to place, but it can exist in three states of matter. It can be a liquid, a solid, and a gas.² Oceans and rivers contain water in liquid form, glaciers and the ice you put in drinks contain water in frozen, solid form, and the air contains water as a gas called water vapor.

1 That means most of Earth's water is found in the oceans.

2 [Refer back to the review on solids, liquids, and gases in the "Introducing the Read-Aloud" section.]



← Show image 9A-3: Evaporation, condensation, precipitation

The water cycle has three main phases: evaporation, condensation, and precipitation. Water changes its form based on the temperature, and whether it is being heated or cooled. In the winter, when it is cold, many people experience days in which snow falls from the sky. The snow covers the land, and icicles hang down from the roofs of houses. But then, as spring arrives and the weather becomes warmer, the snow and ice melt into puddles. The puddles slowly disappear as the warm sunshine causes the water to evaporate. Through the process of

3 This also happens when you boil water.



evaporation, the warmth of the sun changes liquid water into a gas known as water vapor. Water vapor is carried up into the air. The hotter it is, the more quickly evaporation happens.³

Now let's follow that water vapor as it rises up, higher and higher into the sky. As it rises up, it is blown about by the wind, and it moves through the air, or atmosphere. In other words, water vapor may be carried by the wind far away from the place where it was once a puddle.

← **Show image 9A-4: Condensation**

Water vapor in the air far below the clouds is called **humidity**. When there is a lot of water in the air, we say it is humid. At different times of the year, there are different amounts of water in the air. Warm air can hold more water vapor than cold air. That is why on a hot summer's day, if there is a lot of moisture in the air, you will often hear people talk about the humidity.

Water vapor high in the atmosphere forms clouds as it becomes water droplets. The wind carries the water vapor higher and higher into the atmosphere where the temperatures are much cooler. As the vapor cools, it changes back from a gas into water droplets, which form clouds.

When water changes from a gas into a liquid, this process is called **condensation**. Because cold air cannot hold as much water vapor as hot air, condensation happens high up in the sky, or atmosphere. Condensation causes clouds to form. In other words, water vapor becomes water droplets.



← **Show image 9A-5: Dark clouds**

As the tiny water droplets are blown about by the wind, they crash into each other. They join together to form larger water droplets. As this bumping and crashing of water droplets continues, clouds are formed. Eventually, when water droplets in clouds become too large and too heavy, they fall back down to the ground.⁴ Depending on the temperature high up in the atmosphere, the water droplets either fall as rain, sleet, snow, or hail. When water droplets fall to the ground, regardless of what they look like, this is called **precipitation**.

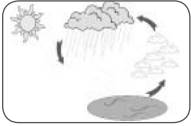
4 The darker the cloud, the more rain or snow will probably fall.



← **Show image 9A-6: Types of precipitation**

So down comes the rain, or snow, or hail, or sleet. It waters the earth and falls into the oceans, lakes, rivers, streams, and ponds. Some of the precipitation seeps into the ground, too. This groundwater nourishes plants. It also provides a source of fresh drinking water. Many people have wells that access the underground water supply.⁵

5 How do you think people get the water that is stored under the ground?



← **Show image 9A-7: Water Cycle**

Once precipitation occurs, the process starts all over again. Water on Earth evaporates and rises up into the atmosphere as water vapor. As it cools or condenses, clouds form once again.



← **Show image 9A-8: Types of clouds**

Clouds are much more than fun shapes in the sky. Without clouds, there would be no precipitation, such as snow, sleet, hail, or rain. Without precipitation, nothing could live or grow on Earth. Clouds also provide a kind of shelter or protection from the sun. Without clouds it would be very, very hot during the day and extremely cold at night. This would make it difficult for living things to survive. Clouds help control the temperature on our planet. Scientists group clouds according to their shape and height in the sky.



← **Show image 9A-9: Cirrus clouds**

Cirrus clouds form at very high altitudes in the atmosphere.⁶ They are wispy, almost feather-like in appearance, and are usually a sign of good weather. These clouds can be up to four miles above the ground. The temperature is very cold that high up in the atmosphere and so cirrus clouds are made largely of ice crystals.

6 The word *cirrus* means “curl of hair” in Latin. Can you see why cirrus clouds have this name?



← **Show image 9A-10: Cumulus clouds**

Cumulus clouds gather in the sky on nice, sunny days.⁷ Cumulus clouds appear lower down in the sky, although they are still about two miles above the ground. Cumulus clouds are round and fluffy-looking. Some people think they look like cotton. They

7 The word *cumulus* means “heap” in Latin. Can you see why cumulus clouds have this name?

are a sign that the weather is going to get colder. However, when cumulus clouds get larger and darker, this can mean that there will be a thunderstorm.



← **Show image 9A-11: Stratus clouds**

8 The word *stratus* means “layer” in Latin. Can you see why stratus clouds have this name?

The appearance of stratus clouds means that you will probably need an umbrella because it is going to rain.⁸ They are usually gray, and they can cover the whole sky and block the sun. Stratus clouds form lower down in the atmosphere.

The temperature affects whether the clouds contain ice crystals or water droplets. The clouds that are high up, in the colder reaches of Earth’s atmosphere, are made up of sparkling ice crystals. The clouds that are lower down, where it is warmer, are made up of tiny water droplets.

The next time you look up at the clouds, think about the amazing water cycle!

Discussing the Read-Aloud

15 minutes

Comprehension Questions

10 minutes

Note: You may wish to show students Cycles Poster 7 (Water Cycle) as a guide for some questions. This poster will be referenced again in the extension.

1. *Literal* What is the main topic of the read-aloud? (The main topic of the read-aloud is the water cycle.)
2. *Literal* Is the earth covered mostly by land or by water? (The earth is covered mostly by water.)
3. *Inferential* What do we call the process when water from oceans, rivers, and puddles changes to a gas and moves into the air—evaporation or precipitation? (When water from oceans, rivers, and puddles changes to gas, we call this process evaporation.)
What causes evaporation? (The heat from the sun causes evaporation.)
Can we *usually* see evaporation or water vapor? (No, we cannot usually see evaporation.)

4. *Literal* What do we call the process when water vapor turns back into a liquid or water droplets because of cooling—precipitation or condensation? (When water vapor turns back into a liquid or water droplets, we call this process condensation.)
5. *Literal* Water can be a solid, a liquid, or a gas. What do we call water when it is a gas? (When water is a gas, it is called water vapor.)
6. *Inferential* Why are the processes of evaporation, condensation, and precipitation considered a cycle? (They are considered a cycle because they happen again and again in the same order.) What is the name of this cycle? (This cycle is called the water cycle.)
7. *Inferential* How do clouds fit into the water cycle? (Clouds are a key part of the water cycle. They form because of condensation; they release precipitation, which rises as a vapor to eventually form more clouds.)
8. *Inferential* When clouds get heavy with water as condensation, what do we call water that then falls from the sky as rain, snow, sleet, or hail? (We call this precipitation.) Which type of precipitation is a liquid? (Rain is a liquid.) Which types of precipitation are solids? (Snow, sleet, and hail are solid forms of precipitation.)
9. *Literal* Where does precipitation go after it falls from the clouds? (After it falls, precipitation goes into the ground or back into oceans, rivers, and streams.)
10. *Literal* Does the earth make new water, or does the same water go through the water cycle again and again? (The same water cycles again and again.)

[Please continue to model the *Think Pair Share* process for students, as necessary, and scaffold students in their use of the process.]

I am going to ask a question. I will give you a minute to think about the question, and then I will ask you to turn to your neighbor and discuss the question. Finally, I will call on several of you to share what you discussed with your partner.

11. *Evaluative Think Pair Share:* Why is precipitation important? (Answers may vary, but should include that precipitation replenishes the earth’s water supply.)
12. After hearing today’s read-aloud and questions and answers, do you have any remaining questions? [If time permits, you may wish to allow for individual, group, or class research of the text and/or other resources to answer these questions.]

Word Work: Precipitation

5 minutes

1. In the read-aloud you heard, “When water droplets fall to the ground, regardless of what they look like, this is called *precipitation*.”
2. Say the word *precipitation* with me.
3. Precipitation is water that falls from the sky in the form of rain, snow, sleet, or hail.
4. The farmer had to water his garden because there had been no precipitation for a month.
5. What is your favorite and/or least favorite kind of precipitation? Be sure to explain why. Try to use the word *precipitation* when you tell about it. [Ask two or three students. If necessary, guide and/or rephrase the students’ responses: “My favorite kind of precipitation is . . .”]
6. What’s the word we’ve been talking about?

Use a *Making Choices* activity for follow-up. Directions: I will name two things. You will choose the one that is a type of precipitation. Be sure to begin your response with “_____ is a type of precipitation.”

1. clouds or rain (Rain is a type of precipitation.)
2. sleet or water vapor (Sleet is a type of precipitation.)
3. snow or humidity (Snow is a type of precipitation.)
4. an ocean or hail (Hail is a type of precipitation.)



Complete Remainder of the Lesson Later in the Day



The Water Cycle

9_B

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Extensions

20 minutes

10 Sequencing the Water Cycle

(Instructional Masters 9B-1 and 9B-2)

15 minutes

- Show students Cycles Poster 7 (Water Cycle), and have them identify the three stages of the water life cycle. (evaporation, condensation, precipitation)
- Give students Instructional Masters 9B-1 and 9B-2. Tell them that they will create Response Card 8; it will show the water cycle.
[Note: This Response Card should be held and viewed using landscape orientation.]
- First, have students cut out the images of the stages of the water cycle on Instructional Master 9B-1.
- Next, have them put the images in the correct order of the water cycle.
- Then, students should glue or tape the images in the correct blanks on Instructional Master 9B-2.
- Finally, have students describe the water cycle to their partner or home-language peers.

A Water Cycle Song

10 minutes

Display Cycles Poster 7 to reference in this activity and throughout this domain. Teach students the following song and accompanying movements about the water cycle. The song is sung to the tune of “She’ll Be Comin’ ’Round the Mountain.”

Water travels in a cycle; yes, it does. [Move arm in a circular motion in front of the body.]

Water travels in a cycle; yes, it does. [Move arm in a circular motion in front of the body.]

It goes up as evaporation, [Move arms and hands, palms up, upward.]

Forms clouds as condensation, [With raised arms, form a cloud with the hands.]

Then falls down as precipitation; yes, it does. [Show rain falling with the hands and arms moving downward.]

Water Cycle Observations

(long-term project)

Set up a miniature, indoor water cycle for students to observe. Pour a small amount of water into a small, clear, plastic cup. Tell students that this represents water that is found on the earth in a lake or puddle. Mark the level of the water by using a marker to draw a line on the cup. Carefully place the cup of water in a clear, plastic bag. Seal the bag. If your classroom has a window, tape the bag to the window. If not, tape the bag to a warm wall. Ask the students to predict what will happen.

Observe the bag each day until students are able to see that some of the water has evaporated, condensed on the sides of the bag, and fallen to the bottom of the bag as precipitation. Have students describe what they see using the words *evaporated/evaporation*, *condensation*, and *precipitation*. Ask students to draw and write about their observations.

You may also make and discuss water cycle observations on days when clouds are visible in the sky or when precipitation is falling.

Domain-Related Trade Book

20 minutes

- Refer to the list of recommended trade books in the Introduction at the front of this *Supplemental Guide*, and choose one trade book about the water cycle to read aloud to the class.
- Explain to students that the person who wrote the book is called the author. Tell students the name of the author. Explain to students that the person who makes the pictures for the book is called an illustrator. Tell students the name of the illustrator. Show students where they can find this information on the cover of the book or on the title page.
- As you read, use the same strategies that you have been using when reading the read-aloud selections—pause and ask occasional questions; rapidly clarify critical vocabulary within the context of the read-aloud; etc.
- After you finish reading the trade book aloud, lead students in a discussion as to how the story or information in this book relates to the read-alouds in this domain.