

WEATHER ON THE WATER

LESSON OVERVIEW

OBJECTIVE

Students will learn that water travels between the earth and the sky and can exist as a solid, liquid, or gas. Students will also discover some of the types of weather.

RECOMMENDED GRADE LEVELS

K-1

DURATION

15-30 minutes

MATERIALS

- Solid, Liquid, Gas Images; Weather photos; and Water cycle images (provided)
- Balloon or sealed container
- Whiteboard
- Tape
- Student “Weather Words” worksheet (provided)

TOPIC BACKGROUND

Water is a type of **liquid**. Water is constantly traveling between the earth and the sky. When water on earth (ocean, lakes, rivers, puddles, etc.) heats up from the sun’s energy, water will **evaporate** and turn into a **gas**. A gas is not visible and can spread out and does not have a definite shape. When water gets very cold it freezes, turning it into ice which is a **solid**. A **solid** has a definite shape. With the heat from the sun, ice can melt back into the liquid state of water.

When water turns into a gas, or vapor, it becomes a part of the atmosphere. This process is called

evaporation. When water vapor cools down again, clouds are formed. This process is called **condensation**. Rain, sleet, snow, and hail are all forms of **precipitation**, which fall from clouds.

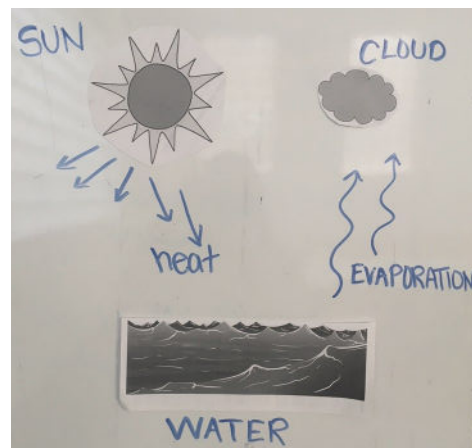
The sun’s interactions with water influence all aspects of weather including precipitation, temperature, and wind.

GETTING READY

1. Print out all provided materials, including a copy of the “Weather Words” double-sided worksheet for each student.
2. Cut out the water cycle images (sun, clouds, water) and four weather photos
3. Gather tape and whiteboard markers to use for activities 1 & 2.

ACTIVITY 1: PHASES OF MATTER AND INTRODUCTION TO WATER

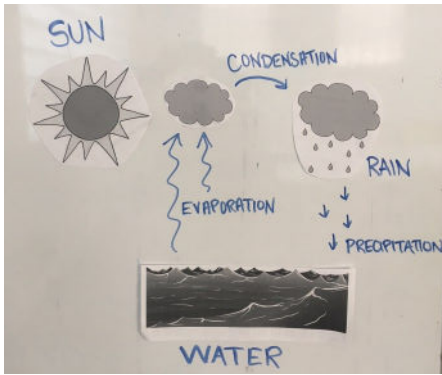
1. Begin by showing students the liquid picture. Explain that liquids spread out to fill the space they are in, like a tub or bottle.
Ask students to think of examples of liquids. *Water, juice, soap, milk, oil, paint*
2. Next show students the solid picture. Ask students:
What does a solid feel and look like? *Hard, has a definite shape*
Do they recognize the solid pictured? *Ice cube.*
Did you know that ice is frozen water? *When water gets really cold it freezes into a hard solid called ice.*
3. Hold up a balloon or sealed container. Ask students is there anything inside here? Explain that gas surrounds us, even though we cannot see it. When you blow up a balloon you are adding air, specifically a gas called carbon dioxide, to the balloon.
4. Lastly show students the gas picture. We know that water is a liquid that can turn into a solid if cold enough. Water can also change into a gas called water vapor. Like the air we breathe, water vapor is clear and a part of the sky. So, when does water change into a gas? *As water heats up it turns into vapor or steam. Water gets warmer from either the sun or from heating equipment such as a stove. Think of a puddle. What happens when the sun shines on the puddle? It dries up. As the temperature of the puddle gets higher, the water molecules spread out, turning it into a gas. This process is called evaporation!*
5. Optional: Tape the water image on a whiteboard with the sun image above. Use a marker to draw arrows showing the movement of water to the sky due to the sun's warmth. Write out key words such as sun, water, heat, evaporation.



ACTIVITY 2: TYPES OF WEATHER AND WATER CYCLE

1. Sometimes water also travels down to the earth from the sky. Can you think of any types of weather that cause water to fall from clouds? *Rain, sleet, snow, hail*
2. Start by showing students a photo of rain and ask if it is a solid, liquid, or gas. Next show students the photos and introduce snow, sleet and hail- all are forms of water that fall depending on the temperature.
3. Show students the picture of hail and ask is this a solid or a liquid? *Solid* However, when this cold solid warms up, it melts into a liquid. Can you think of anything you like to eat that melts when it gets warmer? *Ice cream*
4. Optional: Add to your whiteboard diagram by putting the rain cloud on the board with arrows pointing back down to the water image. Add vocabulary words such as rain and precipitation.

PROCEDURE CON'T



5. Explain to students that water constantly travels in a cycle, moving from earth's lakes, rivers and oceans to the sky when it becomes a gas, then cools down to form clouds and fall back to earth as a liquid or solid.

ACTIVITY 3: WEATHER WORDS

1. Have students practice writing weather vocabulary by completing the weather words worksheet provided.

RECOMMENDED BOOKS

- *Oh Say Can You Say What's the Weather Today?*(Cat in the Hat's Learning Library) by Tish Rabe
- *Matter: See It, Touch It, Taste It, Smell It* by Darlene R. Stille
- *All the Water in the World* by George Ella Lyon Zoehfeld
- *Weather Words and What They Mean* by Gail Gibbons
- *Hello, World! Weather* by Jill McDonald

RECOMMENDED WEBSITES

Weather WizKids

www.weatherwizkids.com

Project WET (Water Education for Teachers)

www.projectwet.org

USGS: Water Cycle for Schools

www.water.usgs.gov/edu/watercycle-kids.html

VIDEO: Science Videos for Kids: What is Matter?

www.youtube.com/watch?v=68QDZA129oE

VIDEO: Changing Water- States of Matter

www.youtube.com/watch?v=tuE1LePDZ4Y

TEACHER NOTES:

VOCABULARY

Cloud: A visible mass of particles of condensed vapor (as water or ice) suspended in the atmosphere of a planet (as the earth) or moon.

Condensation: When a gas turns into a liquid; also the name for the beads of water that form from water vapor, such as dew.

Evaporation: When a liquid turns into a gas.

Fog - A cloud on the ground that reduces visibility.

Freeze - It occurs when the temperature falls below 32 degrees over a large area for an extended period of time.

Frost: Created when the air temperature drops below freezing and the water vapor in the air freezes into ice crystals on a surface.

Gas: state in which matter expands to occupy whatever volume (space) is available.

Hail - A mixture of liquid and frozen precipitation. Hailstones are composed of layers of ice and can become quite large when strong gusts of upward-moving air keep them inside the cloud. As they move around inside the cloud they collide with raindrops, adding layers and growing before they fall to earth.

Ice: A water substance in the solid phase.

Liquid: state in which matter maintains a fixed volume but adapts to the shape of its container.

Matter: Anything that has mass and takes up space. There are 3 states of matter; solid, liquid, and gas.

Meteorologist: A scientist who studies and predicts the weather.

Precipitation: Water that falls to the ground as rain, snow, etc.

Sleet: Solid precipitation in the form of ice pellets which form from raindrops that freeze as they fall through subfreezing air near the surface of the Earth.

Solid: state in which matter maintains a fixed volume and shape

Snow: Precipitation that is composed of white ice crystals which stick together to form snowflakes, which have a hexagonal or six-sided shape.

Storm: Any disturbed state of the atmosphere that creates unpleasant weather like rain, lightning, thunder, hail, snow, sleet, and freezing rain.

Temperature: A measurement of how hot or cold something is.

Water cycle: The movement of Earth's water through the Earth and sky, from liquid water on the ground, to water vapor in the air, to liquid water droplets in clouds, to precipitations, back to water on the ground.

Water vapor: Water in a vaporous form especially when below boiling temperature and diffused (as in the atmosphere).

Wind: A natural movement of air

STANDARDS

COMMON CORE ELA

- Speaking and Listening
- Literacy in Science
- Writing Standards

COMMON CORE MATH

- Counting and Cardinality
- Measurement and Data

NYC K-8 SCIENCE & SOCIAL STUDIES SCOPE & SEQUENCE

- Properties of Water
- Weather and Seasons

NEXT GENERATION SCIENCE STANDARDS

- K. Weather and Climate
- 2. Earth's Systems: Processes the Shape the Earth



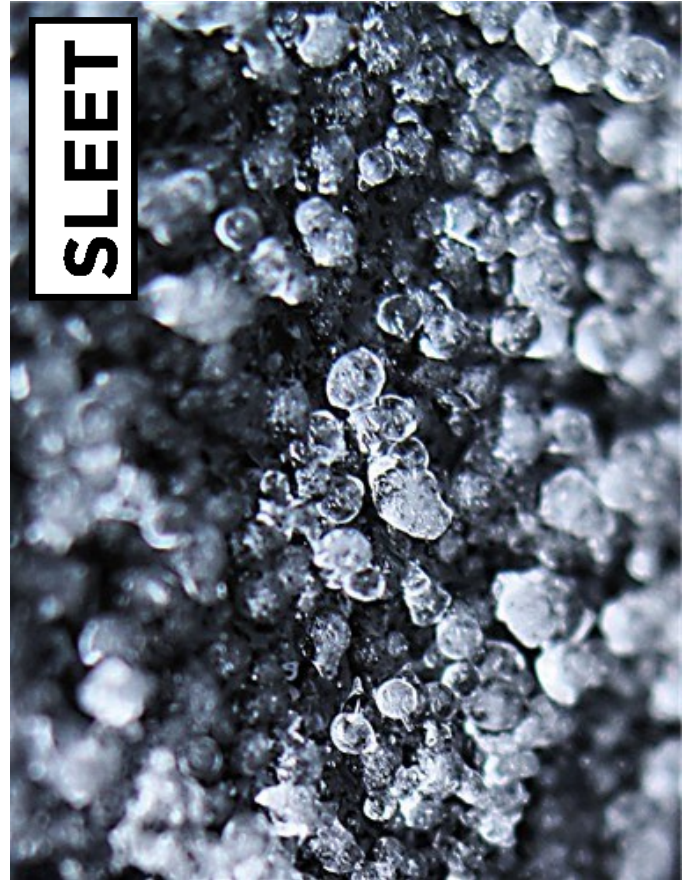
SOLID



LIQUID



GAS

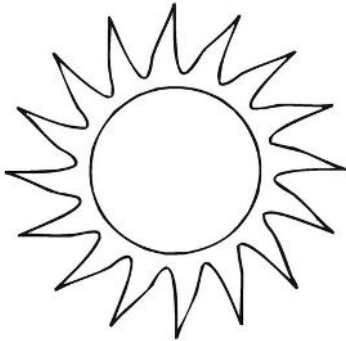


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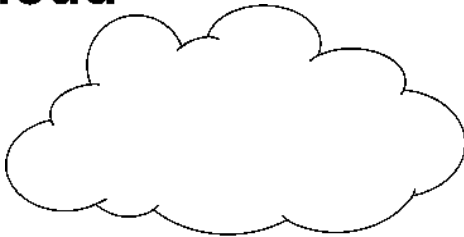
WEATHER WORDS

Practice writing the word for each picture below!

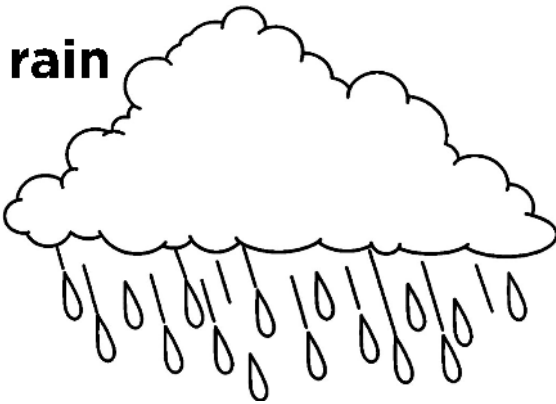
sun



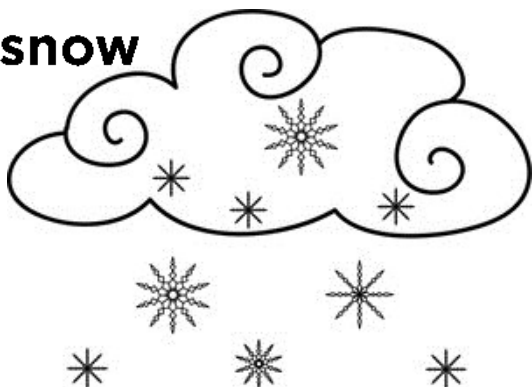
cloud



rain



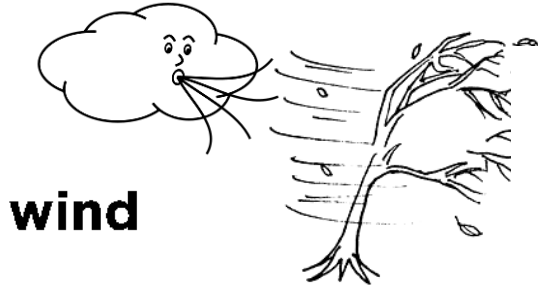
snow



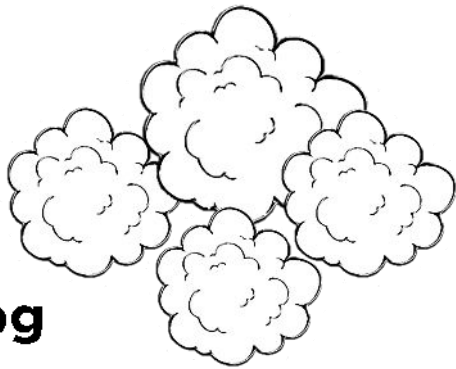
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WEATHER WORDS

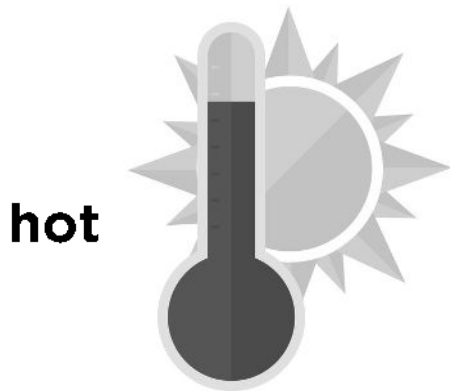
Practice writing the word for each weather picture below!



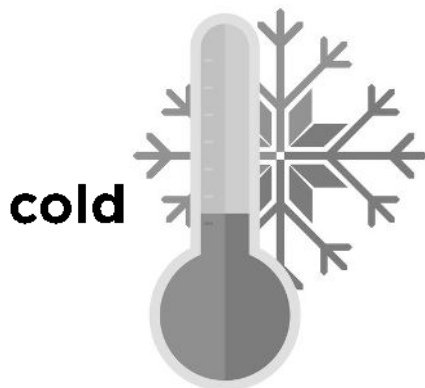
wind



fog



hot



cold

