LICEO ALBONOR

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9 Read and mark (✓) all the true statements.

Water in the Atmosphere

Three other factors for determining weather are humidity, clouds, and precipitation. **Humidity** is the amount of water vapor in the air. The particles of water vapor are too small to be visible, but, when conditions are right, they can come together to form small water droplets and ice crystals. These droplets and crystals are bigger than water vapor particles and can reflect light from the sun. At this point, we can see the water as a cloud. If the droplets or crystals get large enough, they can fall to the ground as precipitation, such as rain or snow.

At-Home Lab

Work with an adult. Fill a bottle with hot water and then wait a minute or so. Gently pour the water out and immediately cap the bottle. Now run cold water over the bottle. What happens? Can you reverse this process?

- [ ] If particles of water vapor come together to form droplets and crystals, we can see them as clouds.
- [ ] Snow falls when water droplets or crystals are small.
- [ ] Humidity, clouds, and precipitation are all related to weather.
- [ ] We can see particles of water vapor in the air because they look like rain.

10 Look and, with a partner, describe what is happening in the picture. Use the words *humidity*, *clouds*, and *precipitation* in your explanation.

Think!

Zoos use hygrometers to measure humidity. Which animals need high humidity?

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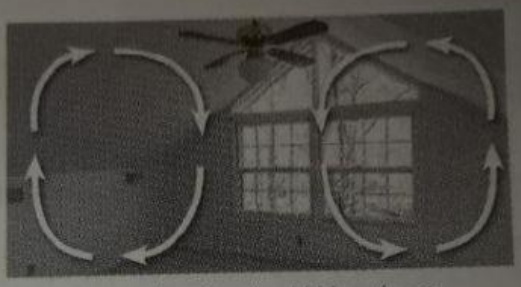
11 **Read, look, and draw arrows to show the motion of air in the room in winter.**

Circulation

Have you ever used an electric fan to cool a room in the summer? You can also use a fan to make a heater more efficient in the winter. The fan moves air around the room.

The wind may blow from different directions, but winds do follow some large-scale patterns over continents and the ocean. These patterns are determined by differences in temperature and pressure in different parts of the atmosphere. The large-scale movement of air is called circulation. **Circulation** is the movement of air that redistributes heat on Earth.

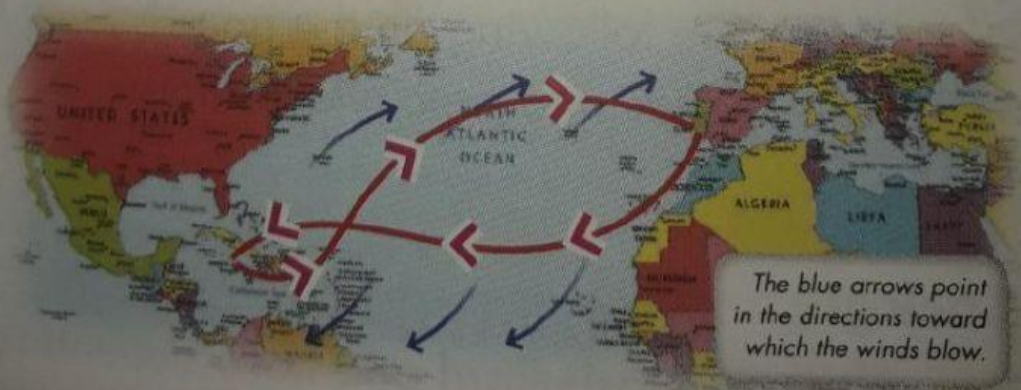
For example, the **trade winds** are a persistent pattern of winds that blow near the **equator**. The warmest parts of our planet are near the equator. The air above this region becomes warm and rises, creating a low pressure zone. High in the atmosphere, this warm air travels away from the equator, cools down, and sinks.



In summer, a ceiling fan should blow the air downward. This makes sweat evaporate faster and people feel cooler.

In winter, a ceiling fan should draw the air upward. In a heated room, the hot air rises to the ceiling. The cold air moving up pushes the hot air toward the walls and then down, where people can be warmed by it.

12 **Look at the route for a ship traveling from Europe to America and back. Draw arrows to show the direction the ship could take to save the most fuel. With a partner, explain the direction you chose.**



The blue arrows point in the directions toward which the winds blow.

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Lesson 2 · How do clouds and precipitation form?

Key Words
- snowflake
- sleet
- hail
- altitude

1 Look and, with a partner, say what figures you can see in the clouds. As a class, discuss why clouds have different appearances.

2 Read and write the two substances that clouds are made of.

Water in the Air

Have you ever watched a cloud get larger? Have you tried to see shapes in the clouds? Clouds come in many shapes and sizes. Remember that clouds form when water vapor changes into tiny water droplets or ice crystals. Whether a cloud is made of water droplets or ice crystals depends partly on air temperature. The temperature of air high in the clouds is often much lower than the temperature of the air close to the ground. Even on summer days, many clouds are made of ice crystals. The ice crystals and water droplets in clouds can join together to make larger particles. The particles can get so large that the gravitational force acting on the mass of the particles can cause them to fall out of the cloud. This is how precipitation forms.

1. _____ 2. _____

3 Look at the picture and circle where precipitation is forming. Discuss what is going to happen and why with a partner.

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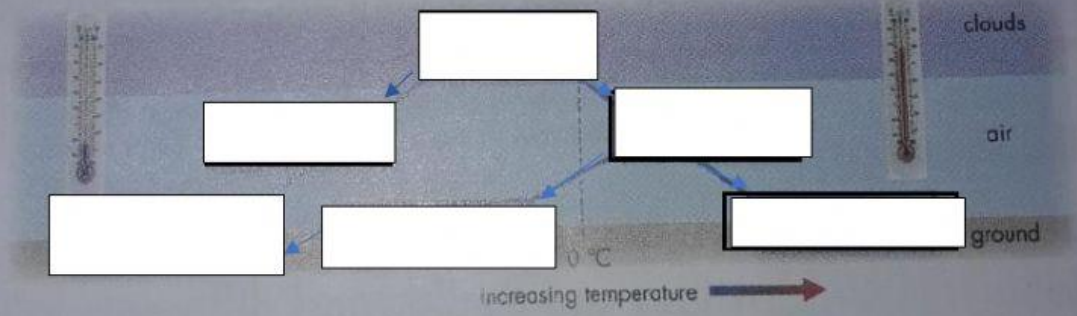
4 **Read and fill in the graphic organizer below.**

Precipitation

You may be surprised to learn that most rain in the United States starts as snow. The temperature of the air high above the ground is often below 0 °C. Clouds of ice crystals form in the cold air. The ice crystals grow larger until they start to fall as **snowflakes**. As they fall, the crystals sometimes stick to other crystals and become larger snowflakes. If the temperature of all the air between the cloud and the ground is less than 0 °C, the ice crystals will fall to the ground as snowflakes. The ice crystals from a cloud may change as they fall through different layers of air. If the ice crystals fall into air that is warmer than 0 °C, they will melt and fall as rain. If the air near the ground is very cold, the rain sometimes freezes before it hits the ground. The frozen raindrops are **sleet**.

Think!

If the air temperature from the ground to a cloud were cold enough for water to freeze and for the cloud to form precipitation, what type of precipitation would fall from the cloud?



5 **What causes layers to form in hail? Read and discuss with a partner.**

Hail

If strong winds blow up through a thunderstorm cloud, raindrops are blown back up into the freezing air at the top of the cloud, creating a small piece of ice. As the ice is blown through the cloud many times, many layers of water freeze on it. Finally, it gets too heavy for the winds to carry it back up. This frozen precipitation that forms in layers is called **hail**. The hailstones fall to the ground.