

Name \_\_\_\_\_

**Day  
1**

**Weekly Question**

# What causes the weather?

Although it is 93 million miles away, the sun has a powerful influence on Earth. Ultimately, the sun is the source of all energy on our planet. Energy from the sun reaches Earth in the form of light. It is this **solar energy** that drives the weather. In fact, if it were not for the sun, there would be no weather.

All three elements that make up the weather—temperature, wind, and **precipitation**—are controlled by the sun. Solar energy determines the amount of heat on Earth. And heat, in turn, controls temperature. The sun also causes changes in air pressure, and these changes produce wind. Finally, the sun affects **humidity**, the increase of which results in precipitation.

**A.** Rewrite each sentence, replacing the underlined phrase with the correct vocabulary word.

1. During the summer months, moisture in the air increases.

\_\_\_\_\_

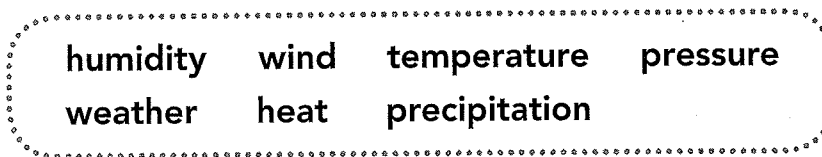
2. Without light from the sun, there would be no life on Earth.

\_\_\_\_\_

3. Rainforests receive a lot of water from the sky.

\_\_\_\_\_

**B.** Write each word in its correct place on the flowchart to show how the sun causes all weather.



Daily Science

**Big  
Idea 3**



**WEEK 1**

## Vocabulary

### humidity

hew-MID-ih-tee  
the amount of water vapor in the air

### precipitation

prih-SIP-ih-TAY-shun  
water droplets that fall to Earth's surface in the form of rain, snow, sleet, or hail

### solar energy

SO-lur EN-ur-jee  
power from the sun in the form of light

Name \_\_\_\_\_

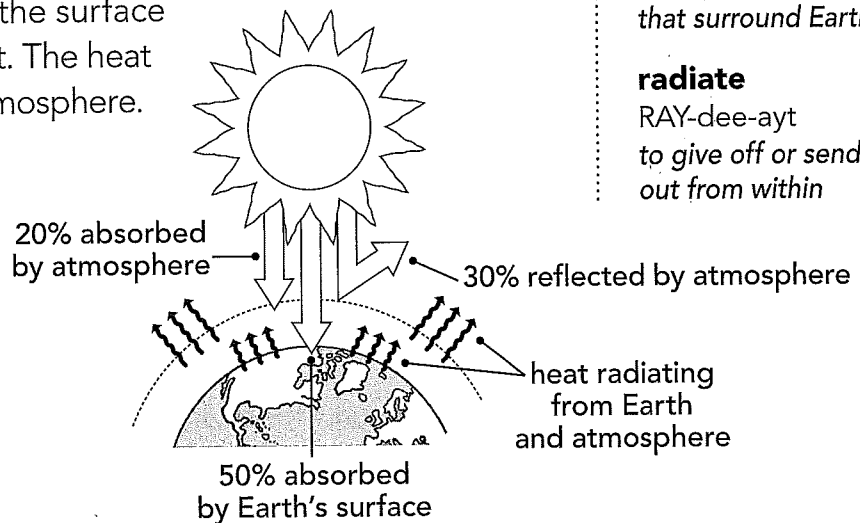
**Day  
2**

**Weekly Question**

## What causes the weather?

Air temperatures vary from day to night and from season to season. This is due to differences in the amount of solar energy that Earth receives. At night, Earth receives less solar energy than during the day. Earth also receives less solar energy during winter than during summer. With decreased solar energy, temperatures drop.

Thirty percent of the solar energy that reaches Earth's **atmosphere** is reflected back into space. The remaining 70% is absorbed by the atmosphere and Earth's surface, which become warmer as a result. The energy that is absorbed by the surface of Earth is transformed into heat. The heat is then **radiated** back into the atmosphere. This process is known as the *greenhouse effect*. It makes Earth's atmosphere about 15°C (59°F) warmer than it would be otherwise. The greenhouse effect is one of the main reasons that life on Earth is possible.



Daily Science

**Big  
Idea 3**

**WEEK 1**

### Vocabulary

**atmosphere**

AT-muh-sfeer  
the layer of gases that surround Earth

**radiate**

RAY-dee-ayt  
to give off or send out from within

Use information from the passage and the diagram above to fill in the blanks.

Earth has an "energy budget," which is the amount of energy that Earth receives and gives off. Earth's energy budget is similar to the budget that you use to manage your money. The money that goes into your bank account is like the amount of \_\_\_\_\_ that is \_\_\_\_\_ by Earth. The money that you spend is like the amount of solar energy that is \_\_\_\_\_ or \_\_\_\_\_ into space. Because the amount of absorption equals the amount of reflection and radiation, Earth's budget is always balanced!

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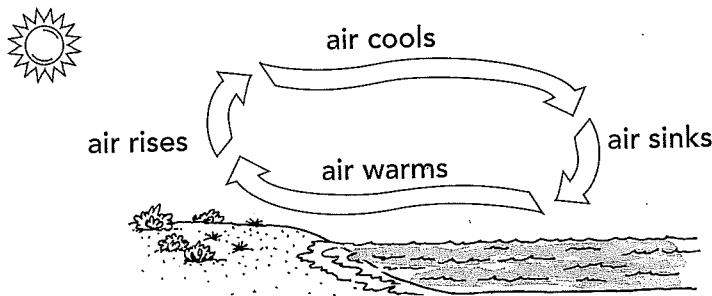
**Day  
3**

**Weekly Question**

**What causes the weather?**

Just as the sun regulates temperature, it also regulates the wind. Wind is created when solar energy is absorbed, transformed into heat, and radiated from Earth's surface, warming the air close to the ground. The heated air molecules move faster and push against each other, causing the air to expand and become lighter. The air close to the ground is under high pressure because of the weight of all the air above it. But when the warm air expands, it decreases the pressure. This causes the warm air to rise.

As the air rises, it cools and contracts. Cold air is heavier, exerts more pressure, and therefore tends to sink. Once near the ground, the cold air again becomes warm, expands, and rises, forming a continuous cycle called a **convection current**. This movement of air from areas of high pressure to areas of low pressure is what we recognize as wind.



**A.** Summarize why warm air rises and cool air sinks.

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**B.** On a sunny day at the beach, the land heats up faster than the ocean. The warmer air over the land rises, so the cooler air over the ocean rushes in to take its place. This creates a wind called a sea breeze. After sunset, the land cools faster than the water, so the air over the ocean is warmer. Describe what you think happens to the movement of air and the direction of the wind.

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Daily Science

**Big  
Idea 3**



**WEEK 1**

**Vocabulary**

**convection  
current**

kun-VEK-shun  
KER-int

*the circular flow  
of a substance  
due to pressure  
and temperature  
differences*

Name \_\_\_\_\_

**Day  
4**

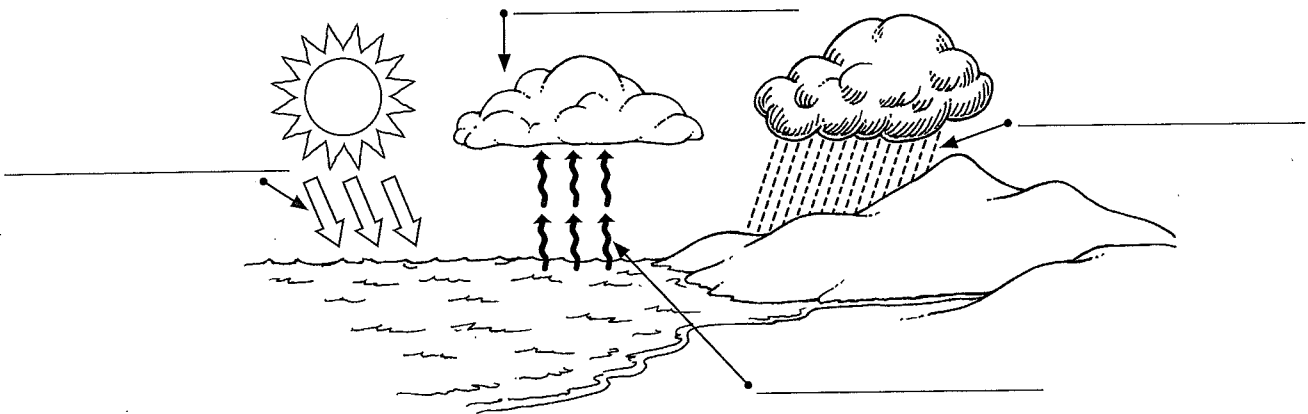
**Weekly Question**

## What causes the weather?

In addition to temperature and wind, the sun also affects precipitation. As solar energy heats Earth's oceans, rivers, and lakes, it causes some of the water to **evaporate** into water vapor. The water vapor rises and increases humidity in the atmosphere, where it begins to cool. As it cools, the water **condenses** into droplets. The droplets collect in clouds, which get heavier and heavier until they can hold no more water. Finally, the water is released, and it falls to Earth as precipitation. This cycle of evaporation, condensation, and precipitation is called the *water cycle*.

Certain combinations of temperature, wind, and precipitation can sometimes result in dramatic weather events, such as tornadoes. These storm systems usually occur where two air masses of different levels of heat, pressure, and humidity meet. In this way, even the darkest, fiercest storms are driven by the sun.

- A. Label each step in the water cycle, using the words *condensation*, *evaporation*, *precipitation*, and *solar energy*.



- B. What often occurs where two air masses of different levels of heat, pressure, and humidity meet?
- \_\_\_\_\_

Daily Science

**Big  
Idea 3**

**WEEK 1**

### Vocabulary

**condense**

kun-DENSS

to convert a gas  
into a liquid

**evaporate**

ih-VAP-ur-AYT

to convert a liquid  
into a gas

Name \_\_\_\_\_



**Day 5**

**Weekly Question**

**What causes the weather?**

A. Write the letter of the correct vocabulary word next to its definition.

- |                                                  |                       |
|--------------------------------------------------|-----------------------|
| ___ 1. wetness in the atmosphere                 | a. evaporate          |
| ___ 2. to change from a liquid into a gas        | b. radiate            |
| ___ 3. the envelope of gases that surround Earth | c. precipitation      |
| ___ 4. rain, snow, hail, and sleet               | d. solar energy       |
| ___ 5. the process that produces wind            | e. convection current |
| ___ 6. to change from a gas into a liquid        | f. humidity           |
| ___ 7. to give off rays or waves                 | g. condense           |
| ___ 8. light from the sun                        | h. atmosphere         |

B. Check the box next to the phrase that completes the analogy.

Evaporation is to water vapor as \_\_\_\_\_.

- |                                                           |                                                         |
|-----------------------------------------------------------|---------------------------------------------------------|
| <input type="checkbox"/> condensation is to precipitation | <input type="checkbox"/> precipitation is to sunlight   |
| <input type="checkbox"/> humidity is to evaporation       | <input type="checkbox"/> evaporation is to condensation |

C. In your own words, explain how the sun causes the weather.

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