

Convection Currents

Cross-Curricular Focus: Earth Science



You may not be able to see the wind, but you can see the effects of wind on the things around you. You can feel it blowing across your face on a chilly day. You can see the leaves blowing down the street and see the sail on the sailboat puff up when the wind catches it. So why does the air move? The simple answer is that the sun heats Earth unevenly, causing different amounts of air pressure in different areas.

The simple explanation does not really give you much of an idea about what causes the wind to blow. You have to look a little deeper. **Convection currents** are loops of moving air or water that transfer energy from one location to another. When convection currents occur in the air, they cause wind.

Local winds, like mountain breezes and valley breezes, stay in a fairly small area. Mountains absorb more heat during the day than the valleys do, so warm air rises off the mountainside. The cooler air from the valley rushes in to take its place. During the night, the mountains cool faster than the valleys, so the whole process happens in reverse. A cool breeze blows down from the mountains.

In areas that are near the ocean, sea breezes blow from the water toward the land during the day and from the land to the water at night. During the day, the land heats faster than the ocean. When the warm air rises over the land, cool air rushes in from the ocean to take its place. Once the water finally warms up, it holds onto the warmth longer than the land. When the warm air rises off of the ocean, the cooler air from the land rushes out to take its place over the ocean.

Global winds cover larger areas. Uneven heating of certain parts of the planet results in planetary winds. These are long-lasting wind patterns that circle the globe in predictable patterns. They curve to the right in the Northern Hemisphere and to the left in the Southern Hemisphere. Fast-moving currents called jet streams blow up to 149 miles per hour in the atmosphere surrounding Earth.

All of these wind patterns influence the weather. Winds blow clouds from one area to another, and clouds carry precipitation. Understanding the patterns of the wind can help you know what kind of weather to expect.

Name: _____

Answer the following questions based on the reading passage. Don't forget to go back to the passage whenever necessary to find or confirm your answers.

1) What is the simple explanation for why air moves?

2) What are convection currents?

3) How do convection currents influence the weather?

4) How does wind occur near mountains in the daytime? _____

5) What is the difference between local winds and global winds?

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Name: Key

Answer the following questions based on the reading passage. Don't forget to go back to the passage whenever necessary to find or confirm your answers.

Actual wording of answers may vary.

1) What is the simple explanation for why air moves?

The sun heats Earth unevenly, which causes areas to have different air pressures.

2) What are convection currents?

loops of moving air or water that transfer energy from one place to another

3) How do convection currents influence the weather?

They create wind, which moves clouds carrying precipitation from one place to another.

4) How does wind occur near mountains in the daytime? **Mountains heat faster, so the warm**

air rises and the cooler air in the valley rushes to the mountains to replace the rising air.

5) What is the difference between local winds and global winds?

Local winds stay in a smaller area than global winds.