

What Causes Weather?

By Cindy Grigg

The sun warms the earth. The earth has a big invisible blanket wrapped around it. This blanket is made of air. The blanket is called the atmosphere. Weather happens in the lowest layer of the atmosphere. This layer of the atmosphere is where we live. The atmosphere lets the sun's heat and light pass through. It keeps most of the heat from escaping back into space.

The atmosphere traps the heat. It works just like the glass windows of a greenhouse. They trap the sun's heat inside. This is called the greenhouse effect. It's a good thing, too, or earth would be too cold for us to live on.

The planet Venus has too much of the greenhouse effect. Venus's atmosphere is mostly carbon dioxide. This is one of what scientists call "greenhouse gases." Carbon dioxide lets the sun's light and heat come into the atmosphere. Then greenhouse gases trap the heat instead of letting it pass back out. Because of this, Venus is the hottest planet in our solar system even though Mercury is closer to the sun. A day on Venus may reach 900 degrees! Too much of the greenhouse effect is what scientists worry is happening to earth now to cause global warming.

Since the earth is tilted more than twenty degrees, the sun's rays don't reach every part of earth evenly. The equator gets more direct rays from the sun. That's why areas around the equator are the warmest places on earth. The North and South Poles get less-direct rays from the sun, and so less energy. This unequal heating is the reason for much of our weather.

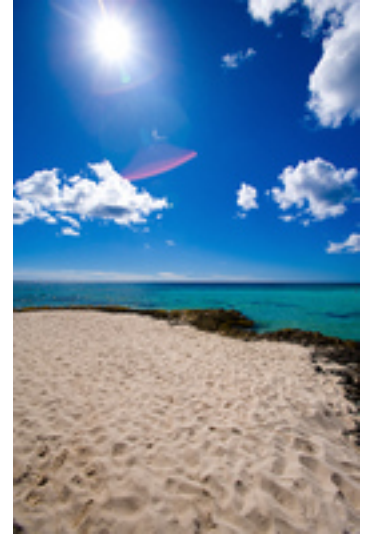
Air near the equator gets very warm. Warm air rises. Rising warm air makes areas of low pressure. At the poles, cold air sinks. Sinking cold air makes areas of high pressure. Air masses may be warm or cold. They may be high-pressure or low-pressure. They may have wet air or dry air.

When a warm air mass gets next to a cold air mass, it causes a change in the weather. The edge where they meet is called a front. The front often brings rain or snow. Differences in the temperature of air masses cause wind.

Mountains also affect our weather. Air near the top of high mountains is much cooler than air near sea level. Air temperatures drop about three and one-half degrees for every thousand foot rise in elevation. On top of high mountains, temperatures may be below freezing all year.

Mountains are tall barriers over which winds must flow. On the side of a mountain facing the wind, warm air rises and then cools. Cooler air cannot hold as much moisture, so there is precipitation in the form of rain or snow. On the other side of the mountain, the air sinks. As it drops to lower elevations, it warms up. Warm dry air dries out the land. Deserts are common on this side of a mountain. This is called the rain-shadow effect.

Air pressure, wind, temperature, and the amount of moisture in the air all cause weather changes. Meteorologists use weather maps to show areas of low or high pressure. They show cold and warm fronts. They show wind speeds and direction. People can use all of this information to find out what changes in the weather are about to come their way.



Name _____



Date _____

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Questions

1. What causes our weather?

_____ 2. The big invisible blanket of air around the earth is called the _____.

- A. atmosphere
- B. greenhouse
- C. meteorologist
- D. low pressure

_____ 3. Too much of the greenhouse effect is a bad thing.

- A. true
- B. false

_____ 4. Which of these is a "greenhouse gas"?

- A. neon
- B. carbon dioxide
- C. oxygen
- D. nitrogen

_____ 5. The North and South Poles get more direct rays from the sun.

- A. false
- B. true

_____ 6. Unequal heating of the earth is the reason for much of our weather.

- A. true
- B. false

_____ 7. Warm air _____.

- A. rises
- B. makes areas of low pressure
- C. both A and B
- D. none of the above

_____ 8. Cold air _____.

- A. rises
- B. sinks
- C. makes areas of low pressure
- D. all of the above

