

Station 7: Air Pressure

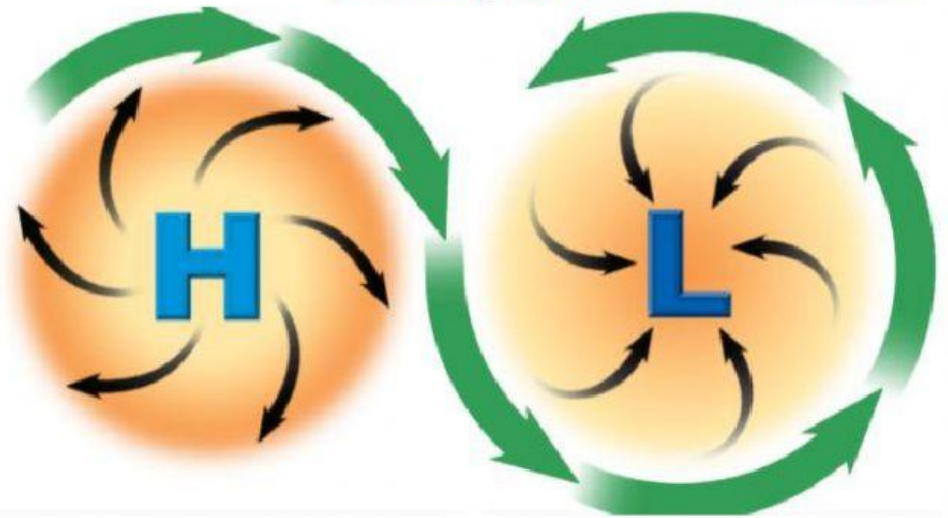
Directions: Read the text, then answer the follow up questions.

What are pressure systems?

Areas of different air pressure cause changes in the weather. In a high-pressure system, air sinks slowly down. As the air nears the ground, it spreads out toward areas of lower pressure. Most high-pressure systems are large and change slowly. When a high-pressure system stays in one location for a long time, an air mass may form. The air mass can be warm or cold, humid or dry.

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A high-pressure system can spiral into a low-pressure system, as illustrated by the green arrows below. In the Northern Hemisphere, air circles in the directions shown.



In a low-pressure system, air rises and so has a lower air pressure than the areas around it. As the air in the center of a low-pressure system rises, the air cools.

Follow Up Questions:

In a high-pressure system, air _____.

In a low-pressure system, air _____.

The diagram to the right shows airflow between two air pressure systems. Describe the airflow that you see shown by the green arrows.

How does uneven heating of the Earth's surface affect the movement of air between pressure systems?

High-pressure systems and Weather

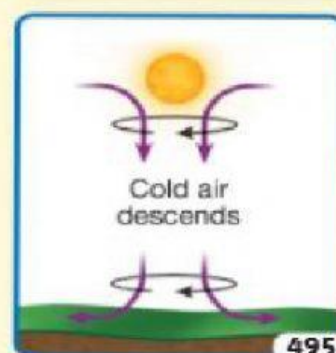
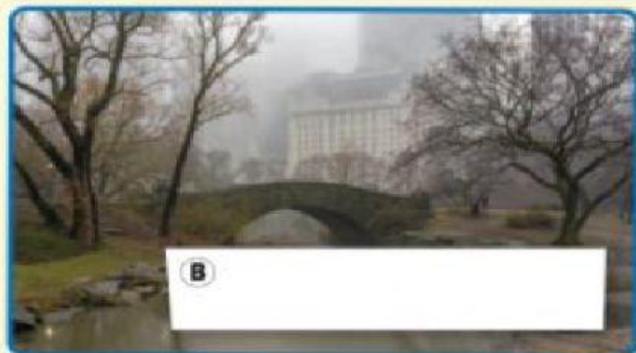
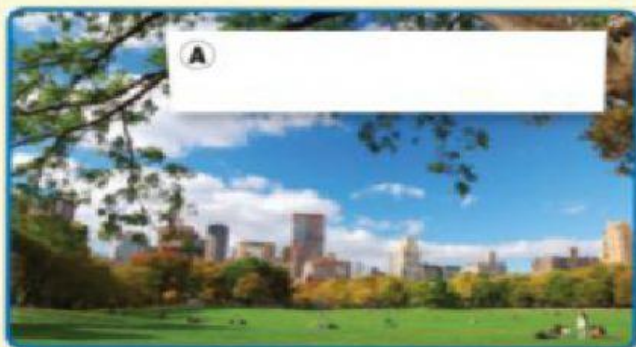
High-pressure systems are areas where air sinks and moves outward. The sinking air is denser than the surrounding air, and the pressure is higher. Cooler, denser air moves out of the center of these high-pressure areas toward areas of lower pressure. As the air sinks, it gets warmer and absorbs moisture. Water droplets evaporate, relative humidity decreases, and clouds often disappear. A high-pressure system generally brings clear skies and calm air or gentle breezes.

Low-pressure systems and Weather

Low-pressure systems have lower pressure than the surrounding areas. Air in a low-pressure system comes together, or converges, and rises. As the air in the center of a low-pressure system rises, it cools and forms clouds and rain. The rising air in a low-pressure system causes stormy weather.

A low-pressure system can develop wherever there is a center of low pressure. One place this often happens is along a boundary between a warm air mass and a cold air mass. Rain often occurs at these boundaries, or fronts.

13 Match Label each picture as a result of a high- or low-pressure system. Then, draw a line from each photo to its matching air-pressure diagram.

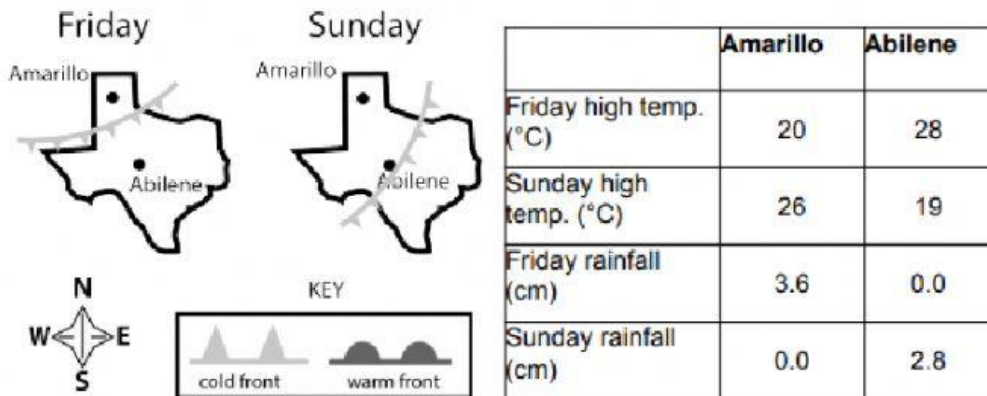


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Station 8: Multiple Choice Quiz

Directions: Select the correct answer for each of these questions.

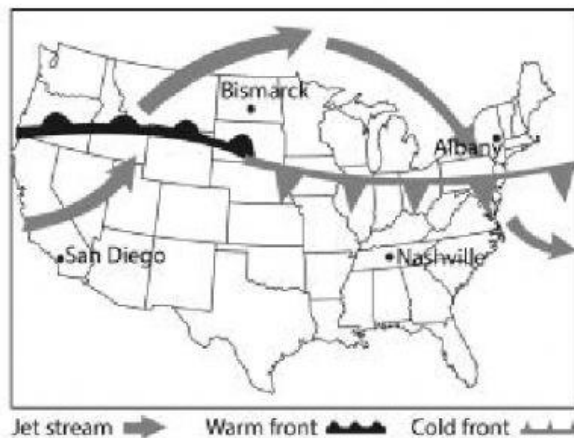
- 1** These weather maps show conditions in Texas on two days, and the table gives the weather conditions.



Data from the weather maps and the table can be used to conclude that—

- A** cold fronts are associated with precipitation.
- B** a warm front usually follows a cold front.
- C** high temperatures can follow a cold front.
- D** air masses usually travel from east to west.

- 2 The jet stream is a global pattern of atmospheric movement that influences patterns in local weather.



The weather is monitored over the next couple of days in the area shown on the weather map. Which of the following observations would support the claim that the passage of a warm front is associated with a lowering of cloud cover?

- A Low clouds in San Diego are replaced by high clouds.
- B High clouds in Bismarck are replaced by low clouds.
- C Low clouds in Albany are replaced by high clouds.
- D High clouds in Nashville are replaced by low clouds.

- 3 Barometers are scientific instruments that measure the pressure of the atmosphere in millibars. The range of atmospheric pressure on Earth is 980–1050 mbar.

City	Cloud Cover (%)			Barometric Pressure (mbar)		
	Fri	Sat	Sun	Fri	Sat	Sun
Giddings	50	50	50	1026	1028	1027
Amarillo	75	80	75	990	996	998
Eules	50	20	0	1004	1027	1035
Tyler	20	20	20	1026	1028	1022

Which city's data provides evidence that high pressure is a predictor of clear skies?

- A Giddings
 - B Amarillo
 - C Eules
 - D Tyler
- 4 A city is most likely to experience a change in weather under which of the following conditions?
- A Warm air over the city gets heated by the Sun.
 - B One air mass replaces another over the city.
 - C An air mass over the city increases in size.
 - D A large mass of cold air remains over the city.