



## Global Winds and Local Weather

The region of Earth receiving the Sun's direct rays is the equator. Here, air is heated and rises, leaving areas of low pressure behind. Moving to about thirty degrees north and south of the equator, the warm air from the equator begins to cool and sink. Between thirty degrees latitude and the equator, most of the cooling sinking air moves back to the equator. The rest of the air flows toward the poles. The air movements toward the equator are called **trade winds**- warm, steady breezes that blow almost continuously. The Coriolis Effect makes the trade winds appear to be curving to the west, whether they are traveling to the equator from the south or north.

The trade winds coming from the south and the north meet near the equator. These converging trade winds produce general upward winds as they are heated, so there are no steady surface winds. This area of calm is called the **doldrums**.

Between thirty and sixty degrees latitude, the winds that move toward the poles appear to curve to the east. Because winds are named from the direction in which they originate, these winds are called **prevailing westerlies**. Prevailing westerlies in the Northern Hemisphere are responsible for many of the weather movements across the United States and Canada.

At about sixty degrees latitude in both hemispheres, the prevailing westerlies join with **polar easterlies** to reduce upward motion. The polar easterlies form when the atmosphere over the poles cools. This cool air then sinks and spreads over the surface. As the air flows away from the poles, the Coriolis effect turns it to the west. Again, because these winds begin in the east, they are called easterlies.



Watch the video on the Coriolis effect.

Write 2 things you learned in the space below.

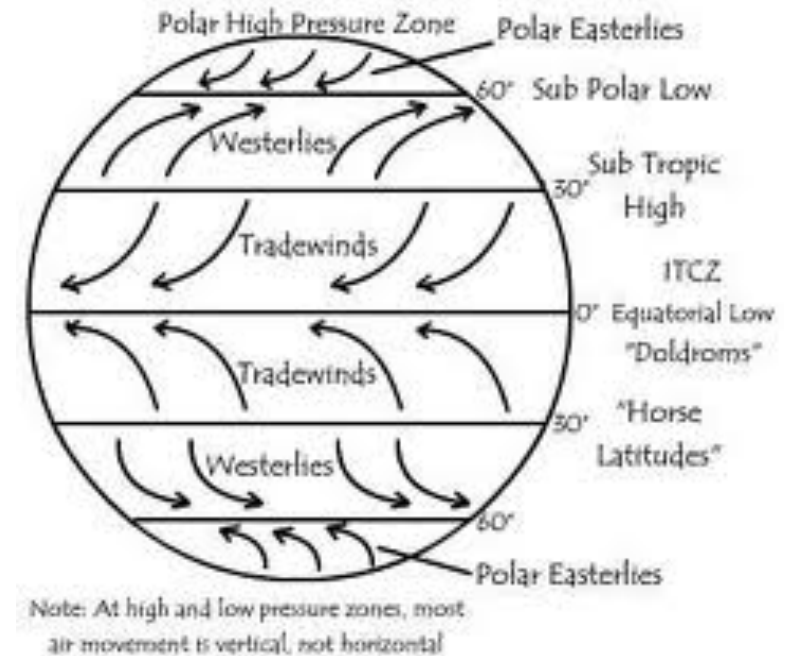
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In the diagram below trace the arrows with the following colors:

1. Polar Easterlies – blue
2. Westerlies – red
3. Trade winds – orange
4. Equator - green



### Questions:

1. What are trade winds? \_\_\_\_\_
2. What are the doldrums? \_\_\_\_\_
3. Which winds are responsible for many of the weather movements across the US? \_\_\_\_\_
4. Why do the winds curve? \_\_\_\_\_



## Reading Weather Maps



Weather is the condition of the atmosphere at a certain time and place. As you read this, where you live may be cool and rainy or it may be hot and sunny. Whatever your weather is like it is influenced by weather patterns across the country and even around the world.

Weather maps provide a simplified picture of the current or predicted weather conditions of an area. They can be based on satellite and radar images, recordings from instruments at weather stations and computer analysis.

The most common weather map you'll come across is a surface analysis map. Let's look at a map and learn what the symbols mean.

1. The first things to identify are the isobars. (iso = equal and bar = pressure) Isobars look a lot like the topographic map lines and like contour lines mean an equal value. Isobars indicate areas of equal air pressure measured in millibars. Isobars play a major role in determining the speed and direction of the wind. Find two areas that have isobars at 1020 and 1017. Trace these lines in green
2. When isobars form concentric closed, but not always round circles, the smallest circle in the center indicates a pressure center. An H indicates an area high pressure. Areas of high pressure usually have fair weather – sunny, warm with light breezes. Find an area with a closed area of high pressure. Trace these lines in yellow.
3. A pressure center can also be an area of low pressure. An L indicates low pressure. Generally areas of low pressure are usually associated with some type of precipitation – rain, snow or sleet. Find an area of low pressure and trace it in purple.

4. The boundary between two air masses is called a front. Most changes in weather occur at fronts. A warm front generally brings a light drizzle or rain and are followed by clear, warm weather. The symbol for a warm front is used with semicircles on one side.

Find the warm front and trace it in red.

5. Cold fronts usually mean heavy rains, thunderstorms and snow. After a cold front passes, the weather is usually clear and clear. Blue lines with triangles on one side represent cold front. The triangles always point in the direction the front is moving. Find the cold front and trace it in blue.

### Questions:

1. What is the highest pressure shown on the weather map?  
\_\_\_\_\_
2. What is the lowest pressure shown on the weather map?  
\_\_\_\_\_
3. What type of weather is Oklahoma City likely to have?  
\_\_\_\_\_
4. After the front passes Oklahoma City what type of weather is it likely to have? \_\_\_\_\_
5. What type of weather is Boston likely to be having at this time? \_\_\_\_\_
6. There is an area of low pressure in the southwest region of the map. What type of weather are they likely having?  
\_\_\_\_\_
7. There is an area of high pressure in the northwest region of the map. What type of weather are they likely having?  
\_\_\_\_\_

Name \_\_\_\_\_ period \_\_\_\_\_

## EXIT TICKET

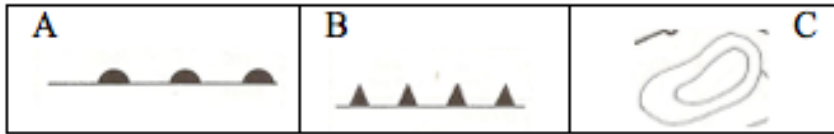
### Global Winds And Local Weather

1. What causes the global winds to blow?

- A. The spinning of the earth
- B. The uneven heating of the earth by the Sun
- C. Day and night

2. What causes the winds to curve away from the equator?

- A. The spinning of the earth
- B. The uneven heating of the earth by the Sun
- C. Day and night



3. Which of the symbols above represents a cold front?

- A. Symbol A
- B. Symbol B
- C. Symbol C

4. Which of the symbols above represents a warm front?

- A. Symbol A
- B. Symbol B
- C. Symbol C

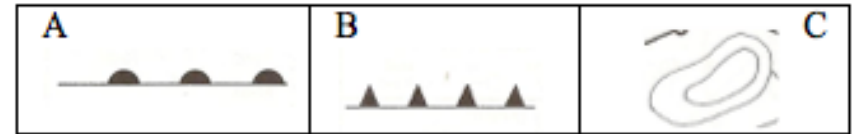
5. Which of the symbols above represent a pressure center?

- A. Symbol A
- B. Symbol B
- C. Symbol C

Name \_\_\_\_\_ period \_\_\_\_\_

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1. Which of the symbols above represents a cold front?

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- B. Symbol B
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3. Which of the symbols above represent a pressure center?

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4. What causes the global winds to blow?

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5. What causes the winds to curve away from the equator?

- A. The spinning of the earth
- B. The uneven heating of the earth by the Sun
- C. Day and night

