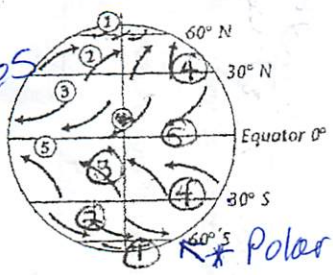


**WINDS**

◆ **Understanding Main Ideas**

Identify the global wind belts and calm areas in the figure below.

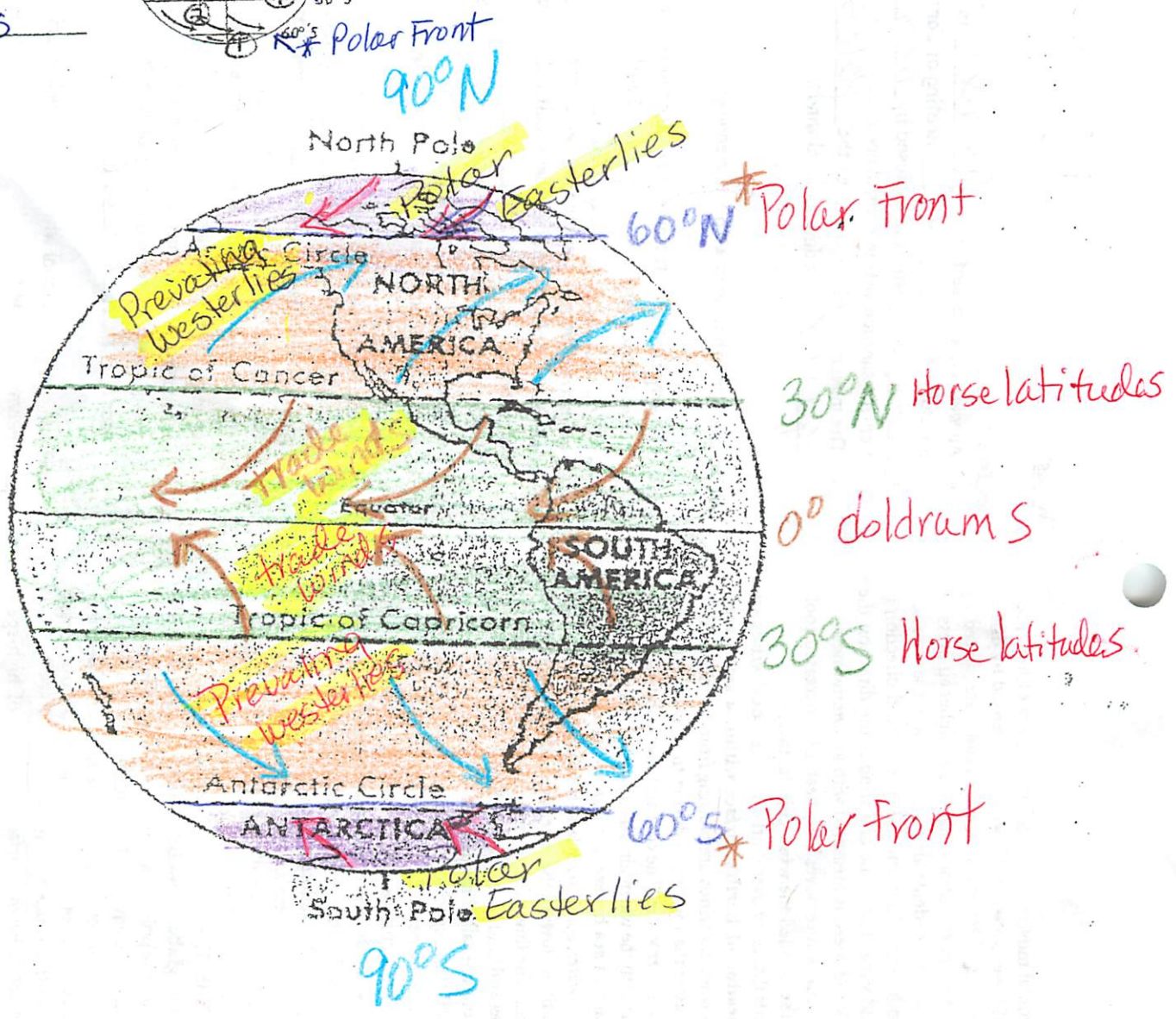
1. Polar Easterlies
2. Prevailing Westerlies
3. Trade Winds
4. Horse latitudes
5. Doldrums



E26

Global Winds

Read  
418  
424.



1. What creates global winds? (p. 421; bold print) differences in heat between equator + poles
2. Which way do winds in the Northern Hemisphere turn? Fig. 22; p. 421 right
3. Which way do winds in the Southern Hemisphere turn? Fig. 22; p. 421 left
4. What causes the Coriolis effect? p. 421 rotation of the earth
5. What are the doldrums? p. 422 calm areas
6. The major global wind belts are polar easterlies, prevailing westerlies, and trade winds.



# Winds

## Guide for Reading

- ◆ What causes winds?
- ◆ What are local winds and global winds?
- ◆ Where are the major global wind belts located?

A **wind** is the horizontal movement of air from an area of high pressure to an area of lower pressure. **All winds are caused by differences in air pressure.** Most differences in air pressure are caused by unequal heating of the atmosphere. Cool, dense air has higher air pressure so it flows underneath warm, less dense air, forcing the warm air to rise.

Winds are described by their direction and speed. Wind direction is determined with a wind vane. The name of a wind is the direction the wind is coming from. Wind speed is measured with an **anemometer**.

Wind blowing over your skin removes body heat. The increased cooling that a wind can cause is called the **wind-chill factor**.

**Local winds** are winds that blow over short distances. **Local winds are caused by unequal heating of Earth's surface within a small area.** Local winds form only when no winds are blowing from farther away.

The sun heats land faster than water, so during the day air over land becomes warmer than air over water. The cool air blows inland from the water and moves underneath the warm air. The flow of air from an ocean or lake to the land is called a **sea breeze** or a lake breeze. At night, land cools more quickly than water, so air over land becomes cooler than air over water. The cool air blows toward the water from the land and moves underneath the warm air. The flow of air from land to a body of water is called a **land breeze**. Sea and land breezes over a large region that change direction with the seasons are called **monsoons**.

Winds that blow steadily from specific directions over long distances are called **global winds**. Warm air rises at the equator and cold air sinks at the poles, causing winds at Earth's surface to blow from the poles toward the equator. **The movement of air between the equator and the poles produces global winds.** Because Earth is rotating, global winds do not follow a straight path. The way Earth's rotation makes winds curve is called the **Coriolis effect**. In the Northern Hemisphere, global winds curve to the right. In the Southern Hemisphere, global winds curve to the left.

The Coriolis effect and other factors produce a pattern of calm areas and wind belts around Earth. The calm areas are called the doldrums and horse latitudes. **The major global wind belts are the trade winds, the prevailing westerlies, and the polar easterlies.** Latitude is a measure of distance north and south of the equator. The trade winds blow between the equator and 30° north and south latitude, the prevailing westerlies between 30° and 60° north and south latitude, and the polar easterlies between 60° north and south latitude and the poles.

About 10 kilometers above Earth's surface are bands of high-speed winds called **jet streams**. They blow from west to east.

## Winds

### Key Ideas:

- All winds are caused by differences in air pressure, which are a result of unequal heating of Earth's surface.
- Local winds are caused by unequal heating of Earth's surface within a small area.
- The movement of air between the Poles and the equator produces global winds.

Write the word that goes with the meaning:

1. the way Earth's rotation makes winds in the Northern Hemisphere curve to the right and winds in the Southern Hemisphere curve to the left/ Coriolis Effect
2. an instrument used to measure wind speed/ anemometer
3. winds that blow steadily from specific directions over long distances/ global winds
4. bands of high-speed winds about 10 kilometers above Earth's surface/ jet stream
5. the distance north or south from the equator, measured in degrees/ latitude
6. winds that blow over short distances/ local winds
7. the flow of air from land to a body of water/ land breeze
8. sea and land breezes over a large region that change direction with the seasons/ monsoon
9. the horizontal movement of air from an area of high pressure to an area of lower pressure/ wind
10. increased cooling caused by the wind/ wind chill factor
11. the flow of air from an ocean or lake to the land/ Sea breeze

monsoon  
jet stream  
local wind

global wind  
wind  
anemometer

Coriolis effect  
land breeze  
wind-chill factor

latitude  
sea breeze

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