# 8th grade notes Week 18

Wind

# 8th grade Anchor Questions Week 18 (Jan 12-16)

1. Explain why the Earth's surface is unevenly heated
2. What happens to air molecules when there are differences in air pressure? Include a diagram
3. Describe what a sea breeze is and why it happens
4. Describe what a land breeze is and why it happens
5. What events cause wind to happen?
6. Describe the global winds on a map and what direction do they flow
7. Describe the calm regions on a map

Vocabulary

| | | | |
|---|---|---|---|
| Land breeze | Air pressure | Monsoons | Sea breeze |
| Molecules | Global winds | Coriolis effect | Convection |
| Calm regions | Doldrums | Horse latitudes | Westerlies |
| easterlies | | | |

# C-notes

## Wind: air molecules move

Wind is air in motion.
It is produced by the uneven heating of the earth's surface by the sun.
Since the earth's surface is made of various land and water formations, it absorbs the sun's radiation unevenly.
Different latitudes receive direct or indirect rays

# C-notes

## Wind: air molecules move

Air molecules ALWAYS MOVE from high pressure area to a low pressure area

High and low pressure areas are caused by uneven heating of Earth's surface.

Air rises where surface is warm→ causes low pressure area

Air sinks where surface is cool → causes high pressure area

# C-notes

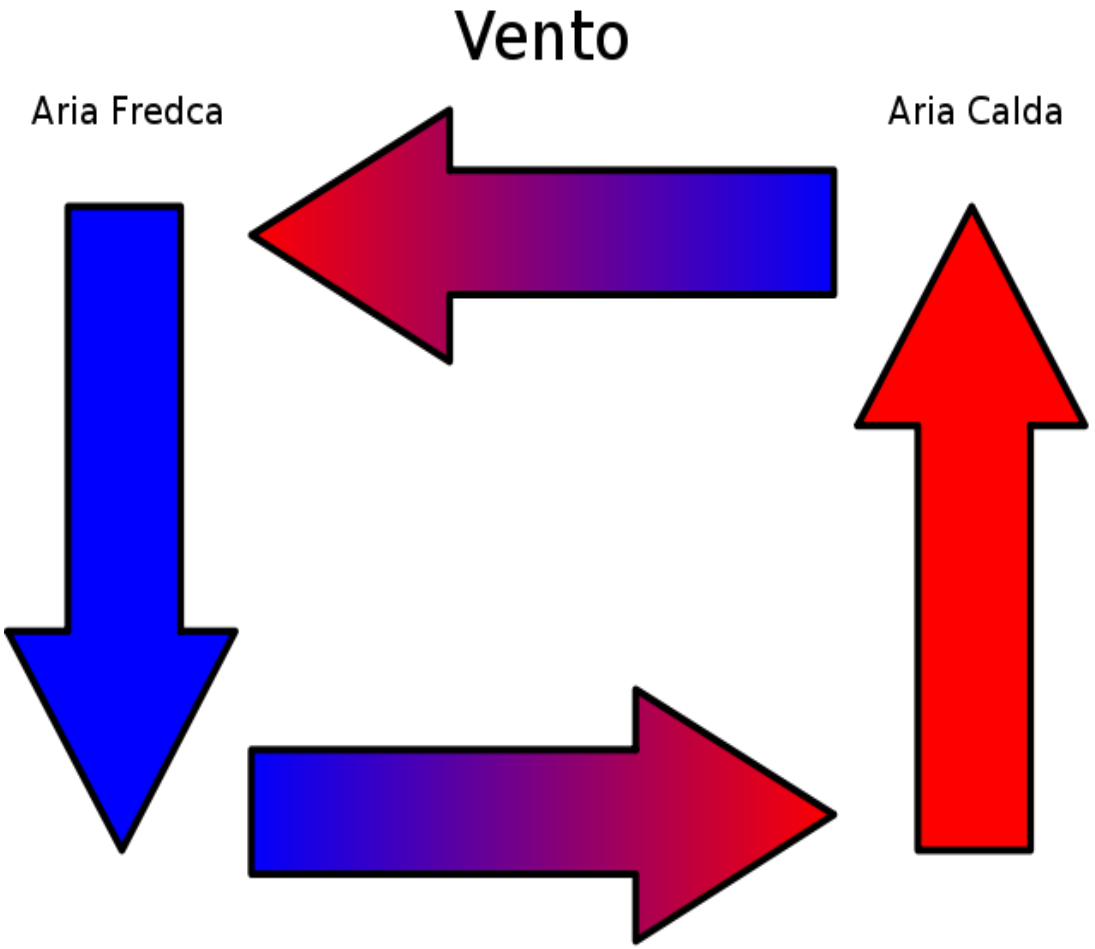
## Wind: Types

GLOBAL WINDS- large areas of Earth, with predominant patterns

LOCAL WINDS- smaller areas that have wind patterns

SEASONAL WIND- winds that follow a pattern depending on the season

# Wind: How it happens…




**Air moves from high to low pressure**

## Steps

1-Earth's surface is heated unevenly
2-Air is heated where it is warmer, then rises
3-This causes a low pressure area
4- Air molecules move in to take up the space

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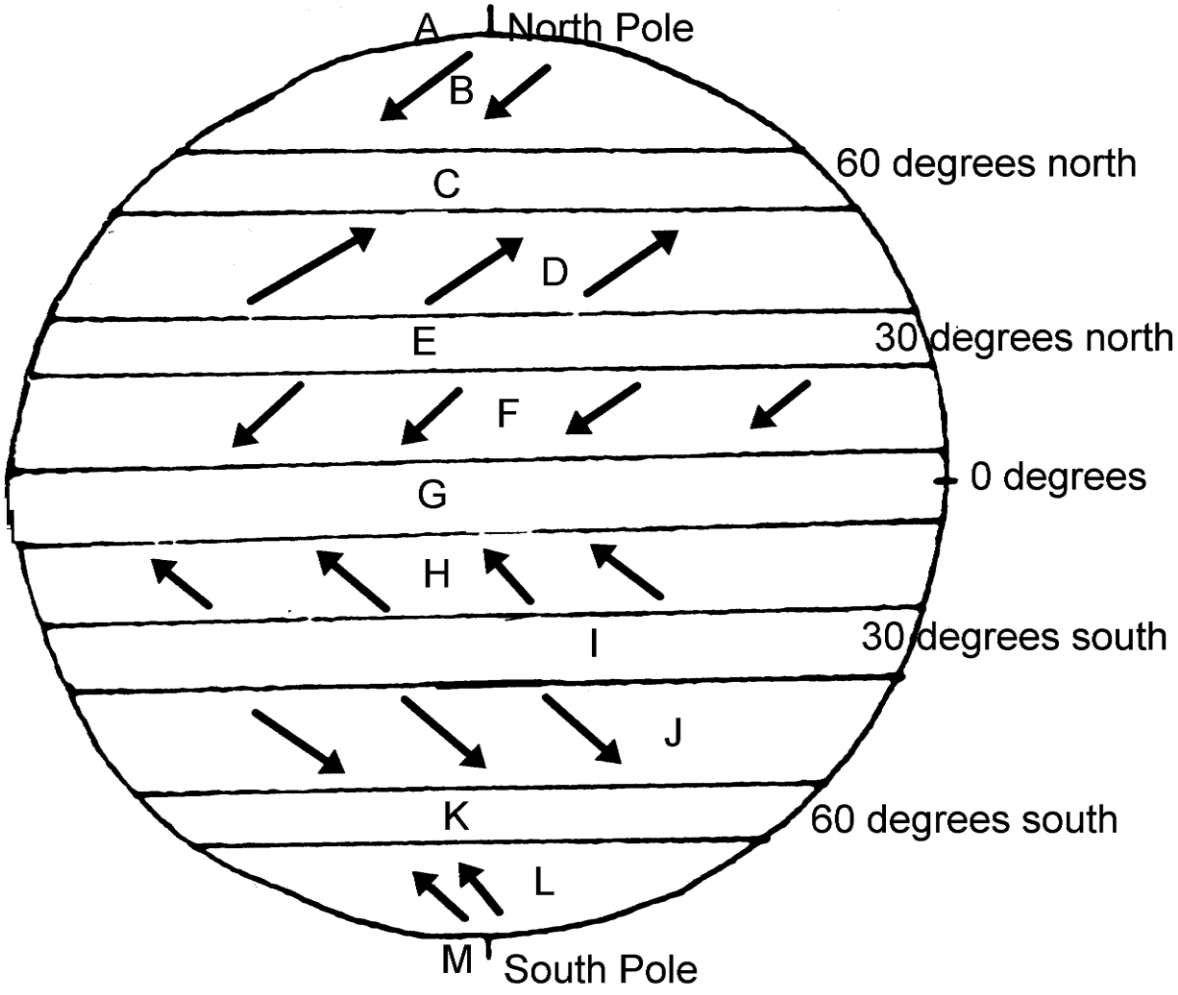
A
North Pole
B
60 degrees north
C
D
E
30 degrees north
F
0 degrees
G
H
I
30 degrees south
J
K
60 degrees south
L
M
South Pole

The section of a cell that flows along Earth's surface is global wind. Notice that the direction of airflow changes from one circulation cel to the next.

## Calm Regions

The air usually stays calm in high-pressure and low-pressure zones. Winds are light, and they often change direction.

1. **The doldrums** are a low-pressure zone near the equator. There, warm air rises to the top of the troposphere, which is the atmosphere's lowest layer. Then the air spreads out toward the poles. The rising, moist air produces clouds and heavy rain. During the hottest months, heavy evaporation from warm ocean water in the region fuels tropical storms.

2. **The horse latitudes** are high-pressure zones located about 30° north and 30° south of the equator. Warm air traveling away from the equator cools and sinks in these regions. The weather tends to be clear and dry.

## Wind Belts

## Wind Belts

As dense air sinks to Earth's surface in the horse latitudes and other high-pressure zones, it flows out toward regions of low pressure. This pattern of air movement produces three global wind belts in each hemisphere. Because of the Coriolis effect, the winds curve toward the east or toward the west. Some global winds are named for the directions from which they blow. The westerlies, for example, blow from west to east.

3. **The trade winds** blow from the east, moving from the horse latitudes toward the equator. These strong, steady winds die out as they come near the equator.

4. **The westerlies** blow from the west, moving from the horse latitudes toward the poles. They bring storms across much of the United States.

5. **The easterlies** blow from the east, moving from the polar regions toward the mid-latitudes. Stormy weather often occurs when the cold air of the easterlies meets the warmer air of the westerlies.

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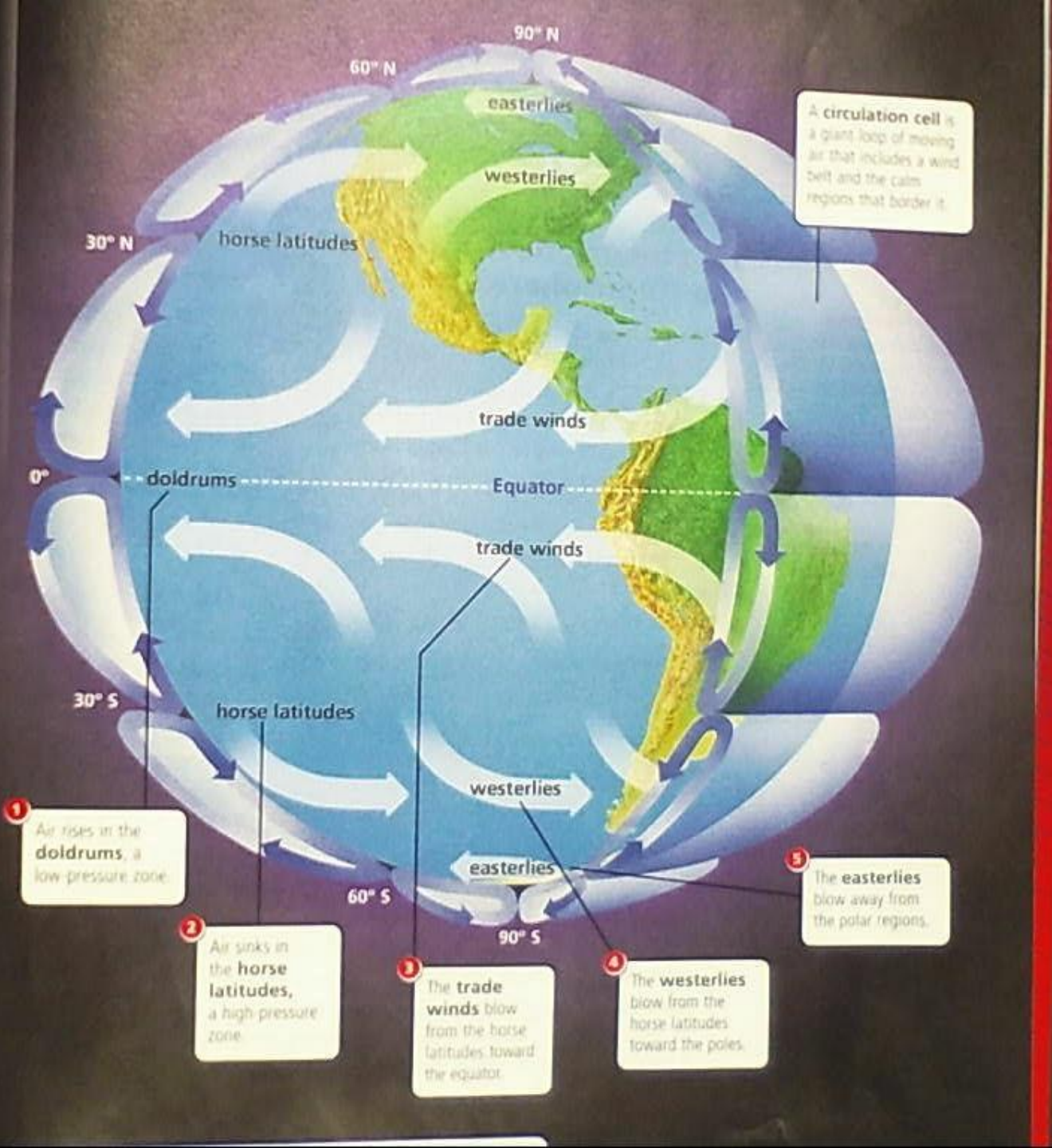
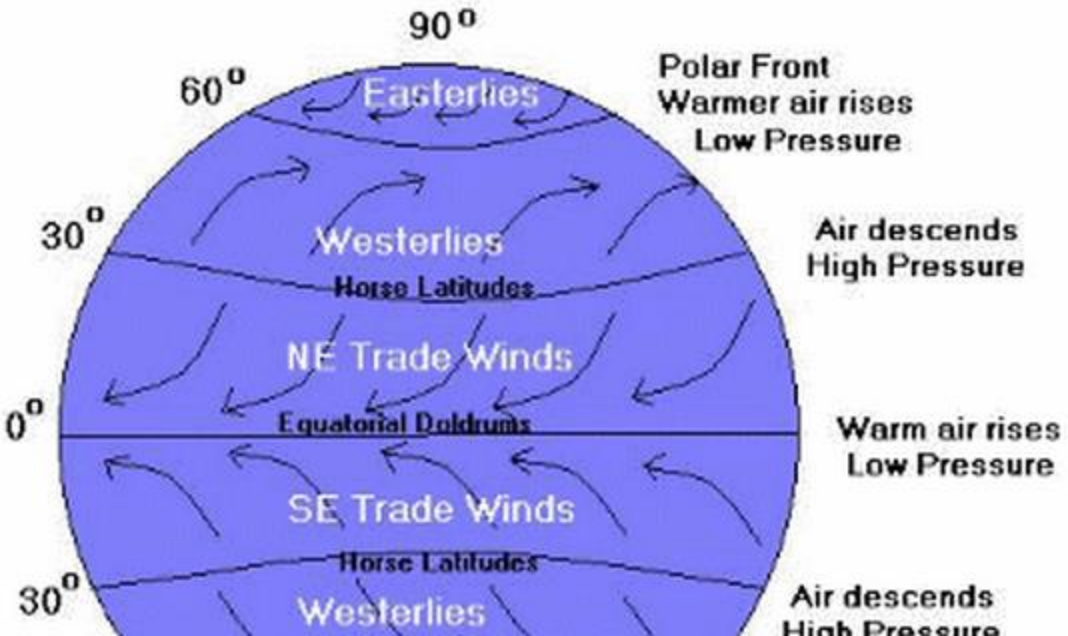


for fanning regional wildfires. For these reasons, they are sometime
as the "devil winds" across Southern California.

## What are the global wind patterns?

The equator receives the Sun's direct rays. Here, air is heated an
leaving low pressure areas behind. Moving to about thirty degrees n
south of the equator, the warm air from the equator begins to cool
Between thirty degrees latitude and the equator, most of the coolin
air moves back to the equator. The rest of the air flows toward th



## What are the trade winds?

The trade winds are just air movements toward the equator. They are 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.

## What are the doldrums?

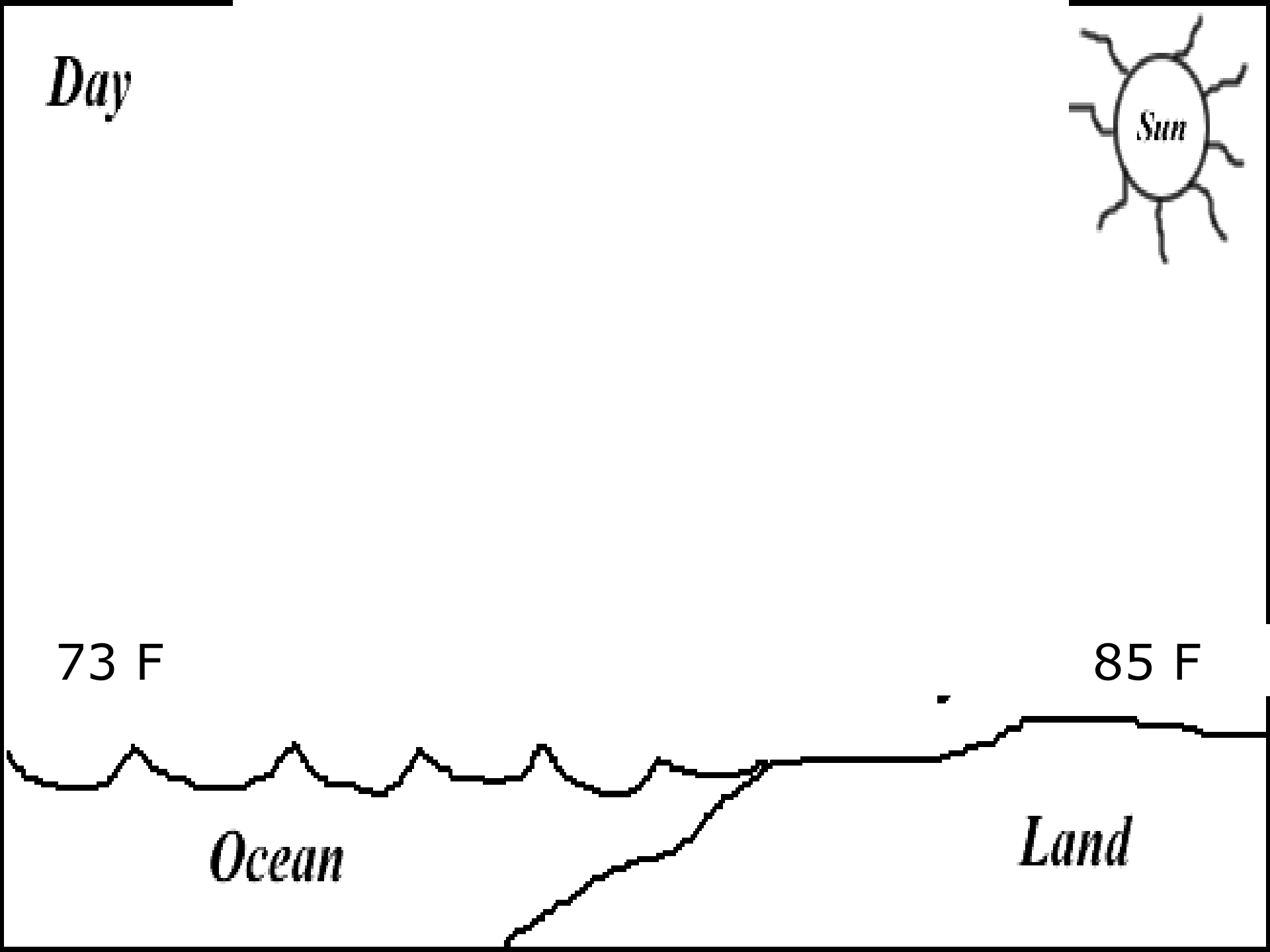
The doldrums is an area of calm weather. The trade winds coming from the south and the north meet near the equator. These converging trade winds produce general upward winds as they are heated, so there are no steady surface winds.

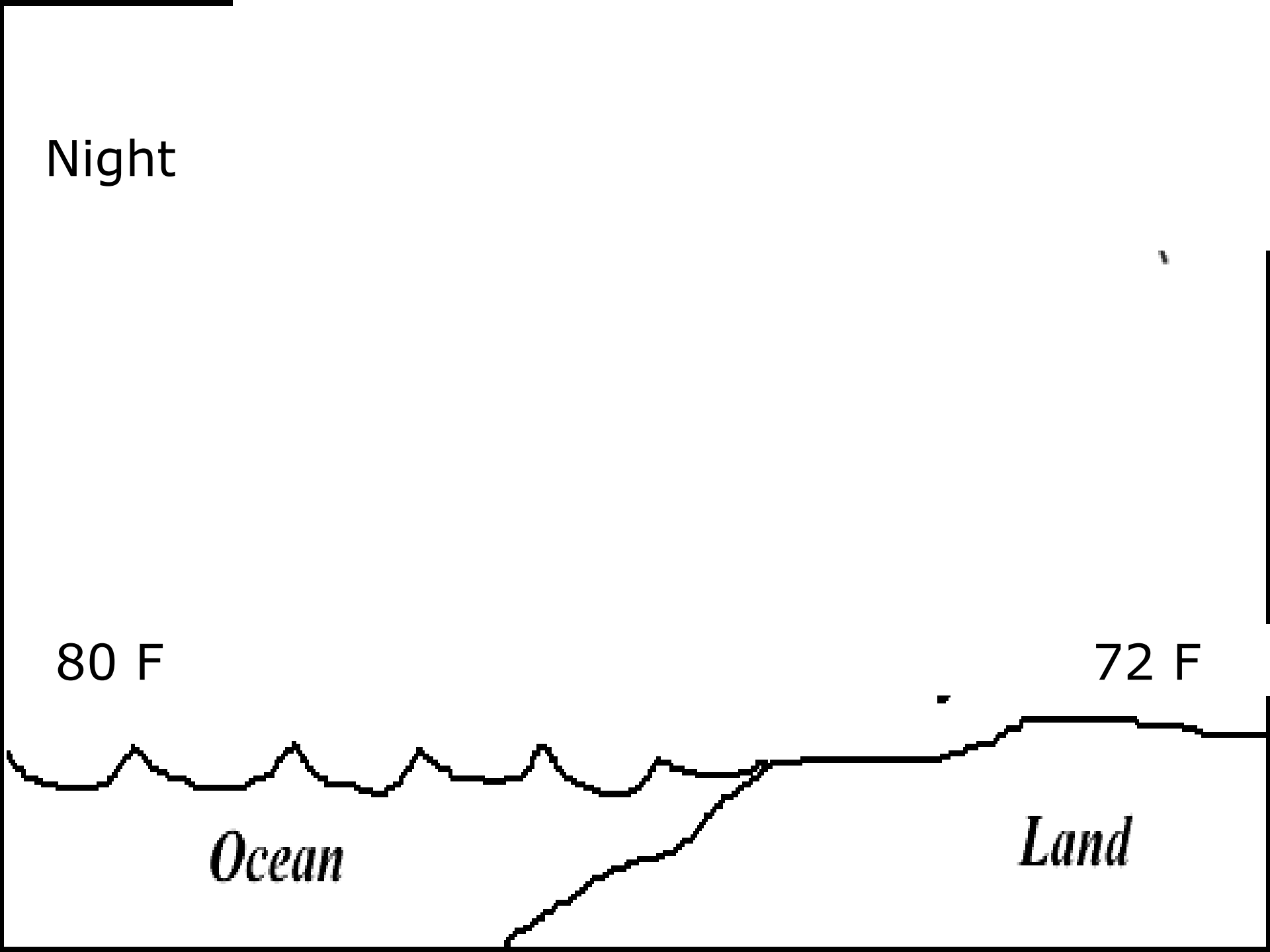
## What are the prevailing westerlies?

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.

## What are the polar easterlies?

At about sixty degrees latitude in both hemispheres, the prevailing westerlies join with the 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, it is turned to the west by the Coriolis effect. Again, because these winds begin in the east, they are called easterlies.


Day
Sun
73 F
85 F
Ocean
Land


Night
80 F
72 F
Ocean
Land