Winds Shape Weather

Trace how global air circulation shapes nearby weather conditions.

8.10.B "identify global patterns of atmospheric movement and how they influence local weather; and"

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline three statements that describe large-scale atmospheric movement. Circle words or phrases that tell how those movements can affect local weather.

Earth's Moving Air

1. Earth receives more direct solar energy near the equator than near the poles. Warm air near the equator becomes less dense and rises. Higher in the atmosphere, that air spreads toward cooler latitudes, cools, and eventually sinks. This rising and sinking creates large convection cells in each hemisphere. Air also rises near about 60° latitude and sinks near 30° latitude. These repeating vertical motions help create belts of low and high pressure, which affect clouds, rainfall, and dryness in many regions.

2. Because Earth rotates, moving air does not travel in a straight north-south path across its surface. The Coriolis effect bends moving air to the right in the Northern Hemisphere and to the left in the Southern Hemisphere. Combined with pressure belts, this deflection produces prevailing winds, including trade winds in the tropics and westerlies in middle latitudes. Prevailing winds often carry air masses and storms in regular directions. Knowing a region's usual wind direction helps forecasters predict which temperature and moisture conditions may arrive.

3. High above the surface, fast west-to-east winds called jet streams flow near boundaries between cold and warm air. A jet stream can guide storms and shift the paths those storms follow. When it bends north or south, one location may receive warmer or colder air than usual, while another receives more clouds or precipitation. Global circulation does not determine every day's weather. Mountains, bodies of water, and local heating also matter, but the large-scale patterns set important starting conditions for local forecasts.

2 ANSWER WITH EVIDENCE

Use the passage

1. How does unequal solar heating begin the convection cycle described in the passage?

2. Name two latitude zones where the passage describes vertical air movement. State whether air rises or sinks at each zone.

3. How do pressure belts and the Coriolis effect work together to influence local weather?

4. How can a north or south bend in a jet stream change weather in a location?

3 YOUR TURN

Your own words

Choose a location near the equator, near 30° latitude, or in the middle latitudes. Write three sentences that name one global air-movement pattern, predict one likely local weather condition, and explain how the pattern causes that condition.

ANSWER KEY # Winds Shape Weather

GRADE 8 · TEKS 8.10.B

PART 1 · READ AND MARK

Underline three statements that describe large-scale atmospheric movement. Circle words or phrases that tell how those movements can affect local weather. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	How does unequal solar heating begin the convection cycle described in the passage?	**Air near the equator is warmed, becomes less dense, and rises. It later cools and sinks at cooler latitudes.**
2	Name two latitude zones where the passage describes vertical air movement. State whether air rises or sinks at each zone.	**Air rises near the equator and near about 60° latitude. Air sinks near about 30° latitude.**
3	How do pressure belts and the Coriolis effect work together to influence local weather?	**Together they produce prevailing winds. These winds carry air masses and storms in regular directions, affecting the temperature and moisture conditions that arrive locally.**
4	How can a north or south bend in a jet stream change weather in a location?	**It can shift storm paths and bring warmer or colder air than usual. It may also change cloud cover or precipitation.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

At 30° N, air that rose closer to the equator has cooled and descended. The sinking air creates a high-pressure belt, so this location is likely to have dry, clearer weather. This global circulation pattern reduces cloud formation because sinking air warms and holds moisture more easily.

Accept equivalent explanations that accurately connect rising or sinking air, prevailing winds, or jet-stream movement to local temperature, moisture, clouds, storms, or precipitation. For the open response, require a correct global pattern, a plausible local condition, and a clear cause-and-effect link.