Same Sun, Different Climate

Trace how location, water, and wind shape climate.

WG.3.2 "Identify and account for the distribution pattern of the world's climates, taking into account the Earth/Sun relationship, ocean currents, prevailing winds, and latitude and longitude."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline the details about sunlight and latitude, circle the ocean currents, and number the wind patterns. Use your marks to explain why places at similar latitudes can have different climates.

A Journey Along Two Latitudes

1. Imagine traveling along 20° N latitude from the Atlantic coast of Mauritania, near 17° W longitude, to northern Hispaniola, near 70° W. Both places receive sunlight at similar angles because they lie at nearly the same latitude, yet their climates differ sharply. Latitude helps explain a broad pattern: sunlight is more direct near the equator and less direct toward the poles. Earth's tilted axis also changes the length of daylight and the angle of sunlight through the year. Seasonal changes grow more pronounced at higher latitudes. Longitude locates each stop east or west, but longitude alone does not set its temperature or rainfall.

2. Near Mauritania, the cool Canary Current flows southward along the coast. It cools the air above it, limiting evaporation and making rain less likely. Around 20° N, sinking air in the subtropical high-pressure belt also discourages clouds. Northeast trade winds often blow from land toward this west-facing coast, so they do not bring much ocean moisture inland. Northern Hispaniola sits beside warmer water. There, northeast trade winds can blow from the sea onto north-facing slopes. Moist air rises, cools, and releases rain. Similar sunlight at these two longitudes does not produce the same amount of rain.

3. Now travel farther north. Paris, near 49° N and 2° E, and Winnipeg, near 50° N and 97° W, have nearly equal latitudes. In both places, the tilt of Earth produces long summer days and short winter days. Yet Paris has milder winters than Winnipeg. The North Atlantic Current carries relatively warm water toward western Europe, and prevailing westerly winds carry maritime air inland. Winnipeg is far from an ocean, so that moderating influence is much weaker. Comparing the coordinates reveals which places share a sunlight pattern; tracing water and wind helps explain why their temperatures still differ.

2 ANSWER WITH EVIDENCE

Use the passage

1. Mauritania and northern Hispaniola lie near 20° N. Why is rain more likely on northern Hispaniola?

2. Why does daylight change more between summer and winter near Winnipeg than near Mauritania?

3. Paris and Winnipeg are at nearly the same latitude. What helps explain Paris's milder winters?

4. A student says Paris has milder winters than Winnipeg because it is farther east. How would you correct that explanation?

3 YOUR TURN

Your own words

Invent two coastal places at the same latitude but different longitudes. In four or five sentences, give each place a warm or cold current and onshore or offshore winds, then predict how their temperature and rainfall may differ. Include how Earth's tilt affects both places through the year.

ANSWER KEY

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PART 1 · READ AND MARK

Underline the details about sunlight and latitude, circle the ocean currents, and number the wind patterns. Use your marks to explain why places at similar latitudes can have different climates. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Mauritania and northern Hispaniola lie near 20° N. Why is rain more likely on northern Hispaniola?	**Warm water supplies moisture near Hispaniola, and northeast trade winds carry that moisture onto its north-facing slopes. Near Mauritania, the cool Canary Current, offshore winds, and sinking air make rain less likely.**
2	Why does daylight change more between summer and winter near Winnipeg than near Mauritania?	**Earth's tilted axis changes daylight through the year, and that seasonal change is more pronounced at Winnipeg's higher latitude.**
3	Paris and Winnipeg are at nearly the same latitude. What helps explain Paris's milder winters?	**The North Atlantic Current brings relatively warm water toward western Europe, and prevailing westerlies carry maritime air inland. Winnipeg is far from an ocean.**
4	A student says Paris has milder winters than Winnipeg because it is farther east. How would you correct that explanation?	**Longitude identifies their east-west locations but does not directly set climate. Ocean water and prevailing winds help explain the winter temperature difference.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

At 25° N, imaginary Port A is at 40° W beside a warm current, while imaginary Port B is at 90° W beside a cold current. Onshore winds bring moist ocean air to Port A, making rain more likely there. Offshore winds carry air away from the sea at Port B, where the cold current also limits evaporation. Port A is likely warmer and wetter than Port B. Because both places are at 25° N, Earth's tilt gives them similar seasonal changes in sunlight despite their different longitudes.

Accept explanations that connect similar latitudes to similar sunlight patterns and use currents, winds, or distance from the ocean to account for climate differences. In the open task, the invented places need not match real coastlines.