# Two Town Climates

Trace how global and surface features shape local climate.

**E.7.9A.4** "Construct an explanation for how climate is determined in an area using global and surface features (e.g., latitude, elevation, shape of the land, distance from water, global winds, and ocean currents)."

NAME _____ DATE _____

## 1 READ AND MARK

Read it twice

**YOUR JOB** Underline the features that affect climate. Then number four steps in the passage that show how ocean air reaches the mountains and leaves Stonefield drier.

### Across the Mountains

1. Imagine two towns at about 40° north latitude: Harborbend on the coast and Stonefield beyond a mountain range. At this latitude, the Sun's rays change angle through the year, bringing warmer summers and cooler winters to both towns. A cold ocean current flows past Harborbend. It cools the air above the water, especially in summer. Because nearby water heats and cools more slowly than land, Harborbend also has smaller temperature changes between summer and winter than a place far inland.

2. Most days, prevailing winds carry ocean air toward Harborbend and then across the mountains. As that moist air climbs the ocean-facing slopes, it cools. Some water vapor condenses into clouds, and rain falls on the coast and slopes. After crossing the peaks, the air sinks toward Stonefield. Sinking air warms and tends to become drier, so Stonefield gets less rain. The mountains create this rain shadow even though the two towns sit at nearly the same latitude.

3. Stonefield sits on a high plateau, while Harborbend is near sea level. Air temperature usually decreases with elevation, so Stonefield's height can make it cooler than a low town farther inland. Yet its distance from the ocean lets the land heat up and cool down quickly, making summer days hotter and winter nights colder than those near the shore. To explain each town's climate, consider more than one feature: latitude shapes the seasonal pattern, while winds, mountains, elevation, nearby water, and the current change local conditions.

## 2 ANSWER WITH EVIDENCE

Use the passage

1. Why might Harborbend have cooler summer air and a smaller change in temperature between seasons than Stonefield? Explain two causes.

2. How do the prevailing winds and mountains cause Stonefield to get less rain than Harborbend?

3. Stonefield is high and far from the ocean. How can these two features affect its temperature in different ways?

4. Suppose the prevailing winds blew from Stonefield toward Harborbend instead. Why might the rain shadow described in the passage change?

## 3 YOUR TURN

Your own words

Imagine a town near the equator on a low coastal plain beside a warm ocean current. Winds usually blow from sea to land. In four or five sentences, explain its likely temperature and rainfall using those features, then predict one way its climate might change if the town moved far inland.

ANSWER KEY

# Two Town Climates

GRADE 7 · E.7.9A.4

## PART 1 · READ AND MARK

Underline the features that affect climate. Then number four steps in the passage that show how ocean air reaches the mountains and leaves Stonefield drier. Accept any marking that follows this job and points at the right text.

## PART 2 · ANSWERS

| # | QUESTION | ANSWER |
|---|---|---|
| 1 | Why might Harborbend have cooler summer air and a smaller change in temperature between seasons than Stonefield? Explain two causes. | **The cold ocean current cools the air near Harborbend, especially in summer. Nearby water heats and cools slowly, reducing seasonal temperature changes.** |
| 2 | How do the prevailing winds and mountains cause Stonefield to get less rain than Harborbend? | **Winds carry moist ocean air up the mountains, where it cools and drops rain. The air then sinks toward Stonefield, warms, and becomes drier.** |
| 3 | Stonefield is high and far from the ocean. How can these two features affect its temperature in different ways? | **Its high elevation tends to cool it. Its distance from the ocean allows greater temperature changes, including hotter summer days and colder winter nights than near the shore.** |
| 4 | Suppose the prevailing winds blew from Stonefield toward Harborbend instead. Why might the rain shadow described in the passage change? | **The winds would no longer carry moist ocean air up the ocean-facing slopes in the way described. Rainfall could shift or decrease, so the same rain shadow would not necessarily form.** |

## PART 3 · YOUR TURN (SAMPLE ANSWER)

Near the equator, the town would stay warm because sunlight is fairly direct all year. Its low elevation would keep it warmer than a high mountain town. A warm ocean current could warm nearby air, and the ocean would limit sharp temperature changes. Winds from the sea would carry moisture inland, which could bring rain. Far inland, the town would lose the ocean's moderating effect, so its temperatures might vary more.

Accept explanations that connect each feature to a climate effect rather than simply naming features. For the wind-reversal question, accept uncertainty about exactly where rain would fall.