Rain at Gull Point

Trace how moving water and air shaped a coastal storm.

E.7.9A.2 "Analyze evidence to explain the weather conditions that result from the relationship between the movement of water and air masses."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline evidence that water entered the air, circle evidence that air masses moved, and number three events in the order that led to rain.

A Storm Comes Ashore

1. At Gull Point, a weather station watched a warm September day change. At noon, the air was 26°C, and the nearby sea was 23°C. A steady wind blew from the sea toward land. By late afternoon, humidity had risen from 60 percent to 82 percent, while the air temperature stayed at 26°C. No rain had fallen. Water evaporating from the sea could add vapor to the moving air. Because the temperature stayed the same, the rise in humidity was evidence that the air held more water vapor.

2. At about 6 p.m., a cold, dry air mass moved into Gull Point from inland. The wind shifted from the sea to the northwest, and the air temperature fell from 26°C to 17°C. The denser cold air pushed under the warmer, moist air near the coast. As the warm air rose, it cooled, and some of its water vapor condensed into cloud droplets. Dark clouds spread overhead, and rain began soon after the wind shifted. The station collected 12 millimeters of rain in the next hour.

3. By 9 p.m., the rain had stopped. The wind still came from the northwest, and the station measured humidity at 65 percent. The sea was still nearby, but air reaching the station was now coming from inland rather than across the water. The observations point to a sequence: air from over the sea carried moisture toward shore, then the arriving cold air mass forced that moist air upward. Once colder, drier air occupied the area, the supply of moist air from over the sea decreased and the rain ended.

2 ANSWER WITH EVIDENCE

Use the passage

1. What evidence suggests that air arriving from the sea gained water vapor before the rain began? Explain your reasoning.

2. Why did rain begin soon after the cold air mass arrived, rather than earlier in the afternoon? Use evidence from the passage.

3. Which two observations show that the air reaching Gull Point had changed by 6 p.m.? What change do they support?

4. The sea was still nearby at 9 p.m. Why had the rain stopped? Support your explanation with an observation.

3 YOUR TURN

Your own words

At another town, cold, dry air at -5°C blows across a lake whose water is 8°C. Humidity rises over the lake, and snow falls downwind but not upwind. Write three or four sentences explaining how moving water and air could produce this pattern. Use at least two observations as evidence.

ANSWER KEY

Rain at Gull Point

GRADE 7 · E.7.9A.2

PART 1 · READ AND MARK

Underline evidence that water entered the air, circle evidence that air masses moved, and number three events in the order that led to rain. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	What evidence suggests that air arriving from the sea gained water vapor before the rain began? Explain your reasoning.	**Humidity rose from 60 percent to 82 percent while the air stayed at 26°C. That rise is evidence of more water vapor in the air blowing from the sea.**
2	Why did rain begin soon after the cold air mass arrived, rather than earlier in the afternoon? Use evidence from the passage.	**The incoming cold air pushed the warm, moist air upward. As that air cooled, water vapor condensed into cloud droplets, and rain began.**
3	Which two observations show that the air reaching Gull Point had changed by 6 p.m.? What change do they support?	**The wind shifted from the sea to the northwest, and the temperature fell from 26°C to 17°C. Both support that a cold air mass had arrived.**
4	The sea was still nearby at 9 p.m. Why had the rain stopped? Support your explanation with an observation.	**The wind still came from the northwest, so air reaching the station came from inland rather than across the sea. The supply of moist sea air had decreased.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

The -5°C air moves over lake water that is 8°C, so water can evaporate into the passing air. The rise in humidity is evidence that the air gains water vapor over the lake. The warmer, moist air can rise and cool as it moves downwind, allowing ice crystals to form in clouds. Snow falls downwind because the air has crossed the lake and gained moisture, unlike the air upwind.

For the lake task, accept explanations that connect evaporation over the warmer lake, movement of moist air, and cooling that produces snow downwind. Students should cite at least two of the given observations.