

Weather on the Move

Use weather data to trace changing air masses.

MS-ESS2-5 "Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions. Clarification Statement: Emphasis is on how air masses flow from regions of high pressure to low..."

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline each measurement that shows weather changing at Riverton. Circle words that show air masses moving or meeting, then number the weather events in time order.

A Changing Day in Riverton

- ① On Tuesday morning, a weather station in Riverton recorded a temperature of 24°C, pressure of 1018 millibars, humidity of 78%, light rain, and an east wind of 8 km/h. A large cool, moist air mass lay east of town. Higher pressure in that region pushed air westward toward lower pressure over Riverton. As the air moved, the station gave scientists data about changing conditions at one fixed location. They compared these measurements with later readings rather than relying on one observation.
- ② By 1:00 p.m., the temperature had risen to 29°C, pressure had fallen to 1012 millibars, humidity was 64%, rain had stopped, and wind came from the south at 15 km/h. A warm, humid air mass had approached from the south while the cool, moist air mass continued westward. Where the air masses met near Riverton, the warmer air was forced upward. Rising air cooled, water vapor condensed, and heavy rain with gusty winds began at 3:00 p.m. The collision changed the weather quickly.
- ③ Forecasting teams used the Riverton records, nearby pressure readings, and radar images to make a forecast. They expected the low-pressure area to move east overnight. Because the meeting of air masses could happen slightly north or south of town, they predicted a 60 to 80 percent chance of rain and winds from 20 to 35 km/h by morning. They also gave a temperature range of 18°C to 22°C. A forecast range describes likely conditions, not a promise that every value will occur.

2 ANSWER WITH EVIDENCE Use the passage

- 1 Identify two data changes that show Riverton's weather changed between morning and 1:00 p.m.

- 2 According to the first paragraph, which direction did the cool, moist air mass move, and why?

- 3 Explain how the meeting of the two air masses led to heavy rain and gusty winds.

- 4 Why did forecasters give a chance of rain and ranges for wind and temperature instead of one exact prediction?

3 YOUR TURN Your own words

New data from Lakeview: At 8:00 a.m., Lakeview has pressure of 1014 millibars, a temperature of 26°C, humidity of 72%, and a south wind. A cool, moist air mass west of Lakeview has pressure of 1021 millibars and is moving east. Write a three-sentence forecast that uses two data details, explains likely air-mass movement or interaction, and gives a probability range for one weather change.

PART 1 • READ AND MARK

Underline each measurement that shows weather changing at Riverton. Circle words that show air masses moving or meeting, then number the weather events in time order. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	Identify two data changes that show Riverton's weather changed between morning and 1:00 p.m.	Temperature rose from 24°C to 29°C, and pressure fell from 1018 to 1012 millibars. Other valid changes include humidity dropping, rain stopping, and wind shifting from east to south.
2	According to the first paragraph, which direction did the cool, moist air mass move, and why?	It moved westward toward Riverton because air flowed from the higher-pressure region east of town toward lower pressure over Riverton.
3	Explain how the meeting of the two air masses led to heavy rain and gusty winds.	The warmer air was forced upward where the air masses met. It cooled, water vapor condensed, and heavy rain with gusty winds began.
4	Why did forecasters give a chance of rain and ranges for wind and temperature instead of one exact prediction?	The air masses might meet north or south of Riverton, so the exact weather at town was uncertain. The ranges described likely conditions rather than guaranteed values.

PART 3 • YOUR TURN (SAMPLE ANSWER)

Because pressure is higher west of Lakeview at 1021 millibars than at Lakeview at 1014 millibars, the cool, moist air mass is likely to move east toward the lower-pressure area. It may meet Lakeview's warmer, humid air, causing rising air and increasing clouds or rain. I predict a 50 to 70 percent chance of showers later today, with temperatures likely to fall from 26°C as the cooler air arrives.

Accept forecasts that correctly use the provided pressure difference to describe air moving from higher to lower pressure. Students may predict different weather outcomes if they support them with at least two data details and state a reasonable probability range.