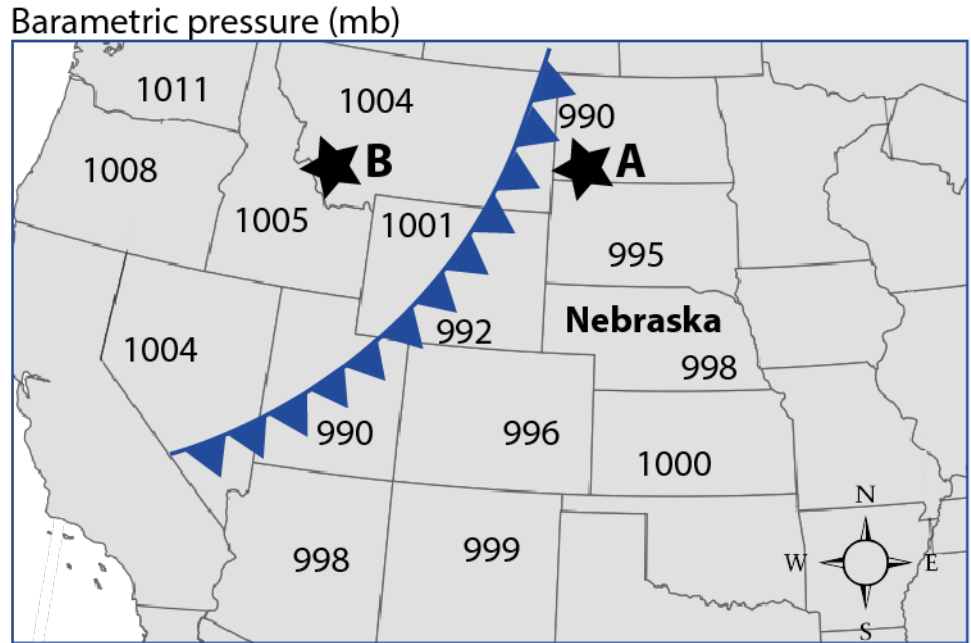


A school in Nebraska is planning a graduation party for a day in May. One day before the party, weather forecasters warned:

▶ Even though it is warm and sunny now, a cold front will soon move into Nebraska.
 ▶ Tomorrow the weather will become cool and rainy.

The weather forecasters used air pressure data (measured in millibars; shown on the map below) to predict more precisely how the front will move.



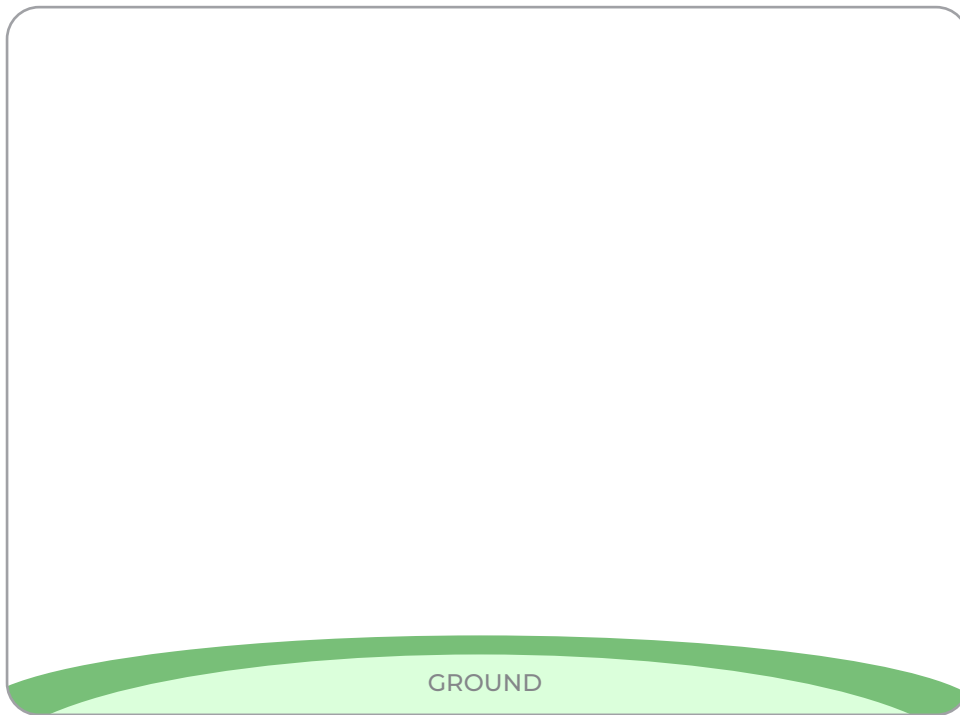
3. Use the air pressure data and cold front shown in the map to describe how air is moving at location A. Explain why it moves this way. Now describe how the air is moving at location B. Explain why it is moving this way.

4. Use the air pressure data and your knowledge about how air is moving at locations A and B to explain *why* weather forecasters predict that the front will *likely* move to Nebraska.

5. Think about the temperature of the air masses that make up a cold front and the air pressure data from the map on the previous page. When the cold front arrives in Nebraska, what will happen to the warm air that is there now? **Draw and label a cross-sectional model in the box below** to show how the air masses will interact.

Your model should show:

- the warm air mass
- the cold air mass
- the location of the cold front
- the direction that the cold front is moving
- what causes the cold front to move this way

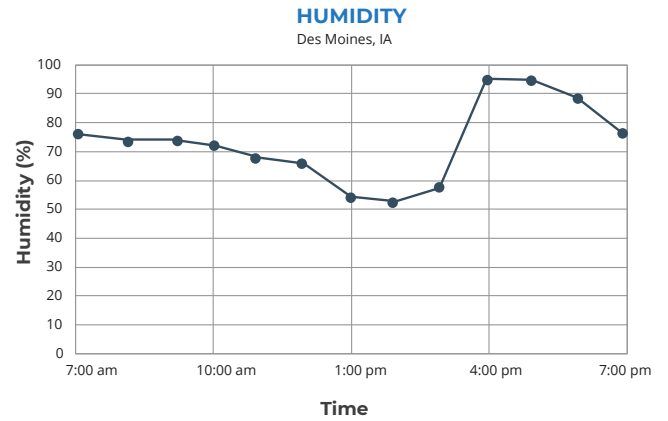
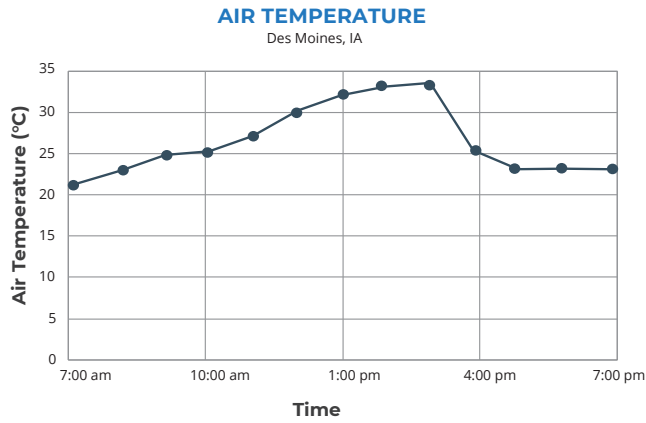


Add arrows, labels, and use color to help you explain what happens to the two air masses in your model.

6. Explain *why* the warm air and cold air will move the way you showed in your model.
7. Before the cold front moved into Nebraska, students noticed it felt very muggy or humid. Use your model to explain *why* it will probably rain in Nebraska during the graduation party.

8. A school in Des Moines, Iowa has a similar problem. On graduation day, there was a thunderstorm around 4:00 p.m. that ended about an hour later.

Use the air temperature and humidity data in the graphs below to analyze the storm.



- a. Think about how air temperature and surface temperature are different. Scientists reported that ground surface temperature at 7:00 a.m. was 23°C. **Draw a new line on the air temperature graph above** to show how the surface temperature changes during the day.
- b. Explain why ground surface temperature would follow the line that you drew.
9. Use the temperature and humidity data in the graphs above to explain why it rained in the afternoon.