Name _____ Date _____

Air Masses, Air Pressure and Wind: Why the Wind Blows and Warm Air Rises

Directions: Read each question and choose the best answer.

1. Sam tightly seals a bag of chips at the bottom of a tall mountain, then carries the bag all the way up to the top. When he reaches the top, the bag has puffed up like a pillow. What explains this?

A. The air inside the bag gets heavier at the top and presses harder on the bag.

B. The air pressure outside the bag is higher at the top, so it squeezes more air into the bag.

C. Cold mountain air leaks into the bag through the plastic and fills it up.

D. The air pressure outside the bag is lower at the top, so the air sealed inside pushes the bag outward.

2. The air around you presses on every part of your body all the time. Why doesn't this air pressure crush you?

A. Air pushes on you from all directions, and the air and fluids inside your body push outward with about the same pressure.

B. Air has no weight, so it does not really press on you.

C. Air pressure exists only high in the sky, not down near the ground.

D. Air presses only on the top of your head, and your skull is strong enough to hold it up.

3. Two cities are 300 kilometers apart. City A has higher air pressure than City B. Near the ground, which way does the wind between them tend to blow?

A. Straight up from City A, because high pressure pushes air upward

B. From City A toward City B, from higher pressure toward lower pressure

C. From City B toward City A, because air is pulled toward higher pressure

D. Nowhere, because the cities are too far apart for wind to blow between them

4. Air pressure is often measured in millibars. Two towns 400 kilometers apart measure their air pressure at noon each day. On which of these four days is the wind between the towns most likely to be strongest?

A. Monday: 1,016 millibars in one town and 1,014 in the other

B. Thursday: 1,005 millibars in one town and 1,002 in the other

C. Tuesday: 1,022 millibars in one town and 1,010 in the other

D. Wednesday: 1,032 millibars in one town and 1,028 in the other

5. A hot-air balloon's burner heats the air inside the balloon, and the balloon rises. Why?

A. Heat is lighter than air, so it floats upward and carries the balloon with it.

B. Hot air has no mass, so nothing pulls it down.

C. The heated air inside is less dense than the cooler air around the balloon, so the denser outside air pushes the balloon up.

D. The burner's flame pushes up on the balloon like a rocket engine.

6. On a sunny afternoon at the beach, a cool breeze blows from the sea toward the land. What causes it?

A. The land heats up faster than the water, so warm air rises over the land and cooler air from over the sea flows in to replace it.

B. The water heats up faster than the land, so warm sea air spreads onto the land.

C. Waves crashing on the shore push the air toward the land.

D. Air over the water is less dense, so it drifts toward the land.

7. An air mass forms over northern Canada in winter, where the land is cold and snowy, and stays there for several days. What is this air mass most likely to be like?

A. Cold and dry

B. Warm and dry

C. Warm and humid

D. Cold and humid

8. A cold, dry air mass moves into a region filled with warm, humid air. What is most likely to happen where the two air masses meet?

A. The warm air sinks under the cold air, because warm air is denser.

B. The denser cold air pushes under the warm air and lifts it, and as the humid air rises and cools, clouds and storms can form.

C. The air masses pass through each other without changing the weather.

D. The two air masses quickly blend into one mild air mass, so the weather stays calm.

9. A weather map shows a large area of high pressure settling over your town for the next few days. What weather is most likely?

A. Heavy rain, because high pressure squeezes water out of the air

B. Thunderstorms, because air rises quickly in a high-pressure area

C. Mostly clear skies, because air in a high-pressure area sinks and warms, so clouds tend not to form

D. Strong winds every day, because high pressure always means strong wind