

**Geology 103**  
**Air Masses, Winds, Fronts Activity Answer Key**

**Questions:**

1. What type of air pressure system is being experienced in the Eastern United States (High or Low)?

**High Pressure System**

2. What type of air pressure system is being experienced in the Western United States (High or Low)?

**Low Pressure System**

3. What type of air mass most likely comprises the pressure system in the Eastern United States? [Remember that cool/dry air is associated with high pressure systems, and warm/moist air is associated with low pressure systems.]

**Cool/dry**

4. What type of air mass most likely comprises the pressure system in the Western United States? [Remember that cool/dry air is associated with high pressure systems, and warm/moist air is associated with low pressure systems.]

**Warm/moist**

Draw arrows indicating the direction of surface winds anticipated around the low pressure system, and around the high pressure system. Draw directly on the paper for the eastern United States (preferably using pencil), and on the clear plastic sheet for the western United States (use a wax or overhead projector marker).

5. What is the wind velocity for the following cities? Wind velocity is a combination of wind direction and wind speed. For each of the cities listed, determine the direction that the wind is coming *from*, and the inferred relative wind speed (i.e., either “fast,” “medium,” or “slow.”)

| <b>City</b> | <b>Wind direction (N, NE, E, SE, S, SW, W, NW)</b> | <b>Relative wind speed (fast, med., slow)</b> |
|-------------|--|---|
| Albuquerque | <b>SE (or E)</b>                                   | <b>Slow</b>                                   |
| Atlanta     | <b>N (or NE)</b>                                   | <b>Fast</b>                                   |
| Rochester   | <b>SW (or W)</b>                                   | <b>Slow</b>                                   |
| Salt Lake   | <b>NE</b>  | <b>Fast</b>                                   |
| San José    | <b>W (or SW)</b>                                   | <b>Medium</b>                                 |
| Tucson      | <b>S (or SW)</b>                                   | <b>Slow</b>                                   |

Now, you are going to *predict* the future conditions based on the information you have. Since we learned that weather systems generally move across the country from west to east, position your

clear plastic sheet so that the weather system that was positioned over the western United States (whose center was near the base of the large arrow) is centered near the tip of the arrow drawn on your map. Let's assume that the eastern weather system is stalled (in other words, is not moving, for some reason). These are conditions that happen with frequency.

6. What type of front would you expect to form between the two air masses? Why?

**A warm front, because the air mass in the west is likely composed of warmer air (it has lower pressure), and the air mass in the east is likely composed of cooler air (it has higher pressure).**

7. What type of clouds/precipitation would you predict for the cities of Chicago and St. Louis (as the Western air mass collides with the Eastern air mass)?

**A long period of light rain or drizzle, coming from flat clouds.**