

## 1 Optics

- Why are clouds white
- Explain why, on some mornings, Mt. Rainier appears taller than it actually is. What weather conditions would be favorable to create such a mirage?

## 2 Stability

- Why does a parcel of saturated air cool more slowly when it expands than dry air?

## 3 Atmospheric Moisture

- What time of day is the relative humidity generally the highest?
- Define absolute humidity and specific humidity. Why might specific humidity be a better measure of the water vapor in a parcel of air?
- What is vapor pressure?
- What is equilibrium vapor pressure?
- How does saturation vapor pressure relate to temperature?
- Define dew point. Which city is likely to have a higher dew point on a typical summer day: A dry desert or a moist jungle?

## 4 Cloud Droplet

- How does the curvature of a drop affect the equilibrium vapor pressure around the drop?
- In a saturated environment, which would evaporate faster: a small droplet or a large droplet? Explain.
- Explain why a very small pure water droplet would evaporate in an environment that has a relative humidity of 100%?
- Explain how a small droplet can grow larger even when the relative humidity is less than 100%
- What are condensation nuclei? How do they assist cloud drop formation? What effect do they have on the curvature and solute effects?
- Explain how cloud droplets form from water vapor.

## 5 Rain

- Describe the formation of a rain droplet
- Why do large droplets fall faster than small droplets?
- Why is condensation alone insufficient for rain drop formation?
- Which cloud is more likely to produce a larger raindrop: cumulonimbus or nimbostratus? Why?
- Why do liquid droplets exist when the air temperature is below freezing?

## 6 Clouds

- What conditions are necessary to create advection fog? Radiation fog? Steam fog?

## 7 Pressure/Winds

- Describe how a land breeze works. Seabreeze?
- If the 500mb pressure level is at the same height above two cities, and one of the cities has warmer air over it, which city will have a higher pressure at the surface?
- Why did the egg get sucked into the bottle in the experiment shown in section? Use the ideal gas law in your explanation.
- When a moist air mass flows over the Cascades, the air on the east side of the mountains is often warmer and drier than on the west side. Explain how this could happen.

## 8 Coriolis

- Which direction does wind flow around a low pressure system in the Northern Hemisphere? High Pressure system?
- If the earth rotated clockwise, how would wind flow around a low in the NH? SH?
- Which direction would the winds in the jetstream blow if the earth rotated clockwise?
- Which direction will wind be deflected if it is travelling from the South Pole to the equator? North pole to the equator?
- Is the coriolis force stronger in Miami, FL or Fairbanks, AK?

- Why does wind flow slightly toward the center of a Low pressure system at the surface but not aloft?
- Why are low pressure systems associated with cloudy weather?

## 9 General Circulation

- Explain how North South pressure differences are responsible for East West winds.
- If the earth did not rotate, what would the general circulation look like? Draw a diagram.