Climatology: Clouds & Condensation

ANSWER KEY

Exercise: 1

Instructions: Idaho can get many different weather patterns and the weather can change quickly. When hiking or camping in the mountains this weather change can seem especially rapid so always be prepared. By doing this exercise, you will become much more familiar with weather. Answer the following completely and accurately.

1. Describe the process of evaporation. What factors can influence the rate of evaporation? Evaporation is the process by which water goes from the liquid state to the gaseous state. Things such as temperature, humidity, and wind will influence the rate of evaporation. High temperature gives the water more energy to evaporate. Low humidity will increase evaporation because the air will have lots of unused water holding capacity. Wind can increase evaporation because it brings the water surface in contact with much more air.

2. As air cools, what happens to the relative humidity? (assume all other factors remain constant). As air cools, the relative humidity will increase because the air can hold less water as it cools down.

3. When dew point is reached, would you expect the relative humidity to be high or low? When the dew point is reached, the relative humidity will be very high.

4. If one volume of air contains twice as much moisture as another volume of air, what does it tell us about the relative humidity of the two volumes of air? Do we have all the information we need to determine the relative humidity? It tells us nothing about the relative humidity because we do not know what the temperature of the air is. We have to know the temperature of the air as well as the amount of air that this water is in before we can determine the relative humidity.

5. What is required for condensation to occur? You need to have a high relative humidity and be at the air's water holding capacity. Water also needs something to stick to such as condensation nuclei.

6. What is haze and describe how haze forms. Haze forms from dust particles in the air. Water can condense on these particles if the relative humidity is high enough.

7. When warm moist air rises, what should we expect to happen? If warm moist air rises, it will expand and cool. As it cools, the relative humidity will increase and water will condense. It can then fall back to the earth as precipitation.

8. When a warm, moist front meets a cold, dry front, what should we expect to happen? As warm, moist air mixes with cold, dry air. The relative humidity will increase and water will condense. The boundaries between warm, moist air and cold, dry air is where storms frequently occur.

9. What is a rain shadow and what causes it? As a cloud goes over a mountain, it rises. As air rises, it expands because there is less atmospheric pressure at higher altitudes. As air expands, it cools. Cool air holds less moisture, rain falls and the cloud loses moisture. After it passes over the mountain, it drops down in elevation and the air becomes compressed and becomes warmer. With less moisture after passing over the mountain, there is less chance of rain falling from the clouds. The area on the far side of the mountain is called the rain shadow because it receives little rain.

10. What type of weather should we expect if the barometric pressure is dropping? A drop in pressure means that air is rising. It cools as it rises and the relative humidity increases. Clouds and rain should be expected.