Use complete sentences on those marked with an asterisk *.

Worksheet: Vapor, Clouds, and Precipitation Name: _____

1. According to page 490, how is water unique?

2. According to figure 17.2 on page 491, during which 3 phase changes do water molecules absorb heat from their surroundings? IMPORTANT: Figure 17.2 is labeled incorrectly, so you are going to have to think about this one.

_____ _____ _____

3. *What happens to the speed of water molecules as they change from vapor to ice?

4. Look at figure 17.3. What is the name of the phase change that caused this frost to form? _____
The water molecules changed from _____ to _____.

5. If a gym that can hold 1,000 fans has 200 people in it, the gym is 20 % full. Which of the numbers in this statement are most like each of the following?

air's capacity: the relative humidity: the specific humidity:

6. According to table on page 493, how many grams of water vapor can a kg of air hold at these temperatures?

14 F: _____ g. 68 F: _____ 95 F: _____

7. *What does the word "saturated" mean when we are talking humidity?

8. * Look at figure 17.4. What change caused the relative humidity to go from 25 % to 50 % to 100 % in this flask?

9. *Look at figure 17.5. Why is the relative humidity 50 % in flask A?

10. *(Figure 17.5) What changed from A to B, causing the relative humidity to increase from 50 % to 100 %?

11. The flask (B: 7 g. of vapor, 10 C) was cooled to 0 C. Now in C it has only 3.5 g. of vapor. What happened to the other 3.5 g. of vapor? Circle one.

It evaporated. It condensed to form liquid water. It formed frost.

12. Look at figure 17.6, showing an average day in Washington D.C. What do each of the following lines represent? Blue: Red:

13. What was the temperature range in D.C. on this day in Celsius AND Fahrenheit? (Think; Calculate it.)

_____ C _____ F

14. On this day in D.C. the relative humidity varied from _____ % at 6 am to _____ % at 6 pm.

15. *What caused the relative humidity to change even though the amount of vapor in the air did not change?

16. Why did the relative humidity go up as the temperature dropped? Circle one.

A. The capacity increased. B. The specific humidity increased.
C. The capacity decreased. D. The specific humidity decreased.

17. Did the air in D.C. reach its dew point on this day? (Hint: what is the relative humidity when the air temperature reaches its dew point?)

18. *Look at the photo on page 498. When the relative humidity is low, why will there be a bigger difference between the wet-bulb and dry-bulb temperatures?

19. If the dry-bulb temperature is 28 C and the wet-bulb temperature is 18 C, what is the relative humidity? Use the table on page 712. _____%

20. *Explain the connection between the photo on the bottom of page 502 and Fig. 17.14.

21. Look at figure 17.10 on top of page 499. As air rises, it cools by expansion. Cloud formation started when the rising air reached 3000 m (condensation level) because the air reached its _____point.

22. Look at the diagram on bottom of page 500. What is causing the air to rise here? (It is called "orographic lifting". What causes the "lifting"?)

23. What two characteristics are used to classify clouds? (p. 506-507)

24. *How is "fog" different from other clouds?

25. *What does "supercooled" mean? (p. 513)

26. *Look at figure 17.29 on p. 516. What is this called, and how did it form?

27. *The <u>layers</u> shown in the piece of hail shown in the middle of page 517 were formed when supercooled droplets froze. Why are there so many layers? (p. 516-517)