



Roland-Story Natural Resources Class
Meteorology Unit
Chapter 4 Study Guide



Name _____

_____ points earned
20 possible points

1. Describe the movement of water through the hydrologic cycle.

2. The quantity of water lost to evaporation over the oceans is not equaled by precipitation. Why then does the sea level not drop?

3. Summarize the processes by which water changes from one state to another. Indicate whether heat is absorbed or liberated.

4. After reviewing table 4-1, write a generalization relating temperature and the amount of water vapor needed to saturate the air.

5. How do absolute humidity and mixing ratio differ? What do they have in common? How is relative humidity different from absolute humidity and the mixing ratio?
6. Refer to Figure 4-12 and then answer the following 3 questions:
- a. When is relative humidity highest during a typical day? The lowest?
 - b. At what time of day would dew most likely form?
 - c. Write a generalization relating changes in air temperature to changes in relative humidity.
7. If temperature remains unchanged, and if the mixing ratio decreases, how will relative humidity change?

12. At what rate does unsaturated air cool when it rises through the atmosphere?

13. Why does air expand as it moves upward through the atmosphere?

14. Explain why air warms whenever it sinks?

15. Why does the adiabatic rate of cooling change when condensation begins? Why is the wet adiabatic rate not a constant figure?

16. The contents of an aerosol can are under very high pressure. When you push the nozzle on such a can, the spray feels cold. Why?

17. How do orographic lifting and frontal wedging act to force air to rise?
18. Explain why the Great Basin area of the western United States is dry. What term is applied to such a situation?
19. How is localized convective lifting different from the other three processes that cause air to rise?
20. How does stable air differ from unstable air?
21. Explain the difference between the environmental lapse rate and adiabatic cooling.

22. How is the stability of air determined?

23. Write a statement relating the environmental lapse rate to stability.

24. What weather conditions would lead you to believe that air is unstable?

25. List four ways instability can be enhanced.

26. List three ways stability can be enhanced.

27. Define the following terms by using the web site at www.rsffa.com, go to Meteorology link and play the hangman game.

- a. absolute humidity –
- b. absolute instability –
- c. absolute stability –
- d. adiabatic temperature changes –
- e. condensation –
- f. convergence –
- g. deposition –
- h. dew point temperature –
- i. dry adiabatic rate –
- j. entrainment –
- k. evaporation –
- l. frontal wedging –
- m. humidity –
- n. hydrologic cycle –
- o. hygrometer –

- p. latent heat –
- q. mixing ratio –
- r. orographic lifting --
- s. relative humidity –
- t. saturation point –
- u. sling psychrometer –
- v. stable air –
- w. sublimation –
- x. transpiration –
- y. unstable air –
- z. vapor pressure –
- aa. wet adiabatic rate --