

PS:ES
White Plains, NY Metar Lab

Name _____
Period _____

A metar (acronym for METeorological Aerodrome Report) is the primary observation code used for reporting surface meteorological data useful to pilots and others. Reporting can include wind, visibility, runway visual range, present weather, sky condition, temperature, dew point, and air pressure and altimeter settings. The metar accompanying this lab was recorded during the week of October 10 – 16, 2004 at the Westchester County (NY) Airport near White Plains, NY. Look over the metar carefully, noting especially changes in temperature, dewpoint and pressure. When you are sure you understand the data on the metar, answer the following questions:

General Questions:

1a. When a particular place on Earth is receiving more energy from the sun than it is losing to cold space, how will the temperature at that place change? _____

Where will the sun be in the sky when those conditions exist? _____

1b. When a particular place on Earth is losing more energy to cold space than it is receiving from the sun, how will the temperature at that place change? _____

Where will the sun be in the sky when those conditions exist? _____

1c. When a particular place on Earth is receiving the same amount of energy from the sun that it is losing to cold space, how will the temperature at that place change? _____

Where will the sun be in the sky when those conditions exist? _____

1d. Recall from class discussion the nature of water vapor. Is water vapor (and hence moist air) heavier or lighter than dry air? _____ Recall our discussion of the weight of water molecules compared with the weight of air molecules, and explain your answer. _____

1e. When there is a big difference between the air temperature and the dewpoint temperature, is the air considered humid or dry? _____

1f. Find the place(s) on the Reference Table Dewpoint chart (page 12) where the dewpoint temperatures and the air temperatures are the same. Look at the Relative Humidity chart on page 12. What is relative humidity when the temperature is equal to the dewpoint? _____. Explain why that is so: _____

1f. Imagine 2 air masses, “A” and “B”, with identical temperatures of 67°F., “A” has a dewpoint of 45°F and “B” has a dewpoint of 65°F. What is different about the air at “B” compared with the air at “A”? _____

Questions based on the Metar

2. Was there a noticeable 'maximum temperature' each day? _____ If "yes", at what time of day did it occur? _____ Why did the temperature rise throughout the morning and into the early afternoon each day? (consider your answers to questions 1a, 1b, and 1c) _____

3. Generally, at what time of day were the lowest temperatures recorded? _____ Consider your answers to questions 1a, 1b, and 1c, and explain why the lowest temperatures were recorded then. _____

4. Generally, at what time of day were the highest temperatures recorded? _____ Again, consider your answers to questions 1a, 1b, and 1c, and explain why the highest temperatures were recorded then. _____

5. Determine and describe the pattern that existed between the dewpoint temperature and the barometric pressure on Wednesday through Sunday, and describe it here: _____

6. You should have noticed (in question 5) that the pressure seems to drop as the dewpoint rises. Why would an increase in the dewpoint cause a drop in air pressure (refer to question 1d, above for help with this answer) _____

7. In general, at what time of day were the dewpoint temperature and the air temperature closest to each other? _____

8. In general, in mid afternoon, how did the dewpoint temperatures compare with the air temperature? _____

9. At what time of day, generally, are the highest relative humidities recorded? _____
10. At what time of day, generally, are the lowest relative humidities recorded? _____
11. On day during the week of 10/10/2004, it rained almost constantly all day. From the metar, determine what day must that have been, and explain how you arrived at your answer. _____

12. What was the relative humidity during Friday afternoon? _____ How do you know? _____

13. Use both charts on page 12 of the reference tables to determine the relative humidity of the air on Wednesday when the highest air temperatures were recorded. Describe HOW you used the charts to determine your answer. _____

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