SOLUTIONS TO THE MODULE #7 STUDY GUIDE

1. a. Aphelion – The point at which the earth is farthest from the sun

b. Perihelion – The point at which the earth is closest to the sun

c. Lines of longitude – Imaginary lines that run north and south across the earth

d. Lines of latitude – Imaginary lines that run east and west across the earth

e. Coriolis effect – The way in which the rotation of the earth bends the path of winds, sea currents, and objects that fly through different latitudes

f. Air mass – A large body of air with relatively uniform pressure, temperature, and humidity

g. Weather front – A boundary between two air masses

2. The weather changes from day to day, while the climate does not. Climate is what you generally expect from a region, while weather is what actually happens from day to day.

3. The three main factors are thermal energy, uneven distribution of thermal energy, and water vapor in the atmosphere.

4. There is no answer for this one. Just be sure that given a picture or drawing of a cloud, you can determine which of the four major types of cloud it is.

5. When a cloud is dark, you add a suffix of "nimbus" or prefix of "nimbo." The proper term is nimbostratus, but stratonimbus is also correct.

6. When a cloud is higher than usual, you add the "alto" prefix. Thus, it would be an altolenticular cloud.

7. Insolation stands for incoming solar radiation.

8. In the Northern Hemisphere, June 21 is the summer solstice. That's when the days in the Northern Hemisphere are at their longest, because the Northern Hemisphere is pointed towards the sun. They then begin to decrease so that by September 22 (the autumnal equinox), they are exactly 12 hours long. Thus, the days are greater than 12 hours long but are decreasing in length. Note that June 22 and September 23 can also be used.

9. In the Southern Hemisphere, the days get longer from June 21 (the Northern Hemisphere's summer solstice) to the December 21 (the Northern Hemisphere's winter solstice). On September 22 (the Northern Hemisphere's autumnal equinox), they are exactly 12 hours long. Thus, from June 21 to September 22, the days get longer but are still under 12 hours. Note that June 22 and September 23 can also be used.

10. The Northern Hemisphere is pointed toward the sun at aphelion, so that's when it's summer in that hemisphere.

11. Temperature differences cause winds.

12. There isn't a steady stream of wind blowing from the poles to the equator because the temperature of the air changes as it changes latitude. This causes loops of wind to develop at different latitudes.

13. The Coriolis effect bends the wind patterns.

14. The ground in Alaska rotates slowly compared to the ground at the equator. Thus, as the missile travels, the ground underneath it will outrun it. As a result, the missile's path will bend to the west relative to the ground. To correct for this, you will have to fire the missile southeast.

15. Along the surface of the earth, winds blow from cold to warm. Thus, the wind will blow from the mountain to the valley.

16. Since it is continental, the humidity is low. Since it is polar, the air mass is cold.

17. Since it is maritime, the humidity is high. Since it is tropical, the air mass is warm.

18. This kind of weather is indicative of a warm front. It is not a stationary front because the rain would have lasted several days.

19. This kind of cloud progression is caused by an occluded front.

20. This kind of cloud pattern and resulting rain is indicative of a cold front. Thus, you should expect cooler temperatures.