09-10 1st Semester Final Review Study Guide

Maps:

1. Be able to read Topographic maps. Know what contour lines and contour intervals mean.

Constellations

2. Why aren't the same constellations visible at night all year long? Why are there different constellations visible during different seasons? What does this have to do with the orbit of the earth around the sun?
3. During the fall, which constellations are visible from Chicago?
4. During winter, which constellations are visible from Chicago?
5. From Chicago, how do stars appear to move across the sky?
6. Be able to identify on a star chart and describe where in the sky (northern sky or southern sky) you can find the following constellations and their brightest stars:

Fall

Summer Triangle – Cygnus (Deneb), Lyra (Vega), Aquila (Altair)

Pegasus, Andromeda, Cepheus, Cassiopeia, Ursa Major, Ursa Minor, Draco

Winter

Orion (Betelgeuse, Rigel), Canis Major (Sirius), Canis Minor (Procyon), Gemini (Pollux, Castor), Auriga (Capella), Taurus (Aldebaran)

Telescopes

7. Explain the basic differences between a refracting telescope and a reflecting telescope.
8. Using a diagram and words, explain how a reflecting telescope works.
9. Using a diagram and words, explain how a refracting telescope works.
10. Who was the first person to record the use of a telescope on the sky? What did he discover?
11. Who invented the refracting telescope?

Light

12. Explain what light is. Can you use the following terms correctly to explain the electromagnetic spectrum? Magnetic & electric fields; energy; frequency; wavelength; photon
13. Can you name the different types of electromagnetic energy in order from most energetic to least energetic?

14. Can you describe how the following people contributed to the knowledge of the electromagnetic spectrum?
    a. Isaac Newton
    b. William Herschel
    c. Johann Ritter
    d. Thomas Young
    e. Hans Christian Orsted
    f. Michael Faraday
    g. James Clerk Maxwell
    h. Henrich Hertz
    i. Wilhelm Roentgen
    j. Ernest Rutherford/Paul Villard
15. Can you describe the atmospheric window? (which types of light get through our atmosphere?)

16. Can you explain the following terms in terms of how light interacts with matter?
    a. Reflection; transmission; absorption; emission

17. Can you draw a picture that shows what those terms mean in question #16?

18. Can you describe why an astronomer may want to take an image of an object with infrared light and also visible light? What would be the use of looking at something with both kinds of light?

Exo-planets

19. Can you explain what an exo-planet is?

20. Can you explain the difference between the transit and wobble methods for finding exoplanets?

21. Given a star's light curve of a time when a planet is transiting, could you determine the percentage of the star's light that is blocked by the transiting planet?

22. Given an exoplanet's light curve, could you determine if it is a water world, an ice world, a continent world or a combination?

23. Can you explain why astronomers take dark frames (opaque image) when they are taking imags of stars?

24. Can you explain why astronomers also measure light from comparison stars when they really want to measure light from a target star?

Weather: Atmosphere

25. Describe the Composition (key gases) of the atmosphere.

26. Describe the layers of the atmosphere and their key characteristics.

27. What is the relationship between temperature and height (or layers)?

28. What is the relationship between pressure and height?

29. Using a diagram and words, explain how pressure differences cause wind.

30. Compare and contrast how Heat is transferred through the following processes:
Conduction Convection Radiation

Weather: Water Cycle

31. Using a diagram and words explain how clouds form.

32. Describe the water cycle.

33. Explain dew point.

34. Explain relative humidity.