

Earth Moon Sun Science Review

Review Text chp 1; chp 4; chp 5

Be able to define

Equinox	Winter Solstice	Summer solstice
Ecliptic	Waning	Waxing
Eclipse	Orbit	Revolution
Rotation	Zenith	

1. Explain the following ideas or events and any effect they had in astronomy:
 - Geocentric view of the solar system – ancients and Ptolemy
 - Epicyle – Ptolemy
 - Retrograde motion of planets
 - 3 laws of planetary motion – Kepler, see question 17
 - Heliocentric view of the solar system – Copernicus, Galileo
 - Law of universal gravitation – Newton, big idea not equation
2. What causes the different seasons we experience in Chicago?
3. Can you compare the times the Sun rises and sets over the course of a year in Chicago?
4. Can you compare the locations on the horizon where the Sun rises and Where it sets over the course of a year in Chicago?
5. Can you explain why the length of a day changes for us in Chicago over the course of a year. When is it longest, when is it shortest and why?
6. How would the length of a day be different at the North Pole over the course of a year?
7. What causes us to see different phases of the moon throughout a month?
8. Identify the nine phases of the moon by name and picture.
9. Put the phases of the moon in order from a new moon to a new moon.
10. Why is the moon sometimes visible during the day?
11. Complete the chart of rise time, zenith time, and set time for the moon phases.
12. 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?

13. During the fall, which 6 bright constellations are visible from Chicago? Can you identify the bright stars Polaris, Deneb, Altair and Vega? Which are included in the summer triangle?

14. Can you describe the importance of Galileo's two publications listed below?

- a. The Starry Messenger
- b. Dialogue on the Two Great World Systems

15. Can you explain Ptolemy's geocentric model of the Universe?

16. Can you explain why Tycho Brahe is still known today for his observational data and his hiring of Johannes Kepler?

17. Can you identify which of the following descriptions go with which of Kepler's 3 laws of planetary motion?

- a. This law is about the speed of planet traveling around the sun. As a planet orbits the sun, the line joining the Sun and the planet sweeps through equal areas in equal times.
- b. This law is about the length of time a planet takes to orbit the Sun (period of revolution). If you use the unit AU (Astronomical Unit) to measure the average distance of the planet from the sun, Kepler's equation appears in its simplest form: $P^2 = R^3$ where P = period of revolution and R = average distance of planet from sun (semimajor axis)
- c. Planets orbit the Sun in ellipses