

ASTR101
Unit 2 Assessment – Answer Key

1. Definitions:

Ecliptic (geocentric)—Path the sun takes in its yearly trip around the celestial sphere.

Ecliptic (heliocentric)—Plane of the earth's orbit around the sun.

Zodiac—The 12 constellations centered on the ecliptic where the sun and planets can be found.

Celestial equator—The extension of the earth's equator onto the celestial sphere. It divides the northern celestial hemisphere from the southern.

Winter solstice—The point on the ecliptic where the sun stops its southern motion on the celestial sphere and turns north.

Autumnal equinox—The point on the ecliptic where the sun crosses the celestial equator from north to south.

Summer solstice—The point on the ecliptic where the sun stops its northern motion on the celestial sphere and turns south.

Vernal equinox—The point on the ecliptic where the sun crosses the celestial equator from south to north.

2. The axis of rotation of the earth is tilted as it orbits the sun. This causes one hemisphere to point more in the direction of the sun at certain times of the year. The direction the axis points in does not change measurably in a year, so six months later, the opposite hemisphere will point in the direction of the sun, reversing the seasons. At points in between, the sun shines directly on the equator and these are the equinoxes.

3. The moon reflects sunlight and orbits the earth. This results in different fractions of the lighted half of the moon being visible from earth. When the moon is roughly in the same direction as the sun, none of the lighted half is visible (new moon). When it is in the opposite direction from the sun, all of the lighted half is visible (full moon).

4. Eclipses occur when the sun, earth, and moon line up exactly. When they are lined up with the moon between the earth and the sun, the shadow of the moon can fall on the earth, causing a solar eclipse. This shadow falls only on a small fraction of the earth's lighted surface. When they are lined up with the earth between the moon and sun, the shadow of the earth can fall on the moon, causing a lunar eclipse. It is possible for the shadow of the earth to completely cover the lighted surface of the moon, producing a total lunar eclipse that can be viewed by everyone on the night-time side of the earth.