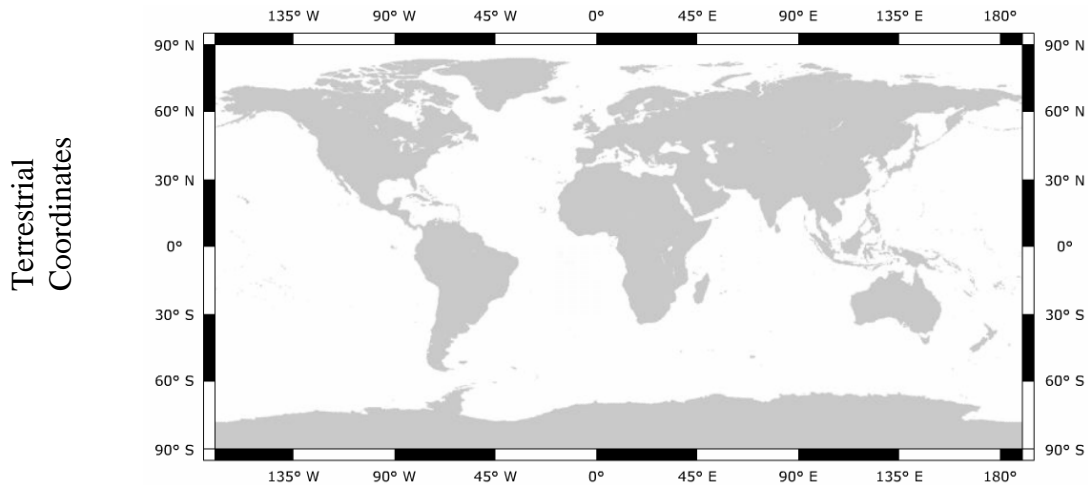
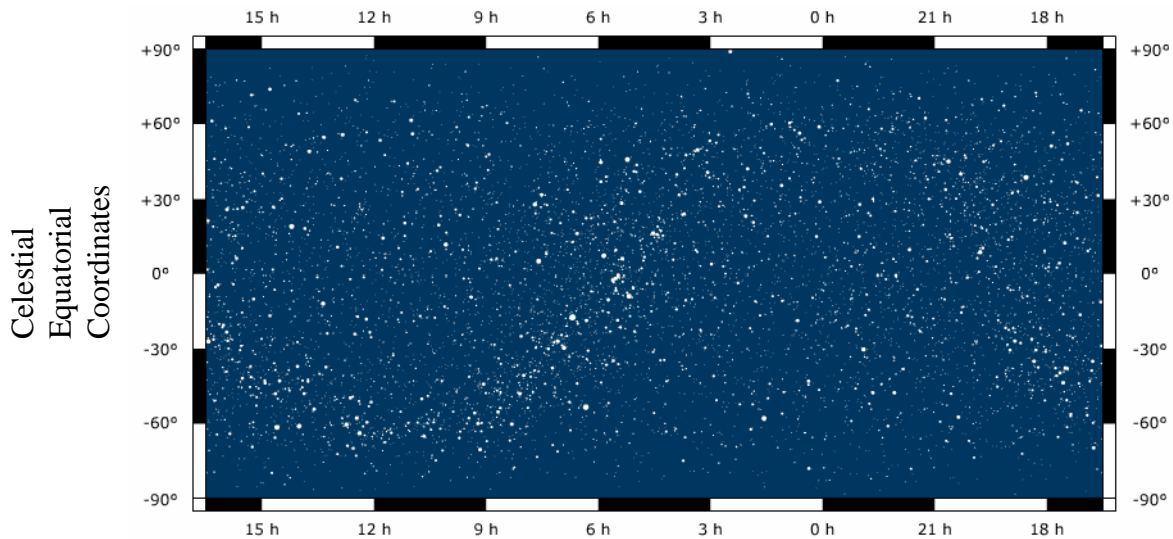


NAAP InClass Worksheet: Basic Coordinates and Seasons Module



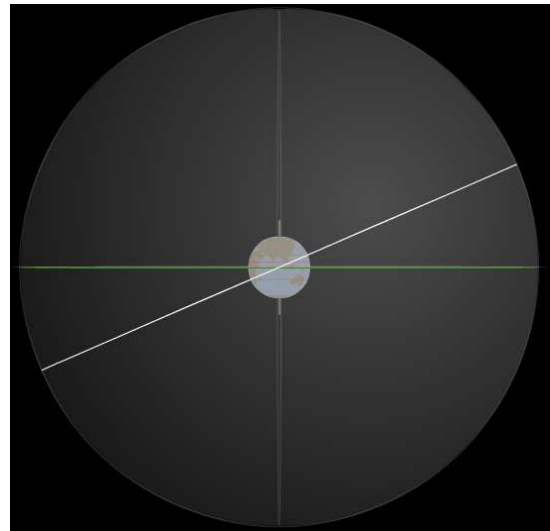
1. Add the following Map features to your terrestrial flat map.
 - a. the Prime Meridian
 - b. the Equator
 - c. the Tropics of Cancer and Capricorn
 - d. the Arctic and Antarctic Circle
2. Add the following cities to your terrestrial flat map
 - a. Greenwich, England – latitude: 51.3°N, longitude: 0.0°W
 - b. Lima, Peru – latitude: 12.3°S, longitude: 76.9°W
 - c. Beijing, China – latitude: 39.5°N, longitude: 116.6°E



3. Add the following to your celestial sphere flat map
 - a. Place a small circle around Polaris (the north star)
 - b. Draw in the celestial equator
 - c. Draw in the ecliptic
 - d. Label the locations: vernal equinox, summer solstice, autumnal equinox, winter solstice
4. Notate the following positions on your graph
 - a. $\alpha = 12^{\text{h}} 45'$ $\delta = -35^{\circ}$
 - b. $\alpha = 19^{\text{h}} 15'$ $\delta = +65^{\circ}$

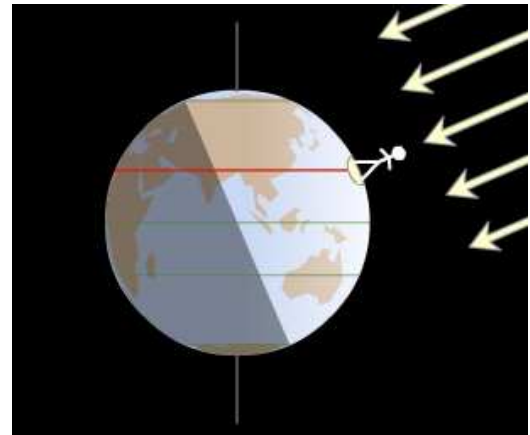
The diagram to the right illustrates the celestial sphere with the celestial equator (horizontal, dark) and ecliptic (white).

5. Note the following locations on the diagram.
 - a. north pole
 - b. south celestial pole
 - c. summer solstice
 - d. winter solstice
 - e. vernal equinox



The diagram to the right show the rays of the sun hitting the Earth on the summer solstice. Note that the direct rays of the sun are hitting at a latitude of 23.5°N on the Tropic of Cancer.

6. Annotate the following on the diagram.
 - a. shade any areas on the earth where the sun doesn't rise on this day.
 - b. Use cross-hatching to mark any areas on the Earth where the sun doesn't set on this day.



The diagram below shows what the rays of the sun look like striking the earth on the Tropic of Cancer on the Summer Solstice. In the box to the right draw these rays as seen by an observer on the Tropic of Capricorn.

