

Eclipses and Motion of the Sun

Name_____

Purpose:

- To provide you with necessary skills to understand the conditions necessary to produce lunar and solar eclipses
- To give you practice using Stellarium

Estimated Completion Time: 50 minutes

Questions

1. Some Stellarium stuff...
 - a. How do you speed up or slow down the rate at which Stellarium animates the motion of the heavens?
 - b. How do you advance or go back by 1 hour?
 - c. How do you advance or go back by one week?
 - d. How can you set both the location and any time in Stellarium?
 - e. How do you turn on the ecliptic line and the azimuthal grid?
 - f. How do you “lock on” to an object so that it stays centred at all times?
2. Set up Stellarium to re-produce the August 21, 2017 eclipse as seen from Idaho Falls, Idaho, US. When does totality begin and end? What was the total duration of the event? Try to be accurate to the nearest second!
3. Now – open the location menu and see how far south or north of this location you can go and still have a **total** solar eclipse. To assist you also open the time menu and notice that you can step by minutes or even seconds. Run the sun back and forth relative to the moon. Remember – if you can see even a sliver of the sun the eclipse is not total. Estimate the width of the path of totality in km. (Hint: 1 degree of latitude = 126 km)

4. Sketch the location of the moon and sun 1 lunar month before, during and 1 lunar month after the eclipse. Why do you use a lunar month?

5. Sketch a configuration in which the moon is new and a solar eclipse does not occur. Be sure to indicate both the earth-moon orbit as well as the earth-sun orbital plane and where the line of nodes is located.

6. The “Super Moon” lunar eclipse of September 27, 2015 will repeat in approximately 1 Saros. Use Stellarium to find when this event will occur and at what time and what part of the sky it will appear in as seen from Edmonton. How is this related to the Saros?

