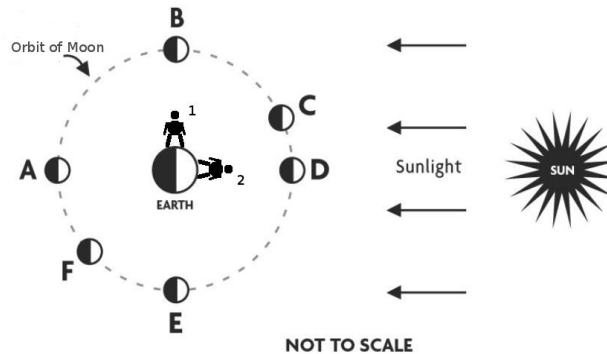


The Moon's Phases and Eclipses

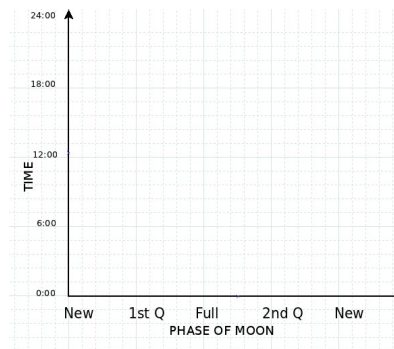
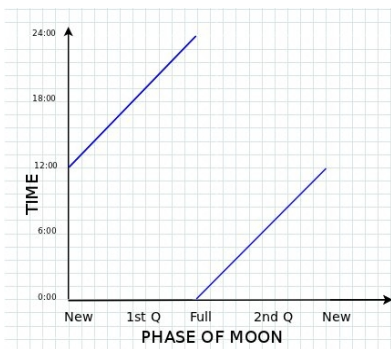
For questions 1-3, refer to the diagram showing the Moon's position relative to the Earth and Sun for many phases.



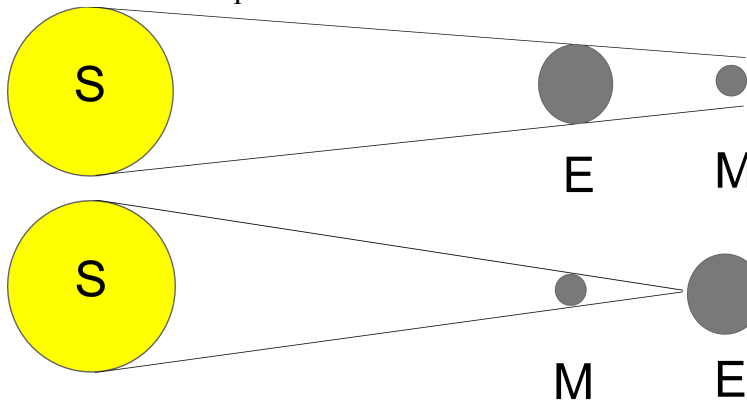
- Write down the approximate time of day for observers 1 and 2.
 - 1 _____
 - 2 _____
- Write down the approximate time of day that an observer on Earth would see the Moon on the meridian for the phases A-E.
 - A _____
 - B _____
 - C _____
 - D _____
 - E _____
- What time of day will an observer see the Moon setting in the West for the phases A-D?
 - A _____
 - B _____
 - C _____
 - D _____
- At the moment of full moon, the Moon should be 175-180 degrees away from the Sun. This means it should be rising when the Sun is setting. On the equinoxes, the Sun should set at 6:00 pm standard time. According to your watch, when do you expect the Full moon to rise on the autumnal equinox (9/23)? _____ . How does this answer depend on your location within a time zone? _____

How does the time depend on how far the Moon is above or below the ecliptic?

- Below-left is a simplified plot of Moon transit time vs Moon phase. (Notice how the time of transit is noon (12:00) when the Moon's phase is "New".) On the right make a similar plot of Moon rise time vs Moon phase.



6. Indicate to the right of these figures whether the Earth-Moon-Sun arrangements shown are for a solar or lunar eclipse.



7. Write two generalizations about the phase(s) of the Moon expected during the two eclipse configurations shown above. (Write full sentences.)

8. Describe the conditions required for someone on Earth to see the eclipse depicted in the topmost figure. (For example, the conditions for being able to see the Sun in the top figure is that the person must be located on the left half of the Earth.)

9. Describe the conditions required for someone on Earth to see the eclipse depicted in the bottommost figure.

10. What general conclusion can you draw about the rarity of the two kinds of eclipses shown in the figures? Consider how often a single person, confined to a single place on Earth, experiences the two types of eclipses.
