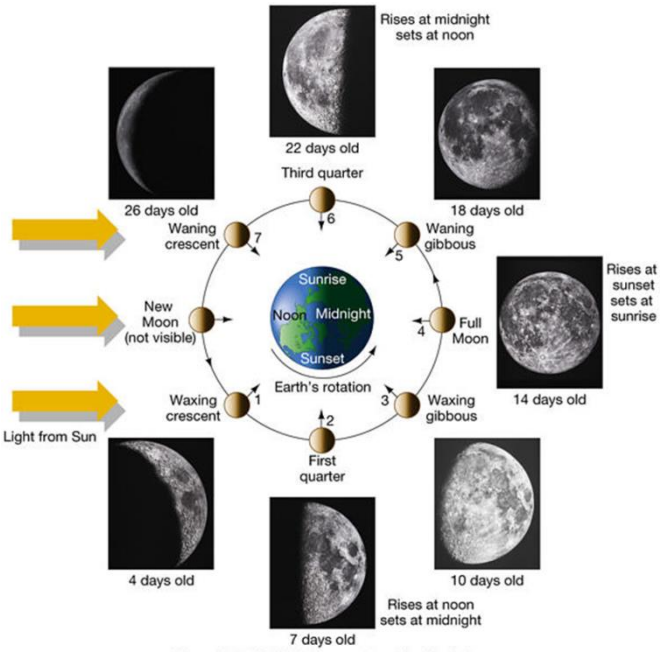
The Moon's Motion and Phases

A. The Moon's Orbit

1. The moon _____ around Earth from _____ to _____.
2. The moon's orbit is an _____.
3. The plane of the moon's orbit is inclined to Earth's at about 5 degrees.
4. The moon takes _____ days to make one complete revolution around Earth

B. Moonrise and Moonset

1. Like the sun, the moon rises in the _____ and sets in the _____.
2. The moon rises at a _____ time each night.
   a. Every 24 hours the moon travels about 13° in its orbit.
   b. When Earth has rotated 360° the moon can't be seen because it has moved in its orbit. As a result, Earth must rotate an addition 13° to see the moon.
   c. Moonrise and Moonset occur <u>about</u> _____minutes later each night. (52 mins.)
   d. Moonrise will appear in the sky to east of its Moonrise position the previous night.



C. Phases of the Moon

1. _____ (____%) of the moon is always in sunlight.
2. As the moon revolves around Earth we don't always see all of the illuminated portion of the moon because we see it from different angles.
3. As a result, the moon appears to _____ during the month. These changes in shape are called _____.

Phases Animation
http://bcs.whfreeman.com/universe6e/pages/bcs-main.asp?v=category&s=00110&n=03000&i=03110.02&o=|03000|01000|&ns=0

Phases of the Moon Summary

a. For the first approximately 14 days, the moon appears to _____ in size.
b. The lighted portion of the moon is on the _____ side.
c. The moon is said to be _____.
d. From the full moon to the new moon the moon appears to get _____.
e. The lighted portion of the moon is on the _____ side.
f. The moon is said to be _____.
g. The complete cycle of phases, from new moon to new moon takes _____ days and is referred to as the _____month (or synodic month).

4. Earthshine

Within a few days of the new moon the faint outline of the entire circular disc of the moon, along with the bright crescent can be seen. This is due to sunlight reflecting off Earth and illuminating the dark side of the moon

Earthshine

D. The Lunar Month vs. the Sidereal Month

1. The moon's period of revolution around Earth is _____ days.
2. The actual period of revolution is called the _____ month.
3. This is 2.2 _____ than the lunar month.

Animation
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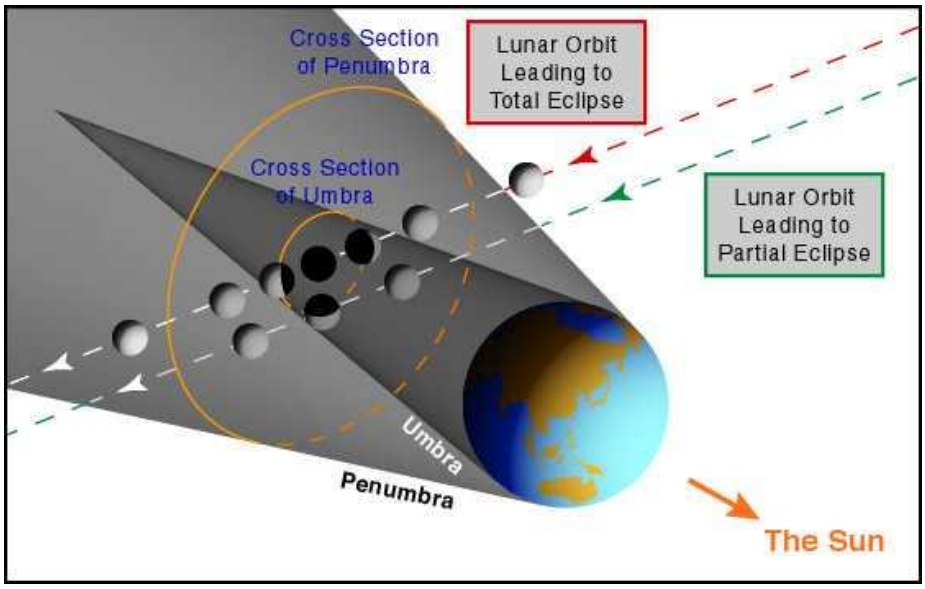
Eclipses

1. Eclipses occur when Earth passes into the shadow of the moon or when the moon passes into Earth's shadow.
2. Because the Sun is a _____ and not a point of light, there are two parts of the shadows of Earth and the moon.
   a._____: Inner section and total darkness.
      (1) Is a long narrow cone-shape.
      (2) The tip of Earth's umbra is nearly 1,400,000 km beyond Earth
   b._____: Outer section and partial darkness.

3. _____ Eclipse

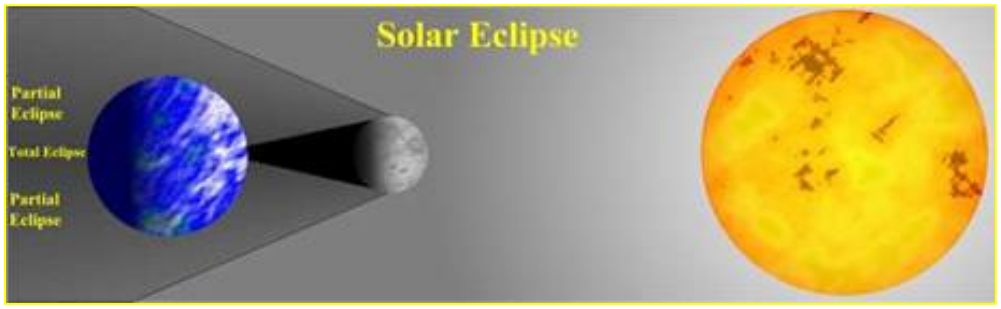
Lunar Eclipse

1. Occurs during a _____moon phase.
2. Duration may last for up to _____ hours.
3. The moon remains visible as a dusky red-orange or coppery color due to some sunlight being refracted through Earth's atmosphere into the umbra.



Lunar Eclipse Sequence
Lunar Eclipse After Totality

4. _____ Eclipse



Eclipses
The Total Solar Eclipse
The Total Solar Eclipse

Solar Eclipse

a. Occurs only during a _____ moon.
b. The moon's umbra is just long enough for its tip to touch Earth during perigee.
c. With a width of just about 269 km, only locations within the umbra will experience a total eclipse.
d. Duration: on up to _____ minutes.

Eclipse Animation

Solar Eclipse Path

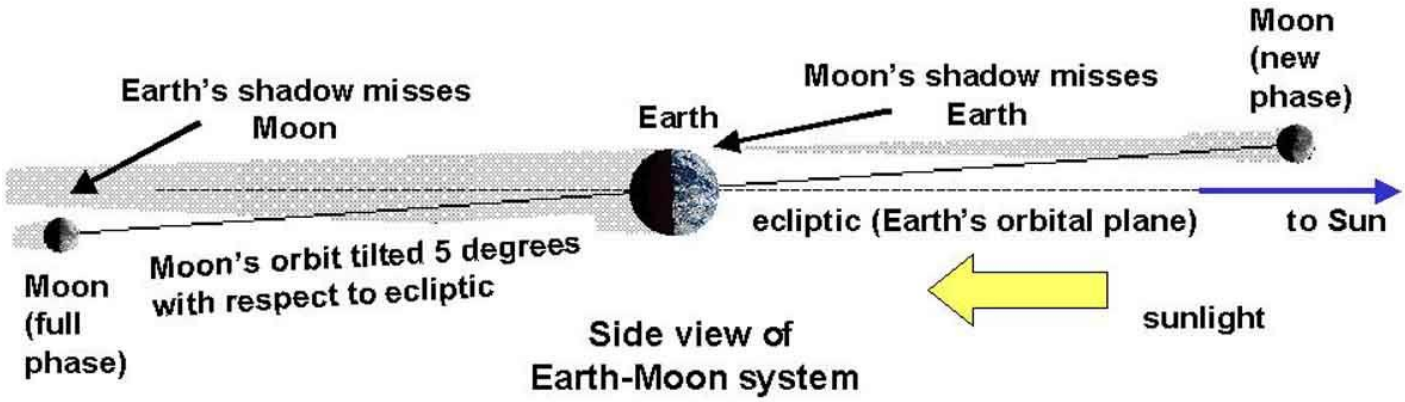
Baily's Beads
Named for British Astronomer, Francis Baily
A thin slice of the sun appears as broken beads of light
Occurs at the beginning and end of the eclipse
The Moon's edge is jagged due to mountain peaks

The "Diamond Ring" Effect

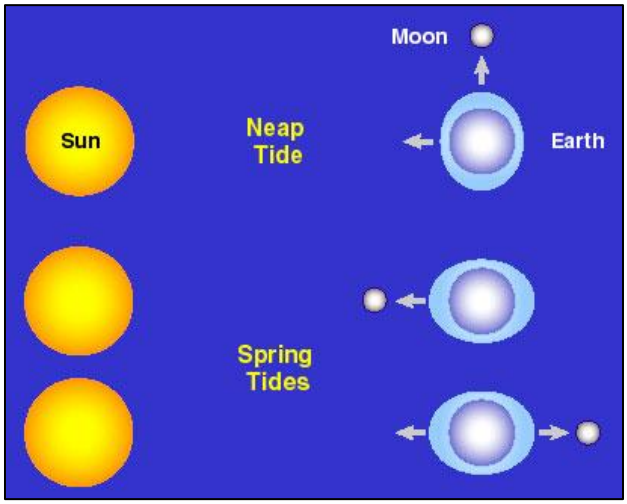
Viewing a Solar Eclipse

Annular Eclipses
Annular ("ring-like") Eclipses

Why Don't Eclipses Occur During Every Full Moon and Every New Moon?
The Moon's Orbit is Inclined at 5°



Tides



Caused by:
The Moon's Gravity
The Sun's Gravity
Earth's Rotation

Tides
Tides
Tides
Tides Animation

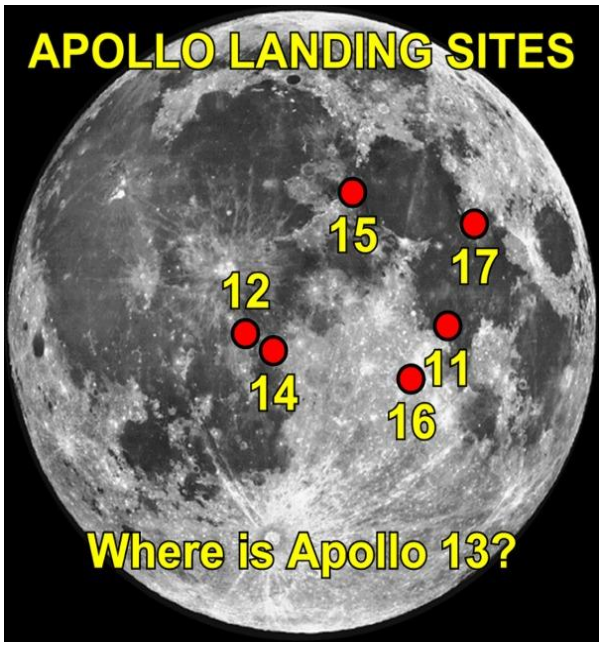
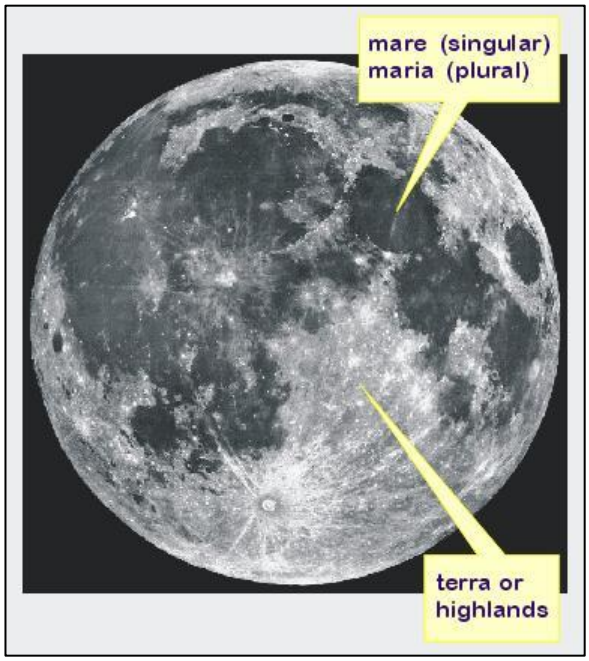
The Bay of Fundy, Nova Scotia
Extremely Large Tide Range
The Bay of Fundy, Nova Scotia

The Moon's Formation
(refer to DVD)

The Moon's Formation

Craters and Maria Formation
Maria and Highlands

Project Apollo

How Did We Go To The Moon?

Apollo Spacecraft