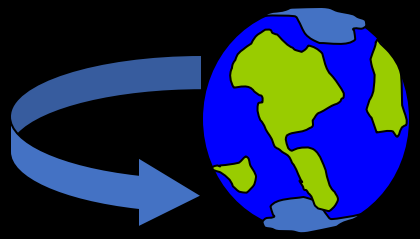
The Earth and Moon

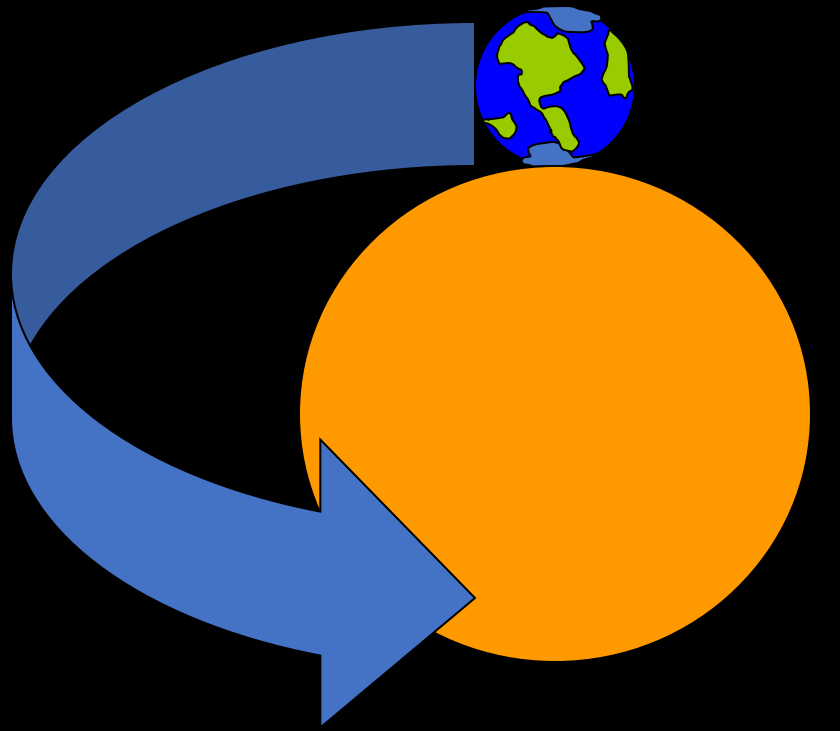
Revolution and Rotation

Earth revolves once a year around the Sun.

Earth rotates once every 24 hours on its axis



rotation

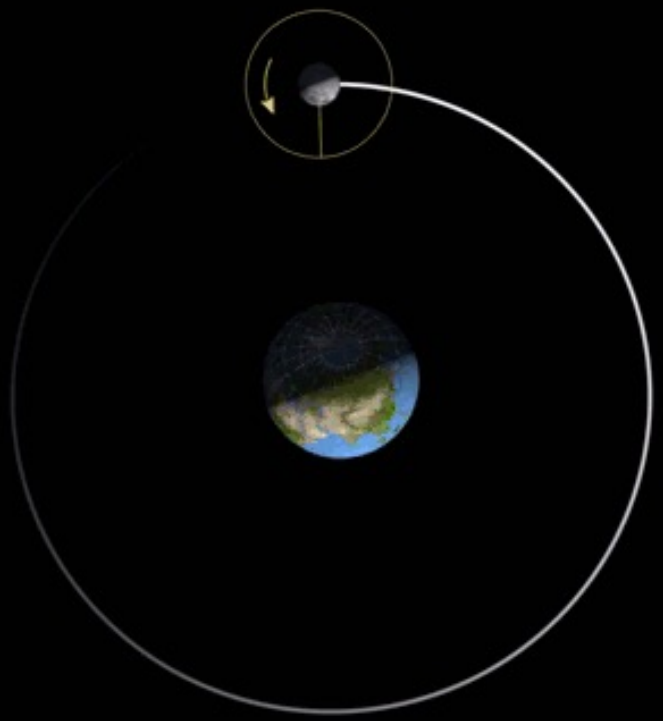


revolution

Earth is both rotating and revolving all the time.

Motions of the Moon

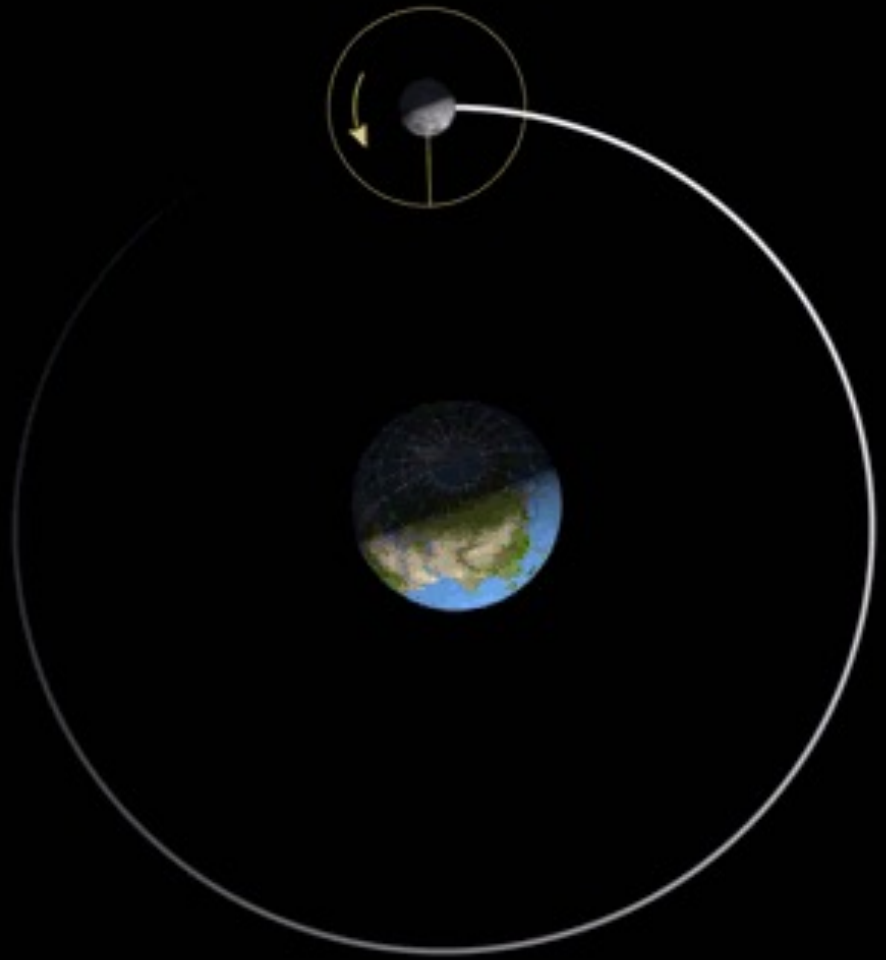
- The Moon's revolution around Earth is responsible for the changes in its appearance.



Synchronous Rotation

- Moon's rotation takes 27.3 days—the same amount of time it takes to revolve once around Earth. Because these two motions take the same amount of time (1:1 ratio), the same side of the Moon always faces Earth.

Synchronous Rotation



Moon Shapes

- The revolution of the Moon around the Earth makes the Moon look as if it is changing shape in the sky.

This is caused by the different angles from which we see the lighted part of the Moon's surface. These are called "phases" of the Moon.

Phases of the moon

A complete cycle of moon phases takes about 29.5 days, two days longer than it takes the Moon to circle Earth. The difference is related to Earth's movement. It takes about two days for Earth, Sun, and Moon to return to their same relative positions.

The phases always follow one another in the same order:

New Moon

Waxing Crescent

First Quarter

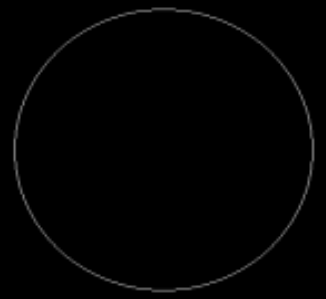
Waxing Gibbous

Full Moon

Waning Gibbous

Third Quarter

Waning Crescent



New Moon

- The lighted side of the Moon faces away from the Earth. This means that the Sun, Earth, and Moon are almost in a straight line, with the Moon in between the Sun and the Earth. The Moon that we see looks very dark

New Moon

Waxing Crescent Moon

- This Moon can be seen after the New Moon, but before the First Quarter Moon. The crescent will grow larger and larger every day, until the Moon looks like the First Quarter Moon.

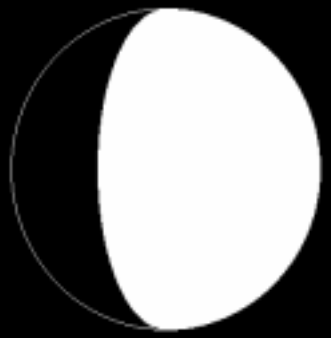
("Waxing" means increasing, or growing larger.)

Waxing Crescent Moon

First Quarter Moon

- The right half of the Moon appears lighted and the left side of the Moon appears dark. During the time between the New Moon and the First Quarter Moon, the part of the Moon that appears lighted gets larger and larger every day, and will continue to grow until the Full Moon.

First Quarter Moon



Waxing Gibbous Moon

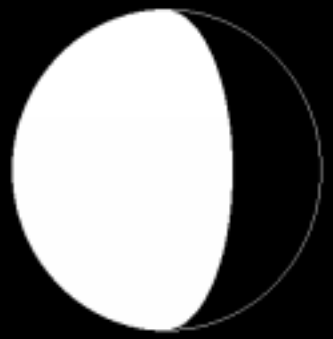
- This Moon can be seen after the First Quarter Moon, but before the Full Moon. The amount of the Moon that we can see will grow larger and larger every day.
  ("Waxing" means increasing, or growing larger.)

Waxing Gibbous Moon

Full Moon

- The lighted side of the Moon faces the Earth. This means that the Earth, Sun, and Moon are nearly in a straight line, with the Earth in the middle. The Moon that we see is very bright from the sunlight reflecting off it.

Full Moon

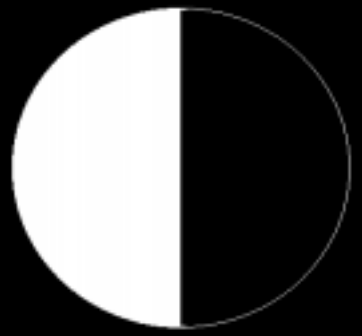


Waning Gibbous Moon

- This Moon can be seen after the Full Moon, but before the Last Quarter Moon. The amount of the Moon that we can see will grow smaller and smaller every day.

("Waning" means decreasing, or growing smaller.)

Waning Gibbous Moon



Third (Last) Quarter Moon

Sometimes called Third Quarter. The left half of the Moon appears lighted, and the right side of the Moon appears dark. During the time between the Full Moon and the Last Quarter Moon, the part of the Moon that appears lighted gets smaller and smaller every day. It will continue to shrink until the New Moon, when the cycle starts all over again.

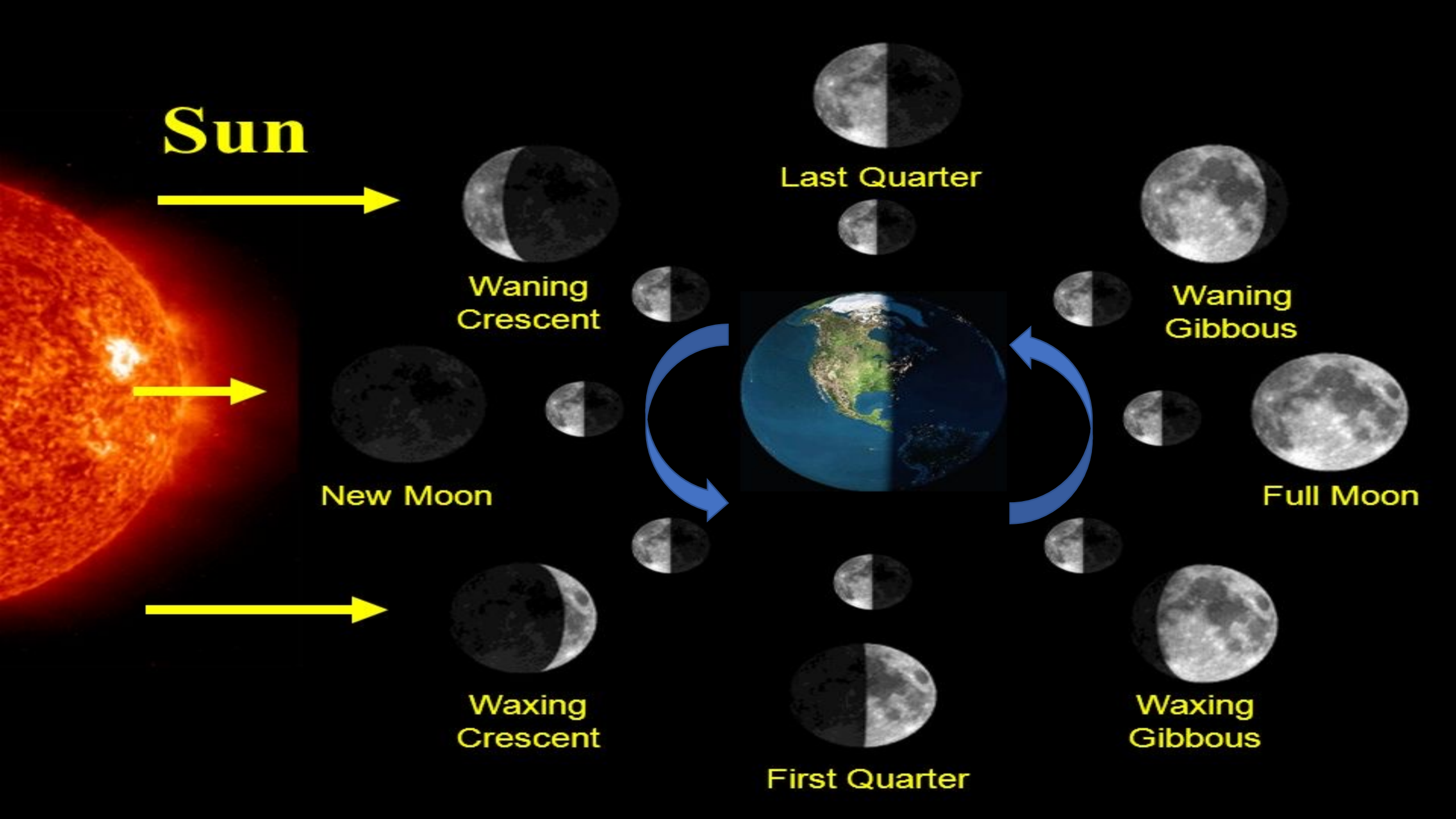
Third Quarter Moon

Waning Crescent Moon

- This Moon can be seen after the Last Quarter Moon and before the New Moon. The crescent will grow smaller and smaller every day, until the Moon looks like the New Moon.

("Waning" means decreasing, or growing smaller.)

Waning Crescent Moon


Sun
Last Quarter
Waning Crescent
Waning Gibbous
New Moon
Full Moon
Waxing Crescent
Waxing Gibbous
First Quarter