

The Moon changes its shape and position on the sky every night.
Why does the Moon change shape?

To answer this question, let's ask ourselves:

- 1) Does the Moon "make" its own light?
- 2) Does the Moon stay still or move through space?

1. The Moon is the second brightest thing in the sky after the Sun. But the Moon does not make its own light. It only looks shiny because it reflects the light from the Sun. Even though the Moon looks very bright sometimes, its surface is dark and uneven and only reflects about 12% of the Sun's light. Imagine how bright the Moon could have been if it was covered in ice!

2. The Moon orbits the Earth and rotates on its axes. It takes about the same time (27 days) for the Moon to complete one orbit and to spin once on its axis. Therefore the Moon is always facing the Earth with the same side. When you observe it from Earth you don't see the Moon spinning, you see it keeping still!

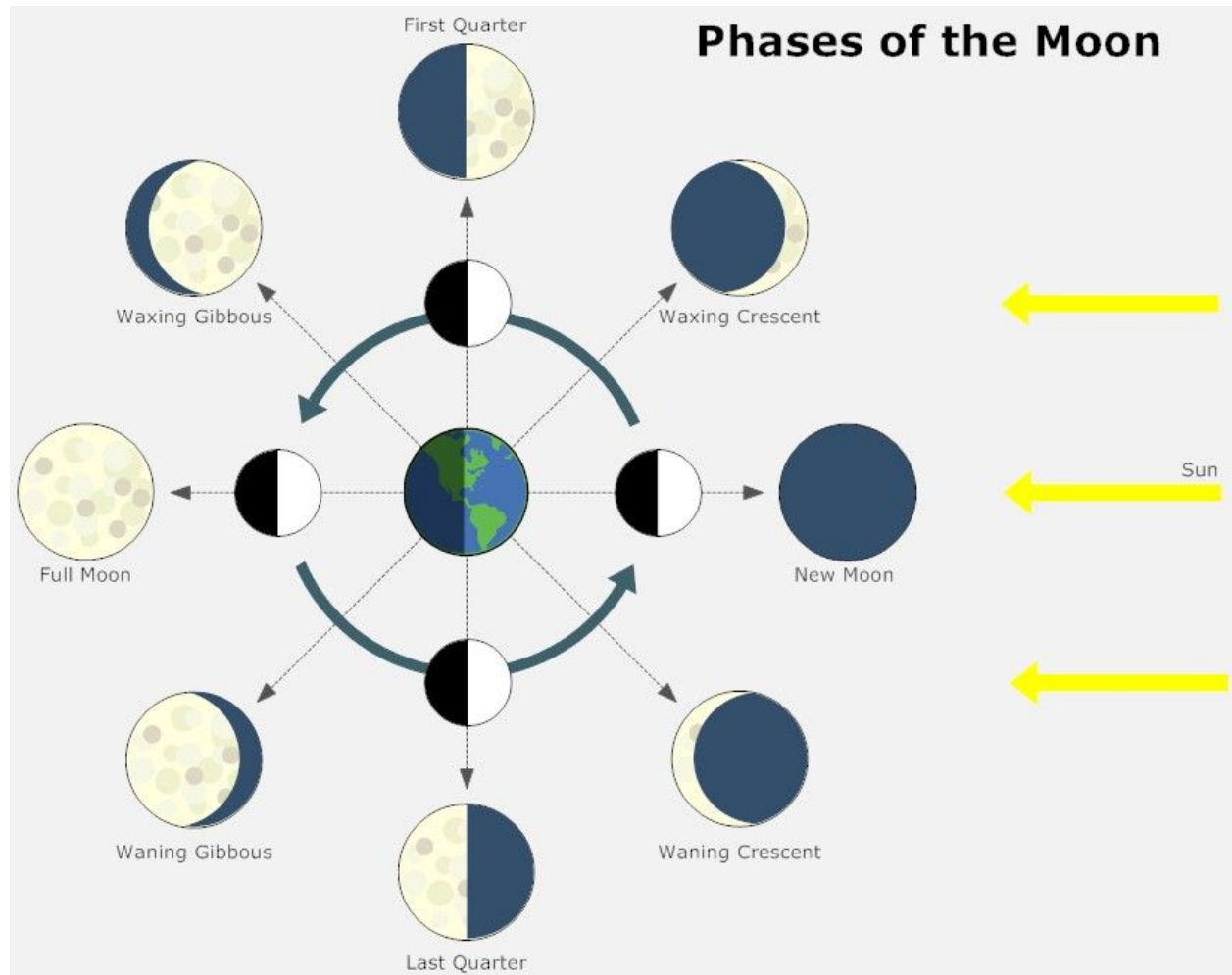
Now if we put 1. and 2. together we will easily see why the moon 'changes shape'!

The Moon is always the same, and always only one half of the Moon (the half that is facing the Sun) is illuminated by the Sun. The half of the Moon that is facing away from the Sun is always in the dark. As the Moon orbits the Earth we just see different portions of the sunlit surface.

The different shapes of the Moon that can be seen by an observer from Earth are called **phases**.

The Moon goes through 8 phases as it orbits the Sun.

They are: New Moon, Waxing Crescent, First Quarter, Waxing Gibbous, Full Moon, Waning Gibbous, Last Quarter and Waning Crescent.



Let's go through all 8 phases:

- 1) **New Moon.** The Moon is in between the Earth and the Sun and all 3 objects are approximately on the same line. The shiny side of the Moon is facing away from Earth so we don't see the Moon on the sky.
- 2) **Full Moon.** The Moon, Earth and the Sun are approximately on the same line and the shiny side of the Moon is facing the Earth.
- 3) **First Quarter.** The Moon is at 90 degrees angle to the Sun-Earth line. When we look at the Moon from Earth, we see that half of the Moon is shiny, another half is in the shade.
- 4) **Last quarter.** Same as first quarter, except shiny half and dark half swap places.
- 5-8) **Crescent and Gibbous phases** are "transition phases" .
 When less than half of the Moon is illuminated by the Sun, it is Crescent Moon.
 When more than half of the Moon is illuminated by the Sun, it is Gibbous (bulging) Moon.