Do you know your Moon phases?

Our Moon is trapped in synchronous rotation with Earth. That means that wherever it may be in its orbit around us, it is always showing us the same face. However, the proportion of that face that is illuminated by the Sun changes throughout the lunar cycle, ranging from a thin crescent right up to fully illuminated. So why and how does this occur? The diagram below shows the relative positions of the Moon and Earth during the lunar cycle, so it will help you understand my explanation a little better!

First of all it important to remember that the Sun is a sphere, and at any one time half of that sphere is illuminated by sunlight. But its relative position to us here on Earth will determine how much of that illuminated portion is visible to us. Picture in your mind a football with a torch shining at it; no matter where you stand, half of that ball will still be illuminated, but where *you* stand will determine how much of that light you see. The same thing happens with the Moon.

Let's start off at the beginning of the lunar cycle with a new Moon. This is when the Moon is located in between the Sun and the Earth; the whole of the illuminated side is facing away from us, so we cannot see any of the illuminated portion from here; therefore the Moon is invisible during this phase. If you read the article I wrote about eclipses last year, you will recall that it is during a new Moon that a solar eclipse occurs, but everything needs to line up perfectly in order for an eclipse to take place. People often incorrectly refer to the far side of the Moon as the dark side; during a new moon, the whole of the far side is bathed in sunlight, so remember that "the Dark Side of the Moon" is a Pink Flyod album name, not a statement of fact!

Following on from the new moon phase, the illuminated portion will slowly begin to increase each night as the Moon apparent motion appears to be taking further East in the sky. This is when the Moon is said to be waxing. During this time you will see a slim waxing crescent which grows day by day until it reaches first quarter phase, approximately 7 days after new moon. At this point, it looks like the right hand half of the Moon is illuminated. It then continues to wax day by day, at this point being called a waxing gibbous moon, until it reaches the full moon phase at approximately 14 days after new moon. When the Moon is full, it is half way round its orbit of Earth and is now on the opposite side of Earth than the Sun. Its entire Earth facing side is fully illuminated (now the far side will be totally dark). Once again, if you remember my eclipse article, you will recall that this is when we have lunar eclipses.

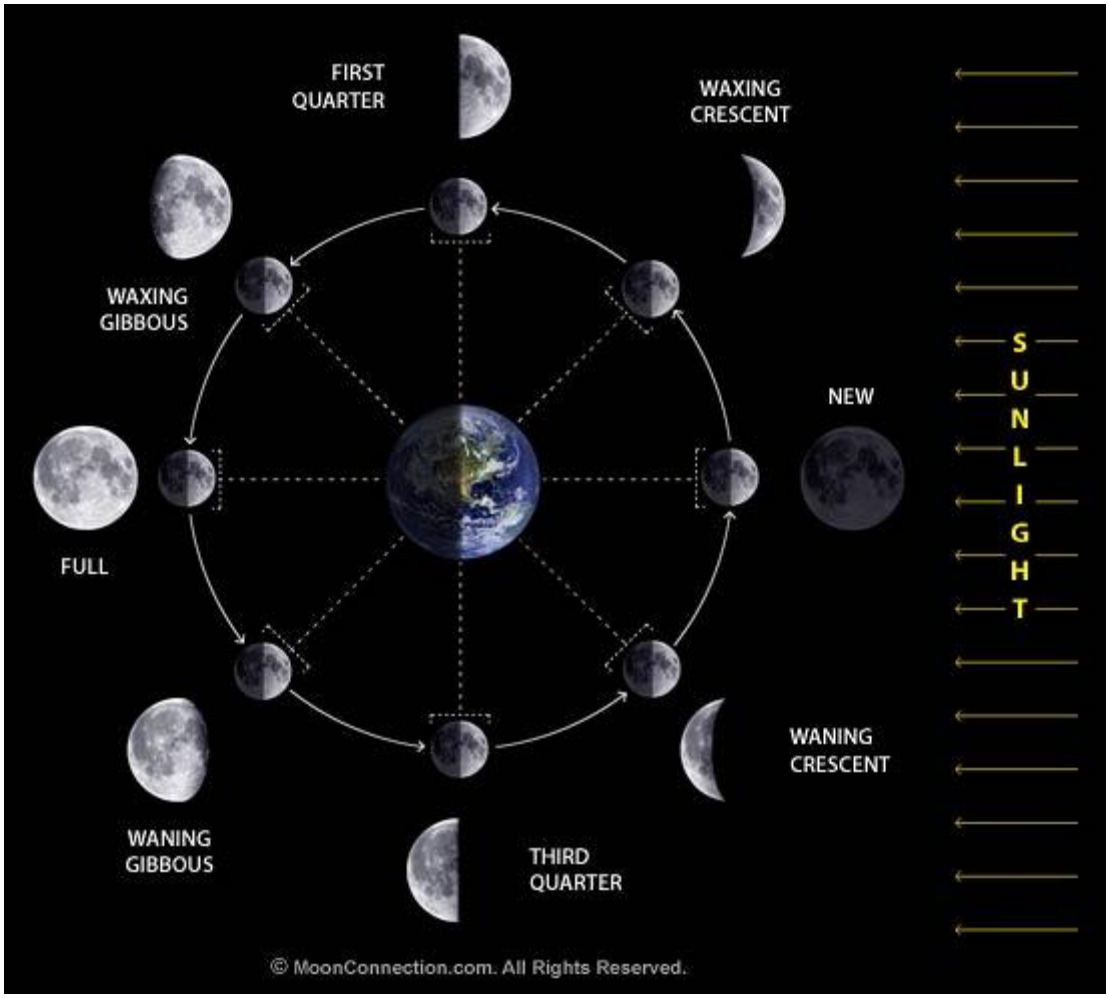

Image taken from www.moonconnection.com/moon_phases

After full, the moon then begins to wane, first moving through the waning gibbous phase until it reaches last quarter, approximately 21 days after new moon. Once again half of the lunar surface appears to be illuminated, but this time it the left hand half instead of the right. Following on from this, the moon moves into a waning crescent, the illuminated portion getting smaller each day until it once again reaches new moon, approximately 28 days since the cycle began.

The phase of the Moon will determine at what time of night you will see it. A waxing crescent moon is visible in the west near to sunset. During the lunar cycle, the Moon rises later and later each day. A first quarter moon is visible for approximately half of the day and half of the night. When the Moon is full, it rises at sunset and remains visible in the sky until sunrise. As it reaches last quarter, it will be visible for half of the night and half of the day. And finally, a waning crescent moon is visible in the east near to sunrise. All of this of course, depending on how much cloud cover there is!

I hope that helps you to better understand the lunar phases. If you want more detailed information about the current moon phase, and moonrise and moonset times, visit http://www.universetoday.com or download their smartphone app “Phases of the Moon”

By Mary Spicer