

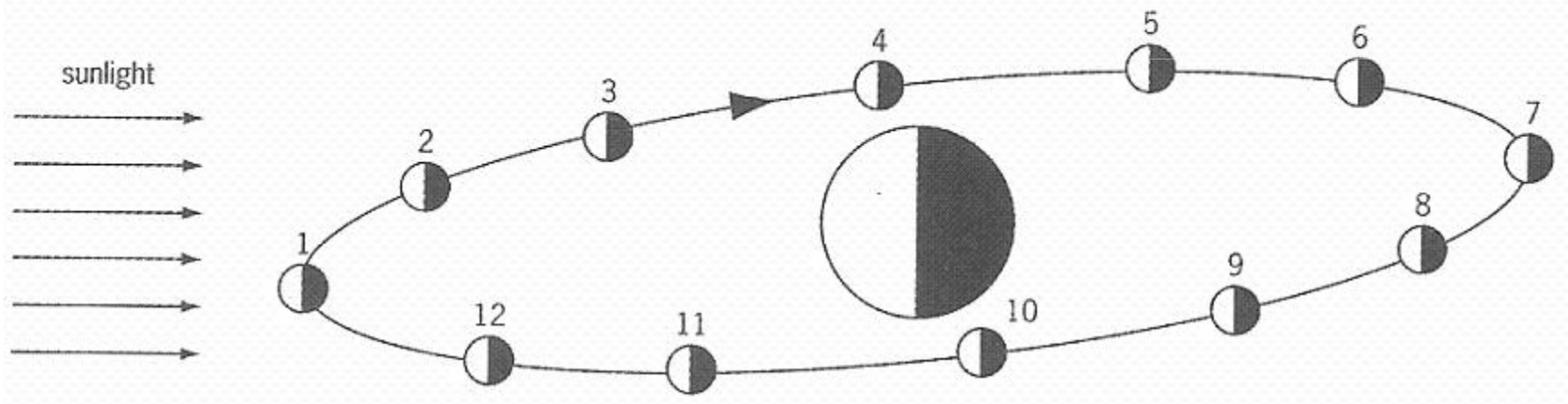
MOON PHASES



Adapted from
“Mr. Valle’s Guide to
THE MOON”

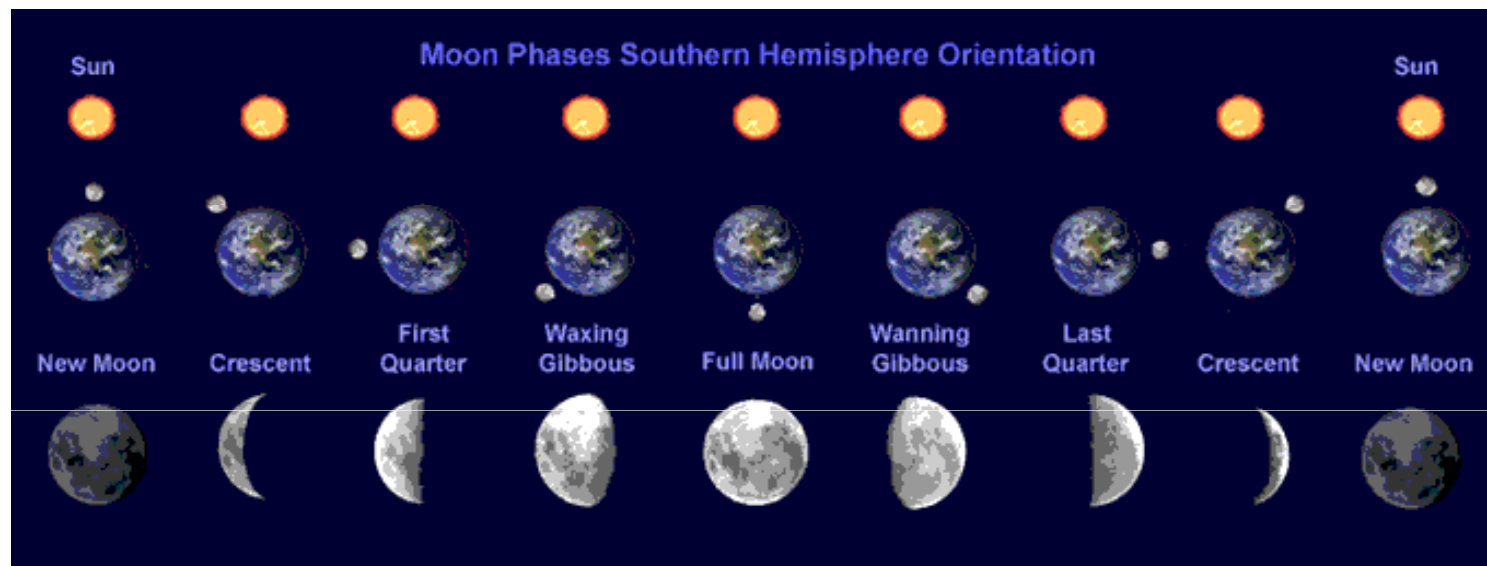
MOON PHASES: 4 KEY CONCEPTS

1. The Moon orbits Earth
2. Half of the Moon is illuminated; that half is facing the Sun



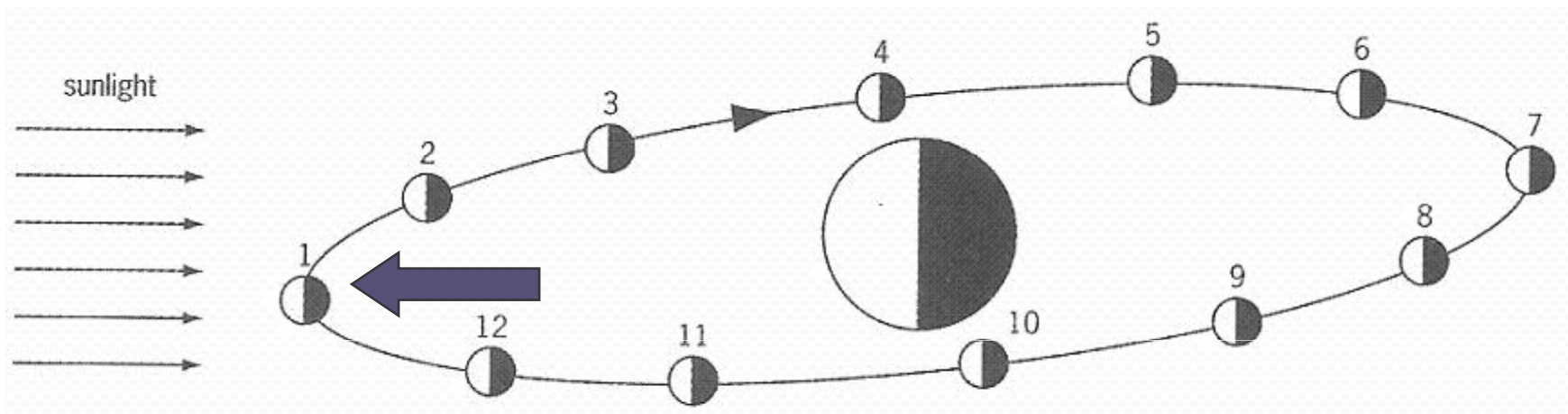
MOON PHASES: 4 KEY CONCEPTS

3. The part of the illuminated half we see determines the phase we see
4. Relative positions of the Earth, Sun and Moon determine the part we see.



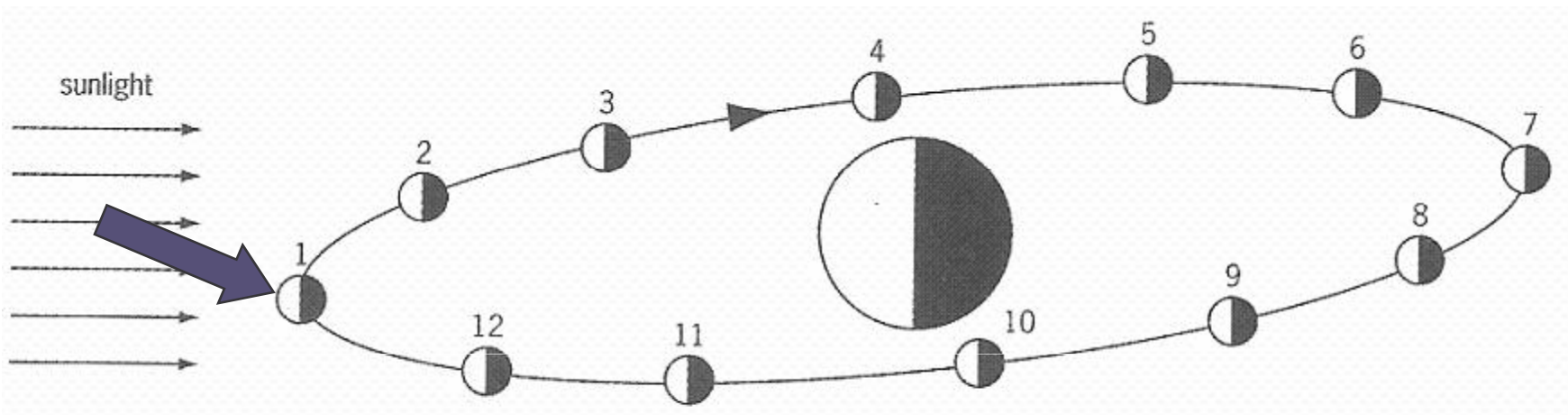
NEW MOON (= NO MOON)

- We start with a new moon. This is when the moon is between Earth and the sun.



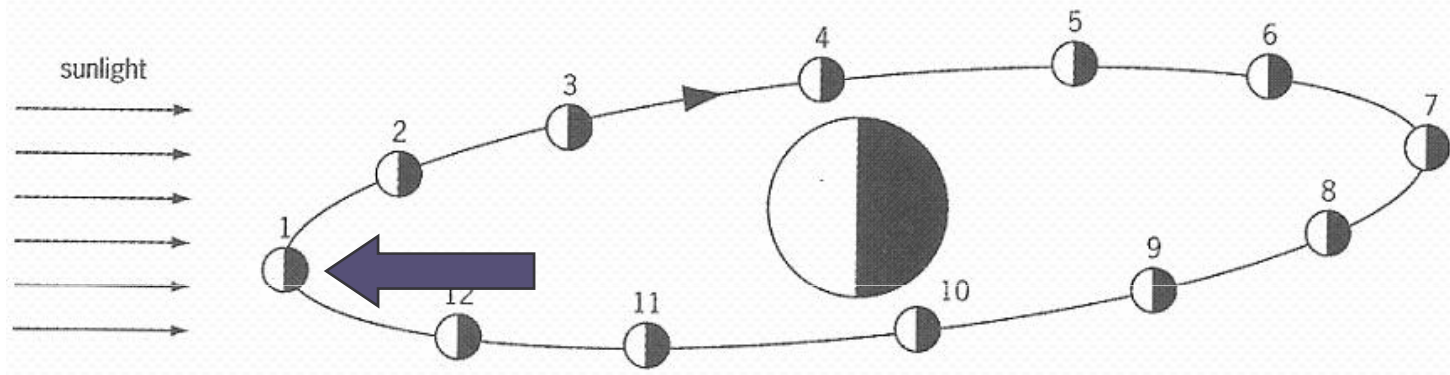
NEW MOON

- When there is a new moon, the sun lights up the side that **faces away** from Earth.



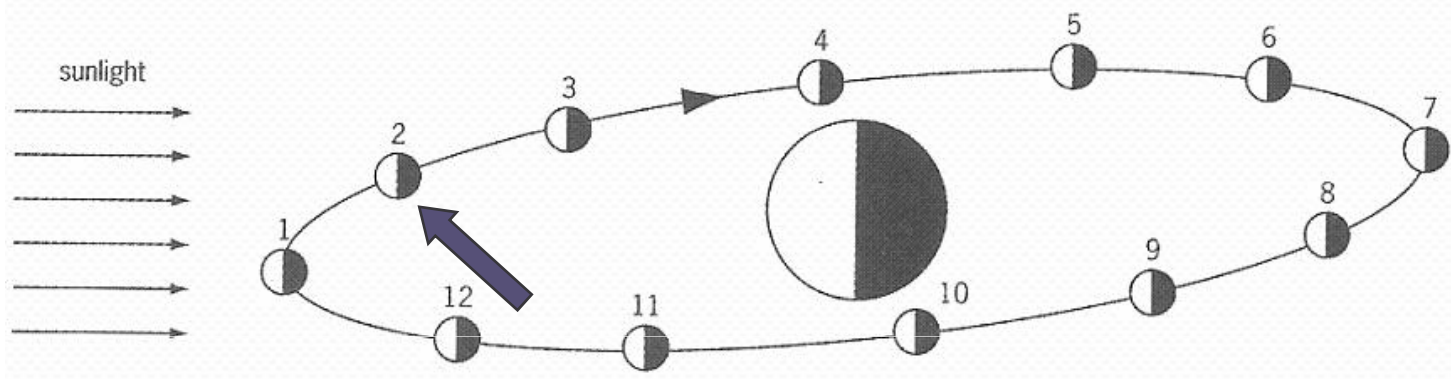
NEW MOON

- Since the lit part of the moon faces away from Earth, we do not see a moon at night.



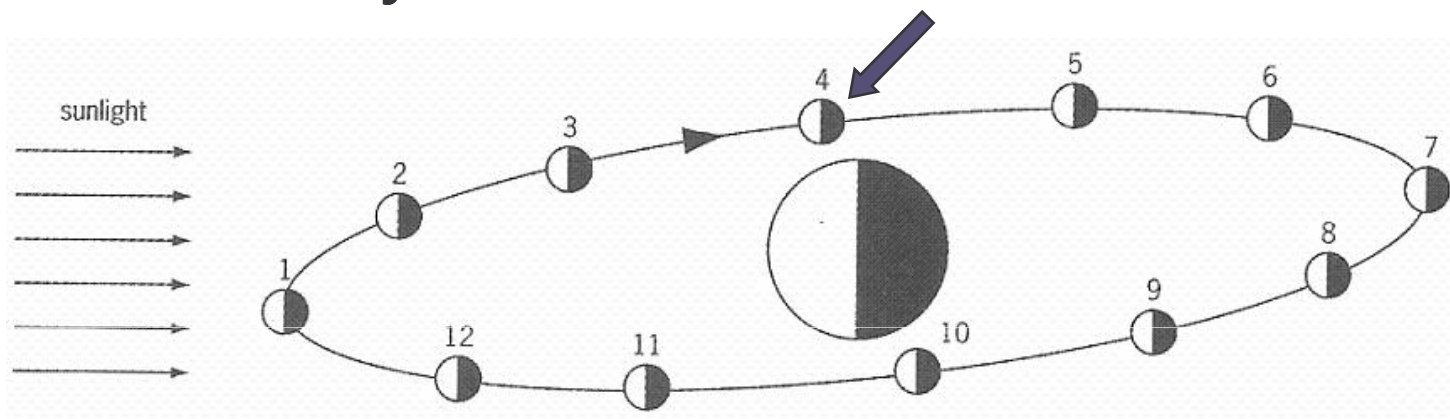
WAXING CRESCENT

- Shortly after New Moon we see a thin crescent of the moon's lit half.



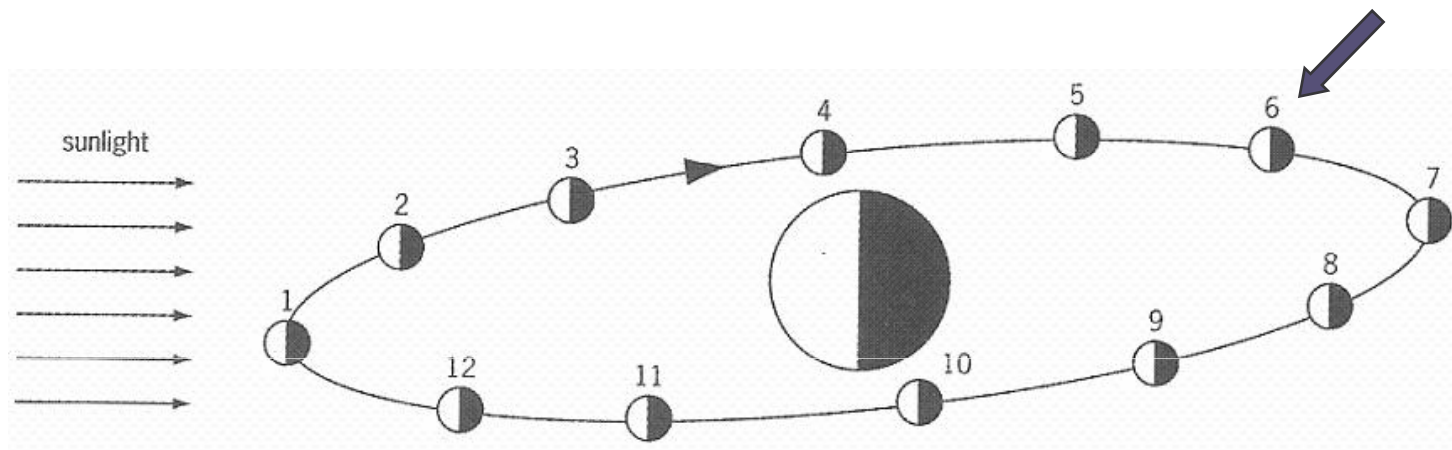
FIRST QUARTER

- A few days later, we see half of the moon in the sky. The Moon is a quarter of the way round its cycle



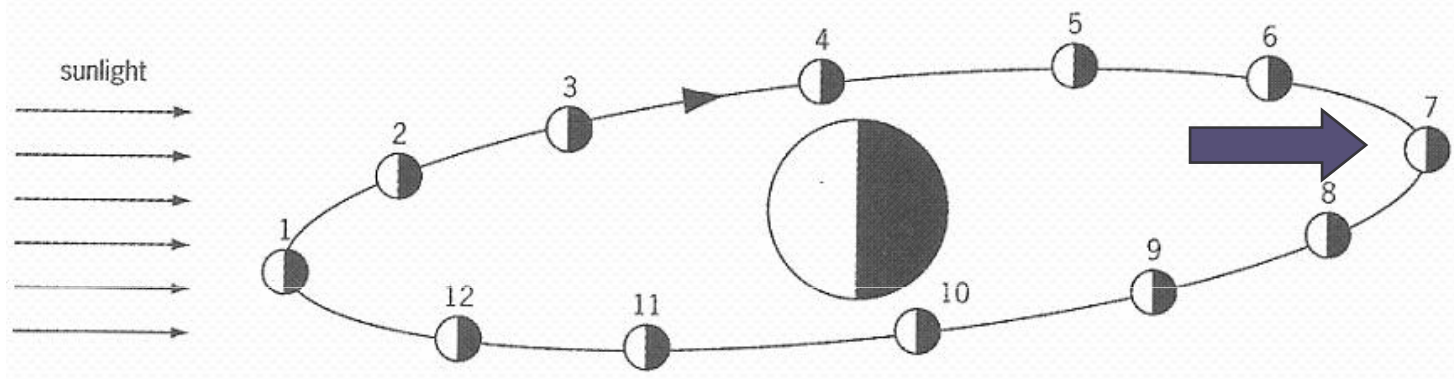
WAXING GIBBOUS

- In another day or two we see more than half the Moon – called a gibbous phase



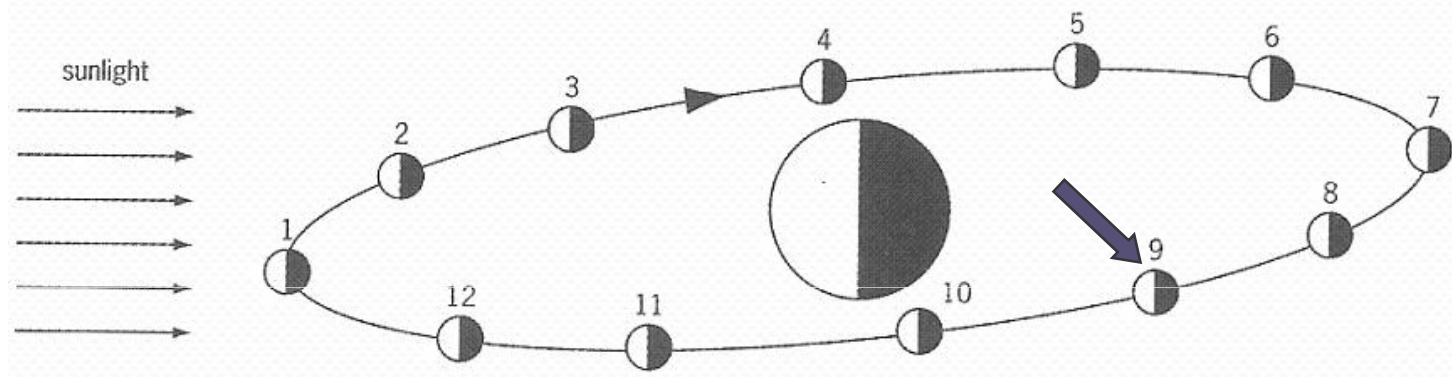
FULL MOON

- Eventually, the moon lines up so that Earth sits exactly between it and the sun. We see the Full Moon.



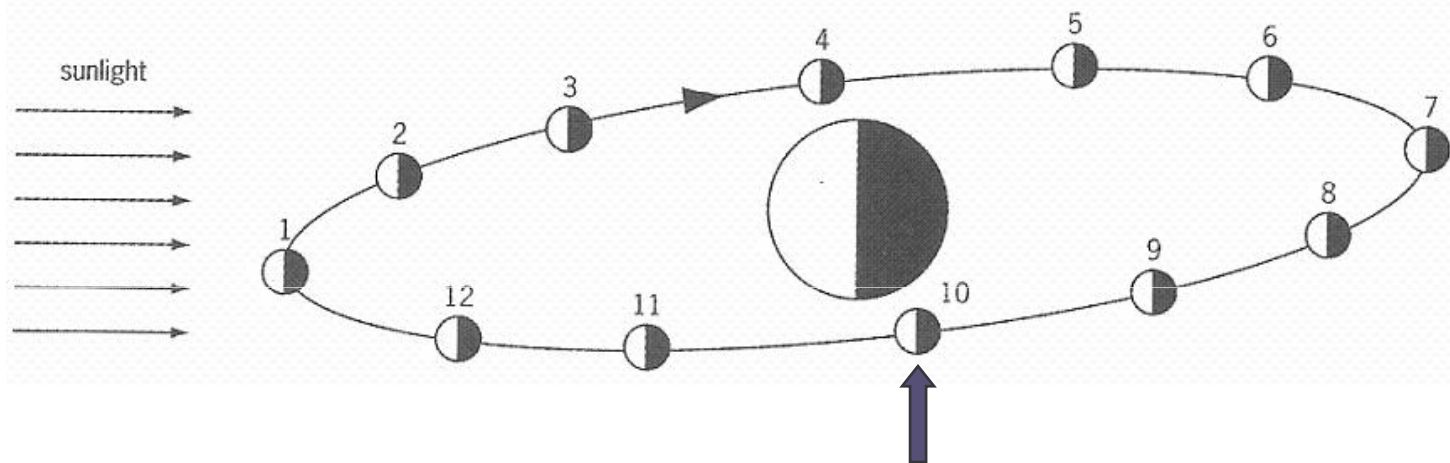
WANING GIBBOUS

- Two or three days later we see less of the Moon's lit surface again – waning gibbous phase



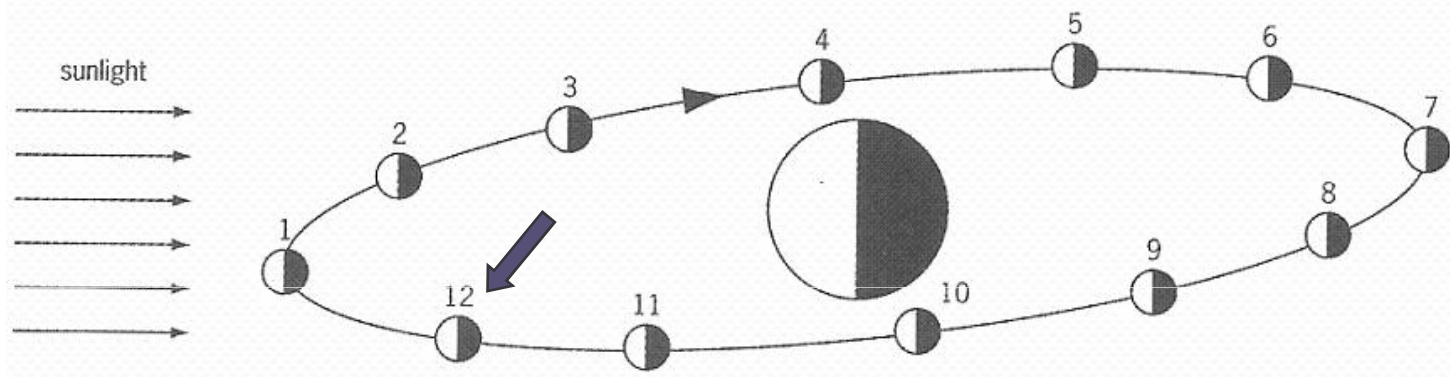
LAST QUARTER

- As days go by, we gradually see less and less of the moon again. It looks like half a circle again: the 'last quarter' phase



WANING CRESCENT

- Over the next few days the crescent gets smaller and smaller until it is no longer visible. Then we are back to New Moon.














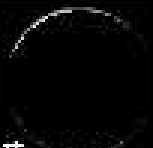


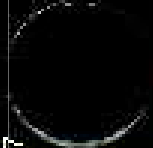


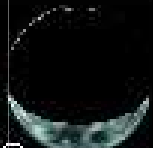
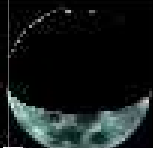

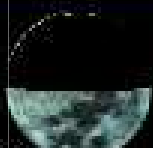







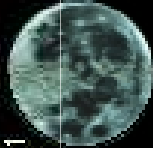


AROUND AND AROUND

The full cycle takes 29.5 days



January 2010

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1 	2 
3 	4 	5 	6 	7 	8 	9 
10 	11 	12 	13 	14 	15 	16 
17 	18 	19 	20 	21 	22 	23 
24 	25 	26 	27 	28 	29 	30 
31 						

This is the real scale of Earth to Moon distance and size



Diagrams in books and on the Internet are rarely to scale, and give the wrong impression of the relative size and distance of the Earth and Moon.

Alternative Model:

Moon = Hockey Ball

Earth = Basket Ball

Earth-Moon distance: 7.5m

Earth-Sun distance: 3000m (3km)

Misconceptions about phases

- Due to Earth's shadow on Moon
- Due to Earth's rotation on its axis
- Due to clouds
- Moon's phase changes according to different geographic locations on Earth