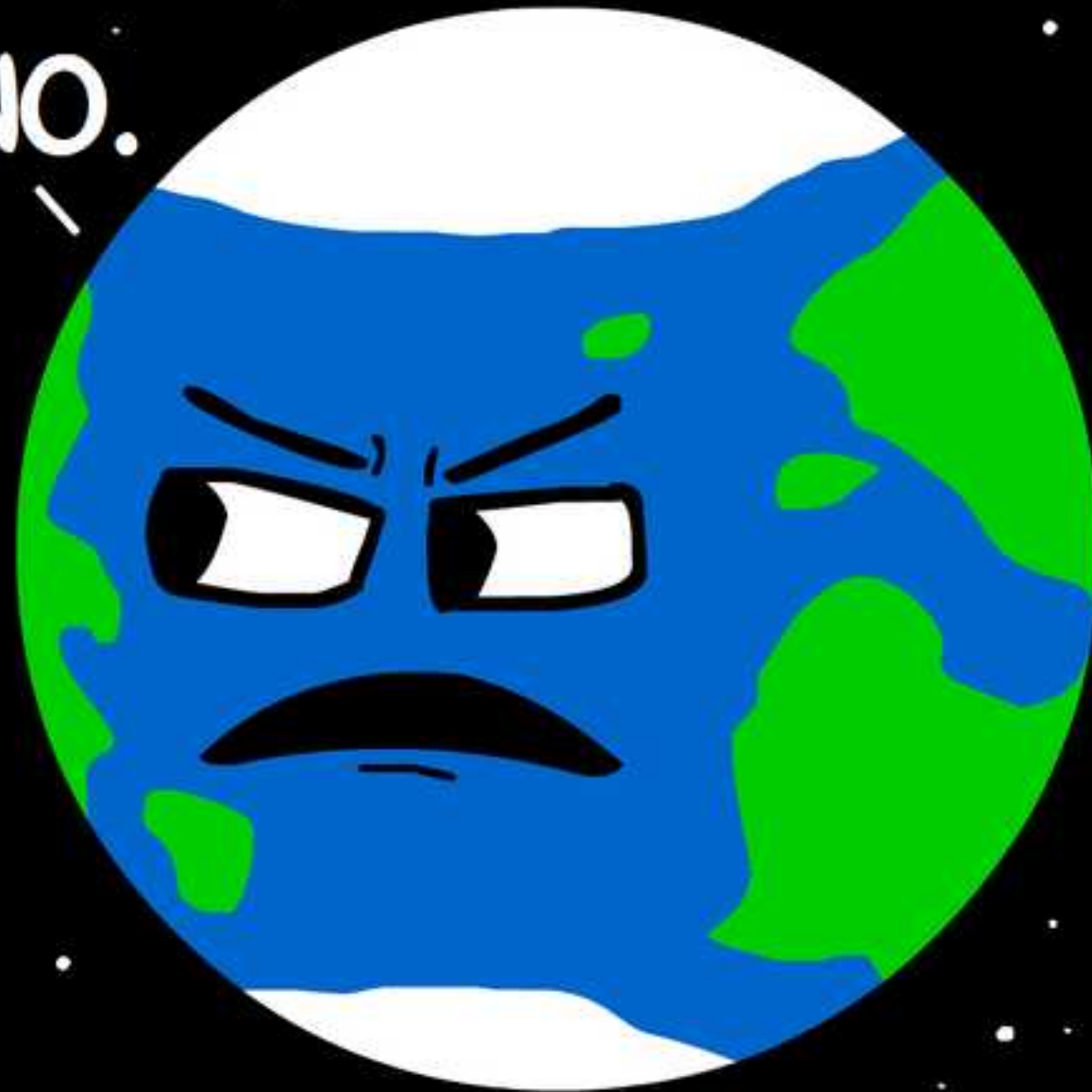


Reminder: no food or
drinks in the planetarium!

DO YOU LIKE MY NEW LOOK?



NO.



WELL, DON'T WORRY.
IT'S JUST A PHASE!

The changing phases of the Moon originally
inspired the concept of the *month*



The Causes of Moon Phases

- Think to yourself about the answer to this question:

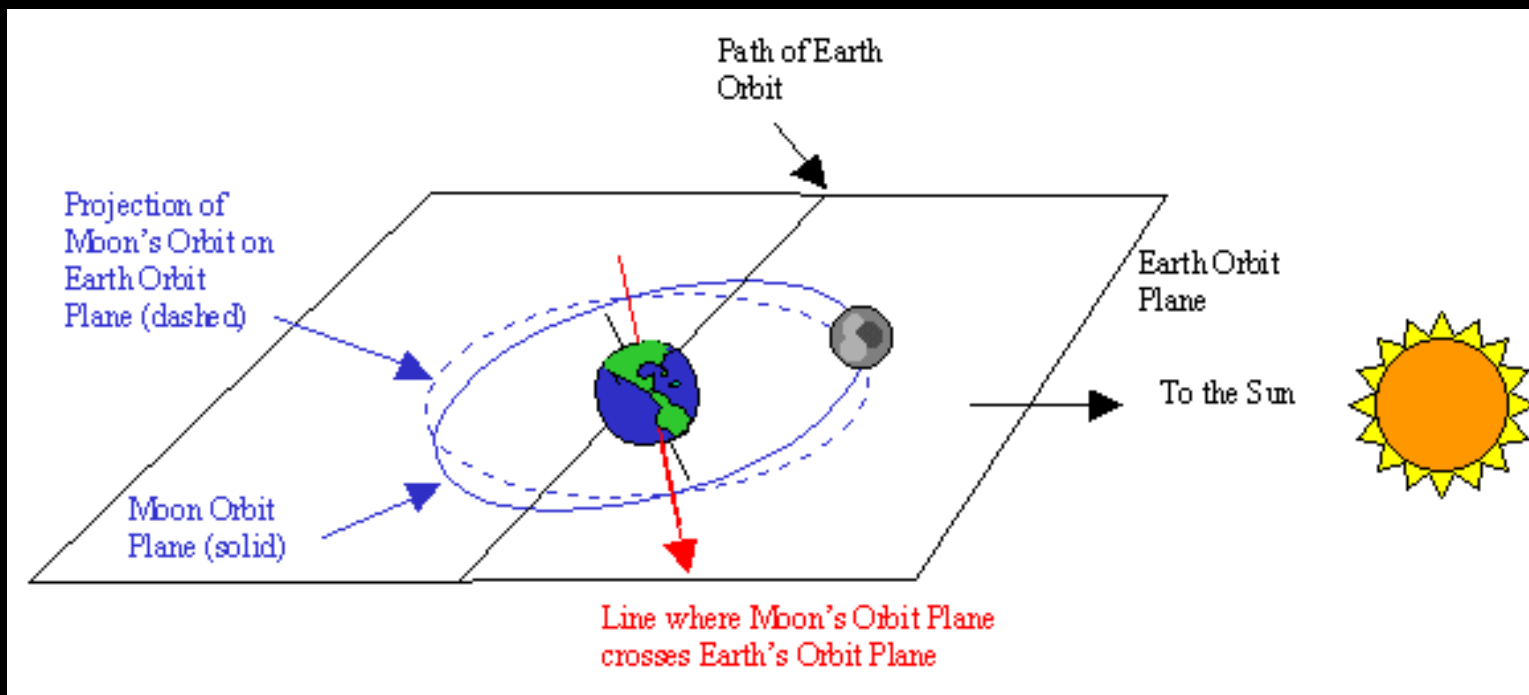
What causes the phases of the Moon?

Take out a piece of paper and quickly write out a brief answer.

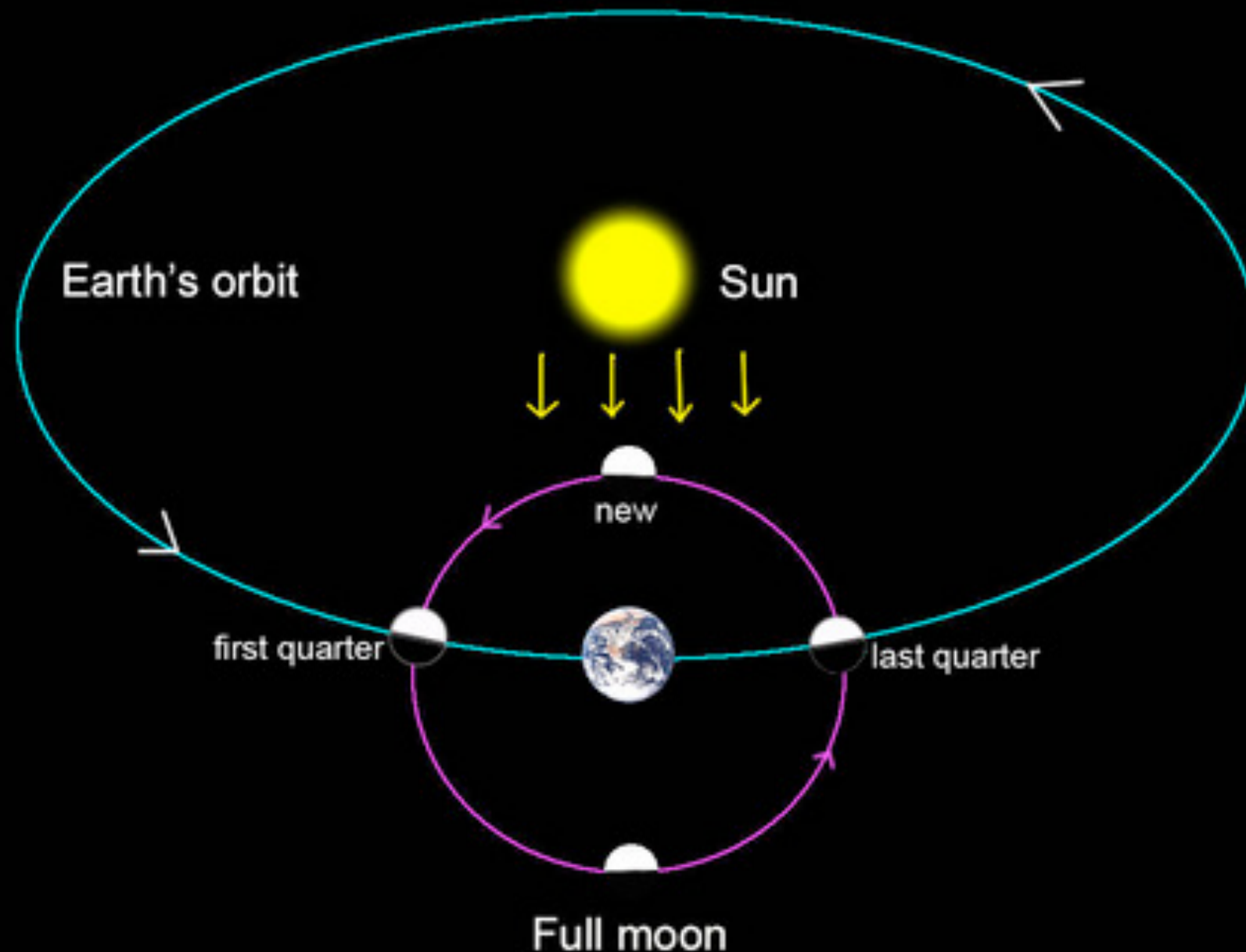
The Phases of the Moon

Moon phases are caused by the orbit of the moon around the Earth every 29.5 days

Moon light is reflected sunlight!

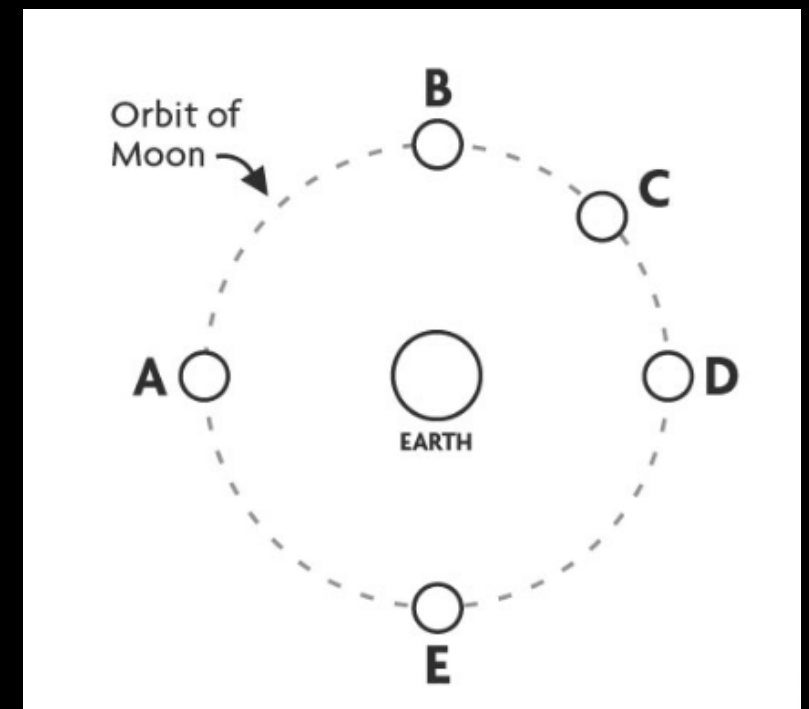


Earth and Moon both orbit counterclockwise as seen from Earth's north pole.

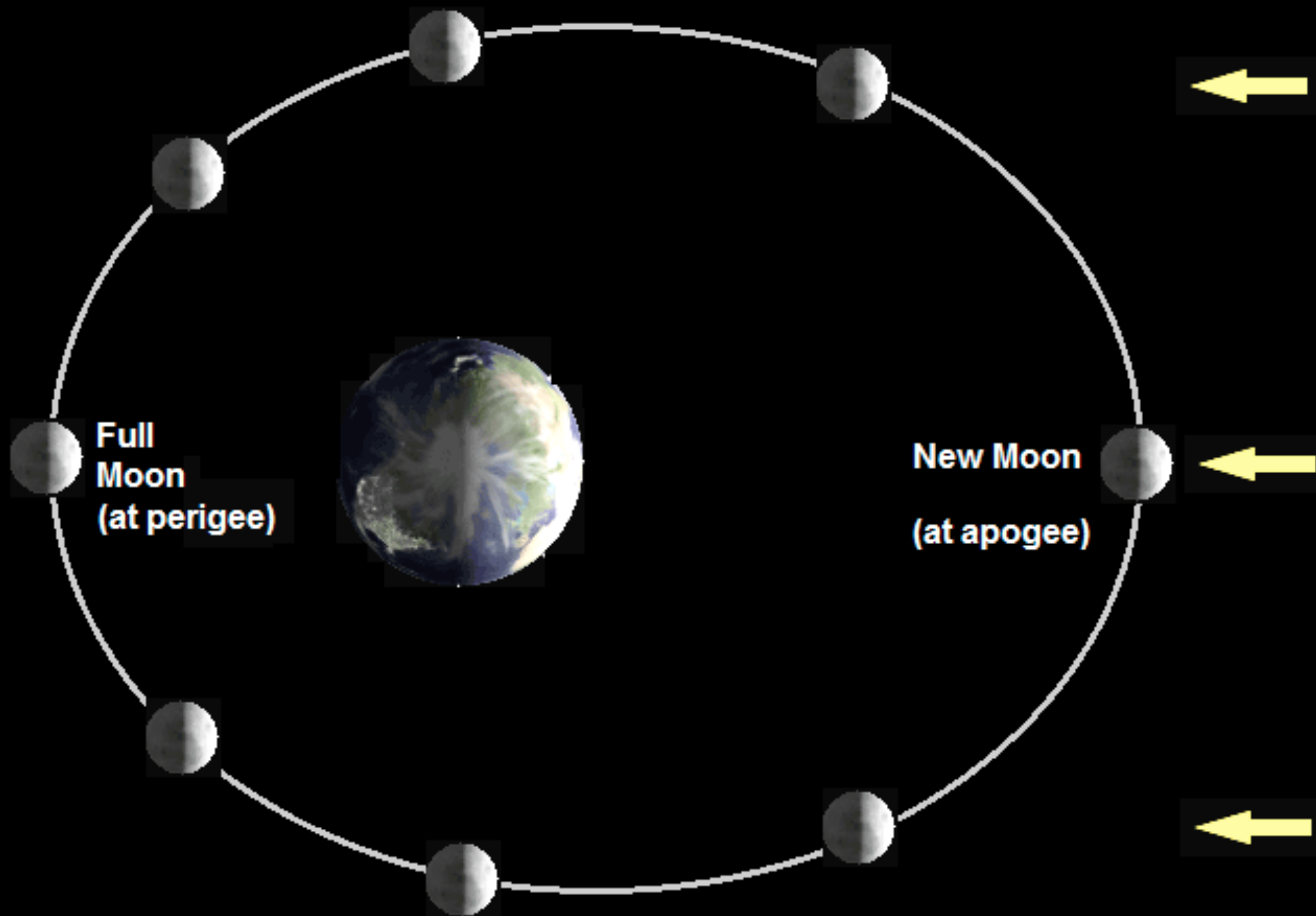


What percent of the surface of the moon is illuminated at any given time?

- Make a drawing of the moon orbiting Earth at different times
- Label the direction of light coming from the Sun.
- Color in the non-illuminated parts of the moon, *as seen from above*.



What percent of the surface of the moon is illuminated at any given time?

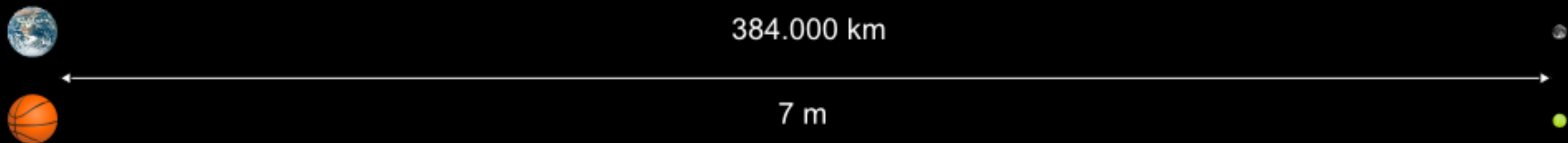


Q: If the Earth is as big as basketball and the Moon is the size of a tennis ball, how much are they separated?

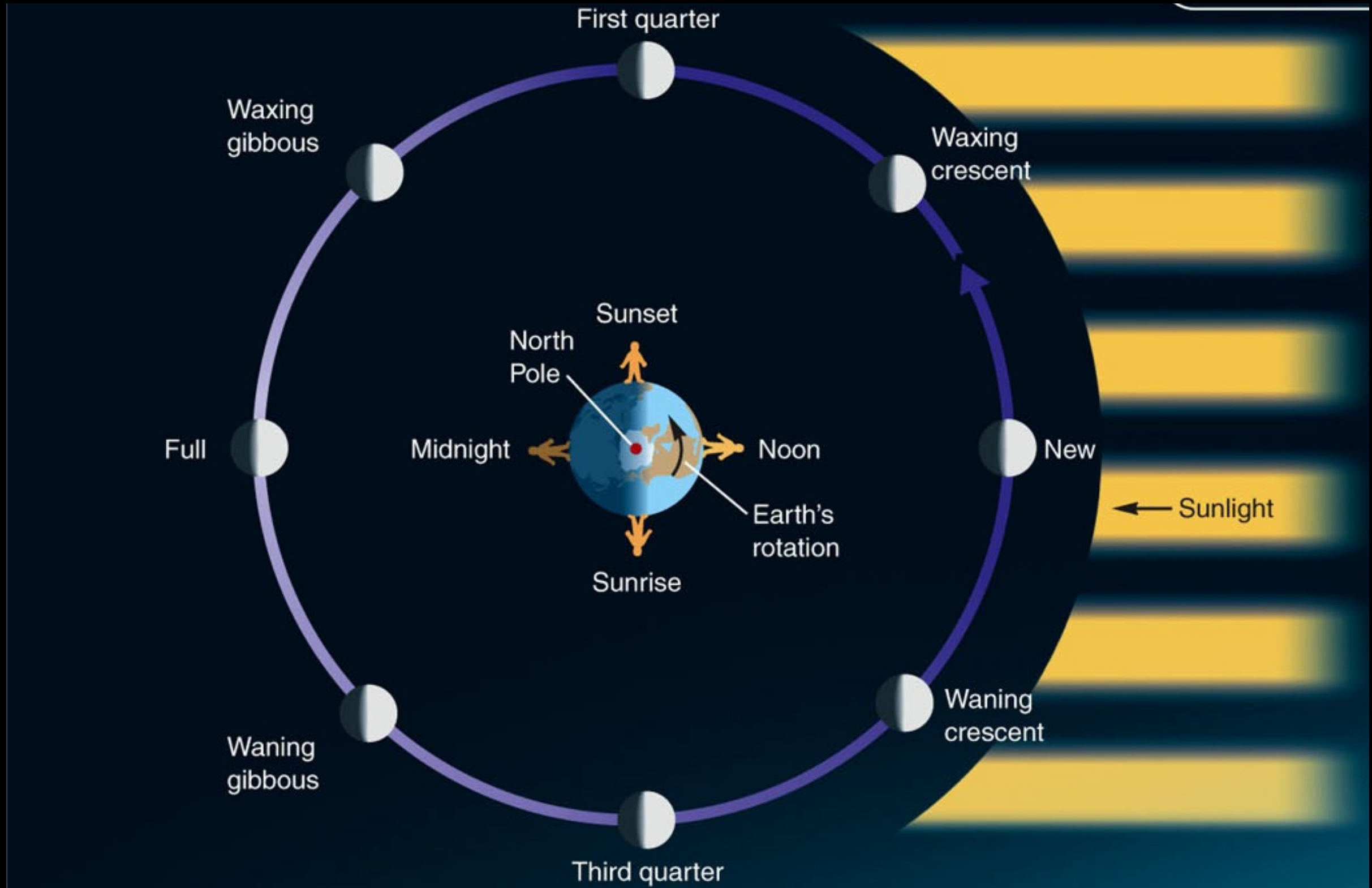
- A) 700 meters
- B) 70 meters
- C) 7 meters
- D) 0.7 meters

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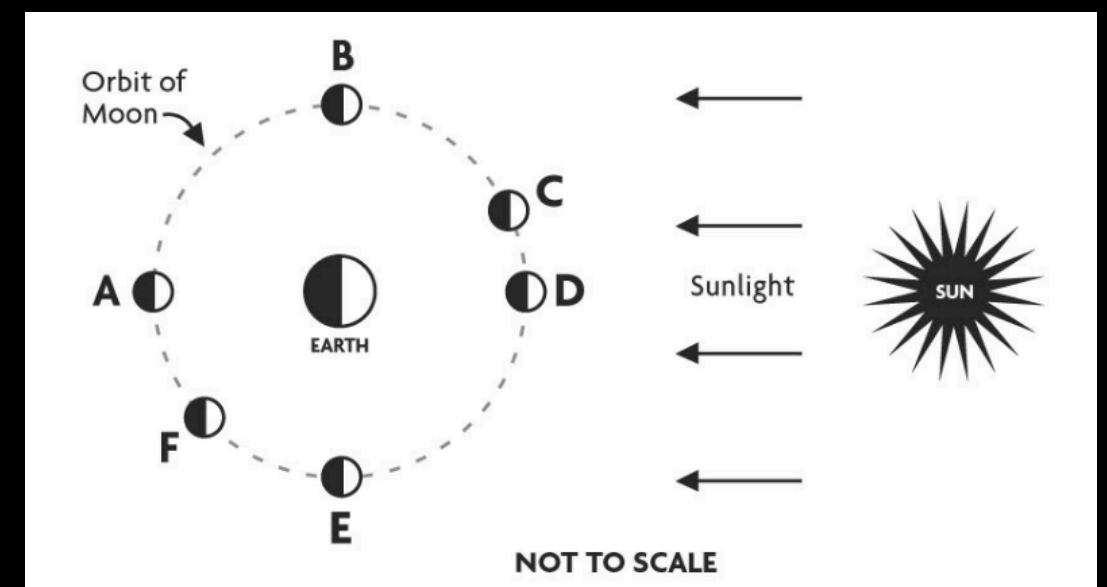
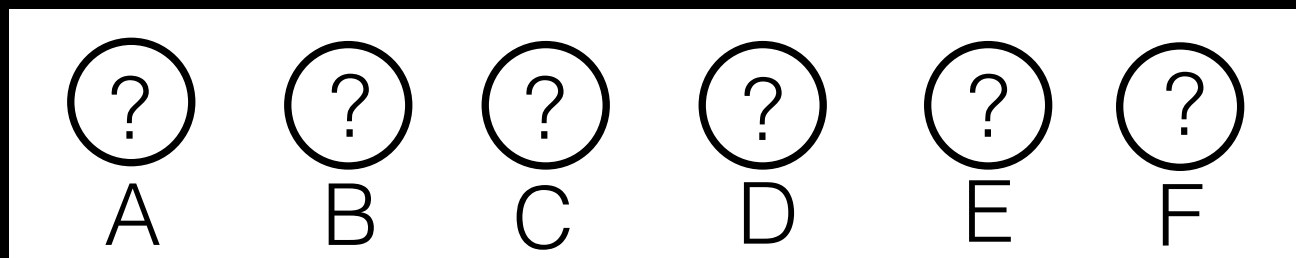


The Phases of the Moon



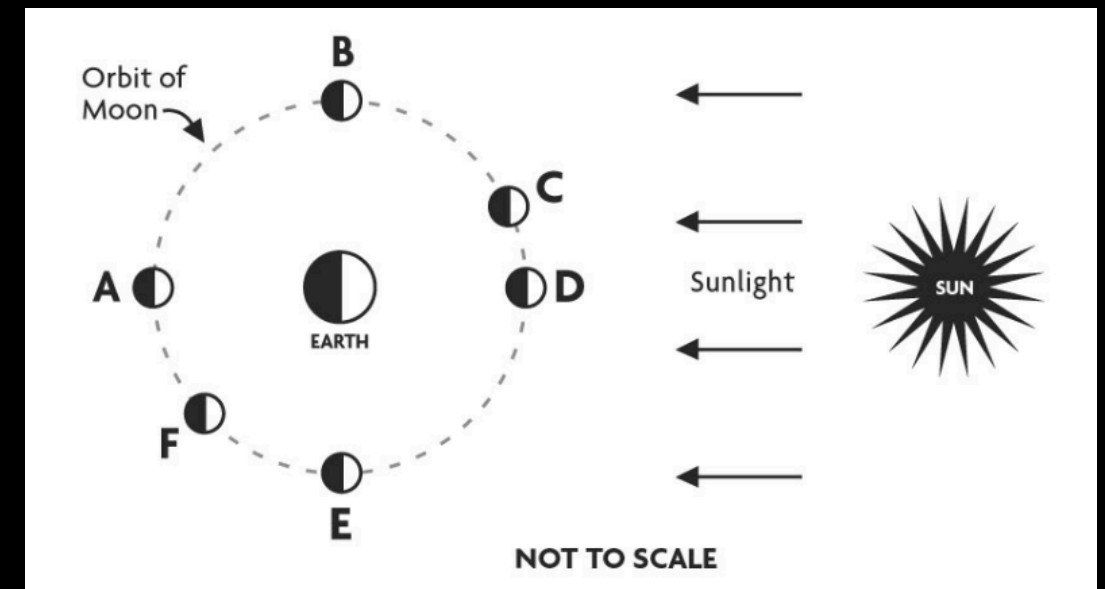
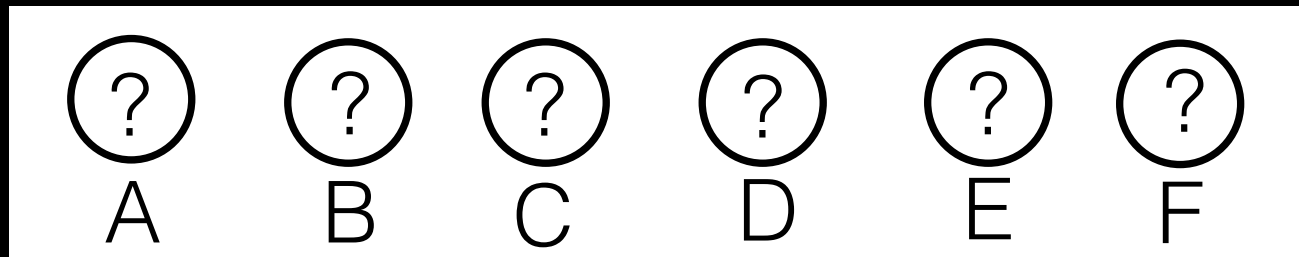
What do we see in terms of moon illumination from Earth?

- Make a drawing of the moon orbiting Earth at different times
- Imagine that you are standing on the *north pole* of Earth
- What do you see when the moon is at different points in its orbit?
- Draw the moon phases.

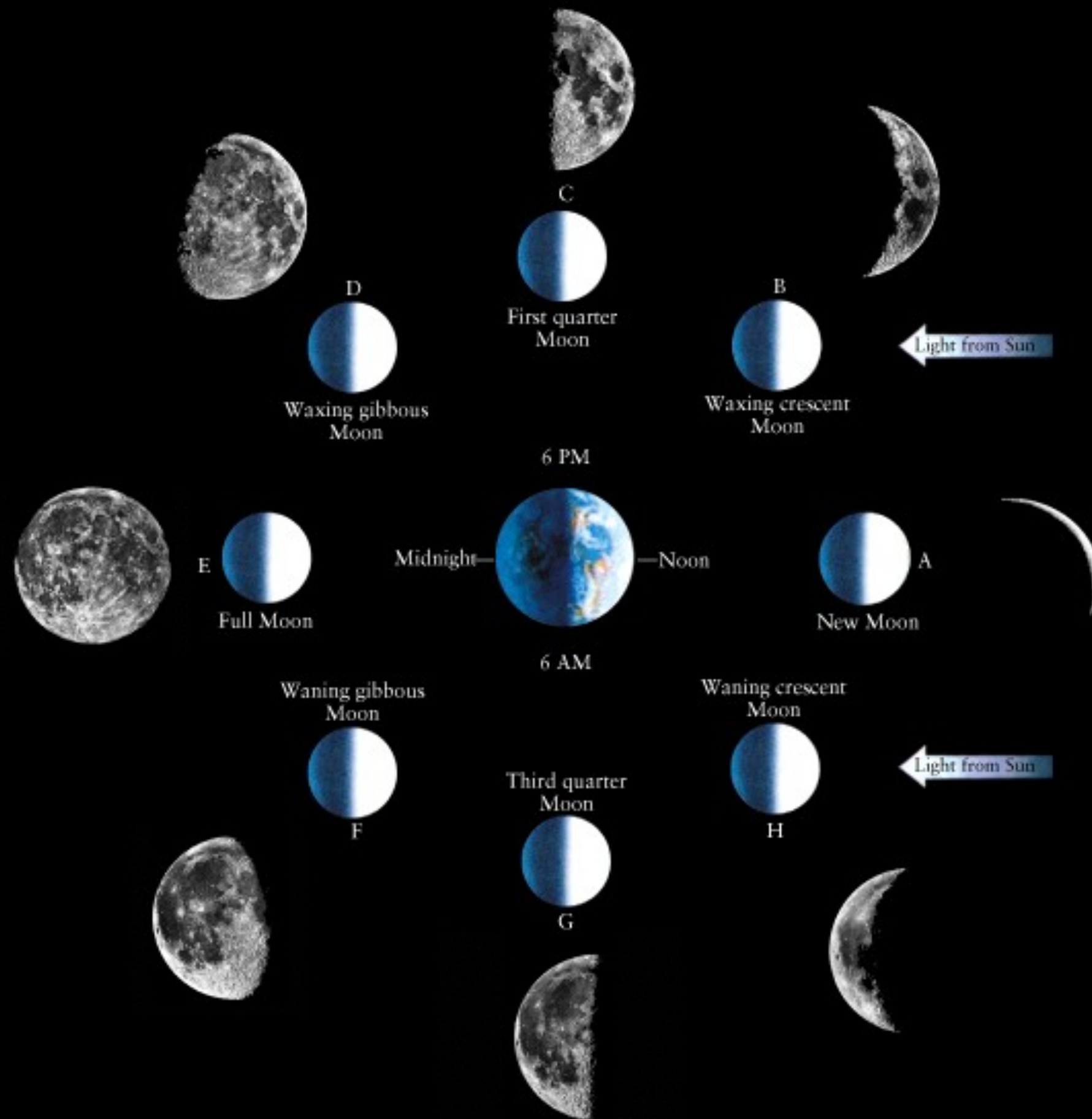


What do we see in terms of moon illumination from Earth?

- What do you see when the moon is at different points in its orbit?
- Draw the moon phases.



Phases of the Moon



Although the Moon is always $\frac{1}{2}$ lit by the Sun, we see different amounts of the lit portion from Earth depending on where the Moon is located in its month-long orbit. ☀

Why do we always see the same side of the
Moon?



Moonrise and set times depend on lunar phase

Phase	Rise	Highest Point	Set
New	6 a.m.	Noon	6 p.m.
1st Quarter	12 Noon	6 p.m.	Midnight
Full	6 p.m.	12 Midnight	6 a.m.
3rd Quarter	Midnight	6 a.m.	Noon