ASTR 101: Introduction to Astronomy
The Solar System

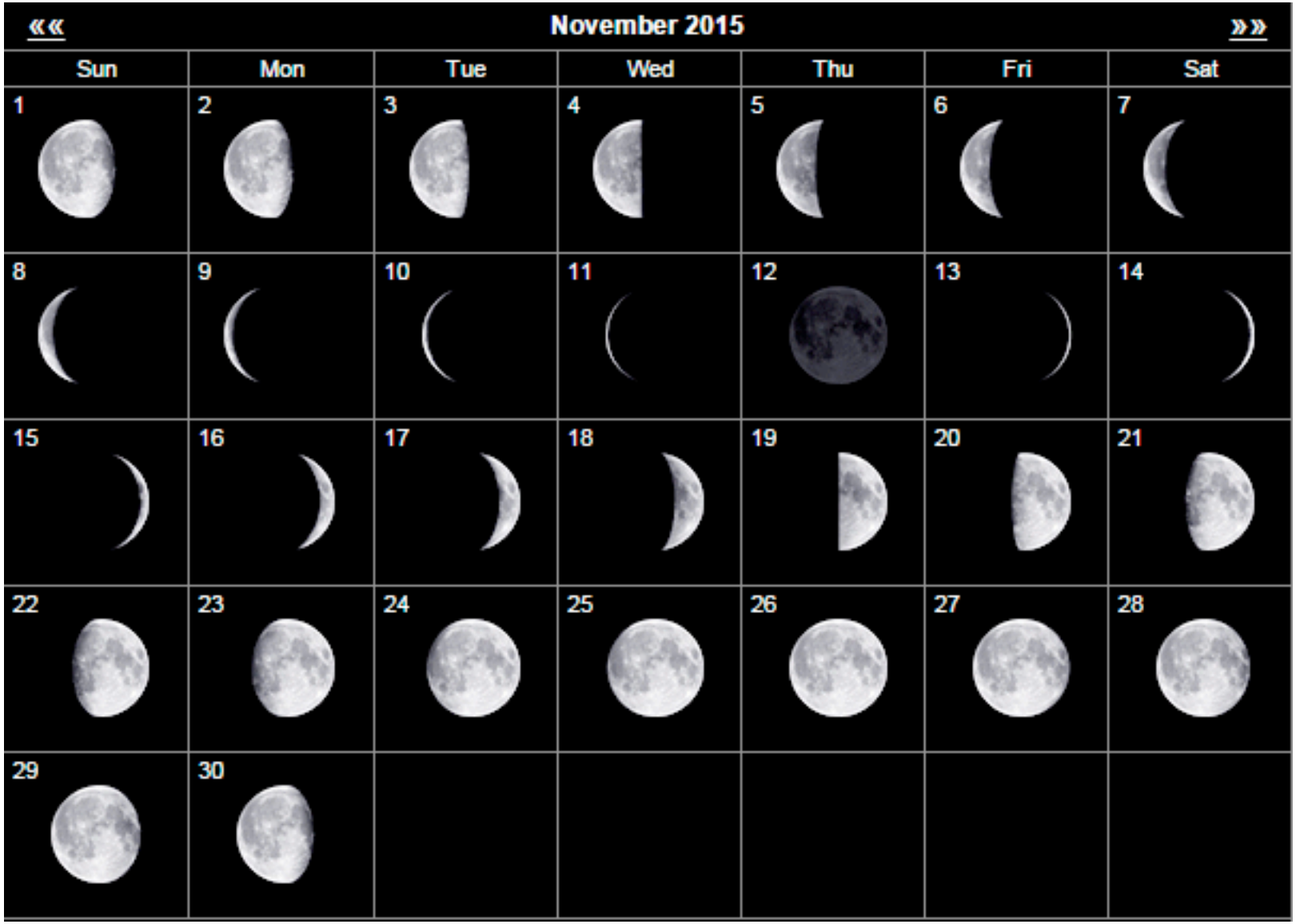
Prof. Colin S. Wallace

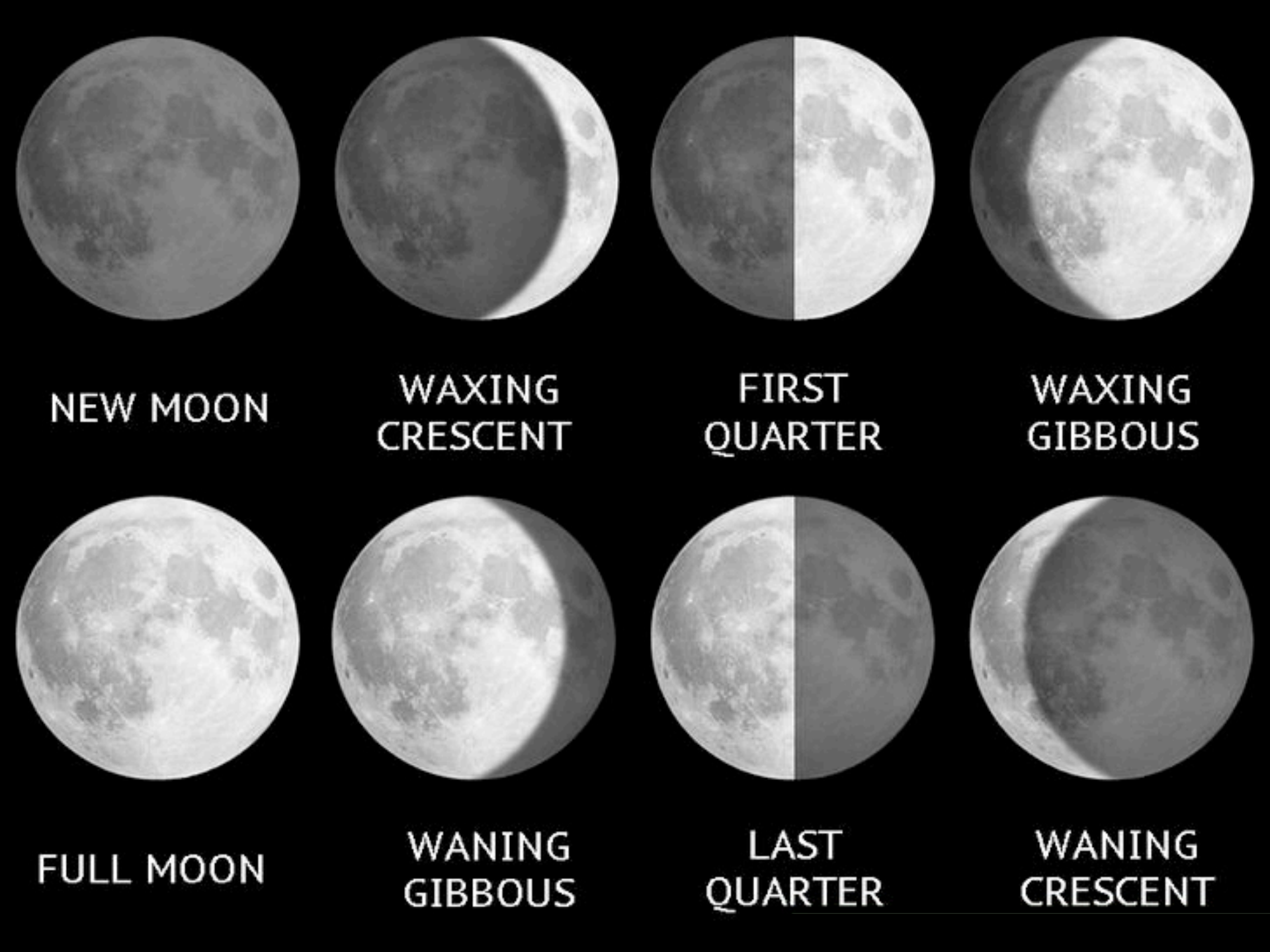
Lecture 9: Moon Phases

August 6, 2018

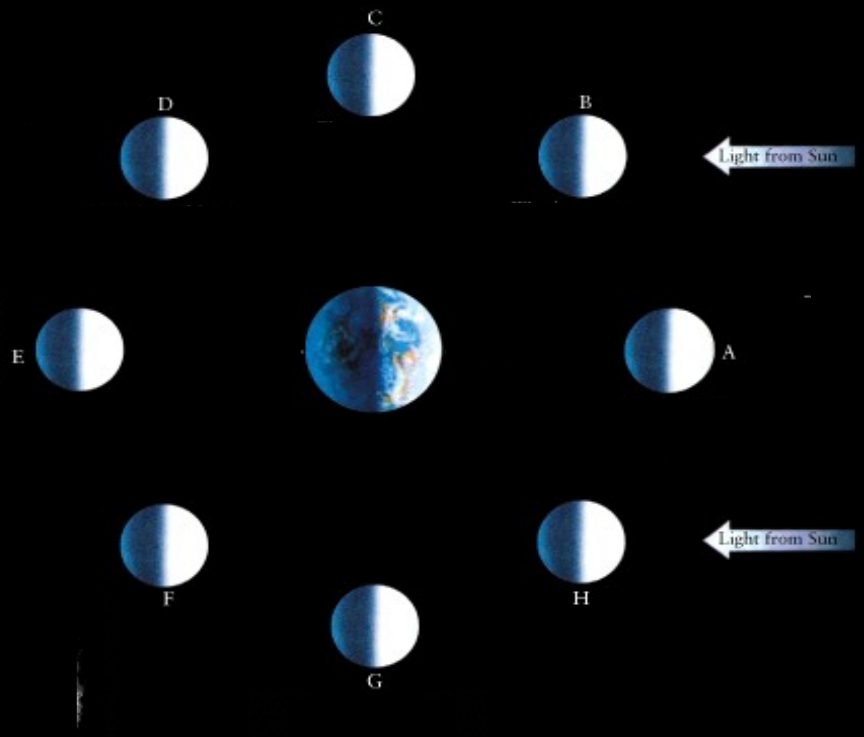
Learning Objectives:

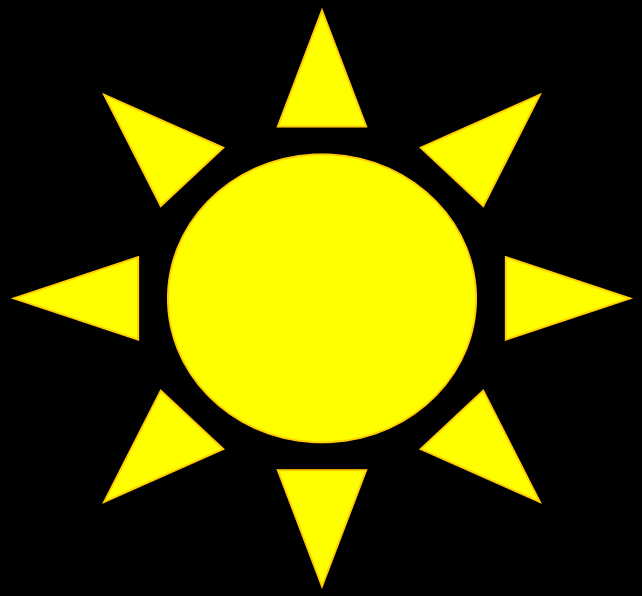
- Identify the phase of the Moon given a picture of the Moon
- Know the order of the phases of the Moon
- Relate the Moon's phase to its location relative to Earth and the Sun
- Determine when the Moon rises, sets, and is highest in the sky based on its phase


«« November 2015 »»
Sun Mon Tue Wed Thu Fri Sat
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


NEW MOON
WAXING CRESCENT
FIRST QUARTER
WAXING GIBBOUS
FULL MOON
WANING GIBBOUS
LAST QUARTER
WANING CRESCENT

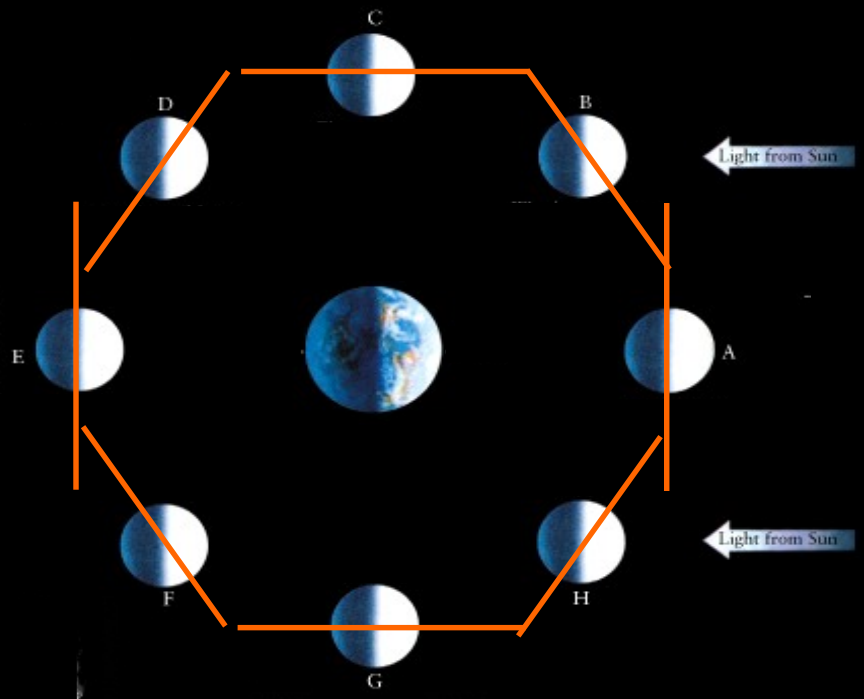
Although the Moon is always ½ lit by the Sun, we see different amounts of the lit portion from Earth depending on where the Moon is located in its orbit.

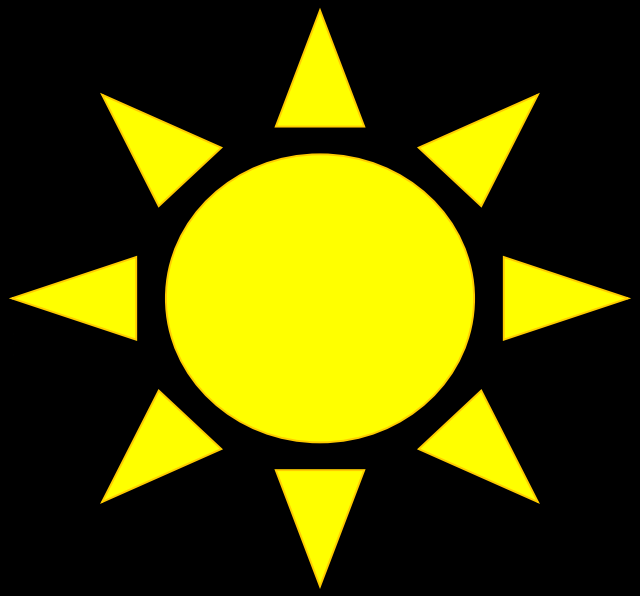




(not to scale)

The lines separate the half of the Moon facing Earth from the half of the Moon not facing Earth.





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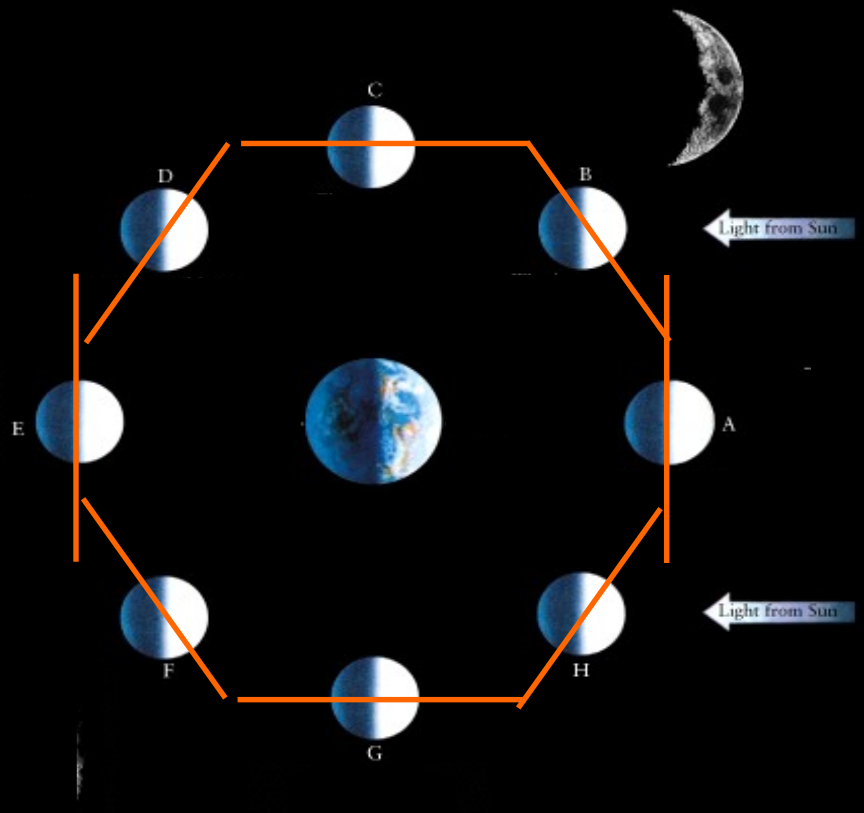

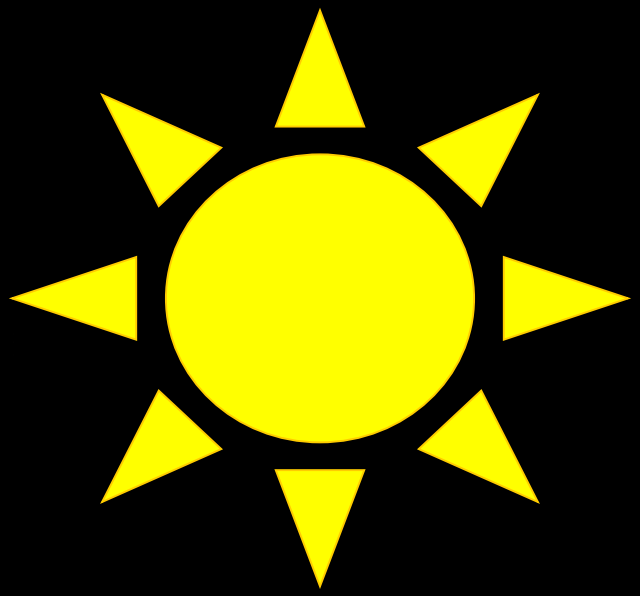

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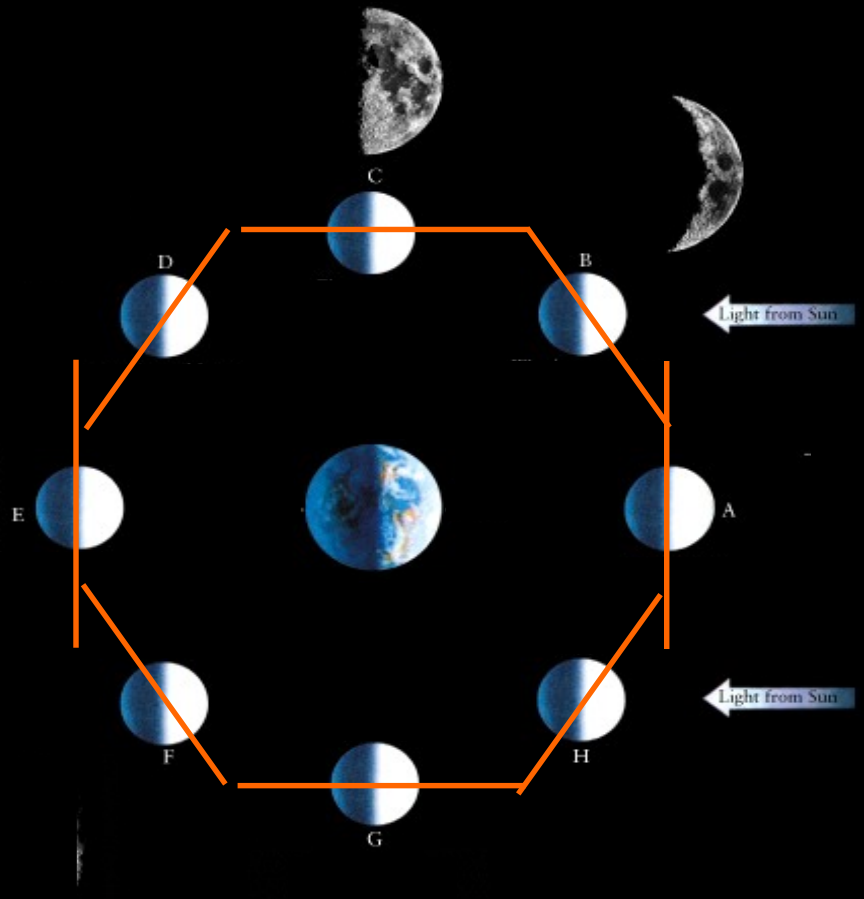

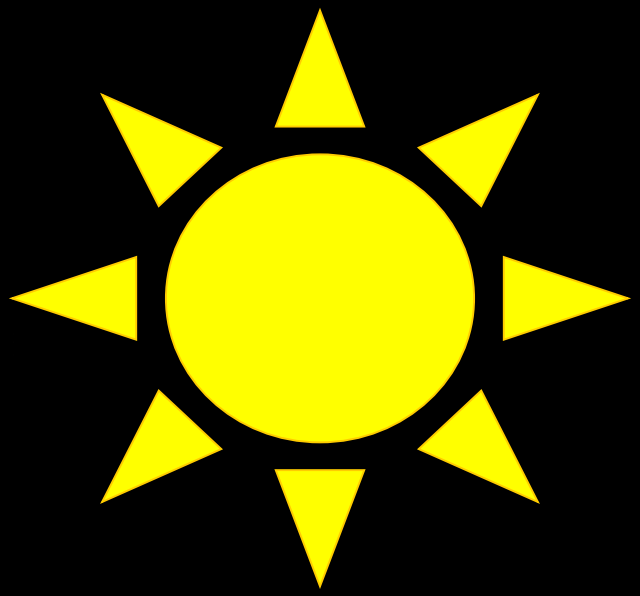

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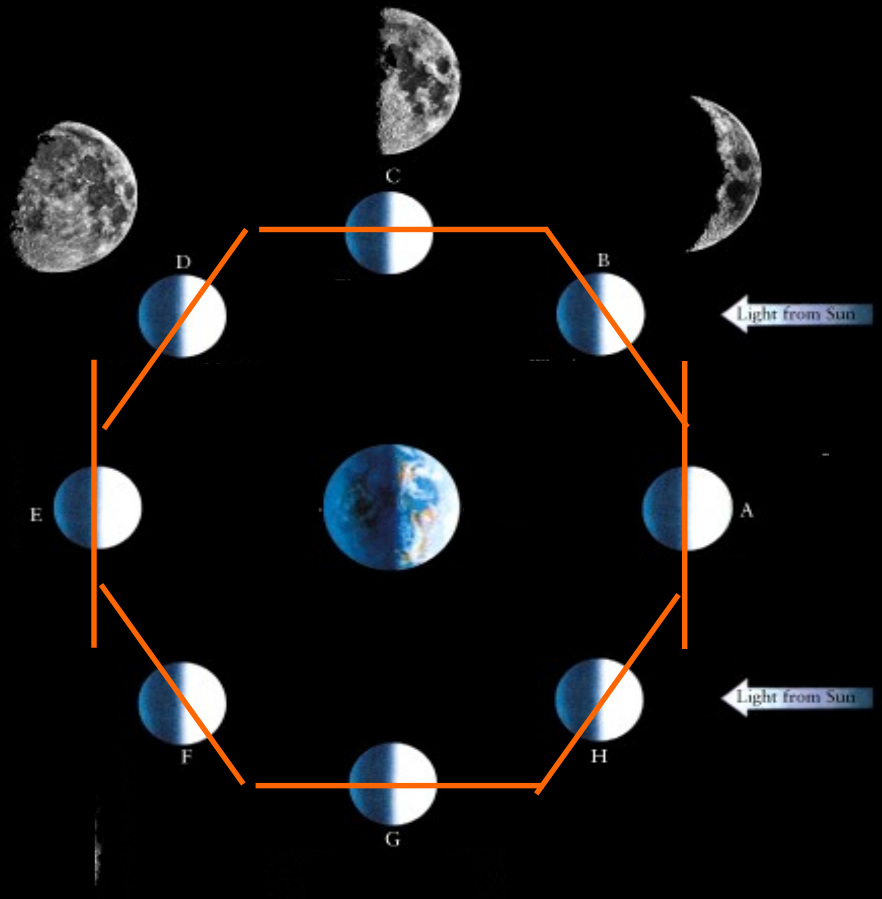

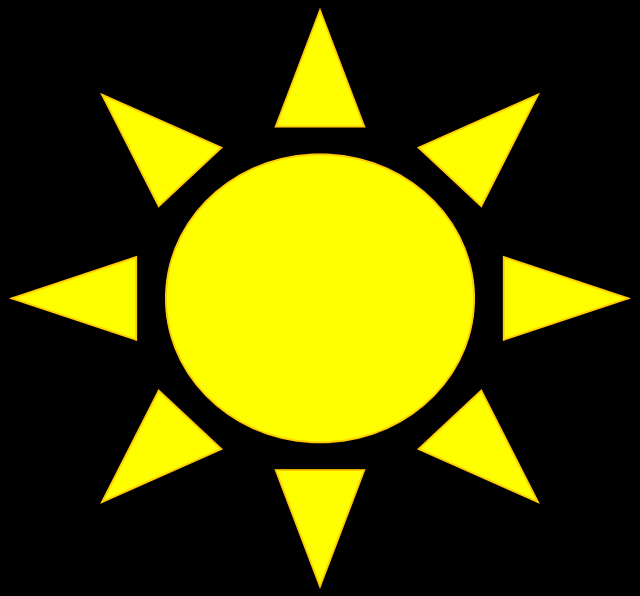

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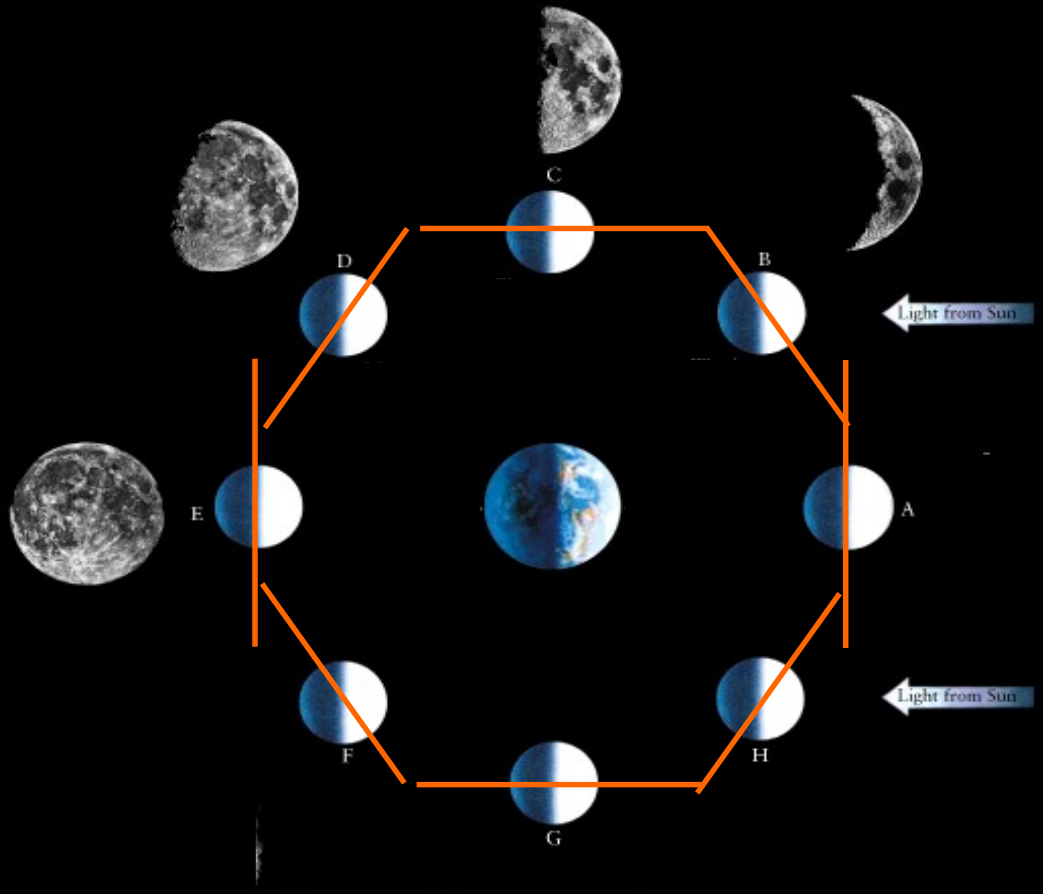

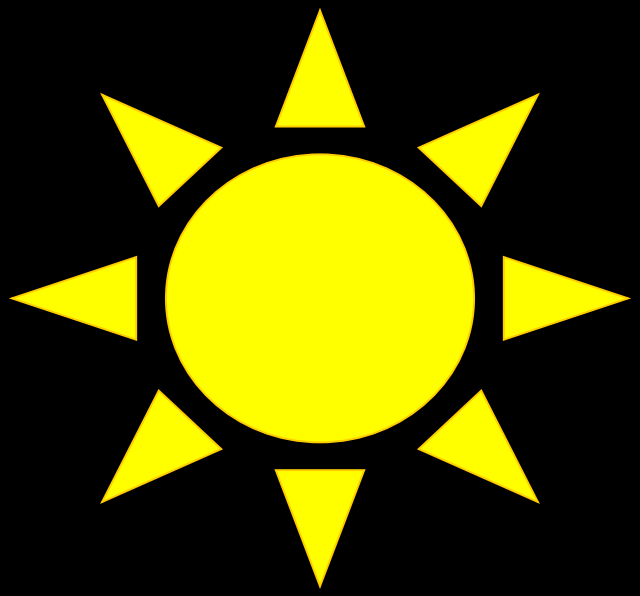

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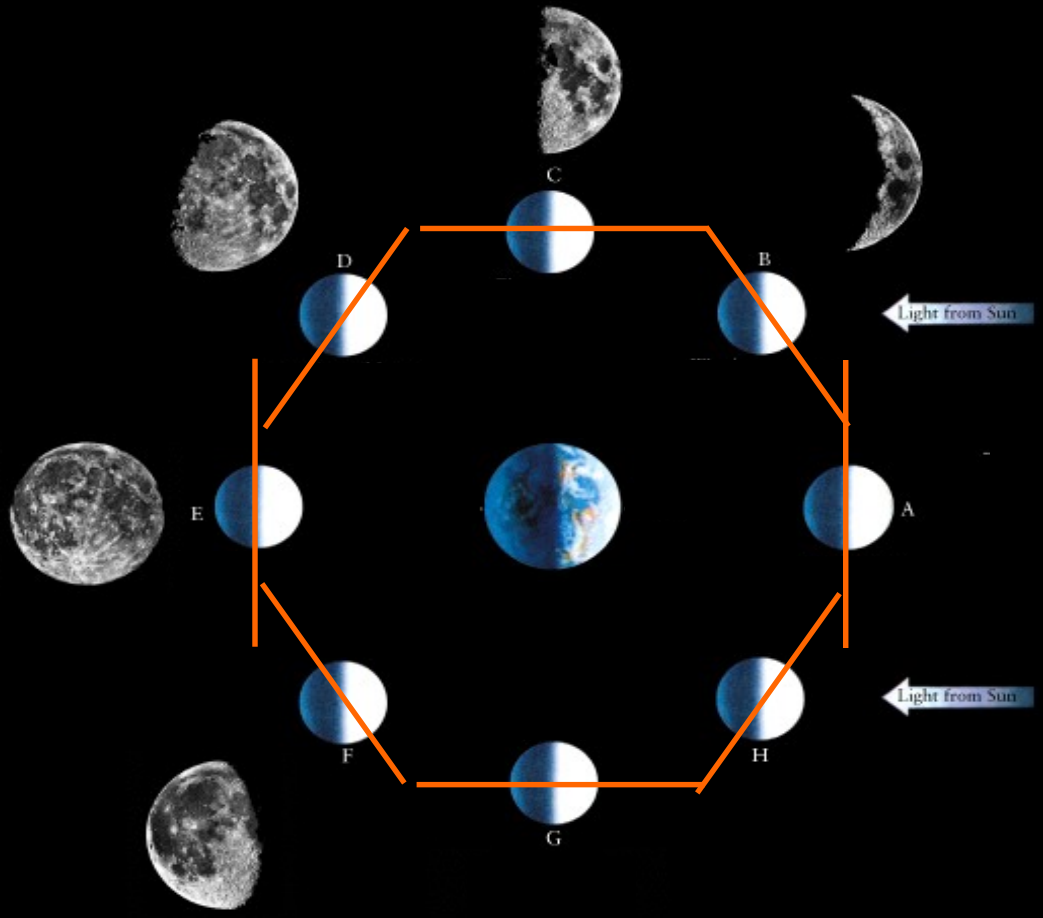

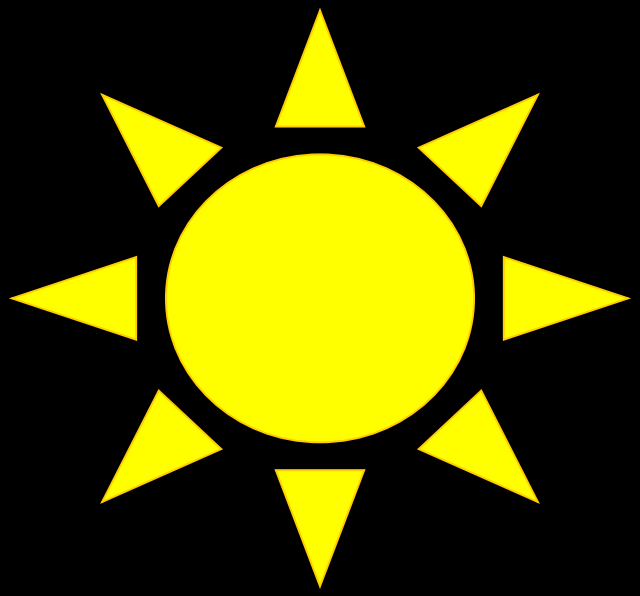

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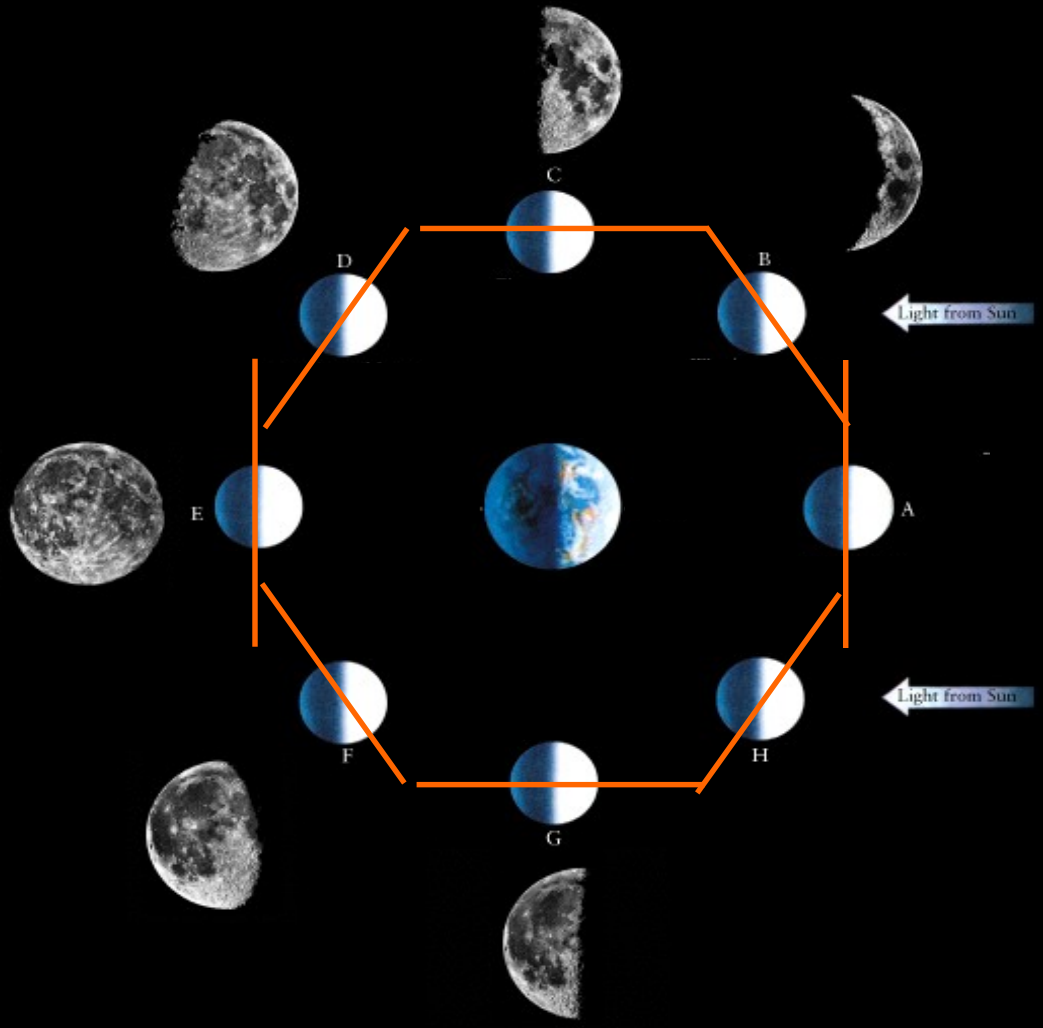

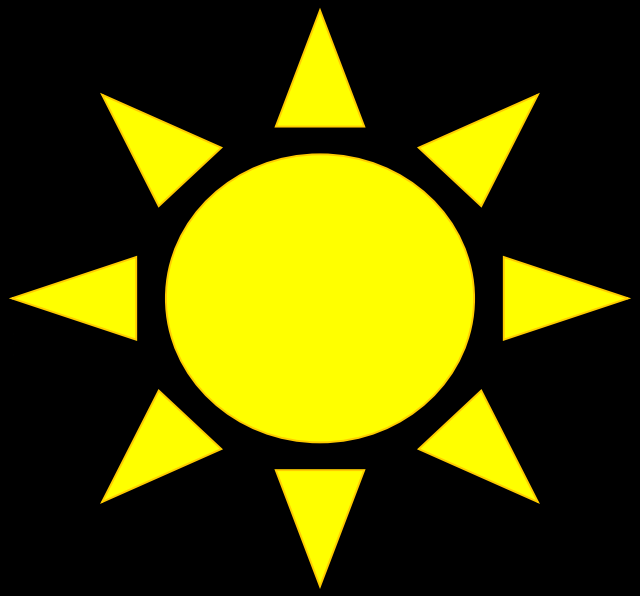

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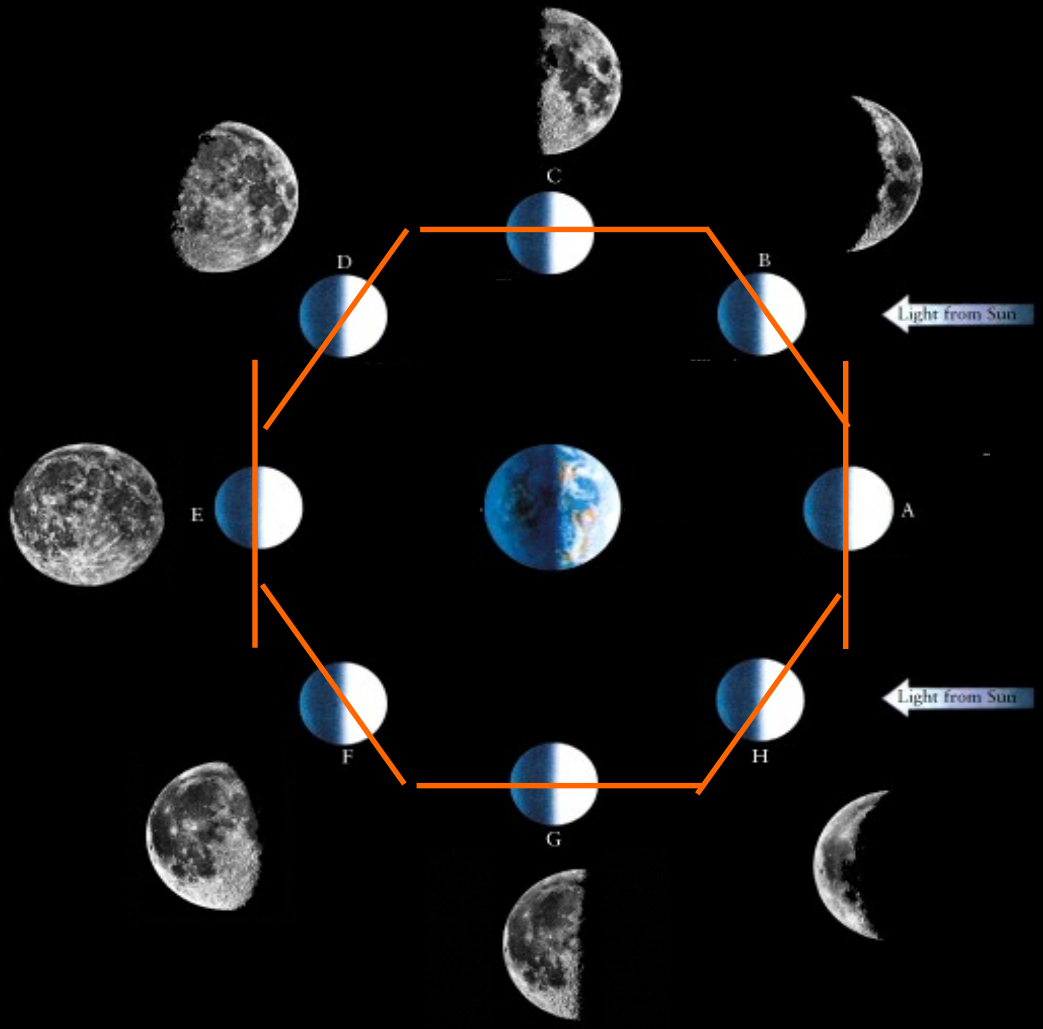

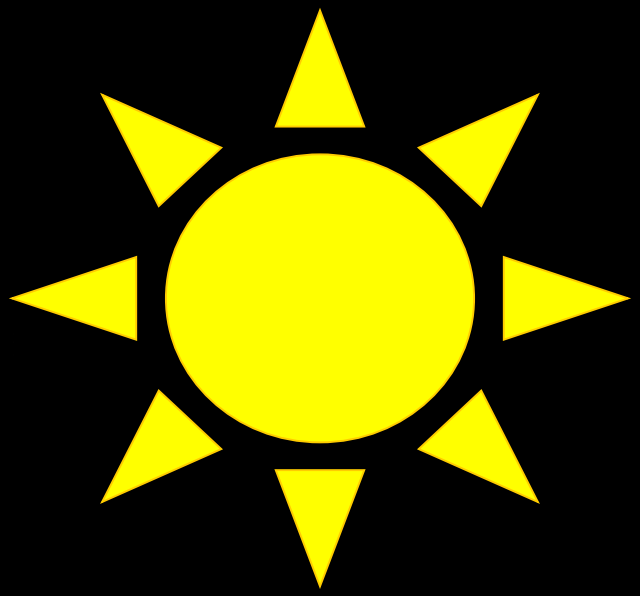

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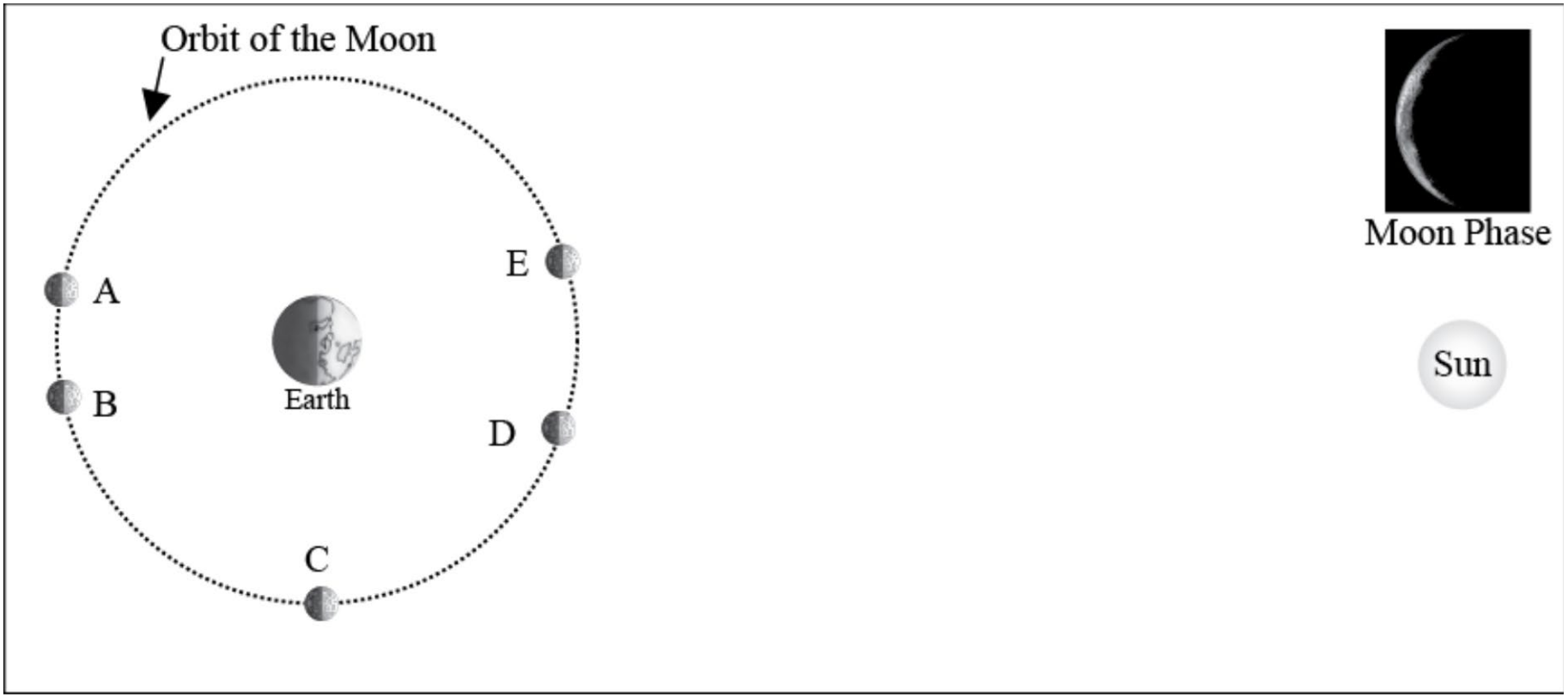
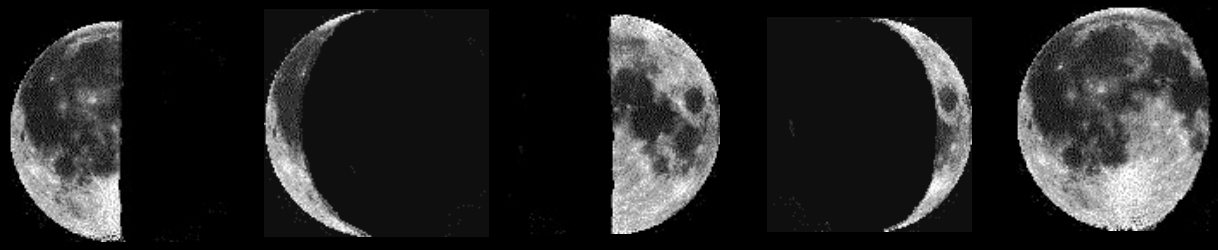
Lecture-Tutorial – Cause of Moon Phases (pp. 81-83)

- Work with a partner.
- Read the instructions and the questions *carefully*.
- Discuss the concepts and your answers with each other. Take the time to understand the material now. It WILL help you on the final exam.
- Come to a consensus on your answer before you both move on to a new question.
- If you are stuck or are not sure of your answer, ask another group.
- If you are really stuck or don't understand what the tutorial is asking, raise your hand and ask for help.

The diagram below shows Earth and the Sun as well as five different possible positions for the Moon. Which position (A-E) of the Moon best corresponds with the Moon phase shown in the upper right corner?

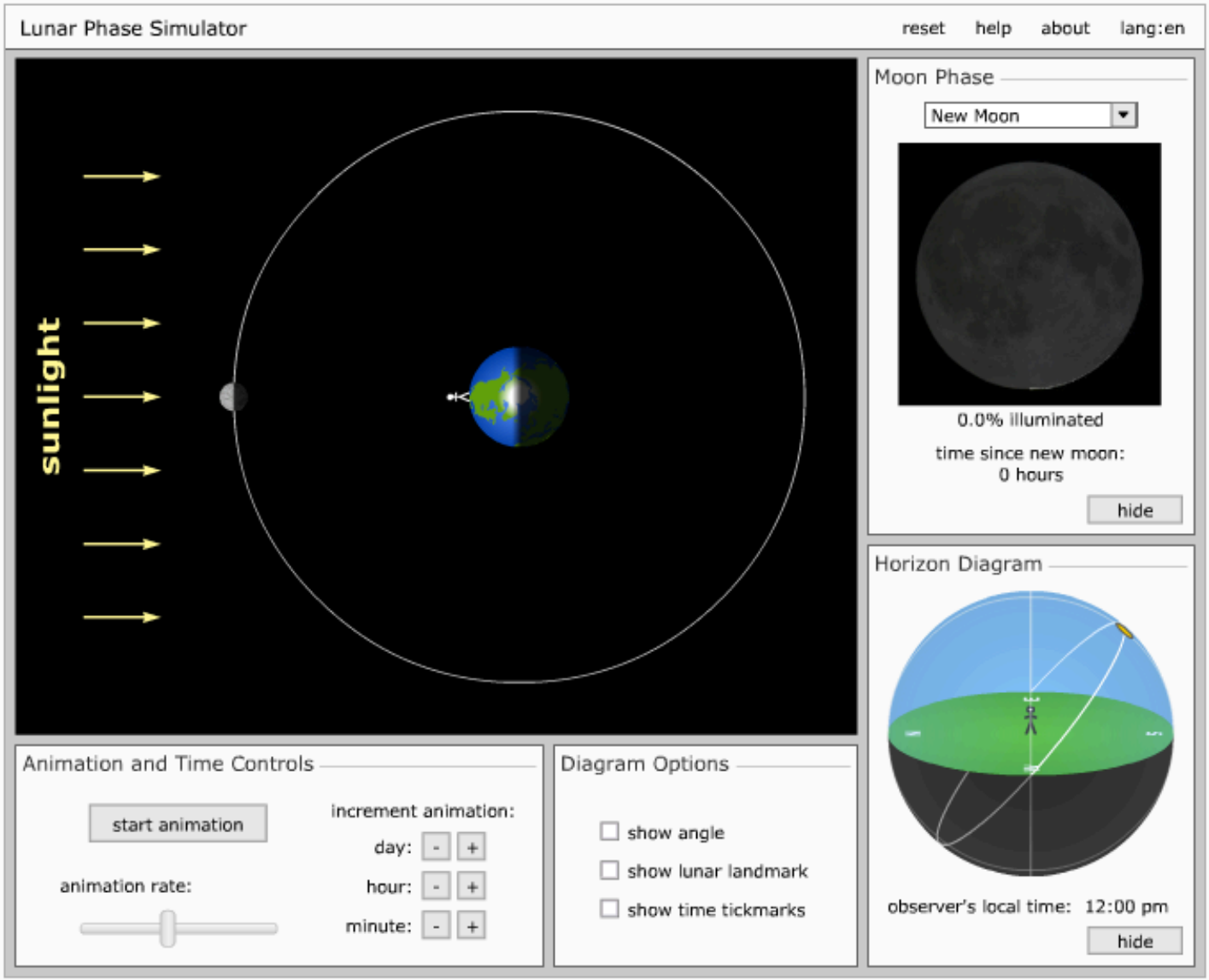


If there is a full Moon today, then how many of the following phases shown below will the Moon go though over the next 11 days?



A) 1
B) 2
C) 3
D) more than 3
E) none

Lunar Phases Simulator:
http://astro.unl.edu/naap/lps/animations/lps.html



Lecture-Tutorial – Predicting Moon Phases (pp. 85-87)

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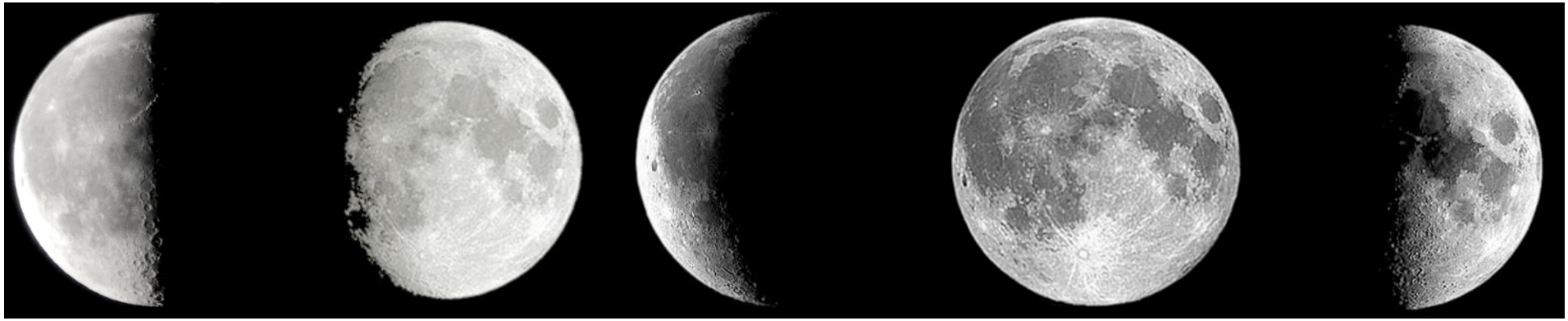
How many of the Moon phases shown below are at or above the horizon at noon?



A) 1
B) 2
C) 3
D) 4
E) 5

Which of the following groups of Moon phases are above the horizon at 9 am?

A) third quarter, waning crescent, and waxing gibbous
B) new, third quarter, and waning gibbous
C) waxing gibbous, full, waning gibbous
D) waxing crescent, first quarter, waxing gibbous
E) none. The Moon can only be seen above the horizon during the night.