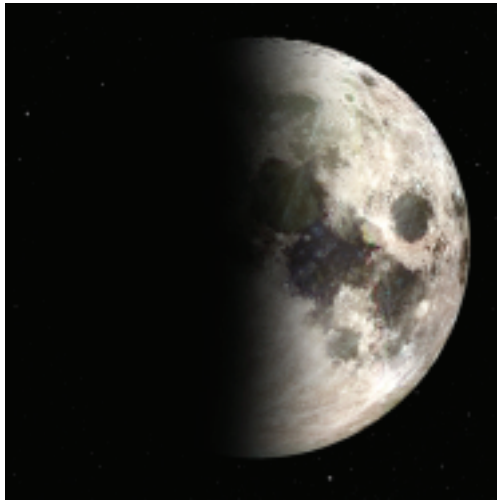
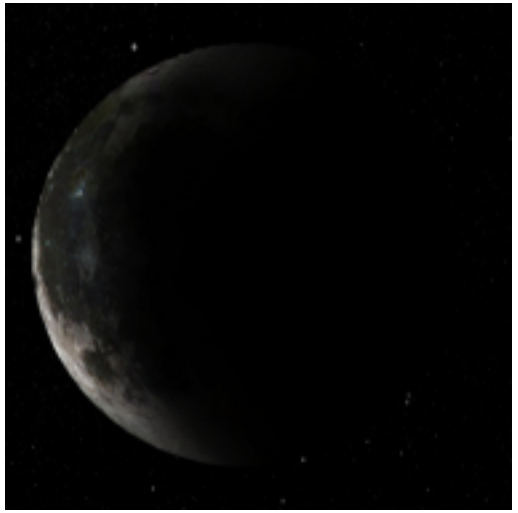
Why is the Moon sometimes bright and sometimes partly shadowed?





The Sun is a source of light. When light shines on a round surface it creates an area of shadow.

Look for the shadows.

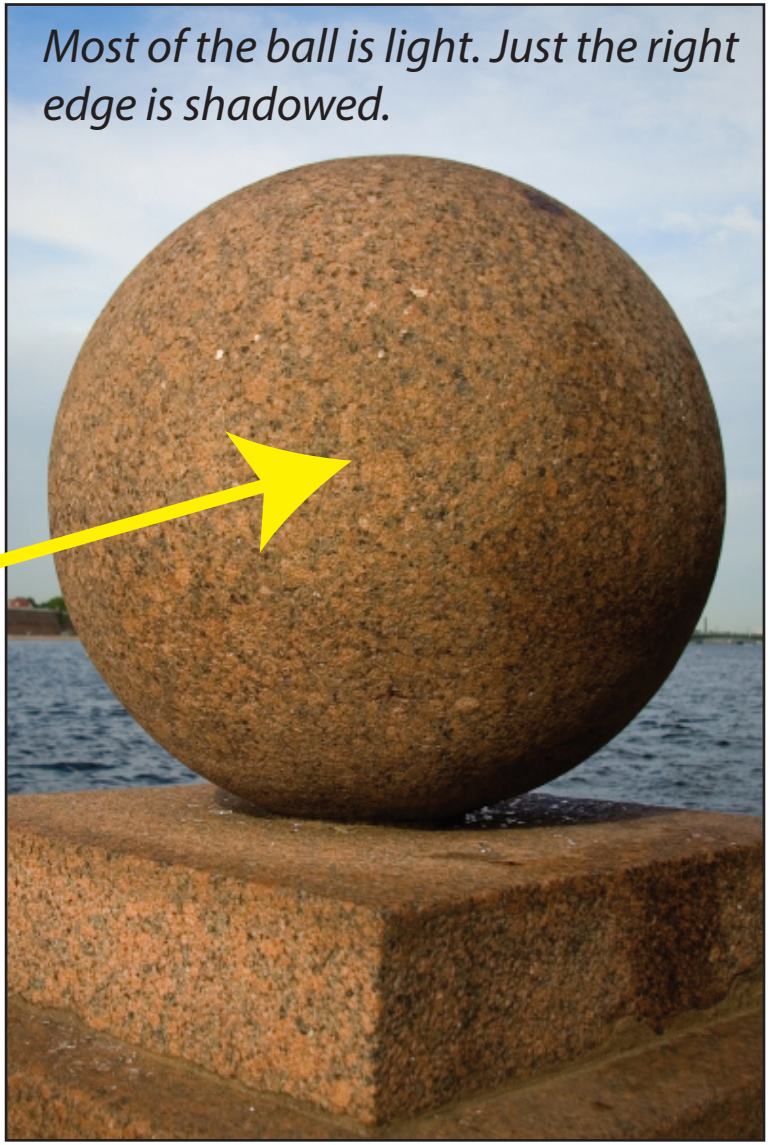
Can you see that only a thin edge of the round rock is shadowed?

What direction is the light coming from?

Here is the same round rock. It is a different time of day so the light of the Sun is coming from a different direction. More of the rock is shadowed. Can you tell where the Sun is?

What do you think would happen if you changed your viewing position?

The amount of shadow we see on the round rock changes when the sunlight comes from a different direction.

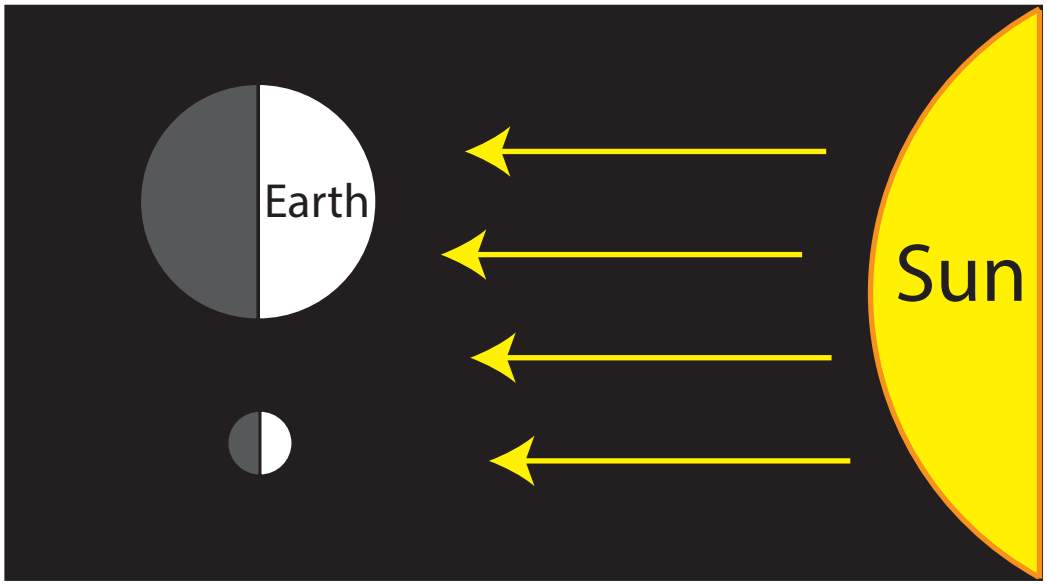


The light is shining from behind the photographer's left shoulder.

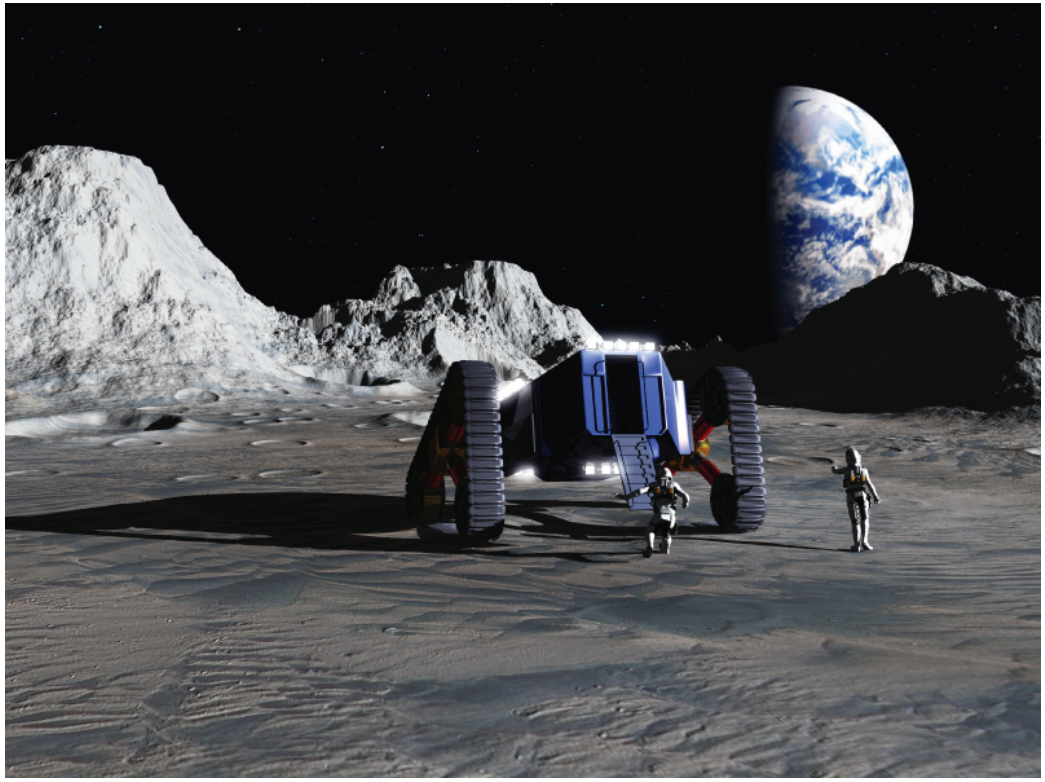
The light is shining from the right side of the photographer.

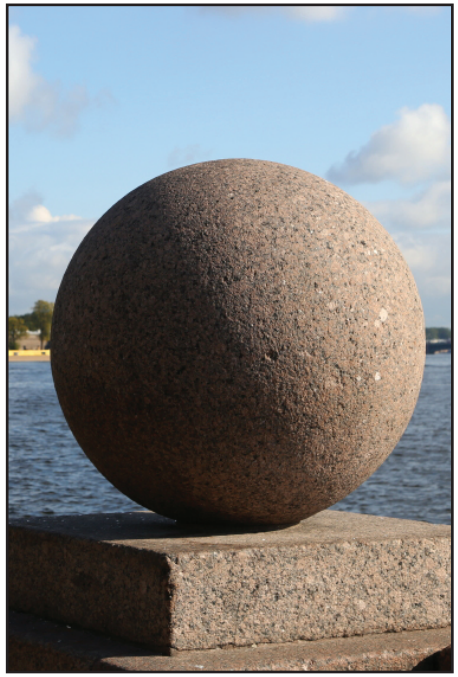
Now imagine some round rocks floating in space...

The Sun appears to move across our sky but the Sun is not moving.
The Earth and the Moon are the ones moving!
The amount of light and shade we see on the Moon changes when it is at different stages of its orbit around us.

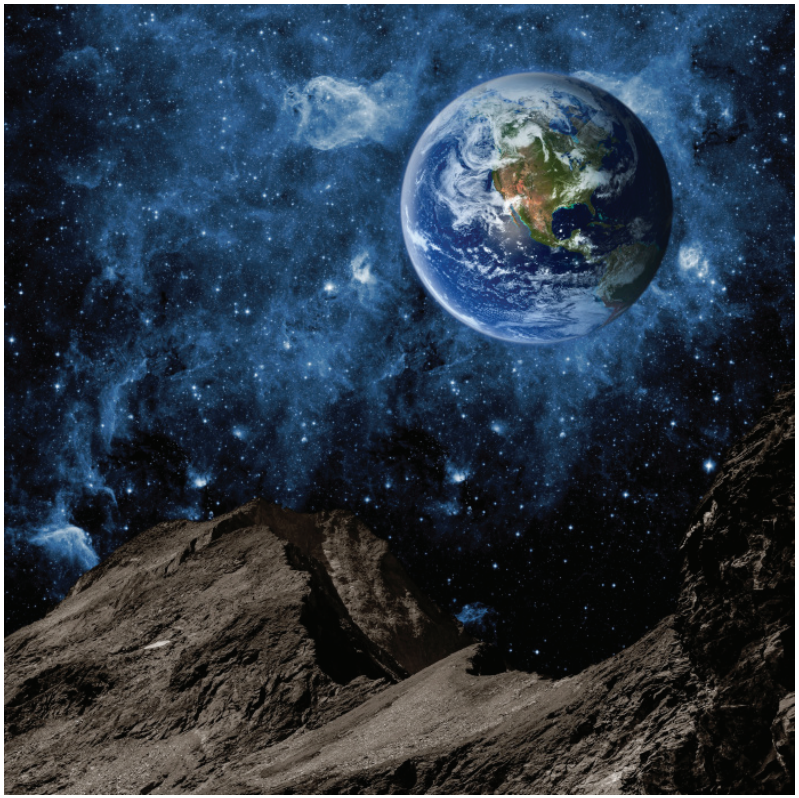


If you were looking at the Earth from the Moon in this position, you would see that the nearest side of the Earth to the Sun would be lit and the other half would be shadowed. The Sun would be to your right.

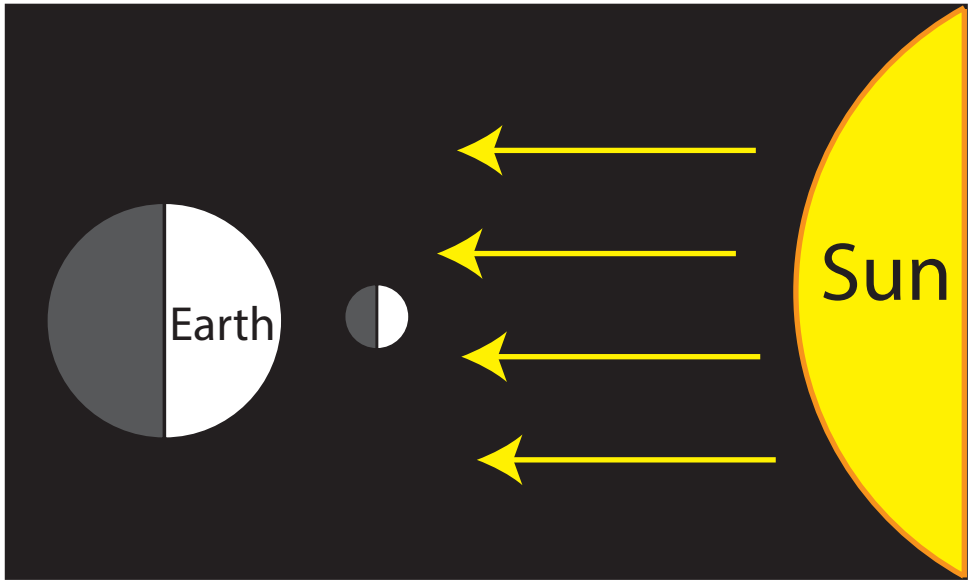


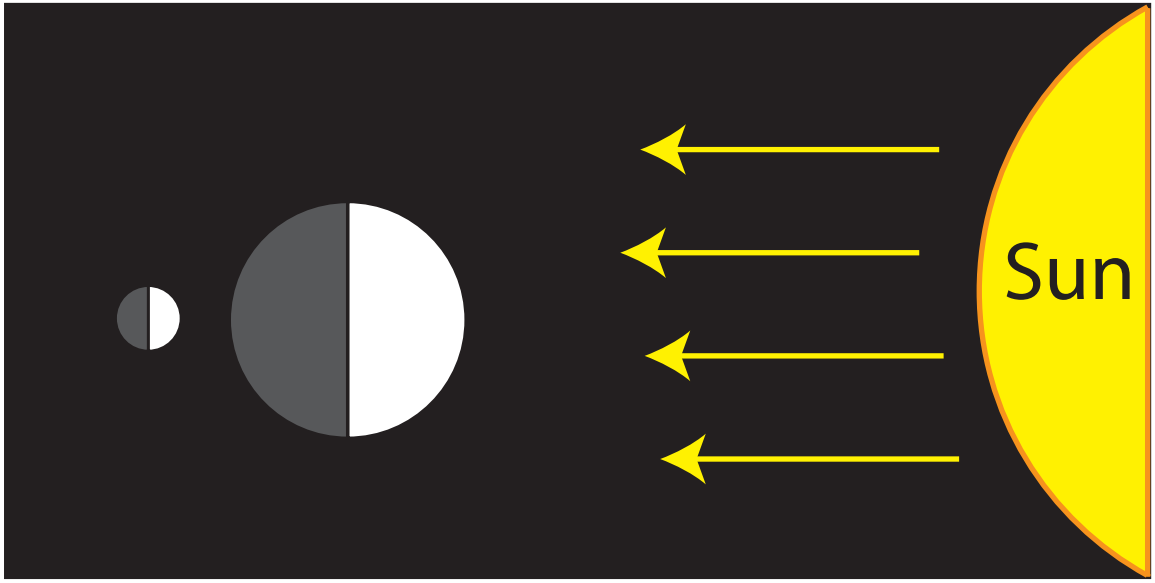


The light is coming from the right, leaving the left side shadowed.



Imagine that the Moon has continued on its orbit and the Sun is now behind you. You would see the whole face of the Earth lit up by the sun.





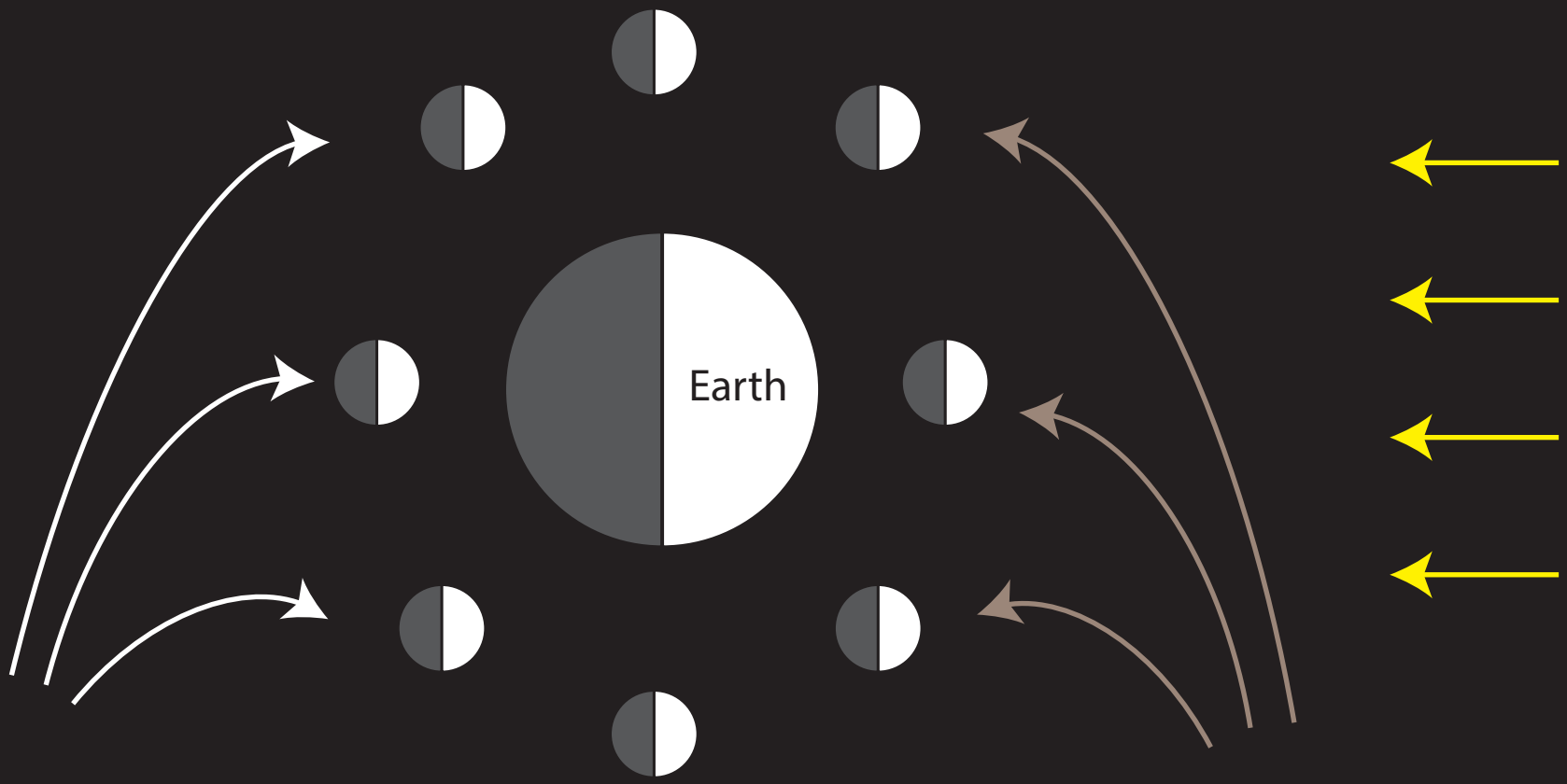
What do you think the Earth would look like from the Moon when it is in this position?

Now think about viewing the Moon from a position on Earth.

When we view the Moon from Earth:

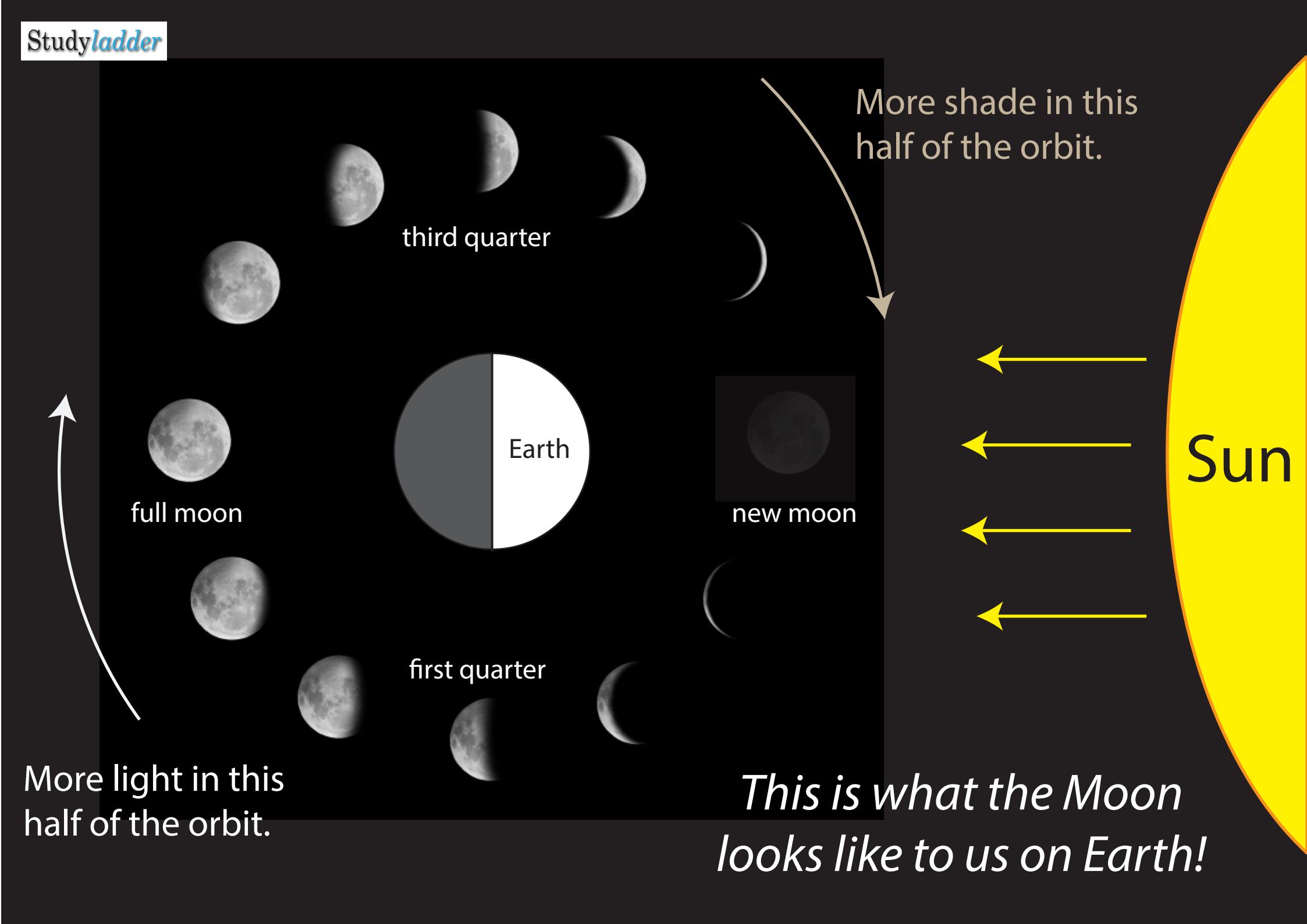
The amount of light and shade we see on the Moon changes as it orbits around us.

The side of the Moon nearest to the Sun is lit and the far side of the Moon is in shade.



We see more light than shade when the Moon is on the far side of our planet.

We see more shade than light when the Moon is between us and the sun.


Studyladder
More shade in this half of the orbit.
third quarter
Earth
full moon
new moon
Sun
first quarter
More light in this half of the orbit.
This is what the Moon looks like to us on Earth!