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Module 3: Our Moon

The Moon is Earth's only natural satellite and plays a crucial role in our planet's tides, climate, and even the way we measure time. It orbits Earth at an average distance of 384,400 km, reflecting sunlight to create the familiar phases we see each month. Unlike the Sun, the Moon doesn't produce its own light—it simply reflects sunlight. As it orbits Earth, we see different portions of its illuminated surface, creating the **phases of the Moon**. These phases change in a predictable cycle due to the Moon's position relative to Earth and the Sun. In this module, we will explore the different **phases of the Moon**, what causes them, and how they impact our world.

The Phases of the Moon

The **phases of the Moon** are the different shapes we see as the Moon orbits Earth. This happens because sunlight shines on the Moon, but we only see the part that is lit up from our point of view on Earth.

There are **eight main phases** of the Moon:

1. **New Moon** – The Moon is completely dark because it's between the Earth and the Sun.
2. **Waxing Crescent** – A small part of the Moon starts to light up on the right side.
3. **First Quarter** – Half of the Moon is lit up on the right side.
4. **Waxing Gibbous** – Most of the Moon is lit up, except for a small dark part on the left.
5. **Full Moon** – The entire Moon is bright and fully visible.
6. **Waning Gibbous** – The Moon starts getting darker on the right side.
7. **Last Quarter** – Half of the Moon is lit up on the left side.
8. **Waning Crescent** – Only a small part on the left is still bright before the Moon becomes dark again.

Then, the cycle repeats! The full cycle takes about **29.5 days**, which is why we see a different shape of the Moon every night.

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Short Answer Questions

Why does the Moon have phases?

What is the difference between waxing and waning?

What is the terminator, and why is it important in understanding the Moon's phases?

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Why is only one side of the Moon always lit and the other always dark?

If today is a Full Moon, what phase will the Moon be in one week from now?

Multiple Choice

1. **What causes the different phases of the Moon?**
   A) The Moon's shadow covering parts of itself
   B) The Earth's shadow blocking the Moon
   C) The Moon's position relative to the Earth and Sun
   D) The Moon changing its shape over time
2. **2. How long does it take for the Moon to go through all its phases (one lunar cycle)?**
   A) 29.5 days
   B) 7 days
   C) 14 days
   D) 365 days
3. **During which phase do we see the entire Moon fully lit?**
   A) First Quarter
   B) Waxing Gibbous

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C) Waning Crescent

D) Full Moon

4. **14. Which Moon phase would be best for stargazing because the sky is darkest?**

   A) Full Moon

   B) First Quarter

   C) New Moon

   D) Waxing Gibbous

5. **19. How much of the Moon is always lit by the Sun, even though we see different phases?**

   A) 50%

   B) 25%

   C) 100%

   D) Only the part we see from Earth

True or False

Answer the following True and False questions. If you answer False explain your reasoning and correct the False statement.

1. **True or False:** The Moon produces its own light, which is why it appears bright in the night sky.

   _____

   _____

   _____

2. **True or False:** Half of the Moon is always illuminated by the Sun, no matter what phase we see from Earth.

   _____

   _____

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3. **True or False:** The phases of the Moon are caused by Earth's shadow covering parts of the Moon.

_____

_____

_____

4. **True or False:** A full Moon occurs when the Moon is on the opposite side of Earth from the Sun.

_____

_____

_____

5. **True or False:** The term “Earthshine” refers to sunlight reflected off Earth that illuminates the dark side of the Moon.

_____

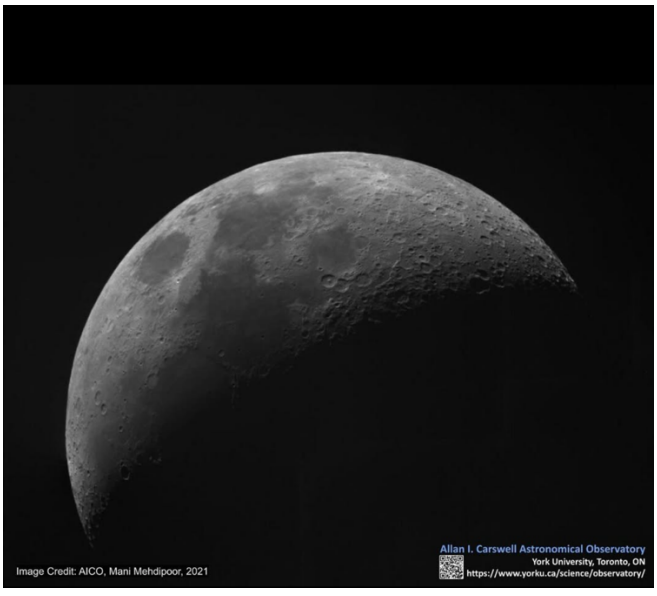
_____

_____

Bonus Question:

What phase of the Moon is shown in the image?

A. Third Quarter
B. First Quarter
C. Waning Crescent
D. Waxing Crescent



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Sources

Moon Phases:

https://youtu.be/AQ5vty8f9Xc?si=DAUZxl3mAzagpyiJ