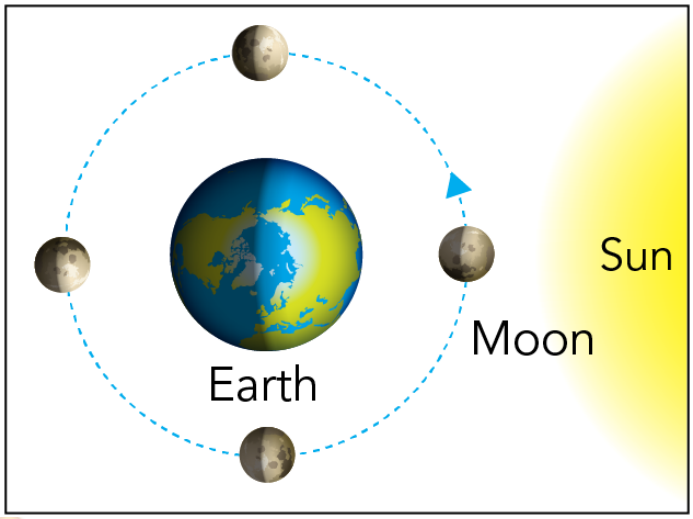
A. Intro to Sun, Earth, & Moon System

Sun, Earth, & Moon System

The Sun, Earth, and Moon are three important parts of our solar system. They work together to create day and night, seasons, tides, and many other fascinating phenomena that affect life on Earth.



The Sun
The Sun is a huge, fiery ball of gas at the center of our solar system. It is so massive that you could fit about 1.3 million Earths inside it! The Sun is incredibly hot, with temperatures reaching millions of degrees Fahrenheit at its core. It is the source of light and heat for our planet and plays a vital role in supporting life on Earth.

The Earth
Earth is our home planet. It is a rocky planet, and it is the only planet in our solar system known to have life. Earth has a solid surface with oceans, rivers, mountains, and forests. It is the third planet from the Sun and takes about 365 days to complete one full orbit around it. This journey around the Sun gives us our calendar year.

The Moon
The Moon is Earth's natural satellite, which means it orbits around our planet. It is much smaller than Earth, and you could fit about 49 Moons inside our planet. The Moon does not produce light on its own, but it reflects the light of the Sun, which is why we can see it shining in the night sky. As the Moon orbits Earth, different parts of it are illuminated by the Sun, giving us the phases of the Moon.

How They Work Together
The Sun, Earth, and Moon interact in various ways, creating many interesting things for us to observe.

Day and Night
As Earth rotates on its axis, different parts of the planet face the Sun. When it is daytime in one location, it is nighttime in another part of the world.

Seasons
Earth's axis is tilted, and as it orbits the Sun, different parts of the planet receive varying amounts of sunlight throughout the year. This is what causes the seasons to change – spring, summer, autumn, and winter.

Tides
The Moon's gravity pulls on Earth, creating tides in the oceans. High tides occur when the water is pulled towards the Moon, and low tides occur when the water is pulled away from it.

Phases of the Moon
As the Moon orbits Earth, the part that is lit up by the Sun changes, which creates the different phases of the Moon – new moon, crescent, first quarter, gibbous, and full moon.

1. What is the source of light and heat for Earth?
    a. Sun
    b. Moon
    c. Earth

2. How many Earths could fit inside the Sun?
    a. About 1.3 million Earths
    b. About 10,000 Earths
    c. About 100 Earths

3. Which planet is known to have life?
    a. Earth
    b. Mars
    c. Jupiter

4. What is the Moon's role in our solar system?
    a. Earth's natural satellite
    b. Source of light
    c. Source of heat

5. What causes day and night on Earth?
    a. Rotation on its axis
    b. Orbit around the Moon
    c. Orbit around the Sun

6. What causes the change of seasons on Earth?
    a. Tilt of Earth's axis and its orbit around the Sun

b. Phases of the Moon
c. Rotation on its axis

7. What creates tides in the oceans?
    a. Moon's gravity pulling on Earth
    b. Sun's gravity pulling on Earth
    c. Earth's rotation on its axis

8. What creates the different phases of the Moon?
    a. Moon's orbit around Earth and reflection of sunlight
    b. Earth's rotation on its axis
    c. Sun's orbit around the Moon

9. How long does it take Earth to complete one full orbit around the Sun?
    a. About 365 days
    b. About 30 days
    c. About 7 days

ANSWERS & EXPLANATIONS

1. Sun
    a. The Sun is a massive ball of gas that emits light and heat through a process called nuclear fusion. Its light and heat reach Earth, providing us with daylight and warmth.

2. About 1.3 million Earths
    a. The Sun is incredibly large and has a diameter of about 1.4 million kilometers. Earth's diameter is about 12,742 kilometers. By dividing the Sun's diameter by Earth's diameter, we get approximately 1.3 million, meaning you could fit about 1.3 million Earths inside the Sun.

3. Earth
    a. Earth is the only planet in our solar system known to support life. It has a unique combination of a suitable atmosphere, water, and a range of temperatures that allow for life to thrive.

4. Earth's natural satellite
    a. The Moon orbits around Earth, making it our natural satellite. Its gravitational pull affects tides and has played an essential role in shaping Earth's history.

5. Rotation on its axis
    a. Earth spins around an imaginary line called its axis. As it rotates, different parts of Earth face the Sun, causing day and night to occur.

6. Tilt of Earth's axis and its orbit around the Sun
    a. Earth's axis is tilted at about 23.5 degrees. As Earth orbits around the Sun, different parts of the planet receive varying amounts of sunlight, leading to the change of seasons.

7. Moon's gravity pulling on Earth
    a. The Moon's gravity exerts a force on Earth, creating bulges of water in the oceans that result in high tides. The gravitational force is stronger on the side of Earth facing the Moon, creating another high tide on the opposite side.

8. Moon's orbit around Earth and reflection of sunlight
    a. As the Moon orbits around Earth, the amount of sunlight it reflects changes from our perspective. This change in illumination leads to the different phases of the Moon that we observe from Earth.

9. About 365 days
    a. Earth takes approximately 365.25 days to complete one full orbit around the Sun. This is why we have a leap year every four years to account for the extra quarter day.