

SOL 4.6 -- SUN, MOON, EARTH

2018 standards

The student will investigate and understand that there are relationships among Earth, the moon, and the sun. Key relationships include

- a. the motions of Earth, the moon, and the sun;
- b. the causes for Earth's seasons;
- c. the causes for the four major phases of the moon and the relationship to the tide cycles; and
- d. the relative size, position, age and makeup of Earth, the moon, and the sun.

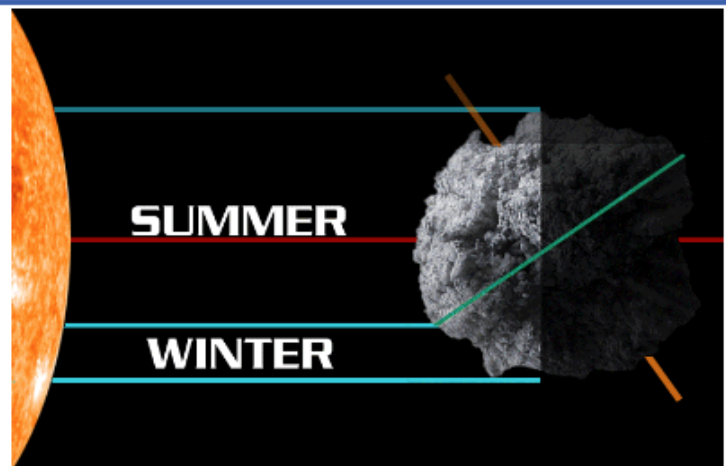


Central Idea: The relationship of the Earth, moon, and sun in the solar system and to each other lead to seasons, tides, and the phases of the moon.

ROTATION, REVOLUTION, TILT

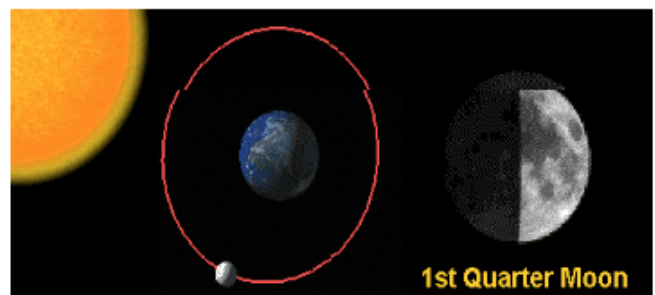
The proximity of the **Earth** to the **sun** and **moon** in our solar system influences Earth systems and enable **life** to exist on Earth.

- The interactions and orientations of the sun, Earth, and moon lead to patterns that are evidenced in **seasons**, **eclipses**, and the **phases of the moon**.
- Earth's **axial tilt** causes the sun's rays to hit the Earth's surface at **different angles**.
 - More **direct rays** are more intense, resulting in **higher temperatures** at those locations.

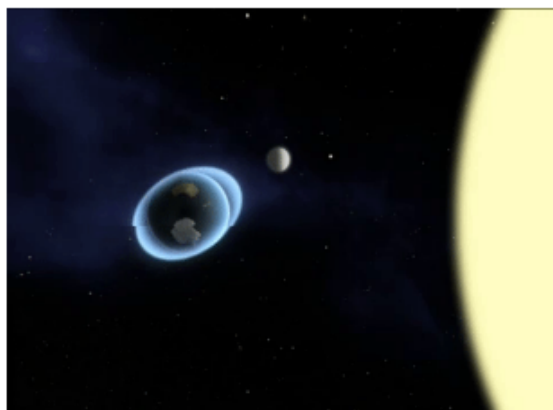


PHASES OF THE MOON

- The **phases** of the moon are caused by its **position** relative to the Earth and the sun.
 - The phases of the moon are caused by the **reflection of sunlight** off the moon's surface and include the following phases:
 - **new, first quarter, full, and last (third) quarter** .



SOL 4.6 Sun, Moon, Earth 2018 standards



Gravity from the moon and sun pulls at the oceans causing tides.

- The **phases** of the moon are responsible for the changes in **tidal range**.
 - Highest **tidal ranges** are associated with **full** and **new moons**, which are when the Earth, moon and sun are **aligned**.
 - The **smallest tidal ranges** are associated with the **first and last quarter**, when the earth, sun, and moon are at **right angles**.



SUN, MOON, EARTH -- SIZE & MAKEUP

- The **sun** is an **average-sized yellow star**, about **110 times the diameter** of Earth.
 - The sun is approximately **4.6 billion** years old.
- Our **moon** is a **small, rocky satellite**, having about **one-quarter** the diameter of Earth and **one-eightieth** its mass.
 - It has extremes of temperature, and no atmosphere or water to support life
- **Earth's surface** is constantly **changing**.
 - Unlike the other three inner planets, it has large amounts of **life-supporting water** and an **oxygen-rich atmosphere**.
 - Earth's protective atmosphere blocks out most of the sun's **damaging rays**.