

SPACE SCIENCE: ASTRONOMY FLIP CARD



Big Idea: Earth is one of many objects in the solar system orbiting the Sun.

The planets in order from closest to Sun to furthest away. Some are small, rocky planets like Earth (Terrestrial latin, “Earth-like”: Mercury, Venus, Mars); some are large planets made of gas like Jupiter (Jovian latin “like Jupiter”: Saturn, Uranus, and Neptune).

Planet	Form	Moons and Rings?	Interesting fact that’s not for the test.
Mercury My	Terrestrial	No—too close to Sun	Travels the fastest; one “year” is longer than one “day” (revolves around Sun before it completes rotation on axis)
Venus Very	Terrestrial	No—too close to Sun	Hot, high pressure, acid atmosphere
Earth Educated	Terrestrial	1—Luna, <u>the</u> Moon	The “Goldilocks” planet—not too hot, not too cold, just right (for water)
Mars Mother	Terrestrial	2—captured asteroids	Has ice water and thin atmosphere; has tallest mountain in the solar system.
Jupiter Just	Gas Giant	4 large, 59 smaller & ring	Twice as large as all the other planets put together.
Saturn Served	Gas Giant	6 large, 54 smaller & rings	Known for its rings
Uranus Us	Gas Giant	3 large, 24 smaller & rings	Orbits on its side; poles have 42 years of light and 42 years of darkness.
Neptune Nachos	Gas Giant	3 large, 10 smaller & rings	Has gaps in rings

Other Solar System Objects:

Moons (natural satellites)—terrestrial or icy bodies that orbit planets, plutoids, and even asteroids.



Plutoids (Dwarf Planets)—Small, icy bodies whose gravity is enough to form them into spheres (circular), but not orbiting in the ecliptic (parallel to the other planets’ paths) in their own orbit.

Comets—a loose collection of ice, dust, and small rocky particles. When close to the Sun it grows a visible coma (a thin, fuzzy, temporary atmosphere), a dust tail, and a gas tail. Comets have orbits that take them from far outside Neptune’s orbit, through the Solar System close to the Sun, and back out again. The orbits take several years. Halley’s Comet, one of the easiest to see, will return in 2061.



Asteroids—rocks and debris which are the leftovers of the construction of our solar system. Most are in a belt which orbits the Sun between Mars and Jupiter, but are much further away from each other than exciting space movies show. Some asteroids have orbits that cross planet orbits, including Earth’s.

Meteors—*Meteoroids* are sand- to boulder-sized particles of debris in the Solar System. The glowing path of a meteoroid that heats up as it enters Earth’s atmosphere is a *meteor*. If a meteoroid reaches the ground and survives impact, then it is a *meteorite*. Many meteors appearing seconds or minutes apart are a *meteor shower*. These usually occur when Earth passes through an area of space where comets leave dust and debris as it crosses Earth’s orbit. The root word *meteor* comes from the Greek “*meteoros*,” meaning “*in the air*.”



The Sun, our star—the center of the solar system, 100 Earths lined up side-by-side equals the width of the Sun. One million (1,000,000) Earths would fit inside it. The Sun’s surface is made of burning gases, with a solar corona extending into space. It provides light and heat energy to the Earth.

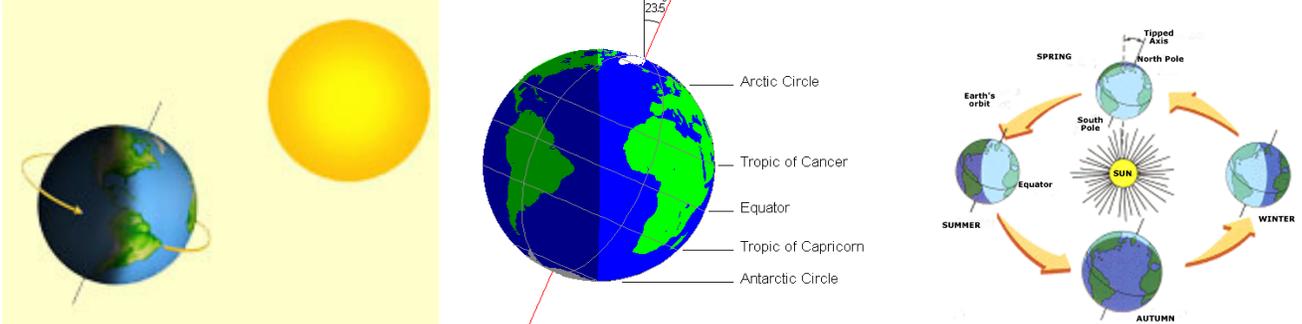
The Moon, our closest neighbor—four Moons side-by-side equals the width of Earth (¼ the diameter of the Earth). It is dry and rocky with many craters, and has no atmosphere. Its gravity creates tide changes on Earth.

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Earth's Movement

Interesting things happen while Earth travels through space . . .

Big Idea: Earth's rotation, tilt, and revolution affect what Earth observers see and experience.



Cause	Rotation Around Axis	Tilted Axis (23.5 degrees)	Revolution Around Sun
Effects	Day and night (24 hours)	Seasons change (every 3 months)	One year (365 ¼ days)
Because	Earth casts its own shadow on the half facing away from the Sun.	Angle of sunlight hitting the Earth's surface changes, changing how much energy it absorbs.	When the Earth reaches the starting point in its orbit, the stars appear the same again.

The SUN, Our Star: 3 Ways the Sun Affects the Earth

Big Idea: The Sun's gravity, heat, and light make life on Earth possible.

Gravity	The Sun's gravity keeps the Earth in an orbit around it. Without the pull of the Sun's gravity, Earth would wander through space, getting very cold when far away from a star, and getting very hot when getting close to a star.
Light and Shadows	When the Sun is close to the horizon at sunrise and sunset, shadows are very long. When the Sun is almost overhead at noon, shadows are shortest. They start long at sunrise, grow shorter until noon, then grow longer again until sunset. Shadows are shortest in the northern hemisphere at noon on June 21st, the first day of summer. Shadows are longest in the northern hemisphere at sunrise or sunset on December 21st, the first day of winter.
Energy	The Sun as a star produces heat and light. Earth receives that heat and light after it travels through space. The Sun is the source of almost all energy on Earth (some energy comes from Earth's own hot core of melted rock, but most of what we use comes from the Sun): <ul style="list-style-type: none"> Plants take the Sun's energy and use it to make food energy (photosynthesis). Some animals eat plants to get energy, and other animals eat those animals. The Sun's energy causes weather conditions on Earth, heating the ground or water to create rising air and evaporating water. The Sun's energy is stored in fossil fuels (for example, coal, oil, or gas) that formed from some organisms that died long ago.

Big Idea: Moon Phases (reflected light from Sun) and Tide Connections (gravity pulls on Earth's water)

New Moon In sky sunrise to sunset	Waxing Crescent After sunrise to after sunset	First Quarter Noon to midnight	Waxing Gibbous Afternoon to after midnight	Full Moon Sunset to sunrise	Waning Gibbous After sunset to after sunrise	Third Quarter Midnight to noon	Waning Crescent Before sunrise to before sunset

“Crescent”—Latin *crescere* (edge)

“Gibbous”—Latin (humped)

“Quarter”—Latin *quarta* (fourth)

“Waning”—Latin *vanus* (vanishing)

“Waxing”—Greek *aux* (growing)

There are **two high tides** and **two low tides** each day due to the **pull of Moon's gravity** on Earth.

“**Spring Tide**”—a very high tide caused by a Full or New Moon.

“**Neap Tide**”—a small change in tides caused by 90 degree difference between Quarter Moon and Sun.