Name: _____ Date: _____

Solar System

Science Literacy Article

Our **solar system** consists of a star, the Sun, and everything else that orbits it including planets, moons, asteroids, meteoroids, and comets. Our solar system formed over *4.5 billion years ago* and is located in the Milky Way galaxy. The planets in our solar system can be divided into two groups which are referred to as the inner planets and the outer planets.

The Inner Planets

The **inner planets** are the four planets located closest to the Sun. These planets are *smaller in size* and have *much smaller masses*. The inner planets are referred to as **terrestrial planets** because they have rocky or solid surfaces. These planets are mostly made up of *heavy metals* and have either *no or few moons*. Let's look at the inner planets, from closest to farthest from the Sun:

1. **Mercury** is the closest planet to the Sun and it is even *smaller than the Earth's moon*. Its close proximity to the Sun makes it the *fastest planet* to orbit the Sun.
2. **Venus** is the second planet from the Sun and is very similar to Earth in terms of its materials and size. Therefore, it is often referred to as "Earth's twin" or "Earth's sister." Venus also has the *longest days* of all the planets due to its *extremely slow rotation*.
3. **Earth** is the third planet from the Sun and has one natural satellite, the Moon. A **satellite** is an object that orbits a planet. The Earth contains a large amount of water on its surface as well as in its atmosphere. It is also the only planet where life is known to currently exist.
4. **Mars** is the fourth planet from the Sun. It has *two moons* and is referred to as the "red planet" due to the *rusty color of its iron-rich soil*. Mars is covered in craters and volcanoes. The largest volcano is three times taller than the highest mountain on Earth.

The Outer Planets

The outer planets are separated from the inner planets by a region of space that contains billions of asteroids and is known as an **asteroid belt**. The outer planets are *larger in size* and have *much larger masses*. These planets are *mainly composed of gases* such as hydrogen and helium and are referred to as **gas giants**. The outer planets all have *dozens of moons* and each also has *rings*, although the rings of some appear very faint. Let's look at the outer planets from closest to the Sun to farthest:

5. **Jupiter** is the fifth planet from the Sun and is the first planet located beyond the asteroid belt. Jupiter is the *most massive planet* in the solar system and has the *shortest days* of all the planets due to its *extremely fast rotation*. It appears to have a giant red spot which is actually a huge storm that has been swirling for hundreds of years.

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6. **Saturn** is the sixth planet from the Sun and is most known for its *clearly defined rings*. Even though Saturn is large in diameter, it is the *least dense* of all the planets in the solar system. It would float in water!

7. **Uranus** is the seventh planet from the Sun and it is unique because it is *extremely tilted and rotates on its side* from top to bottom. Uranus was also the first planet in the solar system to be discovered by the use of a telescope in 1781.

8. The eighth and final planet in our solar system is **Neptune**. It is located *farthest from the Sun* and takes 165 years to orbit the Sun one time. Neptune is nearly four times the size of Earth and has the *most violent winds* of all the planets in the solar system.

The Motion of the Solar System

Gravity governs the motion of all objects throughout the universe. **Gravity** is the force that pulls all objects with mass toward one another. The greater the mass of an object, the *greater amount of gravitational force* the object has. In our solar system, the inner planets tend to have less gravitational force because they have smaller masses. The outer planets have a greater gravitational force which explains why each has dozens of moons in orbit around them. In our solar system, the Sun has the greatest mass of any object. Therefore, *the Sun has the most gravitational force* which explains why the planets revolve around it.

Mass and Weight: What's the Difference?

When studying the solar system, it is also important to understand the difference between mass and weight. **Mass** is the amount of matter in an object. An object's mass *does not change* from one location to another. For example, an object's mass on Earth will be exactly the same as the mass of the same object if placed on another planet. However, an object's weight can change from one location to another. **Weight** is a measure of the force that gravity exerts on an object. The *greater the gravitational force*, the *greater the weight* of an object. For example, Jupiter has more mass than the Earth and has a greater gravitational force. Therefore, *an object's weight on Jupiter would be much greater than the same object here on Earth*.

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