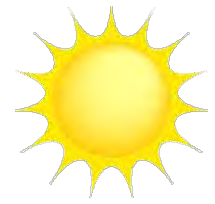




Pocket Solar System



Make a miniature model of Earth's neighborhood!

Our Solar System is made up of the Sun and all the smaller objects that move around it, including eight planets and many dwarf planets, moons, asteroids, and comets.

Materials Needed:

Paper, ruler, scissors, tape or glue, colored pencils or markers.

Instructions:

Step 1: Cut strips of paper about 7.5 cm (3 inches) wide. Tape or glue them together to make a strip one meter (39 inches) long.



Step 2: Draw the edge of the sun on one end of the paper, and the Kuiper Belt at the other end.

Hint: Draw the edge of the sun as close to the end of the paper as you can. This will make the following steps easier.



Step 3: Follow the steps on the *Folding Instructions* sheet to add planets and asteroids. Try to predict where each one goes!

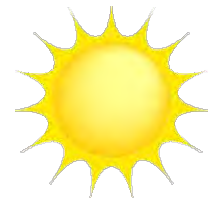
Look at the *What's in the Solar System?* sheet for pictures and descriptions of each one. For younger children, you can choose to draw all the objects, or just a few.

Step 4: Try adding in moons orbiting the planets, comets and asteroids orbiting the sun, or spacecraft exploring the solar system. Be creative!





Pocket Solar System: Page 2



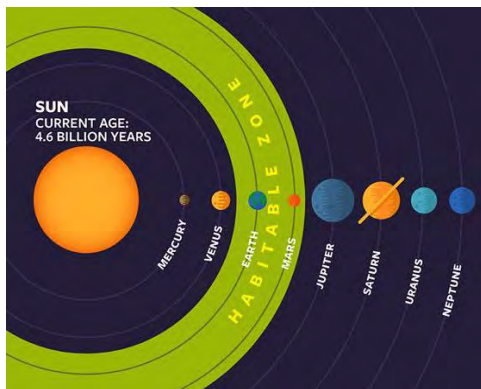
Think and Discuss:

- ★ Were the planets where you expected them to be? Did anything surprise you?
- ★ How are the planets similar?
How are they different?
- ★ What is special or unique about Earth's place in the Solar System?
- ★ What do YOU want to know about the Solar System?



Image: NASA/JPL.

The Habitable Zone



Sizes and distances not to scale.
Image: Cornell University.

Earth is in the Sun's *habitable zone* (also called the Goldilocks zone): the area around a star where the temperature is just right for a planet to have liquid water. If Earth were closer to the Sun, it would be so hot that water would boil away. If Earth were farther away, all its water would freeze into ice. Our planet is not too hot and not too cold; it's just right!

Since liquid water is a key ingredient for life as we know it, scientists think planets in a star's habitable zone are a good starting place to search for life beyond Earth.

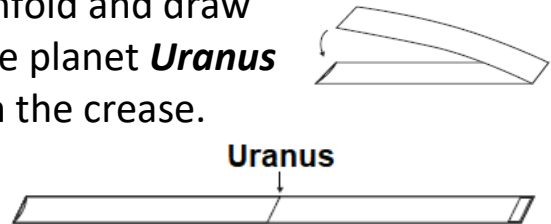
Watch a video to discover more about the habitable zone:
exoplanets.nasa.gov/resources/1062/qalien-whats-a-habitable-zone/

Pocket Solar System: Folding Instructions

Step 1: Draw the edge of the **Sun** on one end of the paper, and the **Kuiper Belt** at the other end.



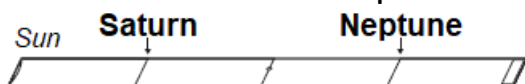
Step 2: Fold the paper in half. Unfold and draw the planet **Uranus** on the crease.



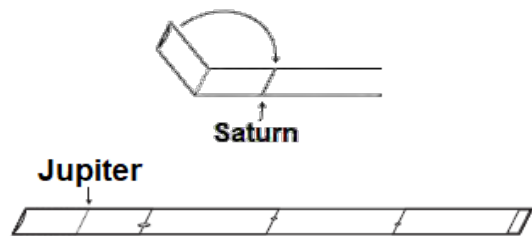
Step 3: Fold the paper in half, then in half again. Unfold.



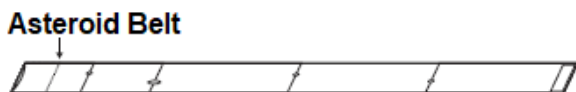
Draw **Saturn** on the crease closest to the Sun. Draw **Neptune** on the crease closest to the Kuiper Belt.



Step 4: Fold the sun to meet Saturn. Unfold and draw **Jupiter**.



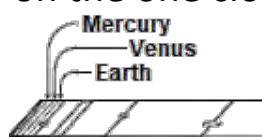
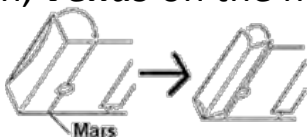
Step 5: Fold the Sun to meet Jupiter. Unfold and draw the **Asteroid Belt**.



Step 6: Fold the Sun to meet the Asteroid Belt. Unfold and draw **Mars**.



Step 7: Fold the Sun to meet Mars. Fold this section in half again. Unfold; you should have three creases. Draw **Mercury** on the crease closest to the Sun, **Venus** on the next one, and **Earth** on the one closest to Mars.



Your Solar System is complete!

Note: This model shows the planets lined up; in reality, the planets are usually scattered around the Sun along their orbits.

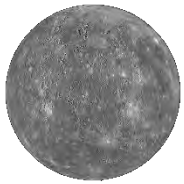
What's in the Solar System?

The solar system is made up of eight planets and many other objects orbiting the sun. In addition to planets, there are dwarf planets, moons, comets, asteroids, dust, and gas, all influenced by the gravity of the Sun.

The scale model you made shows how far away the planets and Sun would be if the entire solar system were shrunk down! The model shows the planets lined up; in real life, the planets are usually scattered around the Sun along their orbits.



The Sun (also called Sol) is a star. There are lots of stars, but the Sun is the closest one to Earth. It is the center of our solar system, and its gravity holds the solar system together. The Sun's warmth and light makes life possible on Earth.



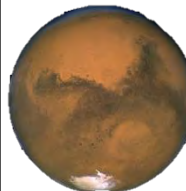
Mercury is the closest planet to the Sun. It is the smallest planet in the solar system: it's only a little bigger than Earth's moon. Its surface is covered in craters.



Venus is the hottest planet. It has a thick atmosphere full of carbon dioxide, and sulfuric acid clouds. Venus spins in the opposite direction than Earth does!



Earth is our home planet. Water covers 70% of the surface. The atmosphere has oxygen for us to breathe, and it's the only planet we know of that supports life.



Mars is a cold desert world. It is half the size of Earth. Mars appears red because of rusty iron in the ground. Mars has polar ice caps, volcanoes, and canyons.

The **Asteroid Belt** is an area between the orbits of Mars and Jupiter where there are lots of asteroids: rocky objects that orbit the Sun and are much smaller than planets. While most asteroids are in the Asteroid Belt, they are found all over the solar system.



Note: Images are not to scale. Photos and information from NASA.

What's in the Solar System?



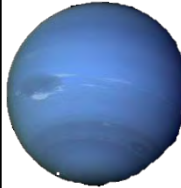
Jupiter is the biggest planet in our solar system. It is a gas giant, without a solid surface. It has a giant storm called the Great Red Spot. Jupiter has at least 79 moons!



Saturn is known for its beautiful rings, made of chunks of ice and rock. Saturn is very light; it would float in water (if there was a bathtub big enough)!



Uranus is the only planet that rotates on its side. The methane in its atmosphere makes it appear blue. Uranus also has rings, but they are faint and hard to see.



Neptune is the most distant planet from the Sun. It is made of a thick fog of water, ammonia, and methane over a solid core. It has a thick, windy atmosphere.

The **Kuiper** (*ky-purr*) **Belt** is a ring of icy bodies outside of Neptune's orbit. **Pluto** is the most famous object in the Kuiper Belt. Pluto is a *dwarf planet*; these objects are much smaller than the eight "regular" planets. There are four other dwarf planets: Ceres, Eris, Makemake, and Haumea.



Pluto



Haumea



Moons, also known as natural satellites, orbit planets and asteroids. There are more than 200 moons in our solar system. Moons come in many shapes, sizes and types.

Comets are balls of frozen gases, rock and dust that orbit the Sun. As a comet gets closer to the Sun, some of the ice starts to melt and boil off, along with particles of dust. This forms a tail that stretches for millions of miles.



People have sent many **spacecraft** to study the solar system. There are satellites orbiting planets and moons, rovers on the surface of Mars, and probes flying to the edge of the solar system!

Learn more about the solar system at

spaceplace.nasa.gov/menu/solar-system/

Note: Images are not to scale. Photos and information from NASA.