



Try This at Home Science: Pocket Solar System

Activity Overview:

Make a model of our solar system that you can take with you anywhere you go!

Materials:

- 3-foot piece of receipt paper, or long strip of paper at least 2 inches wide
- Scissors
- Pencil
- Solar system print-out (included) or markers/colored pencils
- Tape or glue
- Folding Guide (included)

Try this!

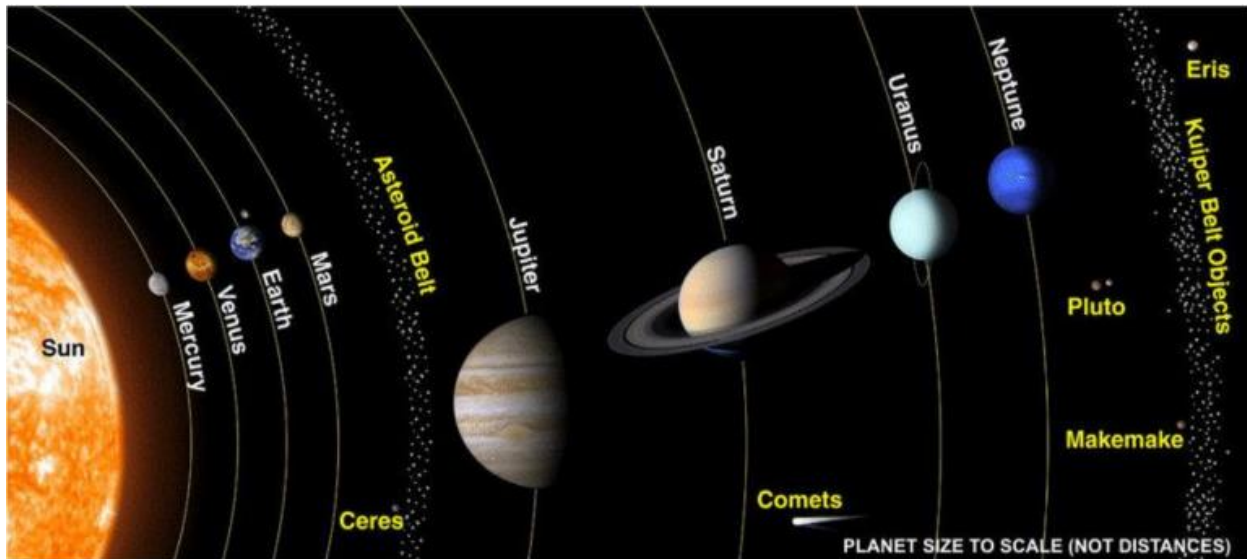
1. Measure out 3 feet of receipt paper or cut 2 inch strips of paper and tape together to form a 3-foot length.
2. Label one end of the paper “Sun”, and the opposite end, “Kuiper Belt.”
3. Without looking at the folding guide, place (but do not glue) or pencil in all the planets and the asteroid belt where **you think** they lie on the paper between the Sun and Kuiper Belt, in relation to the scale of our Solar System.
4. After you’ve made your guesses, use the folding guide at the end of this activity to find the planet’s true locations between the Sun and the Kuiper Belt.
5. Compare your guesses to the correct placements on the strip of paper. Were the results what you expected?

Tips: glue or mark planets as you go, as they dictate where you need to fold to next. Draw a line on every crease, as each one indicates a planet’s orbit

What’s happening?

Our universe is huge and complex, so it can be hard for us to understand just how big it is. This activity helps to better understand the distance between objects in our Solar System. There’s a lot of empty space in our solar system—distances between planets are vast! The solar system is made up of eight planets and many other objects orbiting the sun. In addition to planets, there are moons, comets, asteroids, dust, and gas, all influenced by the gravitational pull of the Sun.

Your model shows the planets lined up so you can see them all at once. In real life, the planets are usually scattered around the Sun along their orbits. Earth and the other planets in the inner solar system are relatively close together, compared with the planets that lie beyond the asteroid belt in the outer solar system.



Take it Further...

How close is the nearest star? Proxima Centauri, the next star closest to our sun, is 4.2 light-years away. A lightyear is the distance light travels in one year, or about 6 trillion miles. This is why we use light-years, to help keep distances simple. To include Proxima Centauri our scale model, it would have to be four miles long!

The pocket solar system model shows the relative distance between objects in the solar system. It doesn't show the relative size of the Sun and the planets. If we were to also take into account the size of the Sun and planets on this same scale, the Sun would be smaller than a grain of sand, and you would need a strong magnifying glass to see any of the planets.

What about Pluto?

Pluto is no longer considered a true planet, but researchers think they may have found evidence for a different, still-undiscovered "Planet Nine." The definition of a true "planet" is as follows: In our solar system, a planet is a celestial body that:

1. Orbits around the Sun.
2. Is spherical due to the force of its own gravity.
3. Has "cleared the neighborhood" around its own orbit.

Pluto met the first two of these criteria, but the last one proved pivotal. "Clearing the neighborhood" means that the planet has either "vacuumed up" or ejected other large objects in its vicinity of space. In other words, it has achieved gravitational dominance. Because Pluto shares its orbital neighborhood with other icy Kuiper Belt Objects, it was reclassified as a "dwarf planet" alongside the biggest body in the asteroid belt, Ceres.

Now try...

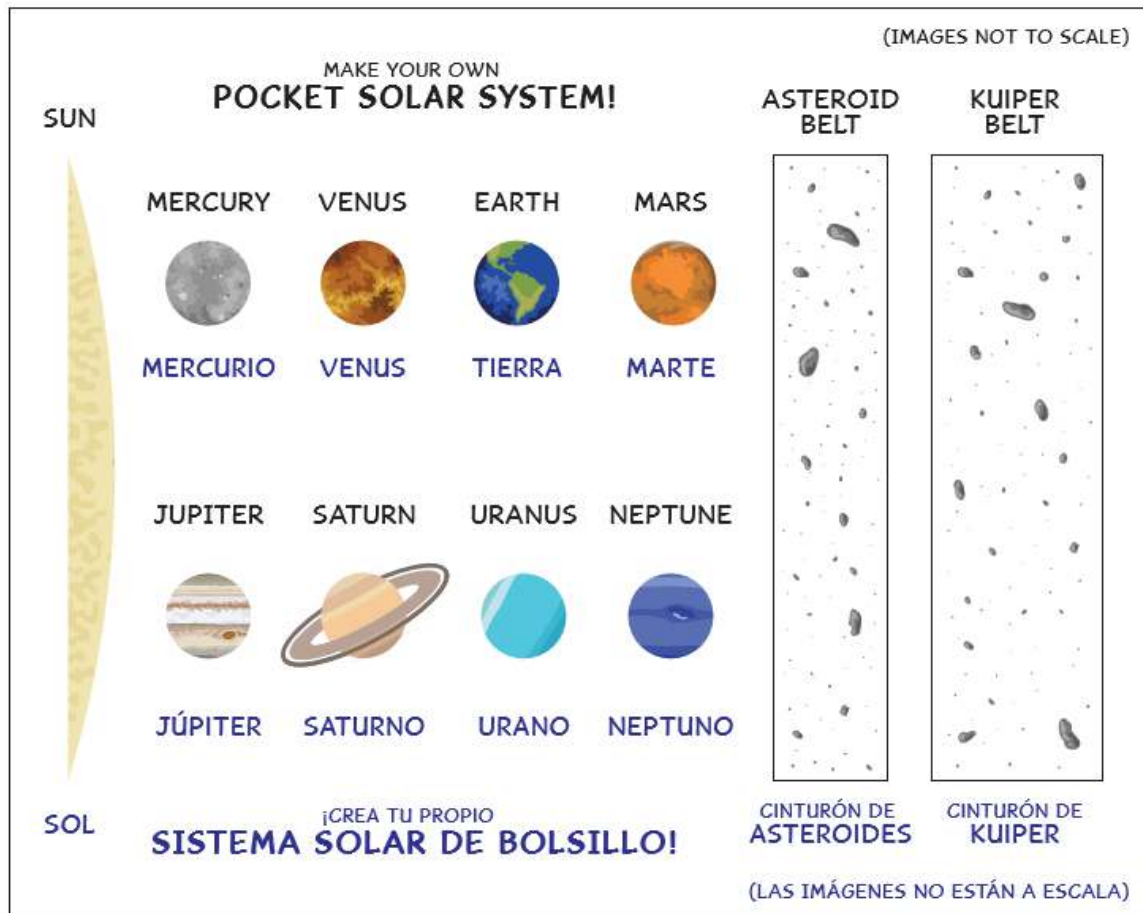
- How can you make your model more accurate by changing the size of the planets?
- Try using a shorter piece of paper. Is it easy to fit all the planets in this amount of space?
- What else can you include to make your model more accurate?

Additional Information

Adapted from [NISE Network Pocket Solar System](#) facilitator guide

Planet images from images.nasa.gov

Solar system images to print and cut out



Folding Guide (visual instructions)

STEP 1 START YOUR SOLAR SYSTEM!

PLACE SUN STICKER AT ONE END

PLACE KUIPER BELT STICKER AT OTHER END

STEP 2 URANUS' ORBIT

FOLD PAPER IN HALF

CREASE FIRMLY!

UNFOLD AND DRAW LINE IN CREASE

PLACE URANUS ON LINE

STEP 3 NEPTUNE + SATURN'S ORBITS

REFOLD PAPER IN HALF AND IN HALF AGAIN TO MAKE FOURTHS

UNFOLD + DRAW LINES ON BOTH CREASES

PLACE SATURN

PLACE NEPTUNE

STEP 4 JUPITER'S ORBIT

FOLD THE SUN UP TO MEET SATURN

UNFOLD, MARK ORBIT AND PLACE JUPITER

STEP 5 THE ASTEROID BELT

NOW FOLD THE SUN UP TO MEET JUPITER

PLACE ASTEROID BELT ON CREASE

STEP 6 MARS' ORBIT

FOLD THE SUN TO MEET THE ASTEROID BELT

UNFOLD, MARK ORBIT AND PLACE MARS

STEP 7 MERCURY, VENUS + EARTH

FOLD THE SUN TO MARS, THEN FOLD SECTION IN HALF AGAIN.

STEP 8

UNFOLD PAPER AND YOU SHOULD HAVE 3 CREASES. DRAW ORBIT LINES AND PLACE:

YOUR SOLAR SYSTEM IS COMPLETE!

THERE ARE MANY OTHER THINGS IN OUR SOLAR SYSTEM. TRY ADDING IN SPACECRAFT EXPLORING THE PLANETS. OR SOME OF THE MOONS OF JUPITER. WHAT ELSE CAN YOU ADD?