CARNEGIE SCIENCE

Astronomy Activity

Pocket Solar System

Objective: Understand the relative scale of the Solar System from the Sun to Pluto.

How big is the Solar System, really? It turns out, it's huge—and the planets are way farther apart than you might think.

In this activity, you'll build a scale model of our cosmic neighborhood that fits on a strip of paper and folds right into your pocket. By spacing out the planets just like astronomers do in real life, you'll get a better sense of the true size and structure of the Solar System.

Materials Needed:

- Sheet of letter-size paper
- Scissors
- Tape
- Pen or Pencil
- Optional: Crayons, colored pencils, stickers

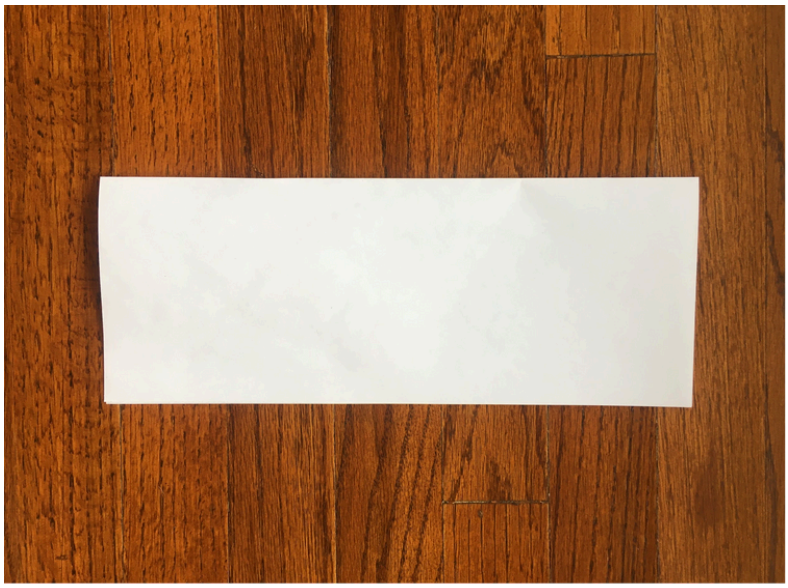
Make a Pocket Solar System

Follow the instructions below to make your own accurate scale model of the solar system that you can fold up and fit in your pocket!

Prepping Your Paper

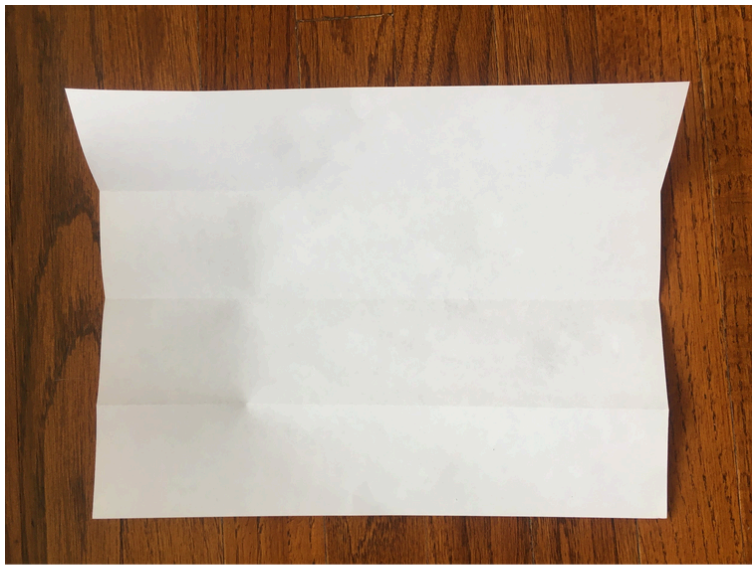
To make a pocket Solar System, you'll need a long strip of paper, about 3 or 4 feet long. Often this activity is done with toilet paper or receipt paper, but you can make a regular sheet of paper into a long strip using these steps:

Step 1: Fold the sheet of paper in half hot dog style, crease well.

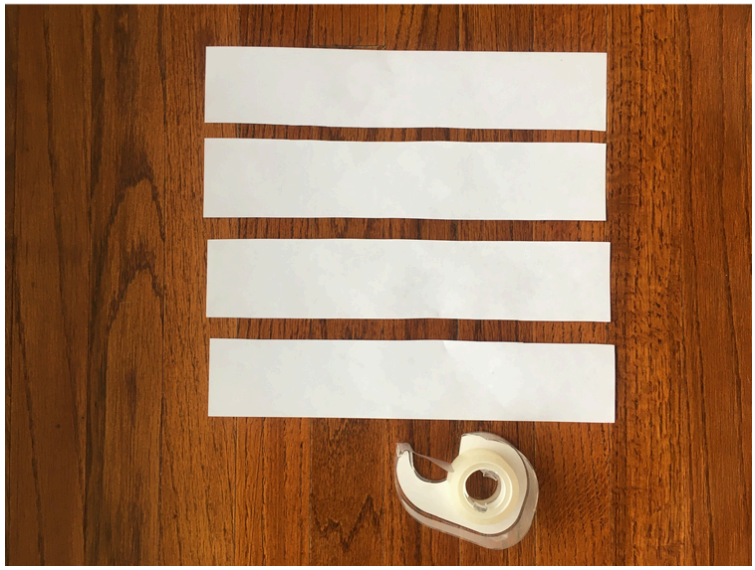


Step 2: Fold in half hot dog style again, crease well.

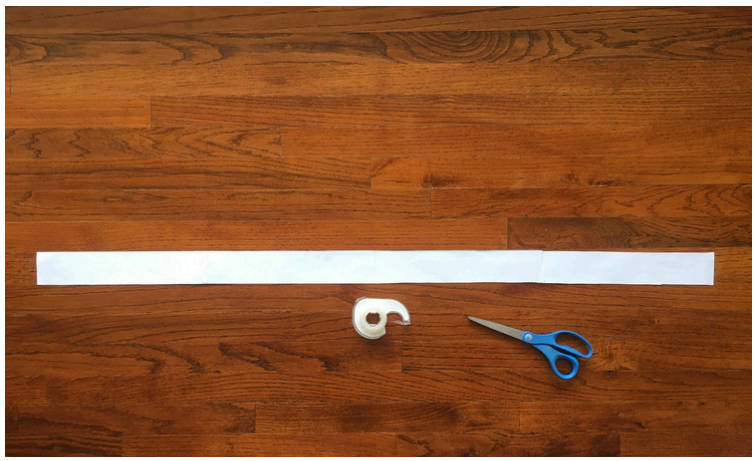
Step 3: Unfold the paper, you should see three lines where you creased.



Step 4: Carefully cut along the lines, making four long, thin strips of paper.



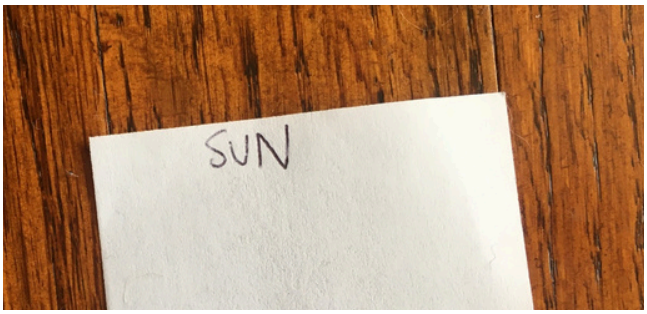
Step 5: Tape the four strips of paper together to create one very long strip of paper. Use tape only on one side so that you can write on the other side!

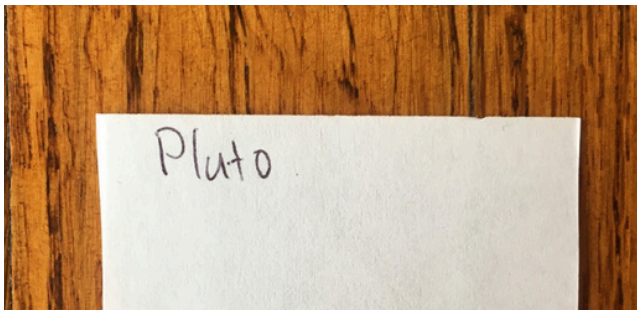


You're now ready to make your Solar System! You will fit planets, dwarf planets, asteroids and more on this long strip of paper. Follow the instructions on the following pages to create your Solar System.

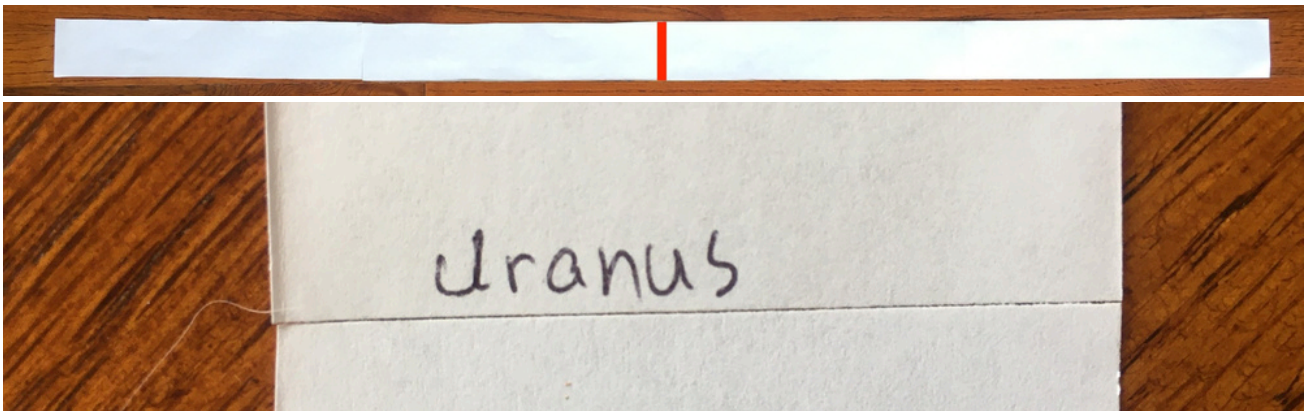
Creating Your Solar System

Sun & Pluto: Label one short edge of the paper “Sun” and one short edge of the paper “Pluto.” Make sure to write the names small so you can fit everything in.

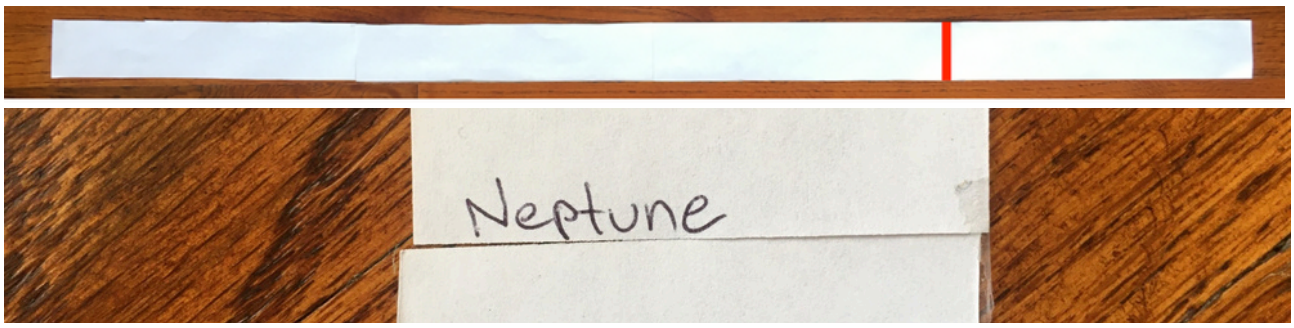


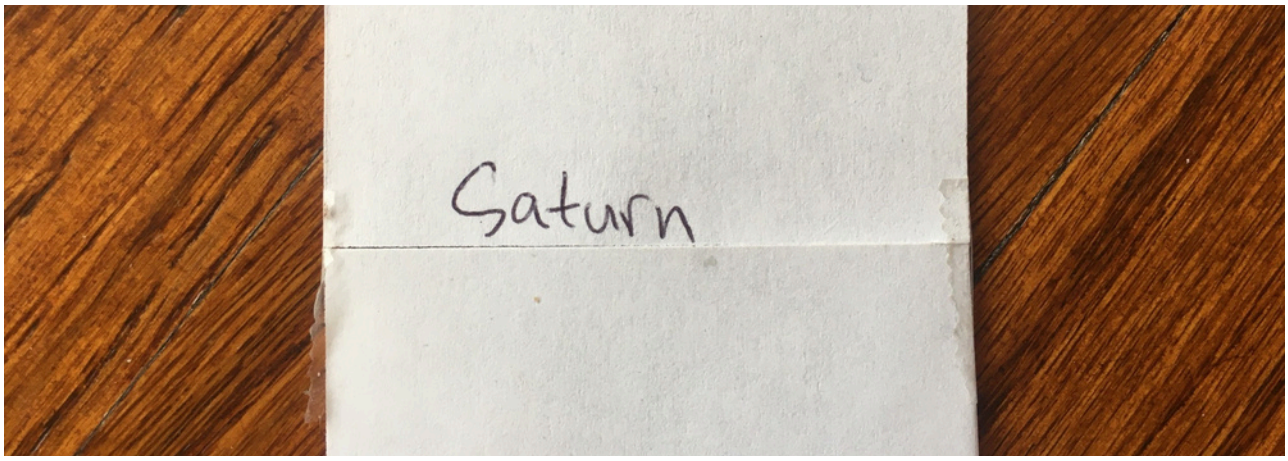


Uranus: Right in the middle of your long strip is a line where two pieces of paper meet. Write “Uranus” next to this line. This is where the planet Uranus is, halfway between the Sun and Pluto!

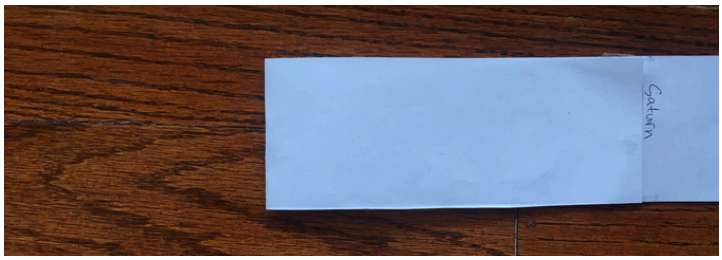


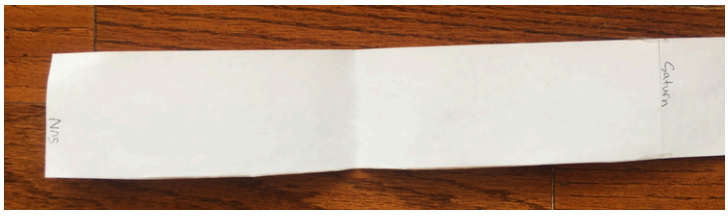
Neptune: The planet Neptune is halfway between Uranus and Pluto. At the line halfway between Uranus and Pluto on your paper, write “Neptune.”

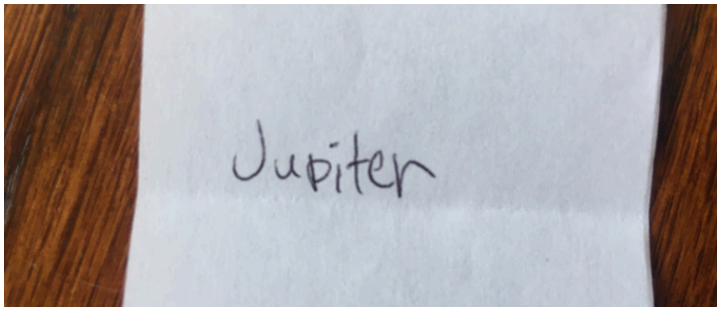




Saturn: Next, on the line halfway between Uranus and the Sun write "Saturn." The ringed planet Saturn is halfway between the Sun and Uranus. The rest of the Solar System will fit between Saturn and the Sun!

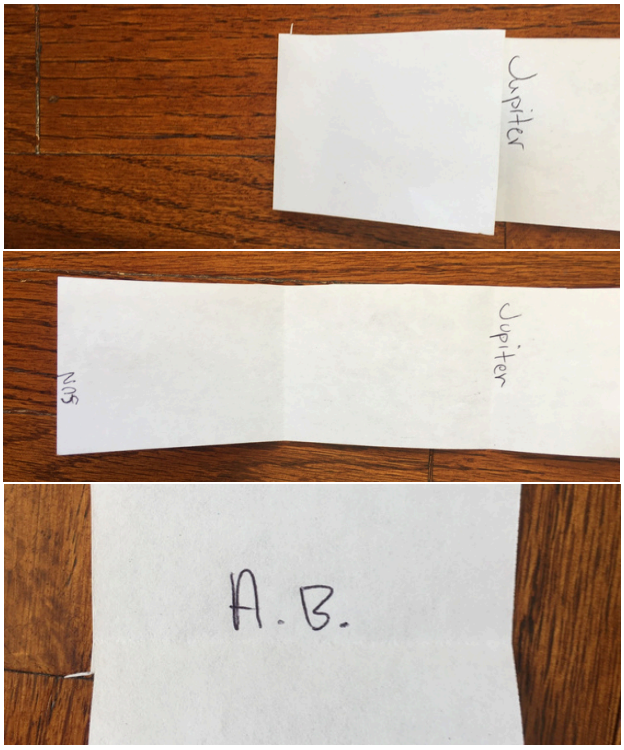




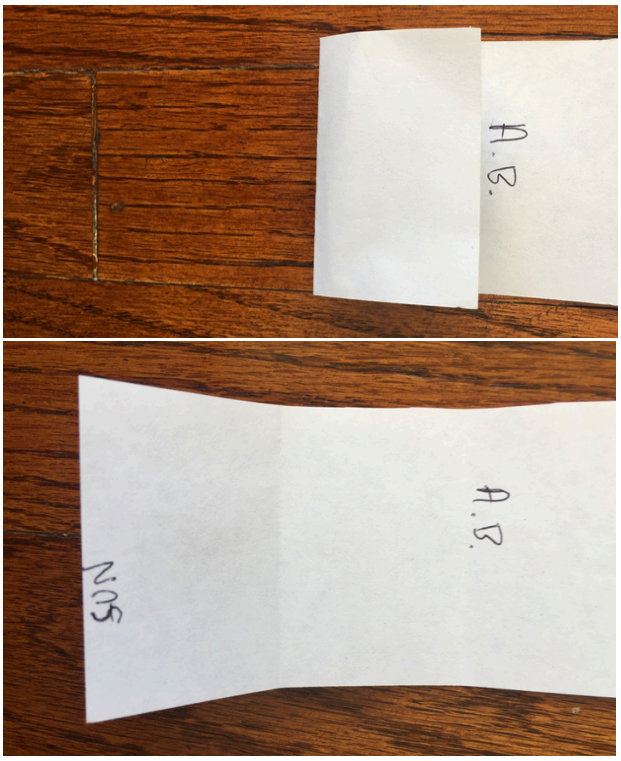


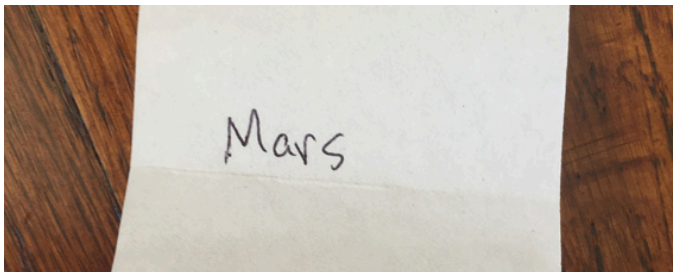
Jupiter: Take the end labeled "Sun" and fold it to the line labeled "Saturn," crease, and unfold. This will make a line on the paper halfway between Saturn and the Sun, write "Jupiter" on this line.

Asteroid Belt: Take the “Sun” end again and fold it to the “Jupiter” line, crease, and unfold. At this line halfway between Jupiter and the Sun, write “A.B." This stands for “Asteroid Belt”, which lies halfway between Jupiter and the Sun.

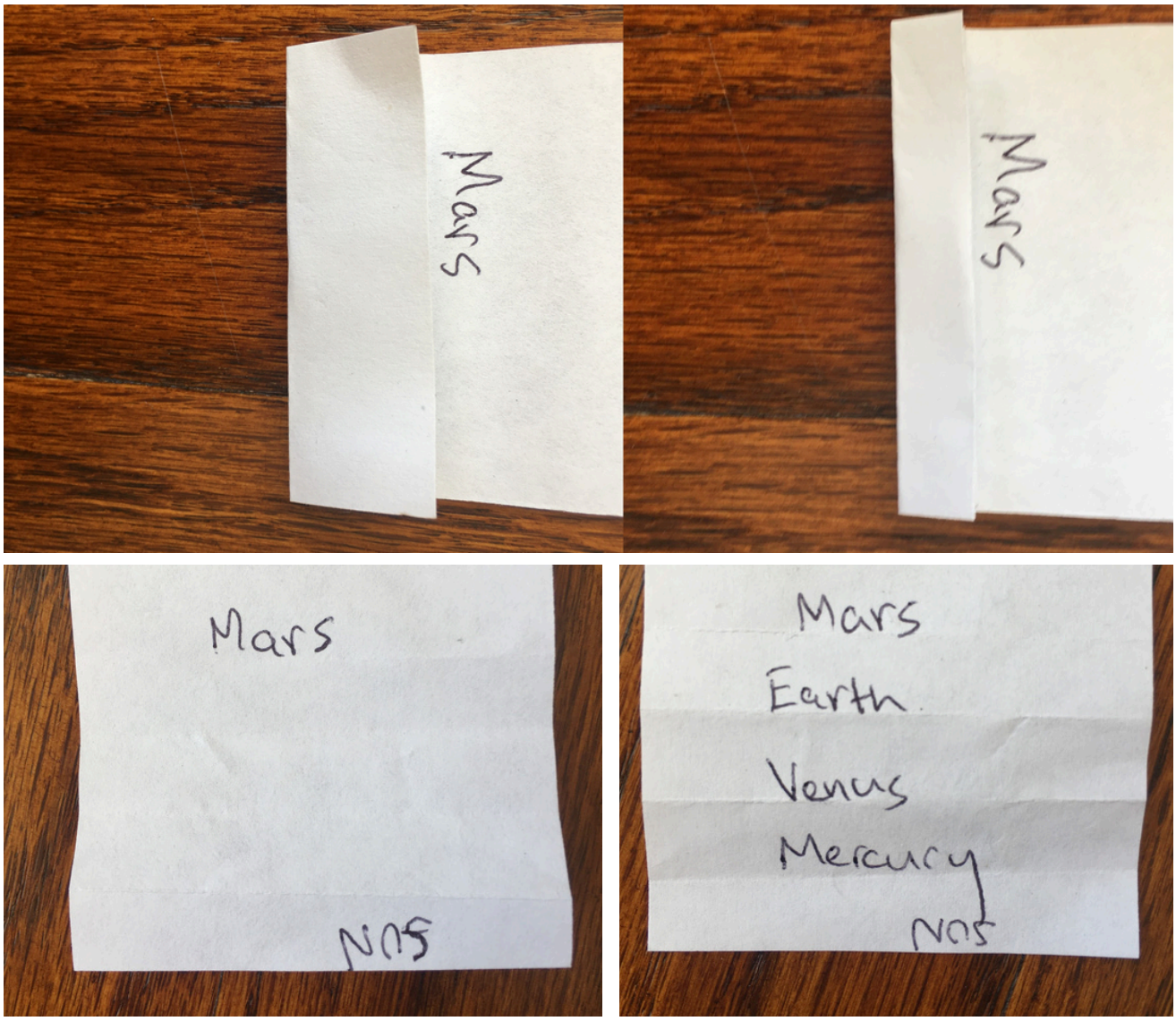


Mars: Fold the “Sun” end to the Asteroid Belt line, crease, and unfold. At this new line halfway between the Asteroid Belt and the Sun. Write “Mars” on this line. Three planets left to fit in the small space you have!





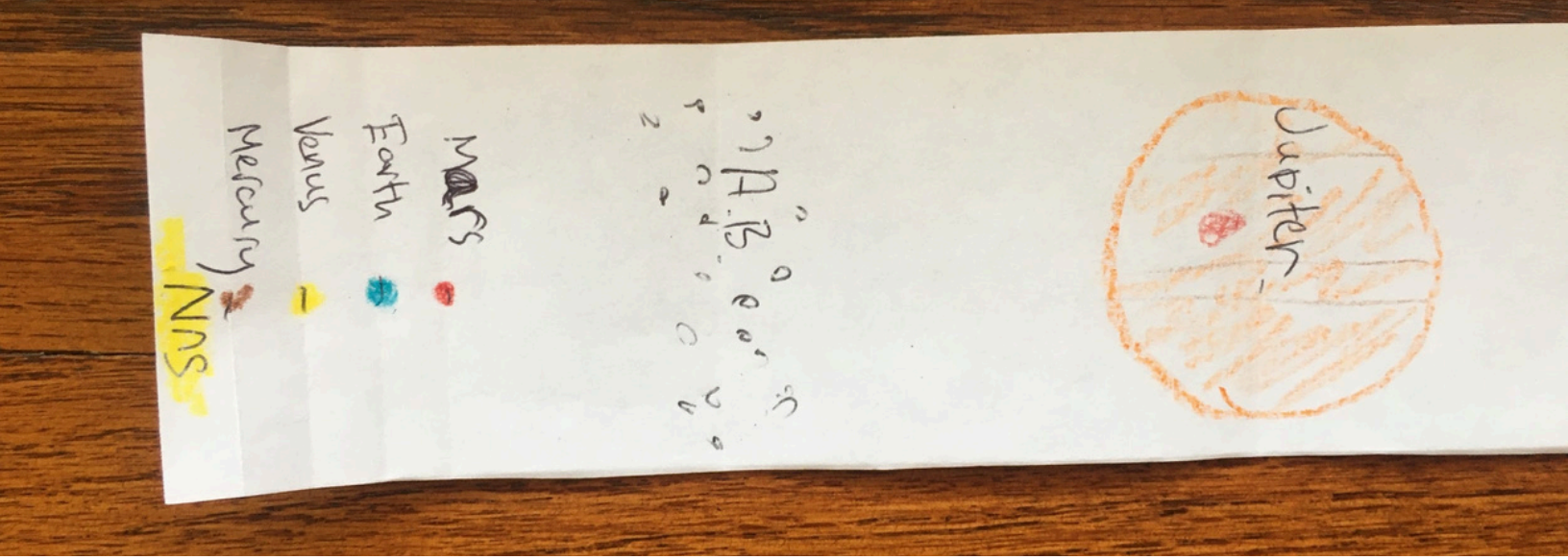
Earth, Venus, and Mercury: Fold the "Sun" end to the Mars line, crease, but **DON'T unfold yet!** Take the end of the paper where you just creased and fold that to the Mars line and crease. When you unfold there should be three lines. From farthest to closest to the Sun, write "Earth," "Venus," and "Mercury."



Congratulations! You should now have the whole Solar System spread across the piece of paper.

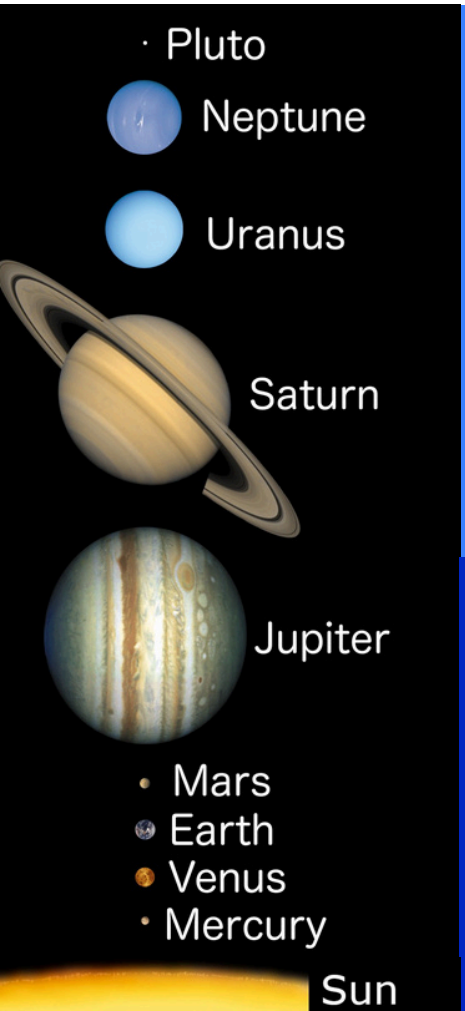
Look at how close together the rocky planets are (Mercury, Venus, Mars, Earth), compared to the other planets.

To travel from the Earth to Mars takes at least 5 months. The New Horizons spacecraft took almost 10 years to travel from Earth all the way to Pluto at the other end of your pocket Solar System.



Decorate: If you want to decorate your Solar System you can try drawing or coloring your own planets or adding stickers if you have them!

There's images of the planets on the next page with the right size and color if you want to try adding them yourself. I decorated part of my pocket solar system with crayons (above.)



Keep Exploring

If you'd like to learn more about the Solar System and everything inside of it, check out some of the following links:

https://spaceplace.nasa.gov/menu/solar-system/
https://nineplanets.org/kids/
https://solarsystem.nasa.gov/

Vocabulary:

Solar System
Planet
Sun
Asteroid Belt

This activity is adapted from a number of sources, including the following:

www.nisenet.org/catalog/exploring-solar-system-pocket-solar-system

https://astrosociety.org/file_download/5c27818a-e947-46ad-a9dc-f4af157af7d8

Simple visual instructions can be found here:

https://www.nisenet.org/sites/default/files/catalog/uploads/ExSci_Space_PocketSolarSy stem_folding.pdf

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