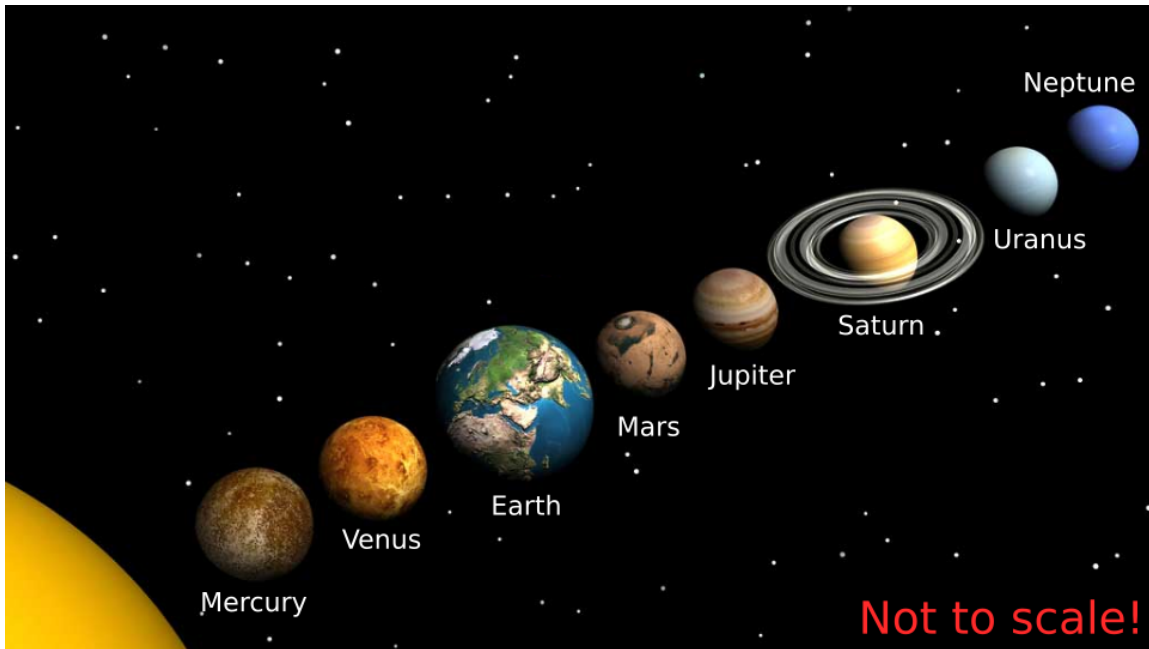


# The Solar System: Scale Models



## Part 1: Distances in the Solar System

We will make a scale model of our Solar System to explore distances between planets.

1. Take a look at the picture of the solar system above. **It is not drawn to scale.** Using the picture, answer the questions below with a planet name, or "can't tell" (if there is no way to tell from the picture).

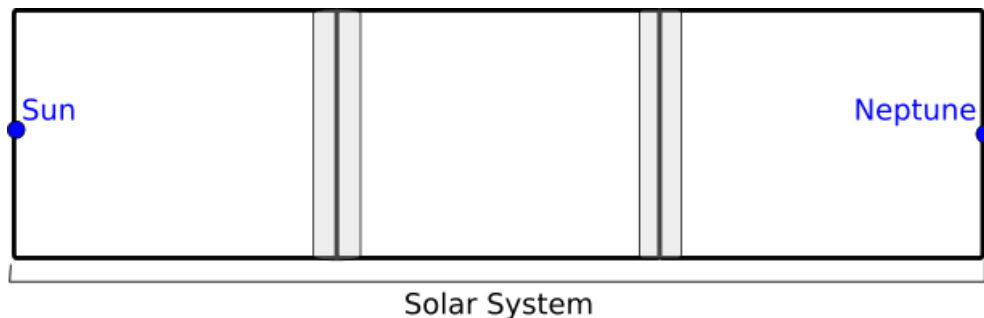
What planet is closest to the sun? \_\_\_\_\_

What planet is furthest from the sun? \_\_\_\_\_

What planet is half-way between the Sun and Uranus? \_\_\_\_\_

Is Mercury or Jupiter closer to Earth? \_\_\_\_\_

2. Tape together 3 sheets of printer paper, end-to-end. This will be your foldable model solar system.



3. Put a dot on the far left edge, and label it as the **Sun**. Put a dot on the far right edge and label it **Neptune**. The total length of your paper now represents the entire size of the solar system.

4. Put a dot one third of the way between the Sun and Neptune (where two sheets of paper connect). Label it **Saturn**. Draw some rings around it.

5. Put a dot half-way between Saturn and Neptune (where the other two sheets of paper connect). Label it **Uranus** .

6. Fold the left-most sheet of paper in half, so that the Sun touches Saturn. Unfold, put a dot on the crease and label it **Jupiter**.

We've now put in all the outer planets. Notice how little space is left for the inner planets!

7. The inner planets are roughly similar distances apart. Use your ruler to mark and label the following dots:

1 cm from the Sun, label **Mercury**

2 cm from the Sun, label **Venus**

3 cm from the Sun, label **Earth**

4 cm from the Sun, label **Mars**.

Now use your scale model to answer the questions from before:

What planet is half-way between the Sun and Uranus? \_\_\_\_\_

Is Mercury or Jupiter closer to Earth? \_\_\_\_\_

Make a guess: if we wanted to include the nearest star (Alpha Centauri) in our scale model, where would we have to put its dot? Pick one of the options below:

- Another 4 sheets of paper away (about 1 meter)
- On the other side of your house (about 20 meters)
- Near the Del Mar County Fairgrounds (about 5 miles)
- in Tijuana (about 40 miles)

Note: All distance estimates assume you are located at Carmel Creek Elementary

## Part 2: Planet Sizes

Now we will build a separate scale model of the planet sizes.

1. Split your 4oz of playdoh in half. Roll one half into a ball and put it on the **Jupiter** dot in your model solar system.
2. Roll the remaining half into a hot-dog and use the knife to split it into 5 equal pieces. Roll 3 of the pieces together into one ball and put it on the **Saturn** dot.
3. Take one of the remaining pieces, roll it into a snake, and split it into 4 equal parts. One piece is **Uranus** and one is **Neptune**.
4. Take one of the remaining marble-sized pieces. Roll it into a snake and split it into 4 parts. Then take one of those blueberry-sized parts and split into 4 again.
5. Take one of those pea-sized parts, roll it into a snake and split it into 4 one more time. One of these little ant-sized pieces is **Earth** and one is **Venus**.
6. Take one of your ant-sized pieces. Split it into 4 parts. Then split one of those parts into 4 one last time. Two of the tiny grains are **Mars**, and one is **Mercury**.

Make a guess: if we wanted to include a ball for the Sun, roughly how big would it be?

- The size of your fist?
- The size of a soccer ball?
- The size of a couch pillow?
- The size of your house?

Do you think we are using the same scale in our model for planet distances and in our model for planet size? How can you tell?

If we were to use the same scale for both, and keep our Playdoh models at the same size, how far away would the Neptune dot have to be?

- Other side of the house
- At the rec center (about 1 mile)
- In New York

List at 3 things wrong with the picture of the Solar System on the first page:

- 1.
- 2.
- 3.