

Play-doh Planets

Audience age: elementary +

Program Type: Tabling

Location: 3 ft of table space

Duration: 10-15 minutes

Volunteers: 1-2

Audience size: 1-8

ACTIVITY GOALS

Program Goals	<ul style="list-style-type: none">● Provide visual examples of size of the planets● Relate sizes and distances of planets to common objects● Give audience opportunity for inquiry-based inference
Audience Goals	<ul style="list-style-type: none">● Learn about approximate sizes of planets

SCIENCE STANDARDS (IF APPLICABLE)

WILL LOOK INTO LATER

HOOK: Would you like to help make the solar system? Do you know how big earth is compared to other planets? We can use Play-doh to make a model of the solar system.

ENGAGEMENT NOTES

1. This can be easily adapted depending on the age of the group since not every audience member is as good at fractions. Language like one tenth is good for older audiences, but can be more confusing for people who have not done fractions yet. Sometimes it works best for the volunteer to divide the Play-doh if the children are struggling with dividing.
2. Giving each audience member a task increases the engagement of all members. Some one can always be dividing or rolling.

MATERIALS

- 3 pounds of Play-doh
- Plastic knives
- Plastic to cut on (play-doh stick to paper and knives tear through table covers)
- Extra large yoga ball
- Sidewalk chalk if doing planet walk

SET-UP PHOTO OR NOTES

1. About three feet of table space is needed, place plastic down
2. It helps to have the Play-doh rolled into a 'log' before hand
3. Blow up the yoga ball and place near table, under works well.

COMPLEMENTARY HANDOUTS

[Exoplanet Handout](#)

[Planet Map Handout](#)

ACTIVITY PROCEDURE OUTLINE

1. Have someone in the audience divide the log of Play-doh into **ten** equal pieces. It is okay if they are not exactly equal, just keep the largest one for the next section. It also works to divide it in half and have two people divide them each into five segments for larger groups.
2. Set the largest **one** aside. Squash **six** of the pieces together to make **Jupiter**. The other **three** start to make **Saturn**. Have some of the audience members roll these into spheres.
3. Roll out the remaining one and divide it into **ten** equal pieces, again setting the largest one aside. **Five** of these can be added to **Saturn**. **Two** of the pieces make **Neptune** and the remaining **two** make **Uranus**. Place these in the correct positions as they are made.
4. Roll out the remaining one and divide it into **ten** equal pieces. Set the largest one aside and add the remaining **nine** to **Saturn**. This completes Saturn, leaving the inner rocky planets. (It is interesting to note the size comparison of what is remaining to the initial amount.)
5. Roll out the remaining one and divide it into **TWO** equal pieces. The smaller one will be Earth.
6. Roll out the remaining one and divide it into **ten** equal pieces, setting the largest one aside. **Nine** of these get combined to form **Venus**.
7. Roll out the remaining one and divide it into **ten** equal pieces, setting the largest one aside. **Nine** of these get combined to form **Mars**.
8. Roll out the remaining one and divide it into **ten** equal pieces, setting the largest one aside. **Nine** of these get combined to form **Mercury**.
9. The remaining **one** is **Pluto**.
10. The yoga ball can be pulled out as the **Sun**. Asking the audience what is missing in their solar system or how big do they think the Sun would be in this model can be a good lead up.

It is good to talk about why Pluto is not classified as a planet anymore since the audience will most likely ask. Pluto is about the same size as other objects that are in the same region and it has not cleared its orbit.

Discussing the distances between the planets is also good. For the model size with 3 lbs of Play-doh results in an Earth about 1 cm in diameter. This would result in distances of:

	Ratio of Orbit to Earth	Distance (m)	Distance (steps)
Mercury	0.387	45.44	34.62
Venus	0.723	84.89	64.68
Earth	1	117.41	89.46
Mars	0.152	17.85	13.60
Jupiter	5.2	610.52	465.21
Saturn	9.58	1124.76	857.07
Uranus	19.2	2254.21	1717.71
Neptune	30.05	3528.08	2688.40
Pluto	39.48	4635.23	3532.04

It may be nice to draw these on the sidewalk with chalk to help the audience get a sense of the distances to different planets. The steps are based on 0.762 meters/step.

There are also handouts that map the position of the planets in Philadelphia if the Earth was the size of a tennis ball.

References:

STEREO NASA

<https://stereo.gsfc.nasa.gov/img/scales.pdf>