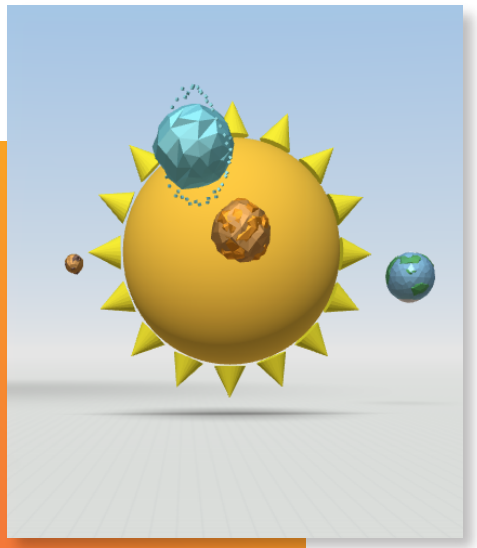
Planets in our Solar System

Grades 4–7

Created by Mike Page & Nate Lott

*Requires accounts with CoSpaces Edu Pro and Tinkercad



Difficulty 2 | 3-45 minutes | small group

Tags: Solar system, Diameter, Circumference, CoSpaces

App/Tech Tools	CoSpaces Edu Pro accounts, Tinkercad account, MERGE Cube, MERGE Headset (optional), device (phone/tablet)

Materials

Learning Objectives

- To recognize the major characteristics of the planets.
- Compare, contrast and personalize your learning in CoSpaces.
- Understanding diameter, circumference, degrees and aspects in block based coding to create the planet rotations yourself.
- Equip students with skills needed to navigate independently in CoSpaces and create a 3D, interactive model of our Solar System.

Activity

1. Familiarize students with CoSpaces. Using these videos, introduce students to this platform and provide the first steps in developing skills in the 3D plane here.

(Video 1) Navigating CoSpaces and Basic Plane Functions. (Video 2) Exploring coordinate grid and coding to create a scene. (Video 3) Using code to create movement in a scene

2. Once students display understanding of these skills, expand onto other aspects of project including: APK of planet size, location, fun facts, research and other information to get students familiar with our galaxy.

3. Assess students background knowledge of AR. What do they connect with? Pokemon Go? Snapchat?

4. Students will be working to develop skills in 3D design .obj files, coding and AR in one lesson. They will then be able to begin their adventure into learning about our planets, their location and how they rotate.

5. Assess whether students can identify the planets and/or name them in order. Lessons on our Solar System can be ongoing outside of this particular activity. Students can brainstorm facts about each planet as a introduction to the topic. Share these facts where all students can see them. Have students add them to their CoSpaces. Once CoSpaces lesson is constructed, students can view and discuss their creations on the Merge Cube.

6. Launch after all students show fluency in CoSpaces. Have Students download .obj files save them into CoSpaces. They will arrange the planets in the correct order, size and location. Students are not expected to do any coding at this point. Upon completion, students will watch videos, using headphones preferably, demonstrating how to complete the coding aspect.

7. Students will now begin to add the code to their projects, include important facts, and share learning with their classmates. Students will use their VR Headset or a tablet while accessing the CoSPaces App and their Merge Cube to view their creation.

Extension Ideas

- Students can work in collaborative pairs or teams to explore and share each other's code and any facts they have researched about the solar system.

- Have students create a CoSpaces information lesson that can be displayed on the Merge Cube. Students can share spaces and see what other facts students have researched.

- Students can create planets on tinkercad to the correct size and scale and adding physical features such as colors, craters, rivers and rings (see chart below).

Element	Actual Diameter (km)	Approximate Scaled Diameter
Sun	1, 392, 000	1, 392 mm (54.8 in)
Mercury	4, 879	5 mm
Venus	12, 104	12 mm
Earth	12, 756	13 mm
Moon	3, 475	3.5 mm
Mars	6, 794	7 mm
Jupiter	142, 980	143 mm
Saturn	120, 540	125 mm
Uranus	51, 120	51 mm
Neptune	49, 530	50 mm
Pluto	2, 300	2.3 mm

- Here is our lesson on our Open Source Lab website.
- Here is a google drive folder of all the planets. Also, I have attached pictures of the code used in CoSpaces.
- Here is a link to view it in CoSpaces and on the Merge Cube.
- **Please Note:** CoSpaces Pro has a cost of $4 USD per licence or you can use COSMIKEPAGE for a 30 day free trial with 100 licences.

Suggested Questions

- Where is Earth located in the solar system and how far is each planet from Earth?
- Which is the biggest planet in our solar system?
- Which is the smallest planet in our solar system?
- What do the positions of the sun and specific planets have in common when viewing it on the Merge Cube?