

Solar System Model

Overview: Building models can help make the complex more understandable, the abstract more concrete, and the invisible visible. For concrete learners, models can help make the connections and relationships between or among unfamiliar objects (such as the planets of the solar system) something that can be experienced. By building scientific models, students construct not only small representations of something, but also knowledge of it! Building models is also a fantastic performance-based assessment method that can illustrate student learning in a number of areas.

Procedure: Building a model of the solar system can help understand not only the size, position, and order of our solar system, but also the orbits and inter-relationship between the planetary bodies. To build a simple model using modeling clay, construction paper, and chalk use the following steps:

1. Using play dough or modeling clay, roll a large ball that will represent your Sun. Typically yellow or orange color is used to make the Sun when creating an authentic solar system model. If you are concerned with the relative sizes of your planets and keeping them to scale, use the calculator found at http://www.exploratorium.edu/ronh/solar_system/
2. Place your Sun in the middle of a large piece of black construction paper (the bigger the better). Use black bulletin board paper to make a very large solar system. Use chalk to create the orbital paths of the planets around the Sun. Again, refer to http://www.exploratorium.edu/ronh/solar_system/ to calculate actual scale distances for your orbital rings.
3. Construct your eight planets (nine if you include Pluto!) using your play dough or modeling clay. Refer to the aforementioned Exploratorium website to help you keep the planet sizes authentic and relative to your model. Visit this website <http://curious.astro.cornell.edu/question.php?number=236> for information related to the colors of each planet.
4. Place your created planets into proper position on your model!

ASOL Covered in this Activity:

3S-SI2: The student will demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations in which:

- 1) models are designed and built.

5S-ESS 2: The student will investigate and understand the organization of the solar system. Key concepts include

- a) The planets in the solar system.
- b) The order of the planets in the solar system.
- c) The relative sizes of the planets.

8S-ESS 5: The student will investigate and understand the organization of the solar system and the interactions among the various bodies that comprise it. Key concepts include

- b) the relative size of and distance between planets.

Materials Needed:

- Large Black Construction Paper
- Play dough/Modeling Clay
- Chalk

Instructional Setting: Classroom, outside, gym

Community Connections and/or Peer Interaction:

Visit a planetarium or local science museum to experience a more in-depth exploration of the solar system and to explore more complex models of the planets.

Have students work with a partner/peer to construct their solar system models. Assign or let students choose their role in completing the project.

Functional Activity/Routine:

Using relative sizes of the Sun and planets that you have created for the solar system model, have students order the objects by size (small to large; large to small).

Identify common shapes and colors that are present in your solar system model.

Strategies to Collect Evidence:

Evaluate students' ability to reconstruct your solar system model in proper order.

Challenge students to construct models of other objects of their choice using classroom art/building supplies.

Specific Options for Differentiating this Activity:

Assign each student a planet. Clear space in your room (or move outside, to the gym, etc.) Have the students physically position themselves in proper planetary order. Have students rotate while revolving around the student chosen to be the Sun.

Have students cut and color small images of planets and organize them into a mobile model by attaching the pictures to a coat hanger.

Program a voice output device with the names of the planets to allow participation by all.

Create a choice board with information including the pictures, names and facts for the planets to use during classroom discussion and answering questions.

Use a pocket chart to put pictures and/or names of planets in the correct order.

Extension Ideas:

Use a telescope to locate the planets in your model.

Add asteroids, comets, and other heavenly bodies to student's solar system models.

Make a playlist using www.youtube.com of songs and videos of the planets.

Create a readers theater and perform it for peers.