



Solar System Bead Distance Activity | Adapted for Students with Special Needs |

This activity was selected from the Mars Activities Book created by the ASU Mars Education Program: <http://marsed.asu.edu/>. Adaptations were made by Dr. Cassandra Runyon at the Southeast Regional Clearinghouse (SERCH) <http://serch.cofc.edu/serch/index.htm>

Goal: The students will understand the distances between the Sun, planets, and small objects in the Solar System.

Objective: To create a model demonstrating the scale distances of the Solar System using astronomical units that have been converted into a 10 centimeter scale.

National Science Education Standards:

Standard D: Earth in the Solar System

National Math Education Standards:

NM.5-8.5 Number Relationships

NM.5-8.13 Measurement

Materials:

- Planet beads:

Sun	BELL
Mercury	SMALL BLACK
Venus	ORANGE
Earth	DARK BLUE
Mars	RED
Asteroid belt	TRI-SHAPED-color varies
Jupiter	GOLD
Saturn	YELLOW
Uranus	LIGHT BLUE
Neptune	CLEAR GREEN
Pluto	SMALL PURPLE
- 4.5 meters of string for each student
- Small piece of cardboard to wrap Solar System string around (10 cm x 10 cm)
- Meter sticks or measuring device
- Student handout

Background:

- To speed up the activity for younger students, the string may be pre-cut and a set of Solar System beads may be put into a plastic zip lock bag for each student. Also, for younger students, a measured marking grid can be put on a tabletop so the students can mark their measured distances and then tie off the beads. If the pre-marking method is used, extra distance must be added to each planet distance to accommodate the string within each knot (approximately 4 cm for a double knot around the bead). Tape newspapers to the surface where the students will be marking their strings, so they do not mark up the counter or floor.
- For older students, measurements are made each time from the Sun to the planet and tied on after each measurement.



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Student Procedure:

1. Convert the various AU distances to centimeters and complete the chart on the student handout sheet.
2. Measure and cut a piece of string 4.5 m long.
3. Using the calculated cm distances, tie the bead onto the string using a double knot.
4. When finished with the activity wrap the Solar System string (with beads) around the cardboard holder.

Adaptations for Students with Special Needs:

FOR VISUALLY IMPAIRED:

1. Vary the bead sizes and shapes to distinguish between the planets.
2. Talk your students through the tour of the solar system – have their fellow students play “tour guide” and describe which planet they are touching, what it looks like and where they will be heading next. This might also be a good time to discuss some of the simple characteristics of each planet (solid surface vs. gaseous surface; close to the sun = hotter, further away = colder)
3. Add a rotating ceramic heater near the Sun and a fan blowing over a pan of ice near Pluto for the cooler outer solar system.

FOR THE ORTHOPAEDICALLY IMPAIRED:

1. Use large pom-poms instead of wooden beads.

Planet Orbits:

To simulate solar system rotation have the student holding the end of the string with the Sun stand still while other students placed at Jupiter and Pluto along the string walk (orbit) around the Sun. Talk about the fact that the planets DO NOT orbit the Sun at the same rate.



