

**Title:** Solar System Distance

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**Subject(s):** Science, Mathematics

**Topic(s):** Solar System, Planets, Space Science, Measurement, Distance, Modeling

**Grade/Level:** K-8

**Objective:**

By the end of this activity, students will be able to create a model of the Solar System using beads.

**Summary of activity:** The students will understand the distances between the Sun, planets, and small objects in the Solar System.

**Time Allotment:** 30 minutes

**Procedures/Instructions:**

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.

**Instructional Materials:**

- [Student Worksheet](#)
- Planet beads (large craft pony beads in 11 colors):
  - Sun=yellow
  - Mercury=solid red
  - Venus=cream
  - Earth=clear blue
  - Mars=clear red
  - Asteroid belt=black



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Jupiter=orange  
Saturn=clear gold  
Uranus=dark blue  
Neptune=light blue  
Pluto=brown  
Spacers=clear

- 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

**Materials for Edible Version:**

- Elastic cord ~80cm
- Fruit loops
- Life Savers
- Jelly Rings
- Spacers (to represent millions of miles, each represents about 30-60 million miles) Cheerios or for a more permanent bracelet use larger Ditali pasta
- Baggies
- Scissors

**Assembly:**

Inner planets:	Outer planets:
Sun – Optional	6 spacers
1 spacer	1 lg yellow/orange
1 small yellow	15 spacers
1 spacer	1 med green
1 small green	17 spacers
1 spacer	1 med blue/purple
1 small blue	14 spacers
1 spacer	1 small black
1 small red	

Totals for Baggies: 63 spacers, 5 small, 2 med, 2 large

**Modifications:**

1. 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 sealable baggie for each

student. Also, a measured marking grid can be put on a table top 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.

2. For older students, measurements are made each time from the Sun to the planet and tied on after each measurement.

### **National Science or Mathematics Standards:**

#### Science

##### Earth and Space Science

##### CONTENT STANDARD D:

As a result of activities in grades 5-8, all students should develop an understanding of

- Earth in the solar system

#### Mathematics

##### Number and Operations Standard

Instructional programs from pre-kindergarten through grade 12 should enable all students to—

- Understand numbers, ways of representing numbers, relationships among numbers, and number systems

##### Measurement Standard

Instructional programs from pre-kindergarten through grade 12 should enable all students to—

- Understand measurable attributes of objects and the units, systems, and processes of measurement

### **Assessment Plan:**

Students can work in pairs to check that their bracelets are accurately completed by matching them against each other or against a key.

# Solar System Necklace

## Student Worksheet

### What you need:

- String or Elastic Cord
- Planets – Disks of various colors and sizes: Colored Beads (or Fruit Loops, Jelly Rings, Life Savers for an edible version)
- Spacers to represent the millions of miles between planets (Each spacer represents 30-60 million miles.) (For an edible version, use Cheerios or Pasta)
- Scissors

### What to do:

1. Tie a knot in one end of the string/cord.
2. Thread beads/disks as follows:

Inner planets – smaller beads/disks	Outer planets – larger beads/disks
1 spacer	6 spacers
1 small yellow	1 large orange/red
1 spacer	7 spacers
1 small green	1 large yellow/orange
1 spacer	15 spacers
1 small blue	1 medium green
1 spacer	17 spacers
1 small red	1 medium blue/purple
	14 spacers
	1 small black

3. Tie the ends of the string/cord together to finish the necklace.