



Scale of the Solar System Key Fob Kits

Shrink the solar system and take it with you! Great for STEAM lessons, tables, or labs. Package kits can be bought individually or at a discount for the entire class.



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Scale of the Solar System Key Fob!

Kits can be purchased at <https://www.alittlescience.com/kits/>

Introduction

With this kit, you can make your own scale model of the Solar System! To have all the planets fit on your fob, we need to shrink them. Instead of the Earth being its actual size, 7926 miles across, it is now only 2.5 millimeters across - tiny enough for you to hold! The rest of the planets have also been shrunk by the same amount. This means their sizes compared to one another are still the same. Jupiter's actual size is 88846 miles across, a little more than 11 times bigger than the Earth. For your fob, Jupiter is a bead 28 millimeters across, which is still a little more than 11 times bigger than your 2.5 millimeter Earth bead. Below is a list of the planets actual size and their bead size.

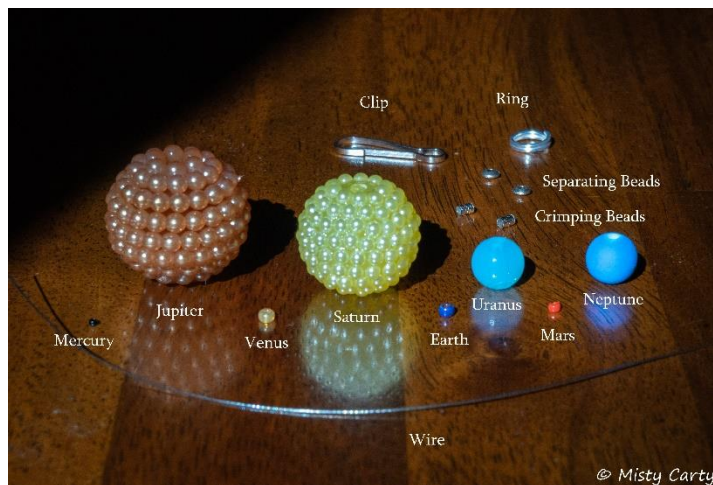
Planet sizes:

Planet	Diameter (mi)	Diameter (mm)
Sun	864,338	272.6
Mercury	3032	1.0
Venus	7521	2.4
Earth	7926	2.5
Mars	4222	1.3
Jupiter	88846	28.0
Saturn	74898	23.6
Uranus	31763	10.0
Neptune	30778	9.7

At this scale the Sun is 10 inches across!

Materials Included in Kit:

- Beading wire
- 1 each of the appropriately sized beads to represent each planet
- Clip
- Ring
- 2 crimping beads
- 2 separating beads

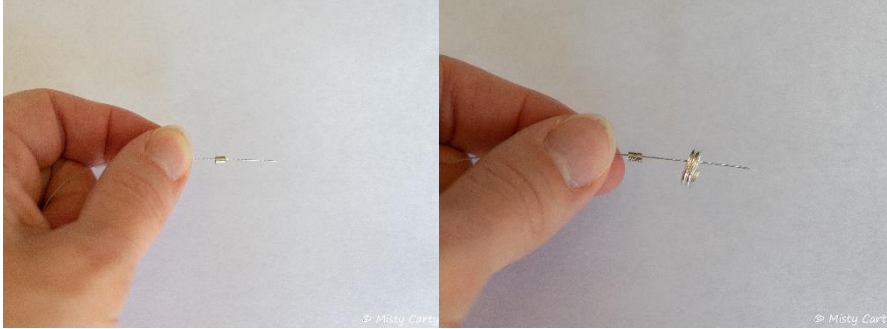


Not included:

- Pliers (to press and flatten the crimping beads)

Instructions:

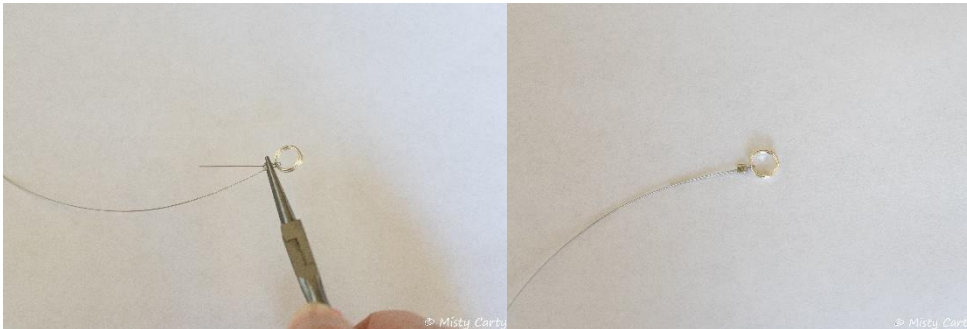
1. Slide one crimping bead and ring onto an end of the wire.



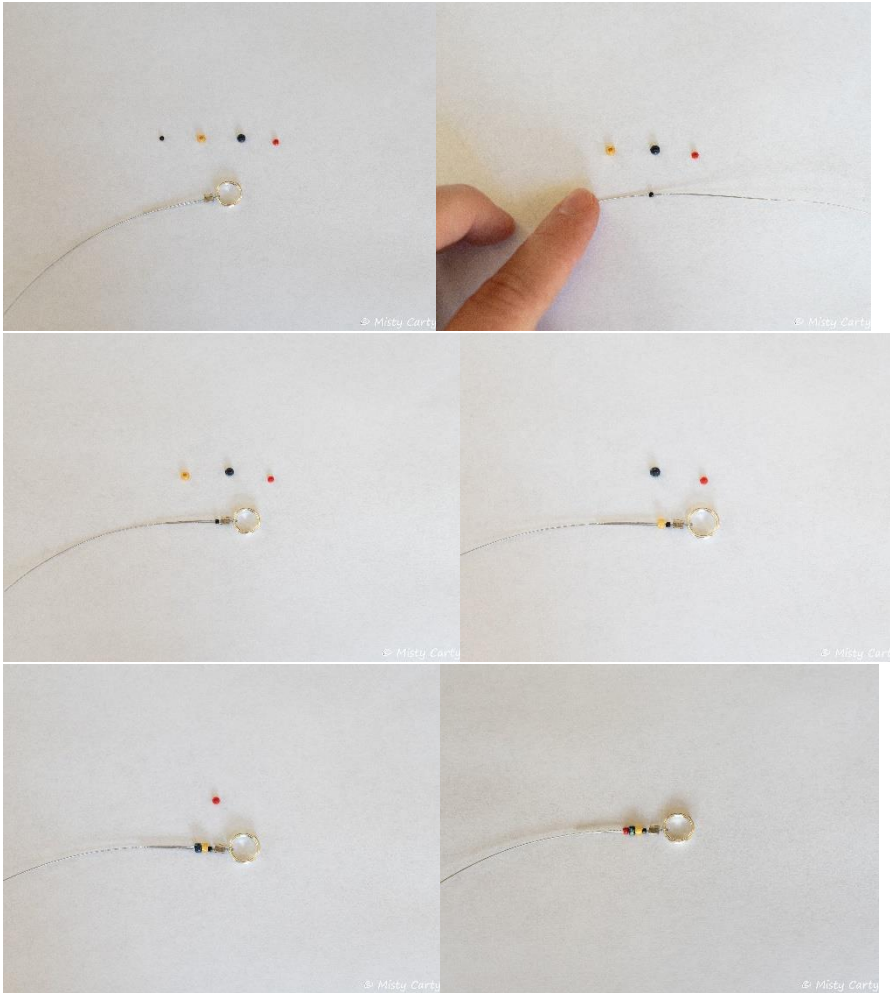
2. Loop the end back through the bead, pushing it securely against the ring.



3. Using pliers, gently squeeze the crimping bead flattening against the looped wire.



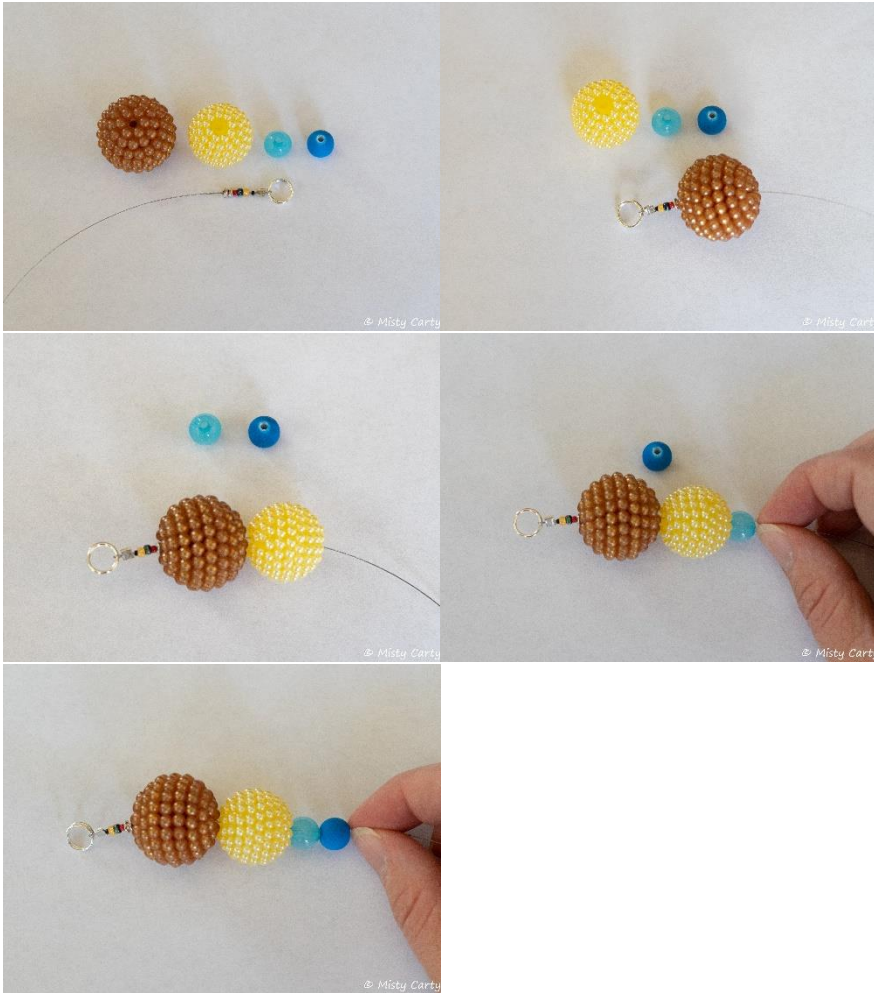
4. Slide your Inner Solar System onto the wire: Mercury, Venus, Earth, & Mars.



5. Next slide on your 2 separating beads – these will keep Mars from sliding under your Jupiter bead.



6. Now, slide on your outer system gas giants: Jupiter, Saturn, Uranus, & Neptune.



7. To secure your entire solar system, slide your last crimping bead on after Neptune.



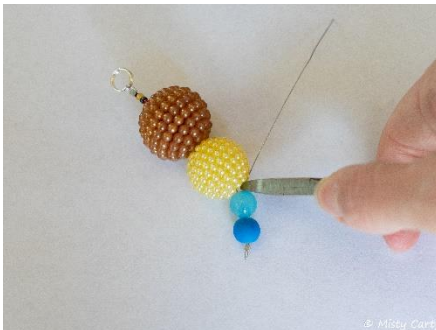
8. Loop the end of your wire through the crimping bead.



9. Pull the wire through the last two beads (Neptune & Uranus). Using your pliers, again gently press the crimping bead, flattening it against the looped wire and securing the end of your fob.



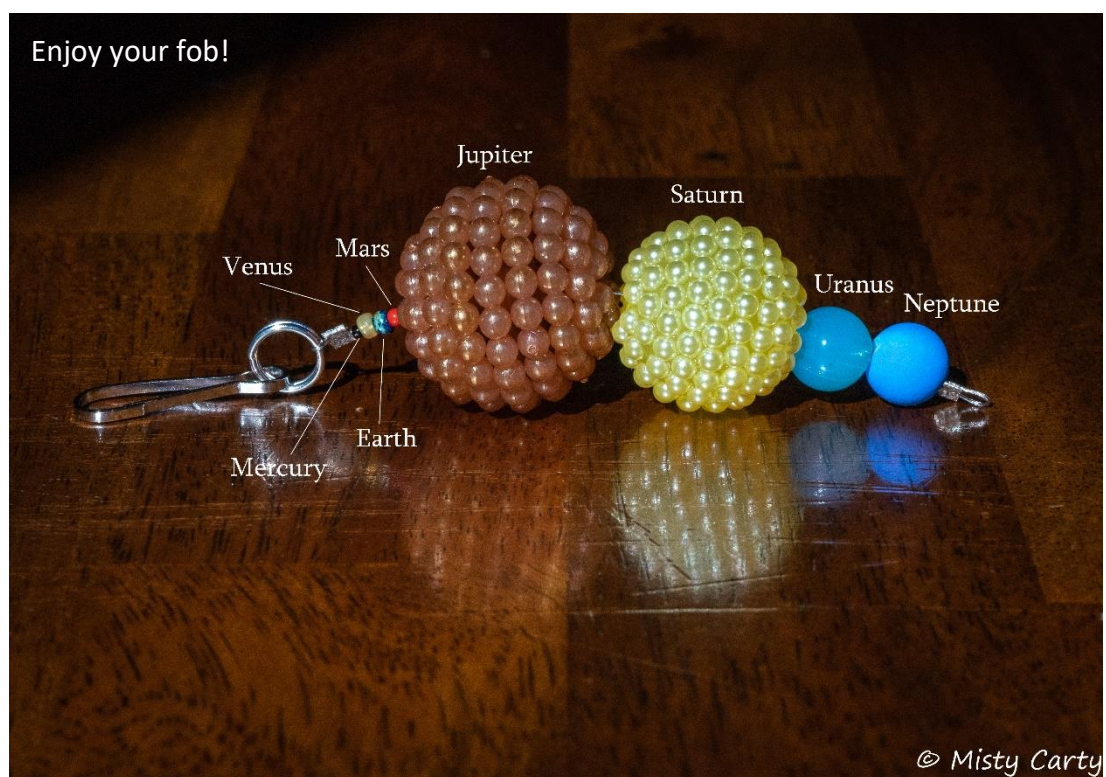
10. Use pliers or sharp scissors to trim the left over wire.



11. Attach your clip to your ring and...



Enjoy your fob!



Taking it Further

Part 1: Let's observe your new key fob!

1. How do the sizes of the planets compare? How would you group the planets and why?

2. Draw the Earth compared to Jupiter.

The Inner Planets – Mercury, Venus, Earth, & Mars – are rocky. The Outer Planets – Jupiter, Saturn, Uranus, & Neptune – are made of gases. How do the sizes of the rocky, inner planets compare to the gaseous, outer planets?

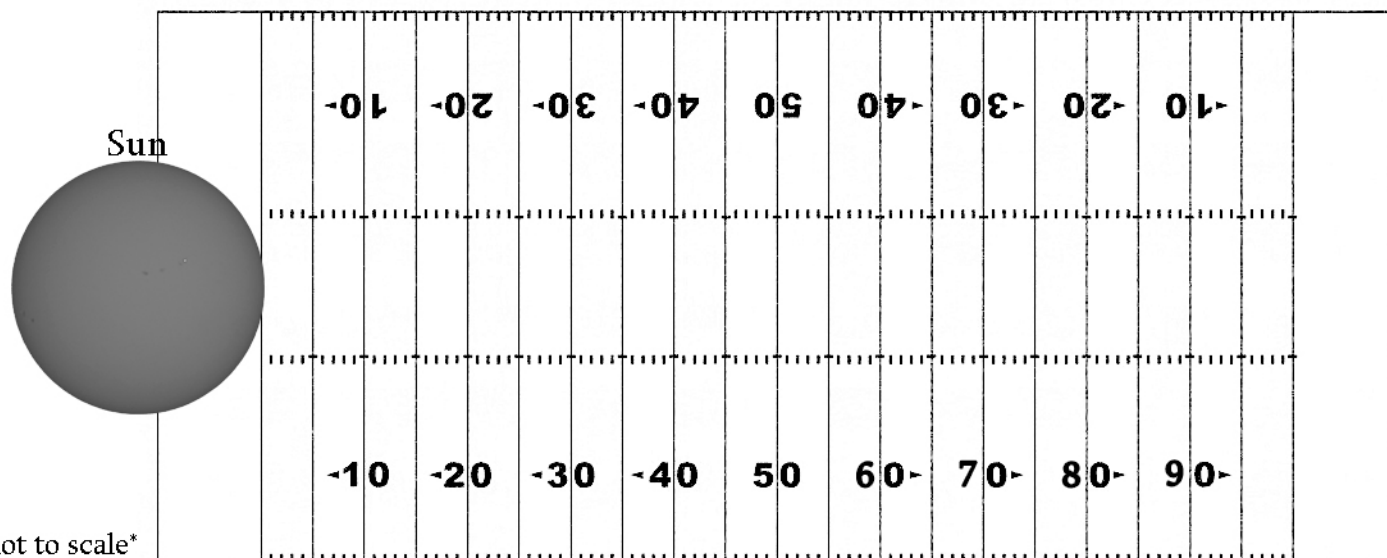
Part 2: How far apart is your scaled Solar System?

Let's take your scaled planet beads and see how far apart they would be. The measurements below have been calculated, in yards, for a regular size football field. We've shrunk a football field to fit on the paper to better see the distances of your scaled Solar System. When you can, try walking the actual distances listed with your fob!

Planet distances from the Sun:

Planet	Distance (mi)	inches	yards	Football Fields
Mercury	35,983,610.00	447.2	12.4	
Venus	67,232,360.00	835.5	23.2	
Earth	92,957,100.00	1155.2	32.1	
Mars	141,635,300.00	1760.2	48.9	
Jupiter	483,632,000.00	6010.3	167.0	1.7
Saturn	888,188,000.00	11037.9	306.6	3.1
Uranus	1,783,950,000.00	22170.0	615.8	6.2
Neptune	2,798,842,000.00	34782.5	966.2	9.7

1. On the football field below, each tick mark is 1 yard. Mark the Inner Planets at their distance from the Sun.



Can you fit the Outer Planets on the football field?

2. On extra paper, draw the number of football fields needed to include the Outer Planets? Mark the Outer Planets. How many football fields did you need?