



Presented by Arkansas Discovery Network

## Pocket Solar System

### Science and Math Concept

Solar System  
Fractions

### Special instructions

Building scale models of the solar system is a challenge because of the vast distances and huge size differences involved. This is a simple little model to give you an overview of the distances between the orbits of the planets and other objects in our solar system. (It is also a good tool for reviewing fractions.)



### Materials

- At least 1 meter of paper tape per person, such as adding machine paper
- Pen or pencil
- Stickers

### What to Do

1. Make sure everyone has a strip of register tape at least a meter long and at most, the length of the person's body. Cut or fold over the ends so they are straight. Label one end "Sun" and the other end "Pluto/Kuiper Belt".
2. Fold the tape in half, crease it, open it up again and place a mark at the halfway-point. Many will be surprised that this is Uranus.
3. Fold the tape in half at Uranus and then in half again making quarters ( $1/4$ ) with the Sun at one end, Pluto at the other and Uranus in the middle.
4. Place a mark at the quarter ( $1/4$ ) mark and the  $3/4$  mark and label as Saturn (closer to the Sun) and Neptune (closer to Pluto), respectively.
5. Stop and admire your work. Which part of the solar system has filled  $3/4$  of your tape? (The 3 most distant planets and Pluto) That means you still have  $1/4$  plus the asteroid belt to fit in the quarter between the Sun and Saturn.
6. Fold the Sun up to Saturn and crease it. Unfold and lay it flat again. Place a mark for Jupiter at the  $1/8$  mark (between the Sun and Saturn), and label it.
7. Fold the Sun out to meet Jupiter to mark the  $1/16^{\text{th}}$  spot. A planet does not go her, but the Asteroid Belt does. (Now things will start to get a little crowded)

8. Fold the Sun to the Asteroid Belt, mark, and crease it. Place a mark for Mars on this fold (between the Sun and Asteroid Belt) and label it. (How many more planets do we need to place?) \_\_\_\_\_
9. Fold the sun up to meet the line for Mars. Leave it folded and fold that section in half. Unfold the tape and you should have three creases. Mark Earth on the crease nearest Mars, Venus on the middle crease, and Mercury on the crease closes to the Sun.
10. Smooth out your model and admire your work.

### What's happening?

You are using fractions to make a pocket solar system. From the model we can see that most of the planets are located within the first quarter of our solar system.

### Questions

1. Are there any surprises when you look at the distances between the planets this way? Many people are unaware of how empty the outer solar system is (there is a reason they call it space!) and how crowded the inner solar system is (relatively speaking).
- 2.

### Hints

[www.astrosociety.org](http://www.astrosociety.org)