Solar System Launch

One astronomical unit is about 92,960,000 miles, the average distance between the Sun and Earth. Because this is hard to imagine, any standard unit of measure, such as centimeters, inches, feet or meters may be used to represent astronomical units in order to show relative scale of the Solar System.

Planet #	Solar System Lineup	Units	# of Centimeters
1	Mercury	0.4	
2	Venus	0.7	
3	Earth	1.0	
4	Mars	1.5	
	Asteroid Belt	in between	
5	Jupiter	5.2	
6	Saturn	9.5	
7	Uranus	19.2	
8	Neptune	30.1	
9	Pluto	39.4	

In this activity, 0.1 units = 1 centimeter

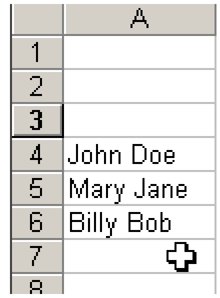
Each team of students will need:

- **measuring tools - centimeter cubes, base ten blocks, rulers in centimeters, etc**
- **several black construction paper strips (1' wide X 18" length)**
- **1 set of Solar System stickers (use stars or glitter to represent the asteroid belt)**
- **scotch tape**
- **2 paper straw rockets (previously made)**

Directions for Solar System Launch

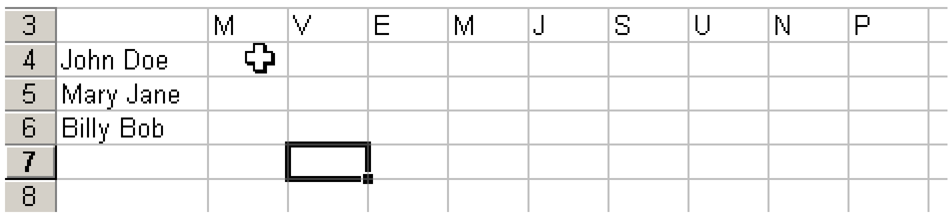
1. Fill in the chart above with the # of centimeters needed to measure distances.
2. Tape 2 black strips end-to-end. (Add more as needed)
3. Beginning with the top of one of the taped strips, attach a Sun sticker.
4. Measure from the **center** of the Sun to the **center** of Planet #1. Add sticker.
5. Measure from the **center** of the Sun to the **center** of Planet #2. Add sticker.
6. Continue this process until all distances are measured and stickers attached.
7. Line up your Solar System strip with the others created by your classmates.
8. Check your team's measurements with your classmates. Were you close?
9. Stand on a mark chosen by your teacher and launch your rocket.
10. Using the computer and the *Solar System Launch Bar Graph*, record where your rocket landed by placing a "1" in the row with your name and in the "Planet Column" closest to your rocket.

Creating the Planet Bar Graph in Microsoft Excel

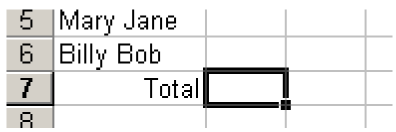


1. Open Excel.
2. In column A, enter the student names.
    a. Under the last student, enter a row for total.

3. Add the planet names.

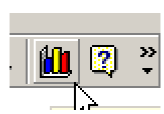


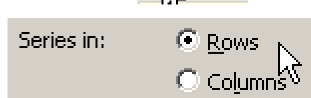
4. Add the formulas to make Excel add the number of students that landed on a given planet.
    a. Click in the first available cell in the column below all of the student names.

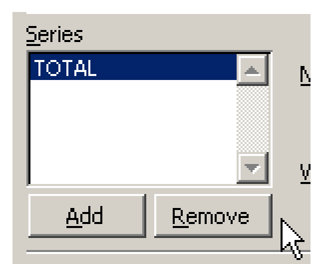


    b. Type in the formula as follows **=sum(b4:b6)**.
    c. Note that the number may be different for your formula depending on the number of students in your group. My student names were in rows 4 through 6. If your students were in rows 4 through 25, then your formula would look like **= sum(b4:b25)**.
    d. Continue adding formulas at the end of each column for each of the planets.
    e. Note: A zero will appear in the column until the students have entered some data.

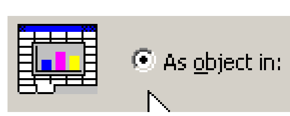
5. Add the bar graph on the same screen.
    a. Highlight the entire chart area.
    b. Click on the chart wizard on the toolbar.
    c. Select column and click next.
    d. Select the series in rows button.
    e. Select the series tab.







    f. Under the series box, remove all of the series **except TOTAL**.
    g. Click next.
    h. Label the chart--Rocket Distance, x-axis—Planets, and y-axis—number of landings.
    i. Click next.
    j. Select As object in button.
    k. Click finish.



6. You can move the chart around by clicking and dragging it to the desired location.