***Lab: Scale Model of the Solar System*** Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Directions:**

1. Obtain a strip of receipt paper at least **2 meters long**.
2. Roll out your receipt paper strip on a flat surface (desk).
3. Draw a large **arc**, or part of a circle shaped like **“ ) “** at the **left-most** end of your paper. This will represent the “Sun”. **Color the Sun yellow** on your strip of receipt paper**.**
4. Using a scale of ***1 cm = 30,000,000 km*** 🡪 Calculate how far away **(distance)** each of the solar system objects should be placed from each other. **Record** all calculated data in data table below in the column labeled ***“Scale Distance (cm)”***.
5. Using a scale of ***1 mm = 2,000 km*** 🡪 Calculate the approximate **size** for the **diameter** (end-to-end) of each of the planets. **Record** all calculated data in data table below in column labeled ***“Scale Diameter (mm)”***.
6. **Plot** the **scale distance (cm)** for each solar system object onto the receipt paper strip at the appropriate locations. Use **scale distance (cm)** plot as the **center** of the **diameter** plot for each planet or object.
7. **Draw a circle** around each planet’s center point according to its scale **diameter (mm).**
8. **Color** each solar system object according to the color scheme from the data table, and **label** each object accordingly on the receipt paper.

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| --- | --- | --- | --- | --- | --- |
| **Name** | **Color** | **Distance from Sun** | **Scale Distance (cm)** | **Diameter** | **Scale Diameter (mm)** |
| Mercury | Grey | 60,000,000 km |  | 4,880 km |  |
| Venus | Yellow-White | 110,000,000 km |  | 12,100 km |  |
| Earth | Blue-White | 150,000,000 km |  | 12,756 km |  |
| Mars | Red-Orange | 230,000,000 km |  | 6,794 km |  |
| Jupiter | Orange-White Bands | 780,000,000 km |  | 142,800 km |  |
| Saturn | Pale Yellow | 1,430,000,000 km |  | 120,660 km |  |
| Uranus | Light Blue | 2,880,000,000 km |  | 51,810 km |  |
| Neptune | Velvet Blue | 4,590,000,000 km |  | 49,528 km |  |
| Kuiper Belt | Black Lines | 5,900,000,000 km |  | -------------- | **----------------------------** |

**Questions & Analysis:** Answer each question in full and complete sentences.

1. Examine the scale model you’ve created.
   1. What do you notice between Mars and Jupiter on the scale model?
   2. What is the name given to the objects that inhabit this region of space?
   3. ***Now draw this onto the strip of receipt paper.***
2. What are the similarities among the **first** four planets (include size, composition, and relative distance from each other, etc.)?
3. What is the collective **name** given to the **first** four planets?
4. What are the similarities among the **last** four planets (include size, composition, and relative distance from each other, etc.)?
5. What is the collective **name** given to the **last** four planets?
6. Why are the planets closer to the Sun so much smaller than the planets far away from the Sun? (Hint: consider the Nebula Theory and the process of formation)
7. What is the Kuiper Belt? *(Use your textbook or research online)*
8. **HONORS ONLY:** How is it possible that all of the planets within our solar system are able to remain in each of their respective orbits around our Sun, neither crashing into it nor flying off into outer space?