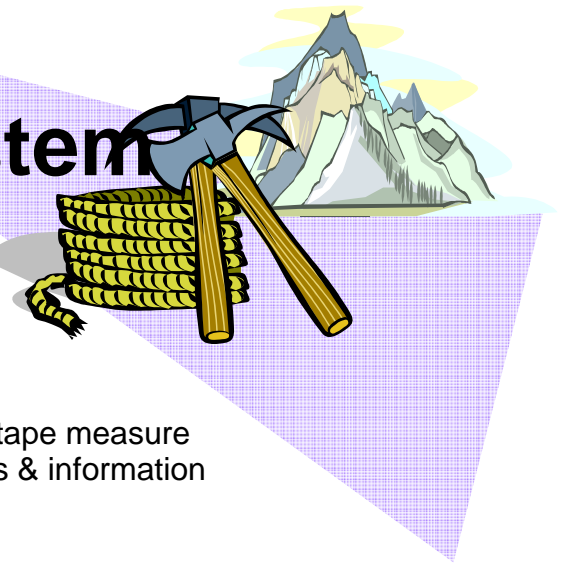


Mini Solar System



QUESTION: What scale must be used to make a model of our Solar System using a roll of adding machine tape?

MATERIALS:

- adding machine tape - roll
- coloring markers
- index card (4" x 6") - 10
- meter stick or metric tape measure
- Solar System pictures & information

PROCEDURE:

1. Read over the paragraph below with your group.

Interplanetary travel is extremely difficult due to the almost unimaginable distances between the planets in our Solar System. Voyager II, traveling at nearly 50,000 mph took 12 years to reach the planet Neptune. We can make a scale model of the distances between the planets using almost anything as our reference. In doing so, we may be able to determine a variety of ways to classify the planets of our solar system. It is almost impossible to make a scale model of the solar system that is correct in both planetary diameter and distance.
2. On an index card draw an illustration of the Sun. On other cards, do the same with each of the eight planets, one object per card. Write interesting facts about the object on the back of the card.
3. Once you have made your set of cards, look them over and list as many ways as possible to classify (group) them by the appearance of the cards.
4. Using a roll of adding machine tape, mark off the distances to the planets using a scale of 10 cm = 10,000,000 miles (refer to the table below).

CELESTIAL OBJECT	NUMBER OF CENTIMETERS FROM THE SUN	NUMBER OF CENTIMETERS FROM THE PREVIOUS OBJECT
Sun	0.0	0.0
Mercury	36.0	36.0
Venus	67.0	31.0
Earth	93.0	26.0
Mars	141.0	48.0
Jupiter	484.0	343.0
Saturn	887.0	403.0
Uranus	1786.0	900.0
Neptune	2800.0	1010.0

ES – Activity #16

QUESTIONS:

1. Name the 8 planets of our Solar System in order.
2. What characteristics are used to classify the planets?
3. Why is it difficult to make a model of the Solar System that is correct with reference to both planetary diameter and distance?
4. As you know, Pluto was downgraded by astronomers and is no longer considered a planet of our Solar System. However, if we had included it in this model, Pluto would be about 86 4" X 6" index card widths from Uranus. How many index card widths would Pluto be from the Sun?
5. In our model, 10 cm is equal to 10,000,000 miles. About how far is Pluto from the Sun at this scale?
6. Alpha Centauri is the closest visible star to our Sun. Astronomers estimate that Alpha Centauri is about 25,000,000,000,000 miles from our Sun. Based on this model, how many centimeters away is Alpha Centauri? If each 4" x 6" index is about 10 cm in width, how many index cards laid edge to edge would it take to show the distance to this star?

FYI

In this model, if we were to show the planets to scale, the Sun would be $0.4 \left(\frac{4}{10} \right)^{\text{ths}}$ inch in diameter, and the Earth would be $0.001 \left(\frac{1}{1000} \right)^{\text{ths}}$ inch in diameter.