HANDS-ON LAB

It's a Long Way to Neptune!

TIME REQUIRED One 45 minute class period

LAB RATINGS Easy 1 2 3 4 Hard

Teacher Preparation–1
Student Setup–2
Concept Level–2 to 3
Cleanup–1

OBJECTIVE

Students will convert and apply data to create a model of the solar system and relative orbital positions of the planets, and create an accurate scale representation of the solar system.

SETUP AND PROCEDURE

- Adding machine paper tape is inexpensive and readily available in many office and school supply stores.
- The adding machine paper tape can be laid in a spoke formation by using a push pin in the center and a piece of corrugated cardboard as a base. It may be interesting to preserve the models in this configuration for other potential activities

ANSWER KEY

Analysis and Conclusion

1. Sample answer: The distances between the planets are extremely large. It is much easier to have a grasp of the relationships without using large numbers.

2. Sample answer: In this case, we would be dealing with light-minutes. For example, it takes light from the sun about 8 min and 20 s to reach Earth. The concept would not have any relevance for this lab.

3. An astronomical unit would be the distance from Mars to the sun. If we were Martians, the rules would be different.

4. Sample answer: Yes. The relative. orbital positions of the planets do not change, so proportionately the models would be accurate.

5. One meter

7. The asteroid belt is about midway between Mars and Jupiter.

8. Sample answer: The belt is held in place by the combined ·effects of the gravities of Mars, Jupiter, and the sun.

9. Sample answer: The locations of the planets' orbits do not change. If the model is accurate, all the scales would be useful.

10. Sample answer: The value of the model increases since I will see the entire orbits of at least the outer planets to scale.