**6th Grade STEM**

**Standard III, Objective 1**

STANDARD III: Students will understand the relationship and attributes of objects in the

solar system.

Objective 1: Describe and compare the components of the solar system.

a. Identify the planets in the solar system by name and relative location from the sun.

b. Using references, compare the physical properties of the planets (e.g., size, solid or gaseous).

c. Use models and graphs that accurately depict scale to compare the size and distance between objects in the solar system.

d. Describe the characteristics of comets, asteroids, and meteors.

e. Research and report on the use of manmade satellites orbiting Earth and various planets.

**Title: Planetary Fractions**

**Description:** Students will use fractions to describe the distance the planets are from the sun.

**Materials needed:** Solar system model, metric ruler, student sheet.

**Time needed:** 30 minutes

**Procedures:**

1. Copy the solar system handout for each student group and a student sheet for each student.
2. Show the video clip: <http://www.youtube.com/watch?v=97Ob0xR0Ut8> (Bill Nye, there are others but he is reliable)
3. Read the introduction to the activity and ask students to estimate how far they think the planets are from the sun, in fractions.
4. All time for the students to measure the distances on their solar system model and record them.
5. Work through some examples of how to calculate the fractions. Do a lot of rounding off of the distances.
6. Have students create a model using their fractions. Use the length of the room you wish to use as “1” and see if students can place a student member at the correct fractional location.

Student Sheet Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Title: Planetary Fractions**

**Introduction:** There are many ways to try and understand the size and scale of the solar system. You may have seen movies or taken a trip outdoors to build a solar system. In this activity, you will use a very small model of the solar system to discover what **fraction** of the solar system a planet is away from the sun. In other words, if Neptune, the farthest planet is “1”, what fraction of that distance is Earth from the sun?

**Directions:**

1. Start by filling out your estimates for the planetary distances, in fractions, on the data table. It doesn’t matter if they are incorrect; just give it a try.
2. Measure the distance each planet is from the sun using the **metric** side of the ruler. Record the distances as decimals, not in fractions.
3. To create the fractional distances, take the distance each planet is from the sun and place it over the total distance to Neptune. Reduce this fraction.

**Data:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Planet** | **My estimate** | **Distance** | **Fractional Distance** | **Reduced Fraction** |
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**Analysis:**

1. Follow the directions as you teacher forms a solar system in the class or gym. How does having the fractions allow you to make a solar system almost anywhere?
2. What surprised you about the location of the planets?
3. Why do the outer planets (beyond Mars) have icy surfaces?