Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Hour \_\_\_\_\_\_\_\_\_\_\_\_\_

Purple **Solar System Project (Summative)**

**Before you start part 1 you will be dividing into groups of three. Ms. Murphy will let you know if there are any restrictions on your groups before you begin.**

**Part 1: Planet sort**

1. Please sort the planets by their size using the sorting cards. Record the planets from smallest to biggest and include the diameter below.

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

2. Please sort the planets by their distance from the sun using the sorting cards. Record the planets from closest to furthest and include their distance.

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

3. Gather the matching activity from Ms. Murphy. Study the items and match the object with the appropriate size. Record your results in the table below from shortest to longest; include the object (Width of Milky Way Galaxy) and the distance (1cm).

|  |  |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Part 2: Model the scale and distance of the Solar System**

Scientist must change the measurements of a system in order to understand the relative measurements within a system. The following builds an exercise for visualizing just how BIG or Solar System really is. Both the relative size and spacing of planets are demonstrated in this activity.

**Directions:**

1. You must complete the Relative distance scale of your planet below.

2. We have determined that Pluto is 6,000,000,000 km away from the Sun. The Sun will be at one end of your meter stick and Pluto is at the other. So, in our scale Pluto is 100cm away from the Sun.

3. Based on the above information how many km would be in 1 cm? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. Using your scale and your planet information from your sorts complete the following relative scales.

|  |  |
| --- | --- |
| **Relative Distance of the Planets** | **Relative Size of the Planets** |
| Earth =2.5 cm | Moon =2.6cm | Sun = 8in or 20 cm | Jupiter = .9in or 2.2 cm |
| Mars= | Jupiter = | Mercury = .03in or 1 mm | Saturn = .7in or 1.7 cm |
| Saturn= 24.4 cm | Uranus = | Venus= .08 in or 2mm | Uranus= .3in or .7 cm |
| Neptune= | Mercury = | Earth = 2mm | Neptune = .7cm |
|  | Venus= | Mars = 1 mm | Pluto = 1mm |

5. Raise your hand and have Ms. Murphy approve your scale and give you the modeling materials.

6. Using a meter stick and the materials provided create a SIZE and DISTANCE scale model of the solar system. Use the meter stick to show the distance between each planet and use the objects to represent each planet (make sure the size is appropriate)

7.Set the sun at one end of the meter stick and Pluto at the other. If Pluto is 1 meter away from the Sun (6 billion km, then how many kilometers is 1 cm?

Draw and label your model below (after your model is complete get Ms. Murphy’s approval)

X\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What is inaccurate and accurate about your model?

**Part 3: Solar System Project Rubric and Directions (Check them off as you read and understand each direction)**

1. You will be designing and creating a model of our solar system. You must pay attention to the scale and size of the objects you use to represent each part of our solar system. \_\_\_

2. You must include all nine planets and their orbits (including Pluto) the orbits can either be drawn onto the model or described by including the speed and how long it takes for them to orbit the sun. \_\_\_

3. You need to include the moon, select a phase, color and position the moon on your model to represent that; you will need to include a caption describing the phase. \_\_\_

4. Four different kinds of satellites, include a them on your model and a caption describing the kind of satellite, what the uses are and where it orbits (These will not be to scale) \_\_\_

5. Two other additional objects that may be found in our solar system. \_\_\_

6. Everything on your model must be labeled. You will need to describe why we use relative scales and include the actual and relative scales for all the objects on your model. \_\_\_

7. Include the following vocabulary with their definitions, orbit, rotation, gravity, and relative size. You will also want some kind of background board or stand to hold your solar system together. \_\_\_

8. Summative extra credit may be earned by going above and beyond with this project.

9. Possible items you may want to consider using clay/play-doh, beads, marbles, coffee beans or any other objects that can be found around the house. \_\_\_

10. After you have read through your directions please plan out your project on the sheet labeled “Project Plan of Work” this will need approval before you begin.

*Checklist* ***Check off the items as your complete them on your project***

\_\_\_Planets (correct color) \_\_\_Correct distance

\_\_\_ 2 additional objects \_\_\_ 3 captions

\_\_\_ Orbits \_\_\_ Vocab

\_\_\_4 satellites \_\_\_ Labels

\_\_\_ Moon in the correct phase \_\_\_ Extra credit

\_\_\_ Correct sized planets

 **Project Plan of Work**

Below I would like you to divide the work amongst your team members. The jobs can include (divide up) the planets, the moon, captions, vocab, decorating the background, two additional objects, and satellites. Please get Ms. Murphy’s approval.

Team member \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Team member \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Day 1: Day 1:

* Supply list Supply list

Day 2:

Day 3:

Day 4:

Team member \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Day 1:

* Supply list

Day 2:

Day 3:

Day 4: Ms. Murphy Approval \_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |
| --- | --- |
| **Grading Rubric** |  |
| \_\_\_3 complete and accurate planet sorts (7.5) |  |
| \_\_\_ Complete and accurate “Part 2 modeling the distance and scale of the solar system” (5) |  |
| **Project**  |  |
| \_\_\_Planets (correct color) (4.5)  |  |
| \_\_\_Correct distance (9) |  |
| \_\_\_ 2 additional objects (1) |  |
| \_\_\_ 3 captions (1.5) |  |
| \_\_\_ Orbits (2) |  |
| \_\_\_ Vocab (2) |  |
| \_\_\_4 satellites (2)  |  |
| \_\_\_ Labels (2.5) |  |
| \_\_\_ Moon in the correct phase (1) |  |
| \_\_\_ Correct sized planets (9) |  |
| \_\_\_Participation Points (10) |  |
| \_\_\_ Extra credit |  |
| Total out of 55 |  |