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

 **Solar System Project (Summative)**

**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.

Materials: Relative size of the planets

Calculators’ Sun= 8in or 20cm Jupiter= .9in or 2.2cm

Rulers, meter sticks Mercury= .03 in or 1mm Saturn= .7in or 1.7cm

Tape measure Venus= .08in or 2mm Uranus= .3 in or .7 cm

String Earth= 2mm

Ball 8 in diameter (20 cm) Mars= 1 mm

**Blue**

**Directions:** 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) if there isn’t an appropriate sized item in your materials please use paper, measure the appropriate diameter and use that to represent the planet. Each group will determine the distance between the sun and their assigned planet.

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?

*Relative distance of the planets*  *Relative size of the planets*

Earth= Moon= Sun= 8in or 20cm Jupiter= .9in or 2.2cm

Mars= Jupiter= Mercury= .03 in or 1mm Saturn= .7in or 1.7cm

Saturn= Uranus= Venus= .08in or 2mm Uranus= .3 in or .7 cm

Neptune= Mercury= Earth= 2mm

Venus= Mars= 1 mm

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?

 **Solar System Project Rubric and Directions**

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. You must include all nine planets and their orbits (including Pluto), our moon in the correct phase, four different kinds of satellites (These will not be to scale) and two other additional objects that may be found in our solar system. Everything on your model must be labeled. You must include captions that explain your distance scale, your size scale, a description of each kind of satellite and the moon phase. 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. Summative extra credit may be earned by going above and beyond with this project.

*Checklist*

\_\_\_Planets (correct color) \_\_\_ Scale description

\_\_\_ 2 additional objects \_\_\_ Size description

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

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

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

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\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Jobs Jobs

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

Job

Keys 1cm= length of a staple

Pluto = 1meter= 6 billion km 10 cm- diameter of a softball

Mercury= 1cm 1 m= width of a door

Venus= 2 cm 10 m = width of a classroom

Earth=2.5cm 100 m= length of your school

Moon=2.6cm 1 km= depth of the Grand Canyon

Mars=3.8cm 10 km= deepest depth of the Pacific Ocean

Jupiter=13.3cm 1000km= length of California

Saturn=24.4cm 10,000km= diameter of earth (12,756km)

Uranus= 48.9cm 100,000km= diameter of Jupiter (142,800km)

Neptune=76.5cm 1,000,000km = diameter of the sun (1.4 million km)

 100,000,000km= distance from the sun to earth (152 million km)

Paces 1,000,000,000 km = distance from sun to Saturn

Mercury = 20steps 38 million million km= nearest star beyond the sun 1 million billion km= width of Milky Way Galaxy

Venus=19 steps

Earth=25 steps

Mars=39 steps

Jupiter= mars + 95 steps

Saturn=Jupiter + 112 steps

Uranus= Saturn+ 249 steps

Neptune=Uranus +281 steps

Pluto= Uranus + 242 steps

**Purple**

**Directions:** 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) if there isn’t an appropriate sized item in your materials please use paper, measure the appropriate diameter and use that to represent the planet. Each group will determine the distance between the sun and their assigned planet.

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?

*Relative distance of the planets*  *Relative size of the planets*

Earth= 2.5cm Moon= 2.6cm Sun= 8in or 20cm Jupiter= .9in or 2.2cm

Mars= Jupiter= Mercury= .03 in or 1mm Saturn= .7in or 1.7cm

Saturn= 24.4cm Uranus= Venus= .08in or 2mm Uranus= .3 in or .7 cm

Neptune= Mercury= Earth= 2mm

Venus= Mars= 1 mm

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?

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*Checklist*

\_\_\_Planets (correct color) \_\_\_ Scale description

\_\_\_ 2 additional objects \_\_\_ Size description

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

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

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

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\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Jobs Jobs

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

Job

Yellow

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*Relative distance of the planets*  *Relative size of the planets*

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Mars= 3.8cm Jupiter= 13.3cm Mercury= .03 in or 1mm Saturn= .7in or 1.7cm

Saturn= 24.4cm Uranus=48.9cm Venus= .08in or 2mm Uranus= .3 in or .7 cm

Neptune= 76.5cm Mercury=1cm Earth= 2mm

Venus= 2cm Mars= 1 mm

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

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

Jobs Jobs

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

Job