Short Performance Assessment: **MS-ESS1-3**

Grade Level: **Middle School**

Adapted from SNAP[1]

Title	**Solar System Scale**		
Designed by		Course(s)	**Middle School**

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Performance Expectation	**MS-ESS1-3**: Analyze and interpret data to determine scale properties of objects in the solar system. **Clarification Statement**: Emphasis is on the analysis of data from Earth-based instruments, space-based telescopes, and spacecraft to determine similarities and differences among solar system objects. Examples of scale properties include the sizes of an object's layers (such as crust and atmosphere), surface features (such as volcanoes), and orbital radius. Examples of data include statistical information, drawings and photographs, and models. **Assessment Boundary**: Assessment does not include recalling facts about properties of the planets and other solar system bodies.

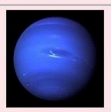
Science and Engineering Practice	**Analyzing and Interpreting Data** • Analyze and interpret data to determine similarities and differences in findings.
Disciplinary Core Ideas	**ESS1.B: Earth and the Solar System** • The solar system consists of the sun and a collection of objects, including planets, their moons, and asteroids that are held in orbit around the sun by its gravitational pull on them.
Crosscutting Concept	**Scale, Proportion, and Quantity** • Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small.

Student Performance	1. Organizing data 2. Identifying relationships 3. Interpreting data

[1] The Short Performance Assessment (SPA) and the Assessment Rubric adapted from the Stanford NGSS Assessment Project http://snapgse.stanford.edu/

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Name_____

		*Mercury[6]	*Venus[7]	*Earth[8]	*Mars[9]	°Jupiter[10]	°Saturn[11]	†Uranus[12]	†Neptune[13]
									
Astronomical symbol[q]		☿	♀	⊕	♂	♃	♄	♅	♆
Mean distance from the Sun	km	57,909,175	108,208,930	149,597,890	227,936,640	778,412,010	1,426,725,400	2,870,972,200	4,498,252,900
	AU	0.38709893	0.72333199	1.00000011	1.52366231	5.20336301	9.53707032	19.19126393	30.06896348

(https://en.wikipedia.org/wiki/List_of_gravitationally_rounded_objects_of_the_Solar_System#Planets)

Using the data chart above, answer the following questions.

1. How many planets can be accurately represented on a standard 8 1/2 x 11 piece of paper, if you drew a model of their orbits? Explain.

2. How many pieces of paper would you need to make a scale model of the entire solar system? Explain.

3 . What does this tell you about the actual location of the planets in our solar system?

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Assessment Rubric* - Question 1				
	Emerging	Developing	Approaching Proficiency	Excelling
Description of performance				
Sample student responses				

Assessment Rubric* - Question 2				
	Emerging	Developing	Approaching Proficiency	Excelling
Description of performance				
Sample student responses				

Insert additional Assessment Rubrics (if needed) here.

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