Schoolyard Solar System

Plan a scaled model of the planets

E.5.8A.1 "Develop and use scaled models of Earth's solar system to demonstrate the size, composition (i.e., rock or gas), location, and order of the planets as they orbit the Sun."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Number the eight planet names in the first paragraph from the Sun outward, underline their distances in the table, and circle the words in the last paragraph that describe what the planets are made of.

A Solar System You Can Walk

1. Imagine laying out the solar system across a schoolyard. The Sun sits at the starting line. Moving outward, the planets are Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune. Each planet travels around the Sun in an orbit, so the planets do not stay lined up. A model shows their average distances from the Sun, not their positions today.

2. For a distance model, let one pace stand for about 150 million kilometers. The table gives each planet's approximate distance from the Sun in paces. Earth is one pace out, while Neptune is thirty paces out. These numbers are rounded because orbits are not perfect circles. If you change the scale, change every planet's distance by the same rule.

APPROXIMATE DISTANCE FROM THE SUN

Planet	Paces	Planet	Paces
Mercury	0.4	Jupiter	5
Venus	0.7	Saturn	10
Earth	1	Uranus	20
Mars	1.5	Neptune	30

3. Distance is not everything. Mercury, Venus, Earth, and Mars are small, rocky planets. Jupiter and Saturn are larger and made mostly of gas. Uranus and Neptune are large, with gas and icy material. On a separate size scale, Earth could be one centimeter wide and Jupiter about eleven centimeters wide. Distance and size need different scales to fit.

2 ANSWER WITH EVIDENCE

Use the passage

1. Where would you place Mars in the pace model? Name the planet just before it in order.

2. How many paces farther from the Sun is Uranus than Saturn in this model?

3. How should models of Earth and Jupiter differ in size and make-up?

4. Find two pairs of neighboring planets that are 0.3 pace apart in the model.

3 YOUR TURN

Your own words

Make a new eight-planet model using two steps for every pace in the table. Fill in the planets in order from the Sun, give each new distance, label each planet small or large, and describe its make-up as rock, gas, or gas and ice.

PLANET	DISTANCE IN STEPS	SIZE	MAKE-UP

ANSWER KEY

Schoolyard Solar System

GRADE 5 · E.5.8A.1

PART 1 · READ AND MARK

Number the eight planet names in the first paragraph from the Sun outward, underline their distances in the table, and circle the words in the last paragraph that describe what the planets are made of. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Where would you place Mars in the pace model? Name the planet just before it in order.	**Place Mars 1.5 paces from the Sun. Earth comes just before Mars.**
2	How many paces farther from the Sun is Uranus than Saturn in this model?	**Uranus is 10 paces farther from the Sun than Saturn.**
3	How should models of Earth and Jupiter differ in size and make-up?	**Jupiter should be larger and labeled mostly gas. Earth should be smaller and labeled rock.**
4	Find two pairs of neighboring planets that are 0.3 pace apart in the model.	**Mercury and Venus are 0.3 pace apart. Venus and Earth are also 0.3 pace apart.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

PLANET	DISTANCE IN STEPS	SIZE	MAKE-UP
Mercury	0.8	small	rock
Venus	1.4	small	rock
Earth	2	small	rock
Mars	3	small	rock
Jupiter	10	large	gas
Saturn	20	large	gas
Uranus	40	large	gas and ice
Neptune	60	large	gas and ice

Check that every new distance is twice its table value and that the planets remain in order. Accept equivalent descriptions such as rocky or mostly gas.