Paths Through Space

Compare solar system objects by their features and movements

E.6.8.4 "Obtain and evaluate information to model and compare the characteristics and movements of objects in the solar system (including planets, moons, asteroids, comets, and meteors)."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline two facts about what objects are like, circle two facts about how they move, and number a pair of facts you could use to compare two different objects.

What Is Moving Up There?

1. Imagine plotting paths across the solar system. Earth and the other planets travel around the Sun on paths called orbits. The Sun's gravity helps keep them on those paths. Planets are large, nearly round bodies that do not make their own light. Earth's Moon is much smaller than Earth and travels around Earth while Earth travels around the Sun. A moon's main orbital partner is its planet, even as both circle the Sun. To model these movements, draw a loop around the Sun for a planet and a loop around the planet for its moon.

2. Asteroids are rocky or metallic objects much smaller than planets. Many orbit the Sun between Mars and Jupiter, but some cross the paths of planets. Comets are made of ice, dust, and rock and also orbit the Sun. A comet may spend much of its orbit far from the Sun. Near the Sun, warmth releases gas and dust, creating a glowing cloud and sometimes a tail that points away from the Sun. Unlike a comet, an asteroid usually does not grow a glowing cloud.

3. A meteoroid is a small piece of rock or metal moving through space. If it enters Earth's atmosphere, it heats the air and creates a streak of light called a meteor. The streak is an event in the atmosphere, not a body orbiting the Sun. A surviving piece that reaches the ground is a meteorite. If someone labels a streak across the night sky "a comet flying past Earth," check the claim against where the light appears and how long it lasts. A meteor lasts seconds; a comet can be seen for many nights.

2 ANSWER WITH EVIDENCE

Use the passage

1. Compare the paths of Earth and its Moon. What two loops would show their movements in a model?

2. An object is rocky, much smaller than a planet, and orbits between Mars and Jupiter. What is it? How is its movement like a comet's movement?

3. How would you change a model of a comet as it moves close to the Sun? Use the passage to explain why.

4. A sign calls a brief streak of light in Earth's atmosphere "a comet." Use two facts from the passage to evaluate the sign.

3 YOUR TURN

Your own words

Draw two labeled panels: one showing an asteroid orbiting the Sun between Mars and Jupiter, and one showing a meteoroid entering Earth's atmosphere and creating a meteor. Add arrows for motion, then write one sentence comparing the two movements.

ANSWER KEY

Paths Through Space

GRADE 6 · E.6.8.4

PART 1 · READ AND MARK

Underline two facts about what objects are like, circle two facts about how they move, and number a pair of facts you could use to compare two different objects. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Compare the paths of Earth and its Moon. What two loops would show their movements in a model?	**Draw Earth's loop around the Sun and the Moon's loop around Earth. Both travel around the Sun as Earth moves.**
2	An object is rocky, much smaller than a planet, and orbits between Mars and Jupiter. What is it? How is its movement like a comet's movement?	**It is an asteroid. Both asteroids and comets orbit the Sun.**
3	How would you change a model of a comet as it moves close to the Sun? Use the passage to explain why.	**Add a glowing cloud and possibly a tail pointing away from the Sun because warmth releases gas and dust.**
4	A sign calls a brief streak of light in Earth's atmosphere "a comet." Use two facts from the passage to evaluate the sign.	**The sign is incorrect. A meteor is a streak in Earth's atmosphere that lasts seconds; a comet orbits the Sun and can be seen for many nights.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Panel 1 labels: Sun, Mars, Jupiter, asteroid on an orbit between the planets, arrow along the orbit.
Panel 2 labels: Earth, atmosphere, meteoroid with an arrow toward Earth, meteor streak in the atmosphere.
Sentence: The asteroid circles the Sun, but the meteoroid enters Earth's atmosphere and produces a meteor.

Accept other accurate loop shapes and arrow directions that show the stated movements. In the open task, look for a distinction between the moving meteoroid and the meteor, which is the streak of light it creates.