

Gravity's Solar Map

Track solar system objects, motion, and the conditions that support life.

7.9 "Earth and space. The student understands the patterns of movement, organization, and characteristics of components of our solar system. The student is expected to: describe the physical properties, locations, and movements of the Sun..."

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline phrases that tell an object's location or movement, circle facts that show what gravity does, and number 1, 2, and 3 beside the three main characteristics that help Earth support life.

A Solar System Tour

- ① At the center of our solar system, the Sun is a star made mostly of hot hydrogen and helium. Its gravity holds the solar system together. Eight planets orbit the Sun in paths shaped like stretched circles. Rocky Mercury, Venus, Earth, and Mars are closer to the Sun, while giant outer planets are farther away. Many planets have moons, which are natural objects that orbit planets. Earth's Moon reflects sunlight as it moves around Earth, while Earth and the other planets continue orbiting the Sun.
- ② Smaller objects also travel through the solar system. Asteroids are rocky bodies, many found in the asteroid belt between Mars and Jupiter. Comets contain ice, dust, and rock. They travel on long, oval paths, and sunlight can form a glowing coma and tail when they approach the Sun. Beyond Neptune lies the Kuiper belt, a broad region holding icy objects and some dwarf planets. Far beyond it, the Oort cloud is a distant, roughly spherical collection of icy bodies. A meteor is the streak of light made when a meteoroid burns in Earth's atmosphere.
- ③ Gravity pulls objects toward one another and keeps their motions organized. The Sun's strong gravity bends planetary paths into orbits instead of letting planets fly away. Earth's gravity keeps its Moon in orbit and holds much of Earth's atmosphere near the surface. Earth supports life partly because it is at a distance from the Sun where liquid water can exist. Water is useful for life processes, and Earth's atmosphere contains gases such as nitrogen and oxygen. The atmosphere also helps regulate temperature and blocks much harmful radiation from the Sun.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 Describe where the asteroid belt, Kuiper belt, and Oort cloud are located, and tell what each contains.

2 How does a comet differ from an asteroid, and what can sunlight do to a comet when it approaches the Sun?

3 Explain how gravity affects the motion of planets and Earth's Moon. Then state what a meteor is.

4 Identify two characteristics of Earth that help it support life, and explain how each helps.

3 YOUR TURN _____ Your own words

Imagine a newly discovered rocky planet in our solar system. Write exactly four sentences that describe its orbit and gravity, a moon or other orbiting object, and two characteristics that could allow life to exist.

PART 1 • READ AND MARK

Underline phrases that tell an object's location or movement, circle facts that show what gravity does, and number 1, 2, and 3 beside the three main characteristics that help Earth support life. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	Describe where the asteroid belt, Kuiper belt, and Oort cloud are located, and tell what each contains.	The asteroid belt is between Mars and Jupiter and contains many rocky asteroids. The Kuiper belt is beyond Neptune and holds icy objects and some dwarf planets. The Oort cloud is far beyond the Kuiper belt and is a distant, roughly spherical collection of icy bodies.
2	How does a comet differ from an asteroid, and what can sunlight do to a comet when it approaches the Sun?	An asteroid is rocky, while a comet contains ice, dust, and rock. Sunlight can form a glowing coma and tail around a comet near the Sun.
3	Explain how gravity affects the motion of planets and Earth's Moon. Then state what a meteor is.	The Sun's gravity keeps planets in orbit around the Sun. Earth's gravity keeps the Moon in orbit around Earth. A meteor is the streak of light made when a meteoroid burns in Earth's atmosphere.
4	Identify two characteristics of Earth that help it support life, and explain how each helps.	Earth is at a distance from the Sun where liquid water can exist, and water is useful for life processes. Its atmosphere helps regulate temperature and blocks much harmful solar radiation. The atmosphere also contains gases such as nitrogen and oxygen.

PART 3 • YOUR TURN (SAMPLE ANSWER)

My rocky planet orbits the Sun at a distance where liquid water can remain on its surface. The Sun's gravity keeps the planet traveling in an orbit, and the planet's gravity keeps one moon in orbit. Oceans provide water for life processes. An atmosphere containing nitrogen and oxygen helps regulate temperature and protects living things from harmful solar radiation.

Accept scientifically accurate descriptions that use equivalent wording from the passage. For the open response, accept any plausible planet description with exactly four sentences that includes orbit and gravity, an orbiting object, and at least two life-supporting characteristics.