

Gravity's Curved Path

Read how gravity and forward motion create an orbit.

6.2.c "gravity contributes to orbital motion; and"

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline phrases that show gravity pulling or changing direction, and circle phrases that show forward or sideways motion helping an object stay on an orbital path.

Falling Around Earth

- ① Imagine tossing a ball sideways from a high mountain. Gravity pulls the ball downward as it travels forward. If it moves slowly, it hits the ground nearby. If it moves faster, Earth's curved surface drops away beneath it, so the ball travels farther before landing. With enough sideways speed and no air resistance, it would keep falling around Earth instead of striking the ground. That continuous fall is an orbit. The object is still pulled by gravity every moment.
- ② Earth's gravity supplies the inward pull that changes an orbiting object's direction. Without this pull, the object would move in a straight line because of its motion. Gravity bends that straight path into a curved one. The Moon stays in orbit because Earth's gravity pulls it toward Earth while the Moon moves forward. The Moon does not fall onto Earth because its forward motion carries it along its curved path. An orbit is a balance between forward motion and gravitational pull, not a place with no gravity.
- ③ Many human-made satellites orbit Earth for communication, weather observations, and navigation. After a rocket places a satellite high above most of the atmosphere, the satellite has sideways motion. Earth's gravity keeps pulling it inward, changing its direction again and again. The satellite's path curves around Earth rather than continuing straight into space. At different heights, satellites need different speeds to remain in orbit. A satellite too slow for its height can move into a lower orbit, where it may eventually reenter the atmosphere.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 Why does a ball thrown faster sideways travel farther before it lands?

2 What does Earth's gravity do to the path of an orbiting object?

3 Why does the Moon stay in orbit instead of falling straight onto Earth?

4 What may happen to a satellite that is too slow for its height?

3 YOUR TURN _____ Your own words

Invent a spacecraft traveling near a planet. In three sentences, explain what gravity does, what the spacecraft's forward motion does, and why the result is an orbit instead of a straight path or a crash.

PART 1 • READ AND MARK

Underline phrases that show gravity pulling or changing direction, and circle phrases that show forward or sideways motion helping an object stay on an orbital path. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	Why does a ball thrown faster sideways travel farther before it lands?	It moves forward faster while gravity pulls it downward, so it travels farther as Earth's curved surface drops away beneath it.
2	What does Earth's gravity do to the path of an orbiting object?	It pulls the object inward and changes its direction, bending a straight path into a curved path.
3	Why does the Moon stay in orbit instead of falling straight onto Earth?	Earth's gravity pulls the Moon toward Earth, while the Moon's forward motion carries it along a curved path.
4	What may happen to a satellite that is too slow for its height?	It can move into a lower orbit and may eventually reenter the atmosphere.

PART 3 • YOUR TURN (SAMPLE ANSWER)

A probe moves sideways near the planet Vega. Vega's gravity pulls the probe inward and keeps changing its direction. The probe's forward motion carries it ahead as it falls, so it follows a curved orbit instead of moving straight away or crashing down.

Accept equivalent explanations that identify gravity as the inward pull and forward or sideways motion as the motion that carries an object along a curved path. For the open task, check that all three required ideas are present and scientifically connected.