

Orbits and Gravity in Space

READ ALOUD PASSAGE

Gravity is a pulling force, and it does something remarkable in space: it keeps objects moving in curved paths called orbits. The Moon orbits Earth, and Earth orbits the sun, but this happens in a way that might surprise you. An orbiting object is always in a state of free fall. Right now, the Moon is falling toward Earth. But the Moon is also moving sideways so fast that it keeps missing Earth. These two things, falling toward Earth and moving sideways, balance each other perfectly. That perfect balance is what we call an orbit. If the Moon had no gravity pulling it inward, it would fly off in a straight line into space and never come back. If the Moon had no sideways speed at all, gravity would pull it straight down and it would crash into Earth. An orbit can only happen when both of these forces work together in exactly the right way. The same idea explains why Earth orbits the sun. Earth is always falling toward the sun, but it is also moving sideways fast enough to keep going around and around rather than falling in. Satellites that humans launch into space work the same way. They must be sent up with enough speed to fall around Earth instead of falling into it.

Activity 1

Fill in the blank with the correct word from the word box.

WORD BOX

orbit free fall sideways gravity balance

1. The path the Moon travels around Earth is called an _____.
 2. An orbiting object is always in a state of _____ toward what it circles.
 3. The Moon moves _____ fast enough to keep missing Earth.
 4. _____ is the force that pulls the Moon toward Earth.
 5. An orbit is the _____ between falling inward and moving forward.
-

Activity 2

Because / But / So Complete each sentence three different ways.

The Moon stays in orbit around Earth because

.....

The Moon stays in orbit around Earth but

.....

The Moon stays in orbit around Earth so

.....

Activity 3

Circle True or False for each statement.

1. **True / False** The Moon is in a constant state of free fall toward Earth.
2. **True / False** Without gravity, the Moon would fly off in a straight line into space.
3. **True / False** An orbit is the balance between falling inward and moving sideways.
4. **True / False** Earth orbits the sun for a completely different reason than the Moon orbits Earth.