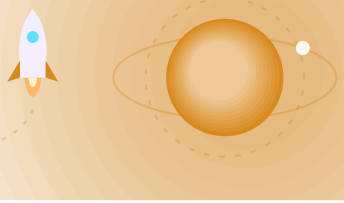
LESSON M-05 · MIDDLE SCHOOL BRIDGE LESSONS (6-8)

Basic Orbit

MIDDLE SCHOOL (6-8)



Name _____ Date _____ Class / Period _____

Falling around the world

A rocket does not need to stay in place to stay up. If it moves sideways fast enough, it keeps falling toward the ground and keeps missing it, because the ground curves away. That is an orbit.

Mission goal: build enough sideways speed to keep missing the ground.

1 LOOK

OBSERVE BEFORE YOU TOUCH A CONTROL

What keeps it up?

- Even _____ km up, gravity still pulls with about _____% of its pull on the ground.
- To stay up at that height, a rocket needs to move sideways at about _____ metres per second.

Write the numbers shown in the sim in the blanks above, then record what you notice:

2 PREDICT

COMMIT TO A HYPOTHESIS FIRST

Prediction 1. A rocket is high above Earth, going around it in orbit. What keeps it from falling to the ground?

Hint: An orbit is a path around a world that repeats again and again.

□ Its engine keeps pushing it up

□ Its sideways speed: it is falling around the world

□ Nothing pulls on it up there

Because...

3 EXPERIMENT

CHANGE ONE VARIABLE AT A TIME

Step 1. Press **[Space]** to light the engine and **[Z]** for full throttle. Climb for about 10 kilometres, then hold **[W]** a moment to lean the rocket over toward the horizon so it builds sideways speed. (**[S]** leans it the other way.) Press **[Space]** when a stage runs out. Keep going until the lowest point of your orbit is above _____ kilometres, then press **[X]**.

Trial	What I changed	What I measured / saw	Matched my prediction?
1			Yes · No · Partly

2			Yes · No · Partly
3			Yes · No · Partly

4 EXPLAIN

CLAIM · EVIDENCE · REASONING

Claim — What did you find out? (answer the mission goal in one sentence)

Evidence — Which numbers or observations from the sim support your claim?

Reasoning — Which science idea connects your evidence to your claim?

Self-check: □ I made a prediction before experimenting □ I used numbers from the sim □ I explained *why*, not just *what*