LESSON T1-03 · TIER 1 · ANATOMY, FORCE & STABILITY

Balancing Act

GRADES 6-12



Name _____ Date _____ Class / Period _____

Why do rockets fly straight?

A dart flies straight because its weight is at the front and its feathers are at the back. A rocket works the same way: where the weight sits compared with where the air pushes decides whether it flies straight or tumbles.

Mission goal: fly a rocket straight up and see what keeps it steady.

1 LOOK

OBSERVE BEFORE YOU TOUCH A CONTROL

Does the wobble die away?

- The balance point (CoM) is where the weight acts. The pressure point (CoP) is where the air pushes on the rocket. Their gap is measured in calibres: one calibre is one rocket-width.
- This rocket's balance number is _____ calibres. A positive number means the balance point is ahead of the pressure point.

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. The balance point (CoM) is ahead of the pressure point (CoP), and a gust gives the nose a small upward nudge. What happens to the wobble?

Hint: The balance point is where the rocket would balance on your finger. The pressure point is where the air pushes on it.

□ It grows bigger and bigger

□ It dies away

Because...

3 EXPERIMENT

CHANGE ONE VARIABLE AT A TIME

Step 1. Press **[Space]** to light the engine and **[Z]** for full throttle. Fly straight up for 10 seconds. Watch the Nose off course number: it shows how far the nose points away from the way the rocket moves. Press **[X]** when you are done.

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*