

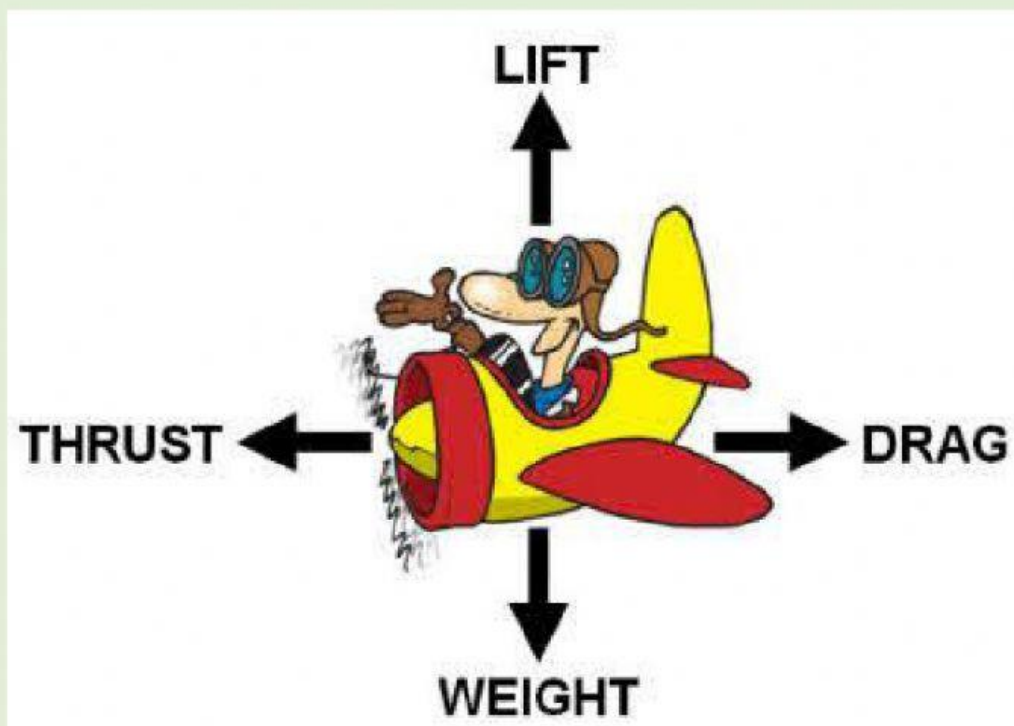


SCIENCE

CHAPTER 8-MOTION, FORCES AND DESIGN PROCESS

LESSON 2- FORCES AND TRANSPORTATION

PART 1



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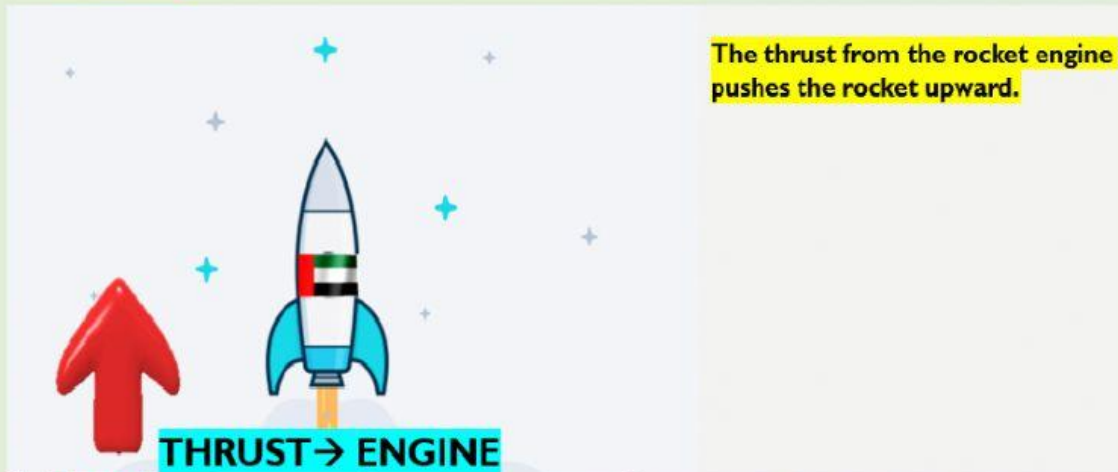
HOW DO ROCKET FLY IN SPACE?

❖ There are 2 type of forces acting on the rocket→

-THRUST

-DRAG

❖ **THRUST** is a force that moves an object forward



❖ **DRAG** is a force that moves against motion of an object- slows it down.

DRAG → AIR

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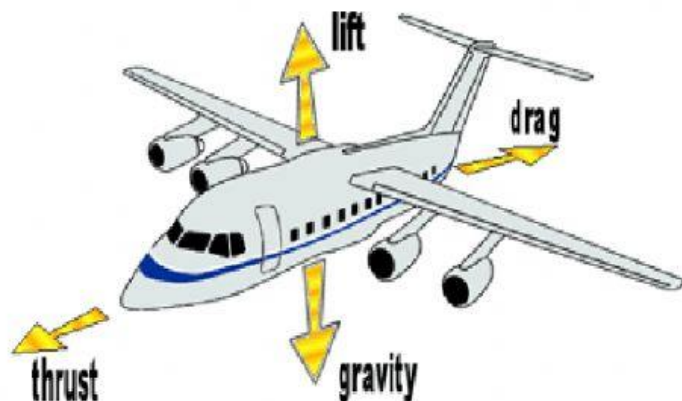


WATCH EXPERIMENT ABOUT FORCES ACTING ON A ROCKET

HOW DO AIRPLANE FLY IN SKY?

Four forces of flight

Lift - upward
Drag - backward
Weight - downward
Thrust - forward



- ❖ Airplanes use the force of LIFT to fly
- ❖ LIFT is the force that holds objects in air
- ❖ **Two things are needed for an airplane to have lift →**

1. Plane must be moving forward

2. Moving air must push against the bottom of the wing

- ❖ Gravity slows the takeoff of the plane.
- ❖ Drag also affects the plane's motion.

FOUR FORCES OF FLIGHT

FOUR FORCES OF FLIGHT SONG

PRACTICE QUESTIONS:

- 1.** How are thrust and drag alike?
How are they different?

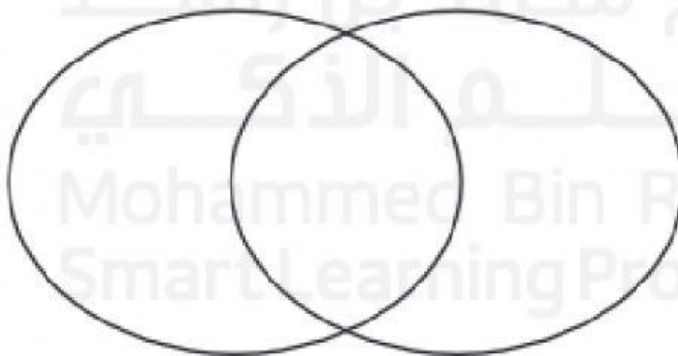
- 2.** There is no air in space, and little gravity. How will this affect the motion of a rocket?

- 3.** How does the motion of an airplane compare to the motion of a rocket?

Airplane

Both

Rocket



- 4.** Why is an engine needed to make an airplane fly?

TYPE YOUR ANSWER

5. **Test Prep** What slows down the movement of a plane?

- A thrust
- B drag
- C buoyancy
- D lift

6. Which two forces slow an airplane's motion as it rises into the air?

- A thrust and lift
- B thrust and drag
- C drag and lift
- D drag and gravity

7. Students have each created their own designs for cargo boats. Which would work best to test their designs?

- A Put the boats in water to see which float and which sink.
- B Put the boats in water and add weights to see which can hold the most weight before sinking.
- C Weigh and measure each boat and then place them in water to see which sink and which float.
- D Have students vote on the best design.

8. The table below shows the weights of different drone prototypes. On which object is the pull of gravity strongest?

Object	Weight (N)
Drone A	12.5
Drone B	10.2
Drone C	12.3
Drone D	7.6

- A Drone A
- B Drone B
- C Drone C
- D Drone D

9. The table below shows direction of the forces acting on a rocket that is moving forward. Engineers need to increase the forward velocity of the rocket.

Force	Weight (N)
gravity	down
drag	backward
thrust	forward

Which change should engineers make?

- A increase drag
- B increase thrust
- C decrease thrust
- D increase gravity

LAB BASED QUESTIONS



CLICK ON
YELLOW ICON
TO OPEN
VIRTUAL LAB
ABOUT THRUST
AND DRAG

PRACTICE QUESTIONS:

1. Air drag slows down the rocket sled.
 - a. YES
 - b. NO
2. Thrust _____ the speed of the rocket sled.
 - a. INCREASE
 - b. DECREASE
3. Friction slows down the rocket sled.
 - a. YES
 - b. NO