

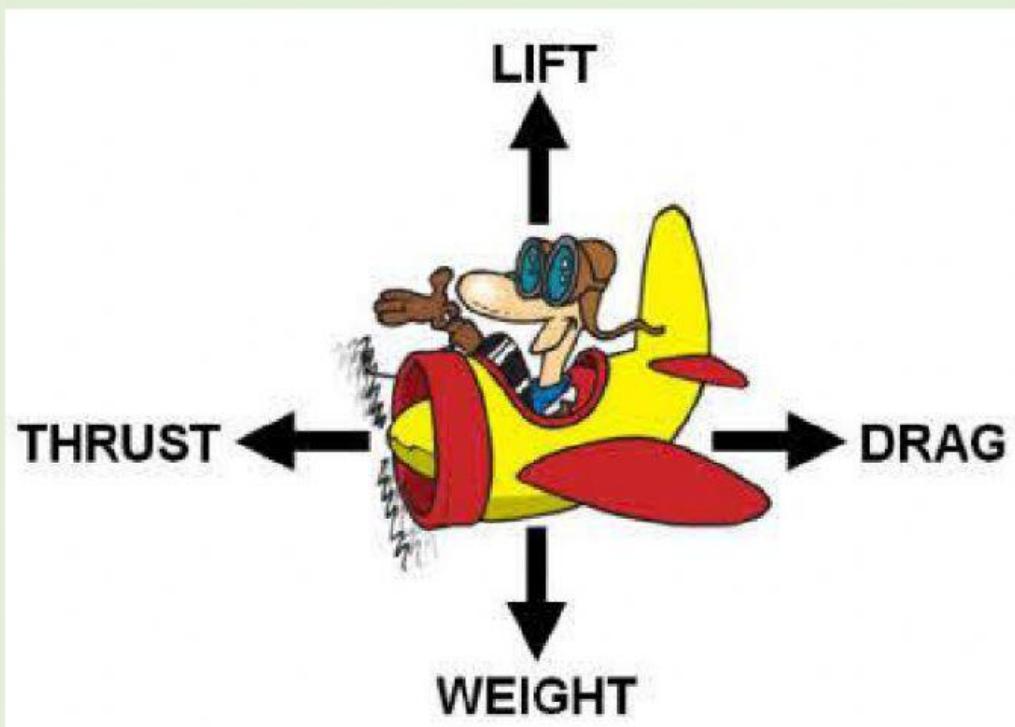


SCIENCE

CHAPTER 8-MOTION, FORCES AND DESIGN PROCESS

LESSON 2- FORCES AND TRANSPORTATION

PART 1



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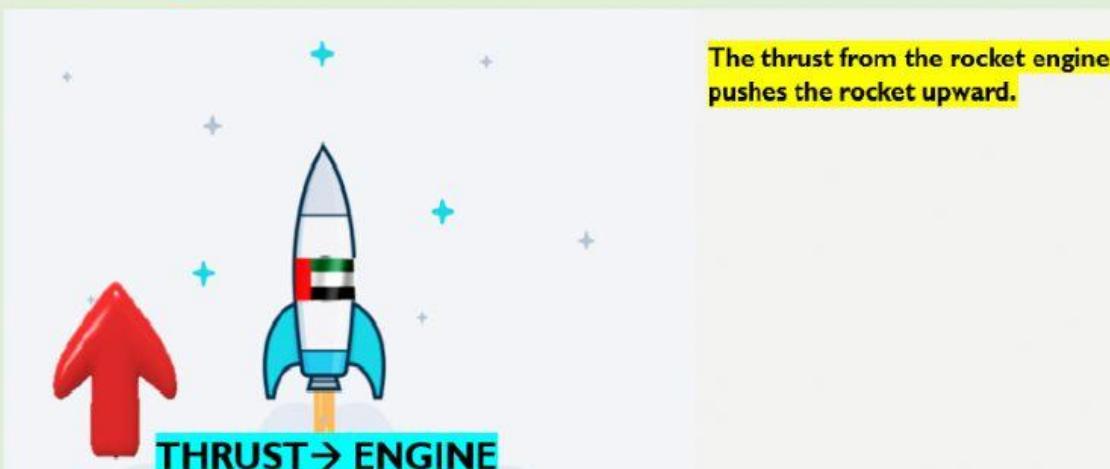
HOW DO ROCKET FLY IN SPACE?

- ❖ 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

PG NO 381 IN YOUR BOOK

Drag pushes the plane down and backward.

IMPORTANT NOTE:
Gravity also pulls the rocket towards earth.

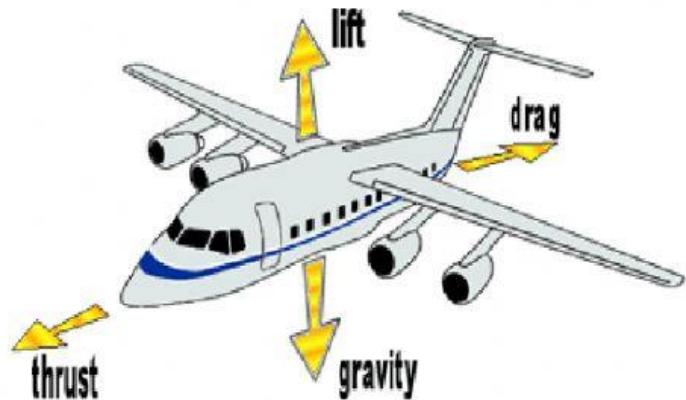


WATCH EXPERIMENT ABOUT FORCES ACTING ON A ROCKET

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.

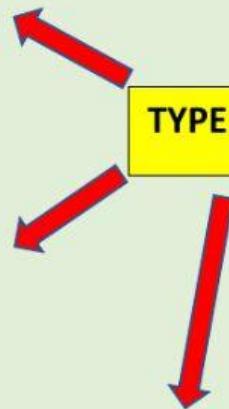
FOUR FORCES OF FLIGHT

FOUR FORCES OF FLIGHT SONG

PRACTICE QUESTIONS:

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

TYPE YOUR ANSWER



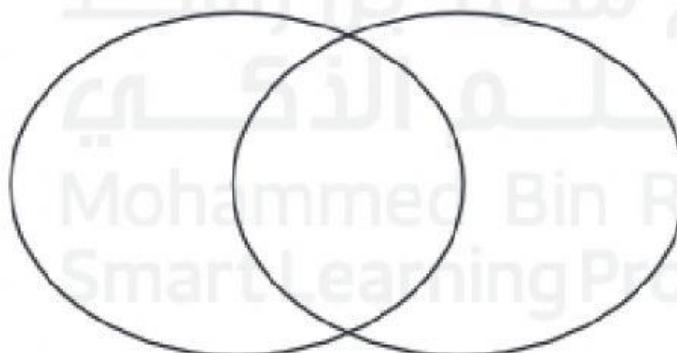
2. There is no air in space, and little gravity. How will this affect the motion of a rocket?

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?

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

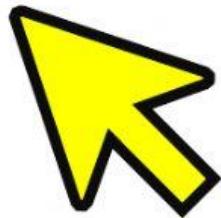
9. The table below shows direction of the forces acting on a rocket that is moving forward. Engineers need to increase the forward velocity of the rocket.

| 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**