

NAME \_\_\_\_\_

## HOW DO THINGS FLY

Have you ever thrown a toy glider or paper airplane and watched it soar through the air? What makes it move through the air and stay afloat? If you guessed force, you are correct. There are four forces that help an airplane fly through the air. Those forces are lift, thrust, drag, and gravity.

Orville and Wilbur Wright were the first to successfully fly an airplane. In order to learn how to fly, the Wright brothers, studied birds. This helped them to better understand how birds take flight and stay in the air. Wings of an airplane, like wings of a bird, help keep an airplane up in the air, but that's not the only reason a bird or airplane can fly. The four forces are the reason the airplane even got up in the air in the first place. These forces act on the airplane to push it up, push it down, move it forward or slow it down.

### THE FOUR FORCES

- **Gravity:** is the force that pulls objects towards the earth.
- **Lift:** is the force that holds an airplane in the air. Most of the lift used by an airplane is created in the wings.
- **Thrust:** Airplanes move in the desired direction because of thrust. An airplanes engines produce thrust which creates motion.
- **Drag:** is the force that acts opposite of the direction of motion. It is caused by friction and differences in air pressure.

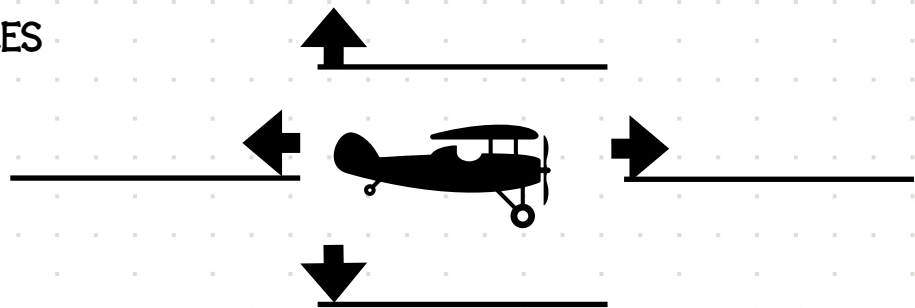
These forces work against each other

Which force is the opposite of lift? \_\_\_\_\_

Which force is the opposite of thrust? \_\_\_\_\_

If the forces work against each other, then how does and airplane stay in the air? The answer is balance. All four forces must be in balance for an airplane to stay in the air. when the forces are balanced, the airplane flies in a level direction. If the forces of lift and thrust are more than gravity and drag, the plane goes up, but if gravity and drag are greater than lift and thrust, the plane goes down

### LABEL THE FOUR FORCES



ROUND 1 SCORESHEET

Team Members	1.	2.	3.	TOTAL
Points Earned				

Based on your first 3 tosses tell me what changes you want to make in your design and why you think the changes will help.

ROUND 2 SCORESHEET

Team Members	1.	2.	3.	TOTAL
Points Earned				

Did your changes increase/decrease your score? Based on your results tell me what you did well, or could have done better.

