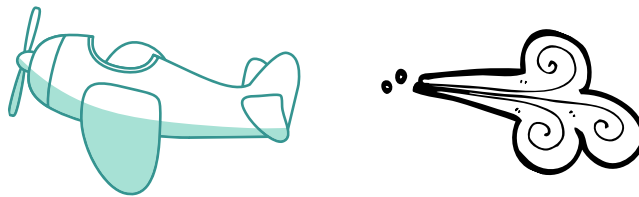


Let's talk about the last reason why an airplane can fly.

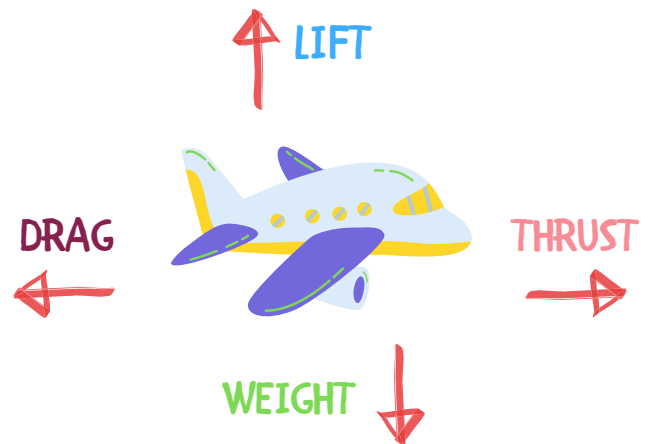
## Newton's Third Law of Motion:

For every action, there is an equal and opposite reaction.



What does this mean? If you push an object, that object pushes back in the opposite direction equally hard. Let's use the four forces of flight (lift, weight, drag, and thrust) to help explain.

Forces are always found in pairs. If the force is the same from opposite directions, the object will not move. When a plane is on the ground, it doesn't move because it has nothing creating **thrust**. As soon as the plane creates thrust, the plane starts to move. This creates **drag**.



WHAT IS THE OPPOSITE FORCE FOR DRAG?  
WHAT ABOUT FOR LIFT?



Time for another cool experiment to help understand Newton's Third Law of Motion!

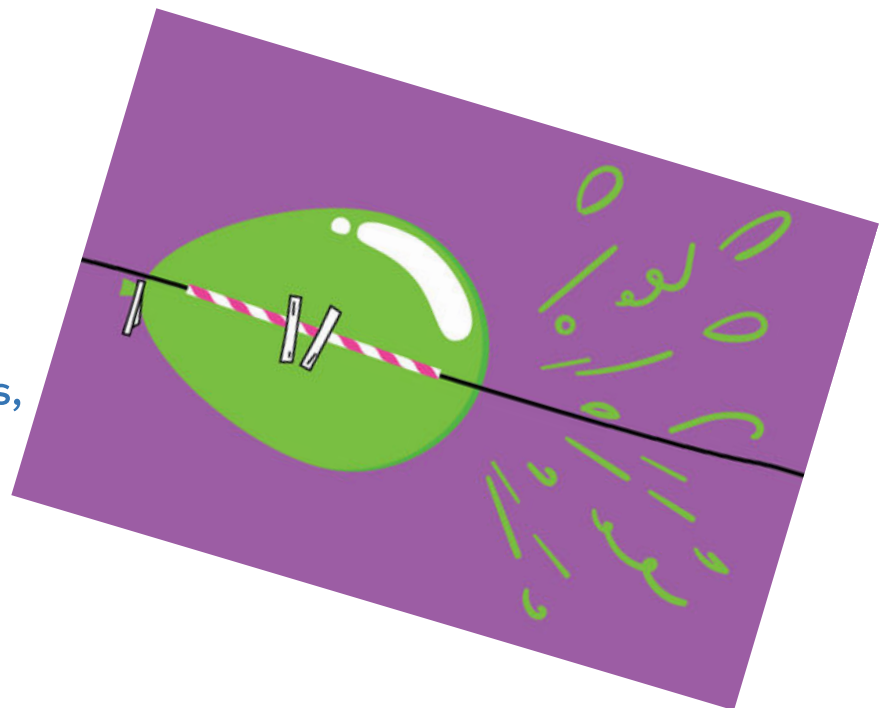


# ROCKET BALLOON



## HERE'S WHAT YOU NEED:

- One balloon
- One straight straw
- Tape
- String
- Decorations (items like construction paper, poms, googly eyes and glue)
- Kitchen sealing clip or clothes pin



## HERE'S WHAT YOU DO:

1. Blow up your balloon and clamp the end so no air escapes.
2. Use your imagination and decorate your balloon in whatever way you'd like. Turn the balloon into a plane, a bird, or anything you can think of. The sky's the limit!
3. Once you have decorated your balloon, tape a straw to the top and run a string through the inside of the straw (at least a few feet - the longer the better).
4. Attach both ends of the string to chairs or something similar a few feet apart. Make sure the string isn't touching the ground.
5. When you are ready, remove the clip and watch the balloon take off!

**BONUS!** Try having a balloon race and make more than one! See which balloon reaches the end of its string first, and think about why that balloon won. Was it lighter, or start with more air in it?

**THINKING ABOUT WHAT WE JUST LEARNED, WHY DID THE BALLOON FLY?**

Once you let go of the clip holding the air in, it escaped from the balloon. This created thrust and moved the balloon forward in the opposite direction that the air was escaping!

