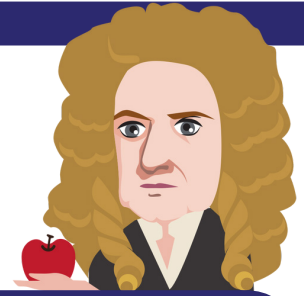


# Newton's 3 Laws of Motion



Name

Draw a line from Newton's law on the right to the correct number of the law on the left.

**1st**

Force is equal to mass times acceleration.

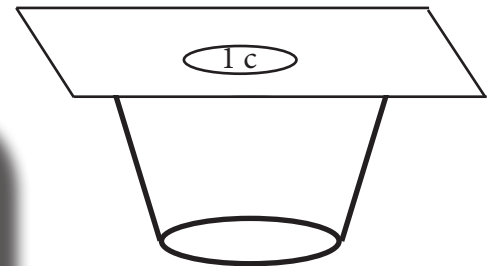
**2nd**

An object in motion will stay in motion or an object at rest will stay at rest until acted upon by an outside force.

**3rd**

For every action there is an equal but opposite reaction.

Using Newton's First Law of Motion, explain the forces acting on the card and the penny when it drops into the cup.

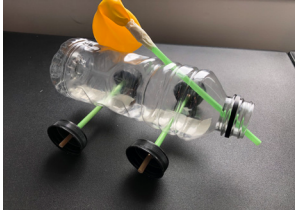
**Next up:**

Build your air powered car.  
Follow the directions in the  
STARBASE Satellites video.  
Season: 1 Episode: 1 Newton's  
Laws of Motion



Don't have the materials from the video? Try making a car out of other materials you can find around your house! Check out the STARBASE Explorer for another idea!

# Air Powered Car... How far will it go?



Things you'll need to test your car:

- Air powered car
- Measuring tape
- Items for your independent variable  
ex. wheels of different sizes or mass to add to your car or anything else you choose.

## Define your variables:

Variables are anything in an experiment that can change.  
Let's identify the variables in this experiment.

Independent variable:

What do you want to test? Here are some options: mass of the car, amount of air in the balloon (force), wheel size, or something else?  
This is the variable that YOU will change on purpose.

Dependent variable:

Distance the car travels

This is what we are measuring.

Constants:

Pick at least 2

These are things that could change, but have to stay the same in the experiment.

## Test the car: 5x

For each trial, change your independent variable from above. For example, if you are testing the mass of your car, trial 1 would start with the lowest mass.

1. Record the independent variable value (i.e. mass) of your car in the table to the right.
2. Inflate your balloon, but don't let the air out.
3. Set your car on the floor next to a measuring tape and release the air.
4. Measure how far the car moves and record the distance in the table to the right.
5. Do this 4 more times, increasing the mass of your car (or whatever you selected for the independent variable) with each trial!

## Record the data:

Trial	Independent Variable	Distance
1		
2		
3		
4		
5		

## Analyze the results:

Independent Variable

How did the variable of  affect the distance your car rolled?

