**Forces**

**Force:**

**There are 2 types:**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**: results when interacting objects are not in physical contact, but are able to exert a push or pull despite being physically separated.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: results when 2 interacting objects are physically touching each other

**These Include**:

* **G**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* **E\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
* **M**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**These Include**:

* **F**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* **A**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* **T**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* **N**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* **A**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* **S**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



**Contact Forces**

|  |  |  |
| --- | --- | --- |
| Force | Definition | Example |
| **Frictional** | Force exerted by a surface as an object moves across it. There are 2 types: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Frictional force opposes the motion of an object (slows the object down) | http://t3.gstatic.com/images?q=tbn:ANd9GcQf4_xZ8thJNDeHsLihR0frKfQk91j-rA1EZTXFBBCxxH9QIfiM:magazine.ufl.edu/wp-content/uploads/2010/10/Illustration_feature.pngA car slowly rolling and eventually coming to a stop.  |
| **Applied** | A force applied to an object by a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | http://t1.gstatic.com/images?q=tbn:ANd9GcSsPvVlpTM5LcnLwXuyNBvugPvTPibXEcAzH9hxnyT06ar50Rv7PQ:images.tutorvista.com/cms/images/83/kicking-of-soccer-ball.PNG |
| **Tension** | The force that is transmitted through a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_, or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ when it is pulled tight by a force acting from opposite ends. | http://t2.gstatic.com/images?q=tbn:ANd9GcSUNxzYck84vnr4xdilUuRE0dxigyyYZ75lLetm2y1EBmWtKawa:media.ehs.uen.org/html/PhysicsQ2/Tension_01/tension.jpg |
| **Normal** | A support force exerted upon an object that is in contact with another \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | * Sitting on a chair
* A book resting on a desk

http://t0.gstatic.com/images?q=tbn:ANd9GcQJlQVVjZk8l5qzXu3mNyaSNRxlvrxnwCTEPxFlihYZljPOobGD:sciencecity.oupchina.com.hk/npaw/student/glossary/img/normal_force.jpg |
| **Air Resistance** | A special type of frictional force that acts upon objects as they travel through\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the air. It is often observed to oppose the motion of an object. | http://t3.gstatic.com/images?q=tbn:ANd9GcQ3iUpd9whCzakhLSIkDDXxOUK7_d8XQshqwPT8lpduQJNSM9Wu:https://playingintheworldgame.files.wordpress.com/2015/01/parachute-clipart-002-parachute_01.png |
| **Spring Force** | the **force** exerted by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ upon any object that is attached to it. | http://t2.gstatic.com/images?q=tbn:ANd9GcTZvfrq8ks9SBj1pvTHISz6S6tRrA05h-0QC9147yhFXXq6b8MHMQ:catalog.miniscience.com/catalog/Mechanics/LEVER/Spring_Scale_6_m.jpg |

Which two forces oppose the motion of an object? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ & \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Oppose means - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Equation to know:**

**Speed (or velocity)**

Speed = distance

 time

Example: What is the speed of a car that travels 120 miles in 2 hours?

Speed = ?

Distance = 120 = 120 miles

Time = 2 hours 2 hours

**What is the difference between weight and mass?**

* mass and weight are different.
* The [mass](http://simple.wikipedia.org/wiki/Mass) of an object is a [measure](http://simple.wikipedia.org/wiki/Measure) of the amount of [\_\_\_\_\_\_\_\_\_\_\_\_](http://simple.wikipedia.org/wiki/Matter) in the object.
* [Weight](http://simple.wikipedia.org/wiki/Weight) is a measure of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* In other words, weight is how hard gravity pulls on an object.
* **Mass *\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*stays the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
* **Weight changes based on \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**

**Newton’s Laws**

**Newton’s 1st Law**: Law of INERTIA: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* It is directly related to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* If mass increases, then inertia \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. If mass decreases, then inertia \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Example: When traveling in a car that stops abruptly, the car will stop moving, but your body will keep moving forward unless acted upon by another force – such as a ***seatbelt!***



**Newton’s 2nd law:** (***How fast I get faster***!)

* Acceleration = force/mass OR
* Force = mass x acceleration

**Newton’s 3rd law:**

* For every action there is an **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** BUT\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ reaction.
* EXAMPLE: If I sit on a chair with a force of 200 N the chair is pushing back up on my with an equal and opposite force of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.



* If a batter hits a ball with 20N of force an ***EQUAL*** and ***OPPOSITE*** reaction would be a force of \_\_\_\_\_\_\_\_\_\_ on the batters bat \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the direction of the balls motion.

**Vocabulary to Know:**

|  |  |
| --- | --- |
| **Word** | **Definition** |
| **Force** | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **Inertia** | A body in motion will remain in motion and a body at rest will remain at rest UNLESS…. \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **Acceleration** | An increase in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_http://t0.gstatic.com/images?q=tbn:ANd9GcTtlVJ1ndvhdYiNqXfwhGlU5ywayU8EbAgcq02aW2dHXm_4UVcR:road2animate.files.wordpress.com/2010/06/screen-shot-2010-06-26-at-9-49-24-pm.png |
| **Friction** | The force exerted by a surface as an object moves across it. It \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the motion of the object and slows it down.  |
| **Weight** | The force exerted on an object by gravity.Formula : Weight = \_\_\_\_\_\_\_\_\_ X \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Weight changes depending on \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. |
| **Mass** | The amount \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Always stays the SAME!! EXAMPLE: Mrs. Uhrlass has the same mass on Earth as she has in space!!! |