Force

You might have heard the word "force" used in everyday life. "My mom *forces* me to do my homework" or "That storm had a lot of *force*." But what exactly is a force? In science, a **force** is a **push** or **pull**. All **forces** have two things that describe it: **direction** and **magnitude**. A **Newton** (N) is the **unit** that describes the **magnitude of force**.

Friction

Friction is a **force** that **holds back** a moving object. You will find friction when objects come into **contact** with each other (touch each other). **Friction** is in the **opposite direction** to the way an object is moving. If a car stops at a stop sign, it slows because of the **friction** between the brakes and the wheels. If you run down the sidewalk and stop quickly, you can stop because of the **friction** between your shoes and the cement. **Friction** that happens between an object and air is called **air resistance**. For example, if you are running, **air resistance** is pushing against you.

Gravity

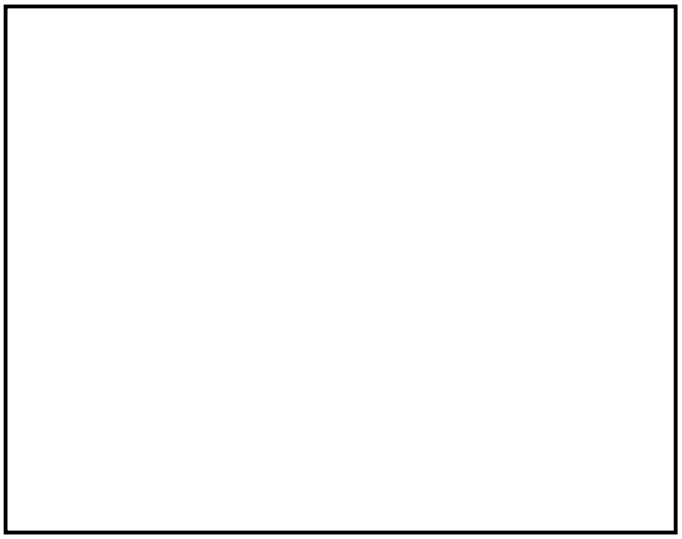
Gravity (or gravitational forces) are **forces of attraction**. We are not talking about finding someone really pretty. We mean when the Earth is **pulling down** on you and keeping you on the ground. That **pull** is **gravity**. Your weight on Earth is your **mass** and **gravity** combined!

Every object in the universe that has **mass** has a **gravitational pull** on every other thing.

Small masses have a **small pull**. For example, you have a gravitational force on the people around you, but that force isn't very strong, because people aren't very massive. **Big masses** have a **big pull**. For example, the Earth has a really large mass so it has a very strong force and is able to pull everything that lives on Earth down.

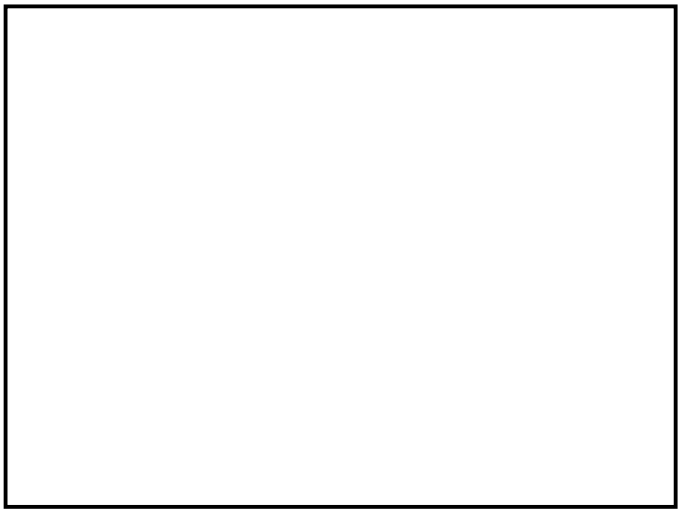
Tension

Tension is a **force** that acts on an object when it is **pulled apart or stretched**. A tow truck pulling a car has a rope that is being stretched, therefore there is tension in the rope. A light hanging from the ceiling does not move because the force of **gravity pulling down** on the light is **balanced** by the force of **tension** in the cord **pulling upward**.



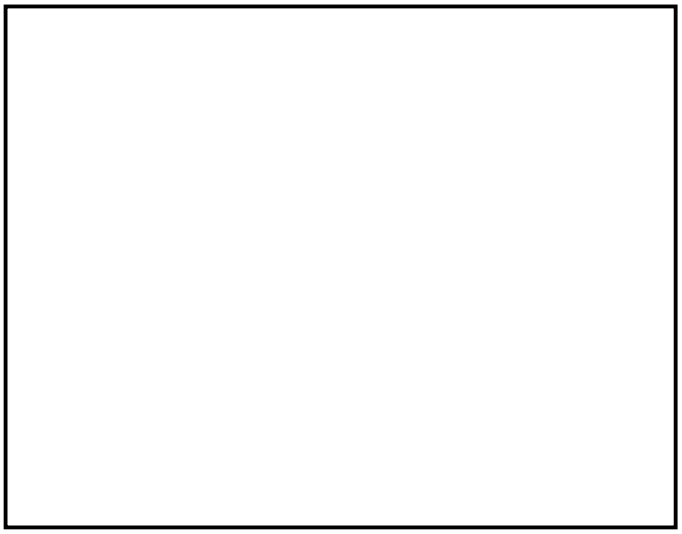
Compression

Compression is a force that happens when an object is **pushed together or squeezed**. If you jump on a soda can and squish it, you are compressing the can. When you sit on a chair without moving, the forces are **balanced.** The **downward** force of gravity caused by your **weight** is **equal to** the **upward** force caused by the **compression** in the chair.



Centripetal Force

The force that makes things move in an **elliptical path** (or in a circular path) is called a **centripetal force**. The word centripetal means "**towards the center**." Gravity is an example of a centripetal force that keeps the planets in orbit around the sun! This force **pulls** the object towards the **center** but makes the object **move in a circle**.



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