Solar System Gravity – Student Activity

Gravity is a force that attracts objects to each other. The more massive an object is, the stronger is its gravitational force of attraction. Gravity acts over great distances. Gravity is the "glue that binds the Solar System together

The Formation of the Solar System *(continued from static electricity activities).*

As the clumps of nebula dust held together by static electricity increased in mass they would also have been attracted together by the much stronger force of gravity. The spinning proto-planetary disc pulled larger pieces towards its centre creating the proto-Sun. This became very hot and exploded, blowing away most of the surrounding disc. The remaining pieces dispersed, crashed and reassembled to eventually form the planets of the Solar System and were held in place by the Sun's gravitational pull.

Teacher demonstration -The effect of gravity on objects in the Solar System

Method

1. Watch the demonstration by your teacher to answer the following questions.

Observation

What happened to the plastic surface when a heavy weight was placed on it? _____

_____

What is this depression supposed to represent? _____

_____

What happened when the marble (or Ping Pong ball) was moving fast? _____

What happened when the marble (or Ping Pong ball) was travelling slower? _____

_____

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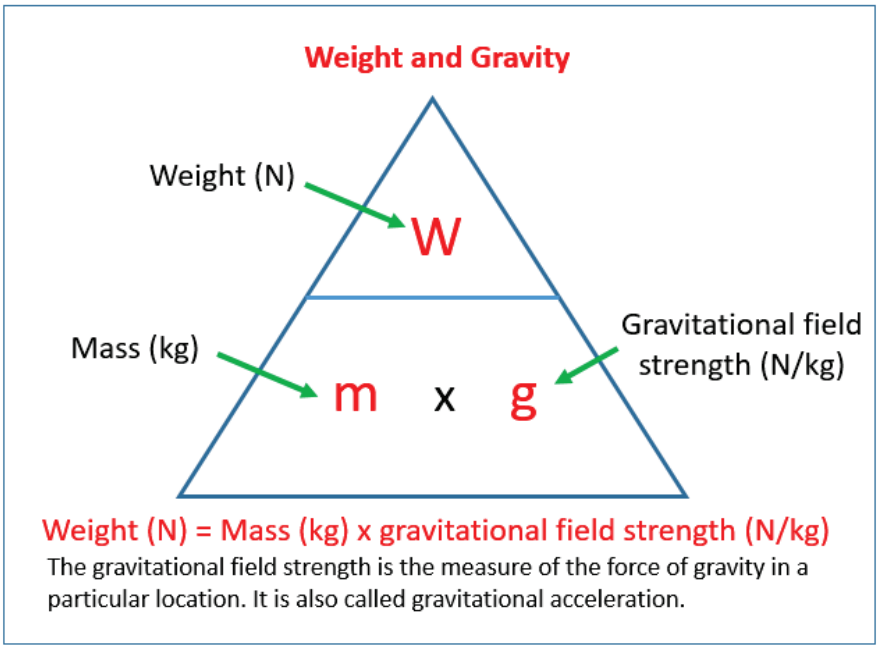
Extension - Weight, mass and gravity

Materials

- Access to the Internet



- Mass is the amount of matter in an object and is measured in kilograms
- Weight is a force due to the pull of gravity on an object and is measured in Newtons.
- Weight = mass x gravity

As gravity changes on different planets (the larger the planet the greater the gravitational pull), your weight will also change. Your mass however will stay the same (unless you burn off some kilos in transit).

The gravitational pull on Earth is ~ 10 N/kg
A student with a mass of 32 kg on Earth therefore weighs 320 N. However, their weight on the moon would only be 53 N, as the gravitational pull is much less.
If they survived the horrific heat on the Sun their weight would be an equally horrific 8,663 N

"Your weight on other worlds" www.exploratorium.edu/ronh/weight/ will allow you to calculate your weight on planets and moons of our Solar System.

	My weight (N)		My weight (N)
Mercury		Jupiter	
Venus		Saturn	
Earth		Uranus	
Mars		Neptune	