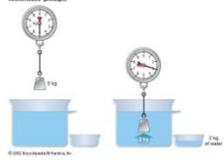


Forces		
<p>What is a force?</p>	<p>Force is any action that alters or maintains the motion of a body or the cause of deformation of an object. Forces can change the shape of objects and the way they are moving.</p>	
<p>Types of forces: Contact and Non-contact Forces</p>	<p>Contact forces are forces that act between two objects that are physically touching each other. Examples of contact forces include friction.</p>	<p>Non-contact forces are forces that act between two objects that are not physically touching each other. Examples of non-contact forces include: magnetic forces and gravitational force.</p>
<p>How do we represent forces? We use vectors: modulus, direction and magnitude (length).</p> 	<p>We can show the forces acting on an object using vectors. Each force is shown as an arrow. An arrow shows: The size of the force (the longer the arrow, the bigger the force) The direction in which the force acts. The arrow is usually labelled with the name of the force and its size in newtons.</p>	<p>Dynamometer: device for measuring mechanical forces.</p> 
<p>People often confuse mass and weight. Remember that weight is a force, and is measured in newtons. Mass is measured in kilograms (kg).</p>	<p>Weight is a force caused by gravity. The weight of an object. The weight of an object is the gravitational force between the object and the Earth. The more mass the object has the greater its weight will be. Weight is a force, so it's measured in newtons. On the surface of the Earth an object with a mass of 1 kg has a weight of about 10 N.</p>	<p>All objects have a force that attracts them towards each other. This is called gravity. Even you attract other objects to you because of gravity, but you have too little mass for the force to be very strong. Gravitational force increases when: the masses are bigger/the objects are closer. Newton's Law</p>
<p>The unit of measure for force is the newton, "N". One newton is the force needed to accelerate one gram of mass by one centimeter per second squared.</p>		
<p>Whenever an object moves against another object, it feels frictional forces. These forces act in the opposite direction to the movement. Friction makes it harder for things to move.</p>	<p>When two forces acting on an object are equal in size but act in opposite directions, we say that they are balanced forces. When two forces acting on an object are not equal in size, we say that they are unbalanced forces.</p>	<p>Bikes, cars and other vehicles experience air resistance as they move. Air resistance is caused by the frictional forces of the air against the vehicle. The faster the vehicle moves, the bigger the air resistance becomes. The top speed of a vehicle is reached when the force from the cyclist or engine is balanced by air resistance. Friction: is the force that exists when two objects rub against each other. (Air friction can slow down a parachute and water friction can slow down a kayak or boat).</p>
<p>Archimedes' principle.</p>	 <p>El principio de Arquímedes es un principio físico que afirma: «Un cuerpo total o parcialmente sumergido en un fluido en reposo, experimenta un empuje vertical y hacia arriba igual al peso de la masa del volumen del fluido que desaloja»</p>	<p>The buoyant force is equal to the weight of the displaced water. Buoyancy: it is an upward force which acts in the opposite direction to gravity on objects immersed in a fluid (liquid).</p>

Energy: it is the ability to do work. Energy is all around us. Law of conservation of energy: You cannot create or destroy energy, only transform energy.		
Form of energy	Characteristics	Examples
Kinetic	The energy of a moving object	Wind, a river flowing, an insect flying, a person running...
Potential	The energy stored in objects	Water in a reservoir, a stretched rubber band...
Mechanical	The sum of potential and kinetic energy	An airplane flying, a working wind turbine...
Electrical	It's produced from various sources: natural and artificial	Static electricity, electrical appliances...
Chemical	The energy released in a chemical reaction	Food, batteries, wood, petrol...
Sound	The vibrations we hear as sound	Clapping, singing, playing musical instruments...
Light	The fastest form of energy	The Sun, stars, light bulbs, fire...
Heat	The thermal energy that flows from a warm substance to a cooler one	The Sun, fire, a heater...
Nuclear	In nuclear fusion, energy is released when atoms are combined or fused. In nuclear fission atoms are split apart.	The Sun (fusion), nuclear power stations...
Sources: renewable and non-renewable.	Sources: renewable and non-renewable. Renewable: solar, geothermal, water, wind, biomass. Non-renewable: oil, uranium, coal, natural gas. Sources: it is important that we do not exhaust the world's resources, and that we learn to harness natural forms of energy such as solar power, wind and water energy.	
Sound is produced when objects vibrate. Sound travels in waves in all directions. Sound can travel through air and water and through solid, opaque objects. Sound can't travel when there's no air. Sound can reflect: echo.		The speed of sound is around 1,230 kilometres per hour. Characteristics of sound: pitch (low or high), duration (short/long), and tone (pleasant/unpleasant).
Light is the fastest form of energy.	The different types of light we see come from natural sources, such as the Sun or lightning, or from artificial sources, such as torches or candles. Light always travel in straight line. Light travels in all directions. It's the fastest form of energy. It travels around 300.000 km per second. The light from the Sun looks white, but is made up of 7 colours: red, orange, yellow, green, indigo, and violet.	Light can be reflected by an object, absorbed by it or it can pass through an object. Objects can be transparent (light can pass through it), opaque (light cannot pass through it) or translucent (only allows part of the light through it). Reflection and refraction of light. When a <u>light ray</u> hits an object and bounces off, it is called reflection. When you think of reflection, think about mirrors . They reflect all of the light. That is the reason you can see yourself. Refraction: bending of light rays (in water).
We use electrical energy for many things at home. We can transform it into light, sound, heat and movement.	Electrical energy is produced when electrons move from one atom to the other, with the use of magnetic forces. Electricity can be made.	Electrical energy can be used for work or stored. Lightning is one good example of electrical energy in nature.

