Forces KNOWLEDGE ORGANISER

Fun fact! Forces work in pairs, as there is always an opposite force in action.

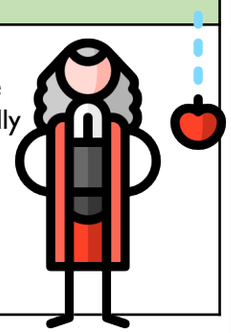
ESSENTIAL FORCES VOCABULARY	
force	A push or a pull in a particular direction.
friction	A force between two surfaces that are trying to slide across each other.
air resistance	A frictional force where air pushes against a moving object.
magnetism	When two magnets are close, they create pushing or pulling forces on one another.
distance	The amount of space between two things.
lever	A machine that helps life loads with less effort.
velocity	Speed in a given direction.
momentum	A measure of mass in motion.
water resistance	A frictional force where water pushes against a moving object.
velocity	The speed of an object plus its direction.
buoyancy	An upward force that a liquid applies to objects.
gravity	A pulling force that a planet exerts towards its centre.
weight	The measure of the force of gravity on an object.
mass	A measure of how much matter is inside an object.
Earth	The planet that we live on.

What is a Force?

A force is a push or a pull in a particular direction. Forces can make objects start or stop moving, move faster or slower, change the shape of the object or change the direction of the object.

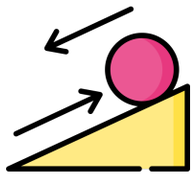
Gravity

Gravity is the force that pulls everything towards the centre of the Earth. Gravity is normally shown by an arrow pointing downwards. We don't feel the effect of gravity unless we jump.



Gravity

Friction is a force between surfaces that are trying to slide against each other. In this diagram, gravity is pulling the ball downwards and friction is slowing it down. There is more fiction on a rougher surface and less friction on a smoother surface. This means that an object would move more easily on a smooth surface.



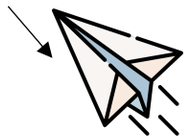
Weight or Mass?

Weight is how strongly gravity pulls an object down. This is measured in newtons (N).

Mass is how much matter is inside an object. This is measured in grams, kilograms or other similar measurements. If you could travel to a different planet, your mass would stay the same but your weight would change depending on how the gravity of that planet pulled you.

Air Resistance

Air resistance is a type of friction between air and another material. For instance, as a paper plane is thrown, air resistance acts against it and slows it down.

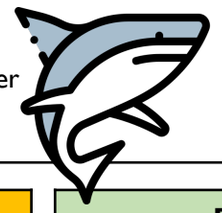


Water Resistance

Water resistance is a type of friction between water and another material. For instance, as swimmers push through water, water resistance acts against them and slows them down.

Streamlined Shapes

Some shapes are streamlined and can move more easily through air and water. An example is a shark, as it has a sharp, pointed nose which allows water to glide over it.



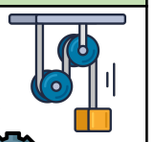
Magnetism

Magnets are rocks or metals which have created an invisible field around themselves that attracts magnets and some metals.

MAKING LINKS TO PREVIOUS LEARNING GOLDEN VOCABULARY	
Space	The effect of **gravity** is different on each planet.
Space	An object's **weight** is different on each planet.
Space	An object's **mass** is the same on each planet.
Space	We can see the effects of **Earth's** gravitational pull.

Pulleys, Gears and Levers

Pulleys are used to make a small force life a heavier load. When more wheels are used in the pulley, less force is needed.



Gears and cogs can be used to change the direction, speed or force of a motion.

Levers can be used to make a small force lift a larger load. The lever rests on a pivot or a fulcrum and an effort is applied.