

Year 5 Science Knowledge Organiser - Forces

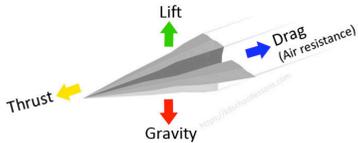
Knowledge - Forces

What is a force?	<ol style="list-style-type: none"> 1. A push 2. A pull 3. A twist 	<ol style="list-style-type: none"> 1. Speeds things up 2. Slows things down 3. Changes shape 4. Changes direction 	 
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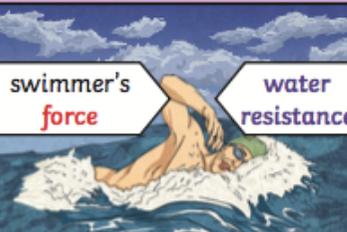
Knowledge - Friction

Water and air resistance are forms of friction. Friction is sometimes helpful and sometimes unhelpful. For example, air resistance is helpful as it stops the skydiver hitting the ground at high speed. Friction on a bike chain can make the bike harder to pedal so it is unhelpful.

Air Resistance

	<ol style="list-style-type: none"> 1. Air resistance slows down moving objects because air slows you down as you move through it. 2. To travel faster through the air things need to be streamlined 	<p>Forces acting on a paper plane</p> 
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Water Resistance

	<ol style="list-style-type: none"> 1. Water resistance slows down moving objects, because water slows you down as you move through it 2. To travel faster through the water, things need to be streamlined 	
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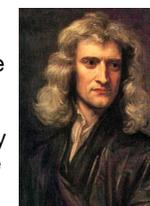
Vocabulary

1. Force	The pulling, pushing or twisting effect that something has on something else.
2. Friction	The resistance of motion when there is contact between two surfaces.
3. Vacuum	A space entirely devoid of matter.
4. Newtons	Unit of force. It is equal to the force that would give a mass of one kilogram an acceleration of one metre per second per second (one metre per second squared).
5. Gravity	The force which causes things to drop to the ground.
6. Air resistance	Describes the forces that are in opposition to the relative motion of an object as it passes through the air.
7. Variable	Able to be changed or adapted.
8. Independent Variable	A variable whose variation does not depend on that of another.
9. Dependent Variable	A variable whose value depends on that of another.
10. Water resistance	Describes the forces that are in opposition to the relative motion of an object as it passes through the water.

Sir Isaac Newton

FACT FILE:

1. Born 4th January 1643 - Woolsthorpe Lincolnshire England
2. His father died 3 months before he was born
3. Studied at Cambridge University and eventually became a professor there
4. Created the now known "Newton's law of universal gravitation" explaining Gravity and its effects - Famously his inspiration was from an apple falling from the tree he was sitting under
5. He has an international standard measure of force named after him: A newton (N)



Mass

1. Mass is how much matter is inside an object.
2. It is measured in kilograms (KG)



Weight

1. Weight is how strongly gravity is pulling an object down.
2. It is measured in Newtons (N)



Pulleys, Gears and Levers

1. Pulleys can be used to make a small force lift a heavier load.
2. The more wheels on a pulley, the less force is needed to lift a weight.
3. Gears can be used to change the speed, force or direction of motion.
4. When two gears are connected, they always turn in the opposite direction to each other.
5. Levers can be used to make a small force lift a heavier load.
6. A lever always rests on a pivot.



Did you know...



Sir Isaac Newton had to leave Cambridge when the university closed to protect itself from an outbreak of the plague!

Year 5 Science Skills Knowledge Organiser - Forces

Key Concepts and what they mean

1. Physics	Physics is the study of energy and matter in space and time and how they are related to each other.
2. Chemistry	Chemistry deals with the properties of substances, the transformations they undergo, and the energy that is released or absorbed during these processes. For example, when plants use sunlight to produce energy (or food for itself).
3. Data Collection	Data collection is the process of gathering and measuring information to answer a question. For example, recording living and non living things to investigate whether numbers change depending on the weather.
4. Cause and effect	Cause and effect is the relationship between events or things, where one is the result of the other or others. For example, the weather gets colder and there is less food around, so animals hibernate.
5. Environmental	Environmental relates to the environment around us at Old Fletton.

Creating a Data Table

Data tables help you keep information organised. If you're collecting data from an experiment or scientific research, saving it in a table will make it easier to look up later.

- 1) Name your table - make sure the title relates to the data you will put in your table
- 2) Decide how many columns and rows you need.
- 3) Draw the table. Using a ruler, draw a large box and making the necessary number of columns and rows.
- 4) Label all your columns.
- 5) Record the data from your experiment or research in the appropriate columns.

1) ↓
Time taken for different shaped parachutes to drop.

4) ↙

Parachute Shape	Time to drop
Square	21s
Triangle	10s
Circle	9s
Rectangle	23s

2) ↑

5) ↘

Literacy links to this topic

Stories that relate to the topic of 'Forces' are:



The Iron Man by Ted Hughes
The Tin Snail by Cameron McAllister

These stories help you to gain a greater understanding of forces and may spark some questions that you might want to ask in your next science lesson!

INDEPENDENT VARIABLE

VARIABLE THAT IS CHANGED

Amount of Water



DEPENDENT VARIABLE

VARIABLE AFFECTED BY THE CHANGE

Size of Plant
Number of Leaves
Living or Dead?



Creating a Forces Diagram

1. A force diagram is simply a diagram showing all the forces acting on an object, the force's direction and its magnitude (size).
2. Identify the object you will draw a diagram for.
3. Identify all the forces acting directly on the object and the object exerting them.
4. Draw an arrow to represent each force, making sure the size of the arrow represents the magnitude or size of the force.
5. Label the diagram.



Experiment Steps to Success - Fair Testing

A fair test is a test which controls all but one variable when attempting to answer a scientific question. Only changing one variable allows the person conducting the test to know that no other variable has affected the results of the test.

To help remember how to conduct your fair test, learn the mnemonic:



For example, testing how quickly three items - marshmallow, chocolate and wax - melt over time.

Change 1 thing: the item you are melting
Measure or observe: melting / temperature
Same for everything else: heating, beaker, size of item, thermometer