

GRAVITY

Knowledge Organiser – Forces (Year 5)



Key Vocabulary

Air resistance
Buoyancy
Friction

Air resistance is a type of friction between air and another material e.g. a plane flying.

Buoyancy is the force that causes objects to float. Friction is a force between two surfaces that are moving, or trying to move, across each other.

Force

A force is a push or pull that causes a change in speed, direction or shape.

Gear

Gears are wheels with teeth that slot together.

Gravity

A pulling force exerted by Earth (or anything else that has a mass).

Lever

A rigid arm that is braced against a turning point, or fulcrum.

Mass

The measure of the force of gravity on an object.

Mechanism

Parts which work together in a machine.

Pulley

A pulley is a simple machine that makes it easier to lift or move a heavy object. It includes at least one wheel and a length of rope.

Streamlined

When an object is shaped to minimise the effect of air or water resistance.

Water resistance

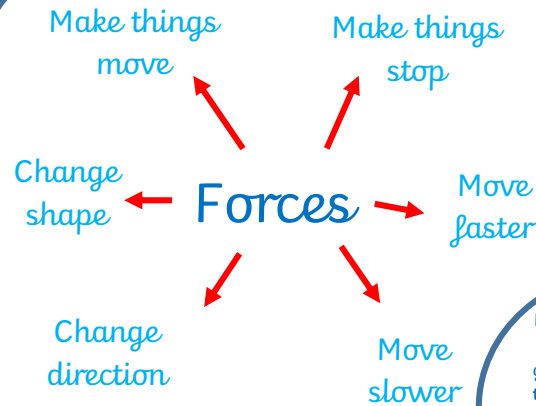
A type of friction between water and another material e.g. when swimming.

Weight

A measure of how much matter is inside an object.

Upthrust

The upward force that a gas or liquid has on an object floating in it.



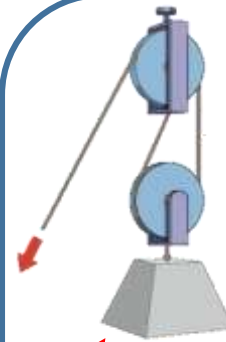
Measuring Forces

Weight is measured in Newtons, named after Sir Isaac Newton who was one of the first scientists to develop the theory of gravity.

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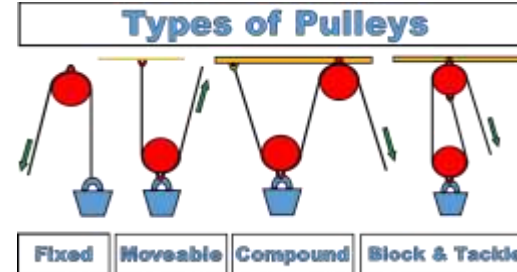
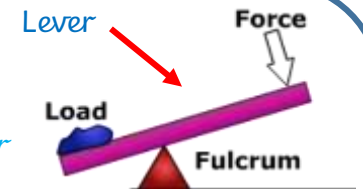


Like Earth, the Moon has gravity, but the Moon's gravity is only a **sixth of the Earth's gravity**. This means you'd weigh much less if you were to stand on the Moon!



Pulley

Key Fact
Gears, Levers and Pulleys (mechanisms)
Pulleys and gears allow a smaller force to have a greater effect.



Gears

Air resistance



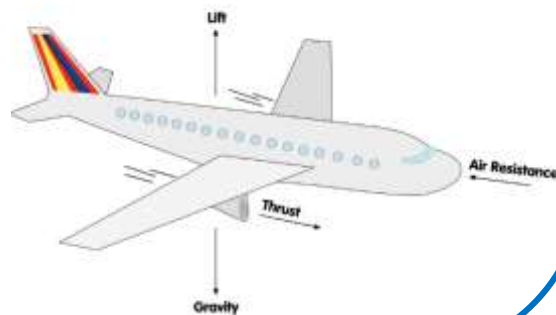
Friction occurs when objects move through water or air. Air resistance is a type of friction between air and another material.

For example, when a parachute opens air particles hit the parachute, making it more difficult for it to move through the air, working against gravity (pulling the person down to the ground) and reducing the speed of the fall to the ground.



Air resistance pushes against the cyclist, slowing him down. The arrow shows the direction of the force.

Some shapes, known as streamlined shapes, cause less resistance than others. Aeroplanes and cars are streamlined, so that they move through the air as easily as possible.



Water resistance and upthrust

Water resistance is a type of force that uses friction to slow things down that are moving through water. It is sometimes called drag. If you have ever walked through water, you have felt the water push against you. When you swim there is friction between your skin and the water particles.

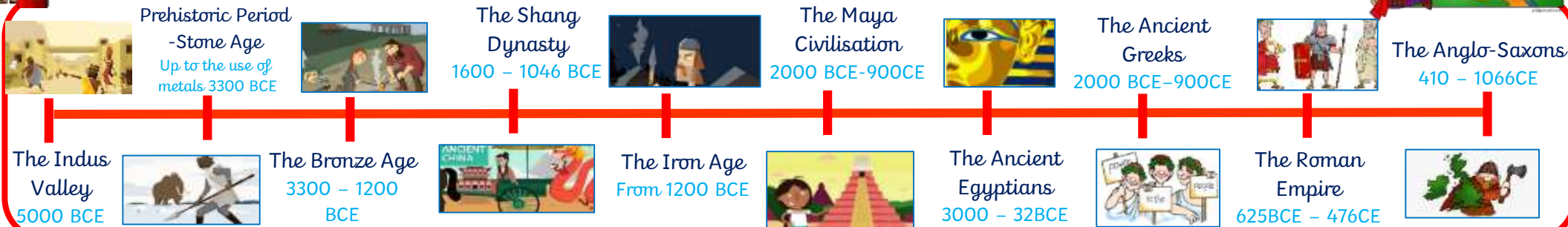


Upthrust is **not** a type of friction. It is the upward force that a gas or liquid has on an object floating in it.

If the upthrust is less than the weight of the object, the object will sink. If the upthrust is larger than the weight of the object, the object will float.



HISTORY Knowledge Organiser – The Romans (Year 5)



Key Vocabulary

- Celt** People living in Britain (also known as Britons)
- Centurian** An officer in the Roman army
- Empire** Lands or regions that are ruled by an emperor. An empire will usually have many different cultures
- Emperor** The ruler of an empire
- Iceni** A Celtic tribe who lived in Britain, in the area of modern-day Norfolk and Suffolk. Their queen was called Boudicca
- Invasion** One country attacking another to take it over
- Legion** A group of 5000 Roman soldiers
- Roman Empire** The name used for land that was controlled by the Romans, including parts of Europe, the Middle East and Africa
- Senate** A governing body (the leaders of Rome)

Early History Time Line

Who ruled Rome?

In the early days, Rome was ruled by kings. Romulus was supposedly the first king. In 509BCE Rome became a republic. The republic didn't allow one person to have complete control. Instead, a group of men called senators shared power in the senate.

Entertainment

The Romans liked to go out and enjoy themselves. People would go to the amphitheatre to see men fighting wild beasts or each other. These men were called gladiators. It was a cruel sport because someone was usually killed. Chariot-racing was a very popular sport all over the Roman Empire. Theatres were also popular, although only men were allowed to perform. Dinner parties at home were popular too. They could last up to 8 hours!

Religion

The Roman had lots of different gods and goddesses. There were gods for almost everything, like thunder, love, war and wisdom. Romans were always trying to keep on the good side of their gods. They made offerings at temples and shrines to make them happy. Some emperors were declared gods too. However, by 400 CE, most Romans had become Christians.

Roman Life

Villas

Wealthy Romans lived in villas, with mosaic floors, which were built around a central courtyard. They had running water and even had under floor heating called the hypocaust!

Baths

The Romans loved washing and bathing and rather it being done in private, the Romans built magnificent public bath houses in towns across their empire, like to one we can still see in the town of Bath, Somerset. The baths were very luxurious, with hot running water, beautiful decorations and three different rooms: one warm (the tepidarium), one hot (the caldarium), where slaves would rub their masters all over with perfumed oil before scraping off the dirt before going into the last room (the frigidarium) to swim in a big cold bath.

Key Events in Roman Britain

55BCE

The Roman Empire (led by Julius Caesar) first tries to invade Britain, but fails

43CE Claudius leads the first successful invasion of Britain



60CE Boudicca leads The Iceni and other tribes in an attack on Roman forces.



122CE Hadrian's Wall is built to separate Romans from the 'barbarians' to the north (Scotland)



410CE Romans leave Britain and return to Italy

What did the Romans give us?

Language:

The language we used today was developed from Romans. The Romans spoke and wrote in Latin and many of our words are based on Latin words.

The Calendar

The calendar we use today is more than 2,000 years old. It was started by Julius Caesar, a Roman ruler. It is based on the movement of the earth around the sun, and so is called the 'solar calendar.' The names of our months are taken from the names of Roman gods and rulers. July, is named after Julius Caesar.

The Romans also gave us:

- Roman numerals
- a legal system
- straight roads
- central heating
- concrete
- aqueducts (bridges for water)



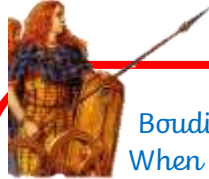
The Roman Empire 210CE



The Roman Empire was the largest empire in the ancient world. Many modern lands were once part of the Roman Empire, for example Britain (not Scotland), Spain, Portugal, France (Gaul), Italy, Greece, Germany, Egypt, and the north coast of Africa. They brought new engineering to many countries such as aqueducts to bring water to cities, improved roads and even sewers to make towns cleaner places.



Boudicca



Boudicca was the wife of Prasutagus, the ruler of a Celtic tribe called the Iceni. When Romans settled in the South of England in 43 AD they made an agreement with Prasutagus so that he would be able to continue as ruler of the Iceni. When Prasutagus died, the Romans turned on the Iceni. They stole from the Iceni tribesmen, made people slaves and they had Boudicca whipped.

When in about 60 CE, the Roman governor was sent to North Wales to lead an army, Boudicca led an attack against the tribe's Roman rulers with several other tribes. Her army was called the Britons. They managed to destroy Camulodunum (Colchester), the capital of Roman Britain and defeated the Roman IX legion. Boudicca and her army destroyed Londinium (London) and Verulamium (St Albans). The Roman army regrouped in the Midlands and finally defeated the Britons in the battle of Watling Street. No one knows what really happened to Boudicca. Some say she killed herself when she knew the Romans had won the battle, others say she fell ill and died.



Emperor Septimius Severus



In 193 CE, Lucius Septimius Severus was named ruler of the Roman Empire and in doing so became Rome's first African Emperor. He was born in Libya, North Africa in 145 CE. He was a popular emperor with the military (army) because he improved their pay and allowed them to marry. He enlarged the Roman Empire further with campaigns in Africa and Britain. He strengthened Hadrian's Wall and took land from part of Scotland, but he did not succeed in bringing the whole of the island of Britain under his rule. However, his army protected Britain from other invaders, making it a safer place to live.



Emperor Septimius Severus died in Britain in AD 211 at the age of 65. He is buried in York Minster.

