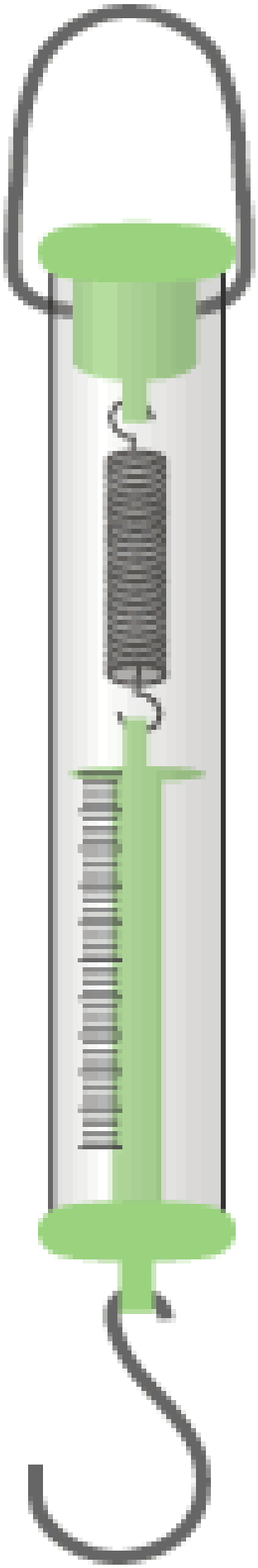
Force

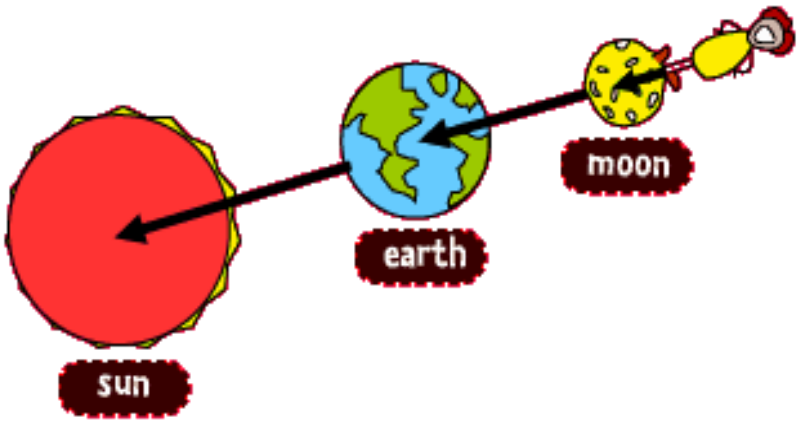


★ An object has a **mass**, which is the total amount of material it is made of. Mass is **not a force** and is measured in kilograms.

★ We measure **forces** in **newtons** using a force meter (also called a newton meter).

★ The word newton comes from Sir Isaac Newton who was the first person to put together some ideas about forces.

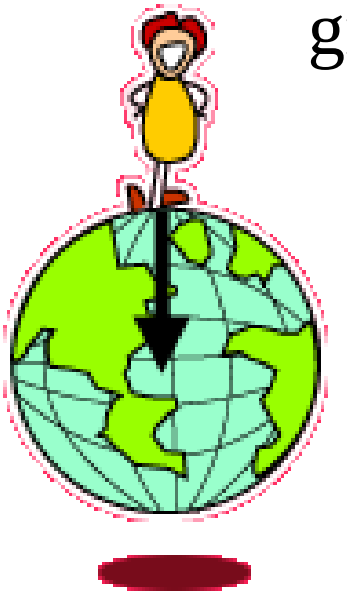
Gravity



★ The force that attracts or pulls the earth and an object (such as a person) towards each other is called **gravity**.

★ The pull on the mass of any object by the planet makes the force that we call **weight**.

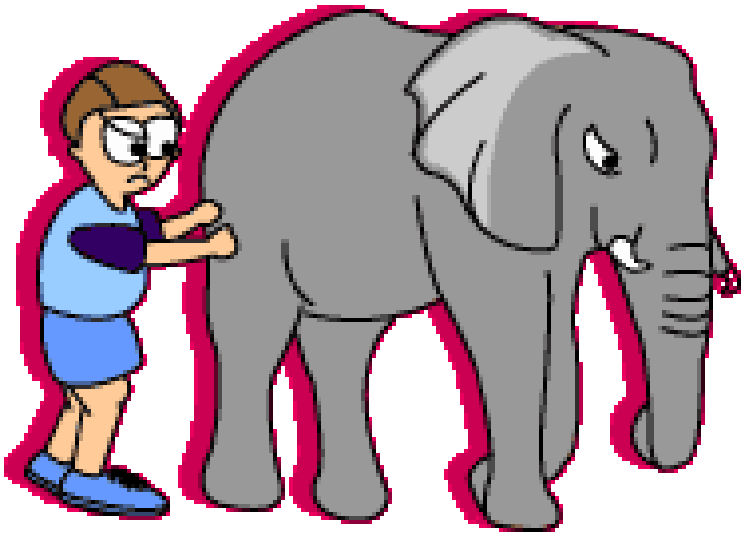
★ Other planets, stars or moons also have gravity.



★ In a diagram we can show gravity or weight by an arrow towards the Earth.

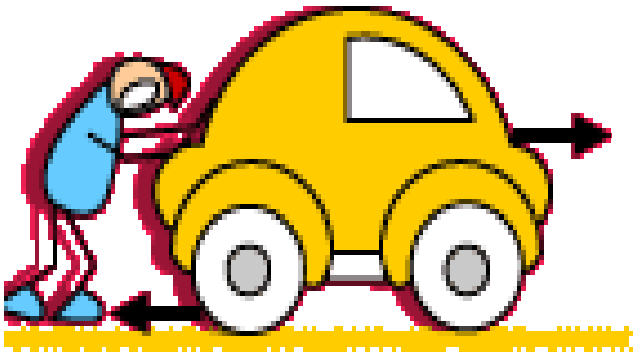
Friction

★ When we try to move an object, the force preventing or slowing that movement is called **friction.**

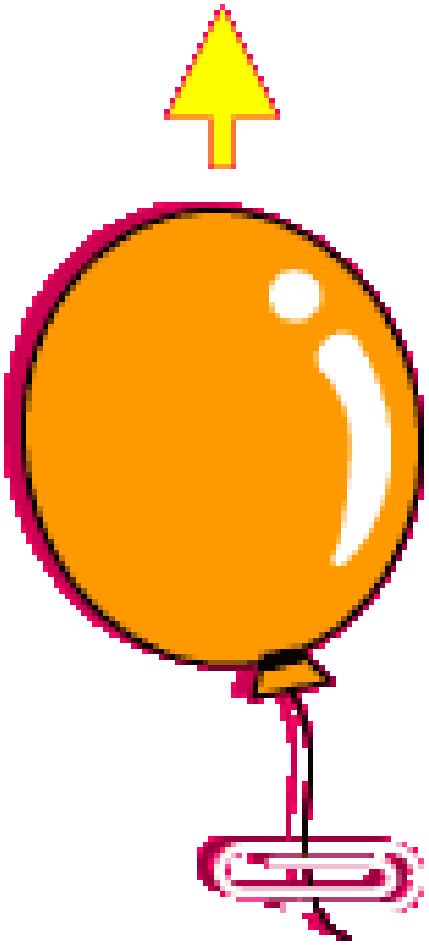


★ If the object is already moving, the force slowing down the object is called friction, so friction is a **push against a moving object.**

★ Friction is a contact force between materials.



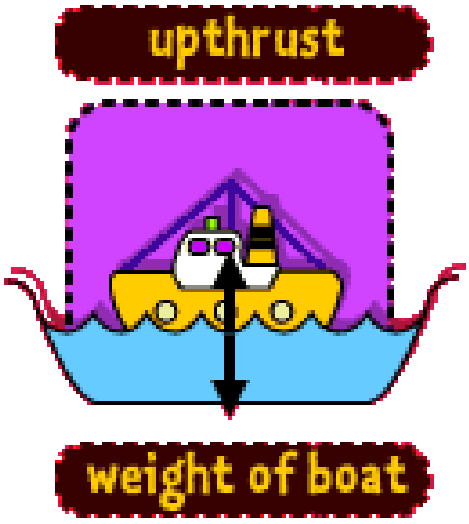
Air Resistance



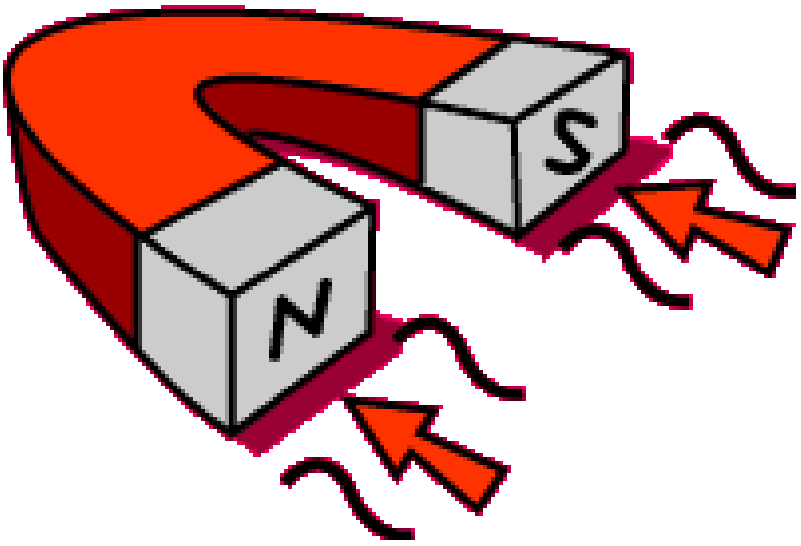
★ **Air resistance** is a type of **friction** between air and another material.

★ Friction can be a useful force because it prevents our shoes slipping on the road when we walk and stops car tyres sliding.

★ Remember! **Upthrust** is **not** a type of friction. Upthrust is an upward force found in gases and liquids. It is made by the gas or liquid below, pushing up more than the gas or liquid above.



Magnetism



★ A **magnet** will pull some metals towards itself.

★ Most metals are **not attracted** (not pulled) to magnets.

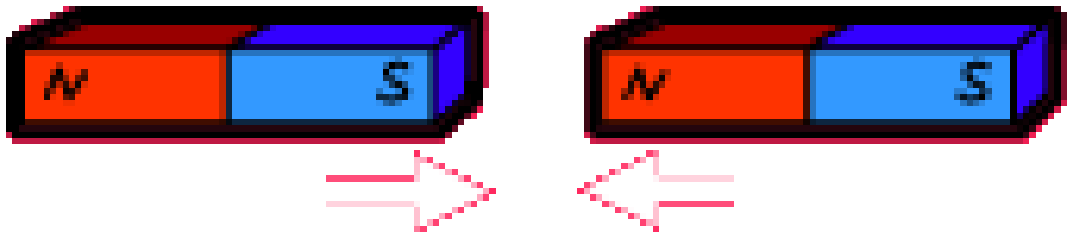
★ The metals that are attracted to magnets are **iron, nickel** and **cobalt.** These metals are called **magnetic**.

★ Steel is a mixture of metals. **Steel is magnetic** because it contains iron.

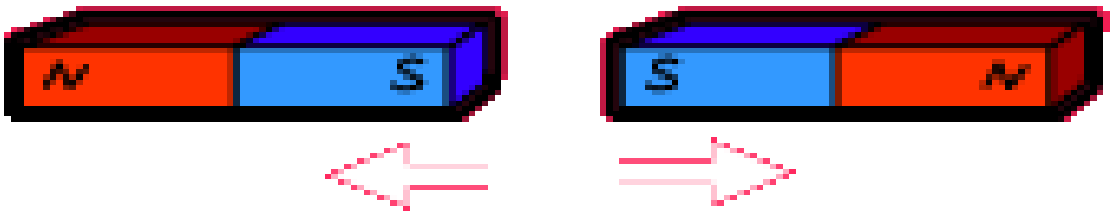
Magnets

★ All magnets have two poles.

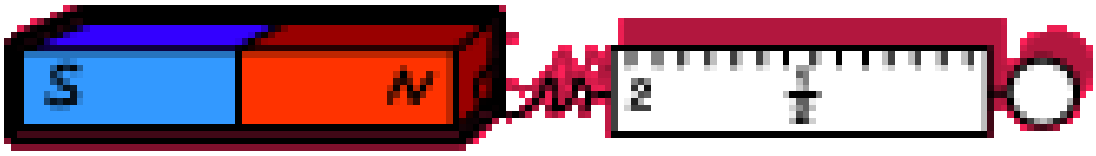
★ Two magnets with **unlike poles** facing will **attract** (pull towards) each other.



★ Two magnets with **like poles** facing will **repel** (push away) each other.

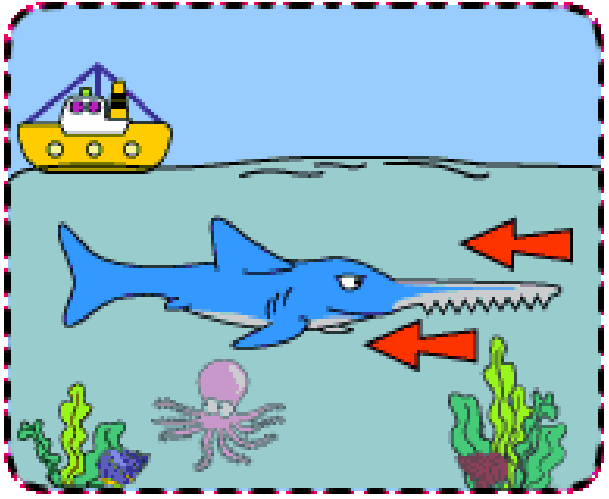


★ The pull of a magnet can be measured with a newton meter.



Quick Question

A sword fish swims through the ocean. What force does the arrow show?



a. Upthrust

b. Weight

c. Surface tension

d. Water resistance

Quick Question

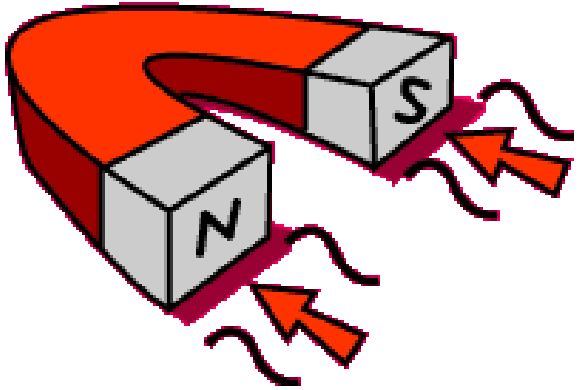
Sarah picks up a steel drinks can with her magnet. What force is balanced by the magnetic force?

a. Air resistance on the drinks can.

b. Upthrust on the drinks can.

c. Weight of the drinks can.

d. Mass of the drinks can.



Quick Question

65 million years ago a comet cras
What pulled the comet to the Ear

a. Gravity

b. Air resistance

c. Friction on the comet

d. Suction by the Earth

Look at the picture. Why has the table on the left got a bigger upward force than the table on the right?

a. There is more friction.

b. There is more grip.

c. The table has more reaction force

d. The push of gravity is bigger.

Fill in the gaps using these words

Newton, gravity, air resistance, weight

_____ is a pull towards the Earth. An object on the ground being pulled by the Earth has _____. Friction slows moving objects down; if they are moving through air we call the friction _____. The man who first created theories about forces was called Isaac _____.

Fill in the gaps using these words

iron, force, newtons, repel, copper

Magnetism is a type of _____ that can be measured in _____. Some metals such as _____ are not attracted to a magnet but a few metals such as _____ are. When two magnets push each other away they are said to _____ each other.

Quick Question

Lavinia falls out of an aeroplane towards the ground. Then she remembers to open her parachute and land gently.

What force slowed Lavinia down?

Quick Question

Two magnets are put close together but they push each other apart. What do we call this?

Which of the following is the best explanation for this?

a. The south poles of both magnets are facing each other.
b. The north pole of one magnet faces the south pole of the second magnet.
c. One magnet is not strong enough to attract the other magnet.
d. One magnet is made of copper.

Quick Question

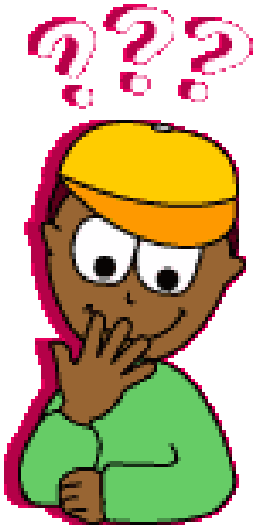
Which of the following metals would *both* be attracted to a magnet?

a. Iron and mild steel

b. Copper and tin

c. Copper and aluminium

d. Lead and iron



Quick Question

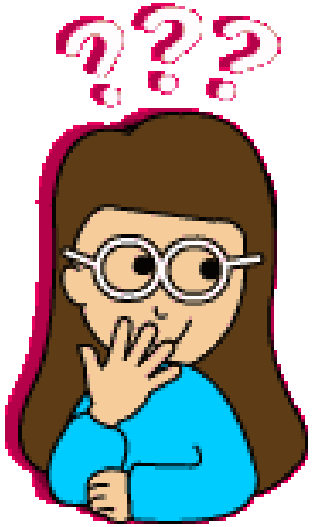
What do we call a force that slows down moving objects?

a. Weight

b. Gravity

c. Magnetism

d. Friction



Try this…

Can you name the different types of magnets?

Use the magnets to work out what metals these objects are made of.

How many paperclips will each magnet pick up?

What does that say about the magnet?

Try this…

Which block travels fastest down the ramp?

Why does this happen?

How can you tell this is a fair test?

Can you think of any materials that would make the block travel faster than the materials used here?