

LO: To identify and understand forces.

Success Criteria

- Identify push and pull forces
- Identify contact and non-contact
- Explore forces on everyday objects

What Is a Force?



A force is a push or pull acting on an object as a result of the object's interaction with another object.

Forces can make objects stop or start moving.

Watch this clip showing the effects of forces on different objects.

While you are watching, note down any examples of pushes or pulls that you see.

If you can watch this video and see if you can spot examples of push and pull forces.



<https://www.bbc.co.uk/bitesize/clips/zkw8q6f>

Pushes and Pulls

Did you spot these examples of **pulling** forces?



The rower **pulls** the oar.



The tug of war teams **pull** the rope.



A catapult is **pulled** back.

The string of the bow is **pulled** back.



Pulling the sledge.



The bell ringers **pull** the ropes.

Pushes and Pulls

Did you notice these examples of **pushing** forces?

The runner's feet **push** off the ground.



A person **pushes** the piano keys down.



The hockey stick **pushes** the ball.



The golf club **pushes** the golf ball.



The bat **pushes** the ball.



The woman **pushes** the pram.

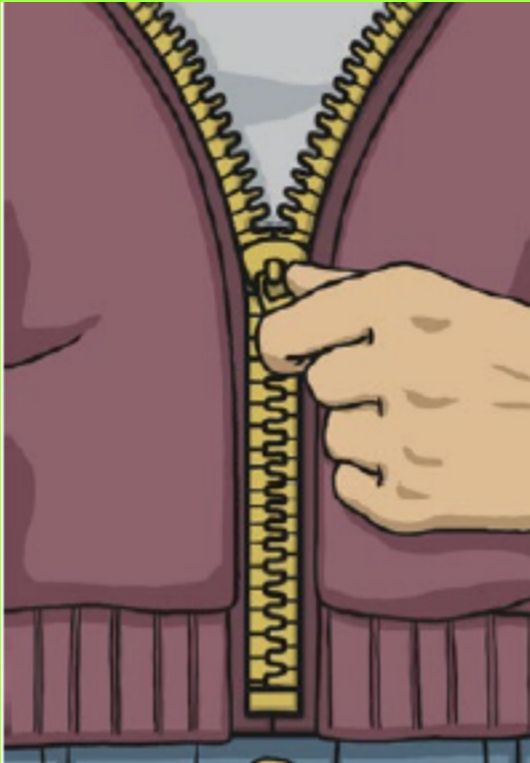


Pushes and pulls are forces. When you push or pull something you make it start or stop moving.

What force is being used in these pictures?
Does it make the object start or stop moving?



What force is being used in these pictures?
Does it make the object start or stop moving?



Contact Forces

Many forces need to touch an object before they can affect it. These forces are called contact forces. When you throw a ball, you have to touch the ball to put a force on it. When you go down hill on a bicycle, the brakes need to touch the wheel to produce the force called friction so that you can slow down.



Non-contact force

Is a force that affects something from a distance like gravity. Some forces do not need to touch the things that they are affecting. Some forces can affect an object from a distance.

You are now going to explore a selection of objects with a force acting on them.

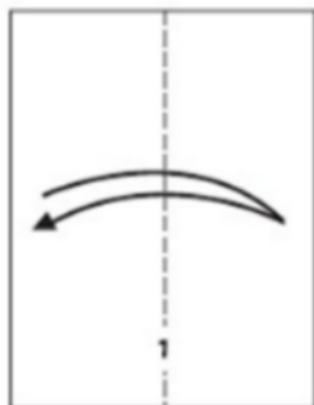
For each set up you will need to:

- . draw the set up
- . label if it is a push or pull
- . decide if it is a contact or non-contact force

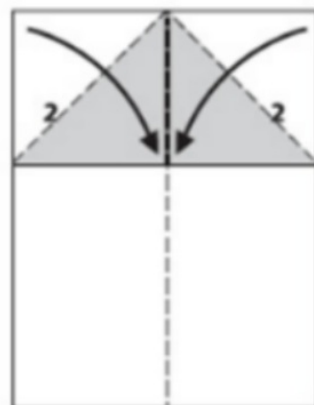
You will need:

- a fridge magnet
- a sheet of paper
- a book
- a rope (you could use a skipping rope, belt, dressing gown tie or a towel.)
- a paper aeroplane (see next slide for how to make one.)

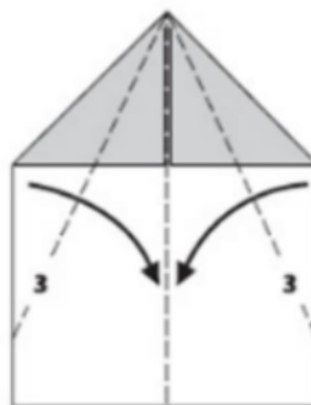
DIRECTIONS FOR FOLDING



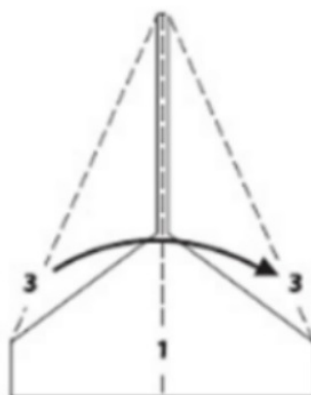
Step 1



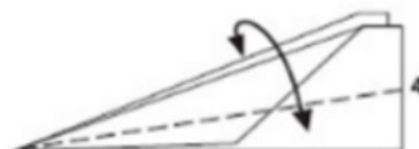
Step 2



Step 3



Step 4



Step 5

1. Fold your paper in half along the dashed line marked **1**, then open the paper back up.
2. Fold the top corners down along the dashed lines marked **2**, so the edges meet at the middle line.
3. Fold the outside edges toward the middle by following the dashed lines marked **3**.
4. Fold your paper in half, just like you did in step 1.
5. Fold the wings down along the dashed lines marked **4**.

Activity 1:

Rub your hands together.

What do you notice about the temperature of them before and after?

Activity 2:

Mini tug of war between 2 people

What helps you grip the rope?

Why don't you fall over?

Activity 3:

Drop a flat sheet and crumpled sheet at the same time.

Which falls slower? Why?

Activity 4:

Hold a book up high and then let it go.

What happens? Why?

Activity 5:

Hold the magnet just above the paper clips.

What happens to the paper clips?

Why?

Activity 6:

Throw the paper aeroplane.

Why does it eventually fall to the ground?

Draw each activity then label:

- is it a push or pull

- contact or non- contact.

Friction

Friction is a push against a moving object. It happens when there is contact between two materials, like a brake pad on a bicycle tyre.

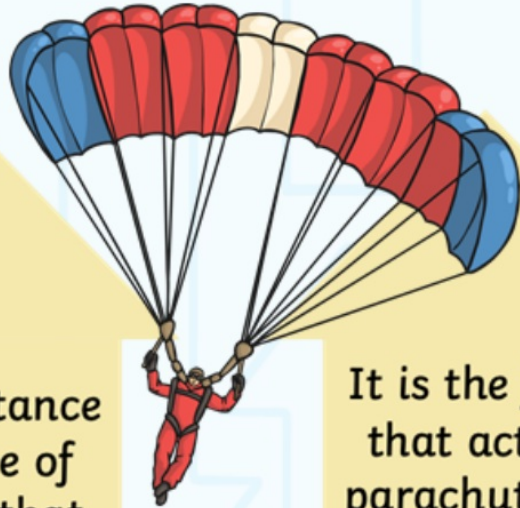
Friction is the force that stops or slows us when trying to move an object. If the object is already moving, friction is slowing it down.



Which of our set ups had the force friction acting on it?

Can you label the correct diagram?

Air Resistance



Air Resistance is a type of friction that occurs between the air and another material.

It is the force that acts in parachutes so that we don't crash to the ground.

**Which of our set ups had air resistance acting on it?
How?**

Can you label the correct diagram?

Magnetism

Magnetism is the force that occurs when a magnet pulls a metal object, or another magnet, towards itself.

Magnetic materials are always metals but only a few metals are magnetic.



Examples of magnetic materials include iron, nickel and cobalt.

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

**Which of our set ups had magnetism acting on it?
Why?**

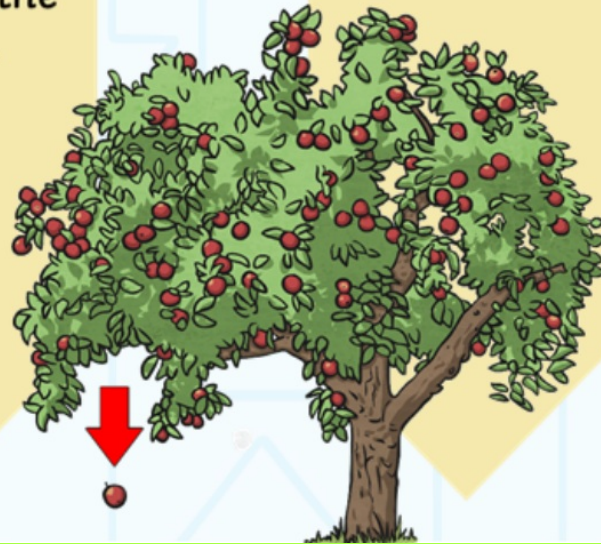
Can you label the correct diagram?

Gravity

Gravity is the force that pulls the Earth and other planets towards the Sun. It also keeps us and other objects on the ground.

We can represent gravity with an arrow pointing down towards the Earth.

Weight is the pull on the mass of an object by the Earth.



**Which of our set ups had gravity acting on it?
How?**

Can you label the correct diagram?

Plenary

- What are 2 examples of a pull force?
- what is a contact force?
- what forces are in action in the picture?

