

FORCES

This half term in Science we are going to look at various forces and perform lots of exciting experiments.

Can you match the force to its description?

Gravity

Water
resistance

Friction

Air
resistance

Upthrust

This force, also known as drag, is friction between a moving object and the air around it.

Water or air pushes back against an object placed in it. If this force is the same as the weight of the object, it will float.

Is the force between two things that are moving (or trying to move) across each other. This force slows a moving object.

Is the force that pulls things together. This pull is because objects have mass. The bigger the mass, the bigger the pull.

This force is friction between water and an object that is moving through it. The water pushes against the object and slows it.

Answers

Gravity

Is the force that pulls things together. This pull is because objects have mass. The bigger the mass, the bigger the pull.

Water resistance

This force is friction between water and an object that is moving through it. The water pushes against the object and slows it.

Friction

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Air resistance

This force, also known as drag, is friction between a moving object and the air around it. The air pushes against the object and slows it.

Upthrust

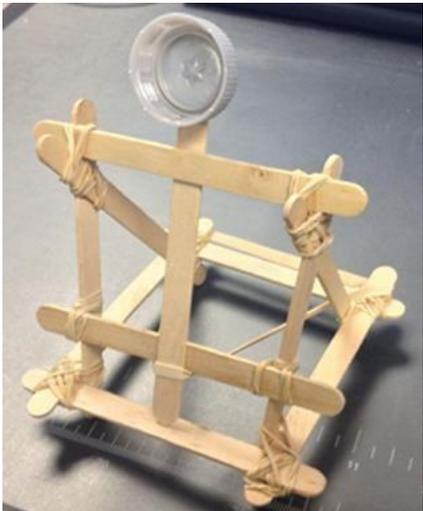
Water or air pushes back against an object placed in it. If this force is the same as the weight of the object, it will float.

Welcome to ...

The Ecclesall

E^{OO}-lympics

Eggvent 1:
Shot putt



Eggvent 2:
Grand Prix

Eggvent 3:
Parachute jump



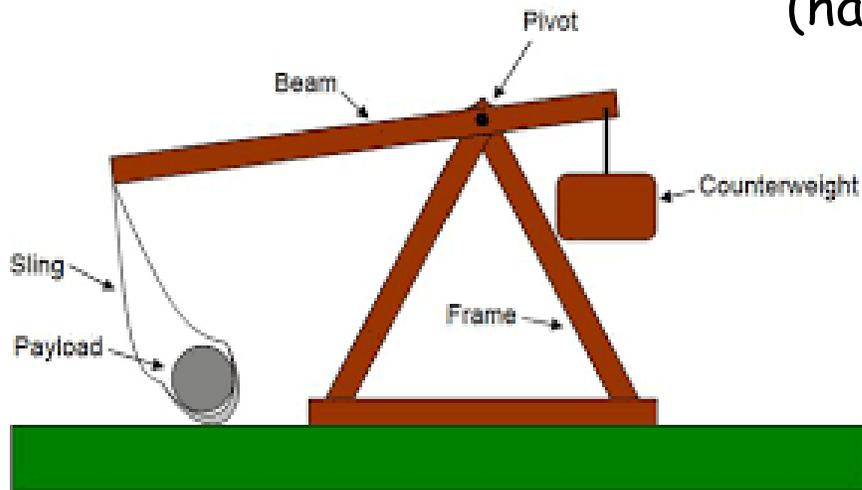
Eggvent 4:
Boat race

The Ecclesall

Egg-lympics

Eggvent 1: Shot putt

Design a catapult/trebuchet with any materials you have (wood, card, LEGO, string, rubber bands etc) which will propel an object (hard boiled egg/plastic egg/tennis ball etc) for a distance.



Design Brief

- Catapults must be free standing
- They must be able to hold and launch an object safely.
- The base must be no more than 30cm²

Key Words

Fulcrum, load, force, air resistance, gravity.

You will need to understand levers to make your catapult.

Scientific Play

Take a ruler, pencil and two coins of different weights. Place the ruler on the pencil and place the coins at either end.

Can you make the ruler balance?

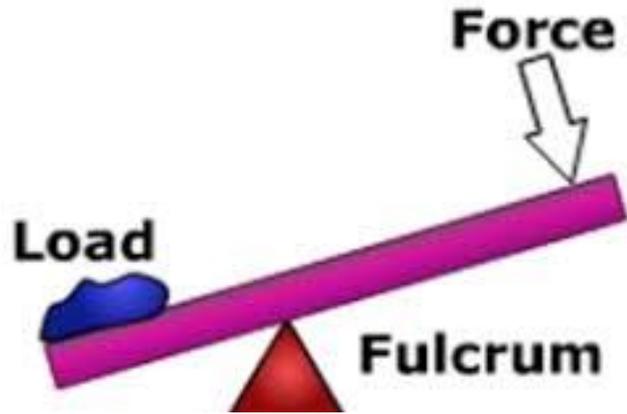
Can you make other objects of different weights balance?

Levers, gears and pulleys are all mechanisms that make jobs easier to do.
Or sometimes just for fun!



All levers have four basic parts:

- Beam - the **lever**, a wooden plank or metal bar resting on the fulcrum.
- Fulcrum - the **pivot** or the turning point.
- Force - the effort or input needed to move the beam and load.
- Load - the item or object being moved or lifted on the plank.



How it works:

If one end of the lever is pushed down, the force will lift the other end. If the other end has a load on top of it, it will be easier to move the load. Think of a boy and girl on a see saw. The boy may not be able to lift the girl up in the air using just his arms. On a see saw, though, the girl (the load) is sitting on one end and then the boy can easily push down on the other end and lift the girl.

Eggvent 1: Shot putt

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Egg-lympics Eggvent 1: Shot Putt

Design Brief:

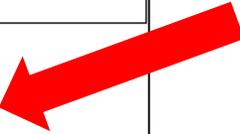
- Designs must be free standing.
- They must be able to hold and launch an object safely.

Three things I want to focus on in my design are:

- 1.
- 2.
- 3.

I have improved my design by:

- 1.
- 2.
- 3.



Research designs of catapults. What makes them work well. Think about how you can reduce air resistance and account for gravity.

Design your catapult on the design sheet. Give detail of materials to be used and measurements of your design. You can use an extra sheet to write up what you researched.

Build your catapult and test it. What can you change to make the object travel further. Record your longest launch.

Take a photo of your catapult, we can't wait to see the different designs.