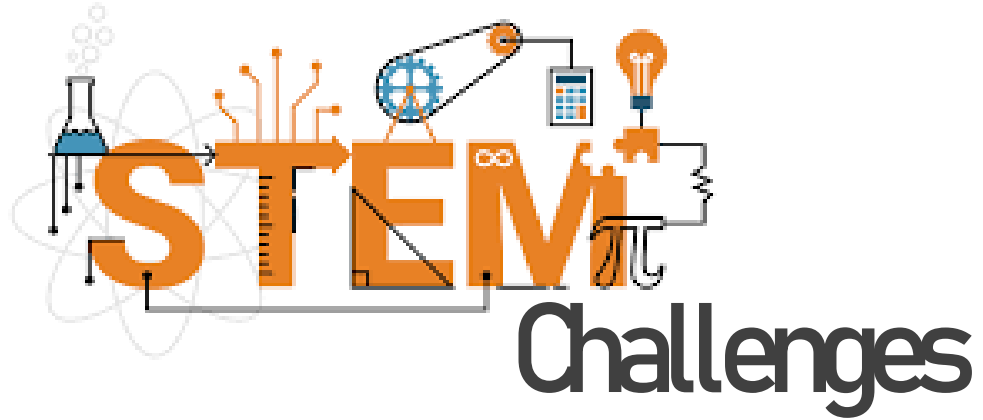


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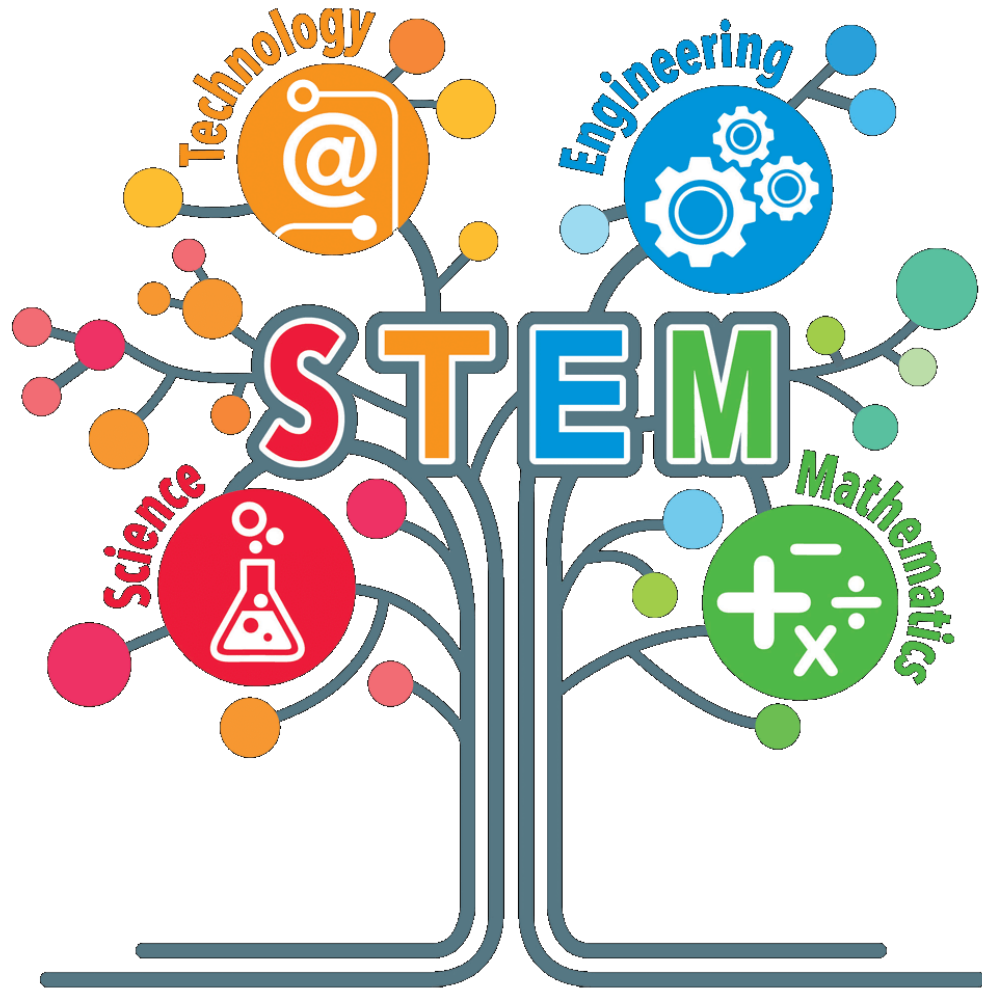
What's it like at the JCB Academy?

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STEM Challenge

What is STEM?



STEM stands for -

Science

Technology

Engineering

Mathematics

These subjects are linked directly to each other and this task will highlight your skills in each of these subject areas.

Objectives

To understand what is meant by STEM. To demonstrate the effect of friction

What is Friction

Friction is a force that acts in the opposite direction to movement. It makes things more difficult to move.

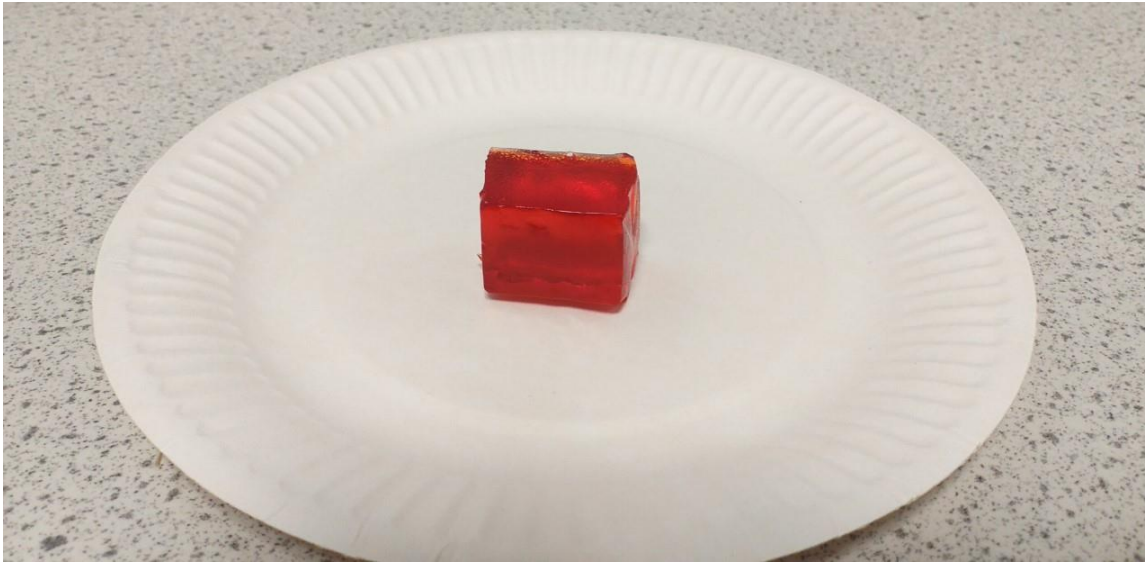
Friction occurs when 2 surfaces rub against each other. The force of friction is biggest when the objects have rough uneven surfaces.

We can show the direction that forces act in using arrows. The bigger the arrow, the bigger the force.



Friction Demonstration 1

Jelly on a plate



Resources

1 cube of jelly

1 paper plate

Vegetable oil

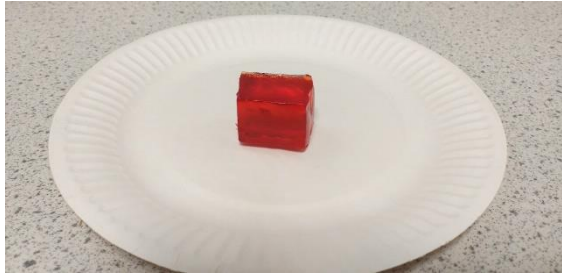
2 pencils or chop sticks

Objectives

To understand what is meant by STEM. To demonstrate the effect of friction

Friction Demonstration 1

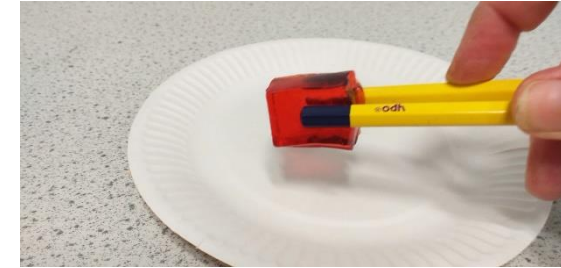
Jelly on a plate



1. Put your jelly on the plate. Try to push it across the plate



2. Tip the plate upside down. What happens?

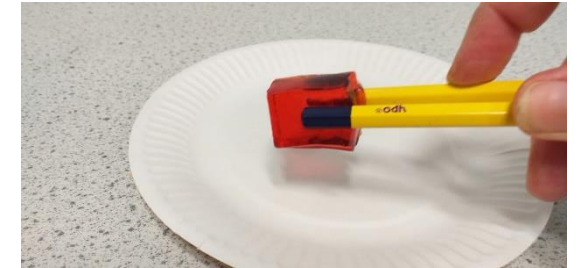
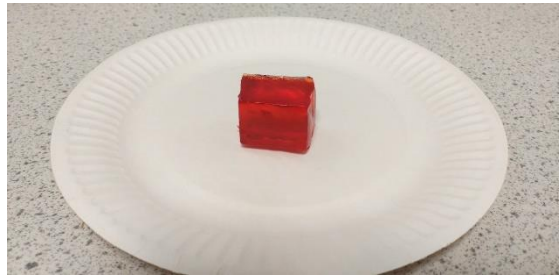


3. Use 2 pencils, or chopsticks, to pick up the jelly

The friction between the jelly and the plate causes the jelly to be difficult to slide, but the friction between the jelly and the pencils makes it easy to pick the jelly up.

Friction Demonstration 1

What happens if we reduce the force of friction?



Add a small amount of cooking oil to your plate and spread it about. Try the same tasks.

Try to push the jelly across the plate

Tip the plate upside down. What happens?

Use 2 pencils, or chopsticks, to pick up the jelly

The cooking oil reduces the friction between the jelly and the plate and pencils.

Objectives

To understand what is meant by STEM. To demonstrate the effect of friction

Friction Demonstration 2

How much rice can you pick up with a pencil?



Resources

- 1 plastic bottle filled with rice
- 1 pencil with a matt finish.

Objectives

To understand what is meant by STEM. To demonstrate the effect of friction

Friction Demonstration 2

How much rice can you pick up with a pencil?



Plunge the pencil in and out of the rice several times, pushing as deeply as you can.



Pick the whole bottle of rice up using the pencil.

The friction between the rice and the pencil is strong enough to hold the pencil in place.

Objectives

To understand what is meant by STEM. To demonstrate the effect of friction

Friction Demonstration 3

Stronger than glue?



Resources

2 books, with a matt finish.

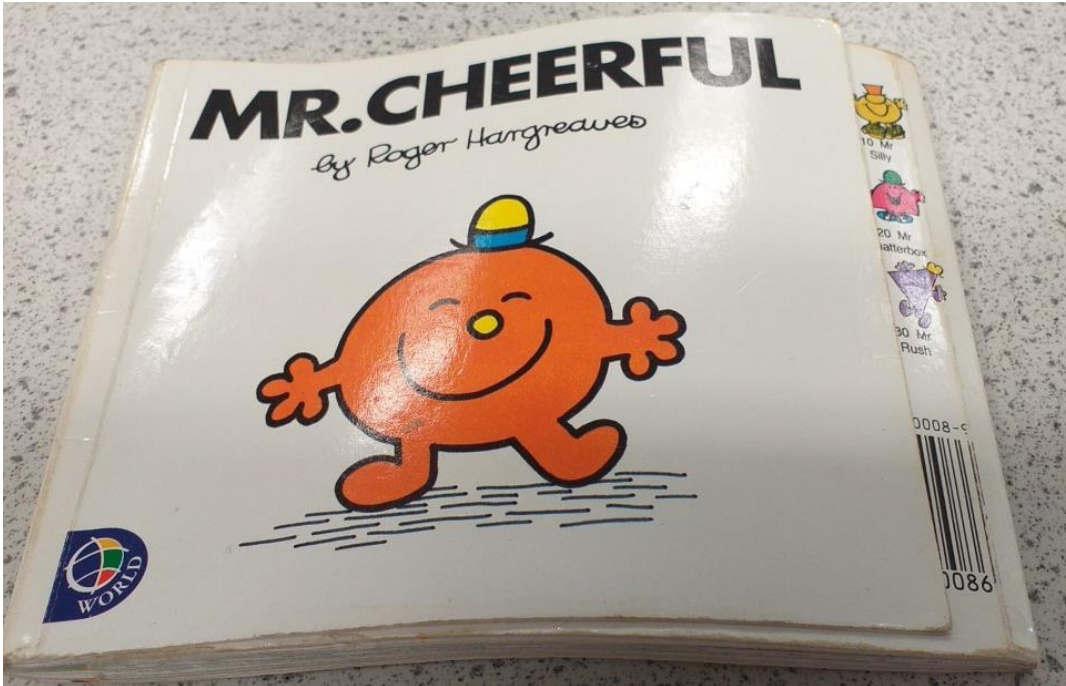
Phone books and yellow pages work very well, as do Mr Men books!

Objectives

To understand what is meant by STEM. To demonstrate the effect of friction

Friction Demonstration 3

Stronger than glue?



Interleave the pages of the books.

Now get hold of each book at the spine and try to pull apart horizontally.

The surface area of paper in contact is so great that the friction between the pages acts like glue

Objectives

To understand what is meant by STEM. To demonstrate the effect of friction

Friction in Real Life

Is friction an advantage or a disadvantage in each of these situations?



Objectives

To understand what is meant by STEM. To demonstrate the effect of friction

Can you think of any more uses of friction in real life?

Can you find some more demonstrations of friction and share them with us?

- You could make a PowerPoint, a Poster or a Video that explains your demonstration of friction.
- Display them in your classroom, present them to your class or send them to UTC South Durham.



STEM Challenge

What's next?

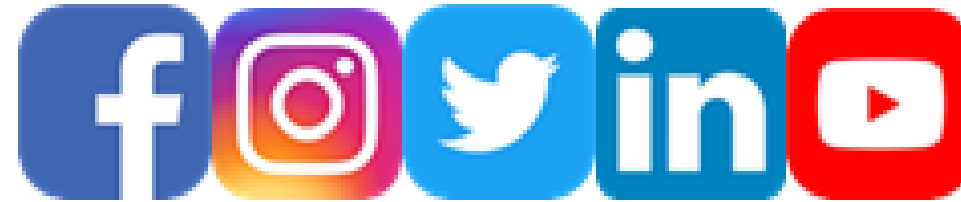
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