

In science, for the rest of the term we are going to be learning about forces.

Key Vocabulary	
<b>forces</b>	Pushes or pulls.
<b>friction</b>	A <b>force</b> that acts between two <b>surfaces</b> or objects that are moving, or trying to move, across each other.
<b>surface</b>	The top layer of something.

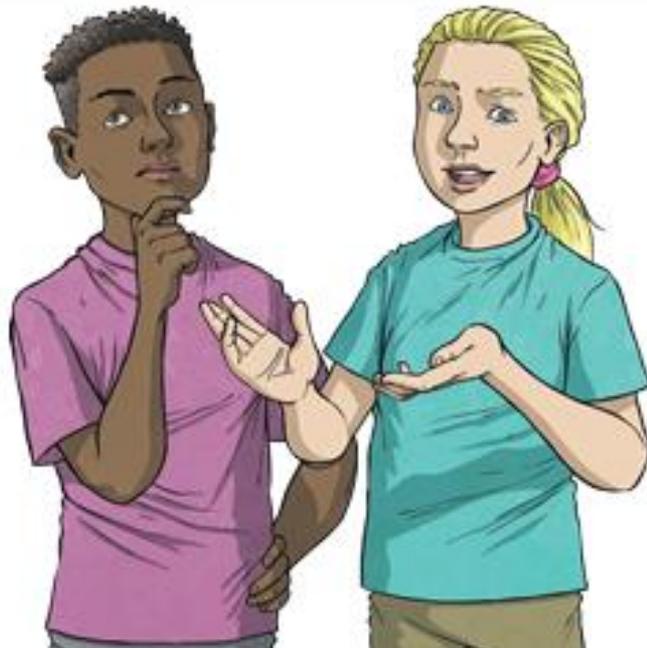
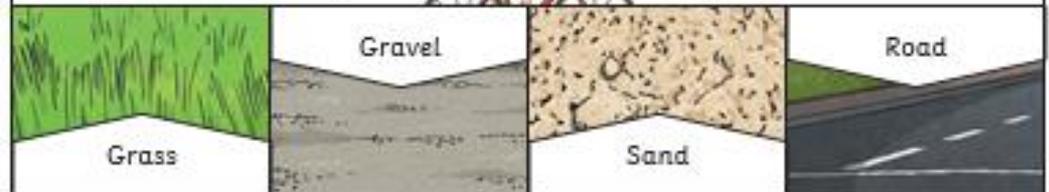
**Key Knowledge**

Different **surfaces** create different amounts of **friction**. The amount of **friction** created by an object moving over a **surface** depends on the roughness of the **surface** and the object, and the **force** between them.

The driving **force** pushes the bicycle, making it move.



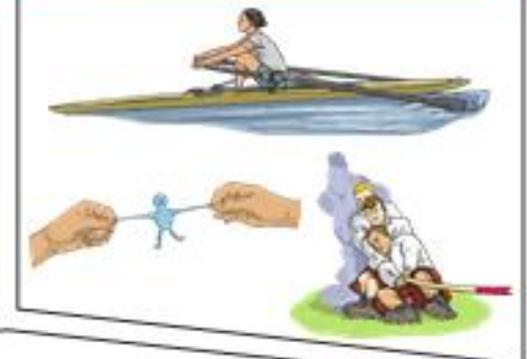
**Friction** pushes on the bicycle, slowing it down.



**Pushes**



**Pulls**



**Forces** will change the motion of an object. They will either make it start to move, speed up, slow it down

LI: I can explain what a force is and how it affects an object

Success  
Criteria

I can explain what a force is using scientific vocabulary.

I can draw on my results to answer questions

Do you agree or disagree with these ideas about forces? Why?



What do you think?

Activity A complete

A force is ...



Wood bank: forces, surface, push, pull, strength, speed up slow down and change direction

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How do you make an object speed up or slow down?

How do you make an object change direction?

Watch the video to find out more.

<https://www.bbc.co.uk/bitesize/topics/zvpp34j/articles/zywcrdm>



Can you add anything to your activity.

Wood bank: forces, surface, push, pull, strength, speed up slow down and change direction

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Watch the forces in action video.  
Can you identify the forces being used?



<https://www.bbc.co.uk/bitesize/clips/zskc87h>

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Activity 2. Draw an arrow to show the amount of force needed to move these objects. The longer the arrow the greater the force needed.



Wood bank: forces, surface, push, pull, strength, speed up slow down and change direction

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Today we are going to investigate forces by making spinning tops.



You need:

- \* coloured pens and pencils
- \* scissors
- \* toothpicks/pencil
- \* small piece sticky tack or playdough
- \* stopwatch (optional)
  
- \* paper and pencils to record experiment and observations (optional)

Wood bank: forces, surface, push, pull, strength, speed up slow down and change direction

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Today we are going to investigate forces by making spinning tops.



Method

Draw different size circles.

Colour in your spinning tops. They need to be bright and patterned.

Cut them out and poke a pencil or a toothpick through the centre.

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## Success Criteria

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Activity                      Make a Prediction.

Which size spinning top works best?

I think ..... because.....

Now spin your tops and answer these questions.

- 1) How does your art design look as the top spins?
- 2) Does the way you use your hand to spin the top make a difference to how well it spins?
- 3) What do you think makes the tops spin and not fall over?
- 4) What makes them stop spinning?
- 5) What happens if the top of the tooth pick gets blunt?



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Wood bank: forces, surface, push, pull, strength, speed up, slow down, stops and change direction

## LI: I can explain what a force is and how it affects an object

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Enjoyed the experiment then why not try one of these

Time how long the spinning tops spin. Does one spinning top consistently spin longer?

Test out the spinning tops on of a variety of surfaces: on different textures and different gradients.

Test out spinning tops of different shapes. Instead of circles, make spinning tops out of squares, rectangles, and triangles. Make a prediction about how well they will spin and then test out the different shapes.

Use different materials to make spinning tops. How do the spinning tops perform when they are make from paper, thick card, cardboard, polystyrene, wood or even a piece of toast?



Happy Spinning!

LI: I can explain what a force is and how it affects an object

Success  
Criteria

Answers to Activity 2. Print off this page or draw the object.  
Draw an arrow to show the amount of force needed to move these objects. The longer the arrow the greater the force needed.



Wood bank: forces, surface, push, pull, strength, speed up slow down and change direction

## What's the science behind spinning tops?

What makes a spinning top spin? Forces!

When we use our fingers to set a top spinning, we are giving the top a force that converts its potential (stored) energy into kinetic energy (the energy of motion).

When the spinning top is spinning, it's balancing on the fine point of the tooth pick. This tiny tip minimises the amount of friction generated by its contact with the surface it is spinning on.

With only a tiny amount of friction influencing the spinning top it keeps on spinning for much longer.

After a while, friction does slow the spinning. The spinning top will start to wobble and eventually stop spinning on the axis of the tooth pick and it will fall to one side.