

Science

Forces

1) How much gravity an object has depends on its _____.

- Weight
- Speed
- Momentum
- Mass
- Acceleration

2) Which of the following has the strongest gravitational pull?

- A bowling ball
- A car
- The Earth
- The planet Mars
- The Sun

4) True or False: Gravity helps the Earth to stay in orbit around the Sun.



TRUE



FALSE

5) What scientist is credited with first describing the mathematics of gravity?

- Thomas Edison
- Alexander Graham Bell
- Isaac Newton
- Bill Gates
- Leonardo da Vinci

6) What do we call the force of gravity on an object?

- Weight
- Mass
- Speed
- Acceleration
- Velocity

Friction



twinkl

Friction

- Explain the effects of friction on a moving vehicle.
- Investigate the effects of friction created by different materials.

What Is Friction?

Look at the statements about friction. Can you decide which are true or false? Discuss your ideas with your partner before sharing your thoughts with the class.

Friction is a force.

Friction slows moving objects down.

All surfaces create friction on an object moving over them.

Friction is always a useful force.

Friction is stronger than gravity.

Friction produces heat.

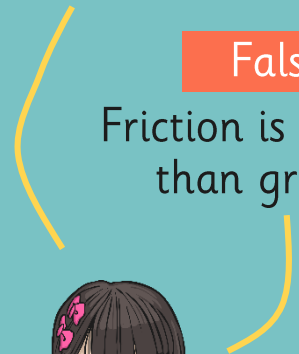


What Is Friction?

How did you do?

True

Friction is a force.



True

Friction slows moving objects down.



True

All surfaces create friction on an object moving over them.



False

Friction is always a useful force.



True

Friction produces heat.

What Is Friction?

Friction is a **force** that acts between two surfaces or objects that are moving, or trying to move across each other.

Friction always acts in the **opposite direction** to the moving object, and always **slows** a moving object down.



What Is Friction?

All surfaces create friction on an object moving across them. Even very smooth surfaces like ice create some friction.

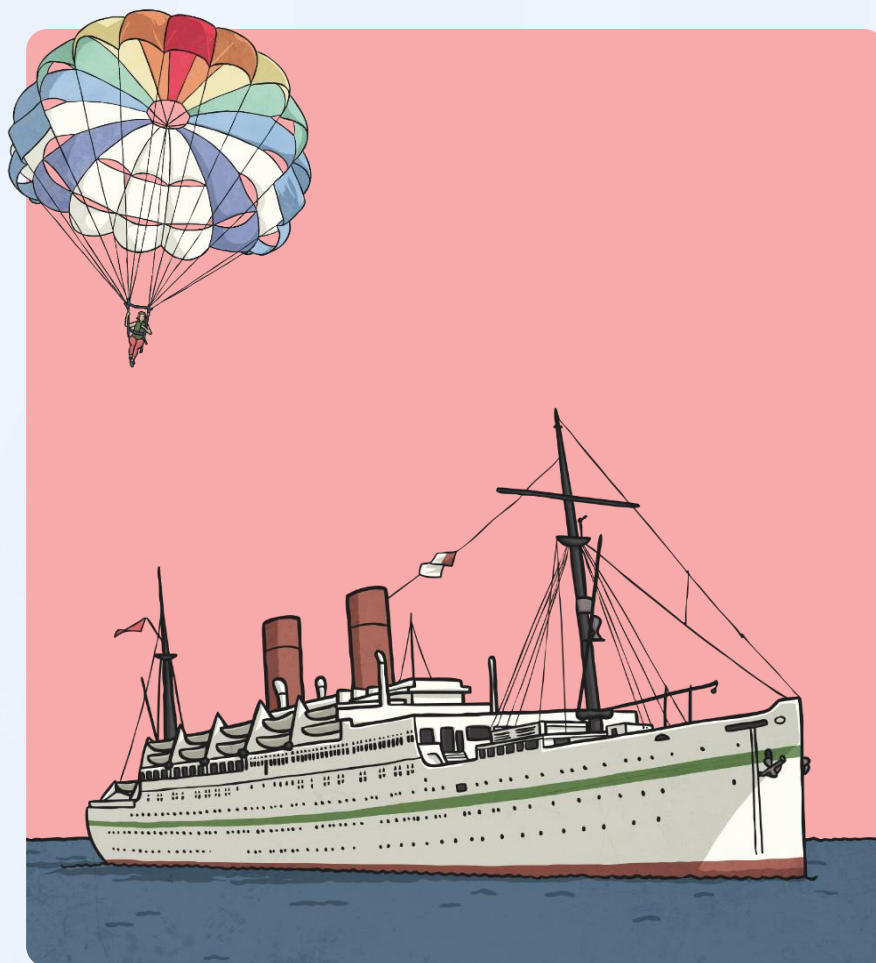
<https://www.bbc.com/bitesize/cips/z79rkqt>



What Is Friction?

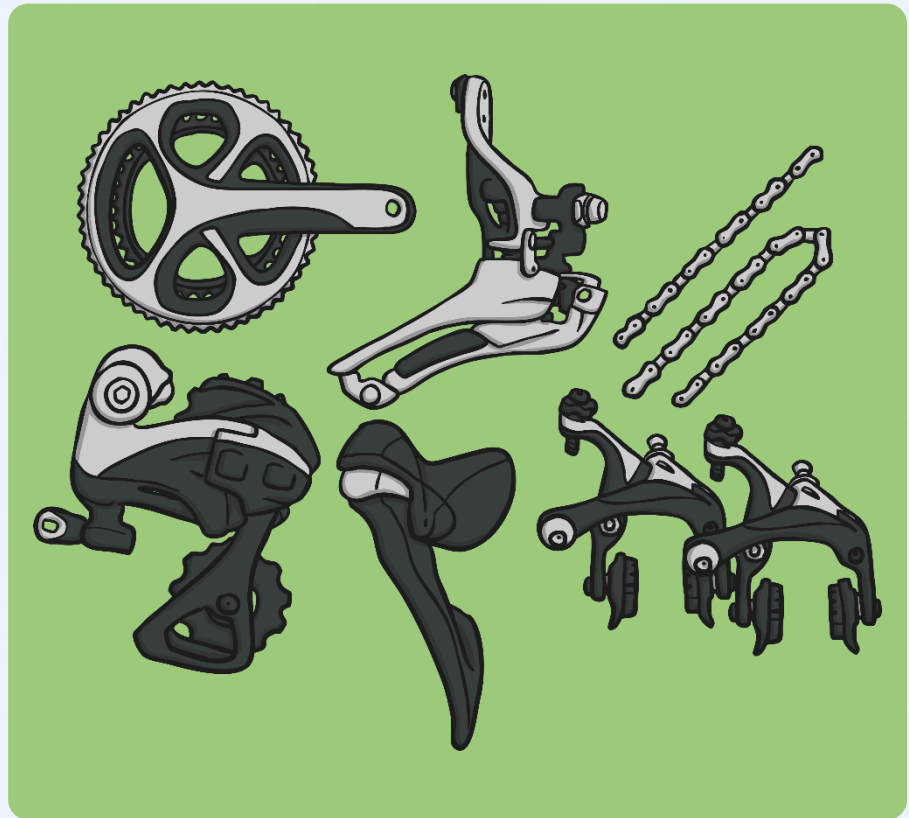
Friction can be **useful** – for example, the soles of your shoes create friction with the ground, preventing you from slipping over.

However, friction can be **unhelpful** too – friction on a bike chain can make the bike harder to pedal.



Friction in Action

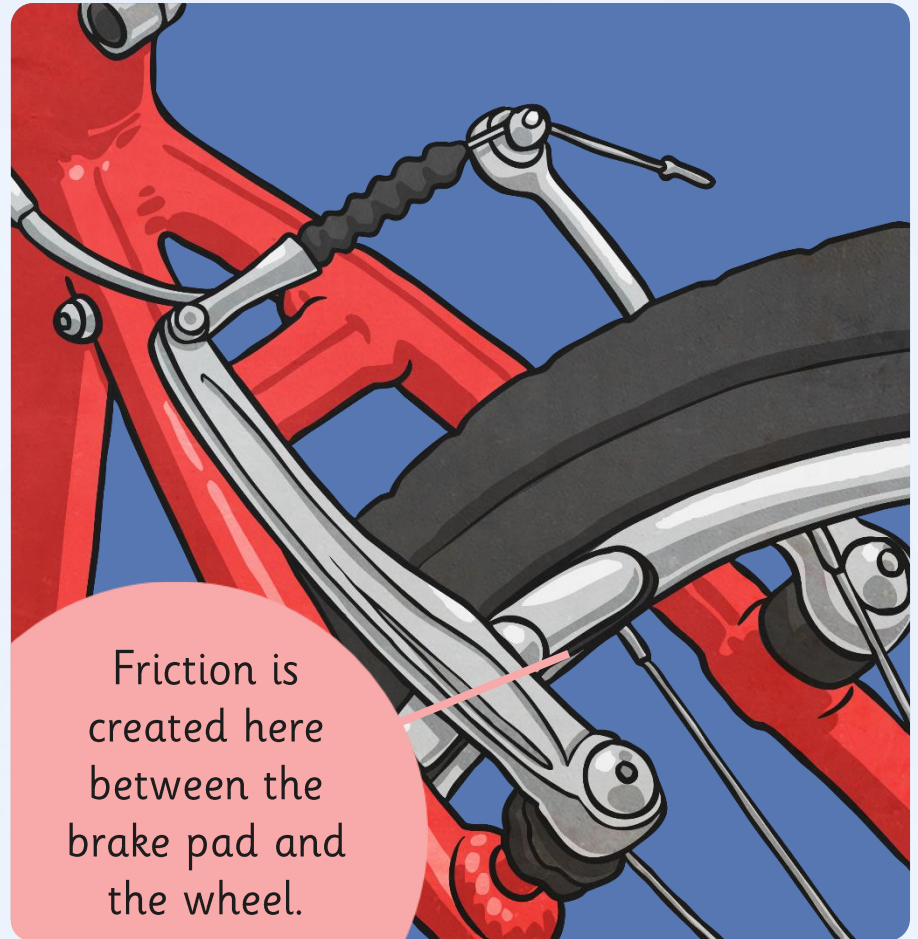
Watch [this clip](#) to see how the force of friction is used to make brakes slow down or stop a moving vehicle.



Friction in Action

The brakes on a bike or car work by creating friction between the brake pad and the wheels.

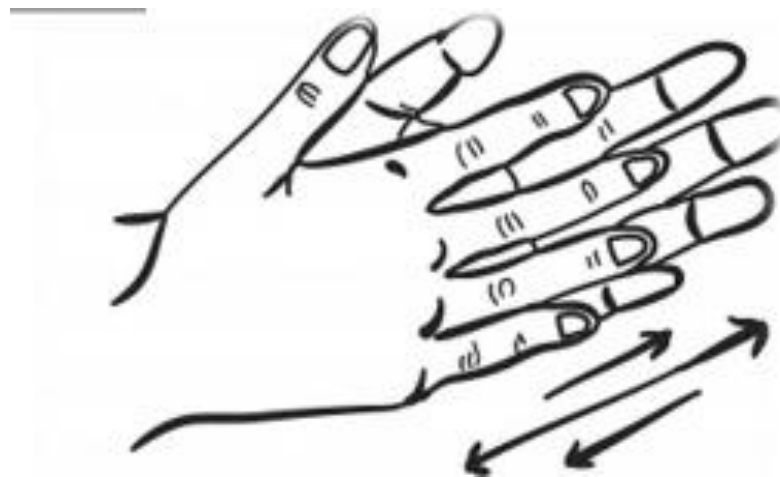
The friction opposes the movement of the wheels, slowing them down and eventually stopping them.



Friction is created here between the brake pad and the wheel.

Friction

- Friction is an **opposing force**
- It **slows down** or **stops** moving objects
- Friction can be **helpful** and **unhelpful** to us
- Friction can produce heat



<http://flash.topmarks.co.uk/4060>

Mini Experiment 1

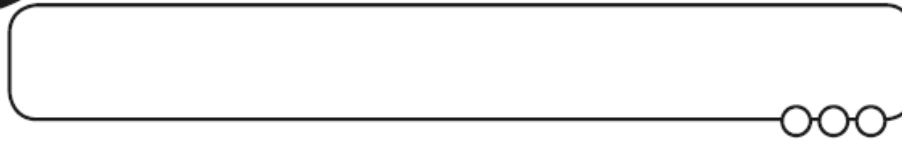


Mini Experiment 2





Investigating Friction



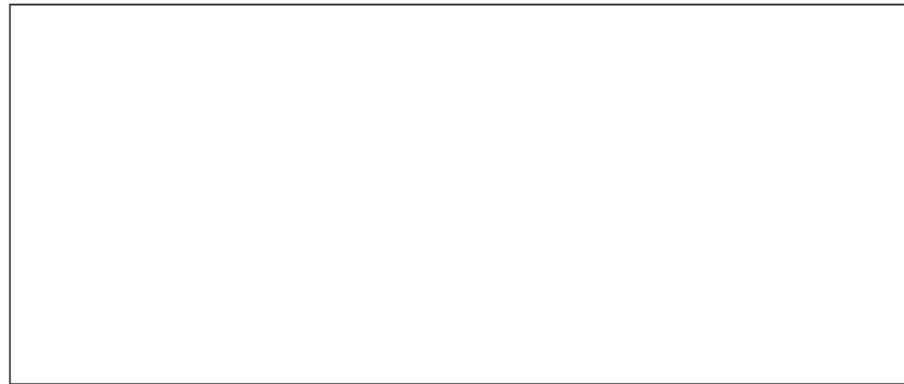
You have been asked to design a new brake pad for a tricycle. You will find out which material creates the most friction and stops the tricycle's wheels the quickest.

Which materials will you test?

Which material do you predict will be the best choice for the new brake pad?

Can you explain why?

Tremendous Tricycles Ltd would like to see a demonstration of the best material in action. Stick a photo or draw a picture of your demonstration of the best choice for the new brake pad in the box below.



Can you explain why this material is the best choice for the new brake pad?

Use these words in your explanation.

friction brake slow stop wheel speed rough smooth surface force push back