

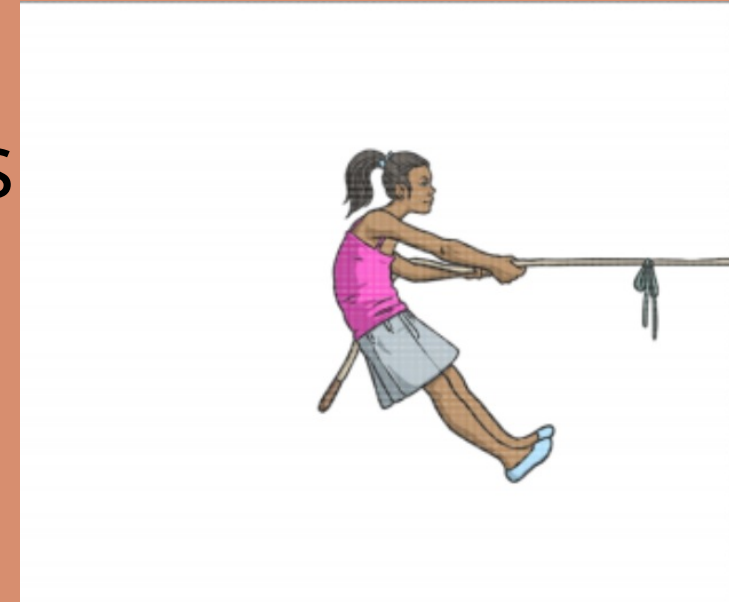
LO: To investigate friction

Success Criteria

- Understand what friction is
- Carry out a fair test
- Evaluate a fair test

Quick Quiz

1. Forces are either a _____ or a _____ .
2. What does a force do to an object?
3. What forces are in action in this picture?



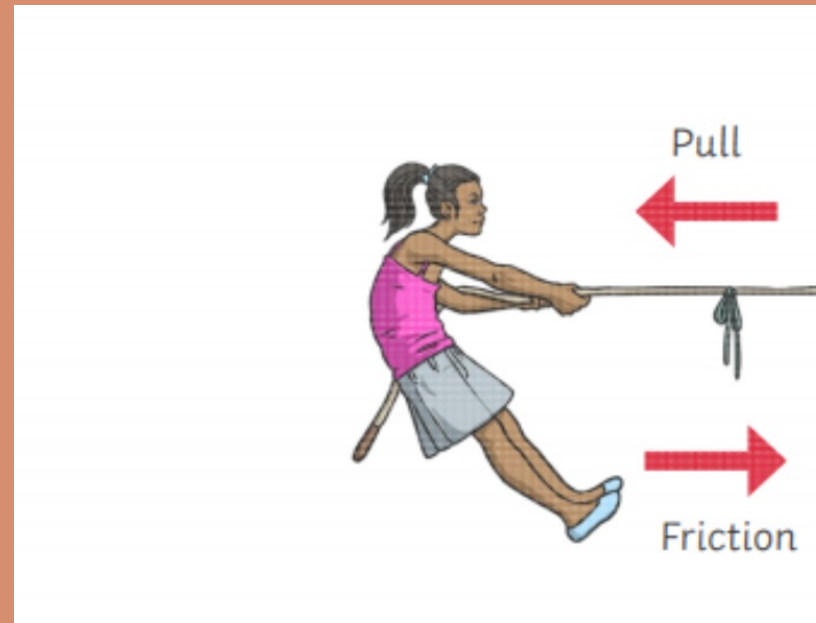
Quick Quiz - Answers

1. Forces are either a push or a pull.

2. What does a force do to an object?

Makes it stop or start.

3. What forces are in action in this picture?



Today we are going to be investigating friction

What is friction?

Timed Pair Share



What is friction? - BBC Bitesize

bbc.co.uk/bitesize/topics/zsxxsbk/articles/zxqrdxs

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KS2

What is friction?

Part of Science | Friction and resistance

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11:53 06/01/2021

<https://www.bbc.co.uk/bitesize/topics/zsxxsbk/articles/zxqrdxs>

RallyRobin



Can you think of a time
when friction is useful?

- *Friction between the brakes and the wheels of a car or bicycle helps the vehicles slow down.*
- Without friction between the shoes and the ground, you cannot walk properly. If there is no friction, all of us would be sliding around without any control over ourselves. While walking, you're pushing your foot back as you try to step forward. Friction holds your shoe to the ground so you can walk around.
- *Friction enables us to write. The frictional force is created when the tip of a pen or pencil is brought in contact with the surface of the paper.*
- You might have noticed that your hands feel warm when you rub them together for a few seconds? Friction is responsible for generating warmth in your hands.
- *When a matchstick is rubbed against a rough surface, some amount of heat is generated and this heat is sufficient for the conversion of red phosphorous to white phosphorous. Since white phosphorous is highly inflammable, a matchstick ignites.*

Sometimes we might want to prevent friction from happening.

Why might we want to do this?



In some cases we want to prevent friction so it's easier to move.

A way to reduce friction is with a lubricant like grease or oil.

Machines and engines use grease and oil to reduce friction and wear so they can last longer. Another way to reduce friction is to change the types of materials in contact with one another.

E.g. ice contacting with steel would produce less friction than rubber would on concrete. This is why ice skates slide so easily on the ice.

Investigation

The minister of transport has had a thought. She has noticed that all of the roads in our country seems to be made of stone (tarmac) but she wonders why this might be? She has asked the best scientific minds in the country to test to see if there might be any other type of surface that would be suitable for our roads instead. She wants you to investigate two key questions.

- *Which surface causes the least friction on car tyres?*

(Longest distance traveled)

- *Which surface causes the most friction on car tyres?*

(shortest distance traveled)

To investigate this you will need

- *a toy car (or something on wheels/that rolls)*

- *a ramp (this could be a anything flat propped up e.g. a book)*

- *a variety of materials with different textures e.g. a towel, paper, tin foil, cardboard, bubble wrap, sand paper*

Method

We will make a ramp and cover it with a material. We will need to place the toy car on the ramp and release it. Then measure how far it travels. We will repeat the experiment but with a different material on the ramp.

In your books write and complete:

Date

LO: To investigate Friction

Today we are going to investigate.....

Prediction

I predict that the car will travel furthest on _____.

I think the _____ will create the most friction.

How are we going to ensure this is a fair test?

KS2

How do you make sure a test is fair?

Part of [Science](#) | [Enquiry types](#)

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When you are testing something, you need to make sure it is a fair test. To do this everything should be the same except the thing you are testing.

<https://www.bbc.co.uk/bitesize/topics/z2ddmp3/articles/zpctrwx>



A Fair Test?

- It is important for your experiment to be a fair test.
- You conduct a fair test by making sure that you change only one factor at a time while keeping all other conditions the same.
- You should also repeat your experiments several times to make sure that the first results weren't just an accident.

What things must we keep the same?

What will be our variable?

Timed Pair Share



What things must we keep the same?

- *the toy car*
- *the height and angle of the ramp*

What will be our variable?

- *the material on the ramp*

In your books:

Variables

To make it a fair test a fair test I will keep these things the same:

My variable is...

Method

Now write a couple of sentences explaining how you are going to carry out the investigation.

Results

Now it is time to carry out your investigation.

Remember:

- Fill in the surface name*
- Repeat each test 3 times*
- Record to the nearest cm*

Conclusion

Look at your results table.

Which surface did the car travel furthest on?

Which surface did it travel the least on?



In your books write:

Conclusion

*The surface that caused the least friction was.....
because.....*

*The surface that caused the most friction was.....
because....*