

LI: To be able to identify the effects of friction between moving surfaces.

Success Criteria

I can identify the effects of friction between moving surfaces.

I will be able to use test results to make predictions to set up further fair-tests.

I will be able to plan a fair-test.

I can identifying the control variables.

Key Vocabulary:

friction

surfaces

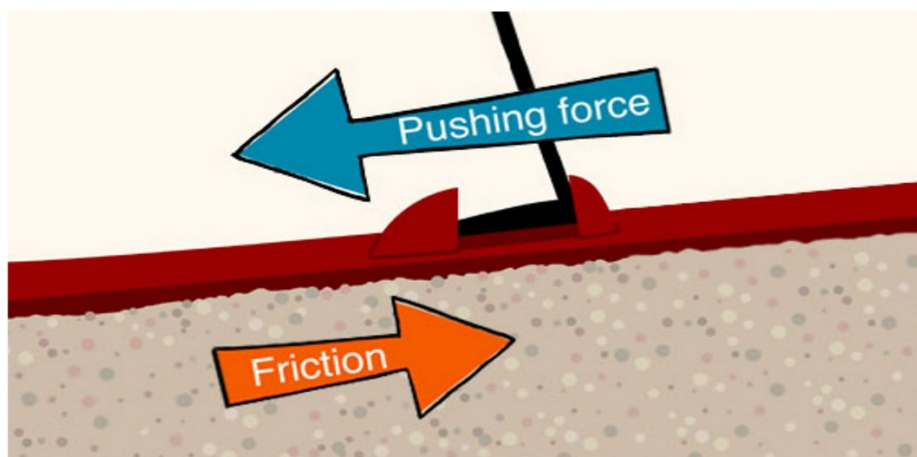
opposite

slows

heat

Newton/force meter

What is friction?



Success Criteria

I can identify the effects of friction between moving surfaces.

I will be able to use test results to make predictions to set up further fair-tests.

I will be able to plan a fair-test.

I can identifying the control variables.

Key Vocabulary:

friction

surfaces

opposite

slows

heat

Newton/force meter

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



Friction

Friction is a force **between two surfaces** that are sliding, or trying to slide, across each other. For example, when you try to push a book along the floor, friction makes this difficult.

Friction always works in the direction **opposite** to the direction in which the object is moving, or trying to move. Friction always **slows** a moving object down.

The amount of friction depends on the materials from which the two surfaces are made. The rougher the surface, the more friction is produced. Friction also produces **heat**. If you rub your hands together quickly, you will feel them get warmer.



Success Criteria

I can identify the effects of friction between moving surfaces.

I will be able to use test results to make predictions to set up further fair-tests.

I will be able to plan a fair-test.

I can identifying the control variables.

Key Vocabulary:

friction

surfaces

opposite

slows

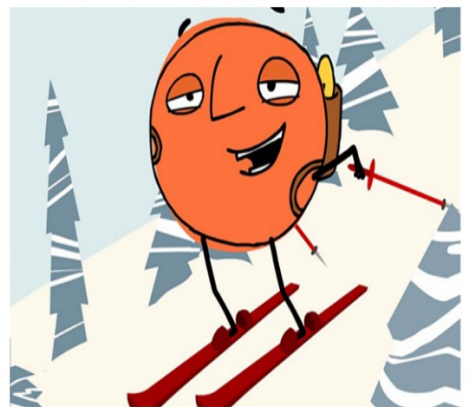
heat

Newton/force meter

Friction Continued

Friction can be a useful force because it prevents our shoes slipping on the pavement when we walk and stops car tyres skidding on the road. When you walk, friction is caused between the tread on shoes and the ground. This friction acts to grip the ground and prevent sliding.

Sometimes we want to reduce friction. For example, we use oil to reduce the friction between the moving parts inside a car engine. The oil holds the surfaces apart and can flow between them. The reduced friction means there is less wear on the car's moving parts and less heat produced.



SC: I can identify the effects of friction between moving surfaces.
 I will be able to use test results to make predictions to set up further fair-tests.
 I will be able to plan a fair-test.
 I can identifying the control variables.

A Year 5 class carried out an investigation on the effects of friction between moving surfaces using different surfaces. The outcome of the investigation is illustrated below.

Extension: Friction - Advantage and Disadvantage

Results are given below in the table given.



This car travelled 27cm



This car travelled 22cm



This car travelled 52cm



This car travelled 28cm

| | The distance (cm) |
|--|----------------------|
| | <input type="text"/> |
| | <input type="text"/> |
| | <input type="text"/> |
| | <input type="text"/> |

B. Based on the experiment above, answer the questions below.

1. On which surface did the car move with the farthest distance? It moved with the farthest distance on the .
2. On which surface did the car move with the shortest distance? It moved with the shortest distance on the .
3. The shortest the distance that the car could reach, the highest the friction happened between the surface of the track and the tires. So, the highest friction happens when the car moved on the .
4. The farthest the distance that the car could reach, the lowest the friction happened between the surface of the track and the tires. So, the lowest friction happens when the car moved on the .

Look at the images and decide if friction is

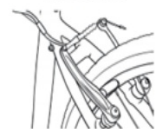
fidget spinner



advantage disadvantage

My explanation:

bike brakes



advantage disadvantage

My explanation:

Success Criteria

- I can identify the effects of friction between moving surfaces.
- I will be able to use test results to make predictions to set up further fair-tests.
- I will be able to plan a fair-test.
- I can identifying the control variables.

Key Vocabulary:

friction
surfaces
opposite
slows
heat
Newton/force
meter

Task 1

Investigative fair-test Investigation – What affects how well the tub travels?

You could set this investigation in the context of a theme park. The owners want to create a ride where the carriage in which people are sitting is flung forward by a massive elastic band. They want to know what affects how well this carriage will travel.



Children to explore how to propel the tub using an elastic band stretched between the legs of a chair.

Children to use the results from their shoe investigation to help to make predictions for this investigation.

Children can plan their own investigation. Their group might want to change: the number of elastic bands, how far back it is pulled, the surface on which it is travelling, etc.

Equipment:

Newton/force meters
Tubs with lids
Variety of elastic bands
Rulers
Materials for making a parachute

[See last page for investigation layout](#)

Recording

Results can be recorded in a table/bar chart, and conclusions can be annotated drawings.

Success Criteria

I can identify the effects of friction between moving surfaces.

I will be able to use test results to make predictions to set up further fair-tests.

I will be able to plan a fair-test.

I can identifying the control variables.

Key Vocabulary:

friction

surfaces

opposite

slows

heat

Newton/force meter

Task 2

Problem-solving – How can we slow down the tub when it is travelling?



The theme park owners want the carriage to slow down quickly, but without hurting the occupants. Can you design and test a parachute that will open from the back of the tub when it begins to travel.

Use photographs to record

AIMS

You need to tell your reader what you were trying to find out.

**Investigative fair-test Investigation –
What affects how well the tub travels?**

PREDICTION

What do you think will happen? What are the expected results?, e.g.

Equipment needed:

Method: Explain exactly what you plan to do in your experiment, or what you did.

Explain how you made sure that you carried out a fair test.

Which *variables* did you change?

Which *variables* did you keep the same?

RESULTS As you carry out your experiment, you'll need to keep record of what happens. Often that will be in a table of results.

CONCLUSION This is where you must try to explain what you have found out from your experiment. Don't just write what happened, but try to explain why you think it happened.

