

## Science Skills Year 7 booklet: 2

### Investigating Friction of Shoes

Task 1 deadline (self-assessed):

Task 2 deadline (peer-assessed):

Task 3 deadline (teacher-assessed):

The tasks in this booklet relate to the investigation below. Read the following information before attempting any of the tasks.

#### To investigate friction of shoes:

- Put a shoe on the carpet.
- Drag the shoe slowly and consistently with a Newton meter and record the force applied. Repeat this 3 times and calculate an average.
- Add a 100g mass to the shoe and repeat the experiment.
- Keep repeating until you have 3 repeats for each mass from 0 to 500g. Record all your results in a table.



#### Risk assessment:

Wear goggles

Work on the floor so masses cannot fall on you

Ensure Newton meter is intact before you start.

Make sure no bare skin is dragged across the carpet.

## Task 1

*Everyone to do-* Match the key terms to the definitions:

|              |  |
|--------------|--|
| Mass         | Something that changes the speed, shape or direction of an object.   |
| Force        | The amount of matter inside something.                               |
| Newton meter | When you do a measurement more than once to make sure it is true.    |
| Friction     | What we measure forces with.   |
| Repeat       | A force that acts against a moving object in contact with a surface. |

**Green:** you will be tested on the spelling of the five key terms

**Amber:** you will be tested on the spelling and the definition of the key terms

**Red:** you will be tested on the spelling and definition of the key terms. You will also need to put each into a sentence

**Killer:** you will be asked for synonyms for the key terms (if there are any!)

## Task 2

**Green:**

Identify three control variables that you would need to keep the same during each of your measurements. Describe how you would keep them the same.

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Peer assessment score:

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**Amber:**

Describe and explain if the method is reliable and explain how you could increase the reliability of the method further.

You need to use a minimum of 40 words and 3 different explaining terms. Hint: make sure you define reliable!

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Peer assessment:

STAR:

STAR:

WISH:

**Red:**

Explain how you could extend the investigation to include two other factors that may affect the friction acting on the shoe. You must describe what you will change and then suggest how it will affect friction.

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Peer assessment:  
STAR:  
STAR:  
WISH:

**Task 3:**

**Green:** On a piece of A4 paper, design a results table for the investigation. Read the method carefully so you include everything.

**Amber:** On a piece of A4 paper, describe what type of graph we could draw from the average forces required to move the shoe. Include which variable will be on each axis and explain why that type of graph is most suitable.

**Red:** On a piece of A4 paper, predict what you think will happen to the force required to move the shoe as you add mass. Explain why you think this will happen in terms of friction.

Teacher assessment:

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|---------|--|
| A2L = 1 | Work is thorough, you have picked challenging tasks and have shown effort and understanding.   |
| A2L = 2 | Work has detail in most places, you have picked relevant tasks and have shown effort.          |
| A2L = 3 | Work lacks detail, there are some errors and shows some lack of preparation/understanding.     |
| A2L = 4 | Work is incomplete, there are errors throughout and a clear lack of preparation/understanding. |

Teacher comment: