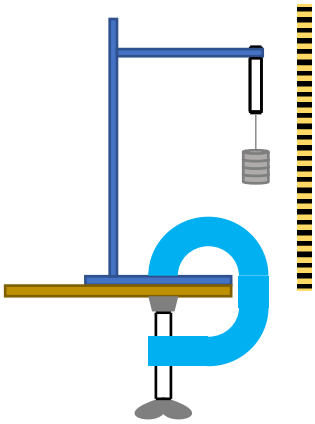
Investigating Hooke's Law

Equipment:
- Spring or rubber band
- Slotted masses
- Ruler
- Clamp, boss and stand
- G-clamp

SAFETY



Method:
1. Set up a clamp, boss and stand, so that the clamp hangs over the edge of the desk. Clamp the stand to the desk.
2. Hang a spring or rubber band from the clamp and measure its length unstretched. Record this in the box below. NB: The rubber band may need to be flattened to gauge its length.
3. Hang a slotted mass from the spring or band and measure its length. Then subtract the original length from its current length to find the extension.
4. Record this information in the table below.
5. Repeat steps 3-4, adding an additional mass each time.

Original length of spring / band _____ mm

Weight (N)	Length (mm)	Extension (mm) Length – Original length =

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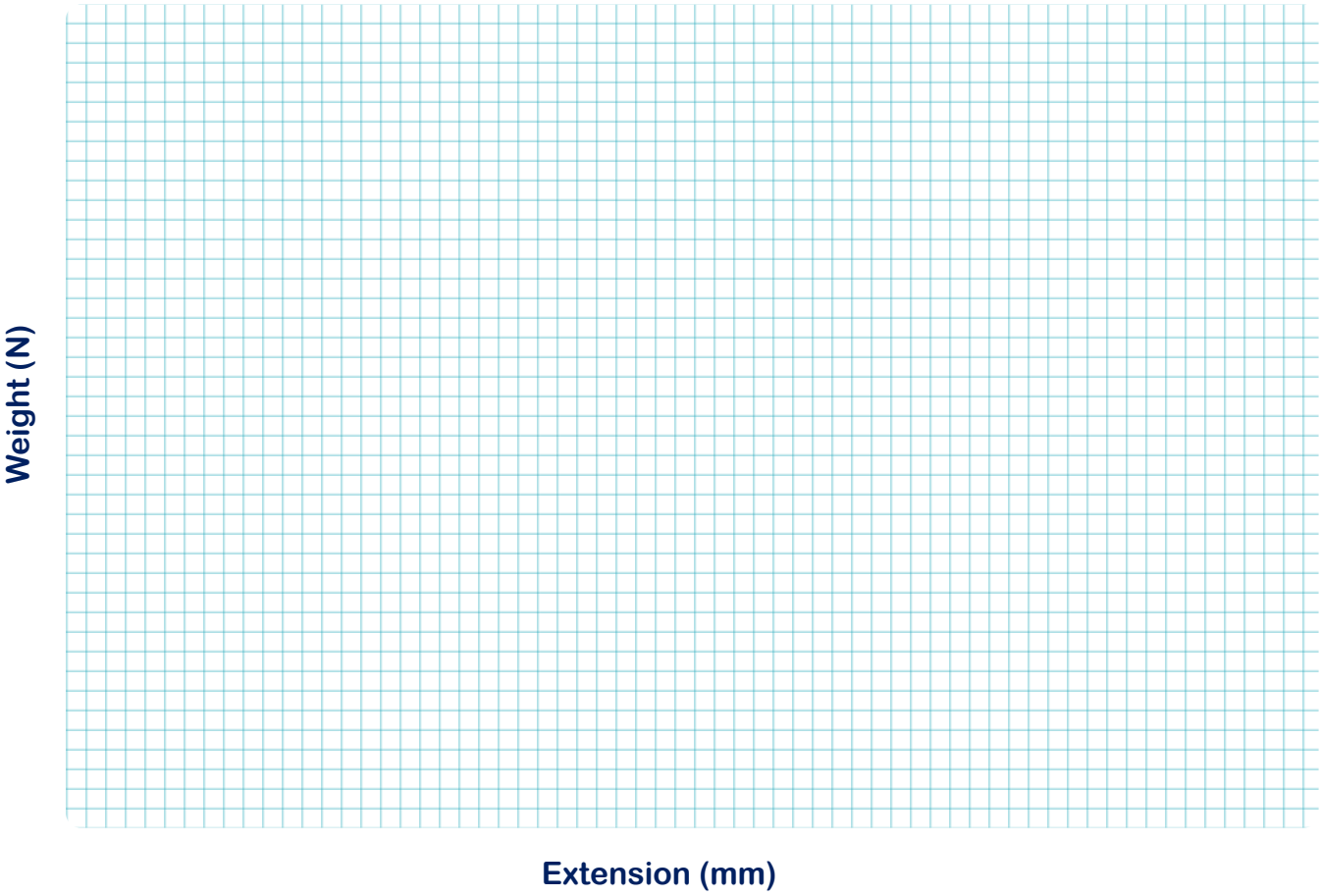
Finding the spring constant

When you have completed your experiment, answer the following questions.

1. Plot your results into the following graph. Remember to draw a line of best fit, not dot-to-dot.



2. What is the general trend you have observed in your results between force and weight (N)?

As the weight in _____ increased, the extension of the spring/band _____ .

3.Circle the statements below that could have been sources of human error.

Using the ruler to measure extension	The weights	Setting up the clamp and stand
Calculating extension	Not waiting for the experiment to stop moving	

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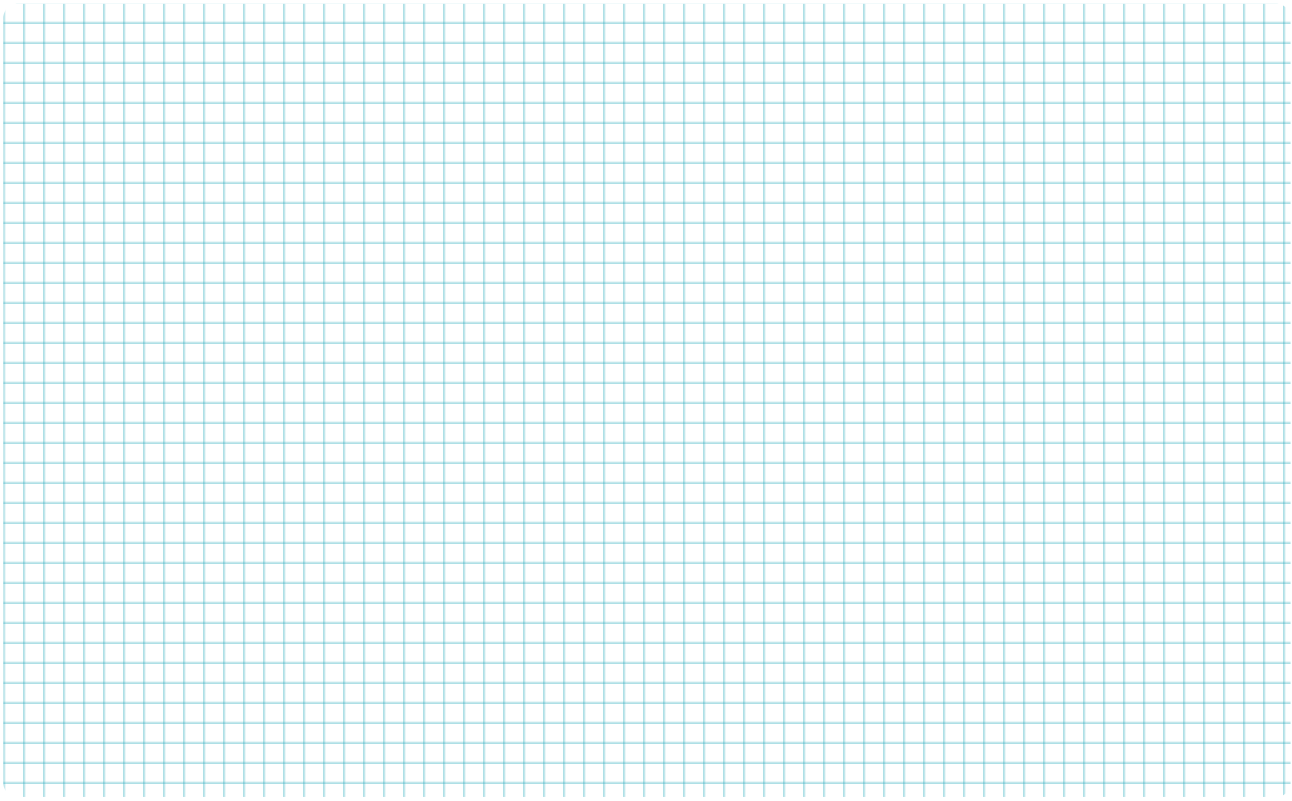
Finding the spring constant

When you have completed your experiment, answer the following questions.

1. **Plot your results into the following graph. Remember to draw a line of best fit, not dot-to-dot.**



2. What is the general trend you have observed in your results between force and weight (N)?

3. Take the gradient of your graph to calculate the spring constant.

(Total weight ÷ Total extension = spring constant.

Show your workings below.

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Identifying springs

List as many examples as you can think of for uses for springs. Use the pictures for inspiration.

Why do we need so many types of springs with different levels of springiness?

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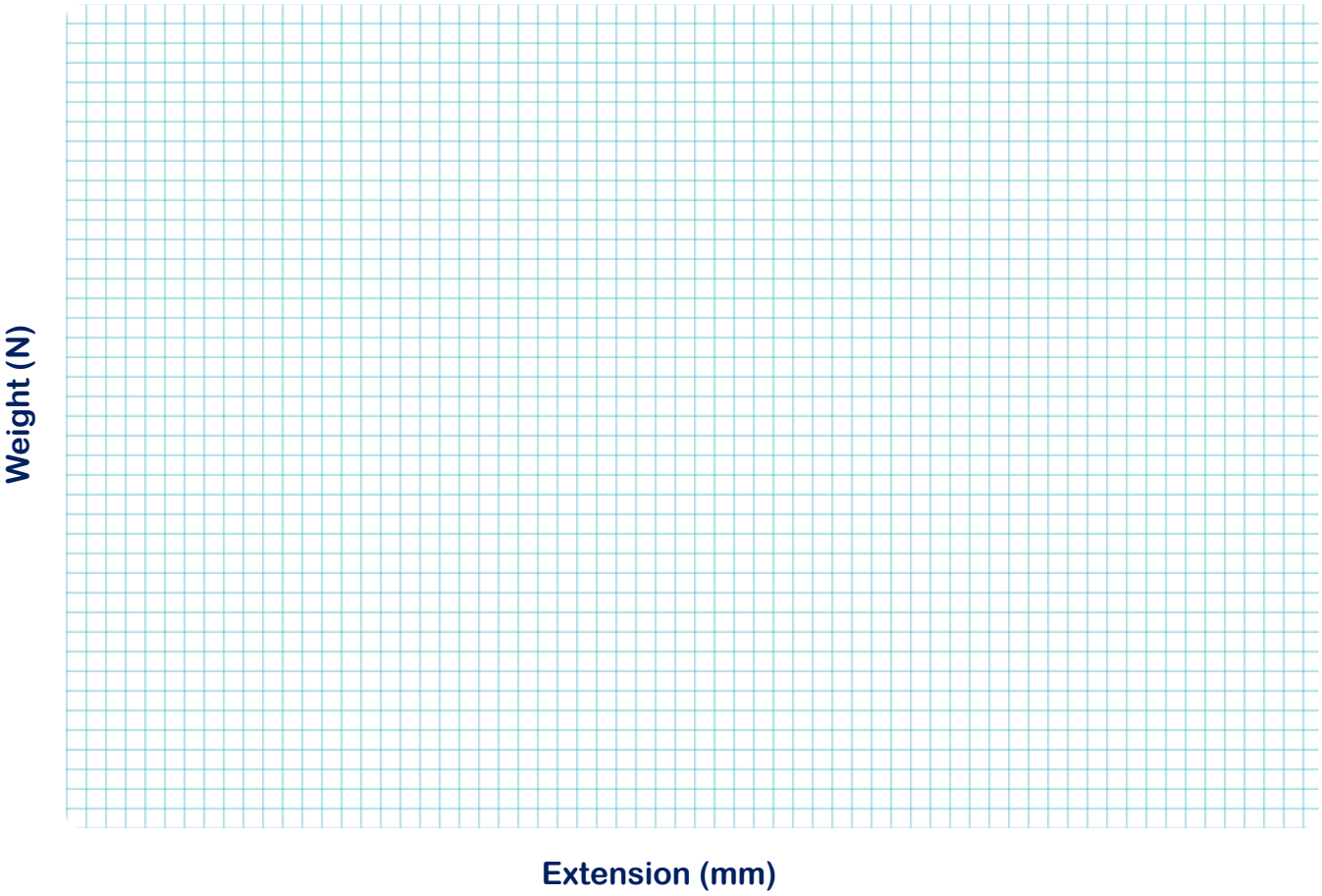
Finding the spring constant

When you have completed your experiment, answer the following questions.

1. Plot your results into the following graph. Remember to draw a line of best fit, not dot-to-dot.



2. What is the general trend you have observed in your results between force and weight (N)?

As the weight in Newtons increased, the extension of the spring/band increased .

3.Circle the statements below that could have been sources of human error.

Using the ruler to measure extension

The weights

Setting up the clamp and stand

Calculating extension

Not waiting for the experiment to stop moving

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Identifying springs

List as many examples as you can think of for uses for springs. Use the pictures for inspiration.






- Car
- Computer key on the keyboard
- Buttons on a computer mouse
- Game controller buttons
- Mattresses
- Toasters and kettles
- Door handles
- Pens
- Clock

Why do we need so many different types of springs with different levels of springiness?

Not all springs need to deal with the same amount of force when being used.

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