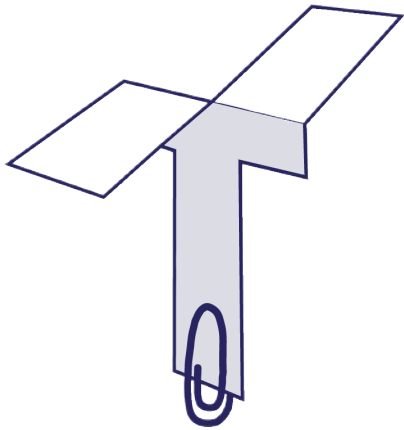


Measurement: 1

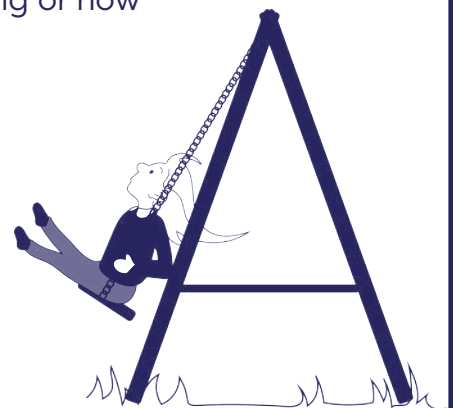


Adele has been making sycamore seed style helicopters from folded card and paper clips. She watches them twirl as they gently fall to the ground. Her friend asks if putting more paper clips on each helicopter will make them fall faster. She can't tell just by watching them so she decides to make a really accurate measurement of the time it takes for a helicopter with 1 paper clip to fall a height of 3 metres. She then makes the same measurement for a helicopter with 4 paperclips attached. She takes her friends advice and repeats each of the measurements 5 times so she can calculate an average time for each helicopter.

Discuss:

Can you think of two reasons why it is a good idea to take each measurement 5 times, rather than once?

Measurement: 2



Sam and Amy are investigating playground swings. They are trying to find out what affects how quickly a swing swings? Is it the weight of the person on the swing? The length of the swing or how hard they are pushed? They carefully design a number of experiments to answer these questions but in every experiment they need to make a very accurate measurement of the **time** it takes for the swing to complete **one full swing** (forwards and back). They have a really accurate timer but when they practice using the timer they find that their ability to start and stop it at the **exact** point when one swing starts and finishes is not so good. The time for one full swing is really quite short (a few seconds) so they need to think about how to improve the accuracy of their measurements.

Amy remembers the “**Think BIG to measure SMALL**” tip...

Discuss:

How could they apply this to their measurement of the time it takes to complete 1 single swing?

Measurement: 3



Eoin's class have been investigating some of the mysterious properties of liquids. Their teacher has asked them to place a 1 euro coin on the table. Using a plastic dropper they slowly add drops of water, one at a time, onto the surface of the coin. They count **how many drops of water** they can add before the water runs off the sides.

Different groups record slightly different number of drops, but everyone is amazed at how many drops the coin surface can hold. It's like the water on top of the coin is held in place by an invisible skin that bursts when it finally falls over the edge. The teacher explains that this is due to an effect called "surface tension".

Someone asks: **Does the number of drops depend on which side of the coin you use?** So the class agrees to try and measure any differences between the drop holding capabilities of the two different sides of the coin. They already feel that if there is a difference it will only be a small so they need to make very careful measurements.



Discuss:

What approach could they take to make their result is as accurate and meaningful as possible?

Measurement: 4



As part of a science investigation Sean has been asked to measure the length of the natural walking stride of 6 different people.

He decides that a stride is **the distance you cover with each step of walking**.

The more he thinks about it the more he realises that this may not be as simple as it sounds.

Discuss:

What advice would you give him to ensure that he measures a reasonably accurate value of each person's walking stride ?