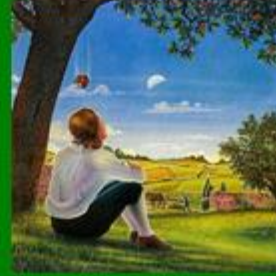




# 'Whatever goes up must come down'



Sir Isaac Newton  
An English physicist and mathematician, born January 4th 1643, died 31st March 1727 aged 84 years old.



In the 1600s, an English physicist and mathematician named Isaac Newton was sitting under an apple tree - or so the legend tells us. Apparently, an apple fell on his head and he started wondering why the apple was attracted to the ground in the first place. After going on his merry way and doing lots of thinking he came to the conclusion that "Whatever goes up must come down."



Sir Isaac Newton



## Law of Universal Gravitation

Newton publicised his Theory of Universal Gravitation in the 1680s, in which he discovered the idea that gravity was a predictable force that acts on everything in the universe.

### Internet investigation

Can you find out other interesting facts about Sir Isaac Newton?

- Where did he grow up and who looked after him?
- What jobs did he have in his younger years?
- Can you name two important discoveries that he made?
- What was his greatest passion in life?
- What did they find in his hair when he died?
- Can you find a weird fact about his teeth?





# 'Whatever goes up must come down'



## Helicopter spinner experiment

Sir Isaac Newton discovered gravity around 300 years ago. When he saw the apple falling from the tree he realised there was a force that made it occur and he called it gravity.



Gravity is the force that pulls objects towards the Earth. It's the reason we walk on the ground rather than float around. How much gravity an object has depends on its mass, or more simply, how big and heavy it is.

How to make a simple helicopter paper spinner. Alternatively YouTube 'how to make a paper helicopter spinner' for a step by guide.



Can you be like Sir Isaac Newton and experiment with helicopter spinners to learn about gravity and forces?

1) Take a piece of paper as shown here.



2) Make three cuts as shown below.



3) Fold the paper as shown below.

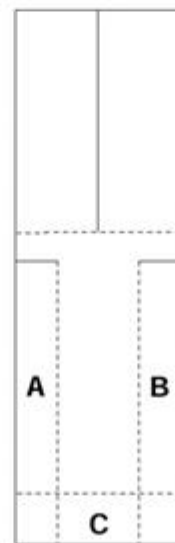


4) Fold the helicopter blades on opposite sides.



www.browndog.com

1. Cut on solid black lines. Fold on dashed lines.



Paper Helicopter Pattern

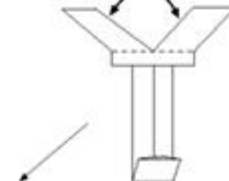
2. Fold A and B to middle.



3. Fold C up.



4. Fold propeller blades outward.



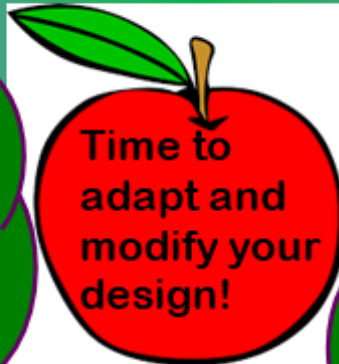
5. Test fly by dropping from over your head.



# How slowly can your spinner go?



Add paper clips to see what happens to your spinner, does it fall faster or slower? Why? You could add paper clips to any part of your helicopter spinner to see if it affects how fast it falls.



Time to adapt and modify your design!

Time to change the spinner paper! You could use a thicker or thinner paper, card or newspaper. Remember to use the same design for each one. Which paper/card makes your spinner fall the slowest? Why do you think that may have happened?



You could change the size of your spinner. Make different size helicopter spinners then compare how slowly they fall. Do the big or small spinners fall the slowest?

You could change your design completely! Have a look on YouTube for 'how to make paper helicopter spinners', pick your favourite and follow the guide. You could learn how to make lots of different types to see which fall the slowest.



Air resistance slows moving objects. When an object falls, air resistance acts in the opposite direction to the weight.



We would love to see your helicopter spinner experiments at school!

