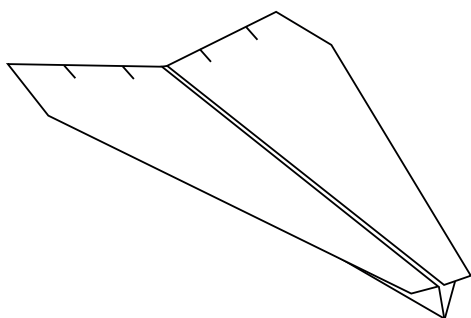


# Paper Aeroplane



This is a practical hands-on session in which students will investigate how wing design can affect the flight of a paper aeroplane. Focussing on the science of forces and motion, students will evaluate each design and change variables, thus developing critical thinking and knowledge of fair testing.

Suitable for Ages 5-11

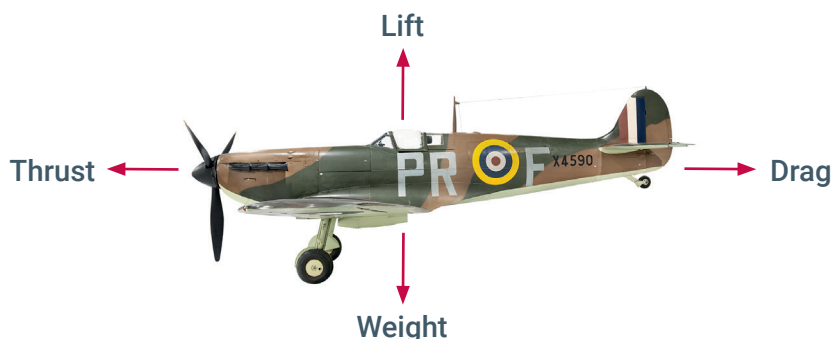
Curriculum links Working Scientifically & Science of Forces & Motion

## Resources

- Paper/Card/Newspaper

## Instructions

Follow the instructions and templates to create one of each type of paper aeroplane. Use the same type of material to create each aeroplane so as to ensure fair testing.



We are going to throw our paper aeroplanes and see how far they go. It is important to think about the forces working on our aeroplanes as we throw them.

- As we throw them, we are giving them thrust. When they have left your hand, there is no more thrust being produced so the paper aeroplane must be well balanced so that it keeps flying.
- Drag is the same as air resistance, and works against your paper aeroplane to slow it down in the air. If your paper aeroplane is too big and has too much surface area, it will slow down very quickly. Therefore, we need to make it aerodynamic.
- Lift and weight work together to keep your aircraft in the air. Lift is generated by the design of your wings whilst weight is how heavy your aeroplane is. We need a good balance to keep your aeroplane in the air for as long as possible.
- For more information on the Theory of Flight, please see our downloadable PowerPoint.

When you have created your different aeroplane designs, stand in a nice open space (living room, dining room, garden etc). Make sure no-one is standing too close to you, and throw your aeroplane straight ahead.

- Which design worked the best?
- Did you throw them all the same way? It is only a fair test if you throw them all from the same spot and in the same way!

Next, try making aeroplanes out of different materials such as card or newspaper. You will notice they fly slightly differently due to weight etc.

Can you make a design of your own? Don't forget to name it! How does it fly?

If you have a tape measure, measure the distance your aeroplanes fly and record them in the chart on the next page.

Use the chart to determine which aeroplane you think was the best!

Record the distances of flight in this table

		Aeroplane type		
		Arrow	Classic Dart	Own design
Material type	Paper			
	Card			
	Newspaper			
	Other material			

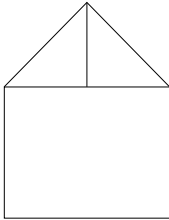
When you have finished your paper aeroplane experiment, don't forget to tag us in your photos on social media.



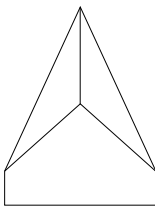
@rafmuseum

## Arrow

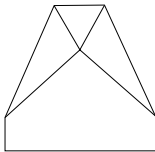
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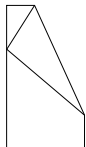
Fold the top right corner down towards you until fold line 1 is showing, and crease along the dotted line. Repeat with the top left corner.



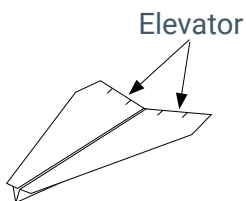
Fold the right side over again and crease along fold line 2. Repeat with the left side.



Fold the tip down towards you and crease along fold line 3.



Turn the paper over, and fold the left side over onto the right side and crease along fold line 4 so that the outside edges of the wings line up.



Fold the wings down along fold lines 5. Partially open the folds you have created so that the wings stick out straight. Cut two slits along the back edge of each of the wings and fold these down. Now you are ready to fly!

CUT HERE



UP

1

1

$\epsilon$

2

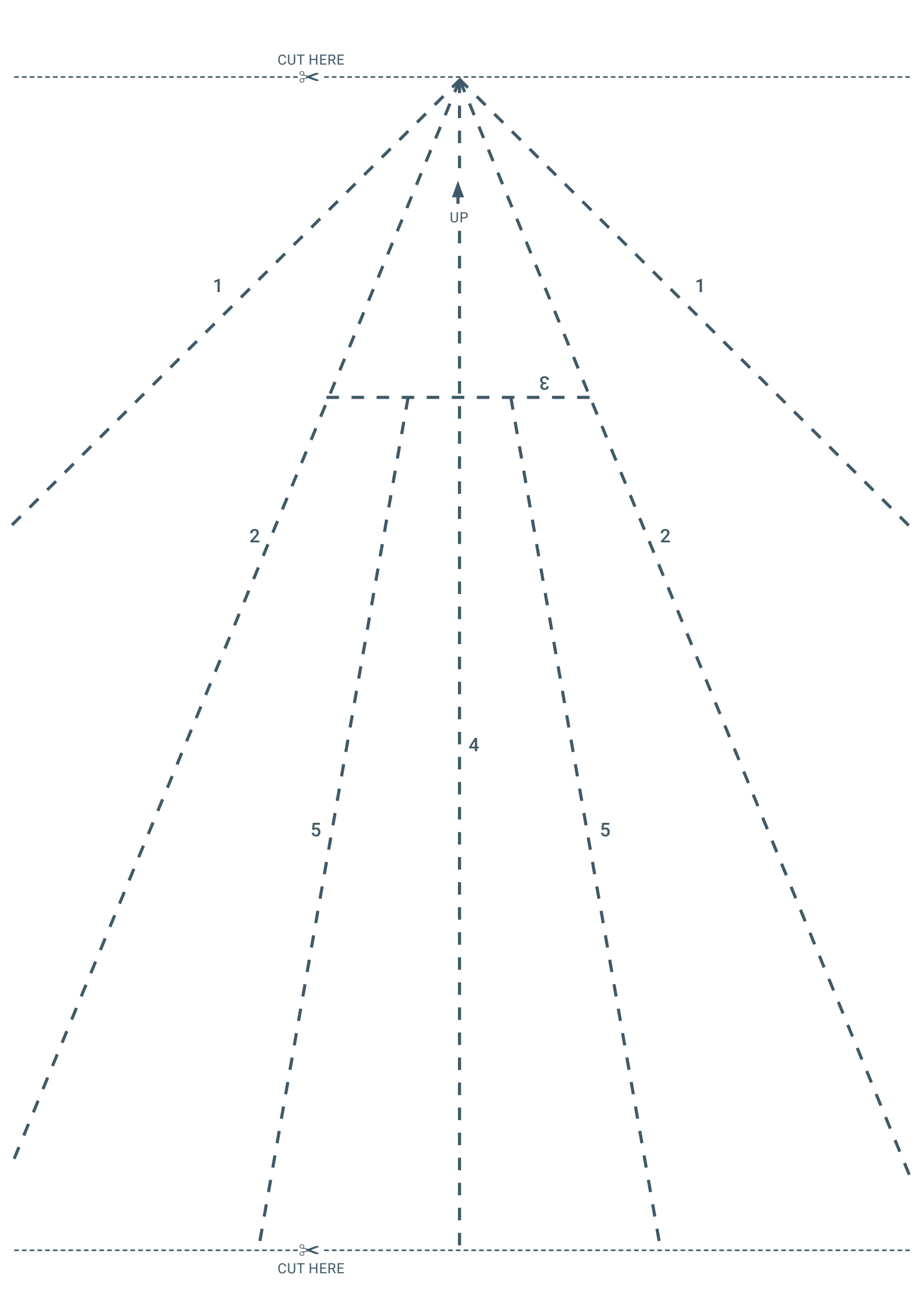
2

4

5

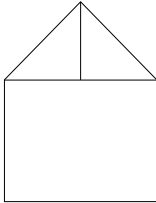
5

CUT HERE

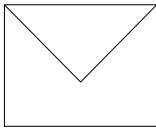


## Classic Dart

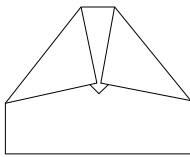
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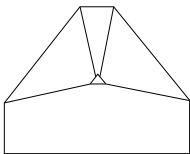
Fold the top right corner down until fold line 1 is showing, and crease along the dotted line. Repeat with the top left corner.



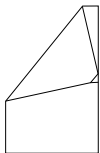
Fold the top point down towards you until fold line 2 is visible and crease along the dotted line.



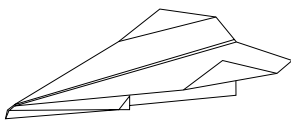
Fold the top left and top right corners down towards you and crease along fold lines 3.



Fold the tip up and over the diagonal folds along fold line 4 to secure them in place.



Turnover and fold the right side over onto the left side along fold 5 so that the outside edges of the wings line up. Also make sure the diagonal folds do not become un-tucked from the tip you folded up in the previous step.



Fold the wings down along fold lines 6 and the winglets up along fold lines 7. You can cut two slits along the back edge of each wing to make elevator adjustments – you are ready to fly!

CUT HERE



UP

2

3

5

3

7

6

6

7

CUT HERE

