





# Paper Airplane Challenge



## Intro

 Age	 Difficulty	 Time	 Learning
1 -100	Easy	10 mins (or longer)	Physics Engineering Aerodynamics



## Activity Aim

The aim of this activity is to build and test a paper aeroplane. Then find a design that can travel the furthest and refine the it to see how far it can go.

The activity allows children to explore different paper airplane designs and to follow engineering principles to design, build, test and refine their aircraft.

Children can log their flights as they modify the design



## Materials

### Required

- Ruler
- Scissors
- Paper (or card)

### Optional

- Sellotape
- Coloured pencils or pens (for decoration)
- Access to a printer



### Instructions

This activity can be modified according to the age of the pilots.

0-6

Design a basic aeroplane such as a [Dart](#), decorate it and see how far it goes

6-12

Try some [different designs](#) and test which one goes the furthest

12-15+

Choose a design and modify it to see if you can extend its range. Investigate different ways of launching the aeroplane and see which technique is the most effective. Explore the change of forces and make sure you keep a log of modifications.

### Learning

Engineers typically have to test a design and any modifications made to establish how the modifications affect performance, a cycle known as design, make, test, refine. This activity explores how different shapes and wing sizes can modify the ability of the airplane to fly.

### More Ideas

- There are plenty of different designs available on the internet. Below are a few ideas:
- <https://www.origamiway.com/paper-airplane-designs.shtml>
- <https://www.foldnfly.com/#/1-1-1-1-1-1-1-1-2>
- Why not try setting out a course using balloons to see how accurate the flight or find a way to measure the height of the flight
- Label your airplane with different components of a aircraft
- The science museum has produced a template of a number of other flying machines including a helicopter. Try building some of these creations [here](#)

### Did you know?

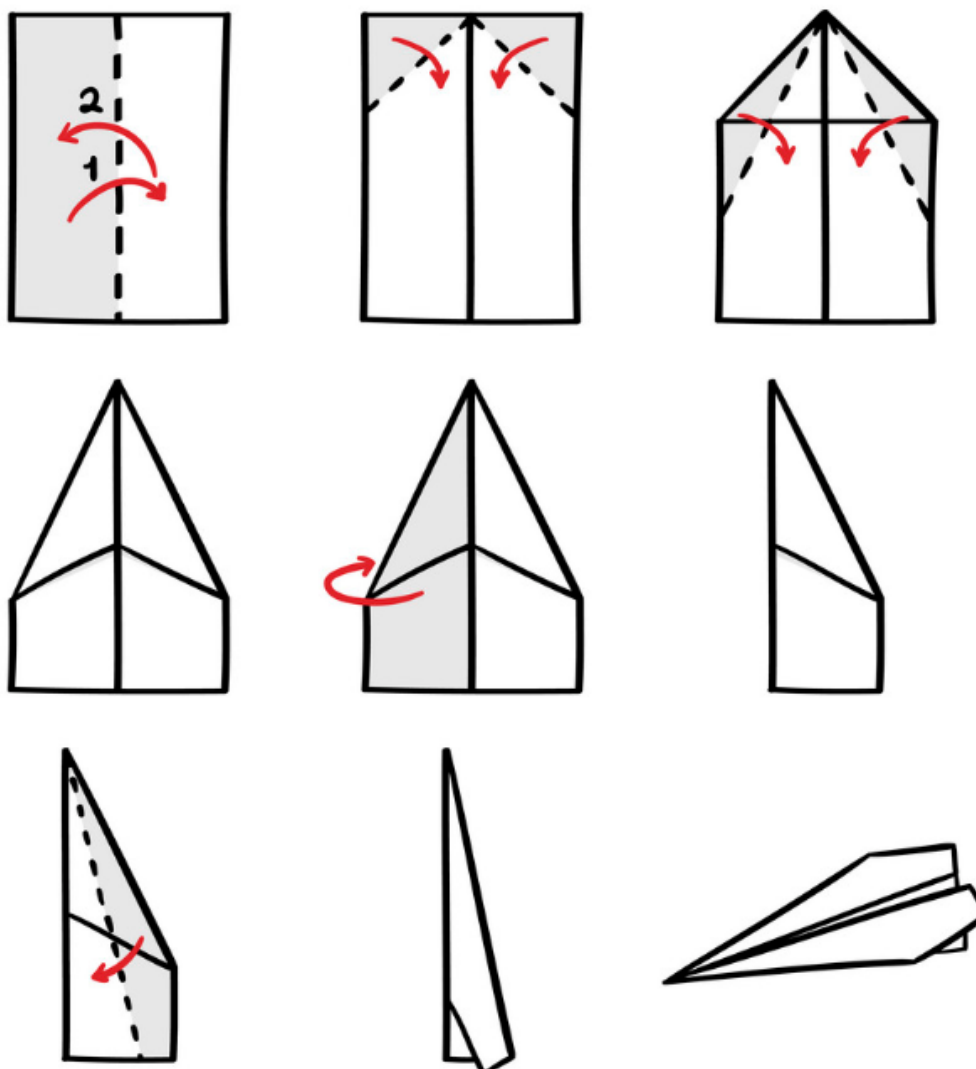
- The forces that make a paper airplane fly are the same as real aircraft. Thrust is provided when the airplane is thrown. As the plane moves forward air moves under the wings and provides lift.
- When the plane is in flight air pushes against the plane and slows it down. This creates drag
- At the same time the weight of the aircraft has an impact on flight and gravity is pulling the airplane back to the ground.
- It's worth considering how these 4 forces, Thrust, Lift, Drag and Gravity effect flight.
- The World Record for longest paper airplane flight sits at 69 meters and was set in 2012 in the USA. [Read more here.](#)
- The largest paper aircraft in the world had an 18 metre wing span. It was built by a German university in 2013

### Take Part

If you take part in this activity, why not upload some pictures of your designs and test flights to the STEM teams page?

**Attachments**

**At.1 How to build a dart paper airplane**





## At.2 Test Flight Recording

Use this test flight template to record the refinement of your design

Test Flight Number:

Date:

Conditions (including weather and temperature):

Design Name:

Design Version:

Recent Modifications:

Launch Technique:

Distance:

Height:

Time in flight:

Notes: