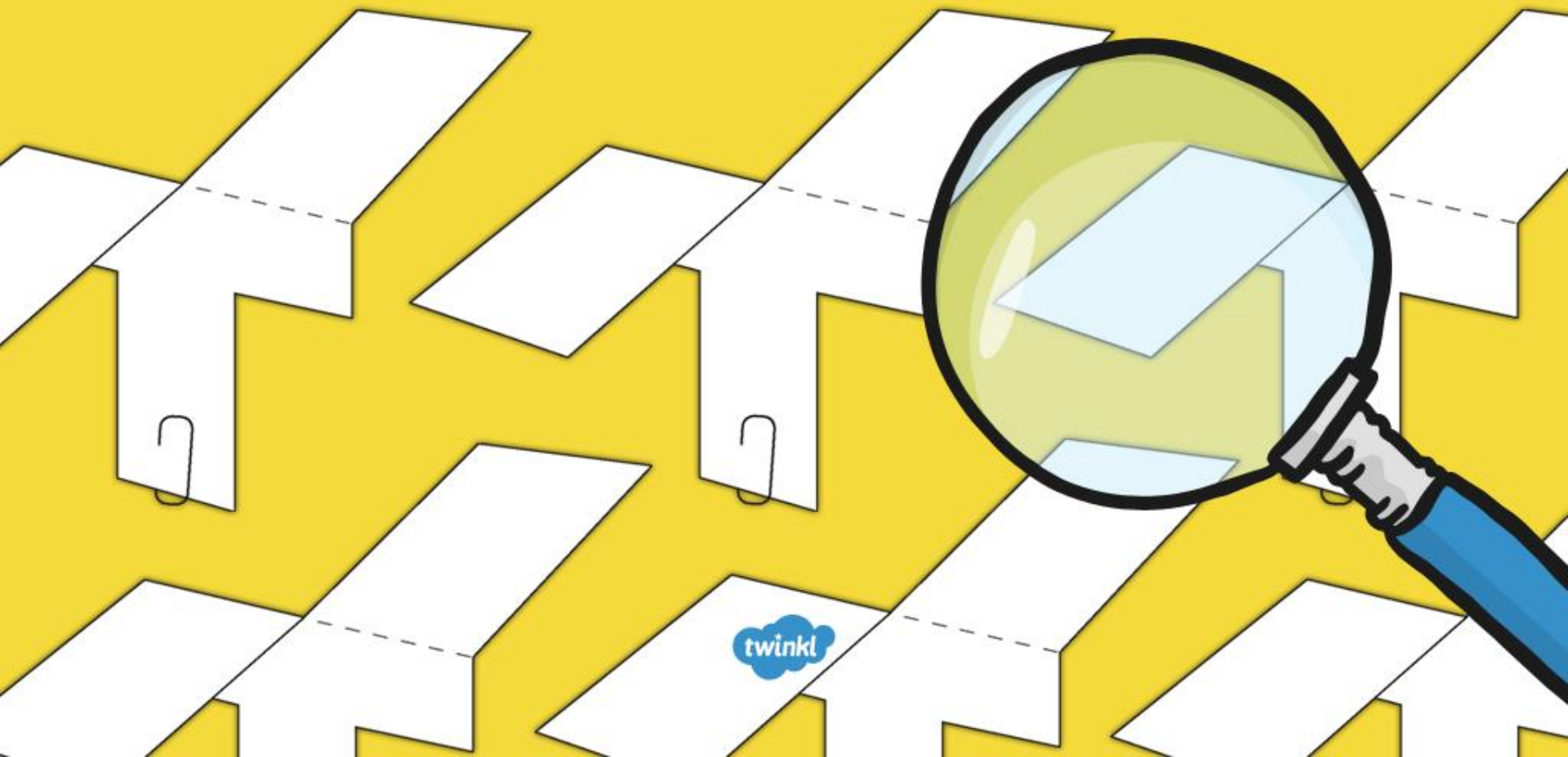


Investigating...

# Paper Helicopters



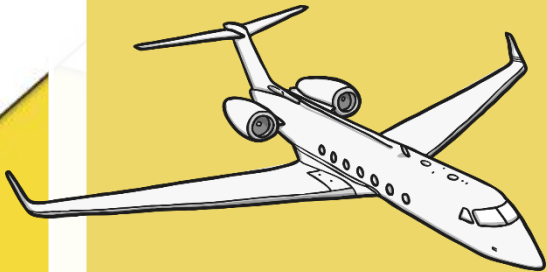
# Aim

- To investigate how changing variables on a paper helicopter affects the speed at which it falls through the air.

# What is 'flight'?

Can you identify an 'odd one out' and give a reason for your answer?

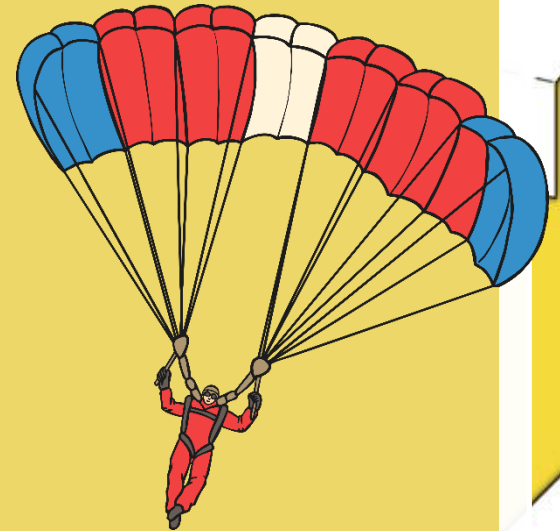
There is no right or wrong answer so be as creative in your thinking as you can!



**aeroplane**



**helicopter**

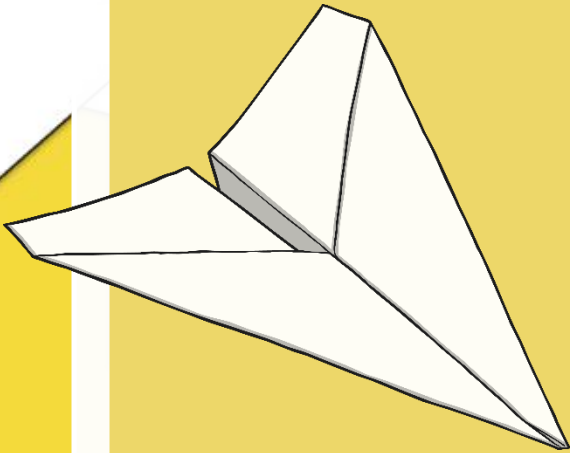


**parachute**

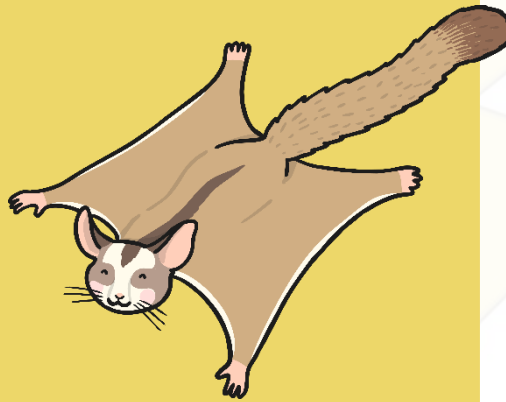
# What is 'flight'?

Can you identify an 'odd one out' and give a reason for your answer?

There is no right or wrong answer so be as creative in your thinking as you can!



**paper plane**



**sugar glider**



**helicopter**

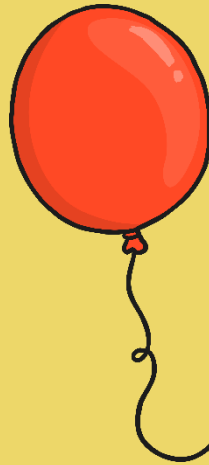
# What is 'flight'?

Can you identify an 'odd one out' and give a reason for your answer?

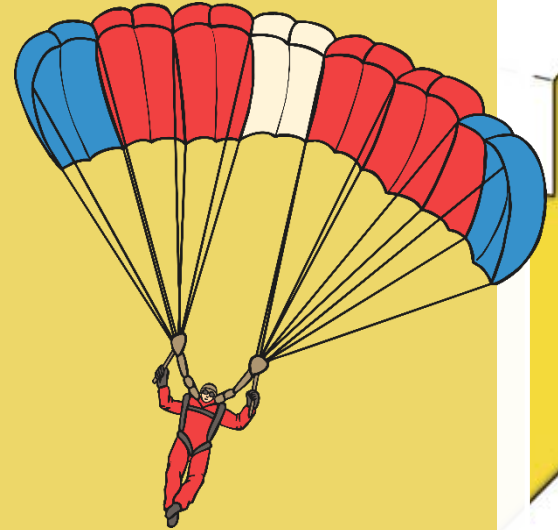
There is no right or wrong answer so be as creative in your thinking as you can!



**bird**



**balloon**



**parachute**

# What is 'flight'?

Well done for thinking so carefully about those choices.

Objects can be airborne in a number of different ways:

**float**

**glide**

**fly**

What is similar or different between each?  
Can you think of an example of each?





# Helicopters

How do you think they work?

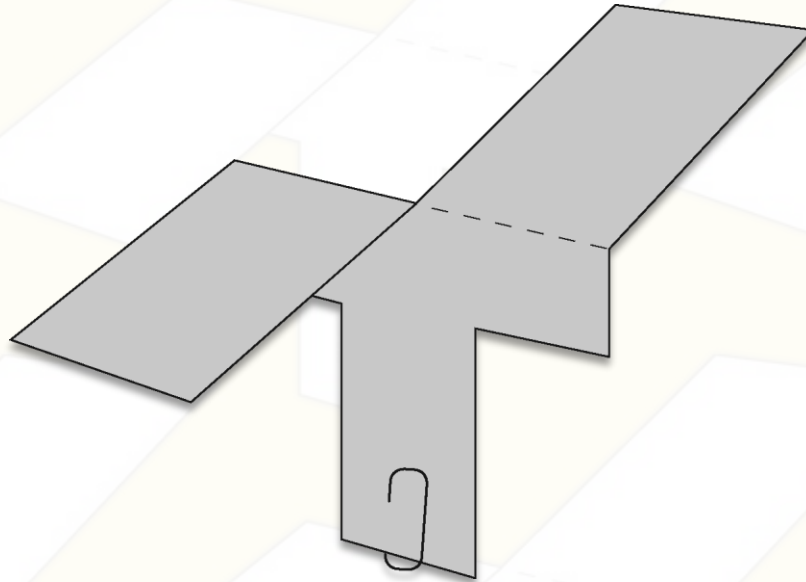
What different types have you seen?

What might make them work better?



# Challenge

You are going to make some paper helicopters, and see how long you can make it stay in the air for.



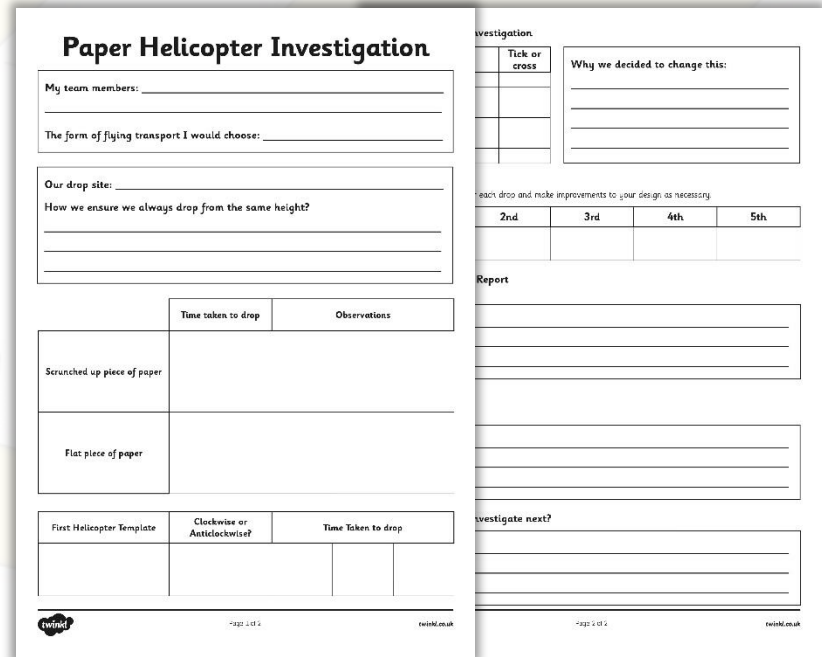


# Challenge

You will need to get the materials listed on the next page and then follow each step in the presentation.

For each of the steps, there is a corresponding section of the accompanying Paper Helicopter Investigation Record Sheet.

Good luck!



The image shows two pages of a 'Paper Helicopter Investigation' record sheet. The left page is the front cover, and the right page is the back cover. Both pages have a white background with black text and lines for writing. The left page has a title 'Paper Helicopter Investigation' at the top. Below the title are sections for 'My team members:', 'The form of flying transport I would choose:', 'Our drop site:', and 'How we ensure we always drop from the same height?'. There is a table with two columns: 'Time taken to drop' and 'Observations'. The table has two rows: 'Scrunched up piece of paper' and 'Flat piece of paper'. At the bottom of the left page is a table with three columns: 'First Helicopter Template', 'Clockwise or Anticlockwise?', and 'Time Taken to drop'. The right page has a section for 'Investigation' with a table for 'Tick or cross' and a section for 'Why we decided to change this:'. Below this is a section for 'each drop and make improvements to your design as necessary' with a table for '2nd', '3rd', '4th', and '5th'. There is a section for 'Report' with lines for writing. At the bottom of the right page is a section for 'Investigate next?' with lines for writing. The Twinkl logo is visible at the bottom of both pages.

**Paper Helicopter Investigation**

My team members: \_\_\_\_\_

The form of flying transport I would choose: \_\_\_\_\_

Our drop site: \_\_\_\_\_

How we ensure we always drop from the same height? \_\_\_\_\_

	Time taken to drop	Observations
Scrunched up piece of paper		
Flat piece of paper		

First Helicopter Template	Clockwise or Anticlockwise?	Time Taken to drop

**Investigation**

Tick or cross

Why we decided to change this: \_\_\_\_\_

each drop and make improvements to your design as necessary

2nd	3rd	4th	5th

**Report**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Investigate next?**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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# You will need:

Several sheets of blank A4 paper

A3 paper

Paper clips

Copies of the Helicopter template

Scissors

Stopwatch

Helicopter Investigation Record Sheet per person

**Paper Helicopter Investigation**

My team members: \_\_\_\_\_

The form of flying transport I would choose: \_\_\_\_\_

Our drop site:  
How we ensure we always drop from the same height? \_\_\_\_\_

Time taken to drop: \_\_\_\_\_ Observations: \_\_\_\_\_

Sketches up piece of paper: \_\_\_\_\_

Flat piece of paper: \_\_\_\_\_

**Paper Helicopter Investigation**

Variable	Link to result
Weight of Helicopter	
Design of Helicopter	
Material of Paper	
Shape of Helicopter	
Size of Helicopter	

Why we decided to change this: \_\_\_\_\_

**Prototype Testing**  
Record the results of each of your prototypes to your design meeting.

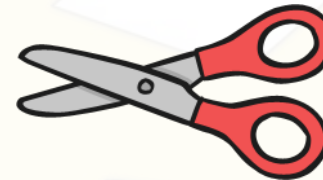
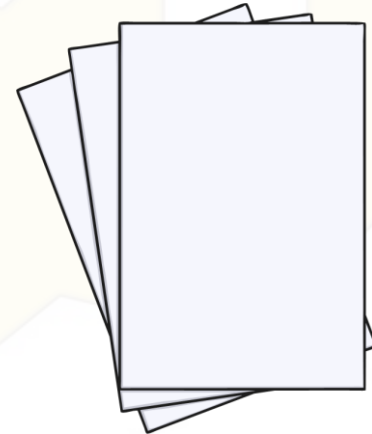
Test	2nd	3rd	4th	5th

**Class Competition Report**  
What happened? \_\_\_\_\_

**Our Team Report**  
What we will do: \_\_\_\_\_

**Paper Helicopter Template**

twinkl



# Step 1

Think carefully about how to conduct your investigation.

## Tip

Have a plan of action!



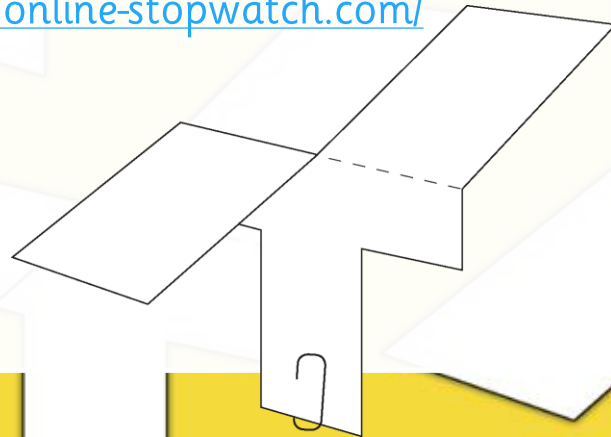
# Step 2

Find a drop site to use for your trials. You need to find a way to ensure that your helicopters are dropped from exactly the same height each time.

**Caution!** If you decide to stand on a chair or a table, check with an adult and take extra care!

Practice timing exactly how long things take to drop to the floor. Press start on the stopwatch as soon as they are dropped and stop on the stopwatch as soon as it hits the floor. Look at the object rather than the stopwatch or ask a member of your team to shout out '**Start**' and '**Stop**'.

Here is an online stopwatch: <https://www.online-stopwatch.com/>

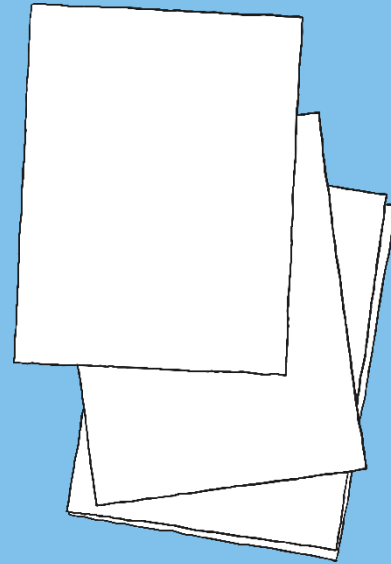
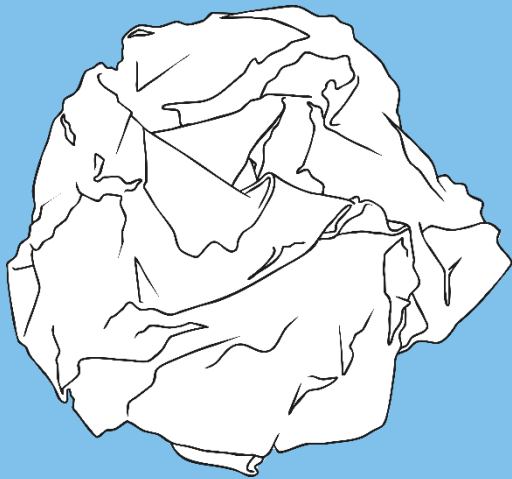


# Step 3

Drop a piece of flat paper and a piece of scrunched up paper.

Time how long they take to reach the floor and record it.

**What do you notice?**

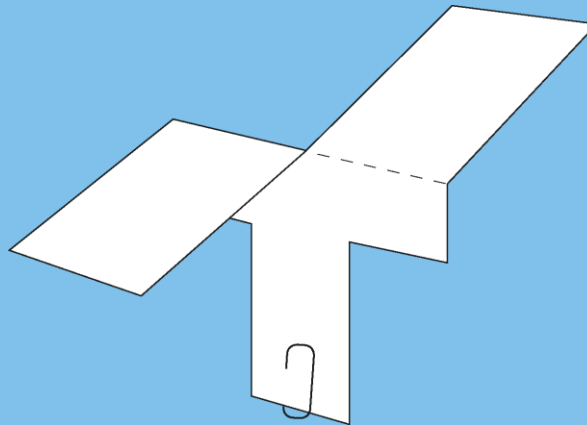


# Step 4

## Make your first paper helicopter.

Use the template provided. Then drop your helicopter until you are happy with the way it is working.

Does it turn **clockwise**? Or **anticlockwise**? How many seconds does it take to reach the ground?





# Step 5

## Now for your challenge!

Change something about your helicopter. Can you adapt it so it stays in the air for the longest possible time?

### Variables you may wish to think about altering are:

- length, size or shape of the rotor blades;
- weight i.e. number of paper clips;
- the size of the helicopter – you could scale your version up or down.

Can you think of any other changes that you can make?

Before you do anything, decide what you will change about the design of your paper helicopter.

Think of reasons of why you think your changes will make the helicopter fly for longer.



# Step 6

Make the changes to your helicopter and test it.

**How long does it take the helicopter to drop to the floor?  
How does this compare with the first drop of the original helicopter?**



