

# How do Planes Fly?

Imagination  
Station

Kia ora explorers!

This worksheet is to help you learn about the amazing way planes fly!

Start by watching this LEGO discover video on YouTube:

<https://www.youtube.com/watch?v=fitQrxBIVhY>



## QUESTIONS:

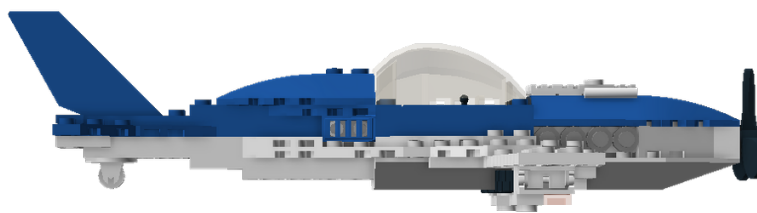
Who were the first people to fly, using kites?

Where were the Wright brothers from?

## Research:

One of the first recorded flights—possibly even before the Wright Brothers—happened right here in Aotearoa New Zealand! Who was the first New Zealander to fly, and where did his first flight take place?

There are four forces acting on a plane as it flies. Add four arrows to this plane to show the direction each force is acting in. Make sure to label the arrows with the name of the force it represents.





## ***How do Planes Fly?***

Give an example of when you might feel each of the four forces in your daily life.

1

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2

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3

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4

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**Research:**

What is another word we can use instead of drag when talking about the force created by an object moving through air?

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**Research:**

Reducing this drag force is sometimes called streamlining. What is another word used to describe an object that is shaped to travel smoothly through air?

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**Research:**

When an object is streamlined to move through water, what word would we use to describe that shape?

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### **LET'S BUILD IT!**

Build an aeroplane! Consider the size and shape of the wings compared to the body of your aeroplane. What will provide the thrust? How can you reduce the amount of drag on your model? You can sketch some plans in the space below.

## BREAKING THE SOUND BARRIER

The Concorde was the fastest commercial plane ever produced, travelling faster than the speed of sound. Do a little **research** and some **calculations** to help explore just how fast this is!

On a dry day, at 20°C, what is the speed of sound in metres per second?

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How fast was the maximum speed of the Concorde in kilometres per hour?

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Convert the maximum speed of the Concorde into metres per second.

**Hint:**  $\text{km/h} = 1\,000\text{m}/3\,600\text{s}$

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The Concorde regularly flew from London to New York, a journey of 5 585 kilometres. How long would that flight take if the plane travelled at maximum speed the entire way?

**Hint:** distance = speed x time

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Calculate how quickly the Concorde could fly from Christchurch, NZ, to Perth, Australia flying at maximum speed, given that the flight would cover a distance of 5051 kilometres.

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## EXPERIMENT:

Try making a plane you can actually fly! For once, we don't recommend LEGO as the best building material! You'll need something lightweight—what about paper?

There are lots of different styles of paper aeroplane, see if you can find one that keeps a minifigure (or other small figurine) in the air for longer than three seconds! Make sure to use a timer!

