

Explore the effects of water resistance.

Success Criteria

- I can explain the effects of water resistance.
- I can identify streamlined shapes.
- I can minimise the effects of water resistance on an object.

Vocabulary

water

resistance

streamlined

pointed

flat

curved

low

high

smooth

surface

push

Water Resistance

How does it feel to walk through deep water?

Think of some words and phrases to describe the feeling.

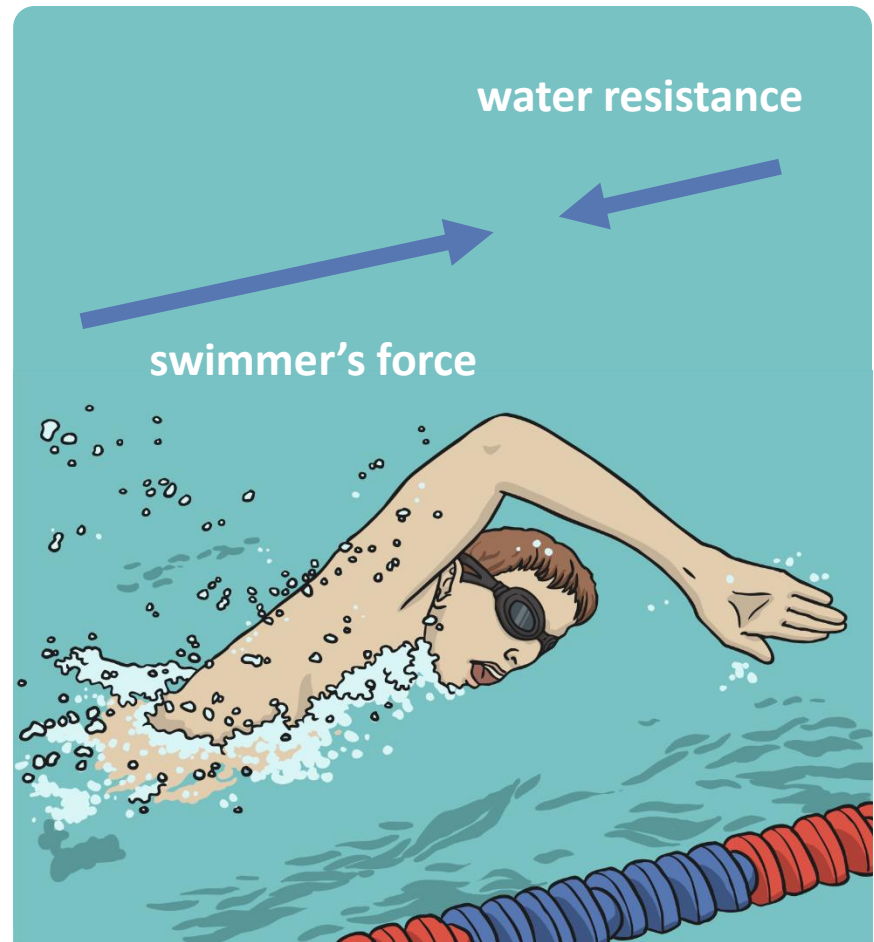
Share your ideas.



Water Resistance

If you have ever walked through water, you will have felt the effects of **water resistance** pushing against you.

Whenever an object moves through water, it experiences the force of water resistance. Water resistance **pushes** objects back, making it hard for them to move through water.



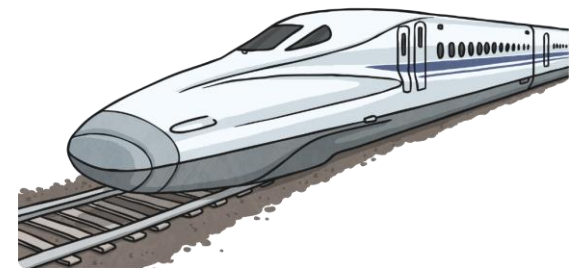
Streamlined Shapes

It is possible **to reduce the effects** of water and air resistance.

Objects that do not experience much water or air resistance are called streamlined.

Watch [this clip](#) to see natural and man-made streamlined shapes.

What do they all have in common?



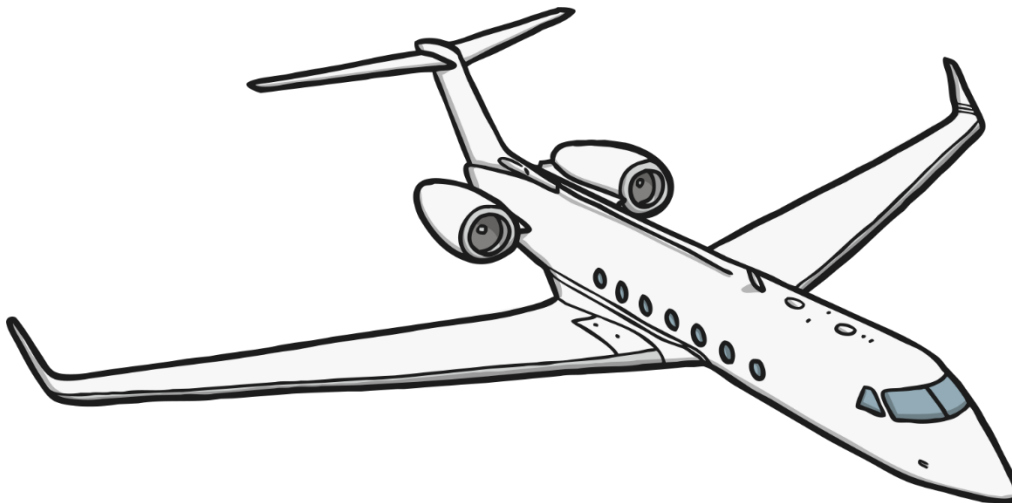
<https://www.bbc.co.uk/bitesize/clips/zxspyrd>

Streamlined Shapes

This aeroplane is **streamlined**.

Its nose is **pointed** so it can cut through the air, and it has a **low, smooth, curved back** to allow air to flow over and around it.

It does not create much **air resistance** so it can move through the air easily.

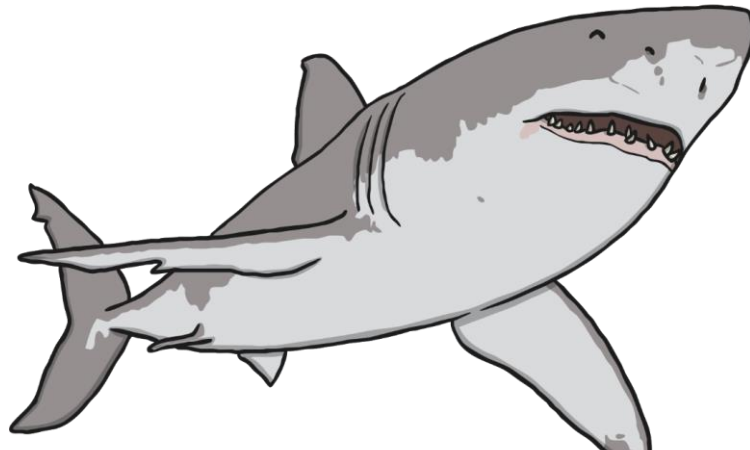


Streamlined Shapes

The shark is **streamlined**.

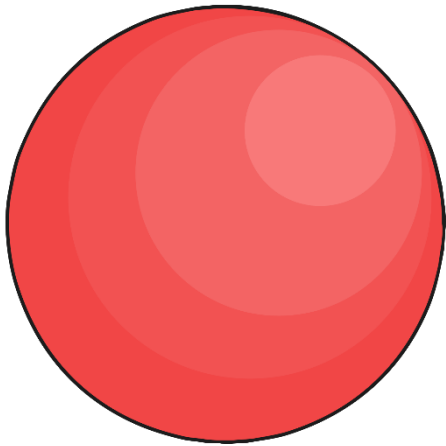
It has a **pointed** nose to cut through the water, and a **smooth, low, curved back** to allow the water to flow over and around it.

It does not create much **water resistance** so it can move through the water quickly.

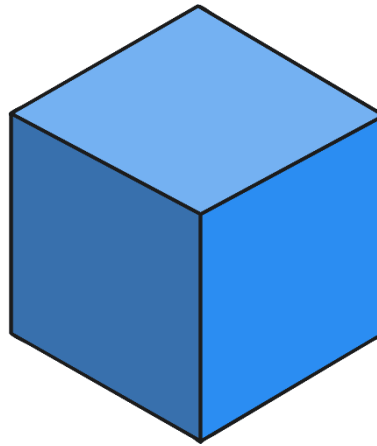


Streamlined Shapes

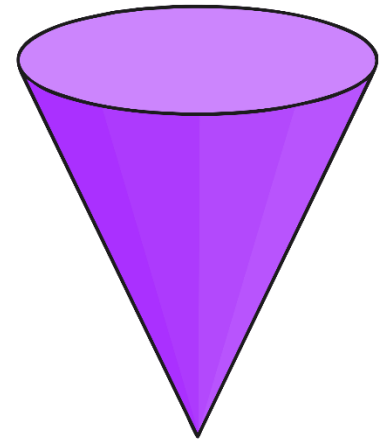
- Watch Mrs Hickman try this mini-investigation to explore streamlined shapes.
- Weigh three equal pieces of Plasticine or modelling clay.
- Then mould each piece into one of the three different shapes shown below.



sphere



cube



cone

Streamlined Shapes

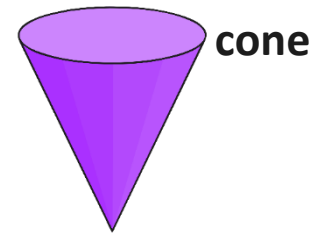
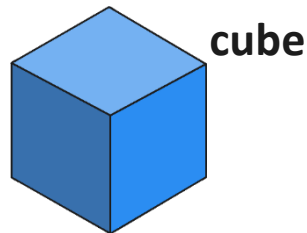
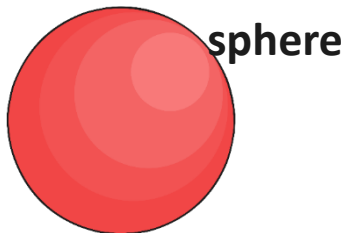
Write Prediction: Which shape do you think will fall **fastest**? Which will fall **slowest**?

Method: Fill a measuring cylinders with the same amount of water.

Drop each Plasticine shape into the water and **time** how long it takes to fall through the water.

Results:

<u>Shape</u>	<u>Time taken to fall through the water</u>
cone	
cube	
sphere	

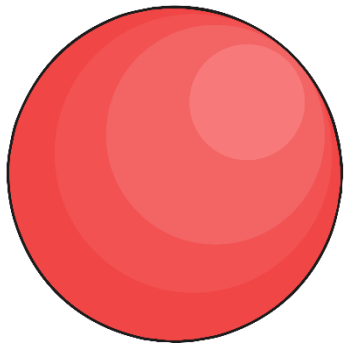


Streamlined Shapes

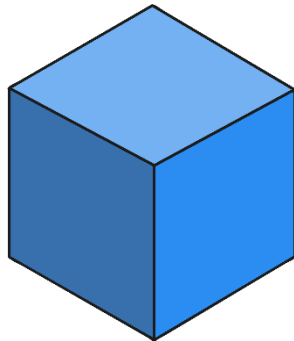
Conclusion:

The **cone** should have fallen through the water the **fastest**. It is the **most streamlined** shape as it has a **pointed end to cut through** the water.

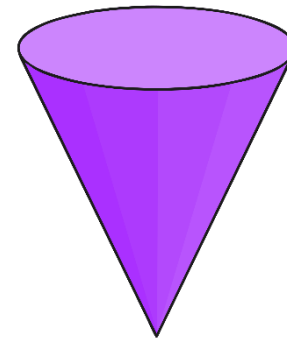
The **cube** should have fallen through the water the **slowest**. It is the **least streamlined** shape because it has a **flat** surface which will create a lot of **water resistance**. The water will push against the flat surface, **slowing it down**.



sphere



cube



cone

Optional Challenge at home: Boat Race

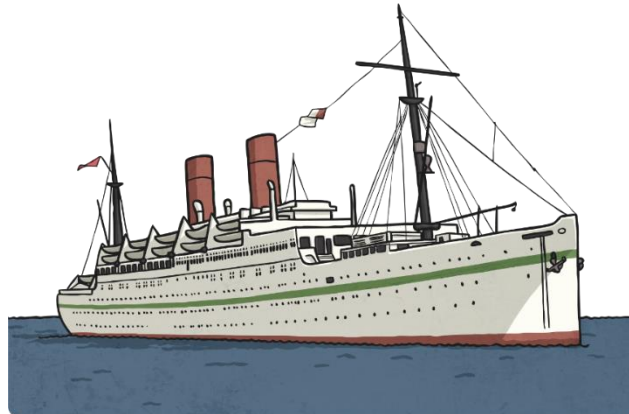
Your challenge today is to use what you have found out about **water resistance** and **streamlined shapes** to make different boats!

You will test your boats by blowing them with a hand held fan.

The **most streamlined** boat will create **the least water resistance**, and will move through the water the **fastest**.

Will your boat win the race?!

Think about the best **shape** for your boats.



Boat Race

Use equipment found at home to make some boats.

Draw and label your boat.

Predict how well you think it will move through the water.

Then **float** your boat in the water tray/bath/sink (if it's small!).

Use the hand held fan to blow the boat through the water and **time** how long it takes to cross the water tray.

The fastest boat wins!

Boat Race – Write up Investigation

Do you think your boat will move through the water easily and quickly? Why / why not?

How long did it take each boat to cross the water tray/bath?

How did each boat do compared to the other boats?

Why do you think your boat performed this way? Use the key words below to explain your ideas.

Key words

water resistance streamlined
pointed flat curved low high
smooth surface push

Draw and label your boats: