

IT'S A DRAG

Challenge



Before you start...

Have balls at the bottom of the tube. Turn the exhibit upside down and watch the balls fall

Try moving the balls up with the magnets. Is it easy for all the liquids?

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Experiment 1

You will be measuring the time taken for the balls to fall in the different liquids.

1 a) Before you start, answer the questions below by drawing arrows to the correct boxes.

What are you changing?
(independent variable)
(one only)

What are you measuring?
(dependant variable)
(one only)

What are you keeping the same?
(There may be more than one correct response)

Weight of ball

The magnet

The liquid

Size of ball

Time of the falling ball

Type of ball

Length of tube

The tube

b) Why is it a good idea to do the experiment more than once?

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c) The liquid in tube 1 is silicone. The other liquids in the tubes are oil, water and shampoo. Which liquid do you think is in each tube?

There is silicone in tube 1

There is _____ in tube 2

There is _____ in tube 3

There is _____ in tube 4

Experiment 2

2 a) Measure the time it takes for the ball to drop and record your results in the table. Be careful to start and stop at the correct time.

	Time taken for the ball to drop (seconds)			
	Drop 1	Drop 2	Drop 3	Average *
Tube 1				
Tube 2				
Tube 3				
Tube 4				

* Average (mean) = (drop 1 + drop 2 + drop 3) ÷ 3

3. Can you explain why it took longer for the ball to drop through the different liquids?

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4. Complete the table

Factor	Will it affect the speed? Yes/No	Explain your answer
Viscosity ("thickness" of liquid)	Yes	<i>It is harder for the ball to fall in a more viscous liquid, as the liquid offers more resistance and so drag is increased.</i>
Diameter of ball		
Weight of ball		
Temperature of liquid		
Colour		

5.

Add arrows to show the direction of the two forces - **weight** & **drag** - acting on the ball in the diagram below.

