Haslingden High School
Science Faculty
HOMEWORK BOOKLET
Year 7 Block A

Name: _____ Form: _____

Subject Teacher: _____

Date Given: _____ Date to Hand in:_____

WWW :

IOTI :

House Points:

Optional Parent / Guardian Comment:

Yr 7 Science Homework Booklet

Introduction

This week your homework booklet is an introduction to scientific skills.

Tasks 1-3 are based on work from your lessons.

Tasks 4-6 are based on new work.

The tasks get harder as you work through the booklet.

Don't worry if you get stuck!!! If you have any problems with any of the tasks, you should see one of your Science teachers to get help. **Ask for help from your teacher!!!**

Fast-flowing fluids!

This week's homework booklet is Science, and it is based around an experiment that you can do easily at home.

You don't have to do the experiment to do the booklet, but why not have a go?

Do different liquids flow at different speeds?

For the experiment, you will need:

- A 2-litre or 500ml fizzy drink bottle
- A stopwatch or clock with a 'seconds' hand.
- A selection of liquids which are different 'thicknesses'. For example:
  - Water
  - Shampoo
  - Double Cream
  - Custard
  - Olive / Vegetable / Sunflower Oil
  - Syrup
  - Liquid Soap
  - Anything runny!
  - **Make sure you ask permission before you use anything from the cupboards!**

Method

1. **Ask an adult** to cut the fizzy drink bottle in half.
2. Turn the top half upside-down and put it into the bottom half point downwards, as shown in the diagram below:

3. You have made a funnel with a base to catch the liquids you pour through!
4. Carefully measure a set amount of one of your liquids. You could use a measuring jug, or just fill a small glass or beaker.
5. Get ready with your watch or clock, then pour your liquid into the funnel and time how long it takes for it all to get through to the bottom.
6. Fill in your results in the table opposite!
7. Repeat the experiment, changing the liquid you use each time.

Results Table

Name of liquid	Time taken to go through funnel (seconds)

Task 1: Selecting Equipment

To conduct the 'funnel' experiment in the lab, we would need some common equipment.

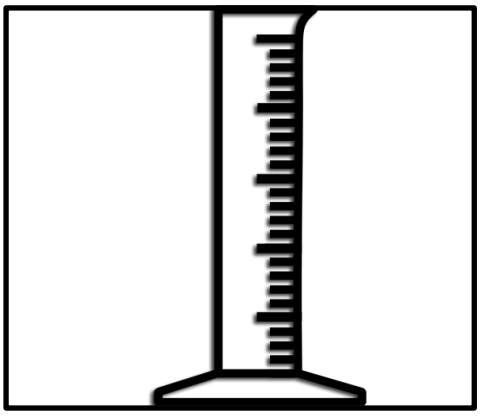
Funnel

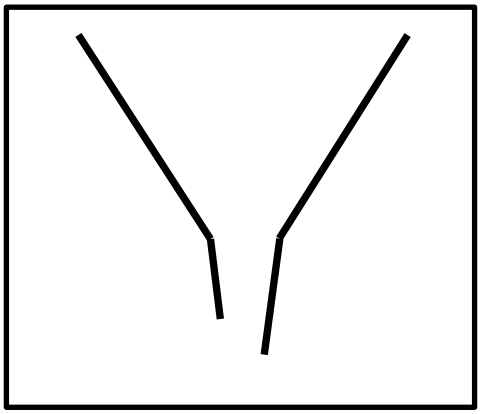
Measuring Cylinder

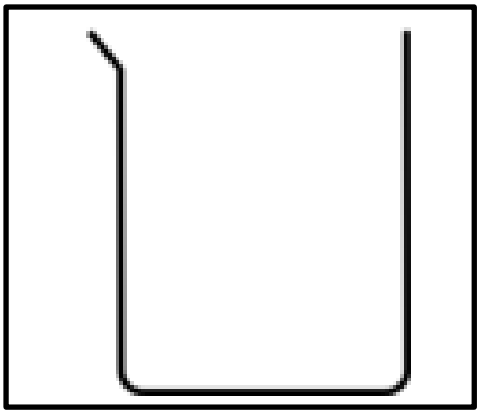
Conical Flask

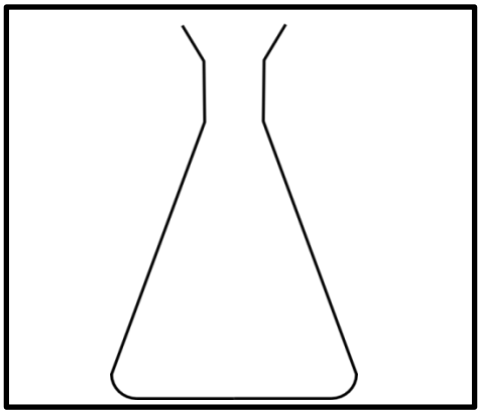
Beaker

Use the labels above to identify the scientific diagrams below:







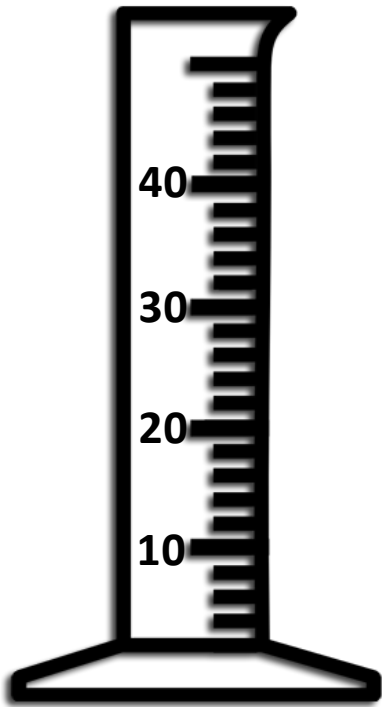


Task 2: Using equipment

Use the diagrams to the left to draw your own diagram showing **the funnel placed in the top of the conical flask**.

You should use a ruler and pencil to draw your diagram.

On the measuring cylinder below, **carefully** draw a line and shade the cylinder to show how high **24cm^3** of a liquid would be.



Task 3: Hazards Symbols – how do we stay safe?

Use your knowledge of hazard symbols to fill in the table below:

Hazard	What does it mean?	How could it cause harm?
		
		
		
		

Task 4: Variables

Before the experiment can start, you need to understand variables.

Variables are things that change in an experiment. There are three types of variable:

- Independent variable: what you change in an experiment.
- Dependent variable: what you watch in an experiment to see if it changes.
- Control variable: what you keep the same to make a fair test.

Here is an example:

One Direction have been asked to play at the Phones 4 U arena in Manchester. Harry is unsure which hair product makes his hair the curliest. He tries **three different types of hair mousse** and then **counts how many curls** are in his hair. He keeps his **shampoo, conditioner and how long he dries his hair for the same**.

- Independent: hair product
- Dependent: number of curls
- Controls: shampoo, conditioner, hair drying time

Look at the method for the funnel experiment on the first two pages of this booklet.

1. What is the independent variable? (What are we changing each time we do this experiment?)

.....

2. What is the dependent variable? (What are we recording at the end to see if it changes?)

.....

3. What are the control variables? (What do we keep the same each time we do the experiment?)

.....

Now try some more!

In each of the examples below, circle the variables and write down which is the independent, dependent and control.

Rhianna is rehearsing for her new video. She wants to slide across the dance floor, but doesn't know which of her shoes are the most slippy. She takes a 5 meter run up in her **trainers, ballet pumps and high heels** and then **measures how long her skid is each time**. She does this on **the same type of floor**.

- Independent:
- Dependent:
- Controls:

Victoria Beckham needs new carrier bags for the customers in her new shop. She needs to find out which material will be able to hold the most without breaking. She cuts out strips of **card, paper and plastic** and then adds masses until they break. She **records how much mass each strip can hold without breaking**. She keeps the length and thickness of the strips the same.

- Independent:
- Dependent:
- Controls:

Carl Froch is training for the heavyweight title fight. One part of his training is skipping. He wants to know if the length of his skipping rope affects how many skips he can do in 10 minutes. He tries out five different lengths of rope and counts how many jumps he does.

- Independent:
- Dependent:
- Controls:

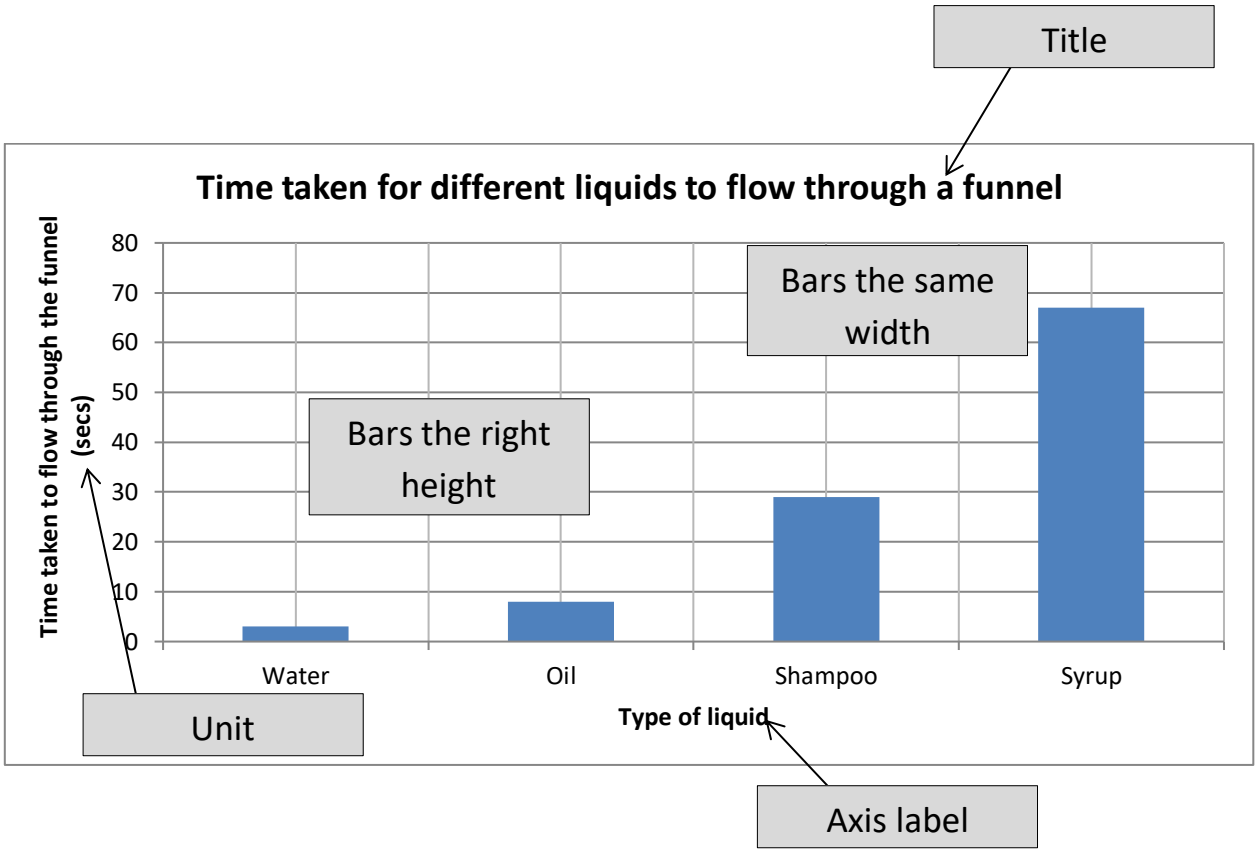
Task 5: Graphs

The perfect graph has:

- A title
- Labels on the axes (the lines) and on the bars
- Any units used
- All the bars the same width
- All the bars reaching the correct height

Here are some results and an example of a great graph.

Liquid	Time to flow through funnel (secs)
Water	3
Oil	8
Shampoo	29
Syrup	67

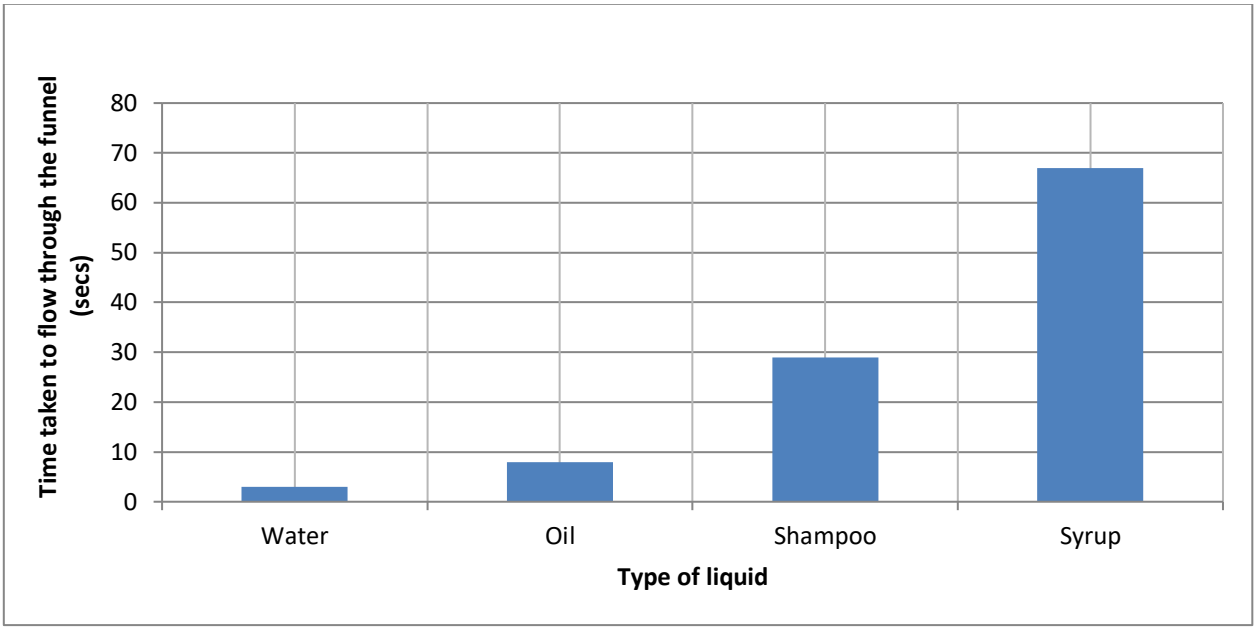


On the next three pages you will see graphs drawn by different students. They all used the same data (numbers in the table) as the graph above.

Your task is to:

1. Spot what they have done well.
2. Spot any mistakes.
3. Write a 'what went well' (WWW) and an 'in order to improve' (IOTI) comment for each graph.

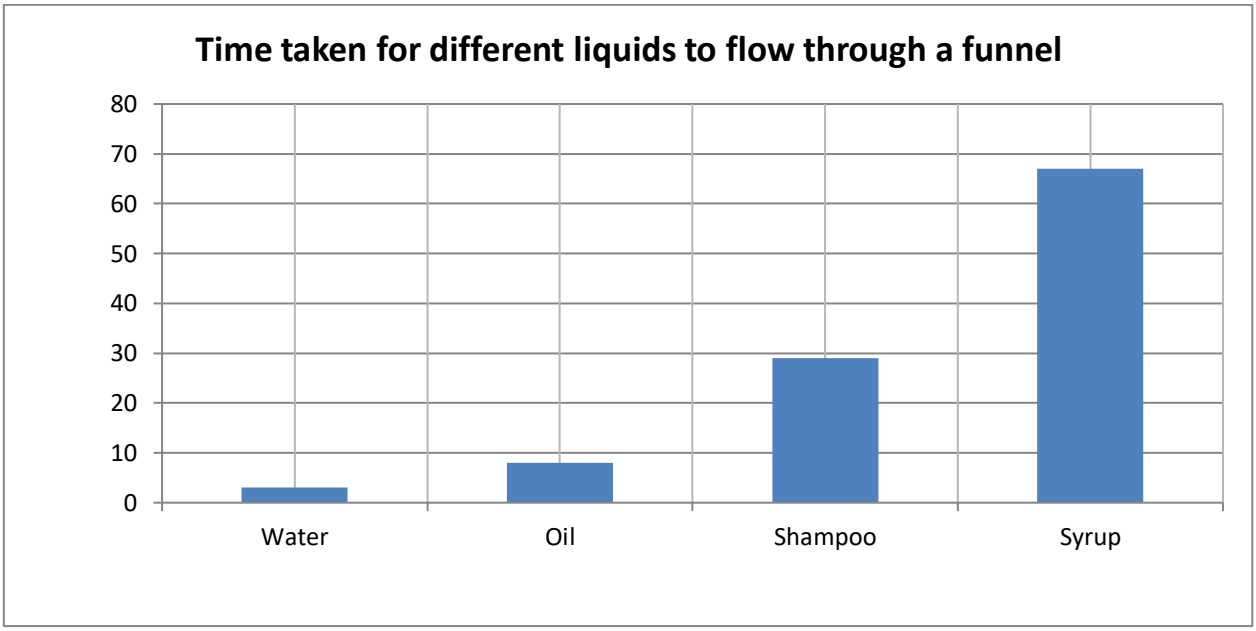
Example



WWW: You have drawn all the bars to the right height and labelled all the axes.

IOTI: Next time put a title on your graph.

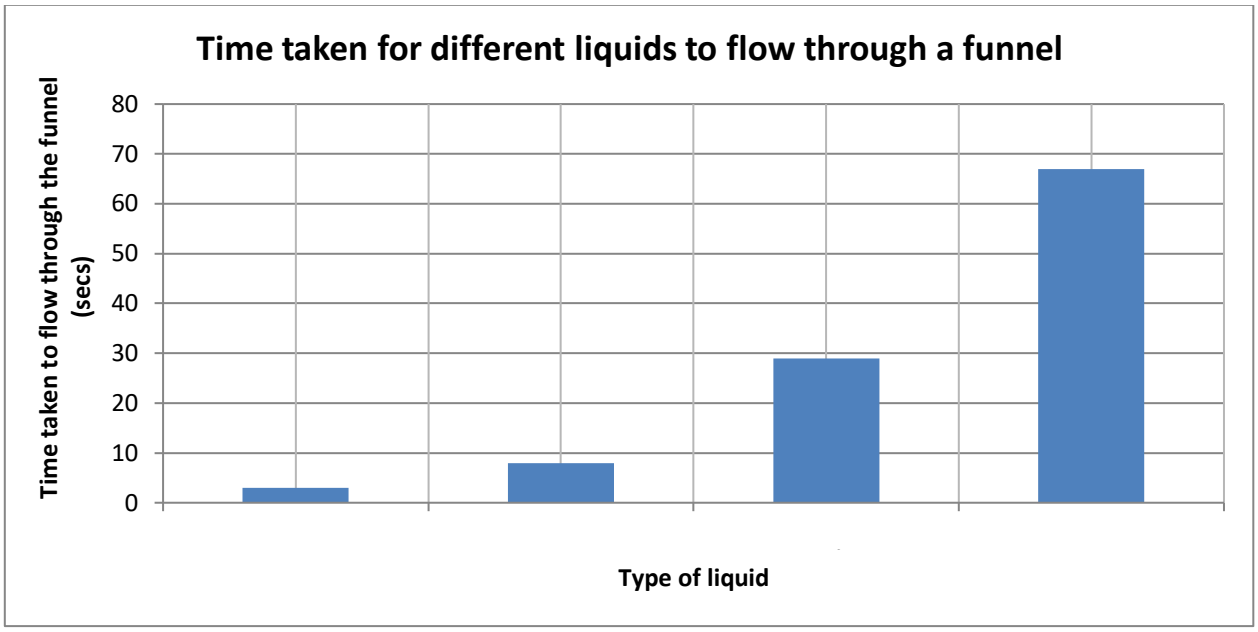
Student 1



WWW:

IOTI:

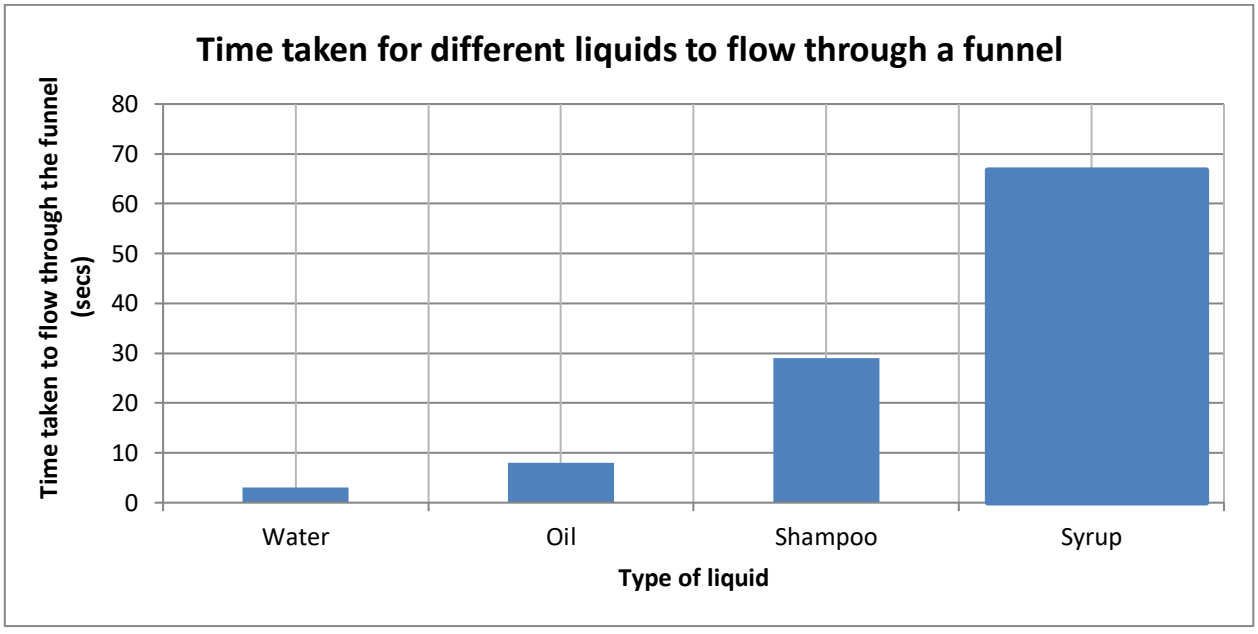
Student 2



WWW:

IOTI:

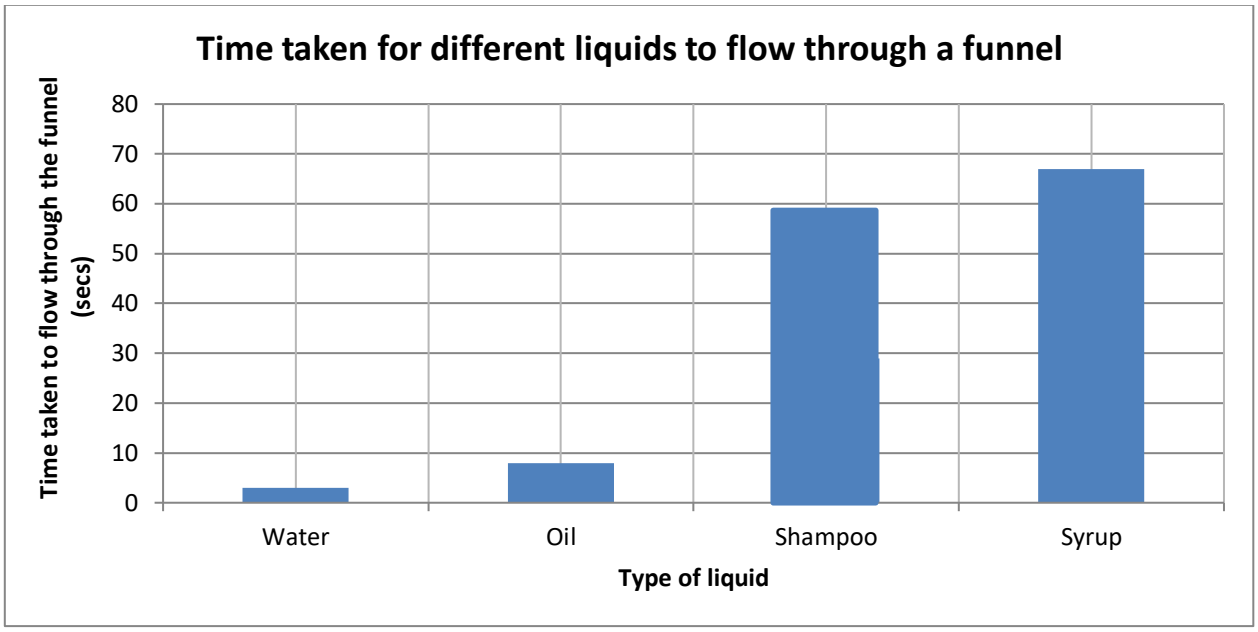
Student 3



WWW:

IOTI:

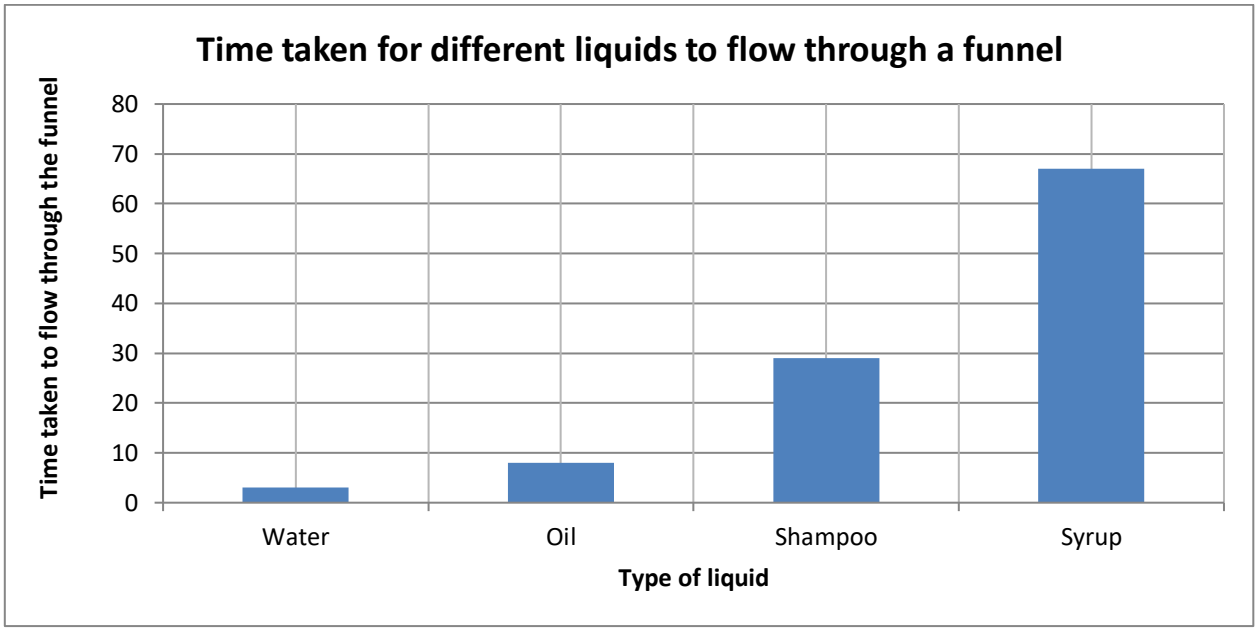
Student 4



WWW:

IOTI:

Student 5



WWW:

IOTI:

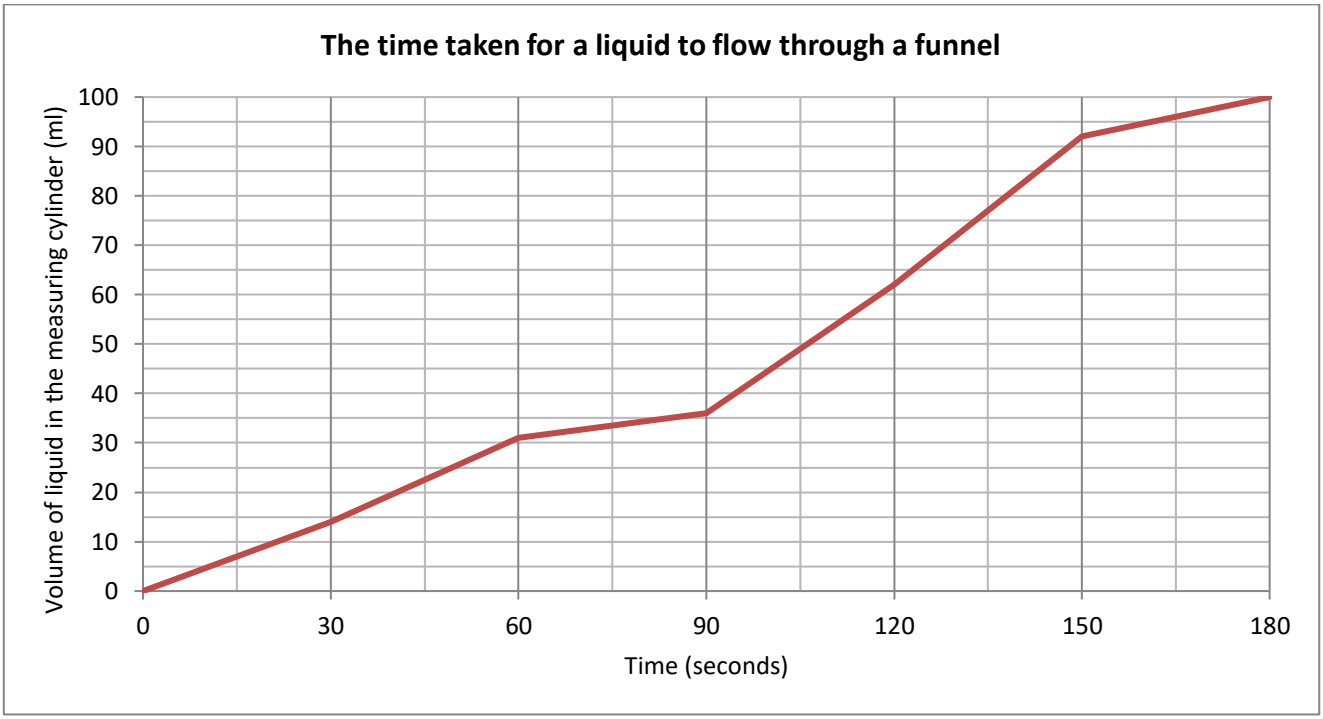
Task 6: Extension Task!

The method we have just tried timed how long it took different liquids to flow through a funnel. A second group of students carried out a similar experiment. This was their method:

1. Stand a funnel in a measuring cylinder.
2. Pour 100ml of washing up liquid into the funnel.
3. Start the timer.
4. After 30 seconds measure how much fairy liquid there is in the measuring cylinder.
5. Repeat step four until all of the washing up liquid has run through the funnel.
6. Repeat the experiment with a different liquid.

Their results are shown in the table below.

Time (secs)	Volume of liduid in the measuring cylinder (ml)
0	0
30	14
60	31
90	48
120	62
150	92
180	100



1. What is the independent variable? (What are we changing each time we do this experiment?)

2. What is the dependent variable? (What are we recording at the end to see if it changes?)

3. How much washing up liquid had flowed through the funnel after 30 seconds?

4. How much washing up liquid had flowed through the funnel after 75 seconds?

5. Describe the pattern you can see on the graph.

6. Are there any points on the graph which don't fit the pattern (are higher or lower than you would expect)? Where are these points?

7. Draw a line on the graph to show a liquid which flows more quickly through the funnel.