Investigation of how water flows under pressure

You will need:

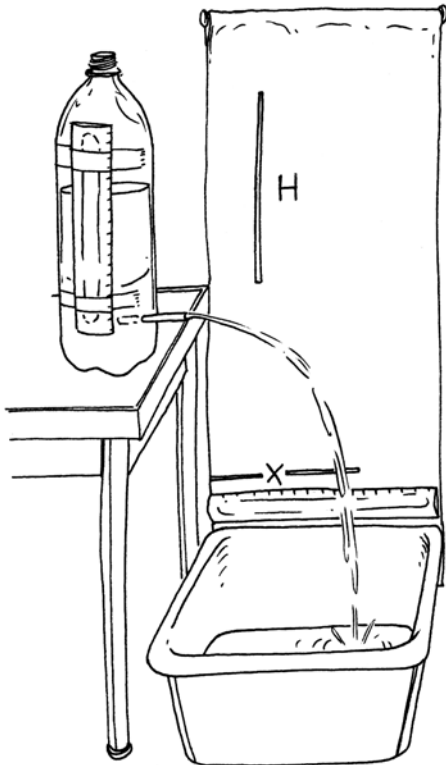A clear, empty 2l fizzy drink bottle (without its cap)

A narrow plastic tube, e.g. a drinking straw, or the tube from the inside of a biro

2l of water

2 rulers

Sellotape

Method

- Push the plastic tube into the bottle about 3cm from the bottom of the bottle

- Sellotape one ruler to the side of the bottle so that its 0cm mark is level with the tube.

- Stand the bottle beside a sink, raised up on several books.

- Sellotape the other ruler horizontally to the top of the sink, with the 0cm mark level with the outside end of the tube.

- Fill the bottle with water (cover the end of the tube with a finger or a bit of blue tack).

- Allow the water to run out of the bottle. Record the height H of the liquid in the bottle, and the horizontal distance X the water travels, at regular intervals (say, at every 2cm of decrease of height H).

Results

H (cm)	X (cm)
20	
18	
16	
14	
12	
10	
8	
6	
4	
2	

Plot X on the y axis against H on the x axis of a graph. Is it a straight line?

Try plotting X^2 against H as well – is that a straight line?

Can you come up with an equation for the relationship?