

Candles

Does the Jar make the Difference?

When a jam jar is placed over a lit tea light, the candle lasts for several seconds before it goes out. Do you know why this happens?

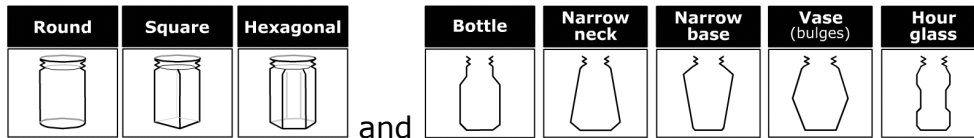


The candle is extinguished as the flame uses up the oxygen gas inside the jar and replaces this with carbon dioxide gas. When all of the oxygen is used up the flame goes out.

For example, a jar of volume 500 cm^3 lasts approximately 18 seconds.

The jar's volume can be easily measured, by filling it with water which is then poured into a measuring cylinder,

How long would you expect a jar of 250 cm^3 to last? Why?



If someone were to investigate several jars, of different shapes and heights but all contain 250 cm^3 of air, would you expect their results to be different? Why (not)?

Carrying out the experiment

The ExperimentsAtSchool website wants to collect as much data as possible from across the country (and even from across the world). To make sure that the data is good, everyone must carry out their work carefully.

Do's

- use Tea Lights which are about 4 cm across (diameter);
- use as many different volumes and shapes of jar as you want;
- repeat individual experiments as many times as you want;
- stop timing as soon as the flame disappears;
- estimate the height of the flame (and add this to the database);
- measure the volume of the jar with water after the burning the candle (in case water drips down onto the candle).
- Try to record the shape of your jar – if it doesn't match the choices given leave it blank.

Don'ts

- hold the jar directly over the flame whilst waiting to start the clock – it will fill with carbon dioxide fumes and smoke.
- repeat the experiment without cleaning the jar – also give it time fill with fresh air.

Jar measurements		Candle measurements	
Height of jar/mm		Time/s	
Volume of jar/cm ³		Flame height/mm	
<input type="text"/>		<input type="text"/>	
<input type="text"/>		<input type="text"/>	

Basic Shape - choose one shape Outline shape - choose one outline

Round	Square	Hexagonal	and	Bottle	Narrow neck	Narrow base	Vase (bulges)	Hour glass

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