

Priory School Science

Surface area and cooling

Scenario:

A manufacturer of paper cups wants to find out which size cup would keep coffee hotter for longer. As an employee in their research division, they have asked you to investigate the matter.

Hypothesis:

The rate at which a container of water cools depends upon the surface area of the water exposed to the open air.

Safety:

- Follow safety procedure when using hot water – Standing during experiment, goggles worn; hot water can scold you.
- Glass beakers and thermometers could smash if handled if not handled correctly; glass is sharp and could cut you.

Equipment:

- A selection of glass beakers – The area of the open top of each will be provided
- Measuring cylinder
- Thermometer
- Stop watch
- Kettle

Method:

- 1: Using a measuring cylinder measure out 50ml of hot water and place into one of the beakers
- 2: Using a thermometer monitor the temperature of the water, starting your stopwatch when 75 degrees celsius is reached
- 3: Record the temperature of the water every minute for ten minutes
- 4: Repeat this procedure three times for each of the other beaker sizes.

Results:

Time (mins)	Temperature of water (C)				
	50ml Beaker	100ml Beaker	200ml Beaker	400ml Beaker	500ml Beaker
0					
1					
2					
3					
4					
5.....					