

## To determine whether volume and the use of lids effect the result using polystyrene beakers.

### Purpose of Investigation

The purpose of this investigation was to find out if the volume of water would effect the rate of cooling within a polystyrene beaker and also if the use of a lid would effect it further.

### Presumed Method

I firstly predicted that the beaker containing lesser volume would remain the hotter throughout the experiment, I also assumed that the use of lids would make the water remain hotter for the duration of time. The scientific knowledge that I based this on was that of insulators and conductors, I thought that using the lids would contain the heat causing it to remain hotter for longer. I thought that what I would need was the two polystyrene beakers, two thermometers, a stop watch and approximately 900ml of water. The way I assumed I would go about conducting the experiment was to fill each beaker with the appropriate volume of water and use the thermometers to measure the heat decrease every 2 minutes.

### Method

Firstly I collected the apparatus that I was going to use:

Two polystyrene beakers

Two lids

Two thermometers

Measuring Jug

Stop watch

900ml of hot water

After I measured 300ml of hot water and poured it in to one beaker, then, measured 150ml of hot water and poured that into the other beaker. After placing in each beaker a thermometer I then proceeded to write down the temperature of each beaker every 2 minutes with the use of the stop watch. After 30 minutes of recording temperatures, I then proceeded to the second experiment, where I measured the same amounts of hot water as before and put them in each beaker as before and then continued to put a lid on each beaker and once again measuring the temperature decrease every 2 minutes.

### Results

My results did not match with my predictions in one case, I actually proved that the more water within the beaker the longer it will stay hot, but my predictions in that the lids would prove to make a difference was correct they did they kept the water hotter for longer.

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Conclusion

When the volume of water was more the water stayed hotter for longer and when it had a lid it stayed hot even longer this proves that polystyrene is an insulator for also the outside of the beaker was not hot to touch even when the water was at boiling point. This gives us reason to why McDonalds uses this material for their hot drinks beakers as they to not conduct heat they insulate it.