

Insulation Investigation

Task- My task was to investigate into which of the following three materials was the best insulator. The three materials are air, polystyrene and cotton wool.

Aim- The aim of the experiment was to find out which of the three materials we had acted like cavity wall insulation the best, insulating the most heat.

Scientific Knowledge- The air filled space between the two beakers will be the least effective because the air in the cavity will have no protection and will cool down the quickest. The polystyrene will be very effective as it fills the gap in the cavity and will form an insulator as we can push in more polystyrene to create fewer gaps in the cavity. I think that the cotton wool will be the most effective as an insulator as the cotton wool can be best pushed together to create no gaps and fills the gap perfectly in the cavity.

Prediction- I think the best insulator in this experiment will be the cotton wool.

Equipment- 3 Large Beakers

3 Small Beakers

3 Thermometers

1 Timer

Cotton Wool

Polystyrene

Cork Bungs

Method- We firstly prepared the beakers by placing the cork bungs in the base of the large beaker and placing on top of the cork bungs the smaller beakers. We then around the sides of two of the beakers put polystyrene in one and cotton wool in another firmly pushing together to try and create no gaps. We then filled the smaller beakers with the same amount of boiling water and took our first temperature reading. We placed over the top of each of the three beakers and took temperature readings from each of them after 1 minute for a period of 15 minutes.

Table of Results-

My Results

Time	Air	Polystyrene	Cotton Wool
0	87	85	80
1	86	85	79
2	85	83	79
3	81	81	78
4	78	79	77
5	76	77	75
6	75	76	74
7	74	74	73
8	72	73	71
9	71	72	70
10	70	71	69
11	69	70	68
12	68	69	67
13	66	68	66
14	66	67	65
15	64	66	64

Other Group' Results

Time	Air	Polystyrene	Cotton Wool
0	85	83	78
1	82	81	77
2	80	80	75
3	78	79	74
4	77	77	73
5	75	76	72
6	7	75	70
7	72	74	69
8	71	73	68
9	70	72	67
10	69	71	65
11	68	70	65
12	67	69	64
13	66	69	62
14	65	67	62
15	64	64	61

In my results the air filled gap had a difference of 23 oC the polystyrene gap had a difference of 19 oC and the cotton wool filled gap had a difference of 16 oC.

The other groups results the air filled gap had a difference of 21 oC the polystyrene filled gap had a difference of 19 oC and the cotton wool filled gap 17oC had a difference of

Graph- See Graph Paper

Conclusion- As you can see from the previous tables of results and graph that cotton wool was the best at insulating the heat therefore having the lesser difference. Due to the proof of these results my prediction was correct as I predicted the cotton wool would be the best insulator. I think the reason why the cotton wool was the best insulator was because we could push together the cotton wool easiest out of the three materials down the gap to fill in all the gap, hence, becoming the best insulator by letting out the less heat.