DOES SIZE AFFECT TEMPERATURE LOSS

INTRODUCTION

We are investigating to find if a small creature eg a mouse will lose heat quicker or slower than a larger creature eg a dog. To investigate this we are going to use 2 different size beakers, fill them with water from the kettle (boiled), then we will record their temperature every minute for 15 minutes and record the temperature change.

To make this a fair test we are going to fill both of the beakers at the same time and record the temperatures at the same time. We will not use insulation in this experiment so we will get clear results and lower the chances of getting rogue results.

EQUIPMENT LIST
➢ Stop watch
➢ 2 x beakers
➢ 1 x beaker (7cm high, circumference 12.6cm)
➢ 1 x beaker (10cm high, circumference 25.1cm)
➢ 2 x thermometers
➢ 1 x kettle
➢ 2 x heat proof mat
➢ 2 x safety goggles

METHOD

We are going to put boiling water into each beaker and record the temperature every minute for 15 minutes. We also will work out the temperature drop and we will repeat this 3 times for each beaker.

PREDICTIONS

I predict that the smallest beaker will lose heat fastest because the surface area to volume ratio is higher than the big ones.

DIAGRAMS

TABLES

TIME (MINUTES)	BIG CAN'S TEMPERATURE (°C)			SMALL CAN'S TEMPERATURE (°C)		
	TEST NO 1	TEST NO 2	TEST NO 3	TEST NO 1	TEST NO 2	TEST NO 3
1:00	91	89	92	87	87	89
2:00	88	87	90	78	84	85
3:00	87	85	87	76	80	83
4:00	85	82	85	74	78	79
5:00	83	80	83	72	75	75
6:00	81	78	82	69	72	73
7:00	80	77	80	67	69	70
8:00	78	75	78	66	67	68
9:00	76	74	77	64	65	66
10:00	75	72	75	62	63	63
11:00	73	71	74	60	61	61
12:00	72	70	72	59	59	60
13:00	71	69	71	58	58	59
14:00	70	68	70	57	57	58
15:00	68	67	69	55	56	57
TEMPERATURE DROP	23	22	23	25	31	32
AVERAGE DROP	23.6666			29.33		

ANALYSIS

We found that the smaller beaker loses heat faster than the large beaker because it has a larger surface area: volume ratio. This was linked to work we were doing on homeostasis in humans and animals. Small animals eg rodents are most likely to hibernate because they lose heat quickly because of their high surface area to volume ratio.

EVALUATION

We could have improved our experiment by recording the temperature with temperature probes linked to a computer that would have recorded the temperature more accurately and at the exact time.

We also could have compared it to another group's results to make sure they were correct.