**Year 9 Investigation Revision**

Alfie was experimenting on the effect of insulation on the retention of heat in a brass cup. He filled two 250mL cups with hot boiling water. To one cup he inserted a thermometer through a Cling Wrap sheet that covered the top of the cup. To the other cup he surrounded it with a thick layer of foam and inserted a thermometer through a sheet of Cling Wrap on top.

His measurements after two minutes were: 96ºC for the insulated cup and 92ºC for the plain cup. He then took seven more measurements every two minutes. They were 93, 90, 86, 82, 78, 74 and 70 degrees Celsius for the insulated cup and the other cup measured: 88, 83, 77, 72, 68, 62 and 55 degrees Celsius.

1. Tabulate the above data.

|  |  |
| --- | --- |
|  | Temperature (ºC) |
| Time (min) | Plain | Insulated |
| 0 | 100 | 100 |
| 2 | 92 | 96 |
| 4 | 88 | 93 |
| 6 | 83 | 90 |
| 8 | 77 | 86 |
| 10 | 72 | 82 |
| 12 | 68 | 78 |
| 14 | 62 | 74 |
| 16 | 55 | 70 |

1. What is the independent variable?
2. What is the dependent variable?
3. Identify three controlled variables.
4. Graph the data given above.

1. How can Alfie increase the validity of his experiment?
2. How can he increase reliability of the experiment?

**Year 9 Investigation Revision**

Anita and Christina are formula 1 car racers. Anita painted her car all black with red flame markings on the side to intimidate her opponent and stamp her dominance. Christina painted her car all white with yellow smiley faces on the side to reflect simplicity and confidence.

On the day of the race Christina won the race. Anita not happy with the outcome demanded an investigation as to why Christina won. She hypothesised that the race was not fair as the colour of the cars might have had something to do with the outcome.

Next day, at noon, both girls took their cars from the garage which was kept air-conditioned at 18ºC. they were stationed outside under the hot summer sun. The girls installed a digital thermometer inside the console to measure the temperature inside the car. The temperature was recorded every three minutes for thirty-three minutes. At three minutes Anita’s car measured 22ºC while Christina’s car measured 20ºC. For the next twenty-four minutes the temperature inside Anita’s car rose to 25, 28, 32, 36, 40, 44, 49, 54ºC consecutively, whereas, in Christina’s car it rose to 22, 24, 26, 29, 32, 36, 40 and 45ºC consecutively.

Over the next six minutes, Anita’s car recorded 60 and finally 66ºC, whereas, Christina’s car recorded 49 and finally 54ºC.

1. Tabulate the above data.

|  |  |
| --- | --- |
|  | Temperature (ºC) |
| Time (min) | Black car | White car |
| 0 | 18 | 18 |
| 3 | 22 | 20 |
| 6 | 25 | 22 |
| 9 | 28 | 24 |
| 12 | 32 | 26 |
| 15 | 36 | 29 |
| 18 | 40 | 32 |
| 21 | 44 | 36 |
| 24 | 49 | 40 |
| 27 | 54 | 45 |
| 30 | 60 | 49 |
| 33 | 66 | 54 |

1. What is the independent variable?
2. What is the dependent variable?
3. Identify three controlled variables.
4. Write an hypothesis.
5. Graph the data given above.

1. Explain the patterns in the graph above.