**Black and Silver Beakers Experiment Homework**

In this experiment we measure the rate of cooling of two almost identical beakers.

One of the beakers was painted black and the other painted silver.

The INDEPENDENT Variable for this practical (the one we changed) was the colour of the beaker.

The DEPENDENT Variable for this practical (the one we measured) was the temperature drop over 10 minutes.

We controlled all the other variables such as:

* The size of the beaker
* The amount of water we put into the beaker
* The starting temperature of the water
* The time that we measured the temperature for

Because we controlled these variables we made sure that our practical produced VALID results.

Remember that ALL objects emit infra red radiation, everything you look at through an IR camera will show a coloured image and the amount of radiation (or the colour of the image) depends on how hot the object is.

Model Results (Use these to draw your graph if your results were unclear).

Plot a graph with the Dependent Variable on the X (horizontal) axis and the Dependent variable on the Y axis – you will need to draw two lines on your graph, one for each of the colours of beaker

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| --- | --- | --- |
| Time (min)***Independent Variable***  | Temperature of the SILVER Beaker (0C) ***Dependent Variable 1*** | Temperature of the BLACK beaker (0C) ***Dependent Variable 2*** |
| 0 | 80 | 80 |
| 1 | 70 | 68 |
| 2 | 61 | 57 |
| 3 | 53 | 47 |
| 4 | 46 | 38 |
| 5 | 40 | 30 |
| 6 | 35 | 23 |
| 7 | 31 | 23 |
| 8 | 28 | 23 |
| 9 | 26 | 23 |
| 10 | 25 | 23 |

Answer the questions on your graph paper:

Q1. Which colour of beaker cooled quicker?

Q2. What type of heat transfer process is taking place? Remember we have ruled out conduction because we used the same type of beaker, convection because we used water at the same starting temperature and evaporation because the surface are of the beakers exposed to the air is the same.

Q3. Which colour emits more infra red radiation?

Q4. What information did you use to answer Q3? (hint compare the temperatures of the beakers at different times)

This is what your graph SHOULD look like, please don’t copy this one as there are some deliberate mistakes... Use this as a guide to producing your graph.

Remember your graph needs a title and units for each axis