

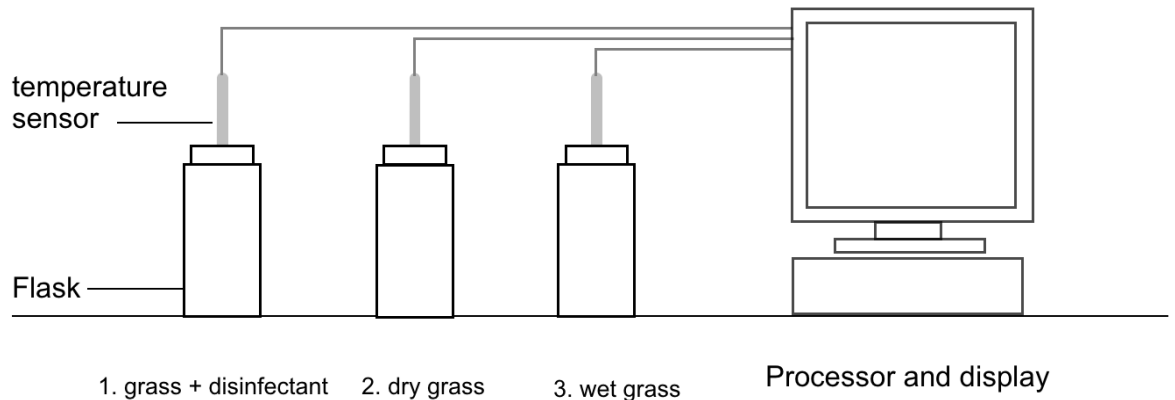
0 1

A student carried out an investigation into the decay of grass. He placed 200g of grass into each of three thermos flasks. All flasks had air holes in the lids.

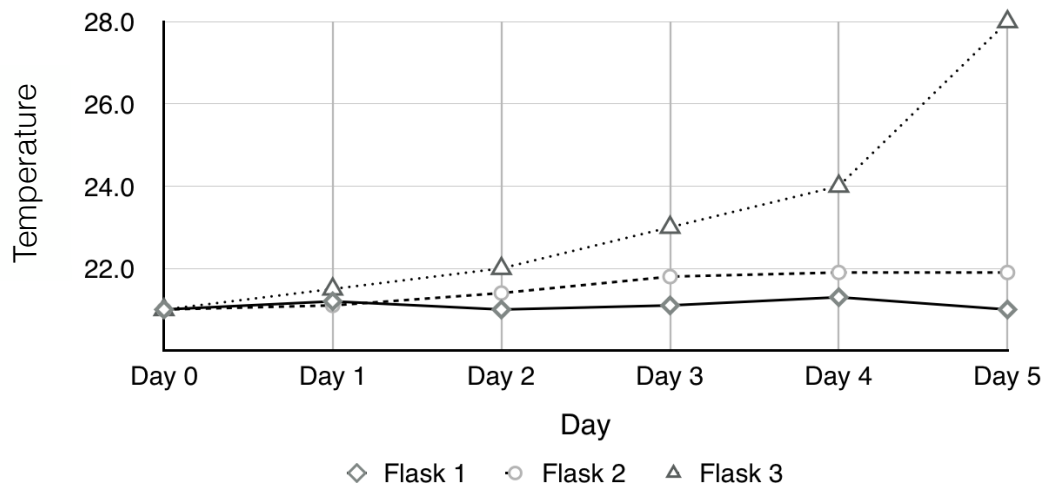
The thermos flasks are good insulators of heat.

The diagram shows the conditions in each of the thermos flasks.

A temperature sensor, connected to a display, was placed into each flask.



Graph 1



Graph 1 shows the results given by the processor and display after monitoring the temperature through the temperature sensors over 5 days.

0 1

1

Give one advantage and one disadvantage of using temperature sensors connected to a processor and a display to record and display the results.

[2 marks]

Advantage: **Accurate readings/a person is not needed to measure the temperature/plot the graph/quicker way to process data/less human error**

Disadvantage: **expensive/ needs to be set up/have technical knowledge**

0	1	.	2
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Compare the changes in temperature between **flask 2** and **flask 3** over the 5 days. **[4 marks]**

Flask 2 temperature rises slowly/only a little or by 1°C [1]
 whereas flask 3 temperature rises by more or 7°C. [1]
 Flask 3 has a steeper increase from day 4. [1]
 Flask 2 has no steep increase [1]
 Both start at the same temperature or at 21°C [1]
 Flask 2 stays the same / almost the same for the last three days or day 3 to 5 [1]

TOP TIP: Remember compare questions should have words like 'whereas' in the answer to highlight that you are looking at two things not just describing one then the other. think!

0	1	.	3
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Explain the changes in temperature for **flask 3** between day 1 and day 5. **[3 marks]**

Microbes/microorganisms decay or rot the grass [1]
 Microbes/microorganisms respire or carry out respiration [1]
 Respiration releases heat [1]
 Moisture needed or moisture increases growth of microbes/microorganisms [1]
 More heat produced over time because microbes reproduce/divide/grow [1]

0	1	.	4
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The temperature of flask 1 changed very little. Suggest why. **[1 mark]**

Microbes/microorganisms/decomposers killed (by disinfectant) [1]

The following advice was given on a compost bin:

0	2	.
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1. Fill with organic waste (grass cuttings, food scraps etc.)
2. keep air holes clear
3. turn the waste material regularly

0	2	.	1
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What is the reason for the advice in point 3? **[2 marks]**

Mix the microbes with the waste [1]
 To release heat or so it doesn't get too hot [1]
 Allow air to get to waste [1]

0	3	.	1
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When fresh milk decays the lactose turns to lactic acid and the pH will lower. If you were to investigate the effect of temperature on the rate of the decay of fresh milk state the dependent variable you will use. **[1 mark]**

pH (over time)

0	3	.	2
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State 2 control variables that you will need to have. **[2 marks]**

same volume/type/lactose content of milk, time intervals, same pH probe [2]

0	3	.	3
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Describe how you could use your results to calculate the rate of decay. **[2 marks]**

measure change in pH [1] over time taken to change [1]