**9 SCIENCE INVESTIGATION**

TESTING INSULATORS



Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Teacher:\_\_\_\_\_\_\_\_\_\_\_\_

Form:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Due date:\_\_\_\_\_\_\_\_\_\_\_

**IMPORTANT INFORMATION**

**Plagiarism**

The experiment is to be done in your science group but your write-up and results are to be done individually.

Plagiarising = instant zero on assignment and you will have to re-do it.

**Presentation**

Neat writing (if you struggle with this, type your information).

Correct spelling, grammar and full sentences.

Assignment neatly stapled together with this sheet attached to the front.

**Assessment policy**

Have sick note/legitimate reason from parent = new negotiated due date.

Assignment not submitted on due date and no sick note from parents = -20% mark

Assignment not submitted on new negotiated due date = -40% mark

+ Letter home to parents

+ Must attend academic completion to complete assignment

**OR**

Submit assignment to student services before academic completion date and academic completion not necessary.

Academic completion not attended = zero on assignment + Saturday detention

**If you know that you cannot submit your assignment on the due date, let your teacher know BEFORE the due date (email them if you are not in school) or just email them your assignment the night before.**

**Aim:** To test how effective different materials are in insulating heat.

**Materials (write materials in a list): (2 marks)**

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**Hypothesis (one sentence statement of what you think will happen): (2 marks)**

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**Independent variable: (1 mark)**

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**Dependent variable: (1 mark)**

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**Two controlled variables: (2 marks)**

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**Method**

1. Pour 200mL of hot water into a can.

2. Place the can inside the box.

3. Record the initial (starting) temperature of the water, and then measure and record the temperature every 2 minutes for 10 minutes.

4. Repeat, using water at the same initial temperature and packing the first chosen insulating material into the space between the can and the box.

5. Repeat, using water at the same initial temperature and packing the second chosen insulating material into the space between the can and the box.

**Results: Table (show results taken from experiment). (3 marks)**

**Graph: show your group results, Draw on graph paper and attach. (6 marks)**

- Use graph paper.

- Use a sharp pencil and ruler.

- Have a title at the top (independent variable versus dependent variable).

- Work out whether you need to draw a bar graph (different groups of data) or a line graph (showing data changing over time).

- Put the independent variable and dependent variable on the correct axis.

- Label each axis.

- Record the units of measurement in brackets next to each label.

- Use an appropriate scale that has the same pattern the whole way along.

**Discussion (describe at least two mistakes/errors that occurred, explain how these affected the results and how they could be avoided next time). (6 marks)**

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**1.** State which material was the best insulator. **(1 mark)**

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**2.** Explain why it was important to test one can with no insulating materials. **(2 marks)**

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**Conclusion** (two sentence statement. First sentence gives general result of experiment, second sentence states whether the hypothesis was proven or not proven.)  **(2 marks)**

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**MARKING KEY**

|  |  |  |  |
| --- | --- | --- | --- |
| **Content** | **Description** |  | **Your**  **mark** |
| Materials | Is written in a list  Includes all materials and amounts | 1  1 |  |
| Hypothesis | Includes both independent and dependent variable.  Does not use ‘I’, ‘we’ etc. | 1  1 |  |
| Independent  Variable | Listed the independent variable. | 1 |  |
| Dependent  Variable | Listed the dependent variable. | 1 |  |
| Controlled  Variables | Listed two controlled variables. | 2 |  |
| Results  table | Drawn neatly in pencil and using a ruler.  Includes the headings and units of measurement.  Includes all the data collected during the experiment. | 1  1  1 |  |
| Results  graph |  | 6 |  |
| Discussion | Describes at least two mistakes/errors that occurred.  Explains how these mistakes/error have affected the results.  Explains how these mistakes/errors could be avoided | 2  2  2 |  |
| Discussion  questions | Question 1 completed correctly  Question 2 completed correctly | 1  2 |  |
| Conclusion | One sentence stating the result of the experiment.  One sentence stating whether the hypothesis was proven  or disproven. | 1  1 |  |
| Presentation | Correct spelling, grammar, full sentences.  Written neatly or typed up neatly. | 1  1 |  |
| **Total mark** | | 30 |  |

Mark as percentage %

Teacher’s comments:

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