**10 SCIENCE INVESTIGATION**

RATE OF REACTION: THE EFFECT OF SURFACE AREA



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 design and conduct an experiment to determine how changing the surface area of a reactant changes the rate of reaction.

Hints: to design your experiment you should consider the following.

- How will you measure the rate of reaction?

- What one factor will you change in each of your samples?

- What factors will you try and keep the same for each sample?

**Materials** (materials in a list, detailed, how many of each item). **(2 marks)**

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**Hypothesis** (one sentence prediction of what 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** (starting from step one, list the steps that were taken). **(3 marks)**

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**Results: table (3 marks)**

(Show results taken from experiment, in pencil, with ruler).

**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: (6 marks)**

(Describe two mistakes/errors that occurred, explain how they affected the results and how they could be avoided next time).

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**1.** Give a reason for the relationship between surface area and rate of reaction. **(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 | Correctly worded (e.g. if, then statement).  Includes both dependent and independent variable. | 1  1 |  |
| Independent  Variable | Listed the independent variable. | 1 |  |
| Dependent  Variable | Listed the dependent variable. | 1 |  |
| Controlled  Variables | Listed two controlled variables. | 2 |  |
| Method | Is written in past tense.  Is written in numbered step-by-step.  Includes all the steps completed in experiment. | 1  1  1 |  |
| 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 | Shows the average results, includes all the things a graph  requires. | 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.  Discussion question. | 2  2  2  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** | | 32 |  |

Mark as percentage %

Teacher’s comments:

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