RATE OF REACTION: THE EFFECT OF SURFACE AREA

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**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? Read page 171 activity 4 of your text book.

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

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

**Materials** (materials in a list, detailed, how many of each item). **(3 marks)**

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**Hypothesis** (one sentence prediction of what will happen). **(3 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). **(5 marks)**

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**Results: table (5 marks)**

(Show results taken from experiment, using a ruler).

**Graph:** show your group results. Draw on graph paper and attach. **(7 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: (4 marks)**

(Describe two things in your experiment that could be improved, explain how they affected the results and how they could be avoided or improved next time).

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**Conclusion**  **(2 marks)**

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**MARKING KEY**

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| --- | --- | --- | --- |
| **Content** | **Description** |  | **Your**  **mark** |
| Materials | Is written in a list  Includes all materials and amounts | 1  2 |  |
| Hypothesis | Correctly worded (e.g. if, then statement).  Includes both dependent and independent variable. | 1  2 |  |
| 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  3 |  |
| 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  2  2 |  |
| Results  graph | Shows the average results, includes all the things a graph  requires. | 7 |  |
| Discussion | Describes at least two things to improve.  Explains how they affected the results.  Explains how they could be avoided or improved.  Discussion question. | 4 |  |
| Conclusion | One sentence stating the result of the experiment.  One sentence stating whether the hypothesis was supported or not. | 1  1 |  |
| Presentation |  | 2 |  |
| **Total mark** | | 35 |  |

Mark as percentage %