# Planning a reaction rate investigation – assessment grid

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rsc.li/2pX2oet

You should have a plan for an investigation into how the size of marble chips affects the rate of their reaction with hydrochloric acid. Use this assessment grid to mark the plan.

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|  | **Poor** | **Adequate** | **Good** | **Excellent** |
| **Organisation of ideas** | Ideas are disorganised. It is difficult to follow the practical method suggested. | There is a clear title. It is possible to understand the method intended.  **(1 mark)** | There is a clear main title. The aim, diagram and method are separated. The method is clear and easy to follow.  **(2 marks)** | The title gives the reader the key information about the plan. The aim, diagram and method are separated and labelled with sub-headings. The method is precise and concise.  **(3 marks)** |
| **Diagram** | No diagram is provided. | The diagram is messy. Labelling is incomplete.  **(1 mark)** | The diagram is neatly drawn with a pencil and ruler. Labels are all correct.  **(3 marks)** | The diagram clearly shows key information about how to carry out the practical. It complements the method given.  **(4 marks)** |
| **Fair test** | Fair testing is mentioned vaguely, but no suggestions of how to improve the experiment are given. | One suggestion for making the experiment fair is given.  **(1 mark)** | Two or three suggestions for conducting a fair test are given.  **(3 marks)** | Four or more distinct suggestions for carrying out a fair investigation are given.  **(4 marks)** |
| **Method for comparing the rate of reaction** | The method is incomplete. There is no description of how to compare the rate of reaction in each case. | The method described would work. A **qualitative** method for comparing the rate of reaction is suggested.  **(4 marks)** | The method described would work well. A **quantitative** method of comparing the rate of reaction, such as by measuring the decrease in mass or volume of carbon dioxide produced, is given.  **(7 marks)** | The method described would work well and give **reliable** results. The volume of carbon dioxide released in a given time is measured using a suitable method.  **(8 marks)** |
| **Safety** | The method is unsafe. | The method is safe.  **(1 mark)** | Suitable safety information is given.  **(3 marks)** | Chemical safety information sheets have been used to research the potential hazards of the chemicals selected.  **(5 marks)** |
| **Prediction** | No prediction is given. | A prediction is stated and explained.  **(1 mark)** | A prediction is stated and the reasons for the prediction are explained in terms of collisions between particles.  **(4 marks)** | A prediction is stated and explained. Evidence of research into how surface area affects the rate of reaction and a clear explanation in terms of collision theory is given.  **(6 marks)** |