Plan an investigation into how different catalysts affect the rate of decomposition of hydrogen peroxide. Use the assessment grid to help you

<table>
<thead>
<tr>
<th>Organisation of ideas</th>
<th>Poor</th>
<th>Adequate</th>
<th>Good</th>
<th>Excellent</th>
</tr>
</thead>
</table>
|                       | Ideas are disorganised and 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 and the method is clear and easy to follow.  
(2 marks)                                                                  | The title gives the reader the key information about the plan. Aim, diagram and method are separated and labelled with subheadings. The method is precise and concise.  
(3 marks)                                                                 |
| Diagram               | No diagram is provided.                                                                      | The diagram is messy or drawn in pen. 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 this 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. A suggestion for how to compare rates of different reactions is not given. | The method described would work. At least two potential catalysts have been chosen. A **qualitative** method for comparing the rate of reaction is suggested. **(4 marks)** | The method described would work well. At least three potential catalysts have been chosen. A **quantitative** method for comparing the rate of reaction, such as measuring the decrease in mass or volume of oxygen produced, has been given. **(7 marks)** | The method described would work well and give **reliable** results. At least four potential catalysts have been chosen. The volume of oxygen 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 particle collisions. **(4 marks)** | A prediction is stated and explained. Evidence of research into how using a catalyst affects the rate of reaction and a clear explanation in terms of collision theory are given. **(6 marks)** |