

Investigation 1

Catalase and hydrogen peroxide

Title of investigation	What factors affect the rate catalase decomposes hydrogen peroxide?
Specification	Single Award and Double Award
Attainment target	Life and living processes <i>or</i> Materials and their properties
Tier	Foundation and Higher

13.1 A checklist for this investigation

Points to be considered	Responses	
	Independent	Dependent
What variables are most frequently involved?	<ul style="list-style-type: none"> • surface area 	<ul style="list-style-type: none"> • volume of oxygen produced
	<ul style="list-style-type: none"> • temperature 	<ul style="list-style-type: none"> • volume of oxygen produced
	It is not recommended that students investigate the effect of changing the concentration of the hydrogen peroxide solution. This effect is more appropriately investigated when dealing with the rate of reaction between marble chips and hydrochloric acid.	
What key factors need to be controlled?	<ul style="list-style-type: none"> • For surface area – the key factors are time and temperature. • For temperature – the key factors are time and surface area. 	
What other factors need to be controlled?	The volume of the hydrogen peroxide solution.	
Is any one independent variable better to investigate?	For able students, investigating the effects of changing the surface area is likely to offer a more challenging activity.	
Is it possible for students to carry out preliminary work?	Yes. There are numerous opportunities for preliminary work for whichever independent variable is investigated.	
Can quantitative predictions be made – as these will help able students to carry out a quantitative analysis of their results?	Yes, for an investigation based on changes in surface area.	
Is the scientific knowledge present in the specification sufficient to enable able students to show a deep understanding of the topic?	<ul style="list-style-type: none"> • Not specifically mentioned in any specification are: <ul style="list-style-type: none"> – the concept of optimum temperature – the 'lock and key' mechanism. • However, the 'collision' theory is present. • In order to give credibility as to why catalase is used in the investigation, students may need to be provided with some extra information (see Section 13.2). 	

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