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## Teacher Guide: Unit 8 Investigating the Scientist's Work

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### Guidance for Teachers

- Guidance on delivery – Page 99-100 – or reference to this from the specifications
- Resources – Page 104-105 – or reference to this from the specifications.

### Guidance on Assessment

- Assessment guidance – Page 100-104 – or reference to this from the specifications
- Assessment Evidence Grid Unit 8 – attached.

### Assignment Work

- The assignment briefs included with this unit are expected to give ideas on how to cover the required assessment criteria.
- The topic chosen for this unit depends on the Centre. Work should reflect progression in work studied for the AS units and build on the practical and organisational skills gained during the course.
- It is important that the time spent on the topic area links to the mark awarded.
- It is hoped that centres will use these ideas as a starting tool.
- Student work included with this unit gives help to support the requirements of the assignment. It is hoped that this should be used to help to support the standard required.

### Suggested Time Allocation

- Based on 50-60 hours spent on this unit
- Includes work on assignment + teaching and learning time
- Some time should also be reserved for feedback and return of work after/before moderation.

<b>Assessment Objective to be Covered</b>	<b>Mark Awarded</b>	<b>Possible Time Allocation</b>
<b>AO1</b>	10	12
<b>AO2</b>	14	16
<b>AO3</b>	26	30

## Teacher Resource Material

- Assessment Recording Sheet – suggestion of a possible method to collate marks from assignments
- Assignment No. 8.1: Generic Assignment Brief
- Assignment No.8.1: Student Work ‘Calcium in Milk’/Commentary on Mark Allocation
- Assignment No. 8.2: ‘Investigating Insulating Materials’
- Assignment No. 8. 2: Student Work/Commentary on Mark Allocation.

**Unit 8: Investigating the scientist's work**

**What you need to do:**

**You need to produce** an information pack, which can be used and understood by a group of scientific research technicians [50 marks].

This evidence needs to include:

**AO1:** a detailed and workable plan for **one** scientific vocational investigation, to include aims and objectives, full details of experimental work, and constraints under which you will need to work, with documented evidence of research [10];

**AO2:** a record of the data collected and how it was processed and interpreted [14];

**AO3:** evidence to show how the plan was implemented safely and an evaluative scientific report on the outcomes of the investigation suitable for the technicians to understand and use [26].

**How you will be assessed:**

Assessment Objective	Mark Band 1	Mark Band 2	Mark Band 3	Mark Awarded
AO1	You will produce a workable and clearly presented plan for <b>one</b> investigation linked to a vocational context; the plan shows a basic knowledge of the scientific principles and experimental techniques involved; [0 1 2]	you will produce an achievable and logically presented plan, for <b>one</b> investigation with direct vocational involvement which shows a sound knowledge and understanding of the aims and objectives set; [3]	you will produce a comprehensive, realistic, achievable and logically presented plan for <b>one</b> suitable investigation which demonstrates thorough knowledge and understanding of the aims and objectives. [4 5]	/10
	You will show evidence of selected research about suitable experimental work and health and safety, identifying information on deadlines you will need to be aware of; [0 1 2]	you will show evidence of a wide range of relevant research, selected from a number of sources with suitable validation, identifying constraints you will have to work under and how they can be overcome; [3]	you will show evidence of thorough research and suitable selection of information from a wide range of sources, identifying and discussing constraints, their effect and suitable contingency plans. [4 5]	
AO2	You will record the results of the investigation and present them in a suitable format; [0 1]	you will produce a description and explanation of the results presented in a suitable format; [2 3]	you will record and present the results of the investigation in a suitable manner and provide a detailed explanation. [4]	/14
	You will show limited processing and interpretation of the data collected with a suitable link to the vocational context set; [0 1 2]	you will show suitable processing and interpretation of the data collected, relating to the objectives of the investigation; [3]	you will show evidence that the appropriate method of processing has been selected and used and any anomalous data identified and evaluated; a critical analysis of the results relating to the objectives of the investigation. [4 5]	
	You will carry out a number of completed straightforward calculations; [0 1 2]	you will carry out a number of complex calculations completed with partial success; [3]	you will carry out a number of complex calculations to completion, obtaining the correct solutions to the appropriate degree of accuracy. [4 5]	

<b>Unit 8: Investigating the scientist's work (continued)</b>				
<b>Assessment Objective</b>	<b>Mark Band 1</b>	<b>Mark Band 2</b>	<b>Mark Band 3</b>	<b>Mark Awarded</b>
<b>AO3</b>	You will provide evidence that the experimental procedures or trials in the investigation have been safely and correctly carried out and repeated where necessary using risk assessments; <b>[0 1 2]</b>	you will show evidence that a range of experimental techniques and procedures has been safely and skilfully completed, using suitably detailed risk assessments, within the constraints of the plan; you will demonstrate that an appropriate degree of accuracy has been used; <b>[3 4]</b>	you will show evidence that a wide range of experimental techniques and procedures has been safely, skilfully, accurately and independently completed, using risk assessments which you have produced. <b>[5 6]</b>	
	You will produce a record which shows that the plan has been followed and monitored; <b>[0 1 2]</b>	you will record any modifications or changes needed to be made, providing reasons for the changes; <b>[3]</b>	you will carry out and provide explanations of any strategies used to overcome any deficiencies or constraints of the plan. <b>[4 5]</b>	
	You will produce a clear and accurate report of the outcomes of the investigation, using basic scientific terminology correctly, which can be understood by research technicians; <b>[0 1 2]</b>	you will produce a logical and accurate report of the outcomes of the investigation, using scientific terminology correctly, which can be understood and used by research technicians; there is evidence to show understanding of the scientific concepts involved in the investigation; <b>[3 4 5]</b>	you will produce a logical and well-structured report of the outcomes of the investigation using all the appropriate scientific terminology, suitable for use by scientific technicians; this will show a high level of scientific knowledge and understanding relevant to the investigation and its applied implications. <b>[6 7]</b>	
	You will interpret the data; <b>[0 1]</b>	you will assess the reliability of the data and how well the investigation achieved its aims; <b>[2 3]</b>	you will discuss the reliability of the investigation with a detailed scientific discussion of how the investigation achieved its aims and objectives. <b>[4]</b>	
	You will produce a basic evaluation of the investigation; <b>[0 1]</b>	you will produce an evaluation of the investigation; <b>[2 3]</b>	you will produce a critical evaluation of the investigation, incorporating suitable amendments where appropriate. <b>[4]</b>	<b>/26</b>
<b>Total mark awarded:</b>				<b>/50</b>