

Sample Teaching Plan
Unit G625: Forensic Science

Suggested teaching time

Plan is based on 12 weeks at 5 hours per week (4 hours contact time + 1 hour directed study)

The learning activities are suggestions only. Teachers may wish to develop alternative strategies. The plan should be read alongside the G625 Specification and, in particular, the Assessment Evidence Grid (attached for your reference).

There are many resources for Forensic Science and only a few are given here.

- www.colorado.edu/outreach?BSI/k12activites/forensics.html has many ideas for practical work and also notes for technicians (however, this is an American site so check Health and Safety regulations).
- www.thinkforensic.co.uk has worksheets, which can be downloaded. A small fee is needed for access.

Week number	Specification Unit Reference and Assessment Objectives	Suggested Learning Activities	Resources
1	3.6.1: Recording & Collection of Evidence – AO1(a) & (c)	<p>Procedures needed to ensure preservation of a crime scene</p> <p>Teacher introduction possibly by use of a video. Candidates increase their knowledge through research and assignment work, discussion on topics given in 3.6.1:</p> <ul style="list-style-type: none"> • recording and preserving a crime scene so that the evidence is not compromised. • ethics of evidence collection. <p>Student-centred research to complete Assignment</p>	<p>www.crime-scene-investigator.net/</p> <p>CSI videos or DVD etc. The Forensic Science World Pfizer.</p> <p><i>Sample Assignment A:</i> Examination Coursework destroyed by Arsonists.</p>
2 – 3	3.6.1: Recording & Collection of Evidence – AO1(b) & (c)	<p>Techniques physical, biological and chemical used to obtain evidence</p> <p>Teacher introduction</p> <ul style="list-style-type: none"> • on collecting evidence using: physical, biological, chemical techniques. <p>Student-centred research to complete assignment.</p> <ul style="list-style-type: none"> • ethics of evidence collection – further discussion. 	<p>The Forensic Science World Pfizer.</p> <p>AS & A2 Applied Science Heinemann ISBN 978 0435692 12 4.</p> <p>Use of <i>Sample Assignment A:</i> Examination Coursework Destroyed by Arsonists.</p>

Week number	Specification Unit Reference and Assessment Objectives	Suggested Learning Activities	Resources
4	3.6.1: Recording & Collection of Evidence – AO1(c)	<p>Ethics</p> <p>Further discussion on ethical issues involved in forensic science (this could be left towards the end of the unit if preferred).</p> <p>Student-centred research to complete <i>Sample Assignment A</i>.</p>	<p>www.ornl.gov/sci/techresources/Human_Genome/elsi/forensics.shtml</p>
5 – 6	3.6.2: Methods of Analysis of Evidence – AO3(a) (b) & (c) and AO2(b)	<p>Physical techniques to analyse evidence Practical work on analysis</p> <p>Teacher-led introduction/practical work followed by candidate assignment on:</p> <ul style="list-style-type: none"> • analysis using Refractive Index of glass or • practical involving soil analysis or • written description of test firings for bullet comparisons. <p>Using ‘matching of patterns’ e.g. fingerprints, footprints, tyre marks, tool marks, dental records.</p>	<p>Fingerprints: www.creative_chemistry.org.uk/activities</p> <p>Footprints: Refractive index, soil analysis. (candidates do not have to complete all practical activities). Standard physics texts. CSI or CSI Miami videoed. Use of <i>Sample Assignment A</i> (write up as a case study). Candidates may prefer to write up practical work as their evidence; this is also permissible. Ref 3.6.2 (page 31).</p>

Week number	Specification Unit Reference and Assessment Objectives	Suggested Learning Activities	Resources
7 – 8	3.6.2: Methods of Analysis of Evidence – AO3(a) (b) & (c) and AO2(b)	<p>Biological techniques to analyse evidence</p> <p>Teacher introduction/practical work. Assignment-based practical work on:</p> <ul style="list-style-type: none"> • using a microscope for identification of e.g. fibres, pollen, hair, crystal structure. • research into analysis using body fluids e.g. DNA analysis, blood. • practical on identification of insects/habitat of insects. • research on immunological analysis and write up. • any points relevant to collection and analysis of evidence. 	<p>Use of insects: www.forensicentomology.com</p> <p>Blood groups. Hair/pollen microscope. Video Advanced GNVQ. Bio Rad kit. CSI. Cross reference to Unit G622 Blood test. R.S.C. publication <i>Chemistry at the Races</i>. Use of <i>Sample Assignment A</i> (write up as a case study). Candidates may prefer to write up practical work as their evidence; this is also permissible. Ref: 3.6.2 (page 31).</p>
9 – 10	3.6.2: Methods of Analysis of Evidence – AO3(a) (b) & (c) and AO2(b)	<p>Chemical techniques to analyse evidence</p> <p>Teacher introduction on methods of chemical analysis. Practical assignment work on:</p> <ul style="list-style-type: none"> • chromatography (possible practical on chromatographic separation of inks used in forgery cases). • analysis using IR. • qualitative analysis of unknown 'white powders'. 	<p>SATIS 16-19 Accident or Arson, Work done in 2.2.3. Chemistry 1, C.U.P. Questions in Salters Chemistry. GNVQ Advanced Science practical folders Heinemann. Analysis of inorganic/organic. www.creative_chemistry.org.uk/activities</p> <p>Chromatography. Infrared spectroscopy. Use of <i>Sample Assignment A</i> (write up as a case study). Candidates may prefer to write up practical work as their evidence; this is also permissible. Ref: 3.6.2 (page 32).</p>

Week number	Specification Unit Reference and Assessment Objectives	Suggested Learning Activities	Resources
11 – 12	3.6.3: Evidence and proof – AO2(a)	<p>Candidates research the evidence (in outline) used in an actual case.</p> <p>Discussion on the strengths and limitations of the evidence produced.</p>	<p>e.g. O.J. Simpson case / Birmingham 6.</p> <p>www.forensic-evidence.com</p>

Work on calculations can be included within the practical work or if candidates wish to complete separate work on this – ideas are given with assignment B.

Unit G625 - Assessment Evidence Grid

Unit G625: Forensic Science				
What the candidate needs to do:				
<p>The candidate needs to produce evidence of their investigation into forensic science [50 marks].</p> <p>This evidence needs to include:</p> <p>AO1: a knowledge and understanding of the need to preserve and record the crime scene and the chemical, biological and physical techniques used to collect and visualise forensic evidence safely, including ethical considerations [21];</p> <p>AO2: a report on a forensic case study on evidence and proof; work which demonstrates the use of calculations to support forensic measurements or observations [10];</p> <p>AO3: at least one forensic analysis in each of the following areas: biological, chemical and physical techniques [19].</p>				
How the candidate will be assessed:				
Assessment Objective	Mark Band 1	Mark Band 2	Mark Band 3	Mark Awarded
AO1	Candidate will demonstrate a basic knowledge of the need to record and preserve the crime scene, giving some of the techniques used; <div style="text-align: right;">[0 1 2]</div>	candidate will demonstrate knowledge and understanding of the need to record and preserve the crime scene, describing a range of techniques used; <div style="text-align: right;">[3 4]</div>	candidate will demonstrate a thorough knowledge and understanding of the need to record and preserve the crime scene with a detailed description and explanation of a wide range of techniques used. <div style="text-align: right;">[5]</div>	
	The candidate's work will show some information on how forensic scientists collect and visualise evidence safely using <ul style="list-style-type: none"> • chemical techniques; [0 1] • biological techniques; [0 1] • physical techniques; [0 1] with evidence of some scientific terminology and corrected punctuation and grammar;	the candidate's work will show research and information on ways in which forensic scientists collect and visualise evidence, safely and appropriately, using <ul style="list-style-type: none"> • chemical techniques; [2] • biological techniques; [2] • physical techniques; [2] generally, candidate will use appropriate scientific terms correctly, and use correct punctuation and grammar;	candidate will produce an in-depth research report showing understanding of a range of ways in which forensic scientists collect and visualise evidence, safely and appropriately, using <ul style="list-style-type: none"> • chemical techniques; [3 4] • biological techniques; [3 4] • physical techniques; [3 4] candidate will understand the science behind these techniques and use appropriate scientific terms and conventions correctly, with correct spelling, punctuation and grammar.	
	The candidate's work will show a basic knowledge of ethical issues involved in retaining samples or data; <div style="text-align: right;">[0 1]</div>	the candidate's work will show a range of information on ethical issues related to forensic science; <div style="text-align: right;">[2 3]</div>	the candidate's work will show a range of relevant information on ethical issues in forensic science and an understanding of the need for an ethical code. <div style="text-align: right;">[4]</div>	

Unit G625: Forensic Science (continued)				
Assessment Objective	Mark Band 1	Mark Band 2	Mark Band 3	Mark Awarded
AO2	The candidate's report, based on a case study, will contain some information on evidence and proof including information on the strengths and limitations of some types of forensic evidence; [0 1 2]	the candidate's report, based on a case study, will contain detailed information on evidence and proof which includes <ul style="list-style-type: none"> the ways in which forensic scientists ensure that the quality of evidence collected and analysed is objective; strengths and limitations of the analytical techniques used and some interpretation of the probability of guilt; [3 4]	the candidate's report, based on a case study, will contain researched and relevant detailed information on evidence and proof which includes <ul style="list-style-type: none"> the ways in which forensic scientists ensure that the quality of evidence collected and analysed is objective; detail on limitations; strengths and weaknesses of the analytical techniques used; an understanding of the probability of guilt and of a need to review evidence. [5 6]	/10
	Candidate will complete straightforward calculations on forensic data and will sometimes obtain the correct solutions; [0 1]	candidate will complete straightforward calculations on forensic data and will obtain the correct solutions; [2 3]	candidate will complete more complex calculations and will obtain the correct solutions to an appropriate degree of accuracy. [4]	
AO3	Candidate will safely carry out one forensic analysis in each of the three areas <ul style="list-style-type: none"> biological chemical physical and record evidence of completion; candidate will use risk assessments; [0 1 2 3 4]	candidate will carry out at least one forensic analysis in each of the three areas <ul style="list-style-type: none"> biological chemical physical safely and with some skill and confidence; candidate will produce and use suitable risk assessments and record evidence of completion; candidate will use a range of techniques and equipment and repeat some measurements where necessary; candidate will work with an appropriate degree of accuracy; [5 6]	candidate will carry out at least one forensic analysis, in each of the three areas <ul style="list-style-type: none"> biological chemical physical safely, skilfully, and accurately using different techniques; candidate will produce detailed risk assessments and use them appropriately and record evidence of completion; candidate will explain why they used the range of techniques and equipment and repeat measurements where appropriate; candidate will work with an appropriate degree of accuracy throughout. [7 8]	/19
	Candidate will make and record at least one set of forensic observations or measurements in each area and display the data obtained; [0 1 2]	candidate will make and record at least one set of appropriate forensic observations or measurements in each area, using some precision in their measurements, and display the data accurately in a range of ways; [3]	candidate will make and record at least one set of relevant forensic observations and measurements in each area, using the appropriate precision in the candidate's measurements, and candidate will display the data accurately in a range of ways. [4 5]	
	Candidate will attempt to process and interpret some results in each of the three areas; [0 1 2]	candidate will process and interpret their results in each of the three areas; [3 4]	candidate will process and interpret their results in each of the three areas in detail, discussing their significance. [5 6]	
Total mark awarded:				/50