**General Integrated Science**

**UNIT 2**

**Task 10 – Extended Response – Zooming Into Evidence**

**Weighting 7.5 %**

**Conditions**

Time for the task:

* Part 1: 1 week to research topic and complete notes. These are to be handed in **prior** to the in-class validation
* Part 2: 50 minutes for in-class validation – extended response exam style questions **without notes**.

## **Criminal Investigation research assignment**

**Part 1: Research notes (40% weighting)**

You are to conduct research into how evidence is collected from a crime scene, how it can be analysed and how it can be used as evidence in a criminal investigation. You will be given some websites that will help you conduct your research but you can use other resources.

The answers to the following questions will form the basis of your research notes.

1. Explain the difference between a crime scene investigator and a forensic scientist
2. When a crime scene investigator arrives on the scene of a crime, what is the sequence of events they must go through to collect valid evidence? List the events in order.
3. List the main types of evidence that criminal investigators would need to collect from a crime scene
4. Why is crime scene photography a useful tool for criminal investigation?
5. Describe trace evidence
   1. Provide examples of trace evidence
   2. Explain how this evidence can be used to solve a crime
   3. Describe how trace evidence is collected from a crime scene.
6. DNA and blood are important sources of evidence in criminal court cases.
   1. Which portions of DNA do forensic scientists use in criminal investigations?
   2. How is DNA evidence collected and then analysed? Provide some examples and explain how they give us useful evidence.
   3. Sometimes crime scenes are cleaned or contaminated, and investigators need blood based evidence. Explain how blood could be found after contamination
   4. Explain how blood droplets and blood splatter patterns are used as evidence
7. Fingerprints can often be found at a crime scene.
   1. Where would a scientist look for fingerprints
   2. How would fingerprints be collected for analysis?
8. What is forensic drug chemistry?
   1. How is it carried out to provide evidence for a criminal investigation?
   2. Provide some examples where this may be a useful technique.
9. Imprints left by people’s shoes/feet and vehicles can provide vital clues for police.
   1. What information can police gain from such imprints?
   2. How are samples of these imprints collected from a crime scene?
10. How long does the process of collecting and analysing data take?

Useful websites:

* <http://www.exploreforensics.co.uk/building-a-case-using-forensic-evidence.html>
* <https://www.australianpolice.com.au/forensic-scientists/>
* <http://www.forensicscolleges.com/blog/resources/csi-vs-forensic-science>
* <http://www.forensicsciencesimplified.org/>
* <https://www.sciencelearn.org.nz/resources/1979-crime-scene-evidence>
* <http://splash.abc.net.au/home#!/digibook/965439/the-real-csi>
* <http://splash.abc.net.au/home#!/media/1264797/fighting-crime-with-science>
* <http://www.bbc.com/news/magazine-11794286>

**Part 2: In-class assessment (60% weighting)**

* You will be given specific exam style questions based on your research. Notes **will not** be allowed for the validation

**Marking key**

1. Explain the difference between a crime scene investigator and a forensic scientist

2 marks

1 mark = forensic scientists are police experts who conduct analysis of crime scenes in the lab

1 mark = investigators examines crime scene and collects evidence

1. When a crime scene investigator arrives on the scene of a crime, what is the sequence of events they must go through to collect valid evidence? List the events in order.

2 marks

1 mark – gives logical events investigator must do, but in incorrect/unsafe/illogical order

2 marks – gives logical events investigator must do in safe and logical order

Preservation, walkthrough/sequence of events, photographs/documentation, evidence collection

1. List the main types of evidence that criminal investigators would need to collect from a crime scene

2 marks

1 mark – images (e.g. photos, video)

1 mark – objects (e.g. body fluids, hair etc)

1. Why is crime scene photography a useful tool for criminal investigation?

2 marks

1 mark – allows recreation of scene for later analysis

1 mark – useful in court to demonstrate layout

1. Describe trace evidence

1 mark - Tiny fragments of physical evidence

* 1. Provide examples of trace evidence

Max 3 marks

1 mark per example

Hair, clothing fibres, glass pieces

* 1. Explain how this evidence can be used to solve a crime

Indicate that someone or something was present around time of the crime

1 mark

* 1. Describe how trace evidence is collected from a crime scene.

2 marks

1 mark – nonspecific answer

2 marks – specific answer for specific types of trace evidence.

1. DNA and blood are important sources of evidence in criminal court cases.
   1. Which portions of DNA do forensic scientists use in criminal investigations?

Autosomal and sex (XY) chromosomes

2 marks

* 1. How is DNA evidence collected and then analysed? Provide some examples and explain how they give us useful evidence.

4 marks

1 mark – biological sample collected

1 mark – examples e.g. hair from clothing

1 mark – compare sample from crime scene to reference samples and/or elimination samples

1 mark – explanation for how it’s useful

* 1. Sometimes crime scenes are cleaned or contaminated, and investigators need blood based evidence. Explain how blood could be found after contamination

2 marks

* 1. Explain how blood droplets and blood splatter patterns are used as evidence

1 mark –gives information on order and location of events, who was there

1. Fingerprints can often be found at a crime scene.
   1. Where would a scientist look for fingerprints

2 marks – several specific examples

1 mark – several vague examples, or one or two specific examples

* 1. How would fingerprints be collected for analysis?

4 marks – describes two collection methods

2 marks – lists two collection methods

1. What is forensic drug chemistry?
   1. How is it carried out to provide evidence for a criminal investigation?

3 marks

1 mark – investigating illegal drugs found during investigation

1 mark – basic (one sentence) or vague description of process given

2 marks – detailed, specific description of process given

* 1. Provide some examples where this may be a useful technique.

1 mark per example

Max 2 marks

1. Imprints left by people’s shoes/feet and vehicles can provide vital clues for police.
   1. What information can police gain from such imprints?

2 marks

Half a mark per example of information

* 1. How are samples of these imprints collected from a crime scene?

2 marks

1 mark – basic (one sentence) or vague description of process given

2 marks – detailed, specific description of process given

1. How long does the process of collecting and analysing data take?

1 mark

At least two weeks