

2022

Year 11 Integrated Science – Unit 2: Physical & Chemical Sciences

Task 10: Forensics Portfolio

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| --- | --- | --- | --- |
| **Assessment Type:** |  | Name: |  |
| Extended Response |  |
| **Duration & Conditions:**  5 weeks – Group & |  | Teacher: |  |
| individual work |  |  |  |
| **Assessment weighting:**  15 % of year mark |  | Date: |  |

|  |  |
| --- | --- |
| **Section** | Marks |
| **Introduction: Forensic Science** |  |
| **Part One: The Crime** |  |
| **Part Two: The Crime Scene** |  |
| **Part Three: Suspect Statements** |  |
| **Part Four: The Evidence** |  |
| **Part Five: Case Solved** |  |
|  |  |
| **Total Mark** |  |

I acknowledge that all the information contained in this task is my own work and not taken from other sources. If other sources have been used, they have been acknowledged in my references.

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(Student Signature)

Please see SEQTA for teacher feedback and comments

# **ASSESSMENT INFORMATION:**

Over the course of Unit 2, you will complete ten (10) tasks in five (5) parts relating to this Forensics Portfolio Assessment. These tasks will be in addition to tests and investigations you complete for the Chemistry and Physics course content. This assessment will be completed over the duration of the remaining year, with blocks of time set aside to work on each task.

Each part specifies if the task is to be completed individually or in a group. Where it specifies group work, groups may be no more than three (3) students/group members.

## **INTRODUCTION:** Forensic Science (Individual work)

This part is an introduction to forensic science. It contains three activities that need to be completed prior to starting the Crime Scene Investigation

## **PART ONE:** The Crime (Individual work)

This part is the introduction to the Crime. You will find out what happened, what the victim should do and why, and about the police roles and how they identify possible suspects.

## **PART TWO:** The Crime Scene (Group work)

This part introduces the initial evidence found at the crime scene. It also includes the victim’s statement to police and maps of the crime scene. You will be asked to explain what should be done with the evidence at the laboratory, to list possible suspects and suggest what questions you would ask.

## **PART THREE:** Suspect Statements (Group work)

This part provides you with statements from six possible suspects. You will need to rank the suspects in of who is most likely to be the thief and provide reasons for this order.

## **PART FOUR:** Examining the Evidence (Group work)

This part provides you with evidence from each of the suspects as well as soil and fibre samples from the crime scene to analyse. You will need to match the evidence with the possible suspects and then evaluate whether there is a reasonable explanation for the link, or if the link makes for a stronger case against any of the suspects. You will need to suggest how you think the crime was committed and by whom.

### **TASK 4A:** Shoe Prints

### **TASK 4B:** Fingerprints

### **TASK 4C:** Soil Samples

### **TASK 4D:** Writing Samples

### **TASK 4E:** Writing Samples Ink

## **PART FIVE:** Case Solved (Individual)

This last part of the portfolio is the conclusion to the investigation. It will be conducted under test conditions and you will be provided with your portfolio of evidence to reach a conclusion of who committed the theft.

Good luck with your investigation!

# **INTRODUCTION: Forensic Science Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

*The tasks in this part are to be completed as* ***Individual work.***

## Activity One: Forensics

Before the twentieth century, it was almost impossible for a criminal to be convicted of a crime unless he or she was ‘caught in the act’ or identified by an eyewitness. However, in the early 1900s solving crimes started to develop into a science, which involved police closely examining the place where a crime was committed. They look for clues or evidence that might lead them to discover who committed the crime.

For this to be successful, the crime scene must be as close as possible to the condition it was when the offender (person who committed the crime) left. If the scene in interfered with, it is possible that clues or evidence might be destroyed or accidentally carried away by innocent people, extra evidence that has nothing to do with the crime could also be left behind.

To avoid this, examining the site should be left to experts because they have been trained to look for the smallest pieces of evidence without doing any damage. They look for hairs, fibres, fingerprints invisible to the eye, small spots of blood and more obvious evidence, such as shoeprints or tyre impressions.

These experts wear special protective clothing that does not shed fibres and stand on duckboards to avoid touching the floor. They also wear hairnets, overshoes and gloves so that they don’t leave anything of themselves behind. Small objects are picked up with tweezers then places into special bags. These bags are sealed and labelled with the type of object, the date, where the item was found and by whom. This evidence is then transported to the forensic laboratory where it is closely inspected or tested by experienced scientists.

1. List five (5) precautions taken by crime scene examiners to ensure that none of their own hairs, fibres or fingerprints are left behind at a crime scene. Explain why you think these precautions are taken. (3 marks)

|  |  |
| --- | --- |
| 1. **Protective clothing** 2. **Duckboards** 3. **Hairnets**   **3 marks if identifies all precautions**  **1 mark if identifies 1-2 precautions** | 1. **Overshoes** 2. **Gloves**   **2 marks if identifies 3-4 precautions** |

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1. What information is written on a bag containing evidence that is collected at a crime scene? Why do you think all this information is necessary? (2 marks)

**Written on evidence bags:**

* **Type of object - date - where the item was found - who found the item**

**2 marks correctly identifies all written components**

**1 mark correctly identifies at least 2 written components**

1. Match each of the below types of evidence to the forensic experts. (3 marks)

|  |  |
| --- | --- |
| Forensic dentist | Blood or saliva |
| Fingerprint expert | Drugs |
| Handwriting expert | Skeleton of unknown person |
| Pathologist or DNA expert | Fingerprints |
| Chemist or pharmacist | Bullets, gun or used cartridge cases |
| Ballistics (firearms) expert | Handwritten note |

1. Imagine you are the first person to arrive home after school. You find the front door open and the entrance hall has been ransacked. Which one of the following things should you do? Explain why you chose this answer. (2 marks)
   1. Run inside and check to see if anything is missing from your room.
   2. Go straight to a neighbour’s house and call your family and the police
   3. Stand in the middle of the footpath and call “help”
   4. Sit down on the front step and wait for your family to get home

**1 mark – chooses b**

**1 mark – explains why leaving the scene and calling the police is the best option**

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## Activity Two: Fingerprints

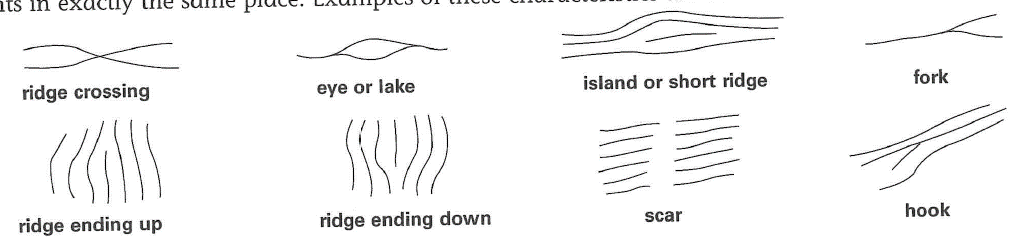
Every person is born with a unique pattern of ridges and furrows on their fingers and hands. These patterns can be used to identify individuals. The ridges and furrows can be grouped into eight basic patterns as shown below.

Diagram

Description automatically generated

Fingerprints cannot be perfectly matched using only these patterns - there must be other characteristics or features that match.

In order to declare that a fingerprint found at a crime scene and a fingerprint held by the police were made by the same finger, a fingerprint expert has to find at least eight (8) identical characteristics on both fingerprints in exactly the same place. Examples of these characteristics are below.



1. A picture containing text, invertebrate, arthropod, trilobite

   Description automatically generatedFind eight characteristics that match the two fingerprints to the right. Classify each characteristic and write the numbers in the appropriate places on the fingerprints. (2 marks)

|  |  |
| --- | --- |
| 1. fork | 5. island/short ridge |
| 2. ridge crossing | 6. scar |
| 3.ridge ending up | 7. hook |
| 4. eye or lake | 8. ridge ending down |

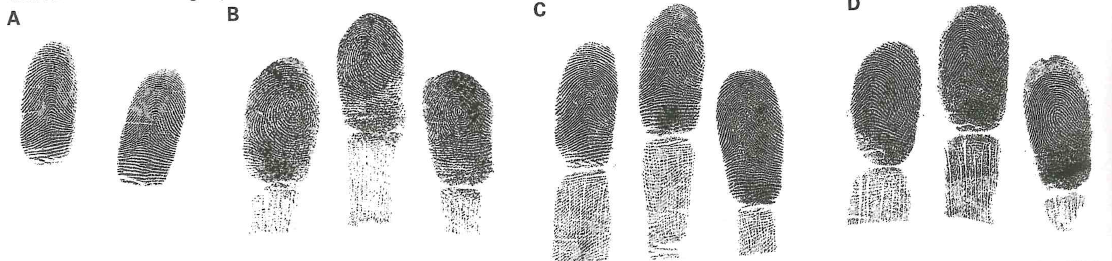
1. Which of the fingerprint above do you think was found at a crime scene and which was made at the police station using ink? (1 mark)

**Square shaped fingerprint made using ink, round partial print found at crime scene**

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1. Match the two fingerprints below (A) with those taken from three different suspects (B, C, D).

(1 mark)



D

## Activity Three: Handwriting

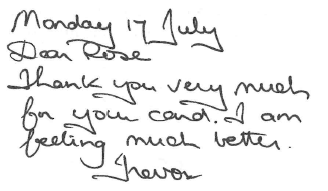
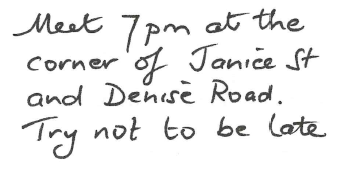
An individuals handwriting is unique and the way it appears on paper depends on the interaction of the brain, eye and hand. Its appearance is also affected by the writers physical and emotional state, the position in which he or she is writing and the type of pen or pencil being used.

The following is a list of criteria that a handwriting expert would look at when comparing two samples of handwriting.

|  |  |
| --- | --- |
| * How high and low the letters are in relation to a horizontal line. | * The slope of the writing (backhand \\, upright || or normal //) |
| * The average space between the words and some letters | * The style of the writing (cursive, printed or block letters) |
| * The pressure and flow of the writing | * The style of certain letters |

Experts that analyse handwriting can tell if a person is right-handed (pulls the pen across the page) or left-handed (pushes the pen across the page).

1. Look at the two samples of handwriting. Do you think that they were written by the same person? Give reasons to support your answer. (2 marks)**1**



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1. Text, letter

   Description automatically generatedThe family of Martha Smith are disputing her will, saying that it was forged. Compare the handwriting on the will with that taken from Martha’s shopping list. Do you think the family is right in having the will checked out? Give reasons for your answer. (2 marks)

**1 mark – answers yes**

**1 mark – loop on y is different, lettering to narrow, o’s are different**

# **PART ONE: The Crime Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

*The tasks in this part are to be completed as* ***Individual work.***

## **The theft of the Southern River College Athletics Trophy**

When Blair arrived at Southern River College on the morning of March 31st it seemed like a normal morning. There were a couple cars in the carpark, but nothing out of the ordinary. Not even when she walked into the gym office and the main door was unlocked, did Blair notice anything amiss. It wasn’t until Kamill and Michael came into the PE office later that morning bringing in an envelope and asking if anyone knew if the sportsperson of the year trophy had been sent off for cleaning that the PE Department realised that something was truly amiss.

Kamill passed the envelope over to Blair, stating that it was wedged between the glass of the display cabinet, before leaving the office with Michael, not realising the seriousness of the situation. Blair opened the envelope and it read:

Ransom note

1. What are the first two things that Blair should do, and in what order? What is one thing that Blair should NOT do. (3 marks)

**2 marks for either - call police, go to HoLA, go to Principal/Deputy, block off the area so no one can touch the cabinet or contaminate the crime scene**

**1 mark for either – don’t tell anyone, go check the trophy cabinet, do nothing**

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1. Give reasons for your answer to question 1. (2 marks)

**1 mark – stop crime scene being contaminated**

**1 mark – help the investigation rather than hinder it**

**Or any other reasonable explanation (the police are experts at catching criminals)**

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1. What consequences could there be for Blair not noticing the trophy was missing? Will this affect the investigation? (2 marks)

**1 mark – delay investigation, might not have accurate time frame**

**1 mark – Blair could be considered a suspect \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

1. Listed in the table are three key people who might be at the crime scene to help you with the investigation. For each person, describe what tasks you think they would be expected to carry out at the crime scene. Use the description to work out who the fourth person is. (4 marks)

|  |  |
| --- | --- |
| Forensic Team Member | Description of each person’s tasks |
| Crime scene examiner/s | **Search crime scene and surrounding areas for evidence left by thief** |
| Psychological profiler | **To work out why the trophy was taken and where to look for it** |
| Police draftsman | **Draw up a map of the crime scene showing where evidence were found** |
| **Police photographer** | *To photograph the scene before anything is moved.* |

1. In the list below, highlight the first two tasks that you (as the person in charge) would carry out.

(1 mark)

* 1. Search for possible evidence at the (crime scene)
  2. Question the staff regarding anything suspicious they have seen
  3. Interview Blair to find out who they think might have taken the Athletics Trophy
  4. Analyse the ransom note
  5. Organise and supervise all the different people who are helping to find the Athletics Trophy.

1. Who will check the ransom note? (1 mark)

**1 mark - Handwriting expert and fingerprint expert**

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1. What are two important things that the person checking the ransom note might look for? (2 marks)

**1 mark - Handwriting comparison**

**1 mark – fingerprint comparison**

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1. List four different types of evidence that you will instruct your staff to look for at the crime scene.

(2 marks)

|  |  |
| --- | --- |
| 1. fingerprints | 1. hairs and fibres |
| 1. footprints | 1. signs of break-in |

or anything that is out of place or looks odd.

1 mark – for at least 2 correct 2 mark – for all 4 correct

1. What are four important questions Blair should be asked? (2 marks)

**What were your movements that morning?**

**Did you notice anything unusual or suspicious?**

**Who has access to the gym and trophy cabinet?**

**Or any other related question.**

**1 mark – for two correct questions 2 marks – for all four correct**

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**Identify who was present when the envelope was found.**

**Identify who might have a motive**

**Any other reasonable answer**

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# **PART TWO: The Crime Scene Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

*The tasks in this part are to be completed as* ***group work.***

1. In the first column of the table below is a list of the evidence found at the crime scene. In the second column explain how you think the experts found this evidence and then how they removed and transported it to a forensic laboratory. In the third column, describe the tests that you think would be carried out on the evidence in the laboratory. The first one has been down for you.

(5 marks)

|  |  |  |
| --- | --- | --- |
| **Evidence** | **How the evidence was found and removed** | **Tests carried out in the laboratory** |
| Fingerprints found where the item was taken from | *Dusted with fingerprint powder.*  *Photographed and then lifted with sticky tape* | *Compared with suspect prints and any on file* |
| Footprints in the PE entrance | Footprints photographed with side lighting, cast made with plaster | Compared with shoe prints made with suspects shoes |
| Soil from the footprint | Using evidence vial/test tube to collect sample | Soil composition test and pH test |
| Ransom note | Note picked up with tweezers and packed in a sealed, labelled bag | Test for fingerprints, handwriting compared to suspect’s handwriting |
| Possible pens for ransom note | Picked up tweezers and packed in a sealed, labelled bag | Chromatography test, test for fingerprints |
| Fingerprints on the ransom note | Dusted with fingerprint powder, photographed and then lifted with sticky tape | Compared with suspect prints and any on file |

1 mark per correct evidence row answered

1. Referring to the evidence that was collected at the scene, give each person listed in the table below a score out of 10 according to how likely it is that they are the thief. For example, give a 10 to those who you think are most likely guilty of the crime. In the last column give reasons for your scores, including possible motives. (6 marks)

|  |  |  |
| --- | --- | --- |
| **Person** | **Score** | **Reason** |
| Robert Forte (Operation Manager) | 5 | Getting married, likes wine, access to trophy cabinet |
| Owen Davies (Deputy) | 7 | Getting married, loves wine, previously worked in PE department, has access to trophy cabinet |
| Blair Pasco (Aboriginal & Torres Strait Islander Program Coordinator) | 7 | Getting married, works in PE department, likes wine, access to trophy cabinet |
| Michael Beards (Chemistry Teacher) | 1 | Not getting married, no connection to PE other than retrieving relief notes |
| Kamill Jinzarli (Human Biology Teacher) | 2 | Not getting married, only small connection to PE (previously worked in PE), loves wine |

**1 mark per correct assumption and score of suspect motives**

1. Write at least six questions you would ask all the suspects. (3 marks)

**0.5 marks per valid question.**

**What were your movements on the previous day? Do you have access to the gym and trophy cabinet?**

**What were you doing in the gym foyer on the morning of the theft?**

**What connection do you have to the physical education department?**

**What happened when you found out something was wrong? Any other acceptable question/s**

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# **PART THREE: Suspect Statements Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

*The tasks in this part are to be completed as* ***group work.***

1. Use the below table to record information from the witness statements that would point to possible guilt (middle column) or innocence (far right column). (6 marks)

|  |  |  |
| --- | --- | --- |
| **Suspect** | **Information that suggests the suspect is guilty** | **Information that suggests the suspect is innocent.** |
| Robert Forte | Likes wine  Getting married  Has access to PE department | No links to PE department |
| Owen Davies | Likes wine  Getting married  Has access to PE department  Previously in PE department | No longer in PE department |
| Blair Pasco | Likes wine  Getting married  Has access to PE department | In PE department, so fingerprints/footprints present |
| Michael Beards |  | No links to PE department |
| Kamill Jinzarli | Likes wine  Previously in PE department | No longer in PE department |

**3 marks – reasonable information suggesting guilty**

**3 marks – reasonable explanation for suggesting innocent**

1. Think of **two other** people that you would like to interview. List each person in the first column of the table below. Use the middle column to write why you want to interview them, and the last at least three questions you would ask each person. (4 marks)

|  |  |  |
| --- | --- | --- |
| **Suspect** | **Reason to interview** | **Three questions you would ask** |
|  |  |  |
|  |  |  |

**2 marks for reasonable suspects with reasons**

# **PART FOUR: The Evidence Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

*The tasks in this part are to be completed as* ***group work.***

### **TASK 4A:** Shoe Prints

1. Compare the shoeprints provided by the suspects with those from the scene. In the table below, advise whose shoeprints were found at the crime scene and if the reason for the footprint could be connected to the theft. (3 marks)

|  |  |  |
| --- | --- | --- |
| **Suspect** | **Shoeprint present? (Y/N)** | **Possible reasons for footprint** |
| Robert Forte |  |  |
| Owen Davies |  |  |
| Blair Pasco |  |  |
| Michael Beards |  |  |
| Kamill Jinzarli |  |  |

**1 mark – correctly identifying shoeprint 2 marks – correct possible reasons for footprints**

### **TASK 4B:** Fingerprints

Inspect the full sets of elimination fingerprints. Use the following codes for the basic patterns in the prints: A = arch L = loop W = whorl C = composite U = unknown Use the below codes for more complex patterns: UR = ulna loop (where the loop slopes down towards the little finger) TA = tented arch RL = radial loop (where the loop slopes down towards the thumb) DL = double loop CPL = central pocket loop

1. For each suspect, identify the shape of the pattern on each of their 10 fingers and record these in the table below. Record any scars with the letter ‘S’. (6 marks)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Left hand | | | | | Right hand | | | | |
| Suspect | Little finger | Ring finger | Middle finger | Index finger | Thumb | Thumb | Index finger | Middle finger | Ring finger | Little finger |
| Robert Forte |  |  |  |  |  |  |  |  |  |  |
| Any other comments regarding palms, fingers, or size of hands | | | | |  | | | | |
| Owen Davies |  |  |  |  |  |  |  |  |  |  |
| Any other comments regarding palms, fingers, or size of hands | | | | |  | | | | |
| Blair Pasco |  |  |  |  |  |  |  |  |  |  |
| Any other comments regarding palms, fingers, or size of hands | | | | |  | | | | |
| Michael Beards |  |  |  |  |  |  |  |  |  |  |
| Any other comments regarding palms, fingers, or size of hands | | | | |  | | | | |
| Kamill Jinzarli |  |  |  |  |  |  |  |  |  |  |
| Any other comments regarding palms, fingers, or size of hands | | | | |  | | | | |

6 marks for reasonable identification of all suspects fingerprint patterns

5 marks for reasonable identification of all suspects fingerprint patterns with some minor errors

4 marks for reasonable identification of 4 suspects fingerprint patterns

3 marks for reasonable identification of 3 suspects fingerprint patterns

2 marks for reasonable identification of 2 suspects fingerprint patterns

1 mark for reasonable identification of 1 suspects fingerprint patterns

1. Look at the fingerprints found at the crime scene. Record the patterns on each fingerprint in the table below. If the fingerprint is not present or its pattern is not clear, write ‘X’ in the space. Then identify any similarities between the fingerprints found at the crime scene and the suspects’ fingerprints. (5 marks)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Left hand | | | | | | | | | | Right hand | | | | | |
| Prints | Little finger | | Ring finger | | Middle finger | | Index finger | | Thumb | | Thumb | | Index finger | Middle finger | Ring finger | Little finger |
| A |  | |  | |  | |  | |  | |  | |  |  |  |  |
| Any other comments regarding palms, fingers, or size of hands | | | | | | | | | |  | | | | | |
| B |  | |  | |  | |  | |  | |  | |  |  |  |  |
| Any other comments regarding palms, fingers, or size of hands | | | | | | | | | |  | | | | | |
| C |  | |  | |  | |  | |  | |  | |  |  |  |  |
| Any other comments regarding palms, fingers, or size of hands | | | | | | | | | |  | | | | | |
| D |  | |  | |  | |  | |  | |  | |  |  |  |  |
| Any other comments regarding palms, fingers, or size of hands | | | | | | | | | |  | | | | | |
| E | |  | |  | |  | |  | |  | |  |  |  |  |  |
| Any other comments regarding palms, fingers, or size of hands | | | | | | | | | |  | | | | |
| F | |  | |  | |  | |  | |  | |  |  |  |  |  |
| Any other comments regarding palms, fingers, or size of hands | | | | | | | | | |  | | | | |
| G | |  | |  | |  | |  | |  | |  |  |  |  |  |
| Any other comments regarding palms, fingers, or size of hands | | | | | | | | | |  | | | | |
| H | |  | |  | |  | |  | |  | |  |  |  |  |  |
| Any other comments regarding palms, fingers, or size of hands | | | | | | | | | |  | | | | |
| Similarities between crime scene prints and suspect prints: | | | | | | | | | | | | | | | | |

5 marks – correct identification and comparison on all evidence and suspect fingerprints

4 marks – correct identification and comparison matching at least 2 crime scene fingerprints to suspects

3 marks – correct identification and comparison matching 1 crime scene fingerprint to suspects

2 marks – correct fingerprint comparison, no matching to suspects made

1 mark – correct fingerprint identification made, no comparison or matching to suspects

### **TASK 4C:** Soil Samples **Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

1. Three soil samples have been collected from around the school. You need to analyse the composition and pH of these samples. Complete the below table with your findings. (6 marks)

|  |  |  |
| --- | --- | --- |
| Soil Sample & location | Composition | pH reading |
| Sample 1 – Community Garden | Sand, gravel, potting mix  Mainly sand & gravel | Acidic, pH of approx. 3-4 |
| Sample 2 – Garden near gym | Sand gravel & potting mix  Equal parts of each | Basic, pH of approx. 9+ |
| Sample 3 – Garden near admin building | Sand gravel and potting mix  Mostly potting mix, then gravel then sand | Neutral, pH of approx. 6-7 |
| Sample 4 – Crime scene soil sample | Sand gravel and potting mix  Mostly potting mix, then gravel then sand | Neutral, pH of approx. 6-7 |

1 mark per correct composition and pH reading of samples 1-3 (max 5)

1 mark for having samples 3 & 4 the same of very similar

1. Using the soil analysis from question 1 and the soil analysis from the crime scene that you conducted, determine where the soil from the crime scene is from. (1 mark)

**1 mark – correctly identifying that samples 3 and 4 are the same/very similar**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

### **TASK 4D:** Writing Samples

Compare the ransom note with the suspects’ handwriting and complete the table below with observations as to why the suspect possibly is or is not the thief. *(Use the writing handwriting analysis information provided)* (6 marks)

|  |  |  |
| --- | --- | --- |
| **Suspect** | **Observations of why this suspect is not the thief** | **Observations of why this suspect is possibly the thief** |
| Robert Forte | Handwriting different, examples of how different |  |
| Owen Davies |  | Handwriting very similar, identifying similar shaped letters/spacings/size |
| Blair Pasco | Handwriting different, examples of how different |  |
| Michael Beards | Handwriting different, examples of how different |  |
| Kamill Jinzarli | Handwriting different, examples of how different |  |

1 mark per correctly identifying suspects not the thief (max 5)

1 mark for correctly identifying Owen Davies handwriting on ransom note

### **TASK 4E:** Writing Samples Ink **Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

A chromatography test has been completed on a sample of the ransom note ink to help with evidence against the thief. Four pens have been obtained from areas around the school relating to the crime scene that could have been used to write the ransom note.

1. Conduct paper chromatography tests on ink from the four pens and complete the below table. Including sticking your chromatography strip to the page. (4 marks)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Pen #** | **Starting Ink Colour** | **Ink colours present** | **Length of each colour** | **Chromatography** |
| Pen #1 |  |  |  | Chromatography experiment did not work. Remove marks from total and disregard this section of assessment |
| Pen #2 |  |  |  |  |
| Pen #3 |  |  |  |  |
| Pen #4 |  |  |  |  |

1. Compare your chromatography results to the ransom note ink. Do any of the inks match? If so, which one?

(1 mark)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Use the information from the evidence collected, then complete the below questions.*

1. Compare the evidence taken from each of the suspects in Part 4 (shoe prints, fingerprints, soil samples, handwriting and fibre) with the evidence found at the scene in Part 2. In the table below, record any evidence that can be linked to a suspect and a reasonable explanation for the presence of the evidence. The first one has been completed for you. (5 marks)

|  |  |
| --- | --- |
| **Suspect** | **Evidence that links this person with the crime scene** |
| Robert Forte | Access to gym, getting married, acted suspiciously after note was found, soil sample matched admin office |
| Owen Davies | Access to gym, getting married, previously worked in PE, soil sample matched admin office, handwriting sample matched ransom note, fingerprints found at crime scene and on ransom note |
| Blair Pasco | Access to gym, getting married, works in PE, shoeprint found at gym, fingerprints found at crime scene and on ransom note |
| Michael Beards | Found ransom note, no other identifying factors |
| Kamill Jinzarli | Found ransom note, fingerprints on ransom note, previously worked in PE. |

**1 mark per correctly identifying evidence related to each suspect**

1. List your three main suspects in order from most likely to least likely. For each person, state why you think they may be the thief. (3 marks)

|  |  |
| --- | --- |
| **Prime Suspect** | **Reason** |
| **1. Owen Davies** | Multitude of evidence, opportunity and motive |
| **2. Blair Pasco** | Some evidence, opportunity, no motive |
| **3. Robert Forte** | Some evidence, opportunity, no motive |

1 mark for identifying top 3 suspects with valid reasons for each

Suspects do not have to be in correct order

# **PART FIVE: Case Solved Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Information for completing part five:

* This part is to be completed individually under test conditions.
* You will be provided with your portfolio and all investigation evidence
* You will have one lesson to complete the provided questions and solve the crime.

1. Use the information in ‘further development’ and the final two statements to answer the following questions.
2. When and how do you think the thief planned the crime? (2 marks)

1 mark – planned at least a week in advance.

1 mark – planned during down time

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1. How did the thief enter the building? (1 mark)

1 mark – through the main door

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Why wasn’t the theft caught on camera? Give reasons for your answer. (2 marks)

1 mark – suspect has access to admin building and keys

1 mark - can access camera room and remove footage or turn cameras away

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. When and how was the ransom note written and place on the shelf? (2 marks)

1 mark – after school when PE department and most staff had left for the day

1 mark – using key to unlock trophy cabinet and placed it on shelf

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. What time do you think the theft occurred? Give reasons for your answer. (2 marks)

1 mark – evening prior to trophy noticed missing (30th March)

1 mark – because the cleaners or any other person did not notice the trophy missing. Or camera footage shows trophy there on 30th March

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. On the weekend of 23-24th of April the trophy was returned. No note was left or any explanation by the suspects given. The school’s security cameras again had the footage removed/deleted and no security systems were set off.

Why do you think the trophy was returned? (2 marks)

2 marks – the thief felt guilty for committing the crime

Or 2 marks – the thief knew that the police were getting close and didn’t want to have the trophy in their possession anymore.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Imagine that you are the prosecution lawyer at the trail of the SRC thief. Explain to the jury how you think the crime was carried out. Describe the motive and mention anyone else you think was involved and how they contributed to the crime. Remember, you must be clear, concise and convince the jury, beyond all reasonable doubt, that this person is the thief. (10 marks)

1 mark – identifies Owen Davies as the thief

2 marks – accurately detail the motive behind the theft (wanting to be part of the PE department again/annoyed that he is no longer part of if)

4 marks – details each type of evidence that supports Owen being the thief (handwriting, fingerprints, motive, ease of access to commit crime)

2 marks – explain how the crime would have been carried out

1 mark – explains if anyone did or didn’t help Owen conduct the crime

**END OF ASSESSMENT**