

INTRODUCTION

After a weekend trip to the city, the Grizzly family arrived late to their cottage home to find it had been vandalized. Upon entering the home, the family found their living quarters in a shambles. Their furniture upended, food was scattered everywhere and graffiti littered the walls. As the family walked through their home, they found their son's chair broken and bowls of porridge left half-eaten in the kitchen. Hearing a noise, Mr. and Mrs. Grizzly rushed upstairs to catch a glimpse of the vandal as she jumped out of the bedroom window, landing safely onto the Grizzly's' garden before running off into the night. Police arrived shortly after the encounter and proceeded to collect statements, take photos and gather evidence

Police surveyed the Grizzly's home and located the point of entry at the back of the house. The back door leading into the kitchen had clearly been vandalized. Pronounced tool marks were visible around the doorframe and the doorknob. The police took photos and dusted the door for fingerprints. While no prints were uncovered, the tool marks left on the door could be analyzed to identify the weapon used to enter the home. Three tools were taken from three of the suspects for laboratory examination.

Tool-mark analysis help forensic scientists identify the tool or tools used at the scene of the crime and link the tool(s) to the criminal. Investigators compare marks by examining detailed photos or silicone casts of the marks and collect trace evidence (such as residue) left behind by the tool.

There are three types of tool marks:

- **Moulded:** The object is inserted into the surface.
- **Slipped:** The object is dragged across the surface.
- **Combo:** The object is both inserted and dragged across the surface.

OBJECTIVES:

- Carefully compare, analyze and record various types evidence

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MATERIALS:

- pencil
- 9 large cubes of modelling clay
- three tools, labelled A, B, and C (must include one hammer)
- ink
- Photo of tool mark evidence

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PRE-LAB QUESTIONS:

- What are the similarities and differences between different tools?
- Do you think that the tool marks differ with the type of material (e.g., door, window, cushion etc.) the tool interacts with?

Procedures:

1. For each tool, provide three large cubes of modeling clay.
2. Students create samples of tool marks for each of the three tools:
 - 1) For a molded mark type, students should insert the tool into the clay and pull it out.
 - 2) For a slipped mark type, students should draw the tool across the surface of the clay.
 - 3) For a combo mark type, students should insert the tool, then draw it across the clay.
3. For each tool mark sample you created you will need to illustrate it in your lab book. Record the information in the following format:
 - Tool:
 - Mark type:
 - Illustrations
 - Record any unique characteristics
4. Place the tip of the tool in the ink pad and then create an ink mark on the lab book.
5. Place the side of the tool on the ink pad and create an ink mark.
6. Measure the instrument and record any unique characteristics.
7. Carefully compare the tool marks shown in the photo to the tool marks they've made on the cubes on modeling clay and decide which tool caused the damage to the Grizzly's back door.

Analysis:

Using the information and the gathered evidence the suspects are

Goldie who had a crowbar

Red who had a screwdriver

Wolfie who had a hammer

Conclusion:

This should be paragraph form and has the information on who you think it was and why using data you collected to backup your answers.

Grading Rubric:

Description	4 points	3 points	2 points	1 point	0 point
Introduction: summary of what happened and what tool marks are. Pre Lab questions answered and correct.	Paragraph form, with all questions answered in detail with information on sources of the information	Missing 1 of the following points: <ul style="list-style-type: none"> Paragraph Questions all answered Sources of information 	Missing 2 of the following points: <ul style="list-style-type: none"> Paragraph Questions all answered Sources of information 	Missing 3 of the following points: <ul style="list-style-type: none"> Paragraph Questions all answered Sources of information 	Did not do this part
Materials Illustration of procedures.	Listed in a chart format with an illustration that is labeled	Missing 1 of the points	Missing 2 of the points	Missing 3 of the points	Did not do
Procedure: A step by step program where someone else can recreate your lab	A little bit of the information is confusing	About $\frac{3}{4}$ of the information is correct.	About $\frac{1}{2}$ of the information is incorrect or confusing	About $\frac{3}{4}$ of the information is incorrect	Did not bother with this.
Graphs: Illustration of 5 different tools with the impressions of the tool marks and ink prints along with record of uniqueness	All correct.	Missing two items on the illustrations	Missing 3 illustrations	Missing 5 items on the illustrations.	Totally screwed up the graphs.
Analysis	Determine the information about who made the marks				missed it
Conclusion: paragraph form, with information about the analysis and data to back up results	All present	Missing one item	Missing data to back up the facts but has the rest completed		Totally missed the point