Maths Murder Investigation
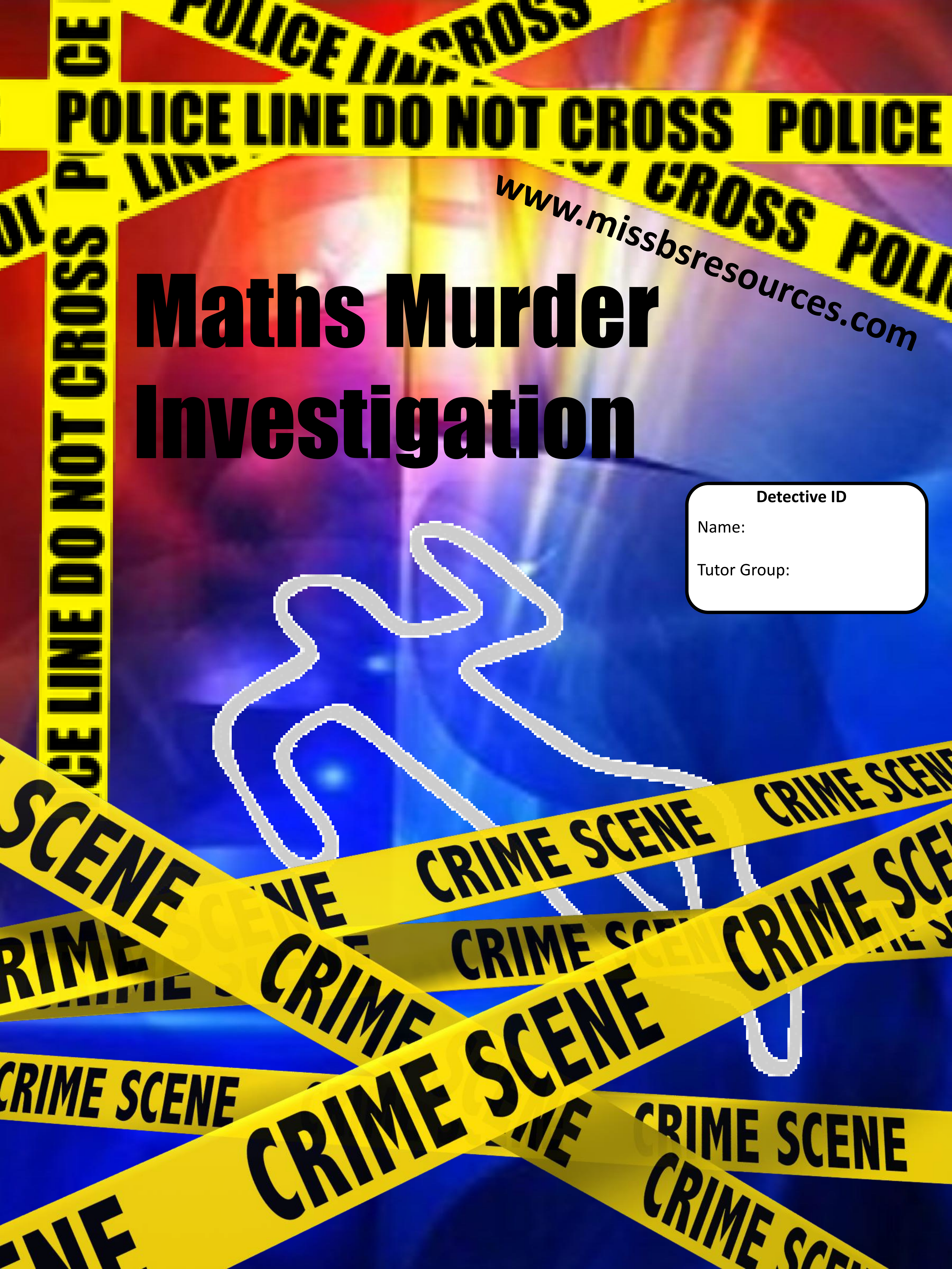
**Detective ID**

Name:

Tutor Group:

A murder has been committed by one of ten suspects. You have been brought in as a detective on this case to solve the crime. To do this collect clues and evidence to find out who the murderer was and what unusual piece of equipment was used.

You will need to analyse all of the clues in order to eliminate suspects and murder weapons. You also need to keep track of your findings and be able to justify your answers; you don't want the murderer to not be convicted because of a lack of sufficient evidence!

Suspect Line Up
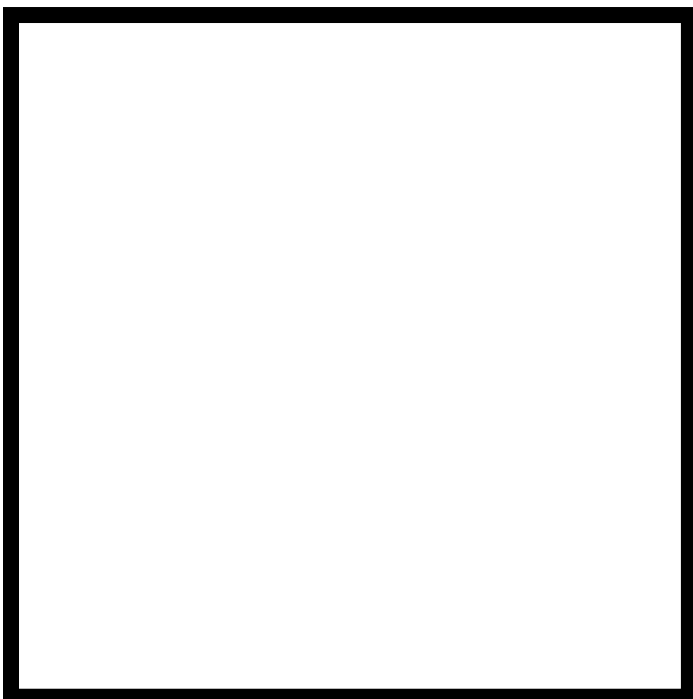
Suspect 1	Suspect 2	Suspect 3	Suspect 4	Suspect 5
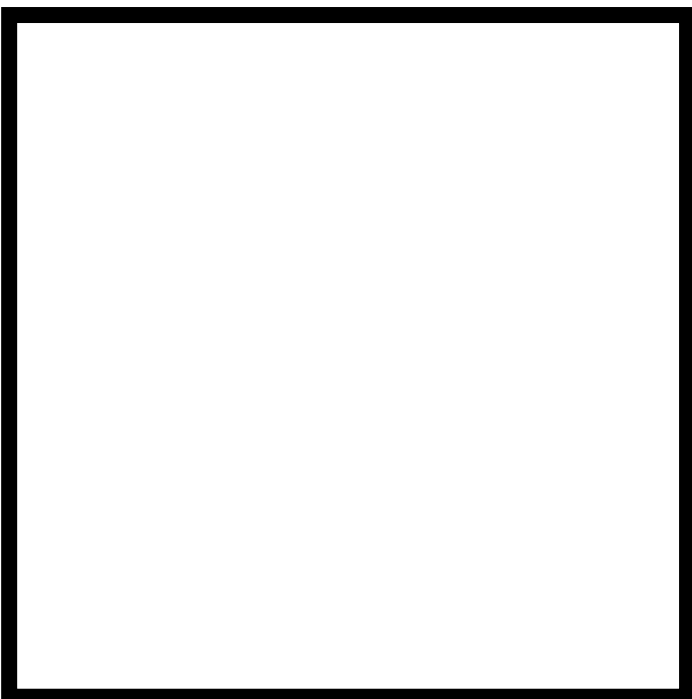
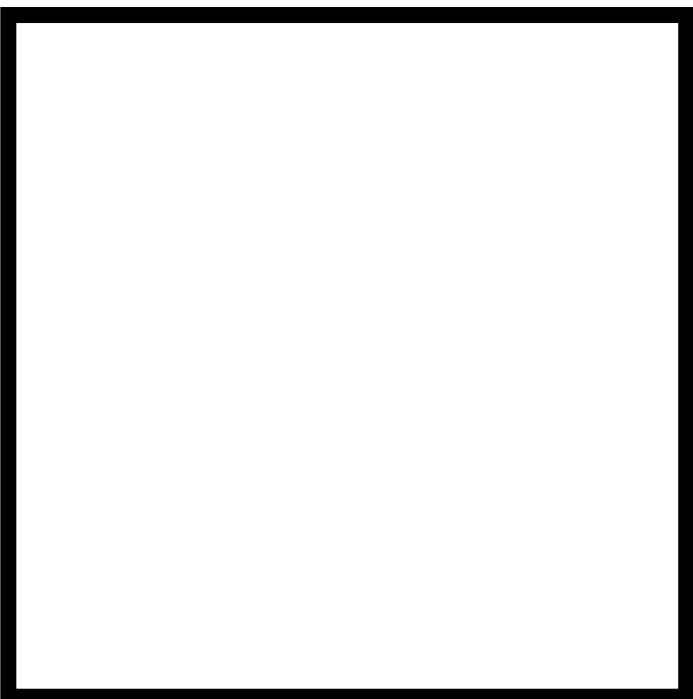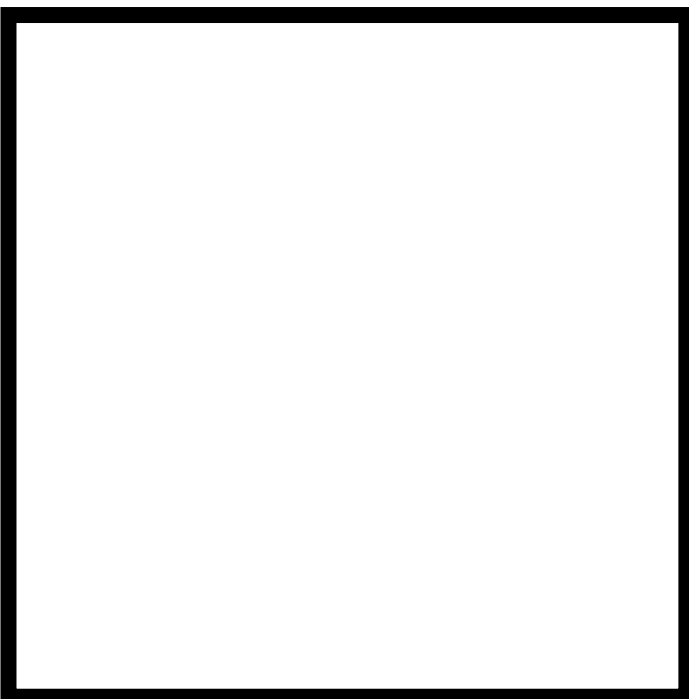|				
Suspect 6	Suspect 7	Suspect 8	Suspect 9	Suspect 10

6'0" 6'0"
5'0" 5'0"
4'0" 4'0"
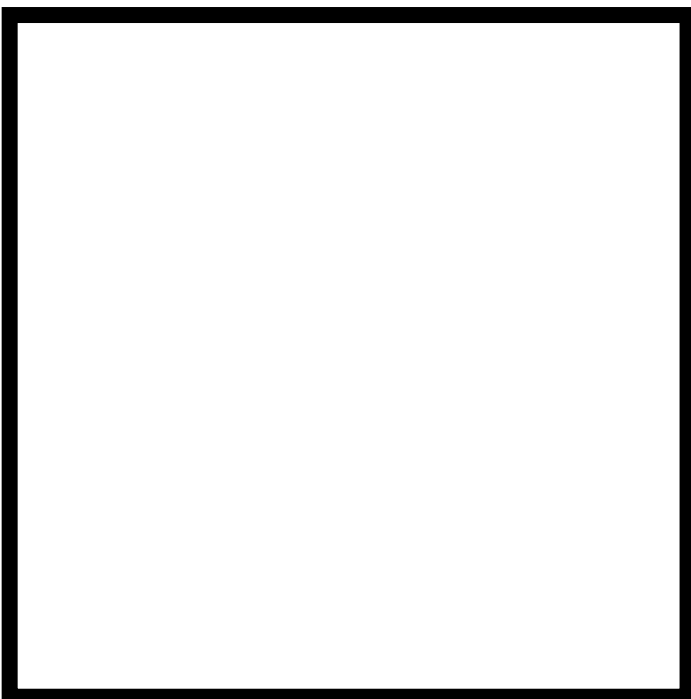3'0" 3'0"
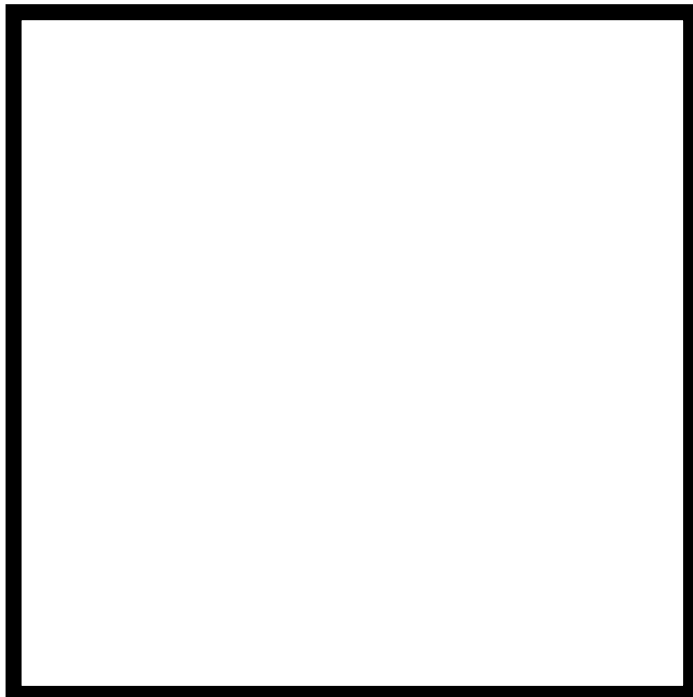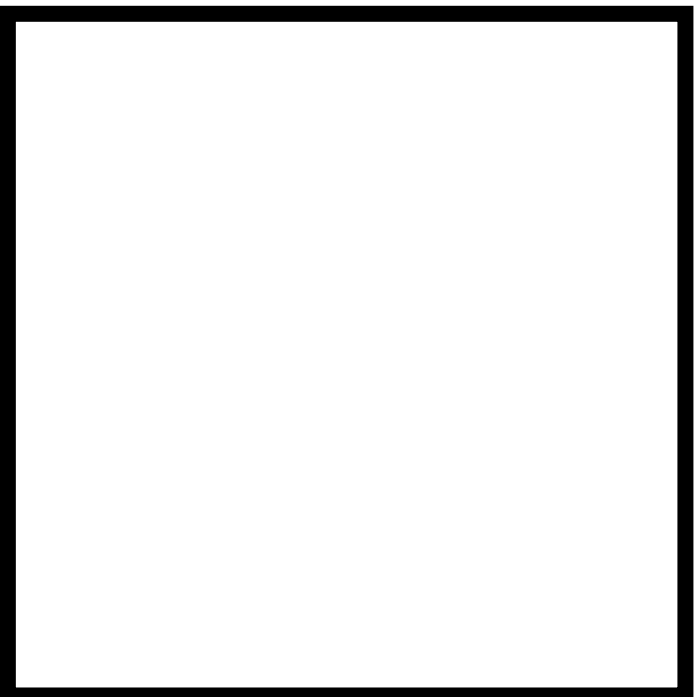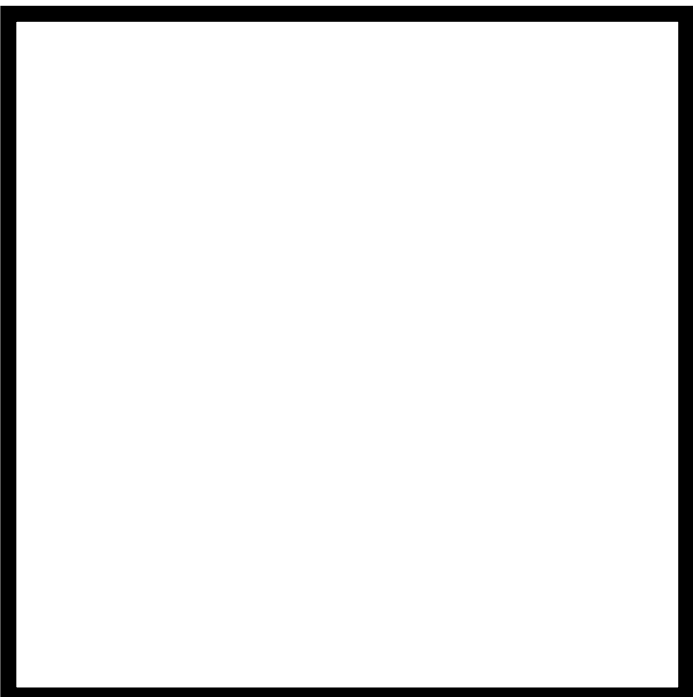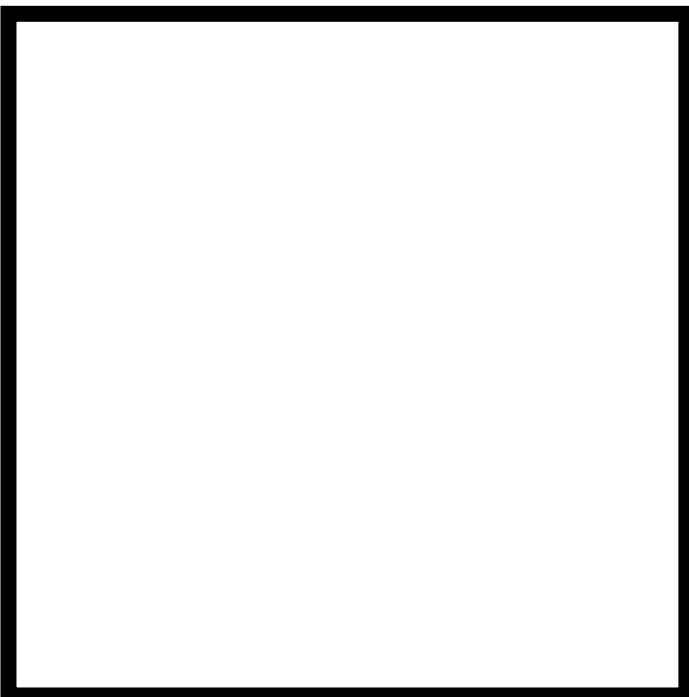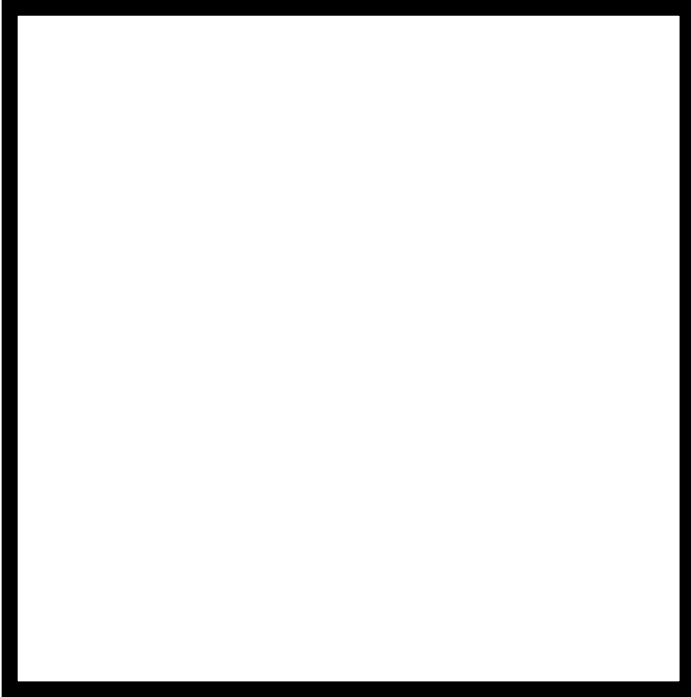2'0" 2'0"
1'0" 1'0"

Suspect Line Up

Suspect 1

Suspect 2

Suspect 3

Suspect 4

Suspect 5

Suspect 6

Suspect 7

Suspect 8

Suspect 9

Suspect 10

6'0"
5'0"
4'0"
3'0"
2'0"
1'0"

6'0"
5'0"
4'0"
3'0"
2'0"
1'0"
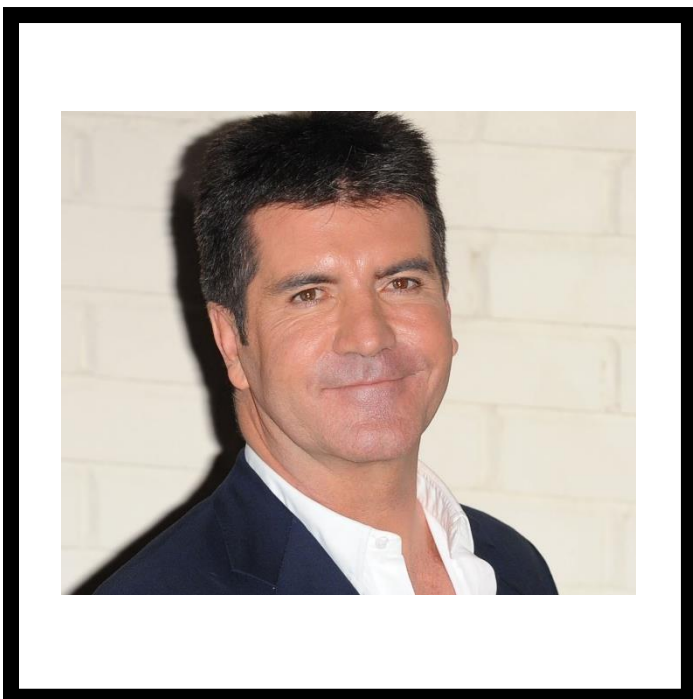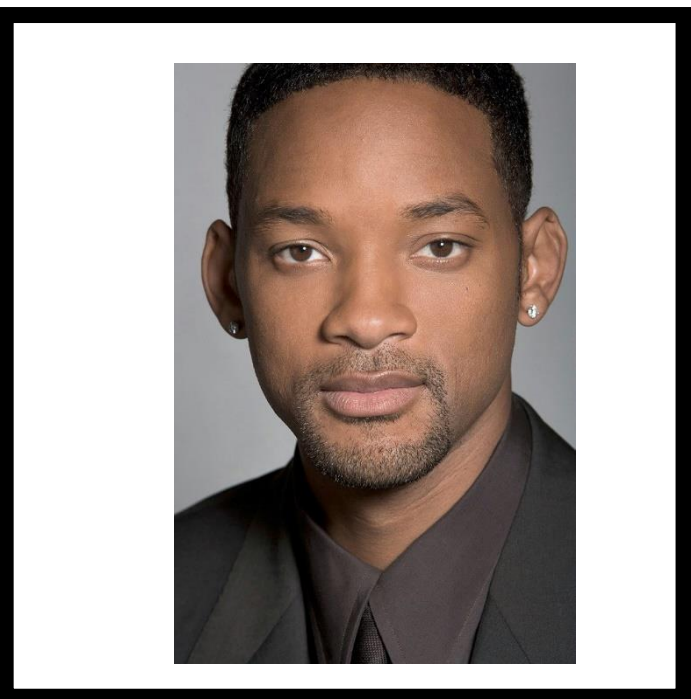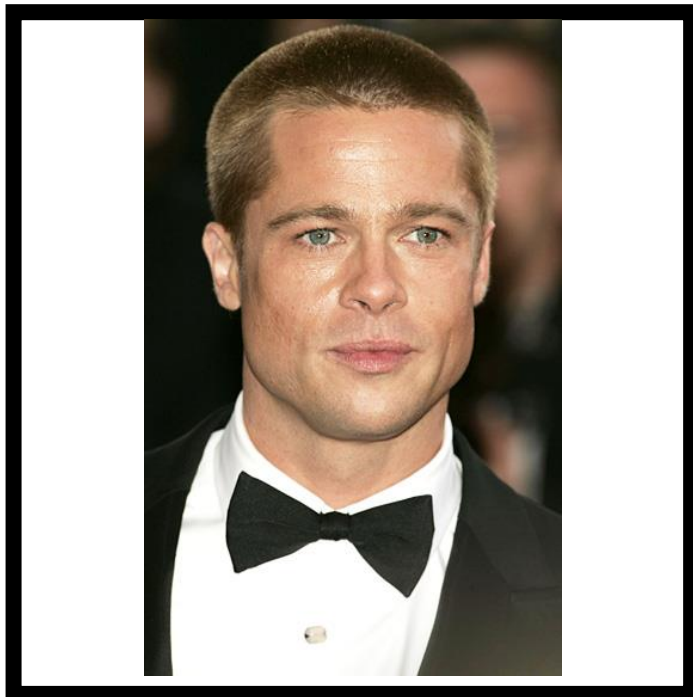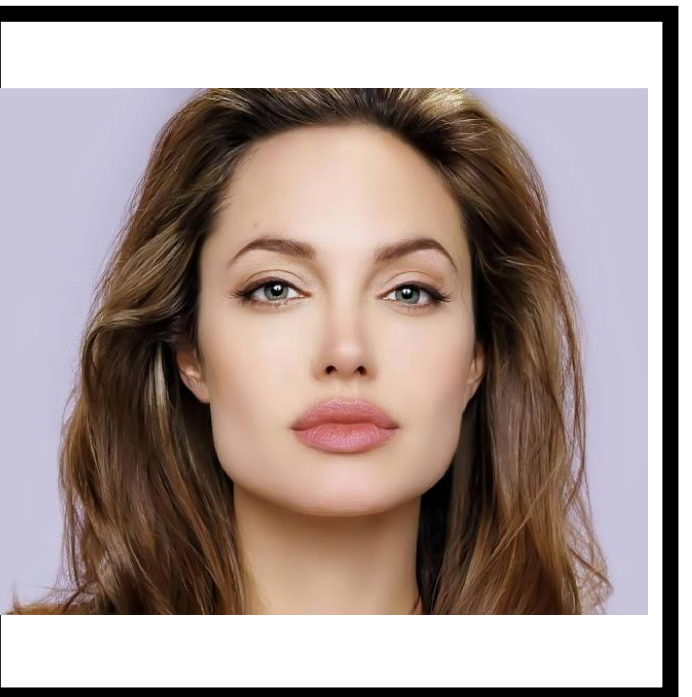
Murder Weapon

Weapon 1
Compass

Weapon 2
Scissors

Weapon 3
Book

Weapon 4
Meter Ruler

Evidence 1

Money was stolen from the school safe which has a combination code. Each suspect was interviewed rigorously, while attached to a lie detector. You know the final digit of the code is 4; work out each suspects answer and eliminate any suspect who didn't know $x = 4$.

Suspect 1: $x + 9 = 13$

Suspect 2: $3x = 12$

Suspect 3: $x + 5 - 9 = 0$

Suspect 4: $2x + 5 = 17$

Suspect 5: $5x - 3 = 17$

Suspect 6: $x - 3 = 1$

Suspect 7: $7x = 35$

Suspect 8: $\frac{4x}{4} = 4$

Suspect 9: $3(x + 4) = 15$

Suspect 10: $8 + x - 5 = 7$

Investigation Evidence Form

Who was eliminated and why? Justify your verdict

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Evidence 2

After checking the amount stolen from the school safe, the police realised more than £1,000 was stolen. You have now opened an inquiry into the suspects bank accounts. If they have less than £1,000 in their bank account you can eliminate the suspect.

Substitute the following values into the expressions to find the suspects bank account amount. $a = 25, b = 10, c = 20$

Suspect 1: $a \times b$

Suspect 2: $6 \times a \times b$

Suspect 3: $(5 \times a) + (c \times b \times b)$

Suspect 4: $a + c$

Suspect 5: $4 \times a \times b$

Suspect 6: $2a^2$

Suspect 7: $50 \times c$

Suspect 8: $100 \times (a + b + c)$

Suspect 9: $\dfrac{2 \times a}{b}$

Suspect 10: b^3

Investigation Evidence Form

Who was eliminated and why? Justify your verdict

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Evidence 3

To break through the window to get into the building a person must have the strength of a multiple of 8.

Suspect 1: $8a$

Suspect 2: 56

Suspect 3: 63

Suspect 4: 1

Suspect 5: 64

Suspect 6: 800

Suspect 7: 4

Suspect 8: 48

Suspect 9: 16

Suspect 10: 96

Investigation Evidence Form

Who was eliminated and why? Justify your verdict

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Evidence 4

The suspect seems to have caught there arm on a broken window. This means you were able to collect a sample of blood. After sending it to the lab you can confirm it is Type O. Blood analysis looks for antibodies to indicate the blood type.

x antibodies indicate Type O, y antibodies indicated Type A and z antibodies indicate Type B.

After taking a sample of blood from each suspect you now need to analyse the lab results to see which antibodies each suspects blood contains. Anyone who isn't Type O can be eliminated.

Suspect 1: 4x + 3y – 4x
Suspect 2: 6x – 5x + 4y – 3y + x
Suspect 3: 8y + 2y + 3x + 2x
Suspect 4: 3z – 3z + 2x
Suspect 5: 7x + 4y + 3x – 10x
Suspect 6: 5z + 2y – 5z
Suspect 7: 3x + y – 3y
Suspect 8: 2y + 2z + z + x
Suspect 9: -8x – 2x
Suspect 10: 2x + y – 2z – 2x

Investigation Evidence Form

Who was eliminated and why? Justify your verdict

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Evidence 5

The CTTV footage has been viewed and the murder victim was seen going into the building, towards where the safe is stored. It is starting to look like a robbery gone wrong. Unfortunately the CCTV footage has been hacked and turned off after this point.

You were able to work out the digital signature of the computer was 16x + 24y. In order to narrow down the suspects you confiscated their laptops. You can rule out anyone from your inquiry without the digital signature of 16x +24y.

Suspect 1: $7(x + 2y)$

Suspect 2: $4(4x + 6y)$

Suspect 3: $6(4x + 9y)$

Suspect 4: $2(8x - 12y)$

Suspect 5: $8(2x + 3y)$

Suspect 6: $5(x + 7)$

Suspect 7: $4(6x + 4y)$

Suspect 8: $2(8x + 12y)$

Suspect 9: $4(6x + 4y)$

Suspect 10: $4(3x + 3y)$

Investigation Evidence Form

Who was eliminated and why? Justify your verdict

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Evidence 6

There was a partial finger print found on the murder weapon. You took everyone's finger print in order to find a similar print. However there was in problem with the labs printers, all the finger prints were printed at different scales. You can eliminate anyone whose finger print isn't an enlargement of the partial print.

5cm

3cm

10cm

7cm

11cm

| Suspect 1 Miss Bartram | Suspect 2 Miss Dryden | Suspect 3 Miss Dickinson | Suspect 4 Miss Martin | Suspect 5 Miss Peskett |

8cm

2cm

4cm

9cm

8cm

| Suspect 6 Mrs Cameron | Suspect 7 Mrs Charlton | Suspect 8 Mrs Garside | Suspect 9 Mr McKeown | Suspect 10 Mr Taggart |

Partial print

30cm
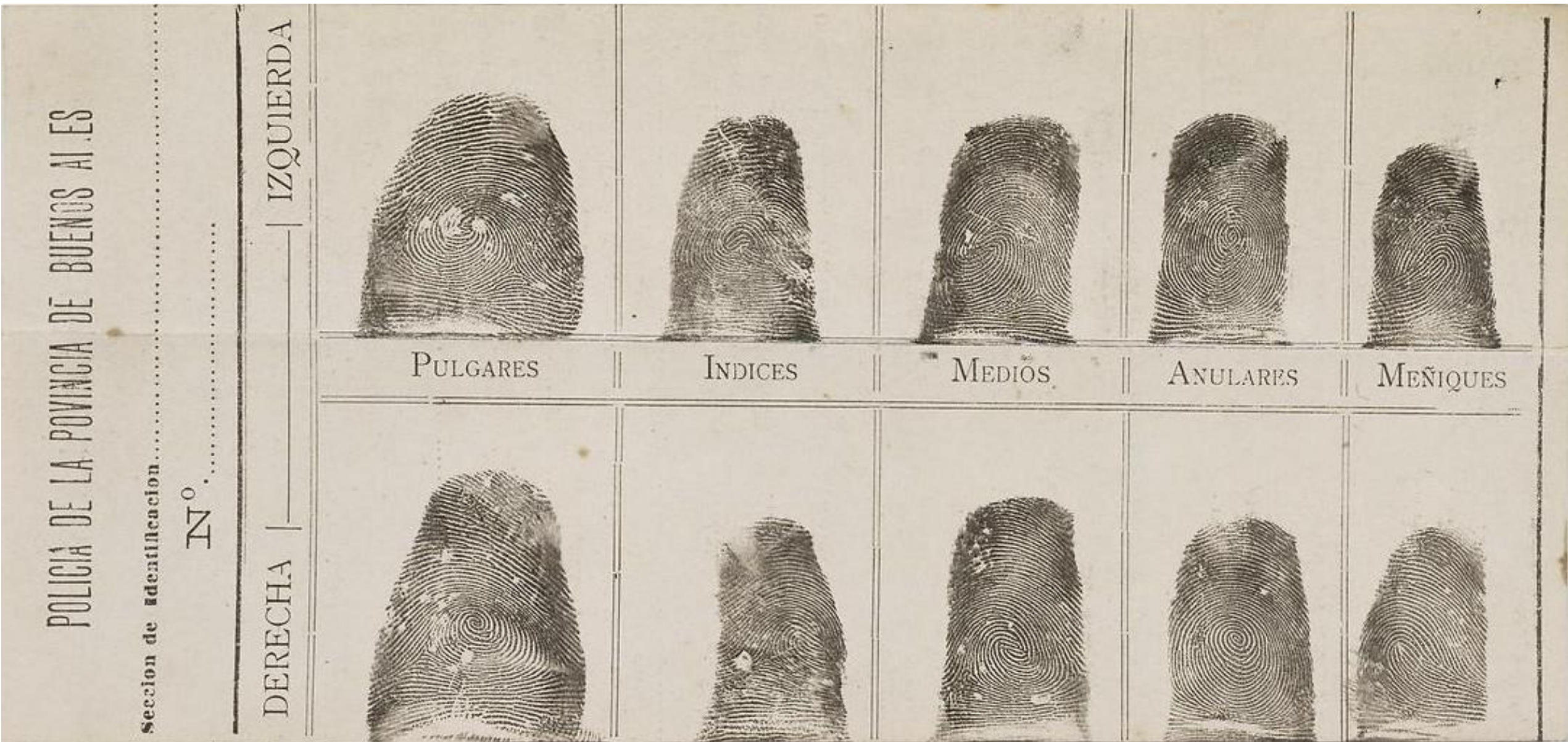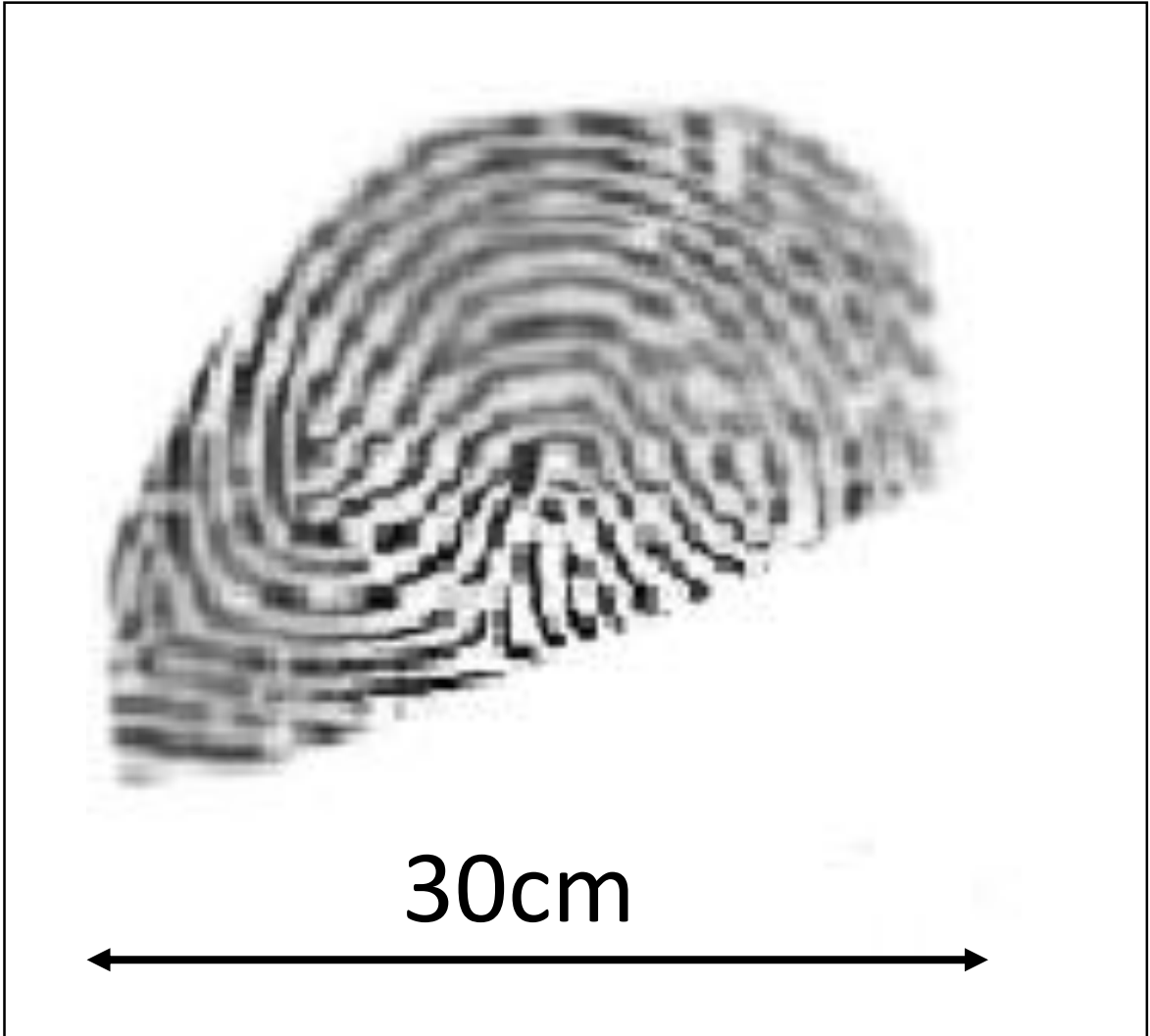
Investigation Evidence Form

Who was eliminated and why? Justify your verdict

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Evidence 7

Your received a message from the labs about the murder weapon, however the message is all scrambled. Every letter has been replaced with a number. Can you spot the pattern and unscramble the message to find the weapon.

20,8,5 13,21,18,4,5,18 23,5,1,16,15,14 4,15,5,19 14,15,20
1,16,16,5,1,18 20,15 2,5 1 8,5,1,22,25 15,2,10,5,3,20.

20,8,5 5,14,20,18,25 23,15,21,14,4,19 19,21,7,7,5,19,20 20,8,5
23,5,1,16,15,14 8,1,4 1 19,8,1,18,16   16,15,9,14,20.

21,14,6,15,18,20,21,14,1,20,5,12,25 23,5   3,15,21,12,4 14,15,20
7,5,20 1,14,25 4,14,1 9,14,6,15,18,13,1,20,9,15,14,   1,19 9,20
23,1,19   3,15,14,20,1,13,9,14,1,20,5,4 1,14,4   6,15,21,14,4
14,1,5,18 20,8,5   11,9,20,3,8,5,14.

A	B	C	D	E	F	G	H	I	J
1			4	5					
K	L	M	N	O	P	Q	R	S	T
11									20
U	V	W	X	Y	Z				

Investigation Evidence Form

What was the murder weapon and why? Justify your answer.

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Investigation Report

Record your results here by ticking the boxes of those suspects eliminated on each piece of evidence.

	Sus 1	Sus 2	Sus 3	Sus 4	Sus 5	Sus 6	Sus 7	Sus 8	Sus 9	Sus 10
Evidence 1										
Evidence 2										
Evidence 3										
Evidence 4										
Evidence 5										
Evidence 6										

Final Verdict

Murderer _____

Weapon _____

Describe what you think happened and justify your answer.

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