In the Frame...

Piece together the evidence to discover the truth behind this case

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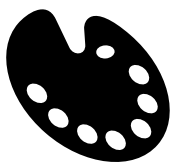Angela O'Sullivan

DE MONTFORT UNIVERSITY LEICESTER

ROYAL SOCIETY OF CHEMISTRY

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Acknowledgements

With thanks to:

The Royal Society of Chemistry for supporting the project as part of their Outreach fund.

Ian Newsham from DMU, for his guidance and creativity with the artwork.

Nick Rowan from DMU, for his help and support with the use of Seekbeak.

Gabrielle Illston-Baggs from DMU for working as our student advisor.

Kevin Farrugia, Joel Able, Nazmin Juma, Unmesh Desai and Andrew Doyle from DMU, for their technical knowledge and support.

Steve Furzeland, Dominic White and Mark Bowden from Carl Zeiss Ltd, for their help and support.

Colin Edwards from Oxford Instruments for his help and support.

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For feedback and any comments you may have, please leave them at:

https://forms.gle/awEyJ23GeycZdohDA

In the Frame: the journey of a painting….

Maya was a fine art student, rushing to meet a submission date. She didn't realise that her decision to submit this particular painting for her assignment would have such far-reaching consequences! Follow the journey of her painting, starting at a typical student house…
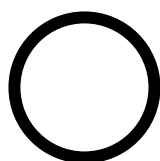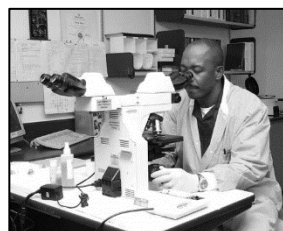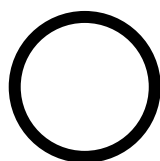
Start:

De Montfort University

Art Class
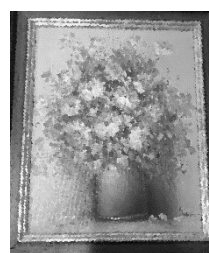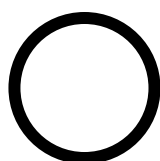
The Student House

Virtual laboratories

Who painted the artwork?

You have been selected as the lead forensic scientist in order to solve a possible art fraud case. We need your help to uncover telling the truth.

At your disposal are a range of techniques that are used in forensic analysis, these techniques will be demonstrated and it is your role to analyse the evidence.

You will be presented with a series of scenes (using Seekbeak) and evidence and it is your role to uncover who is telling the truth.

Seekbeak allows you to view 360 images within your web browser. Use your mouse to interact with the images, you can drag the image around to view different parts of the image. There are videos to introduce the techniques, information points for you to find out about the techniques, a simple glossary to explain the techniques can be found at the end of the workbook. There are also photos to 'jump' to the next location and hidden objects for you to find throughout. Hover your mouse over the image to see if you find the objects, if you locate one with your mouse the area will change colour. If you click on the area, it will reveal the hidden object.

Scene 1: Maya's Student House

https://seekbeak.com/v/YojXLv5rj8e

Have a look around her room.

Can you find her diary?

What happened to her today?
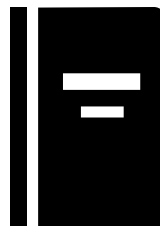
Scene 2: Maya's Student House

https://seekbeak.com/v/El18KW7MqOB

Can you see her diary? Move the pages on.

What has happened since you last read it?

What's happened to the last page?

Can you see Maya's vase of flowers?

Can you see her painting of the flowers?

Is it a good likeness?

Can you see her paints and brushes?

What colour is the paint?

Can you see her painting coat? Move the image on to see the paint stains.

Move the image on again, what else is on her coat?

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Can you see the litter bin?

What might the scrunched-up paper be?

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What else is in the bin?

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Scene 3: Maya's Student House

https://seekbeak.com/v/7MqR32dv1dW

After Maya submitted her assignment, she is awaiting her results.

Have a look around her room again.

Can you see the computer screen?

What does it say?

Can you see the letter?

What does it say?

Maya has been accused of something.

What do you think?

Your job is to go to the virtual laboratories to analyse the evidence to see whether the accusation is true.

Scene 4: Virtual Laboratories

Enjoy looking around our laboratories, here you will find a variety of techniques to analyse the evidence to help you make your decision. Some of the equipment shown in the images is just for information purposes. Remember if you are finding the information about the techniques difficult to understand, there is a glossary with a short summary.

Here you have access to the following labs:

- Forensic analysis lab
  - **Raman – Paint analysis**
  - ESDA – Impression analysis
  - VSC – Ink analysis
- Fingerprint and DNA analysis lab
  - Superglue Fuming – Fingerprint analysis
  - **Black Magnetic Powder – Fingerprint analysis**
  - **DNA analysis – Hair analysis**
  - TLC – Ink analysis
- SEM lab
  - **SEM/EDX – Paint and fibre analysis**
- Analytical lab
  - **ATR FTIR – Paint analysis**
  - HPLC

The evidence related to this investigation is in **bold** and can be found by clicking on the analysis section in Seekbeak.

https://seekbeak.com/v/B81vPmVGjoN

We now need to analyse the evidence at the university.

Evidence	Analysis	Supports Maya as the artist (Yes/No)
Hair on overalls	DNA	
Fibres on the frame	SEM	
Fingerprints on the outside of the frame	Black Magnetic Powder	
Fingerprints on the inside of the frame	Black Magnetic Powder	
Paint found at the house	SEM/EDX, ATR FTIR, Raman	
Paint on the overalls	SEM/EDX	
Receipt	Visual	

So that now that you have seen all of the scientific evidence.

Is there anything else that you would like to see?

Has Maya been rightly or wrongly accused?

Explain your answer below.

Glossary

Not sure what some of the scientific terms mean?

This should help!

AFM – Atomic Force Microscopy, is used to image the surface roughness of a sample.

DNA (Deoxyribonucleic acid) analysis, identifies how individuals are related.

EDSA - Electrostatic Detection Apparatus is used to produce a visual image of indented impressions in paper.

HPLC – High Pressure Liquid Chromatography, is used to separate a liquid sample using a column and a solvent as a mobile phase.

FTIR Spectroscopy – Uses Infrared light (we are unable to see this with the naked eye) to identify functional groups (different chemical bonds) of a sample.

Raman Spectroscopy – A vibrational technique that allows functional groups (different chemical bonds) to be identified.

SEM/EDX – Scanning Electron Microscopy/ Elemental Dispersive X-ray Spectroscopy, is used to image the surface of a sample. EDX allows the elemental composition of a sample to be identified.

TLC – Thin Layer Chromatography, is used to separate a sample (e.g. ink) using a solvent.

Topography – detailed information about the surface of a sample for example, roughness or smoothness.

VSC - Video Spectral Comparator, is used to look at documents under different light sources.