INDUSTRY IN THE CLASSROOM

VIRTUAL ENGAGEMENT LESSON GUIDE

HOW TO SOLVE A MURDER

DIGITAL SKILLS EDUCATION

Skills Development Scotland

Virtual Engagement Lesson Guide
How To Solve A Murder

Version 1.1

January 2021

Introduction

The web is filled with educational resources that can be used to bring cyber security to life. But it can be difficult to know which ones will work well for young learners, and which are suitable to be delivered virtually in classrooms.

This lesson plan is an example of a high quality cyber security activity suitable for highschool age students. Cyber Skills Live activities are tried-and-tested and are great for industry volunteers to use remotely with a class.

In *How To Solve A Murder* pupils solve the case of a murder in Bishopbriggs by sifting through the evidence. This introduces some of the basics of *digital forensics*.

Each is designed to last around 30 minutes, and learners only need a web browser to use them. These activities may be used to support the teaching and delivery of learning outcomes for the NPA Cyber Security qualification.

Daniel Devine
Digital Skills Education
January 2021

How to use this lesson plan

- ❏ Play through the "How To Solve A Murder" activity
- ❏ Watch the playthrough videoRead through the lesson plan, this suggests timings and talking points. Where possible use these notes but you should also add in your own knowledge and experience
- ❏ Read the sample slides and adapt them to suit you:
- ❏ Practice running through the activity using the lesson plan

Remember, for advice on organising and running this virtual engagement session you should refer to the Virtual Engagement Best Practice Guide.

Factsheet

Topics: Cyber Security, Digital Forensics

Target Audience: S1-S4 (ages 11-16) secondary school students.

Target Volunteers: Anyone working in technology with a familiarity with the basics of cyber security. Background knowledge in forensics is useful but not required.

Skills Level: Suitable for Beginners.

Need to know: These are really popular with learners and a fun activity to do in the classroom. They're a great way to introduce digital forensics topics in a way that feels like a game.

Preparatory work:
1) Read the Virtual Engagement Best Practice Guide
2) Play the activity yourself
3) Build and customise your session

Required equipment: Pupils each need access to a modern web browser.

Websites required:
https://cyberskillslesson.com/
https://scotiarail.co.uk/
https://nationalrail.co.uk/

The context: *"Become a digital detective and see how you can use your digital skills to solve a crime. Start the investigation by collecting, identifying and validating the digital evidence and see if you catch the criminal."*

Hints for on the day: Play along with the young people, it'll keep your pace right and will mean you can give hints or directly talk about what they are doing.

Lesson Plan

Time	**Cyber Skills Live - How To Solve A Murder** **Volunteer:** **Teacher:** **Sample Slides**: https://docs.google.com/presentation/d/1ai51ZzO-xhds00qMz90J5jyOENSNKcVeKWeZWGWUUaY/edit?usp=sharing
Hook	
2	Make sure to include: ● Your name and how you'd like to be addressed ● Where you are calling from ● What your role is (a brief description of what you do) ● Who you work for and what the company does "Hello, I'm Andrew McLeish. Today you can call me Andy. I'm joining you today from our office in Linlithgow. I am a digital forensics analyst at Fair Isle Forensics, we're a company that helps people recover deleted files from smartphones, tablets, and computers. Sometimes we work with businesses who need to recover documents they've accidentally deleted, and other times we work with the Police to help them gather evidence for cases." "Today you're going to become a digital detective and see how you can use your digital skills to solve a crime. Our activity is based on a real-life job role, digital forensics for the police." "You're also going to get the chance to ask me any questions about my role as Digital Forensics Officer working at Fair Isle Forensics."
Engage	
5	Give a short, 2-3 slide, presentation on the area and what you do. Think about what context the learners might need for the activity - in this case linking it to the need to work digital evidence. Use the question in the slide to prompt discussion: "Are deleted files gone forever?" As part you this section you could: ● Talk about a task you do at work ● Ask the pupils a question ● Discuss a relevant recent news story
Explore	
2	**Starting the activity:** "Go to cyberskillslesson.com and select How To Solve A Murder. It'll work in any modern web browser like Google Chrome or Firefox.

	You'll be asked what school you are joining from, select "_____" Enter your first name, and choose an avatar"
5	**Log the evidence:** A series of questions where you have to collect information on the evidence found. Data to collect: ● type ● manufacturer ● serial ● date of seizure ● location of seizure Things to talk about: ● Logging the evidence ● Chain of custody/forensic link/paper trail ○ Documentation of the collection, transfer and analysis of evidence ● Contamination/tampering could lead to evidence being challenged or ruled inadmissible
5	**Preparing The Drive For Examination** Steps: ● Take a digital copy ● Calculate the hash ● Mount the image Things to talk about: ● Why it's important to take a forensic clone -> may accidentally destroy or tamper with the evidence if working on original ● A hash is like a digital fingerprint, if the clone is a bit for bit copy the hash of the copy and the original will be the same ● Mounting let's you open a clone/image as if it was a real drive, allowing you to look at the files and folders within **Ask the students to pause playing after mounting the image to keep everyone working at a similar pace.**
5	**Examining Chat Logs** Steps: ● Find the chat logs ● Sift through the chat logs Things to talk about: ● We've heard that our suspect has been speaking to a known criminal called Neville. It would be great to know what they've been talking about. ● Terminal commands to list files (ls), move into folders (cd), output files (cat), and search (grep).

	• Too many texts to work through manually, can search for keywords.
	
	Key messages:
	• Our suspect, Chris:
	  ○ "I've planned my escape, I've just booked my ticket to the secret hideout"
	• Known criminal, Neville:
	  ○ "Good. I'll meet you there - make sure you're not followed"
	
	"Well done, this is very interesting. We know that Neville really is helping Chris run away, and he's getting a ticket. Suggests to me that it could be for public transport so a bus, train, or boat."
	
	Ask the students to pause playing after the successful search for 'hideout' to keep everyone working at a similar pace.

5	**Examining Browsing History** Steps: • Find the web browning history • Search the web history Things to talk about: • Needing to know where the hideout is. We know he bought a ticket. Online? • Amount of data browsing history tells you about a person • Using search (by date) to cut down the number of entries to look at
5	**Find The Hideout** Steps: • Learners to look at each of the URLs • One is for ScotiaRail, they should look at this (let them work it out) • Look at the destination (they'll need to click the link to National Rail website) • Answer is Dunrobin Castle
Involve	
10	Q&A with the class. The teacher will relay questions to you. **Common Questions and sample answers:** "*How much do you get paid?"* *"People working in Digital Forensics on average get paid around £25,000 a year when they start. With experience, you can earn £30,000 to £45,000 a year. Analysts can earn up to £80,000 in more senior roles."*

	"Do you only work with the police?" *"No, usually I work with businesses who have accidentally deleted files or think they have suffered from a cyber crime. I only sometimes work with the police. The police also employ a lot of digital forensics workers."* *"Where can I study digital forensics?"* *"There are different options, some universities have degrees in digital forensics, but there are also modern and graduate apprenticeships. Studying cyber security is a good start. I went to Abertay University and studied computer science, then changed job roles after a few years at my previous company."* *"What school subjects should I pick?"* *"People in cyber security have a wide range of backgrounds. Computing is probably the most important subject. Maths and Physics are useful too."* Link what you say to everyday life, make it relatable to the learners. Share *your* experience, you can give so much more than generic career information.
Sustain	
2	• Visit the Digital World website (https://www.digitalworld.net/cyber-security-careers) • Play more Cyber Skills Live activities • Does your company have any outreach planned? • Teachers: register for next event

Activity Screenshots