The Big Data Show

Being a Digital Citizen in the 21st Century

PART A HISTORY OF HACKING, PART DIGITAL MAGIC

Teachers Pack

2018

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Introduction

A Word From Clare Duffy

Video resource 1: Interview with Clare Duffy
(Rupert Goodwins talks with Clare Duffy)

What is your vision for The Big Data Show?

I imagine a large beautiful traditional theatre full of young people all playing games on their mobile phones and engaging with a story about the first prosecuted hack in the UK.

I love the idea of making a show for young people for that kind of traditional and quite weird often intimidating environment. It's strange: the seats are red velvet, the ceiling elaborate gold-carved. Where else looks like that? A palace? But that space says something about what people 100 or 150 years ago thought about public space and therefore what they thought about private space. I think it's a really exciting to explore how a story about hacking and privacy can be told through live interactive games in historical environment like this.

What stage is the project at now?

Right now we are in a research and development stage. In 2017 we developed the design and concept of the show with Perth Academy pupils and shared an early version of the play at the Science Festival.

Now we've developed the app so that it is available on Google Play and the App Store and we've invited schools in Perth, Edinburgh and Glasgow to enter into our creative process and give us feedback. We have lots of questions. We want to know what it's like for pupils and teachers to play together. If that is fun and also a good way to think and learn together. We wanted to create an app that appears to be an addictive game but that has secret levels and digital magic tricks which are revealed as part of a live performance to the audience that test what they know about cyber security. We want to find out what the energy of gaming in large groups is like and how it interacts with telling the story of the first prosecuted hack in the UK. We want to find out what young people know about their data and how it is used, what it is worth and to also see if we can inspire our audience to

want to know more about cyber security in all its forms. Also we're testing the app that we designed last year with Orthrus Studio and pupils at Perth Academy. We need to know that it works technically.

How did you come to the idea of The Big Data Show?

In 2011 I made a show called Money the Game Show, in response the financial crisis and the fact that I understood almost nothing about how or why it had happened. I made this show by putting 10,000 real pound coins on stage, dividing the audience into two teams and demonstrating through a series of very childish and fun games 'how to be a hedge fund manager' and 'how the financial crisis happened'. I became inspired by the power of games to tell stories as part of live performance. I started talking to Rupert Goodwins about his past as a teenage hacker and began to think about how data is a kind of currency and the way it works and moves through the world is potentially even more hidden than how money works. So that was it. Rupert and I decided to write a show that used the audience's own mobile phones to dramatize what data is and how intimately interwoven it is into our everyday digital on and off-line lives.

Money The Game Show is published by Oberon https://www.oberonbooks.com/money.html

A Word From Rupert Goodwins

Video Resource 2. A series of specific questions answered by Rupert Goodwins in an interview with Clare Duffy

Rupert answers the questions:

- What did you do when you were 16 in 1984?
- What was "The internet" in 1984?
- What happened to your friends?
- What is the Computer Misuse Act?
- Why are you making a show about it now?
- What are your favourite do's and don't's of Cyber Security?
- Should we be worried?

Some Stats About Young People, Big Data and Cyber Security

"I ask all leaders and educators (…) to regard cyber resilience as vital to their success in our online world." John Swinney. Deputy First Minister.

Pupils "became much more aware of the amount of data gathering going on in the background without them giving explicit permission and this was a shock to them." Mrs Hollas. Drama Teacher. Perth Academy. After The Big Data Show workshops Spring 2017.

There is a need to think critically about 'everyday' digital technology use

12– 18 year olds today are the first generation to have grown up in a continuously online environment. Our 2017 developmental workshops in Perth Academy showed peer pressure and bullying is magnified through digital technology. One pupil said: "(Snapchat) is the most stressful thing in the world, I hate Snapchat but I would never ever delete it." Only one pupil out of 60 participants said they didn't use Snapchat.

Pupils in our workshops reported frequent bad cyber security, such as giving their password to other people. They also reported privacy was important to them.

Only half of 8-17 year olds (51%) said they always think about what personal information they could be sharing before they post a photo or video online. (Power of the Image Report. UK Safer Internet Centre. 2017) The National Crime Agency said, "in one week, authorities identified 345 vulnerable children and arrested 192 people, 30% involving streaming, blackmail and grooming." (BBC News 4th Nov. 2017.)

There is a need to demystify 'big data', how it is gathered and what it is used for.

Only 8% of consumers understand how organisations use their personal data. (Whose Data Is It Anyway? The Chartered Institute of Marketing. 2016) The amount of time 12-15s spend online has more than doubled since 2005 from 8 to 18.9 hours in 2015. (Ofcom report: 2015)

Our workshops showed none of the pupils knew their data is sold to 3rd parties. This led to discussion about how people/groups might use this information, including law enforcement agencies, scientists, medical researchers, criminals and politicians. We found

there was a significant difference in pupils' privacy settings between the first and second workshops.

There is a need to create a learning environment for teachers and young people to play and learn together.

Our workshops at Perth Academy showed a generational divide in relation to cultural use of digital technologies.

> *"I don't think mums and dads really understand, my mum is quite happy to take my phone away, but my whole life is on my phone." Perth Academy Pupil. Age 15.*

> *40% of UK population play online games and 6 in 10 children aged 10-15 have bought a game for themselves. (IPSOS Study 2012.)*

Social media platforms such as Snapchat also maintain consumption through gaming elements such as the collection of 'streaks', which pupils at Perth Academy reported made it so stressful.

> *I feel that we, as a society are sleepwalking into some very tricky times regarding data and its value to some very amoral people who see it as a way to make money with no regard for privacy for the people providing it. I, especially, feel we are silently and unwittingly abdicating the duty of care we have for young people in allowing this to happen without asking enough questions or even knowing we should!!* Sarah Lowis, Drama Teacher, Perth and Kinross.

Ofcom's report November 2015 shows tablets are increasingly used as the default entertainment screen, which makes adult supervision much more difficult. The report also found that:

> *"the relatively low levels of critical understanding raises challenges for how children keep their personal information safe"*
> *(Ofcom report: children and parents: Media Use and Attitudes Report. November 2015)*

About Curriculum Connections

In the appendices we have listed all the curriculum areas we think The Big Data Show connects with. Our hope in creating this resource pack is that it will inspire cross curriculum connections and inspire teachers to reach out to other departments in addressing cyber security in its broadest aspects.

We have also referenced where we believe the connections are with each workshop plan. Please let us know if there are more or if we've got it wrong. This is a living document and your feedback will make it better for the next teacher or pupil.

Part of the reason we created Civic Digits Theatre Company is because we're so excited about how digital technology is woven into the fabric of our everyday lives and touches every aspect of who we are and hope to be. How can we be happy, thoughtful, successful digital citizens, friends, families, scientists and artists all at the same time?

List of Supporting Workshops

Health and Well Being

Discussion: Do you want the right to delete your data?
Resources: Video x and x

Drama 1

Using drama to explore health and wellbeing

Drama 2

Issue based hot seating and other techniques

Social Studies

Discussion: How did we get here? A history of hacking
Resources: Video Rupert

Technologies

- Cheesy Cyber Security Quiz
- Create a game to teach someone something about cyber security. Maltesers and straws
- How did they do that? A practical fun workshop on teasing out the structure of the hardware and software and how it all fits together and how data travels through it
- Next level challenge: We give you access to the open source code for Swipe: Big Data Show. Can you hack it?

Literacy and Reading

The Small Print: A playful workshop reading the terms and conditions they accepted and finding the funny bits and the nonsense bits.

Seniors Students Training Workshop

Explores data breach and consequences of sharing / leaking personal data / builds skills and understanding

Creative writing exploring identity, character, tone and dramatic structure

Mini Swipe Introductory Workshop

A starting point for pupils who have not seen the show or for classes who saw it to have a reminder as a lead in to discussion.

Teachers Twilight Workshop

Supporting Workshop Outline Plans:

Health and Well Being and Literacy and English

Debate: Do you want the right to delete your data?

Social wellbeing

● As I explore the rights to which I and others are entitled, I am able to exercise these rights appropriately and accept the responsibilities that go with them. I show respect for the rights of others.

HWB 3-09a / HWB 4-09a

Listening and Talking:

Tools for listening and talking:

● When I engage with others, I have the right to hold a different opinion.

● I can respond in ways appropriate to my role and make a relevant contribution, encourage others to contribute and acknowledge those contributions to reflect on, clarify or adapt thinking.

LIT 3-02a

Would pupils like the right to delete all their data? An age of consent for online data? You might want to create teams to work on different aspects of the question and take a vote at the end of the session.

1) **Resource 3. Video: Second interview with Rupert answering these questions:**
   - What is data?
   - how is it collected and why?
   - how can you delete content that you have posted on line or that other people have posted about you online
   - How difficult is it to delete your data?
   - How much might it cost?
   - What would you lose if you deleted all your data?

2) **Resource 4. Video: Cy and Bug in the hot seat talking about their experiences of cyber bullying.**
   a) Discuss: What (if anything) did Cy do wrong? What can he do now? What do you think he will learn from this?

Extra Reading:

5 rights: Our Digital Rights

Jon Ronson So You've been Publicly Shamed

Drama 1

Using drama to explore health and wellbeing

Health and Well Being

As I explore the rights to which I and others are entitled, I am able to exercise these rights appropriately and accept the responsibilities that go with them. I show respect for the rights of others

HWB 3-09a / HWB 4-09a

Through contributing my views, time and talents, I play a part in bringing about positive change in my school and wider community

HWB 3-13a / HWB 4-13a

Drama

I can create, develop and sustain a realistic or stylised character through the use of voice, movement and language.

EXA 3-12a

Introduction:

This session uses drama techniques to explore young people' attitudes and awareness towards key themes.

- Minimum Time: 1 hour to get into it but the work could be developed over a number of weeks.
- Requirements: A cleared classroom, hall or drama studio. Flip chart paper and marker pens
- Preparation: Decide on your key theme for the session (eg. relationships / cyber security / safety / pressure etc.)

Getting Started:

- Use a *warm-up game* to instill skills of observation, negotiation and cooperation within the group to stretch their imagination and to assess what the group dynamic is on that day.

Games for control of scenes, fun and challenges

- Can This Group?: This is a cooperative game and is limited only by your own imagination. It can very easily be linked into themes. The idea is that the group is asked to complete a simple task in the count of, say, five. The rules are that they cannot speak, or direct each other with signs or pull or push each other into place - it must happen 'as if by magic'. The task may be standing in their own space, it may be standing in a perfect circle, or making the letter A as one group, or standing in groups of the same height etc.

- Can This Group? Advanced Version! Once the pupils have started to work together well and cooperate with each other the tasks can be expanded to include pictures of school life, favourite places, objects on the beach, a football match, or a concert. The teacher should go round and ask everyone in their frozen pose what they are - there are no wrong answers!! If they have an idea (eg. apiece of seaweed, a microphone) accept it! Encourage them to see that there are no wrong answers - they can be anything!

- The Remote Control Game: A useful and fun drama game that goes the group a shared set of 'commands' to help in the playback of scenes. Ask the young people to imagine themselves just before they wake up in the morning or out at a favourite coffee shop for example - somewhere they know well. You have the remote control and you can fast forward, rewind, slow motion, play and turn the volume up and down. You can even move them one frame at a time! Press play and watch them come to life. Pause them before each change of instruction and vary it by pausing all but two or three people and giving different groups a chance to 'perform' within the context of the game. All of these 'game commands' once learned can be used in directing the playback of the drama created later in the workshop.

Finding the starting point:
- Brainstorm the key theme in small groups - this gives a broader canvas and limits word association led brainstorms. Feed back to the whole group and listen to each other.

Achieving consensus:
- What are the three most important words and why? Ask the groups to decide privately which words are the most important to young people their age.

Exploring the context:
- Ask each of the groups to make three still images to represent their most important words. The image must contain conflict and be naturalistic, not symbolic - a moment of real life frozen. Prompt the young people to draw not from the TV, but from their lives.

Facilitating the image:
- Each group then present their images to the rest of the group who are asked to guess what is happening in the picture. By examining the image presented by each group it is possible to explore the range of situations it may represent to the audience. By not being too specific too early in the discussion it is possible to allow participants to share their concerns, experiences and coping strategies. This debate provides an opportunity for listening to the contexts within which young people place the themes under discussion.
- **Useful questions**: What might be happening? Where might it be taking place? What could you change? What would the picture look like? Who could change it? What could they do? Careful construction of questions will make responses easier for the group.

After questioning the rest of the group about the image ask those who created the image to describe what was going on in their story.

Building 'controls':
•Use the Remote Control Game to build controls within the group before asking them to develop their still images into short plays. (Included at the end of this section)

Priortising:

- Ask the groups to choose one of their images and make a short play involving words and movement to show how that situation occurred. Ask them to finish their play on a freeze consisting of their original image. Again prompt them to work from their lives and not from the TV - set a time limit.

Facilitating the Scenes:

- Play the scenes back to the audience and use the Video Game controls to rewind, turn he volume up, go in slow motion etc. Where are the hot spots in this scene? Where are the decision / pressure points? Where are there opportunities for change? How would that change happen? What would people have to say? Who else might get involved in this scene? How would they get involved? What things do the characters in the scene need to know to help them? How can they find out?

Reflection:

- Leave time at the end of the session to reflect further - 'out of character' - on what has been learnt and on how effective the group feels the process has been in getting at some insights and some truths.

Drama 2

Issue based hot seating and other techniques

Curriculum connections

Drama:
I can create, develop and sustain a realistic or stylised character through the use of voice, movement and language.

EXA 3-12a

I can demonstrate sensitivity, precision and depth in the portrayal of a character, conveying relationships and situations in a variety of settings and to different audiences.

EXA 4-12a

In response to a variety of stimuli, I can use my understanding of characterisation to create characters using different approaches, making use of voice, movement and language. I can present my work to an audience.

EXA 4-13a

Introduction

Video resource 4: Cy and Bug are in the hot seat talking about their experiences of cyber bullying.

- Minimum Time: 1 hour to get into it. The work could be developed over a number of weeks.
- Requirements: A large classroom with cleared space at the front for the Continuum, 3 way debate etc. Flip chart paper and marker pens
- Preparation: Decide on your key issue for the session (eg. "Every child and young person should have the right to easily edit or delete all content they have created".)

Introduction:

- Hot seating generally involves a volunteer agreeing to represent a fictitious character who answers questions put to her or him by the rest of the group. In this session the term is extended to include a variety of strategies which allow the members of the group to put themselves on the spot and explore attitudes and values which they may recognise as current in the real world. In whatever hot seat exploration the group creates, decisions can be made, risks taken and consequences addressed in the relative safety of a fiction.

Getting Started:

- Talk to the class about the theme for the session. Ask them to think of a fictitious character who might relate to that theme (eg. parent / young person / large corporation / teacher / police etc.)
- Or use video resource 4 where the actors hotseat their characters 'Cy' and 'Bug'

Role on the wall:

- Split the class into small groups of five or six. Draw an outline of a person on a large piece of paper (or blackboard). Ask the whole class to decide what the above character is like on the inside (write suggestions inside the body outline) and on the outside (what do they look like / how old are they etc. - these comments should be written around the outside of the body outline).

- Once the character has been created, ask the groups to think of other types of people who would relate, both to the original character and to the theme in question. You need one character selected for each of the smaller groups. Then ask each group to work together also do a 'role on the wall' for their character.

Key advantages:

- Because it is fiction it allows people to register personal concerns in public in some safety;
- Because everyone is invited to contribute there is a sense of group commitment to the characters we have invented.

A Continuum - Where do our characters stand?:

- Ask for a volunteer or nominee from each group.
- The volunteers/nominees will work together to represent the original character you created with the whole class. The other groups are asked to represent each of the other characters that have been created.
- Then individually each person in each group decides where she or he thinks that character might stand on a particular issue (eg. the right to erasure of data).
- Without consulting the others each then places them on an appropriate spot along an imaginary line from one extreme position to another.
- The task is then for each separate 'group-character' to negotiate an agreed position on the continuum. For example, if four out of five of the group representing a Police Officer decide that she is 'for erasure' and one doesn't agree, then the group has to debate the matter until it comes to an agreement. The group may need to find a compromise somewhere along the continuum (indicating perhaps a strongly held conviction but with specific reservation) or may manage to achieve unanimity by reasoned argument within the group and end up at one or other end of the continuum.
- If the group has chanced to arrive at exactly the same point on the continuum right from the start then it should discuss what made each member if the group decide that this was where their character would stand.
- Each (group) character then presents a single prepared sentence that states its convictions (not at this stage an argument, simply a bald statement of belief).

The context for dealing with this matter:

Can the whole group agree who this issue was raised between the four or five characters we have created? A specific time, place and occasion for the exchange will help create a fictional reality and prevent it from simply becoming a debate between the individuals in the group. It is a debate between them of course, but some people may well be arguing on this occasion from a point of view they have never before considered and people may wish to try out attitudes they might normally feel inhibited from holding.

A Three Way Dialogue:

Each group elects one of their number to represent their character, offers a little advice on how the character might enter the debate, then watches and listens as the three characters, within the agreed context (a school parents' evening perhaps), start up the dialogue. The dialogue then continues for as long as it seems productive.

Some rules to help:

- Time Out: At any point in the dialogue one of the characters may call "time-out" and retreat to the support group for advice or ask for a substitute who will then represent their character as the dialogue resumes (at the same time and place as before or at a different time and place if the whole group can see a point to such a change)
- Narration: The group leader may find it useful at times to move the fiction forward by interrupting the dialogue to narrate a sentence or two which prepares for the setting up of a new episode.

Some Strategies to help:

- Teacher in Role: A strategy which allows the leader to set up, prompt, support and challenge the group in its role playing. It does not call for great acting skills. On the contrary, the aim is to do the least required to provoke the best from the group. It is generally most productive to choose a role which needs to seek advice or help from the groups' role(s). At the heart of the drama there will be a dilemma. Teacher in role allows the leader to propose an appropriate dilemma from within the drama and to set the tone and level of seriousness needed to make the whole thing work.

- Thought Tracking: Attention will often be focused on a small group who have volunteered to improvise or present a moment. There may be times when the leader judges that those who are watching and listening to this dramatic episode should be more actively involved.
    - A simple and effective way of doing this is to freeze the active group and invite everyone to provide the possible thoughts of one or more of the characters. Surprising and valuable insights are sometimes elicited by this strategy.

Inside and Out:

- The teacher may feel that it would be enlightening to see how honest and straightforward that characters are being in their dealings with each other.
- Ask for volunteers to stand behind each character to represent their innermost thoughts.
- As the dialogue evolves the 'thoughts' can place a hand on the shoulder of their character at any appropriate moment.
- All dialogue freezes for that moment and the inner thoughts are expressed aloud by the interrupter.

- The dialogue then continues as though nothing had happened.
- The other characters should carry on as though they had not heard the thoughts of course, though they might 'suspect' that the person they are talking to is being less than honest!
- This is often an amusing and revealing strategy but should be used sparingly and with care, perhaps towards the end of a dialogue.

Reflection:

- A good deal of reflection, discussion and debate is integral to this whole process of drama.
- In addition, however, it is advisable to leave time at the end of the session to reflect further - out of character - on what has been learnt and on how effective the group feels the process has been in getting at some insights and some truths.

Social studies: How did we get here?

People, past events and societies

- I can present supported conclusions about the social, political and economic impacts of a technological change in the past

SOC 4-05a

Video Resource 2: A series of specific questions answered by Rupert Goodwins in an interview with Clare Duffy

He answers the questions:

What did you do when you were 16 in 1984?
What was "The internet" in 1984?
What happened to your friends?
What is the Computer Misuse Act?
Why are you making a show about it now?

Resource 5: News clippings from the time:

"Hacker who broke into Dukes computer file found guilty of forgery"
"Computer messages 'went to Palace'"
"Hacker in 'plea to be reported'"

Challenge:

What might have happened if Rupert and his 3 friends hadn't hacked BT's Prestel System?
What might have happened if the Prestel hackers had been un-ethical hackers?
What might have happened if the House of Lords had up held the original judgement of the Prestel Hackers?

Can you find a story in the news this year about hacking?

What relationship is there between the story from 2018 and 1984?

The responses to these questions could be shared in discussion or as written reports. They could also form the research for a creative piece of writing.

Technologies

Digital Literacy

● I can keep myself safe and secure in online environments and I am aware of the importance and consequences of doing this for myself and others.

TCH 3-03a

- Cheesy Cyber Security Quiz
- Create a game to teach someone something about cyber security. Maltesers and straws
- How did they do that? A practical fun workshop on teasing out the structure of the hardware and software and how it all fits together and how data travels through it

The Big Data Show's Cheesy Cyber Security Quiz with Answers

(NB Pupil copy without answers available on our website here.)

1) **When was the first message sent from one computer to another?**
   Answer: 1969
   Bonus question: what was sent?
   Answer lo: First two letters of "login"

2) **When was snapchat invented?**
   Answer: 2011

3) **Strong passwords: the best way to make a password is by**
   a) using the name of your pet and the year of your birth
   b) Using three random words together such as elbow-wasp-custard

c) Using random words and keeping all your passwords in a book in your bag so you don't get locked out of your favourite app because you can't remember your new password.

Answer: B

GOLDEN RULE: Never use a password for more than one thing. If hackers steal your username and password from one service, they'll try to use them for your email or other services. Thwart them.

Bonus question:
Can you guess the American nuclear launch code password used in missile silos between 1962 and 1977? Answer: 00000000 (eight zeros) (NB: The American Air Force officially denies this, but operators from the time confirm it.)

Bonus facts:
President Carter left his launch codes in the pocket a suit he sent to the cleaners, and President Clinton mislaid his codes for four months but didn't tell anyone.

4) **True or false: You should always download software or app updates because they will contain upgrades to the security of the software.**
Answer: True - but beware unexpected prompts that ask you to confirm a security update or warn you of a virus infection. Most updates happen automatically when you start up or shut down your computer or mobile device, or when you visit the app store.

You should be careful when upgrading your apps that you check that your personal security settings are still as you set them. Sometimes an upgrade resets your security to a default.

5) **You see an email that looks like it is from a friend or a company that you use, like Instagram or Apple. It is asking you to download a document. What do you do?**
a) Download it
b) Delete it immediately
c) Phone your friend or the company to see if they did send it
Answer: (B) Also beware unexpected instant messages with links in, they can also be dangerous spam.

GOLDEN RULE: If you didn't ask for it or aren't expecting it - don't click on it

6) **You are going on holiday where you know there will be no access or v. little access to internet. You want to make sure you keep up the apps you are using, like snapchat. Do you**
   a) Give your passwords to your best friend who you totally trust so that they can make sure you don't lose any streaks.
   b) Send a final sad face message to everyone explaining that you have to go to the far side of the moon where there is no internet and that when you come back you hope that you will be welcomed back.
   c) Just don't use the internet for a bit. It's quite nice to have a break.

Answer (b) or (c). Everyone knows that going analogue is the new cool.

7) **You are using free wifi on a bus or in a café. List these internet use activities in order of risk. Most risky 1 least risky 3**
   a) Email (2)
   b) Gaming (3)
   c) Shopping (1)

8) **Someone you don't know wants to be friends via an app do you**
a) See who your mutual friends are and ask them if they are genuinely friends
b) Decline anyone you don't know
c) Tell them where you live and invite them round to dinner.

Answer: It depends on what information being a friend will give that person access to.

9) You're browsing a website you haven't visited before on your mobile when you get a pop-up message saying your phone is infected and you should download a scanner to fix it immediately. Do you:
a) Follow instructions as quickly as you can
b) Ignore it and carry on
c) Build a large bonfire and burn your phone to ashes - it's the only way to be safe

Answer: (b) In general, the sketchier the website the more likely it is to be carrying fake adverts and pop-ups that try to trick you.

10) Imagine someone who knows nothing about internet security.
What would you tell them?

Bonus question:
Imagine someone who knows nothing about the internet… What is the best thing/s?
Shared conversation

A Game To Explore Cyber Security

Challenge:
Invent a game to teach something to someone who knows nothing about cyber security

Questions to consider before starting as a whole group

1) What sort of person might not know anything about cyber security?
2) What sort of game might they like?
3) What information or data do you think is the most important or sensitive?
4) What makes a game a game? For the purposes of this exercise you're going to make a game that is easy to explain, that has a clear way to win and is fun.

Split up into smaller groups

5) Each group gets the same objects. These can be anything you want. We suggest easy to source, everyday objects such as straws, balloons, Maltesers, cups. Or 2 sheets of paper. A stack of paper clips and 2 pencils. You don't have to use them.

6) Each group has a fixed amount of time to create a game that demonstrates an aspect of being safe online.

For example: At a recent hackathon at Codebase the winning team created a game that replicated a social media platform but it wouldn't let you login unless you cleared a level of security. By having to check the settings for example. Then at the next level you had to find ways of balancing risks with opportunities to use and enjoy the app.

7) Give the game a name. Practice explaining it.
8) Share
9) Play each game and vote on which game is the best solution to the challenge.

Information it would be great to feedback to Civic Digits
What did participants identify as most important cyber security risks?
What solutions did they create?

Resource 6: Safe, Secure & Prosperous: A Cyber Resilience Strategy For Scotland
Cyber Streetwise Get Safe Online

How did they do that?! (Packets)

Practical fun workshop on teasing out the structure of the hardware and software and how it all fits together and how data travels through it

Computing Science

● I can describe the structure and operation of computing systems which have multiple software and hardware levels that interact with each other.

TCH 3-14b

● I can explain the overall operation and architecture of a digitally created solution

TCH 4-14b

Workshop: Map the Data Journey

Challenge:

Can you work out what the journey is of GPS data through The Big Data Show app?

Resource 7:
A map of the data flow and control system for The Big Data Show app.
GPS Data Flow Diagram showing how Swipe collects and displays location data.

> **Suggestion:** Use everyday or fun objects to represent the data journey and make the data journey as a whole class. For example: Maltesers or paperclips can represent GPS co-ordinate data, which is collected at every play of SWIPE, and then string and labels or stickies, to describe either place or parts of the control system.

Additional Challenge:
The open source code for Swipe: big data show can be found here Can you hack it?

Literacy and Reading

The Small Print: A playful workshop reading the terms and conditions they accepted and finding the funny bits and the nonsense bits.

Understanding, analysing and evaluating

● To show my understanding, I can comment, with evidence, on the content and form of short and extended texts, and respond to literal, inferential and evaluative questions and other types of close reading tasks .

ENG 3-17a

● To show my understanding, I can give detailed, evaluative comments, with evidence, on the content and form of short and extended texts, and respond to different kinds of questions and other types of close reading tasks.

ENG 4-17a

THE SMALL PRINT

Resource 8**:** The terms of service for Swipe
Resource 9**:** A copy of the Terms of Service annotated by Clare Duffy with her thoughts and reasons for writing it like this.

Additional reading: Why not find the terms of service for a popular app such as Facebook or Snapchat?

Challenge 1: How many silly or non-sensical phrases or sentences can you find in the Terms of Service for Swipe?

Challenge 2: Can you re-write these terms in 'plain English'?

Discuss or write a response to these questions:
How would you describe the tone of the Terms of Service?
If the Terms of Service was a person what kind of person would they be? Describe what they

1) Wear
2) Eat for breakfast
3) Do at the weekend

What stories do you know where a character is tricked into signing a contract?
The Little Mermaid (Disney version)
Dr Faustus
The Picture of Dorian Gray
Wall Street (Film. Director. Oliver Stone)

Creative writing exploring identity, character, tone and dramatic structure

Creating texts

● I can engage and/or influence readers through my use of language, style and tone as appropriate to genre.

ENG 3-27a / ENG 4-27a

Digital Literacy

● I can keep myself safe and secure in online environments and I am aware of the importance and consequences of doing this for myself and others.

TCH 3-03a

• I can evaluate the implications for individuals and societies of the ethical issues arising from technological developments.

TCH 3-06a

Creative Writing 1: Tone

Resource 10: Video Bug describing the data breach of sharing his mum's poetry.
Resource 3: Video interview with Rupert about data

1) **10 questions to think about character**

What 5 words would you use to describe Bug?
What does she like eating?
What is her favourite app?
What do you think she will do in the future for a job?
What hobbies does she have?
Who is the most important person in her life?
What does she hate?
Where does she go/what does she do when she is upset?
What makes her laugh?
What music does she listen to?

2) Can you write a description of another time Bug regretted posting something online? A) Imagine that she is describing this to her mum. B) imagine she is describing the same thing to her best friend.

3) Discuss: How does who is listening change the way she describes what happened?

4) Watch Rupert's interview about data and the right to remove data.

5) Write a letter or speech to be given in public, to the Government or to a large internet company like Google or Apple from Bug arguing that he and other young people should have the right to easily edit or delete content they have created.

6) Discuss what is formal language or appropriate language to use in public or when trying to engage with authority and/or powerful organisations.

Resource 9: 5 rights Our Digital Rights
The first of The Five Rights Framework is The Right To Remove

UNCRC Article 16 (right to privacy);
Article 12 (respect for the views of the child) 'Sometimes I regret what I post online and wish there was some easy way to make it disappear.'

Creative writing 2: Dramatic Writing

Creating texts

● Having explored and experimented with the narrative structures which writers use to create texts in different genres, I can:
○ use the conventions of my chosen genre successfully and/or
○ create an appropriate mood or atmosphere and/or
○ create convincing relationships, actions and dialogue for my characters .

ENG 4-31a

Health and Wellbeing

Mental and emotional wellbeing

Social wellbeing

● As I explore the rights to which I and others are entitled, I am able to exercise these rights appropriately and accept the responsibilities that go with them. I show respect for the rights of others.

HWB 3-09a / HWB 4-09a

Video Resource 11: Rupert meets Robert after the first trial.

Rupert I'm sorry Robert.

Hey. Robert.

RUPERT (*Looking around him*) Is this really necessary?

ROBERT They were recording my phone calls Rupert. Do you think that's all they were doing?

RUPERT But are they allowed to even do that?

ROBERT I'm not sure. But they did, didn't they.

RUPERT I'm sorry Robert.

ROBERT Where have you been? Why didn't you get arrested? Why didn't they make records of your phone calls for 5 months? Did you know about any of this? Did you say something to anyone?

RUPERT Well. You saw me on TV

ROBERT Rupert. This isn't funny. This is real. This is me stripped naked and running for my life with people watching every moment. Do you know how that feels? Do you?

1) **Dramatic writing needs action**

What is the action in this scene?
What is at stake?
What do the characters want?
What do you think is the likely outcome/s?

Write what happens next in the scene or in a later scene.

2) **Action is character**

There is a saying that when writing drama "action is character".
Discuss (or think about) what mistakes people make online or what concerns/worries they have about cyber security?

Think of an action, something someone might do that relates to cyber security.

Now develop your first character (A):

Answer these 10 questions about character A

1) What is their obsession or passion in life?
2) What is their earliest memory?
3) What are they the most proud of?
4) What is their home like?
5) Describe their bedroom.
6) Give them a name.
7) Favourite food
8) Hopes or ambition
9) What do their parents/careers do?
10) What haven't they told anyone?

Now imagine someone who has a) either just found out what Character A has done and is upset about it or b) they want to stop Character A before they do something to do with cyber security risk.

First answer these questions about Character B.

1) How did they find out what Character A did?
2) Why are they upset and/or why do they want to stop them?
3) What are they going to do?
4) How do they feel about it?
5) What do they hope will happen?

Now write a short scene where character B confronts character A.

Subtext

Something to think about: When you're writing dialogue people often say more 'in between the lines' than out loud. Look at the clip from the show.

What do you think is being said between the lines?
Can you write in the subtext between these lines?
Can you write in the subtext between the lines in your own dialogue?

Creative Writing 3: Identity in The Big Data Show

Video Resource 12: Clare Duffy talks with Rupert Goodwins about 'Identity'

How many different representations of Rupert Goodwins are there in the workshop?

1) The figure in the game
2) We all put up our right hand and say 'I am Rupert Goodwins' because it's in the terms of service we agreed to
3) The actor playing Rupert, when they put on the jumper
4) The real Rupert Goodwins answering questions at the end
5) Are there more?

Create two characters, you can look at recent news stories and find character/s to base your writing on. The first one is really worried about cyber security. The second character doesn't think there is any risk or danger about cyber security.

First answer these questions:

What would someone who was really worried about cyber security worry about?
What would they do to protect themselves?
What would they miss out on?

What risks does the second character take?
What might the consequences of those risks be?
How many different types of identity do each of the characters have? (ie they are a son/ pupil/brother/friend/gamer called Sqeaky the mouse etc)

Write a short story about how these two characters meet online and then in real life.*Senior*

Pupils Training Workshop 1 (90 Minutes)

Cyber Security, Leadership and Communication Skills

The 4 capacities

- Successful learners
- Confident individuals
- Responsible citizens
- Effective contributors

"to exercise their responsibilities as members of a community"
includes:

- opportunities to participate responsibly in decision making
- to contribute as leaders and role models
- offer support and service to others
- play an active part in putting the values of the school community into practice.

Objectives

To explore the setting for the intervention in the performative workshop

To make the intervention for the performative workshop
To brief the participants about their visit to other classes through the school (15/20 minutes)

Session Plan

1. **Introduction** Clare/Freda

(2 mins)

2. **Game – (team building) '**Name click'.

(5 mins)

3. **Game - (working together)** 'Can this group?' Building to creating images and finish in circle (images evolve to 'situations' in real life to spark ideas in heads of pupils)

(5 mins)

4. **Group work - Brainstorming.** Put into 4 groups, each with named facilitator. quickly introduce yourselves to facilitator and write the word 'data' in middle of sheet Throw down as many words that you associate with data that you can on the sheet (paper and pen)

(5mins)

5. **Group work - 'Consequences'** creating the key scene. Room check to introduce the term 'personal data breach' and establish what we understand it is.
In groups choose 3 of your words that:

- are about the sharing of data,
- are very relevant to young people's lives now
- and your group regard as important.

Select from these 3 the one that most relates to everyday life, the one that you think is most important to young people like you. Think of a situation related to the word you have chosen which explains how important the word is. It must be a moment in real life frozen. It is about the **consequences of not knowing**. Everyone in the group must have a role: you must know **who** you are, **where** you are and **what** is happening in the story

(10 mins)

6. **Extending the narrative** Make the short scene that happens just before and leading up to that image. Again everyone in the group must have a role - you must know who you are, where you are and what is happening in the story. (The scene ends in frozen image you made just now).

(15 mins)

7. **What's The Story?** Lightening share the four stories (with facilitation from Freda) to whole room. Discuss and finish with agreeing an image/story title/label for each.

(10 mins)

8. **The Intervention** - explain it and Clare chooses the scenario we will work from. Work out what the data breach is and tell them the scenario for the performative workshop - allocate roles to the groups.
Rehearse it.

(20 minutes)

Senior Classroom MiniWorkshops Outline Training Plan.
The performers share with the senior pupils the moment in the play when Swipe is introduced. The pupils will experience it again in show as part of their training/ familiarisation.

MiniWorkshop Agenda:

- Play Swipe with the class
- Quiz - run the Cheesey Cyber Security Quiz (ask the questions and share answers when finished).
- Answer questions about their experience of The Big Data Show

(15 mins)

Thank you! If time!

(3 mins)

Senior Pupils Training Workshop 2 (60 Minutes)

Cyber Security, Leadership and Communication Skills

The 4 capacities

- Successful learners
- Confident individuals
- Responsible citizens
- Effective contributors

"to exercise their responsibilities as members of a community"
includes:

- opportunities to participate responsibly in decision making
- to contribute as leaders and role models
- offer support and service to others
- play an active part in putting the values of the school community into practice.

Objectives
To explore the setting for the intervention in the performative workshop
To make the intervention for the performative workshop
To brief the participants about their visit to other classes through the school (15/20 minutes)

Session Plan

1. **Introduction** Clare/Freda

(2 mins)

2. **Game – (team building)** 'Name click'.

(5 mins)

3. **Game - (working together)** 'Can this group?' Building to creating images and finish in circle (images evolve to 'situations' in real life to spark ideas in heads of pupils)

(5 mins)

4. **Group work - Brainstorming.** Put into 4 groups, each with named facilitator. quickly introduce yourselves to facilitator and write the word 'data' in middle of sheet Throw down as many words that you associate with data that you can on the sheet (paper and pen)

(5mins)

5. **Group work - 'Consequences'** creating the key scene. Room check to introduce the term 'personal data breach' and establish what we understand it is.
In groups choose 3 of your words that:

- are about the sharing of data,
- are very relevant to young people's lives now
- and your group regard as important.

Select the one that most relates to everyday life.

(7 mins)

6. **Creating the narrative** Make a very short scene in which a person, friends or a group are let down by a data breach. Everyone in the group must have a role - you must know who you are, where you are and what is happening in the story. It is about the consequences of not knowing. (The scene ends in a freeze - we must decide that point).

(8 mins)

7. **What's The Story?** Lightening share the four stories (with facilitation from Freda) to whole room. Discuss and finish with agreeing an image/story title/label for each.

(8 mins)

8. **The Intervention** - explain it and Clare chooses the scenario we will work from. Work out what the data breach is and tell them the scenario for the performative workshop - allocate roles to the groups.
Rehearse it.

(10 minutes)

Senior Classroom MiniWorkshops Outline Training Plan.
The performers share with the senior pupils the moment in the play when Swipe is introduced. The pupils will experience it again in show as part of their training/ familiarisation.

MiniWorkshop Agenda:

- Play Swipe with the class
- Quiz - run the Cheesey Quiz (ask the questions and share answers when finished).
- Answer questions about their experience of The Big Data Show

(10 mins)

Mini Swipe Introductory Workshop

Presented by senior pupils who have been trained in delivery, this intervention is a starting point for pupils who have not seen the show or for classes who saw it to have a reminder as a lead in to discussion.

MiniWorkshop Agenda:

- Play Swipe with the class.
- Quiz - run the Cheesey Cyber Security Quiz (ask the questions and share answers when finished).
- Answer questions about their experience of The Big Data Show

Who's Who in The Big Data Show?

Person	Role
(CD) Clare Duffy	Creative Director Civic Digits, Associate Artist Perth Theatre, Co-director Unlimited Theatre.
(SG) Suzy Glass	Executive Producer
(RG) Rupert Goodwins	Co-writer
(FB) Freda O'Bryne	Creative Learning Director

Orthus Studio

Director Oliver Smith: Delivery of the app for use in live performance and workshops.

Ethics Committee

Person	Affiliation	Role
(EK) Prof. Ewan Klein (Chair)	University of Edinburgh	Data
(NC) Dr. Natalie Coull	Abertay University:	Ethical Hacking
(LP) Dr. Lynn Parker	Abertay University:	Games
(DS) Daniel Sellers	Scottish Government:	Cyber Resilience
(LG) Liz Green	Youth Link Scotland	youth work

Producers

- Civic Digits C.I.C
- Perth Theatre
- Unlimited Theatre

Partners

- Prewired (coding youth club)
- Edinburgh International Theatre (Creative Learning),
- The Citizens' Theatre (Glasgow, Creative Learning)
- Dr Alasdair Rutherford: Senior Lecturer in Quantitative Methods in Sociology, Social Pol&Criminology, University of Stirling (Setting and evaluation of data literacy test)
- TBDS Ethics Committee (Details given above)
- Abertay University

Resources and Contacts

Civic Digits Download Swipe
Civic Digits teachers pack
Civic Digits Video Resources
Civic Digits PDF Resources
Civic Digits Risk Assessment
Civic Digits Contact

Media

BBC online:

- **Aleks in Wonderland** the story of the internet: This is a great 3 part series that gives a really fanatically accessible history of the internet.
- **Bringing Up Britain** Radio 4 programme: parenting in the age of the smart phone
- **How to avoid Surveillance** ... with the phone in your pocket - Christopher Soghoian
- **Your Smartphone is a Civil Rights Issue** - Christopher Soghoian
- **What Your Devices Know (and share) About You** - Kashmir Hill and Surya Mattu
- **Take Back Control of your personal data** - Maria Dubovitskaya
- **Governments Don't Understand Cyber Warfare**, we need hackers - Rodrigo Bijou
- **Gaming Can make a Better World** - Jane McGonigal
- **Youtube Event testing 'is google listening to you'**: "Does Google and Facebook listen in and record conversations and audio even when they're not open? I perform a live test using Google chrome on a Windows 10 PC to discover whether my microphone appears to be recording me even when my browser is turned off in order to better target advertisements."

Websites

Youngscot

- Young Scot is the national youth information and citizenship charity. It provides young people, aged 11 - 26, with a mixture of information, ideas and incentives to help them become confident, informed and active citizens.

Coderdojo

- CoderDojo Scotland is part of a global collaboration that provides free coding clubs for young people.

Codeclub

- Code Club UK is a nationwide network of volunteers and educators who run free coding clubs for young people aged 9-13.

Youth Scotland

- Youth Scotland's work reaches 64,255 young people and supports 7,558 youth workers.

5Rights

- enables Children and Young People to Access the digital world creatively, knowledgeably and fearlessly.

HM Government Cyber Aware Blog:

Paul Pangaro 'Getting Started Guide to Cybernetics'

Edinburgh University's Edinburgh Local Initiative linking into City Region Deal.

Netaware Your Guide to the Social Networks Your Kids Use

Fortnite All you Need To Know

Parents vs Kids - who is safer online? Fun Quiz

UK Safer Internet Centre- Top tips for 11 to 19s

Uk Safer Internet Centre - Teachers and staff resources

UK Safer Internet Centre - Parents Guide to Technology

Partner Organisations

Civic Digits www.civicdigits.com

Unlimited

- Unlimited is a company of UK artists and producers making and telling inspirational stories for live performance in public spaces – theatres, festivals, galleries, museums, the streets of your city, on the internet and for broadcast.

Perth Theatre

- Perth Theatre has a long history of artistic innovation and excellence having been at the heart of cultural life in Perth for over a century.

Prewired

- Prewired provides an unstructured but supportive environment for under 19s to explore and learn about computer programming and related topics.

Codebase

- CodeBase is the UK's largest tech scaleup incubator, and one of Europe's fastest-growing tech hubs.

Abertay

- Abertay is in the heart of Dundee, combining the advantages of a close-knit campus with city centre life

Orthrus

- Orthrus Studios is a specialist in Serious Games and bespoke Software development.
- **EIF** The **Edinburgh International Festival** brings audiences and artists together from all over the world

Appendix 1: Curriculum Connections

Health and Wellbeing:

- engages children and young people and **takes account of their views and experiences**, particularly where decisions are to be made that may impact on life choices
- **takes account of research and successful practice** in supporting the learning and development of children and young people, particularly in sensitive areas such as substance misuse
- uses a variety of approaches including **active, cooperative and peer learning and effective use of technology**
- encourages children and young people to **act as positive role models** for others within the educational community
- leads to a lasting commitment in children and young people to follow a healthy lifestyle by **participation in experiences** which are varied, relevant, realistic and enjoyable
- helps to f**oster health in families and communities** through work with a range of professions, parents and carers, and children and young people, and enables them to understand the responsibilities of citizenship (roll out of show in 2019)
- harnesses the **experience and expertise of different professions**, including developing enterprise and employability skills

Experiences and outcomes

- learn about where to find **help and resources to inform choices**
- assess and manage risk and **understand the impact of risk-taking behaviour**
- reflect on my strengths and skills to **help me make informed choices** when planning my next steps

Across all areas:

Mental, Emotional, Social and Physical Wellbeing:

Social wellbeing:

As I explore the rights to which I and others are entitled, I am able to exercise these rights appropriately and accept the responsibilities that go with them. I show respect for the rights of others

HWB 3-09a / HWB 4-09a

Through contributing my views, time and talents, I play a part in bringing about positive change in my school and wider community

HWB 3-13a / HWB 4-13a

Relationships -I understand and can demonstrate the qualities and skills required to sustain different types of relationships.

HWB 3-44b / HWB 4-44b

Mental and emotional wellbeing:

I am aware of and able to express my feelings and am developing the ability to talk about them.

/ HWB 3-01a / HWB 4-01a

Social wellbeing

As I explore the rights to which I and others are entitled, I am able to exercise these rights appropriately and accept the responsibilities that go with them. I show respect for the rights of others.

HWB 3-09a / HWB 4-09a

The Expressive Arts

- active involvement in **creative activities and performances**
- tasks or performance **opportunities which require a creative response**
- **opportunities to perform or present** to an audience
- **partnerships with professional** performers or artists and other creative adults
- raising awareness of **contemporary culture** and connecting with young people's experiences
- appropriate, effective **use of technology**
- both **collaborative and independent** learning
- establishing links within the expressive arts subjects and with the wider curriculum
- opportunities to **analyse, explore and reflect**.
-

Learning in, through and about the expressive arts:

- enables me to **experience the inspiration and power of the arts**
- recognises and **nurtures my creative and aesthetic talents**
- provides **opportunities for me to deepen my understanding of culture** in Scotland and the wider world
- is **enhanced and enriched through partnerships** with professional arts companies, creative adults and cultural organisations.

Drama

I can create, develop and sustain a realistic or stylised character through the use of voice, movement and language.

EXA 3-12a

I can demonstrate sensitivity, precision and depth in the portrayal of a character, conveying relationships and situations in a variety of settings and to different audiences.

EXA 4-12a

In response to a variety of stimuli, I can use my understanding of characterisation to create characters using different approaches, making use of voice, movement and language. I can present my work to an audience.

EXA 4-13a

I can analyse technical aspects of drama and scripts, make informed judgments and express considered opinions on my own and others' work.

EXA 4-15a

Literacy and English

Experiences and outcomes

I develop and extend my literacy skills when I have opportunities to:

- **communicate, collaborate and build relationships**
- **reflect on and explain** my literacy and thinking skills, using feedback to help me improve and sensitively provide useful feedback for others
- **engage with and create a wide range of texts** in different media, taking advantage of the opportunities offered by ICT
- **develop my understanding of what is special**, vibrant and valuable about my own and other cultures and their languages
- **explore the richness and diversity of language**, how it can affect me, and the wide range of ways in which I and others can be creative
- **extend and enrich my vocabulary** through listening, talking, watching and reading.

In developing my English language skills:

I **engage with a wide range of texts** and am developing an appreciation of the richness and breadth of Scotland's literary and linguistic heritage

I enjoy **exploring and discussing word patterns and text structures**.

Listening and Talking:

Tools for listening and talking:

When I engage with others, I can may have the right to hold a different opinion. I can respond in ways appropriate to my role and make a relevant contribution, encourage others to contribute and acknowledge that those contributions to reflect on, clarify or adapt thinking.

LIT 3-02a

When I engage with others I can make a relevant contribution, ensure that everyone has an opportunity to contribute and encourage them to take account of others' points of view or alternative solutions.
I can respond in ways appropriate to my role, exploring and expanding on contributions to reflect on, clarify or adapt thinking.

LIT 4-02a

Finding and using information:

As I listen or watch, I can:

- identify and give an accurate account of the purpose and main concerns of the text, and can make inferences from key statements
- identify and discuss similarities and differences between different types of text
- use this information for different purposes.

LIT 3-04a

As I listen or watch, I can:

- clearly state the purpose and main concerns of a text and make inferences from key statements
- compare and contrast different types of text
- gather, link and use information from different sources and use this for different purposes.

LIT 4-04a

Understanding, analysing and evaluating:

I can show my understanding of what I listen to or watch by commenting, with evidence, on the content and form of short and extended texts.

LIT 3-07a

I can show my understanding of what I listen to or watch by giving detailed, evaluative comments, with evidence, about the content and form of short and extended texts.

LIT 4-07a

Creating texts:

When listening and talking with others for different purposes, I can:

- communicate information, ideas or opinions

- explain processes, concepts or ideas
- identify issues raised, summarise findings or draw conclusions.

LIT 3-09a

When listening and talking with others for different purposes, I can:

- communicate detailed information, ideas or opinions
- explain processes, concepts or ideas with some relevant supporting detail
- sum up ideas, issues, findings or conclusions.

LIT 4-09a

I can engage and/or influence readers through my use of language, style and tone as appropriate to genre.

ENG 3-27a / ENG 4-27a

Social Studies

Experiences and outcomes

Learning in the social studies will enable me to:

- **develop my understanding of the history**, heritage and culture of Scotland, and an appreciation of my local and national heritage within the world
- **broaden my understanding of the world** by learning about human activities and achievements in the past and present
- develop my understanding of my own values, beliefs and cultures and those of others
- **develop my understanding of the principles of democracy and citizenship** through experience of critical and independent thinking
- **explore and evaluate different types of sources** and evidence
- learn how to locate, explore and link periods, people and events in time and place
- learn how to locate, explore and link features and places locally and further afield
- engage in activities which encourage enterprising attitudes
- develop an understanding of concepts that stimulate enterprise and influence business
- **establish firm foundations for lifelong learning** and for further specialised study and careers.

People, past events and societies

I can describe the factors contributing to a major social, political or economic change in the past and I can assess the impact on people's lives.

SOC 3-05a

I can present supported conclusions about the social, political and economic impacts of a technological change in the past.

SOC 4-05a

I can discuss the motives of those involved in a significant turning point in the past and assess the consequences it had then and since.

SOC 3-06a

Having critically analysed a significant historical event, I can assess the relative importance of factors contributing to the event.

SOC 4-06a

Technologies

- develop understanding of the **role and impact of technologies** in changing and influencing societies
- contribute to building a better world by taking **responsible ethical actions** to improve their lives, the lives of others and the environment
- gain the skills and confidence to **embrace and use technologies** now and in the future, at home, at work and in the wider community
- become **informed consumers** and producers who have an appreciation of the merits and impacts of products and services
- be capable of making reasoned choices relating to the environment, to sustainable development and to **ethical,** economic and cultural issues
- broaden their **understanding of the role that information and communications technology** (ICT) has in Scotland and in the global community
- broaden their understanding of the **applications and concepts behind technological thinking**, including the nature of engineering and the links between the technologies and the sciences

Key concepts/significant aspects of learning in the technologies:

- Awareness of **technological developments** (Past, Present and Future), including how they work.
- **Impact, contribution, and relationship of technologies** on business, the economy, politics, and the environment.
- **Using digital products and services** in a variety of contexts to achieve a purposeful outcome
- Searching, processing and **managing information** responsibly
- **Cyber resilience and internet safety**

Digital Literacy

I can keep myself safe and secure in online environments and I am aware of the importance and consequences of doing this for myself and others.

TCH 3-03a

I can explore the impact of cyber-crime for business and industry and the consequences this can have on me.

TCH 4-03a

Technological Developments in Society and Business

I understand how scientific and technological developments have contributed to changes in everyday products.

TCH 3-05a

I can evaluate the implications for individuals and societies of the ethical issues arising from technological developments.

TCH 3-06a

Computing Science

I can describe the structure and operation of computing systems which have multiple software and hardware levels that interact with each other.

TCH 3-14b

I can explain the overall operation and architecture of a digitally created solution

TCH 4-14b

Appendix 2: Performative Workshop Outline

1. Introduction

In which we meet the Digital Magicians hear about bullying, earning a streak, our digital footprint and almost meet Rupert.
Themes: Identity - what is it? Theatre and how it works. The language of 0 and 1. The start of social media. The arc of history. Ethical Hacking. Our digital footprint.

5 mins

2. SWIPE

In which we play Swipe together, talk about our favourite apps and ponder the question of online identity.
Themes: The joy of gaming and playing together. Identity. Winning. Game design.

5 mins

3. Unlocking The Next Level: Infinite Rupert.

In which we talk about hacking, selfies and exploring the world of the internet. We meet Rupert, travel back in time to the 80s and learn about why his best friends were arrested.
Themes: The hackers challenge. Unlocking the invisible game - a simple 'hack'. Online time and how we use using selfies as an example. The fun of competing against each other, failing and trying again, trying different strategies out. Storytelling and oral history. Music and how it affects our experience and mood.

10 mins

4. Digital Magic Tricks Commence!

In which the phones go wild and we learn about Terms and Conditions...
Themes: Software controlling hardware. Software containing embedded functions we may not know about. Harvesting gf data and our role in that process. The uses of data harvested from apps.

10 mins

5. Rupert's Story Part 1. Nan/knitting

In which we talk about the cloud, the cybersphere and our presence there and in real life, Rupert hacks his nan's phone and gets a new jumper.

Themes: Binary code vs knitting. The Cloud - an abstraction or a physical reality? Controlling our data - where and what it is. Taking things too far? The consequences of what we do .

3 mins

6. The GPS Data Trick

In which we talk of secrets, feelings, sharing information and whether it really matters at all. What are the potential risks of so much data being available to companies/ governments/others?
Themes: Consequences. Cheating. Controlling your data - once released you can't take it back. Online safety. GPS Tracking. Profit from data. What agreeing to terms and conditions means. Vulnerability online.

5 mins

7. Rupert story 2: Film and arrest - Play game in reverse

In which we see news footage from the 80s about the hackers arrest, meet a policeman, talk about password security and lose a very important book.
Themes: History of ethical hacking and introduction of legislation. Friendships and loyalty. The role of those in power in protecting our data.

12 mins

8. (Non-) digital Magic trick 5: Senior pupils participation/the challenge and forum

In which the show goes to far and shares information that hurts and people are angry.
Themes: Consequences. Controlling your data. Online safety

20 mins

9. Rupert Interview

In which we the real Rupert talks to us and answers questions. We also meet the real jumper.

10 mins

Appendix 3: The Big Data Show Workshop Script

By Clare Duffy and Rupert Goodwins

Preset Swipe on control system and 80s pop playlist.

There are two workshop leaders. They are geeks. As the class/audience enter they say 'hi' and check that they have their phone with them. If they don't they give a show phone to anyone who needs one (we should have 25).

They also check that their phones have got SWIPE downloaded and open.

Have they been playing Swipe? What do you think of it?

Check that the sound is on and that no other apps are open.

We're testing this app so if during the workshop it seems like your phone isn't doing what the other phones are doing. The first thing is to close the app and reopen it
Make sure you are connected to our wifi hotspot. THEBIGDATASHOW password hrhacker

They have top hats which they put on when everyone has sat down.

1. Introduction

CY	Hello.
Pupil	Hello.
Cy	It has to start somewhere doesn't it?
	I mean.
	Where do ideas even come from?
	Who am I? (To audience member) Who are you?
	No really who are you?
AM	(Name/response)
CY	Well done! (That's an amazing name.) Pleased to meet you. Be proud. (So that's your name) but who are you?
BUG	CY! Can we just say 'hello' like people do eh?
CY	"People"? Typical people you mean? Boring…

BUG Maybe if we say who we are?

Cy Ah. Yes. Brilliant. Yes. I'm Cy this is Bug and we are digital magicians.

Bug Or ethical hackers.

Cy We are a theatre company. That's Freda. She's our workshop leader. That's Clare. She's our producer. And that's Bill our stage manager. How many of you have been to the theatre?

We want to make a show. An amazing show in a massive theatre, with red seats and gold decoration because it would be so cool to make one of those places built 100 years ago, when there were still horses and carts in the streets, to fill it will teenagers and technology and make it amazing.

So the thing is, we need your help.

Bug Yeah. We really do.

Cy We're about half way through making our show but we're stuck. In a jam. Our creative juices are putrifying like a banana you forgot you had at the bottom of your bag, maybe you put it in a little side pocket and then 3 maybe 4 months later, you put your hand in to that side pocket looking for a pen and your fingers return to you covered with radioactive banana syrup.

Bug Cy!

Cy We need your help. Our ideas are stuck on the fly mat of creativity.

Bug Ok. Enough. Cy. Don't you want to know who has won?

Cy Ah yes. Who's the best at SWIPE?

Bug Has anyone got over 50? Over 100? 120? 150 etc

Wow.

Right here right now let's have a swipe off!

Let's split into teams.

Bug Freda you're on my team

Cy Clare you're with me.

Bug If you lose your tree lives sit down. Be honest!

Cy Once you've sat down you can keep playing if you want. But can you turn off the sound please, thanks.

Bug Ready steady go!

Bug and Cy try to make it more difficult for each other's teams.

If they are going for too long Clare will say 'let's have a count down!'

2. Play Swipe

They get the audience to play. Everyone plays Swipe in two teams.

When Freda loses she goes into the audience and casually engages with the pupils about how they react to the game.

3. Unlocking the next level. Testing different music

Bug Swipe has secret and hidden levels too. We made it.

CY Who knows what a hacker is?

Pupils reply and CY engages with them.

Cy So I'm a hacker. Bug here is a hacker. We love hacking. Hacking is really a game. The best game because you can play it everywhere. Everything can be turned into a game by a hacker. Because a hacker just wants to know. Wants to know how, why, what, who.

BUG Hey Cy. You going off on one?

CY Sorry. Yes.

I do do that. I do go off down rabbit holes of thought. One thing leads to the next and the next and before you know it people start to think you're a bit weird. A bit of a geek. Which is why Suzanne Connors picked on me. Which is why Suzanne Connors snapped me and sent it to basically everyone in the whole world and I had to work out how to trick the google algorithm to hide my digital footprint, which took a really quite a long time and I'm really good at that stuff. Because I love hacking.

BUG Our show is about hacking.

Cy It's a digital magic show

Bug We made Swipe for you for fun. But also it was a challenge to any potential ethical hackers. There's a secret door to the next level of the game. Did anyone find it?

Engage in response from the audience.

Bug You have to be on the Game Over page of Swipe. Then if you tap on the colour red 5 times you will unlock .

Ready? 1, 2, 3, 4, 5

Trigger the new game

A new game. We call this "Infinite Rupert"

That's it. Have you all got this?

On the screen Infinite Rupert is running.

Brilliant.

Are you all in? Great.

Bug Swipe up to jump up. Down to go down. Back to go back. You're collecting passwords.

They start playing the game with no music. We let them play for a minute to get the idea of the game. Low key engagement with them and teachers.

Bug (*To a teacher*) What's your name?

Teacher (*Teacher says name*)

Bug Do you like it?

Teacher Yes. It's very 1980s, Jet Set Willy!

Bug Yes! Exactly. I love 80s games, jet set willy, pac man, super mario

It's a bit boring without any music. Cy can you give us some music?

Play music 1

Responses from the audience. Cy and Bug build up the track from a beat, a bass line, vocals, and cow bells.

Cy Can you hear the cow bells?

Bug No.

Cy takes the track back down to the bells. "oh yeah!" Says Bug.

Cy then plays with the tempo of the music for the game. Asks the audience how that changes how the game feels.

Bug But this game is all about a hacker in the 1980s collecting passwords, gaining deeper and deeper access to the crazy jungle of creeper connectors and cable vines that would become the internet. We need something more intense Cy!

Cy plays a more intense track for the game. Bug digs it intensely!

4. Introducing character: Rupert is a geek…and what is the internet anyway?

Bug So we called this game Infinite Rupert because it's about a real person called Rupert Goodwins. In 1984 he was 18 years old and part of gang of 4 hackers.

Hey. Everyone. Look up for a second. This is Rupert.

Cy (*Becomes Rupert*) Hi. I'm Rupert.

Rupert It's ok. You can go back to playing.

Bug What's your favourite factoid Rupert?

Cy Um…The first computer to 'talk' to another computer was in 1969. It was a link in the Advanced Research Projects Agency Network, or ARPANET

It said LO. As in 'lo!' Just two letters and then it crashed.

Bug LOL!

Cy/Rupert By 1984 ARPAnet had over 100 networks linked to it and there were more and more networks of networks interconnecting through the telephone system.

In 1984 the internet is exploding and I want in. It's the only game worth playing. I can't believe how lucky I am. I'm here at the birth of the greatest invention since fish finger sandwiches…it's good. And that's me in the game running along telephone lines from universities to shops to libraries, banks, train info…because everything is getting connected.

Can you help me? I need us to get 10,000 passwords in the next 90 seconds?

Play game for 90 seconds

What scores did you get?

For a group of 100 everyone needs to get on average 100 passwords.

Rupert either waits till 60 seconds and then sends sound effect: STOP!

Or is cued by Cy and Bug when they say: "We're almost there!"

Then goes to hub.

Cy and Bug celebrate and thank audience. "We did it!"

Cy That means we've unlocked the next level.

5. Connecting more emotionally with Rupert and showing audience where the jumper came from.

Rupert In 1984 I Rupert Goodwins was a teenage hacker. There were four of us in our gang of geeks. Keith. Steve. Robert and me.

Keith and I worked out there were secret numbers that did secret things in the telephone system all beginning with the number 1.

Bug (*Comically sitting down as an old woman knitting Rupert's blue jumper*) I'm Rupert's nan.

Rupert dials a number and puts it down. The phone rings next to Nan. She picks it up. There's no one there. Rupert sniggers. She puts it down again. She knows it's Rupert.

Rupert (*Looking at the pattern*) Nan. This looks like computer code.

Nan Oh yes dear. Knitting is just like your lovely computer codes but much better.

Rupert It's not better

Nan Does a flashing light keep you warm?

Rupert It might do if it's controlling the country's electricity.

Nan Just two stiches, knit and pearl and I can make anything I want.

Rupert In wool! 0 and 1 on a computer can make anything anywhere.

Nan Destroy anything too no doubt. You wouldn't have computers without knitting you know.

Rupert Yes Nan. I know. I know.

Rupert dials a number puts the phone down. Phone rings. Nan picks up. Rupert laughs with childish glee.

Nan Oh. Rupert! Honestly. Not again. Stop mucking about with the blinking phone. I know it's you doing that!

Now listen Rupert. You're not the only one with a brain in this family and you need to be careful. It's all very funny making the phone ring because you've discovered something about how the system works…. It's a great trick. Ha ha. But what else are you tampering with in there?

They keep those 1 numbers secret for a reason don't you think?

Yes. I know how you do it. I told you…you get your brains from me. And if you're not careful it's going to get you into trouble. Maybe very serious trouble and I don't know what your parents will say if they find out that I've been letting you get away with all this hacking business.

Rupert I just want to know how things work Nan. Everything is data. Everything can be understood as a 1 and a 0.

Nan A knit and a pearl!

Rupert Yes

Nan I know. But just because you can, doesn't mean you should.

Data is like energy it can't be destroyed, only changed, which means you have to think about the consequences of what you change it into.

Listen to me. You know I started out as an ambulance driver in the war? I loved it, whooshing through the streets at top speed at night. It felt good to help people and the army taught me how engines worked. I always loved taking things apart too. Just like you.

Rupert (*Heard it all before*) Yes. Nan.

Nan What you don't know is that after that, I worked on the machines that shot down German planes.

Rupert Wow. Cool!

Nan No. Not wow Rupert. Very much not cool. Cool and wow science. Ok yes, but … it did not feel good seeing a plane going down and knowing there was a young man maybe two young men inside, not much older than you are now.

She is moved.

So. Just you be careful young Rupert.

Rupert But Nan there's no law against finding out about things.

Nan Isn't there? Why do people put passwords on their computers then?

Rupert Ha! People leave their passwords just lying around all over the place. It's so easy to get into some places. We're not doing any harm.

Nan (*Real question*) Do you want to get caught?

Rupert No. Not exactly. But

Nan But what

Rupert Well if they found out I could hack them maybe they'd give me a job stopping hackers who aren't as nice as me getting in?

Nan Hmmm. Well…

Do you like your new jumper?

Rupert Thanks Nan.

We make all the phones ring.
And then they go to hub green. (maybe)

Cy and Bug (in response to the phones ringing) Decline

6. Introducing the story of the Prestel hack and revealing a bit more about our access to audience's phones.

Cy (*As Rupert in his blue jumper*) In 1984 me Rupert Goodwins and three friends Steve, Robert and Kieth hacked British Telecom. They had a service called Prestel that was a bit like a search engine. Where you could get information about train time tables, the weather, you could do your banking through it and you could buy things.

We found the password and username for the systems manager for BT because they left it written on the login screen. So we called them up and said "Hey guys. We know how to get into your system. Do you fancy giving us a job to help you with your security?" And they said, "We don't believe you." So we changed the Index page of their site so that it said Idnex.

And we rang them up again and they didn't do anything. So then Robert Shiffreen wrote an article about it and did an interview on a computer programme on the telly.

And they still didn't do anything. So then I, Rupert Goodwins, went on the 6 o'clock news and showed them how I could hack Prince Philip's email.

And it turns out when you start to include the Royal Family things get very hot very quickly.

Play the video on everyone's phones. (4 min film)

Text for 1984 news item

OPENING GRAPHICS FOR 1984 BBC NEWS.
NEWSREADER FOOTAGE: GOOD EVENING THIS IS THE (6 O'CLOCK) NEWS

EXT: REPORTER IN RAINCOAT WALKING MICROPHONE IN HAND TO CAMERA

REPORTER
A computer system used by tens of thousands of British households and businesses has been broken into by unauthorised users, who have altered information provided by newspapers and sent messages as the Duke of Edinburgh.

British Telecommunications, which runs the Prestel system, says that it is taking action to secure the system, but the attackers say they are still able to access it.

VT PLAYS - CLIPS OF PEOPLE USING PRESTEL, CLOSE-UPS OF SCREENS, HOME COMPUTER USERS, ETC.

V/O REPORTER
British Telecom's Prestel system is connected to individuals and businesses across the country through their telephone lines to computers. They use it to make purchases, arrange holidays, exchange messages and read news. However, a number of anonymous computer experts, commonly known as hackers, claim to have broken through the security of the system and to have been able to read private correspondence, change information from publications like the Financial Times, and even take on the identity of Prince Philip, the Duke of Edinburgh.

CUT TO REPORTER IN FLAT, BY MONITOR, TO CAMERA

REPORTER
One of the so-called hackers demonstrated to the BBC today his ability to send an email identified by the system as coming from H R H The Duke of Edinburgh, as well as changing information available in the public areas of Prestel. He agreed to talk to us under the condition of anonymity, although we can reveal he is a teenager who lives in north London.

CUT TO HACKER SITTING BY MONITOR, FACING REPORTER OFFCAMERA.
HACKER'S FACE IS IN SHADOW, BUT WE SEE HIS UPPER BODY, ARMS AND HANDS. HE IS WEARING A HIGHLY DISTINCTIVE HANDKNITTED JUMPER. THE SAME JUMPER WE SAW NAN KNITTING.

REPORTER
We have gone to great lengths to keep your identity secret. Can you tell us why you want us to do that?

HACKER
Well. (Gleeful laugh) I don't think I'm really meant to hack Prince Philips' email.

REPORTER
So why are you showing us you can?

HACKER
Because if I can, then someone else much less … nice than me might start doing really bad things with this information.

REPORTER
I see. So how easy is it to access this system?

HACKER
Very easy. I dial up Prestel using my home computer, enter the ID password of the system manager, and I can access anything I wanted.

REPORTER
But how did you get those access codes?

HACKER
BT left them on the front page of a test computer that I previously dialled-up; I didn't even need to log in. Anyone who had dialled up would have seen them.

REPORTER
Why did you choose to impersonate the Duke of Edinburgh?

HACKER
My friends and me have told BT about the security problems, but it hasn't fixed them. Once I found Prince Philip's account, I thought it would get their attention.

REPORTER
Aren't you breaking the law? Are you worried about the consequences of your actions?

HACKER
I don't think so, there's no law against accessing a computer system. Anyone can do it. It's up to BT to make things safe for its users, and it hasn't been doing that.

CUT TO EXT. REPORTER TO CAMERA.

REPORTER
BT denied that it had been aware of the security issues earlier, or that the hackers had been in contact before going public. It said that it took security very seriously, and was taking every measure to maintain it. However, as the Government prepares to privatise BT in the biggest ever sale of state assets on the stock market, the hackers appear to still have the upper hand.

Cue from the video for Mrs Thatcher and Prince Philip to appear. "It looks like the attackers have the upper hand."

Cy and Bug play Mrs Thatcher and Prince Philip.

Mrs Thatcher Who the (beep) was that!?

Prince Philip I have no idea. I'm so embarrassed. I mean. Good god woman. Maggie. I mean Madam Prime minister Mrs Thatcher. I never use this damn thing.

But if they can send a message from me and it seems as if it really is from me, then, well, the mind boggles, genuinely boggles beyond all orbits.

Mrs Thatcher If this is the security of Prestel what about all the other things we trust BT with? I mean. It's the speaking clock for God's sake.

Prince Philip And doesn't it control the nuclear early warning system?

Mrs Thatcher How do you know about that?

Prince Philip Well. I had always wondered about where all the numbers beginning with 1 were so

Mrs Thatcher (*Interrupting*) And more than that, we're just about to sell it. What kind of confidence can we offer in the share price when there's this kind of thing going on!

Get me the head of British Telecom on the phone now.

Prince Philip And get that arse in the god awful jumper behind bars.

Play the escape version of the game.

Bug Now can we use our passwords to help Rupert escape from the police?

Start by playing first version and then switch it and music so that Rupert is running away from the police. Show game over scoreboard.

2 mins of "Running Away Rupert" Dog barks.
Show game over scoreboard.

6.b Leading into DIGITAL TRICKS.

Digital magic trick 1: message from Rupert:

"Thank you for helping me escape the police!"

Bug Have you just got a message?

What does it say? How did that happen?

They run and get their hats.

It's digital magic! I am Bug the great digital magician and I am full of tricks.

Phones ring again.

Is it anybody's birthday today? *(It's very likely to be)* Happy b day (name) And by the power of the internet I can do this.

Digital magic trick 2: Music: Happy Birthday plays. Followed by 3 text messages

HAPPY
BIRTHDAY
"NAME"

CY How did we do that?

Did you all agree to the Terms and Conditions when you downloaded the app? Do you know what you agreed to?

Bug Freda. Have you got the Terms and Conditions there?

They roll out the long scroll of hand written T's and C's
Read the quote from the Terms of Service where it says "when an actor from The Big Data Show asks who is Rupert Goodwins" I will raise my right hand and say, "I am Rupert Goodwins"

Bug So. Who is Rupert Goodwins?

Audience (maybe): I am Rupert Goodwins!

Digital magic trick 3
Cue: phones say "I know your secret" x 5 then text message: I know your secret.

7. Everyone has a secret and the GPS trick

BUG Everyone has a secret don't they?

My secret is that I cheated on my creative English exam when I was in S5. I copied a poem that I found in my mum's shoe box under the bed. So, the bigger secret is that I was looking where I shouldn't have been looking and I found a poem my mum wrote. It was about the noises you hear when you can't sleep at night. It was about listening to a new baby breathing in the night. It was probably me. So the bigger secret is that I stole something from my mum. But bigger than that I stole something

from my mum that I can't give back. I stole a private thought. I might have been the only person who had read that. Not now of course, because I got an A for it in Creative writing. The teacher said it showed great imaginative insight. My mum was so proud because I always got terrible marks in anything arty.

My secret is that I hate secrets too, like our hero Rupert Goodwins. I want to know everything that is hidden.

If you look at your phones again you will be able to see the GPS for your phone ever since you agreed to the terms and conditions of Swipe. When you agreed to the Ts and Cs for Swipe you agreed for us to access your location data. All the free apps you use and probably even most of the ones you pay for, take your data and most sell it to other companies, who mostly then try to sell you things. That's how they make their money.

Digital magic trick 4: Participants see their GPS mapped onto their phones since they started using SWIPE

Cy How does that make you feel?

What could I know about you from the data of where you have been for the past 2 months?

What if I mapped that data against your contacts for example, or your text history?

Bug My teacher, Mrs Holles was so delighted with my poem, my mum's poem, that she made me read it out in class. And when I got to the bit about being scared I, she, wouldn't be a good mother, I started crying. I had enormous tears rolling down my face.

Everyone laughed and Mrs Holles (*teacher in school?*) gave me a tissue. Mrs Holles said that it was very brave to imagine what it is like to be someone else and that made me cry even more, which made everyone laugh even more. I started making weird noises, in my chest and throat, like I couldn't catch my breath and I had to put my head between my knees and because I didn't know I needed to do that until I did it, I fell off my chair and Mrs Holles couldn't shut anyone up then. Because I was on the floor. I was so embarrassed and my nose swelled up where I bumped it on the desk. Mrs Holles put the poem up on the school website. And then my mum knew I had stolen her secret, private thoughts and she was… what?

Annoyed. Hurt and embarrassed. And the worst of this was embarrassed. Not just embarrassed like I was because I fell off my chair and on my

nose. But actually maybe ashamed. Ashamed that I stole them and ashamed that if she told anyone then everyone would know that is how she felt when she was a new mum and it was the middle of the night and she was probably actually really quiet scared.

But…despite all that I'm glad that I read the poem. I love my mum and I do feel closer to her. I just wish I hadn't shared it.

CY Sharing privacy comes at a price. Instagram was sold to Facebook for 1 billion dollars in 2012, which means that Facebook were really buying the 33 million Instagram users for 30 dollars each.

BUG Which is totally fine by me because I love Instagram. I don't want to pay for it because I don't have any money and I really don't care if I get a couple of adverts for pizza when I'm near a pizza shop. Yer'know!

CY Ok. Fine. But nearly everything I do, see, like, everything I think practically is on line, is data. Google, Amazon, Facebook know almost everything about me, not because I've put it all in there at once, but because what I look at and what I like tells them who I am and even gives them probabilities about what I'm likely to do in the future.

So, what if I'm gay and I don't want anyone to know yet and google keep sending me gay adverts and someone looks over my shoulder… Or I'm pregnant and a company sends me a free trial of nappies in the post but my parents don't know yet. Or I'm a Muslim in an Islamaphobic state. Or…what?

8. Arrest of Robert

Magic trick 5: All the phones start playing rain sound effects.

Rupert When you see films about hackers being arrested the police come in with a SWAT team, through the windows in black boots with big guns. After I did the interview on the 6 o'clock news the police started monitoring Steve and Robert's phones.

I don't know why they didn't bug mine and Keith's unless perhaps it had something to do with the fact that we both worked for Marconie space and defence. And we had both signed the official secrets act.

Bug I'm Robert Shiffreen.

Robert It's 9.30 pm on the 26th March 1985. I'm at home with my sister and Nan. My parents were on holiday.

A knock on a door comes from the phones.

Digital magic trick 6: *The rain turns to a storm.*

Robert I always kept my notebook hidden under the draw of my desk.

Gaffer tapes a blue notebook under a chair or a table

It was a blue, hard backed notebook with all the passwords and usernames I had discovered.

I knew, or at least I thought I knew that I hadn't broken the law. There wasn't any law against hacking a computer and I hadn't done anything wrong. I hadn't hurt anyone and I'd told BT what I was able to do. Anonymously. That's what I had told my parents when they went berserk at the phone bill I had run up hacking all night, every night.

But here were the police. No boots. No uniforms and apparently no guns. But definitely and terrifyingly still the actual police.

D.I. Austen consults a little black police notebook.

D.I Austen Mr Robert Shiffreen?

Robert Yes.

D.I Austen I'm Detective Inspector Austin.

(*To audience)* There were four guys standing in the doorway behind D.I Austen holding a roll of black bin bags each and they couldn't have been holding those bin bags in a more menancing way. I started sweating. My mouth went dry and I had a hot tight lump in my stomach. My legs were wobbly. I stood there, looking at D.I Austen and suddenly I had the most urgent need to go to the toilet. I'd never really been scared before. That's not true actually. This was exactly how I felt when I nearly got beaten up on my way home from school once.

I'm a nerd, a boffin, a quiet, shy, techy, know-it-all, geek and some people just don't like that. You know it's not even that they don't like it. It's just …you're vulnerable. You don't have a gang of mates. You travel solo, mostly. Not a loner. I like people. I'm sociable. But when a bully comes up to you and you know that they're going to try and hit you, you just know it in the pit of your stomach. I didn't get hit. I pointed behind this arsy stupid kid and said, 'Look over there' and then legged it. But I couldn't leg it here. Here was a Detective Inspector with four big stupid guys rolling black plastic bin bags in their hands.

I kept looking at the draw of my desk. I tried so hard not to. But I just couldn't stop looking at it.

D.I Austen I have here, (*waves paper*) a warrant for you arrest and for the seizure of all your computer equipment.

Robert What are you arresting me for?

D.I Austen Forgery.

Robert Forgery?!

Are you nuts? I mean. I'm sorry. I haven't forged anything. I don't understand.

D.I Austen You used someone else's I.D to gain access to BT Prestel Micronet.

Robert Erm. That's not forgery.

D.I Austen I think it is.

Robert I opened a log in screen and there was a note on the Login screen with a user name written on it. And the login screen said, "Please Log in" I mean. It was inviting me to.

D.I Austen But that wasn't your login name.

Robert But it was right there inviting me to log in.

D.I Austen And the password?

Robert It was 1, 2, 3, 4

D.I Austen It was as easy as 1, 2, 3, 4?

Robert No. Literally the password was 1, 2, 3, 4.

D.I Austen Christ!

Robert I know!

I did tell BT their security was total … rubbish.

D.I Austen You told BT you were hacking them?

ROBERT Well I got my friend Denise to do it. I didn't want them to know who I was.

D.I Austen So you did know you were doing something criminal?

ROBERT No. Well. I'm a bit hazy on software copying.

The point is I told them and they didn't believe me. So I changed the Index page, the first page you see as a user when you open Prestel on your TV I changed the word INDEX to IDNEX.

D.I Austen (*Tries to hide smile*) Did you now.

Robert Yes. I did and they change it back. But they still didn't change their security. I could still get in.

D.I Austen Is that when you pretended to be a member of the Royal Family?

Robert What?

D.I Austen There was an article on the 6 o clock news.

Robert (*Feigned innocence*) Really?

D.I Austen Someone did an interview on the 6 o'clock news. But they protected their identity by appearing in silhouette.

Robert Well it wasn't me. I know nothing about that.

He looks at where his notebook is hidden again.

D.I Austen He was a right joker whoever it was that did this hack of Prince Philip's email. He wrote on tv and I quote "I do so enjoy puzzles and games. Toodle loo. Pip pip" and signed it HR Hacker! What a joker! What a little tricky Mr McTrickster.

I don't think his wife, The Queen thought it was so awfully funny. Do you?

Robert No. I don't know anything about that. I wouldn't. I wouldn't be so … childish.

What happens now?

D.I Austen You're going to come to the station with me now and tomorrow I will interview you.

Robert stands up to be handcuffed.

D.I Austen That won't be necessary. Why do you keep looking over there Robert?

Robert I. I. I just think I should turn off my computer that's all. To save… electricity.

D.I Austen Is that all?

Austen goes to look at the desk. He opens the drawers. Then pulls them out and looks underneath. Finds the notebook and flicks through it.

D.I AUSTEN O.K

That's a lot of information. A lot of private information.

ROBERT "Information is like energy. It can't be destroyed."

ROBERT My parents by the pool in Tenerife the next day opened The Telegraph newspaper to read that that their only son had been arrested in London at the same time as Steve Gold from Sheffield for hacking B.T. and impersonating Prince Philip.

After our arrest I heard there were hackers all over the UK planting their hard drives at the bottom of the garden. Dropping floppy disks off the ends of piers.

Final Running Away Rupert game is triggered

Purple rain backing track starts to play.

Rupert Hey. Rob.

RUPERT (*Looking around him*) Is this really necessary?

ROBERT They were recording my phone calls Rupert. Do you think that's all they were doing?

RUPERT But are they allowed to even do that?

ROBERT I'm not sure. But they did, didn't they.

RUPERT I'm sorry Robert.

ROBERT Where have you been? Why didn't you get arrested? Why didn't they make records of your phone calls for 5 months? Did you know about any of this? Did you say something to anyone?

RUPERT Well. You saw me on TV

ROBERT Rupert. This isn't funny. This is real. This is me stripped naked and running for my life with people watching every moment. Do you know how that feels? Do you?

9. (Non-) digital Magic trick 7: Fake data breach

Text message: Congratulations (name) you have won the Big Data Show grand prize.

Cy Oh yes this is great. Congratulations (name).

Bug Yes. The Big Data Show prize is all about the data and so that means we know that you really like ……. since you were there (at the time and place agreed by the plant actors' workshop)

Pupil 1 What? You said you were (….). I thought ……..

Pupil 2 No. Yes. I'm sorry. It's a mistake. I didn't. It's not true.

Pupil 1 I can't believe you could do this to me! How can I ever trust you again?

Pupil 1 leaves

Pupil 3 (to actors) Look what you've done!

Pupil 4 (to actors) you've got no right to share information like that

Pupil 5 (To pupil 4) Yeah. But (name) should have done that to (name).

Pupil 4 That doesn't matter. They should have done it. What are you going to do now?

Cy (To Freda and Clare) We said this would happen!

Bug Yeah. We just wanted to do all our tricks safely.

Clare It's not our fault. If people are lying (*or what the story is*) to each other it's nothing to do with us

Freda I don't think any real harm has been done has it. They'll make up I'm sure.

Appendix 5: Who is Who in The Big Data Show?

THE BIG DATA SHOW
Performative Workshop Autumn 2018
Directed by Clare Duffy
Written by Clare Duffy and Rupert Goodwins
Performed by Kim Allan and Amy McGregor
Creative Learning Director Freda O'Byrne
Produced by
Civic Digits Theatre Company C.I.C
Unlimited Theatre
Perth Theatre.

SWIPE: BIG DATA SHOW APP
made by Orthrus Studio
SWIPE Video
Ruth Barrie & Glenda Rome
of Waltzer Films
SWIPE Game Design:
Art work: Simon Messer and Abbie Smeaton
Programmer: Dean Sinclair
Ethical Hacker: Nikola Cucakovic
With the support of
Dr Lynn Parker. Computer Arts Programme Leader. Abertay University
Dr Nataile Coulle. Lecturer in Cyber Security. Abertay University

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Sl throu
bad time recently. This has really
hurt her. You don't know what the consequences could be!
re senior pupils than 5 group and in things like "yea

What are you going to do?!"

Phones ring again it's Rupert. He enters the stage.

Rupert Hello. I'm Bill and I'm also known as Rupert Goodwins. I was a teenage hacker but now I am a technology journalist and co-writer of this play. And I'm very glad to tell you that no data has been breached. Come back in (name).

Cy and Bug Let's give the *actors* from year 5 a big round of applause!

10. Rupert Goodwins is in the house!

Rupert answers questions about data security and his life story
Freda/Clare/Amy and Kim asking the audience questions about how the show told the story.

How did the whole thing make them feel?

Final data literacy test. Explain what it is.

Play **delete data** animation

The End

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