civic digits

The Big Data Show:

An Introduction to Cyber Resilience and Digital Citizenship

About Civic Digits

What does it mean to be human in the 21st century? Civic Digits blends digital technology, gaming and live performance to create innovative and interactive experiences, to question what it means to be a digital citizen in the 21st century.

The company was founded in 2018 by award-winning playwright Clare Duffy, after a chance meeting with ethical hacker, Rupert Goodwins. Civic Digit's first production is The Big Data Show, telling the story of the first prosecuted hack in the UK (which was by Rupert Goodwins).

For more information about Civic Digits, visit www.civicdigits.com
Follow us on social media: @civicdigits

About this pack

This pack is intended to provide teachers and educators with everything they need to know to take part in The Big Data Show and carry out two workshops, which will inform participants about cyber resilience and being a digital citizen, why data security is important on a personal level and in broader terms of local communities, national and global issues.

Completion of both workshops and taking part in The Big Data Show will qualify each pupil for 1 credit at SQA Level 3 in "An Introduction to Cyber Resilience and Digital Citizenship."

We hope the experience will inspire your pupils to think of data as something they can be creative with, and in turn, help inspire them to consider taking computer science as a subject and that they will enjoy working with digital technologies in their life and careers.

If you have any questions about The Big Data Show or the workshops, you can contact us (Civic Digits) at: contact@civicdigits.com

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About The Big Data Show

In 1984 Rupert Goodwins, a teenage ethical hacker, hacked the email account of Prince Philip. At a time when cybercrime didn't exist, he and his friends were prosecuted with (but not convicted of) forgery. This case formed the basis of today's cybercrime laws.

The Big Data Show is a ground-breaking, immersive creative learning experience using performance, gaming and digital magic, which tells that story, and explores the importance of cybersecurity in today's digital world.

The Big Data Show takes the form of an interactive theatre show, designed to educate young people across the UK in cyber vulnerability.

#TheBigDataShow

Thanks to:

Remote Workshop 1: Build Your Own Motorised Emoji

Build your Own Motorised Emoji
Remote Workshop

Learning outcome of Workshop 1:

To introduce the concept of 'data' - what it is, what it is used for.

Teacher Preparation:
Kit, Materials and Resources

You will be sent a case with all the kit, materials and resources you need to run both remote workshops.

In the case there are:

a) VizBlock Commands
• Sheets with instructions to tell the VizBlocks what to do. These are labelled 'A'. (pg. 19)

b) Phones
• 6 phones, with chargers
• Phone labelled number 16 on the back is the teacher's admin phone and has all the apps on it needed to run the workshop.
• Phones 1, 2, 3, 4 and 5 are for pupils.
• The code to unlock the phones is 3131, or 313131

Each phone has the software uploaded.
Check the app icons are displayed on the screen.

Face tracker: https://192.168.4.1/face-tracker/
Pupil control: (vbcontroller):   https://raspberrypi.local:1880/vizblock-control-ler/

These apps are only on phone 16 (the teachers' or workshop leaders' phone) and only work when the phone is connected to RaspberryPi.

Teacher Admin: (PIP Admin)   https://raspberrypi.local:1880/admin/
Weather data: (Datasettracker)https://192.168.4.1/face-tracker/dataset.html
Node-RED: https://raspberrypi.local:1880/

(PLEASE delete photos from phones at the end of the session)

c) Materials to design the face of the emoji
• Tissue paper to cover the blocks (silver, gold, patterned wallpaper, a range of colours).
• Sheets of paper to make face shapes with (silver, gold, patterned wallpaper, a range of skin colours).
• A range of different cards to cut out shapes for eyebrows and mouth.
• Template examples for mouth and eyebrows
• Pritt Stick, scissors, blue tack, A1 paper, marker pens, Post-its
• Feathers, pipe cleaners, other wobbly resources to add to the eyebrows
• Magnets to hold up the face or background
• VizBlocks 'Motorised Emoji' kits, designed by Creative Informatics at Edinburgh University:

d) Motorised emoji kits
• 1 magnetic wall
• 1 raspberry pi
• 5 VizBlocks
• 5 connector wires
• 1 charger pack
• 6 way extension lead
• a small stick to turn on the blocks

If any of these items are missing or faulty, please contact us:
contact@civicdigits.com / 07487 506409

While we all need to protect ourselves and the young people we work with during the pandemic we want to deliver these workshops as safely as possible, which is why we have developed them as a remote package. This is the first time that we have delivered these workshops remotely and we know there will be things that are challenging and that might not go smoothly.

We have a dedicated team member 'on call' with whom you can discuss any questions about this programme. You can call 07487 506409 and email contact@civicdigits.com.

We are also offering 'twilight' teachers sessions to bring teachers together to ask questions and test setting up and delivering the workshops. Please book your places as soon as possible. Information about how to join will be included in the confirmation email you received when you booked this programme.

Teacher Preparation: Introduction

In section 2, we will go through how to prepare for the remote workshops and set up your kit, which will have been sent to you by Civic Digits.

Our video training will go talk you through the preparation. You can watch that by scanning the QR code below. We suggest that you stop and start this video as you work through it.

https://youtu.be/k2Hj0l2A6f0

What is a VizBlock?

They are a tangible, modular data visualisation toolkit. They can be programmed to respond to data input. Our VizBlocks were designed by Creative Informatics at Edinburgh University.
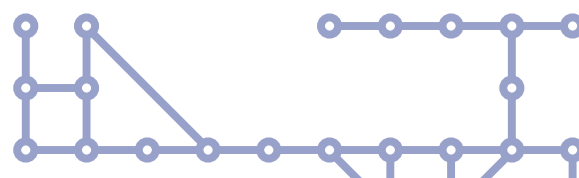
What is a motorised emoji?

This is a term we've made up to describe how the VizBlocks can be programmed to show emotions, like happiness or sadness.

We have created an emotion recognition app that can collect data from your face. It measures the shape and size of your face in typically 'happy' and 'sad' expressions.

What is a PiP?

The name of our motorised emoji. PIP stands for Personal Information Presentation kit. It is made of five VizBlocks, each representing a part of the face (eyebrows, eyes and mouth). This is what your pupils are going to make, play and learn with.

Teacher Preparation: Setting Up Your Kit

Plug the aerial into the Raspberry Pi and plug in the Pi (it doesn't have a very long lead, so you'll need to be near a wall socket or use an extension lead.) It turns on as soon as it's plugged in, but it will need a minute or so to start working. You can tell that it's ready when the VizBlock network appears on your phone's list of WiFi hotspots.

Connect your phone or computer to the VizBlock WiFi with the password, dataisfun. (Your phone may say there's no internet access, which is correct, you can connect anyway.) All the phones we have sent you already recognise the VizBlock WiFi and should automatically connect to it.

Each motorised emoji face is made from 2 LED VizBlocks, and 3 servo blocks. They have magnets on them so that they attach easily to these metal boards. They have names etched at the back. Each block represents one part of a face. For example: 'Bob' is the left eyebrow. The names and functions of each block are on the sheets titled 'Sheet 'A': VizBlock Commands' (see page 19)
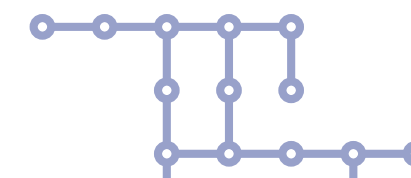
Each block should be fully charged at the beginning of each session. The batteries last for approximately 2 hours. You can tell that they are fully charged if there are 4 red lights inside the block. If there are none, or just one or two they are undercharged. To charge them, turn them off at the back. The switches are a bit tucked away, so use the pen or stick provided to gently turn them on. Then connect them with the connectors. They will charge quicker that way. If they are charging there will be a red flashing light.

Turn on the blocks and attach them to the metal board in the right configuration.

So;

Bob = left eyebrow
Joy = right eyebrow
Eve = left eye
Fin = right eye
Caz = mouth

A blue light will display when they are on and connected to the Raspberry Pi. They might flash with light or whizz a bit, that's all fine. That means that they have connected.
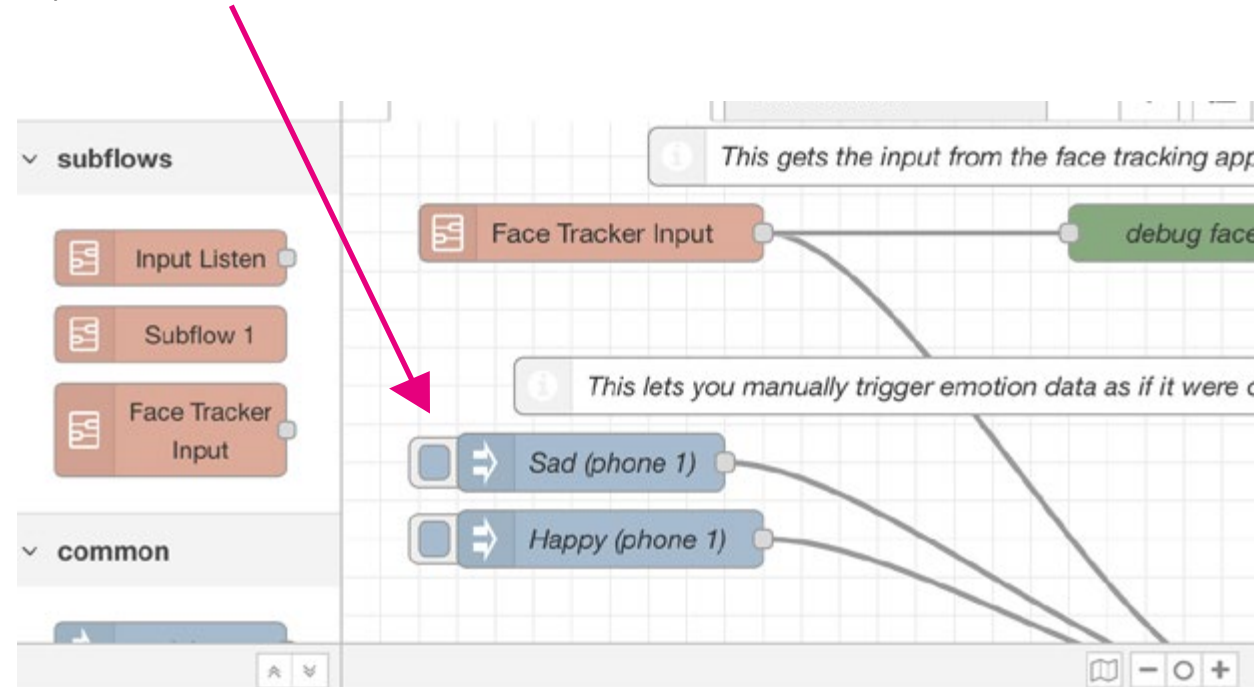
To test the VizBlock

'Note: The 'whole face' box in the admin app needs to be set to '1' to control the whole face via VizBlocks'

Open phone 16 (the password is 3131). Open the 'node red' app. This is the programme for VizBlocks. (It's easier to read if you put the phone on its side.). The two blue nodes control the happy and sad modes of PIP.

Tap the blue buttons to the left of the arrows.

The buttons on the left of the arrows pointing to Sad and Happy will tell the VizBlocks to perform the sad or happy faces.

The LED blocks go orange for happy, and half blue for sad. The motors on the servo blocks will change their angle correspondingly.

If you are having trouble at this point, give the VIzBlock a minute. Sometimes, when you send it lots of messages, it gets a bit overwhelmed and needs to relax and get back on track.

Using facetracker

Still using your phone, open the facetracker app. This will ask you if it can access the phones' camera. Give it permission. This app does not store any data so there is no risk of any facial data being breached.

Press to start and PIP should respond. You'll see two lines at the top left of the screen which measure the amount of happiness or sadness that it is recognising being expressed. Happy is in red at the top and Sad is in blue underneath.

There is a green button on the right hand side of the screen. When you press it, it will show all the points being measured. The translation of this data into emotion recognition is very far from accurate. For example, glasses make a big difference to how much the algorithm recognises the expression, and lighting can also make a difference.

*You need to allocate which phone is able to control the PiP. To do this, open the admin app on Phone 16. Underneath phone mapping, there is a box titled 'Whole Face'. Put the number of the phone you want to control PiP with in there.

Designing your motorised emoji to perform happiness and sadness

On the phone, open the VizBlock controller app. This opens up an easy to navigate control system. Chose which block you want to programme.

For this example, we'll play with Eve first. Eve is the left eye. We're going to experiment using the codes on the laminated sheets in the kit labelled 'A'.

Where it says 'test commands', you can play with what the colour, number of lights and movement of the eyes can do. So for example, enter pink_leds 12 for 12 pink lights. Or if you want them to pulse, write breathe_pink and give a value for the speed of the movement between 0 and 255.

The servo blocks change the expressions of the eyebrows and the mouth. You can set the angle by writing 'goto' space (number)

Or you can make them wiggle by typing slow_wiggle and the angle you want them to wiggle at (for example 90 degrees).

If you make any mistake in the code, it doesn't work. Things that often trip us up are having capitals, no underscore or no space. There is a really important learning here that accuracy is essential in coding. Hopefully your pupils will be motivated to get it right so they can make the emoji do what they want it to.

Set behaviours

When you have decided what you want your happiness and sadness values to be, you can set them in 'Set Behaviour'. This is the black button underneath the test commands.

You can set the number and colour for each eye, the angle for each eyebrow and for the mouth. Unfortunately, at the moment we can't set the 'breathing' (pulsing) or the wiggling. But you can get a strong representation of happy and sad by setting the behaviour of each block so that they all work together to make the expression you want them to.

Other data sets

Workshop 1 is designed to move from thinking about what data is, to using some of our personal data (that is the data that can be gathered from our facial expressions), to then thinking about how you can turn data into creative expression.

We will ask your pupils to imagine what it would be like if PIP had a consciousness. To help us do that we're going to get them to see the weather data for the past 10 years in Scotland, where the motorised emoji expresses happiness for the sunniest days and sadness for the least sunny days. Here's how to enter the weather data for 10 years in Scotland:

- On the phone, open the datasettracker app. On the top dropdown menu, select the Leuchars weather dataset and then click LOAD DATA.

- Click on a row in the weather data table to send that data to the VizBlock server, OR press the play button in the bottom right corner to automatically cycle through the data.

To view the data on the VizBlock Face, go to the Civic Cigits admin app on the phone and select Dataset as the Data Source for Face 1. The face will now respond to the amount of sunshine in each year.

Teacher/Workshop leader admin

Using the Civic Cigits admin app, you can control which phones can control the VizBlocks. At the bottom of Civic Cigits admin it says 'Phone Mapping'.

Put the number of the phone you want to be able to control the whole face, in here. Or you can assign different phones to different blocks by toggling to individual features.
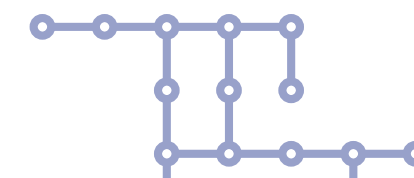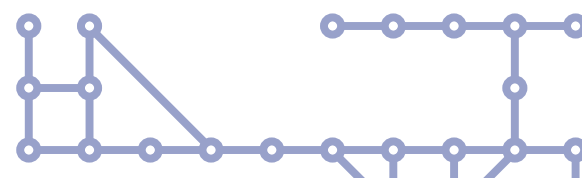
Using Node Red to control the whole face after allocating control to other phones

If you have changed the control phone for face tracker or individual blocks, please reset the 'whole face' box in the admin app to '1', when you want to use node red to see all the blocks working together.

'Processing'

This decides how the data from the face or from the weather is presented. Either from one discrete set of data to another or you can put it on continuous and PIP will make the transitions smoother.

You should now be set up to run the workshop from a technical point of view. Please get in touch with us if you have questions, or to book a live tutorial or q&a with us if needed.

Delivering The 'Build Your Own Emoji' Workshop

Before the workshops:

Get the motorised emoji set up at the start of the workshop ready to use. It should look like a face, be ready to present 'happy' and 'sad', but not be designed.

The session is designed to last 90 minutes, but you can adapt it to suit your needs.

There are video clips to introduce all the exercises, followed by clips with responses and follow up information. It is designed for you to play and pause throughout. You can access the videos via the QR codes throughout. Please familiarise yourself with the videos before the workshop.

These workshops are designed for 15 pupils to work in groups of 3 and as a whole group.

Intro: Aims of the course and looking after yourself and each other

https://youtu.be/djlHiJ_-5c0

During the video, pupils will be asked a series of questions, designed to get them thinking about their data online. They will need a pen and paper.

(Teachers please take a note of answers. This data will be requested at the end of the workshop).

1. On a scale of 1-10 where 10 is everything and 1 is nothing at all:
I feel able to keep myself safe online
I want to know more about data
I would consider a future career working with data

2. (two minutes to answer)
If your phone was an animal, what animal would it be?
Draw a picture to show to the rest of the group, and explain why/how that animal represents your phone.

3. (15 minutes to answer) What is data?

Answer: Data is what we collect when we measure things (objects, people, places, events etc). Data can be turned into information when we analyse it, think about it, or use it to try to answer questions.

4. What data can you collect about this room you're in at the moment?
For example, How many people are here? How many girls/boys? What are the ages/birthdays? What else?

5. Can you list all the apps you use on your phones?
What are the 3 most popular amongst the group?

6. What data does the most popular app need to work?
Location, photos, video, date of birth?

7. Can you list all the data your phone could collect about you?
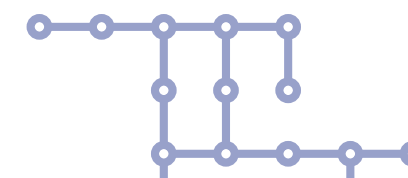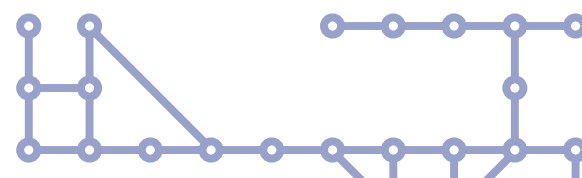Take a few minutes to list all the different types of data.

Some answers:
- GPS (location) not only on a map but also how high or low you are
- how fast you walk
- what you are saying
- what you are watching
- photos (which are stamped with time/date/location) who's in the photos with you, who is nearby but not in the photo
- how well you are sleeping
- a fitbit measures heart rate, blood pressure etc
- your name, address, where you go to school, what clubs you go to
- who your family and friends are
- what you're doing everyday, from your calendar
- what your interests are, partly from where you go, partly from your google searches,

All of these things can tell someone:
- what your personality is like
- what you like, what makes you angry, confused, happy
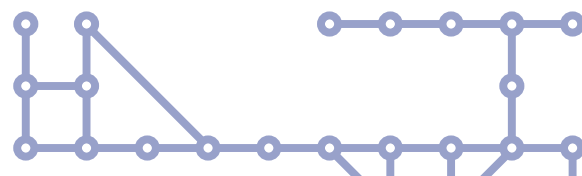- your gender, race, sexuality, religion and political beliefs

8. Is there any data your phone can't collect about you?

9. Why might companies collect this data?

10. Some companies, like Google and Facebook might not actually sell your actual data directly, but they will sell the information they think they know about you based on that data. This information is then used to try to get you to change your behaviour, to get you to buy things or to want to do things or to change your opinions, to get you to think differently. What do you think about that?

11. Homework:
Before the next workshop, can you find out more about what data is, and how to protect yourself and others online?

Playing with 'PIP' your personalised information presenter

PIP (Personalised Information Processor)
(10 minutes)

PIP stands for personal information presenter. It's built out of 5 mini computers, which you can programme to respond to data.

In groups of three, and one phone per group, the pupils will be shown how to use the PIPs via video titled PIP.
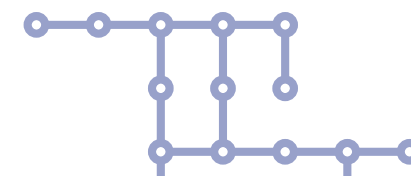
VizBlock commands
(10 minutes)

Each group should get a VIzBlock and an instruction sheet with instructions on how to programme these blocks.

On the phones, the app "VBcontroller" will let pupils programme the block.

When the groups have played with the blocks and programmed some emotions, they can place the blocks back on to the magnetic wall and see if their blocks all work together to make a face that works. The teacher can make the motorised emoji show happy or sad using the node red app on their phone.

Designing the PIP
(15 minutes)

Now the groups can create a bit more personality for their motorised emoji. We've provided some materials for them to design their PIP.

Open source data sets

The PIPs respond to any data, not just faces.

What is a data set?

Data is what we collect when we measure something. A data set is a set or collection of things that we've measured.

At this point, the teacher should switch the data source for the PIPs from 'emotion' to 'dataset' in the 'Civic Digits Admin' app.

Run the data for sunshine in Scotland over the past 10 years. PIP shows happiness if there was sunshine on that day.

**Writing the motorised emoji's first speech
(10 minutes)**

The pupils will be asked to imagine what it would be like if this motorised emoji became conscious. What would it be like for this motorised emoji to wake up? What would it see, feel or understand about the world?

2500 pupils in Scotland are doing this programme this year and there are 3 prizes for the 3 best stories or speeches. £250 for the first prize, £150 for the second prize and £100 for the 3rd prize.

Each pupil gets 10 minutes and maximum 500 words to write their motorised emoji's first speech. Speeches should be written in the first person.

You can submit your pupils' work by post to Civic Digits, Code Base, 37a Castle Terrace, Edinburgh EH1 2EL.

T&C's
One entry per pupil. Each entry should be submitted with the student's initials, class, teachers name & school. Winners will be announced in March 2022. Teachers will be contacted directly and arrangements for prize money made.

**Conclusion
(5 minutes)**

Please enter these results along with those taken at the start of the workshop
Questions for pupils:

Thinking back to the same questions that they answered at the start. Have they changed? On a scale of 0 or 'nothing at all' to 10, being everything...

- I feel able to keep myself safe online
- I want to know more about data
- I would consider a future career working with data

A: VizBlock Commands

Code to unlock the phones: 3131

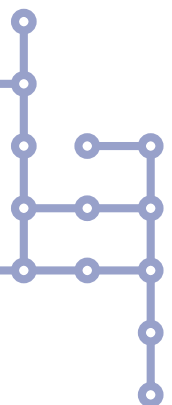**PIP (Personal Information Presenter)**

- Bob = left eyebrow
- Joy = right eyebrow
- Eve = left eye
- Fin = right eye
- Caz = mouth

For the servo blocks you can send:

- goto <angle> (e.g. goto 20)
- wiggle (angle you want them to wiggle at (e.g 90)
- slow_wiggle (angle you want them to wiggle at (e.g 90)
- fast_wiggle (angle you want them to wiggle at (e.g 90)

For the leds you can send:
- <colour>_leds <num> , where <num> is the number of LEDs to be lit and <colour> is one of white, red, orange, yellow, green, pink, purple. e.g. pink_leds 12
- breathe <speed>, where <speed> is a value between 0 and 255.
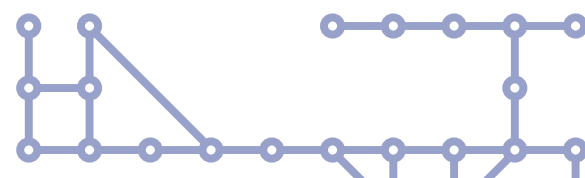- 'breathe_red' or 'breathe_blue' (number 0-255)
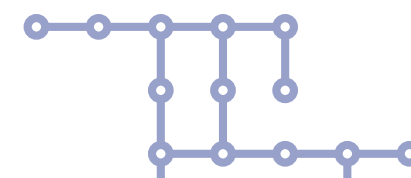- breathe_green 50

Workshop 1: Feedback Form

We are asking that teachers fill a short feedback form at the end of each workshop, this can be found here:

https://docs.google.com/forms/d/e/1FAIpQLSd5QnFxwSxi-foZw2_cCe9fje1ic4DQCJ_QZhnglwk66KS-kkQ/viewform

The Big Data Show: Interactive Performance Guide

The Premise of The Show

Cy and Bug are young female ethical hackers who have made a live interactive experience for young people, teachers, parents and guardians to tell the story of the first prosecuted hack in the UK.

This was a test case at Southwark Crown Court in 1985. The defendants were accused of forgery because there was no crime of 'hacking' then. Because of this case the Computer Misuse act of 1990 was made into law. There is a public archive of the case at Bletchley Park.

Cy and Bug find they are being hacked by Rupert Goodwins, one of the hackers from that case, who escaped prosecution.
Rupert is now a famous tech journalist. But he wants to make amends for getting his friends in trouble when he was a teenager.

Cy and Bug have to work out if he is who he says he is, if they should trust him, and discover what secrets really mean to them as the show unfolds.

Preparation: Joining the Show

The show happens on the pupils' own mobile phones via an app Super Swipe and through our website (thebigdatashow.online). Every pupil needs to be able to see two screens: the website and a phone with the app on it.

You can do this either with:

1) a computer connected to www.thebigdatashow.online with the screen projected for your class to see.

2) or set the class up sharing computers. We advise 2-3 per computer.

When you go to the website there are links there for the pupils to download Super Swipe.

If they go to the website on their own phones this will be easier.

Or they can search for Super Swipe on the app store or google play.

> The show will work really well if you can encourage pupils to play Super Swipe as much as possible in the week leading up to the show.

The show will work best if you walk the class through downloading the app and exploring the website at least one week before the show you are coming to. There is a hidden game on the website.

You can find it if you click on the Civic Digits icon of a figure typing at a computer in the bottom right hand corner of the screen. It will take you to 'Name that Microbe'. This is a simple, fun game, it will be part of the actual show.

We hope it signals that in The Big Data Show experience, you have to keep your eyes out for hidden clues and prizes.

Each show has its own six figure code. You need to put the code into both the website and the app. This makes you a team. This will allow us to have a 'Swipe Off' competition at the start of the show and find out live who is the best at Swipe that day.

We want the pupils to feel that the show is as 'live' as possible and specifically for them. So we want pupils to send in a picture of themselves.

This isn't a photo or a selfie. For data protection reasons we only want drawings or photos of things they feel represents them.

Preparation: Joining the Show

Before the show:

1. Get your students to download the SUPER SWIPE APP from the Apple or Google Play store for free, now! Have a play and see what score they can get!

2. Get your students to draw a picture of themselves, take a photo of it and then please send them all together to contact@civicdigits.com with your show code in the subject line (at least 24hrs before your show).

3. Please watch this video and/or read below.

https://youtu.be/pz7xx1rlE_8

Your Show Code will be provided in your email from the Civic Digits Team.

For the show:

FOR THE SHOW:
1. Go to https://thebigdatashow.online 10 minutes before the show is due to start

2. Enter your show code into the bar that says Show Name

3. Open the app, click where is says DEACTIVATED in red and enter the same code – it should then turn green and say ACTIVATED

4. Make sure the sound on your phone is TURNED ON.

5. Enjoy the show!

The structure of the show

The show works in five x10 minute episodes with intervals of a couple of minutes in between.

During the intervals there will be mini puzzles to complete. Each puzzle unlocks a prize and an important part of the show in the form of photos or film.

The breaks are designed to give participants a chance to talk, stretch and rest in between episodes. We have made suggestions for conversation during each interval on the following pages.

Episode 1: It's Cy and Bug's digital adventure

Cy and Bug are digital magicians. They have made this show for you to tell the story of one of the first ethical hackers, Rupert Goodwins. There is a swipe off competition. We see all the self portraits of the pupils in the class. Cy and Bug ask if anyone can hack the app. They tell them how to do it and the players get a new, previously hidden game on the app called "Infinite Rupert". Infinite Rupert is an infinite runner game. It shows Rupert collecting passwords to try and hack the internet in 1984, which was then called ARPANET. But then Cy and Bug get hacked by Rupert Goodwins himself.

The episode ends abruptly.

Interval 1

The prize is an article about the Pretsel Hack.

To talk about: Who do you think Rupert Goodwins is? What does he want? How would you respond if someone you didn't know contacted you online?

Episode 2: Is it really Rupert, and what does he want?

In this episode Rupert explains that he wants to make amends for how he got his friends arrested in 1984 and asks for the magicians' help. Bug doesn't trust him, but Cy is more of a risk taker. They continue to play Infinite Rupert and work out how they can find out if he is who he says he is. Rupert starts to text the audience. Has he hacked their phones as well? What is going on? Bug is not happy. They shut down to investigate further.

Interval 2

Solving the puzzle unlocks a video of Rupert on the BBC 6 o'clock news, telling the world how he hacked Prince Philip's email. There is also a short animation of Prince Philip and Mrs. Thatcher's response.

To talk about: Who was Mrs. Thatcher? Who is Prince Philip? Why are such important people upset by Rupert hacking BT Pretsel? How would you feel if your personal data was breached?

Episode 3: The arrest of Robert Shiffreen

Cy thinks she's proved that Rupert is who he says he is. They play Infinite Rupert again, now collecting usernames and passwords. When you match a username and password you get access to the next level, a new area on ARPANET: BT Prestel. When you are in there, if you collect Prince Philip's username and password you turn into a crown and if you collect a bank's username and password you turn into a £ sign. Cy and Bug act out the scene where Rob Shiffreen was arrested by DI Austin. Rupert then sends all the players their own GPS data. So they can see where they were every time they played Super Swipe before the show started. (This works best if the players have played in different places over the past week)

The Infinite Rupert game becomes finite and the players are tasked to save Rupert from the police dogs he is now running away from. Now if he dies, that's it. Game over.

Interval 3

Players can access a private recording Bug sent to Cy, about when she stole a poem which belonged to her mum. It seems Rupert has breached her data.

To talk about: What is the value of a secret? Why do we have secrets? Can there ever be good outcomes when secrets are told?

Episode 4: How does it feel to lose control of your data?

Bug is furious with Rupert for exposing her private message to Cy. But Cy has to admit that he could only do it because she sent it to the wrong email group by mistake. Now it's just out there. Bug leaves, leaving Cy to cope on her own. It transpires that Cy has an ADHD diagnosis and struggles without her right hand person. There are a series of digital tricks, which explore what companies can know about you from the data they take, because you have agreed to the Terms and Conditions for your free apps. Cy works out that you would be 75 years old by the time you read all the terms and conditions on the average S1's phone.

Interval 4

Players can access a private recording Bug sent to Cy, about when she stole a poem which belonged to her mum. It seems Rupert has breached her data.

To talk about: What is the value of a secret? Why do we have secrets? Can there ever be good outcomes when secrets are told?
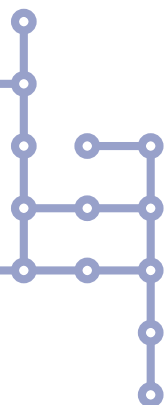
Episode 5: The trial of Robert Shiffreen

Bug, Cy and Rupert explain that the whole show has been full of set ups and tricks from the start. Rupert, Cy and Bug have made the show with Civic Digits Theatre Company. There has been no breach of data. Everyone is safe. If you want to find out more there will be a link to our website where Rupert Goodwins answers questions about cybersecurity, resilience and working in the tech industry.

We play finite Rupert again. When the countdown ends if you have saved Rupert youhave a green screen. If your Rupert is dead, you have a purple screen. This will determine how you interact with the final courtroom scene in the show. If you saved Rupert you can vote whether you think Rob Shiffreen will be found guilty or innocent of forgery.

This final division of the players into different groups is meant to demonstrate how everything you do online affects what you can do in the future. How you are profiled and what opportunities you may or may not have access to.

To talk about: We hope this is the beginning of a big conversation about who has access to our data and how it is used in every area of life, from advertising to political campaigns.

Remote Workshop 2: Everything is Data

> **Learning outcome of Workshop 2:**
>
> **Upgrade your digital citizenship knowledge and skills.**

Introduction

This final workshop will work through three key learning outcomes, which your pupils will be tested on at the end of the workshop.

There are three scenes performed by Bug and Cy where they explore a fictional data breach scenario. At the end of each of the scene there is a series of questions for your class to discuss, followed by some answers from Bug and Cy. These questions and answers relate directly to the test.

When you have worked through the video, set the test for your pupils (see Appendix 1.)

More information about the test is on pg. 34.

Certificates can be downloaded from our website, or we can post them, for you. to fill in the pupils names and award them. For data protection reasons we do not hold the names of any pupils in your class.

This workshop is designed for 15 pupils to work in groups of 3 and as a whole group. Play the video as you go along and pause when indicated.

Play video:

https://youtu.be/hUUyGPeO6Nc

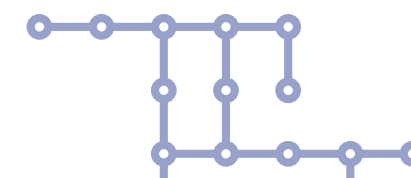**1. What was the most surprising, enjoyable or memorable part of The Big Data Show?**

2. Was there anything you didn't understand or that you found confusing?

3. Can you answer these 3 questions again?
On a scale of 0 - 10 where 10 is strongly agree and 0 is completely disagree:
- I feel able to keep myself safe online
- I want to know more about data
- I would consider a future career working with data

Act 1: All Problems Are Relative

Learning outcome 1: Understanding what data is.

Play Act 1.

Discussion of Act 1: Demonstrate an understanding of what digital data is

1. What is data?

Answer:
- Information about something
- Anything stored on a phone, computer, smart device or tablet
- Easily collected, transferred and analysed in bulk
- Not limited to computer data, but that's where it is most potent

2. How can data be collected online?

Answer:
- Doing a search
- Going to a web site
- Typing in an email
- Doing an online quiz
- Browsing a shopping site
- Listening to music or watching a video

3. How can data be stored?

Answer:
Data can be stored:
- Locally, in a device's memory or disc
- Remotely, on a company's servers
- Anywhere in the world
- Indefinitely, unless it is deliberately erased

4. How can data be collected through a smart device?

Answer:
Data can be collected from a smart device by:
- Its normal use accessing the Internet
- Apps sharing microphone, camera, satnav, Bluetooth, WiFi and other sensors
- Cell Phone use, via the phone networks
- Connecting to other smart devices, like fitness trackers or smart lights.

5. Why might a company or an institution want to collect your data?

Answer:
Organisations want your data to:
- Sell you things
- Check you for trustworthiness - are you a robot?
- Sell your data to other companies or political organisations
- Build up a picture of how you use apps or services, to make them better

6. Why do hackers want to access data?

Answer:
Hackers want to get access to data because
- It may be valuable, like credit card numbers
- It may let them hack other things or commit further crimes, like ID theft
- It may harm companies who'll have to pay to undo the damage
- Curiosity
- To prove a point or make a protest
- Mischievousness or vandalism
- Political aims

7. What legal rights do you have over your personal data?

Answer:
You have the legal right to:
- Grant or withdraw permission to share your data
- Change your mind at any time
- Know what use your data is being put to
- Know what data is being held about you
- Get your account cancelled and all data deleted with a service

Act 2: Are You Being Served?

Learning outcome 2: How to protect your and others' data online

Play Act 2.

1. Why is it so important to protect your and others' data online?

Answer:
A data breach can mean a company:
* Is fined by the data regulator
* Is liable to court action if damage ensues
* In extreme cases, banned from operating services in a country

2. If your personal data is stolen from a company what could happen?

Answer:
If your data is stolen, then:
* Hackers could take your ID and use it online
* Credit cards or bank account details could be used to take money
* Email accounts used to compromise you by publishing secrets
* Items or services ordered in your name

3. What are the potential consequences of a data breach for a company?

Answer:
After a data breach, companies can:
* Lose money through theft, fraud, loss of business or fines
* See their share price go down
* Have competitors know their plans and secrets
* Suffer long-term reputational damage affecting future plans
* In the worst case, cease trading

Act 3: Cut And Thrust

Learning outcome 3: Demonstrate ways of protecting their and others' data online

Play Act 3.

1. How do you decide what you want a company to have access to when you download an app?

Answer:
To decide what to share:
* Understand what you want the app or service to do for you
* Ask yourself if it needs the data it's asking for to do that
* Read the requests its making, and the terms and conditions

2. What risks are involved when an app wants permissions to access your data, your microphone or camera?

Answer:
Risks of sharing data, microphone, camera, etc are:
* You are not aware of exactly what is being collected and when
* You lose control of what is being collected and when
* Hackers can snoop on your everyday life

3. What are risky downloading situations?

Answer:
Risky downloading situations are:
* Web sites you don't recognise or don't seem to be run by reputable organisations
* Links in mail or instant messaging you weren't expecting, especially if claiming to be urgent
* Stuff that looks too good to be true - paid-for games for free, or illicit content

4. How do you create a strong password?

Answer:
Strong passwords are:
- Not reused
- Not a common word or phrase
- Not shared with anyone
- Use random words you can remember
- Have numbers as well

5. You should always download software or app updates because they will often contain upgrades to the security of the software.

Answer:
Keep your phone updated by:
- Being familiar with how it gets its system updates, so you can spot fakes
- Turning on auto-updating in app stores and phone settings
- Not ignoring a prompt to update, and follow its instructions

Final Part: The Test

Congratualations! You have reached the end of 'An Introduction to Cyber Resilience and Digital Citizenship'. We really hope it's been fun.

This test should take approximately 15 minutes. Please answer the test questions by printing the test in Appendix 1 and ask the pupils to write their answers on their papers. Answers to the test are in Appendix 2.

Each paper needs to have:

1) The lead teacher's name. This is the name of the teacher who has booked the programme with Civic Digits
2) The pupil's initials, including their middle names
3) The name of the school and the class

When the test is finished please ask the pupils to exchange their papers and mark them for each other.

If they have more than 60% they have passed.

Please post the test papers to: Civic Digits. Code Base, 37a Castle Terrace, Edinburgh EH1 2EL. or verification.

Workshop 2: Feedback Form

We are asking that teachers fill a short feedback form at the end of each workshop, this can be found here:

https://docs.google.com/forms/d/e/1FAIpQLSc2Y-MuRUscn8A8ngCyNIVSwCaLAITdZ-A8VNyQiqX-KybW_vOQ/viewform

The Big Data Show
Company Credits

Creative Team

Co-writers	Clare Duffy & Rupert Goodwins
Director	Clare Duffy
Art Director	Ana Inés Jabares-Pita
Sound Designer & Composer	Susan Bear
Editor & Animator	Iain McCall
Producer	Robyn Jancovich-Brown
Executive Producer	Suzy Glass
Performers	Cindy Awor & Kim Allan
App Developers	Two Tails Indie Game Studios
Web Developers	Fox Dog Studios
Original App Developers	Orthurus
Additional filming	Ruth Barrie & Glenda Rome of Waltzer Films
Production Manager	Chris Hay
Technical Manager	Andrew Kirkby
Press & PR	Magda Paduch for Cornershop PR
Marketing	Helen Eragona
Access Consultant	Dalton Weir
Creative Technologist	Libby Odai
Show Technician	Adam Bowers

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With thanks to:
Rob Schifreen
Keith Lockstone
Dan O Donnell
Alistair Kelman
Chris Lewis

Appendix 1:
Introduction to cyber resilience and digital citizenship Test

IMPORTANT: THROUGHOUT THIS TEST WHEN THE QUESTION USES THE WORD 'DATA', IT REFERS EXCLUSIVELY TO <u>DIGITAL</u> DATA.

Learning outcome 1: Demonstrate an understanding of what digital data is.

1. In your own words answer the question: What is data?

2. Name three ways that data can be collected online.

3. Select <u>one way</u> that data is stored.

Data can be stored in:
1. A book
2. Clouds in the sky
3. A computer's memory circuits
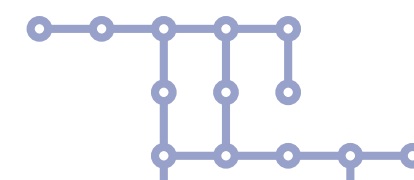4. Your memory

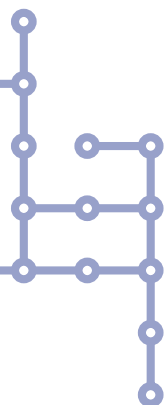**4. Identify two types of data that could be collected through a smart device**

1. The phone numbers of the friends you call
2. What you eat for breakfast
3. What time you arrived at school
4. Who bought you the best present you got for your birthday this year.

5. Find at least one reason why a company or an institution might want to collect your data.

1. To buy time on the internet
2. To find people they can sell things to
3. To sell to other companies
4. To research the way people behave
5. To track sea level changes

6. Identify two reasons why hackers want to access data. Which two of these reasons explain why hackers want to access data?

1. It lets them blackmail companies by threatening to reveal their secrets
2. To go to prison
3. To recruit you as a hacker
4. To brag of their skills in front of other hackers

7. Identify at least one of these which are the legal rights you over your personal data.

1. You can force a newspaper to publish your data
2. You can deny permission for a company to gather or use your personal data
3. You can demand a company to tell you what data of yours they have and how they use it
4. You can request a company keep your data forever

Learning outcome 2: Identify the importance of protecting their and others' data online.

1. If an organisation does not protect your data online, then it may be legally liable to:

1. Publish an apology in a newspaper
2. Get a large fine
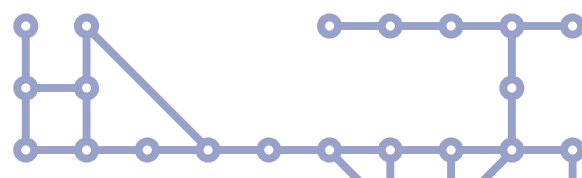3. Give the mobile phone numbers of its directors to its customers
4. Upgrade its software

2. If your personal data is stolen from a company two things that could happen are:

1. You could lose money from your bank account
2. You could have private photographs published online
3. You might have to buy a new mobile phone
4. You'll get compensation from the local council

3. Identify at least two potential consequences of a data breach for a company from a list of options.

If a company's data is hacked, two things that could happen are:

1. It has to close down
2. It needs to design a new logo
3. It has to pay a large ransom to hackers to get its data back
4. Nothing. Everyone understands that these things happen

Learning outcome 3: Demonstrate ways of protecting their and others' data online

1. When you download an app you can decide what you want that company to have access to by:

1. Carefully reading what it is asking you for when it first installs.
2. Looking for 'privacy' in Settings on your phone or app
3. Asking your friends what settings they use
4. Typing in 'privacy' to Google.

2. An app wants permissions to access your data, your microphone or camera, what two of these risks are involved?

1. Your parents will be able to see or hear what you are doing
2. The company could use your data to track you, without your knowledge
3. Your phone might use more data
4. Hackers may have infected the app with malware and steal your data

3. Identify two risky downloading situations from a list of options
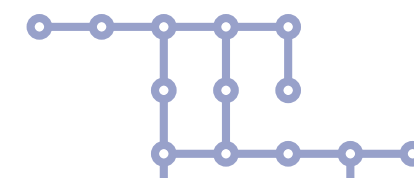**Which two sorts of downloads are particularly risky?**

1. Picking an app by a well-known company from your phone's official app store
2. Finding a paid-for game for free on a website you don't know and downloading it
3. Accepting a security update for your phone from its main screen
4. Clicking on a link in an email you weren't expecting or from someone you don't know.

4. Two things that make a strong password are:

1. Your pet's name followed by the numbers 1234
2. Using the word PASSWORD
3. Two or more unconnected words with two or more random numbers
4. Never using the same password for more than one thing

5. True or false: You should always download software or app updates because they will often contain upgrades to the security of the software.

END OF TEST.

Appendix 2:
Introduction to cyber resilience and digital citizenship
Test Answers

Learning outcome 1: Demonstrate an understanding of what digital data is.

1. In your own words answer the question: What is data?

Look for understanding of digital data as something that can take many forms - pictures, sounds, location, etc - and exist in many places - phones, websites, the Cloud, and so on. Understanding digital data as information understood by a computer/digital device but not limited to a single form or location

2. Name three ways that data can be collected online.

Look for personal data gathering - web searches - or corporate data gathering - web browsers, cookies, filling in registration forms, etc.

3. Select <u>one way</u> that data is stored.
Correct answer: 3

4. Identify two types of data that could be collected through a smart device
Correct answers: 1 and 3

5. Find at least 1 reason why a company or an institution might want to collect your data.
Correct answers : 2, 3 and 4.

6. Identify two reasons why hackers want to access data. Which two of these reasons explain why hackers want to access data?
Correct answers: 1 and 4

7. Identify at least one of these which are the legal rights you over your personal data.
Correct answers: 2 and 3

Learning outcome 2: Identify the importance of protecting their and others' data online.

1. If an organisation does not protect your data online, then it may be legally liable to:
Correct answer: 2

2. If your personal data is stolen from a company two things that could happen are:
Correct answers: 1 and 2

3. Identify at least two potential consequences of a data breach for a company from a list of options
Correct answers 1 and 3

Learning outcome 3: Demonstrate ways of protecting their and others' data online

1.When you download an app you can decide what you want that company to have access to by:
Correct answers: 1 and 2

2. An app wants permissions to access your data, your microphone or camera, what two of these risks are involved?
Correct answers: 2 and 4

3. Identify two risky downloading situations from a list of options
Which two sorts of downloads are particularly risky?
Correct answers: 2 and 4

4. Two things that make a strong password are:
Correct answers - 3 and 4

5. True or false: You should always download software or app updates because they will often contain upgrades to the security of the software.
True.

Appendix 3:
Trouble-shooting and FAQs

Trouble-shooting the Build Your Own Motorised Emoji kit

Firstly, and most importantly...everything is going to be fine! Whatever the issue is, there is probably a solution for it here. If there isn't you can call Civic Digits on 07487 506409 or email contact@civicdigits.com. We will answer messages within 24 hours. In most cases we will be able to respond quicker than that. We will try to arrange a time to talk to you in person and try and trouble shoot whatever the issue is over a zoom meeting or phone call.

It can be a real challenge to make new or unfamiliar technology work. We are trying to make these workshops available despite the restrictions that Covid has imposed on us and we hope that it works as smoothly as possible so that your pupils have fun playing with data, learning about keeping themselves safe and resilient on line and hopefully getting their SQA accreditation.

FAQs

1) The VizBlocks Wi-Fi isn't showing on my phone

Try refreshing the list of hotspots on your phone.

Unplug and plug in the Raspberry Pi. On the end of the Pi closest to where the power cable plugs in, you'll see two LEDs, one green and one red. Both will light up when power is first applies, but as the Pi boots up the green LED will flash irregularly, and then go out once the Pi is ready for use.

If neither light lights up, check the power supply is connected correctly and on at the mains

If the green light doesn't start flickering within ten seconds of power being connected, check the card that holds the Pi's software. This is in a slot to the left of the green LED and can be gently extracted by thumbnail. If it needs to be reinserted, the gold connections should face upwards, into the body of the Pi, and the card should slide in gently until it's about a millimetre beneath the edge of the Pi. It doesn't click into place and shouldn't need much pressure, so check it's the right way around if it doesn't want to go in.

If all seems OK but there's still no VizBlocks hotpot, check that the Wi-Fi adaptor is plugged in correctly. This is a USB plug with a very small black plastic body, and it can go into any of the four USB ports in the end of he Pi opposite the end with the lights.

2) My admin phone (Number 6) doesn't open the apps (VB controller, Node Red, face tracker or data set)

Check: Are you connected to the Vizblock Wi-Fi? Check Wi-Fi in settings to see if you are connected to VizBlocks Wi-Fi.

If you are, try going into settings, Wi-Fi tap the info icon to the right of the VizBlocks connection, and tapping Renew Lease (this may be at the bottom of the list, so you might need to scroll down the options). If this works you should do it with all the phones.

3) The VizBlocks aren't moving when I test with Node Red

Are you pressing the blue button on the left of the arrows? It's super easy to miss. Don't press the arrows, press the button on the left of the arrows

4) Some blocks are moving when I use the apps and some aren't

Check that they are all turned on. On is on the right if you are looking at the back of the block. Use a pen to flick the switch sometimes it's a bit tucked into the block.

Check that they are all flashing with a blue light this means that they are connected to the Raspberry Pi

Check that they are charged. If they are fully charged you'll see 4 red lights underneath the connection for charging

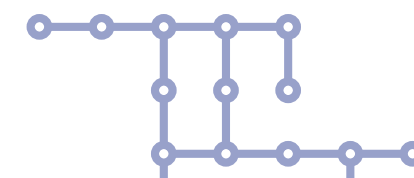**5) My blocks are not charging fully**

They do take a long time to charge, sometimes they need to be left over night to charge. Make sure you charge then while they are turned off

6) The facial recognition app isn't working

Check that in Civic digits admin you have assigned a phone to the facial recognition. It should default to phone 1

Check that you have clicked on the Start button in the app, you know you have because the red and blue lines should start reacting to your facial expression

This does often not work the first time you open it. If you close the app and re-open it and then give it a minute to connect to the pi it should work.

7) I've done something to the Node Red app. I opened it and could find it but now I can't find any 'happy' or 'sad' buttons

Please let us know straight away and we will fix it from our end.

8) I can't find the apps on my phones

Please get in touch with us and we will talk you though putting them back on the phones.

Links are here for each app. When you have connected to the app you can go to share, then add to home screen to create an icon on the phone.

Node Red: https://raspberrypi.local:1880/
Face Tracker: https://192.168.4.1/face-tracker/#(number of phone)
Pupil control: (vbcontroller):   https://raspberrypi.local:1880/vizblock-controller/

These apps are only on phones 16 the teachers' or workshop leaders' phones.

Teacher Admin: (PIP Admin):   https://raspberrypi.local:1880/admin/
Weather data: (Data set tracker):   https://192.168.4.1/face-tracker/dataset.html

civic
digits

Creating a digital future where we all can flourish