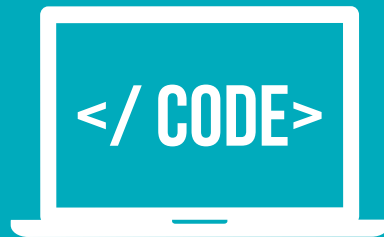


Digital Scotland Challenge Badge

Activities, support and
resources to help you work
towards achieving the Digital
Scotland challenge badge



Introduction

Demand for digital technology skills is accelerating across Scotland and bringing with it a wealth of opportunity for our young people to pursue interesting, important and rewarding educational pathways and careers.

Girlguiding Scotland want to empower every girl to make the most of the amazing opportunities technology has to offer, both in her everyday life and her future career. But we know gender stereotypes and a lack of female representation in science, technology, engineering & maths can sometimes hold girls back. In fact our research found that from as young as seven, girls think that science is a subject for boys. And only 37% of girls aged 7-21 would consider doing a job in technology (Girlguiding's Girls Attitudes Survey 2017). We want to change this – and we hope this challenge pack will help you and your unit get excited about technology and discover the digital skills to re-invent the future!

This challenge has been created to:

- Celebrate digital technology in Scotland
- Support Girlguiding members to become aware of and develop digital technology skills
- Encourage Girlguiding members to think about how they can play a part in Scotland's digital future.



Digital Scotland challenge outline

The Digital Scotland challenge badge is aimed at all guiding sections and consists of 4 Topics:

- Research and exploration
- Creativity and Design
- Problem solving/computational thinking
- Digital technology careers.

Each topic includes a range of activities to choose from for all age ranges. These include performing some activities away from a computer (marked unplugged in the activity table) and some activities online (marked as digital).

Before young people take part in online activities, it is important they are aware of staying safe online and the responsible use of technology.

Use the Web safe code:

Rainbows

<https://www.girlguiding.org.uk/what-we-do/rainbows-5-7/im-a-rainbow/rainbow-web-safe-code/>

Brownies

<https://www.girlguiding.org.uk/what-we-do/brownies-7-10/im-a-brownie/brownie-web-safe-code/>

Guides

<https://www.girlguiding.org.uk/what-we-do/guides-10-14/im-a-guide/guide-web-safe-code/>

To find out more about staying safe online visit the Think You Know, Child Exploitation and Online Protection website <https://www.thinkuknow.co.uk/>

How to achieve the challenge

How to achieve the Digital Scotland challenge badge

The table of activities shows four topics along the top: research and exploration, creativity and design, problem solving/computational thinking and digital technology careers. The level of challenge increases as the girls move sections.

- Rainbows will choose 1 activity per topic and will complete 3 in total from their section of activities
- Brownies will choose 1 activity per topic and will complete 3 in total from their section of activities
- Guides will choose 1 activity per topic and will complete 4 in total from their section of activities
- Rangers will choose 1 activity per topic and will complete 4 in total from their section.

We've included links to further resources throughout this pack. Please note these links do go to external websites and we're not responsible for the content hosted on these sites.

Once you have completed the challenge you can buy badges from the Girlguiding Scotland shops in Edinburgh and Glasgow and online at shop.girlguidingscotland.org.uk

We'd love to hear what your unit gets up to!
Tweet us at [@GirlguidingScot](https://twitter.com/GirlguidingScot) using [#DigitalScotlandChallenge](https://twitter.com/hashtag/DigitalScotlandChallenge).

Find us at:

 **GirlguidingScot**

 **GirlguidingScot**

And, by emailing hello@girlguiding-scot.org.uk

How to achieve the challenge

	Topic 1 Research and exploration	Topic 2 Creativity and design	Topic 3 Problem solving/ Computational thinking	Topic 4 Digital technology careers
Rainbows Age 5-7 <p>All activities are unplugged and will last 45 mins to 1hr with an option of creating a digital presentation in activity 4.1</p>	What is a computer? <p>1.1 Explore how computers are used in everyday life including how computers have changed. How do computers help us at the supermarket, in hospitals, at the bank?</p> <p>1.2 The special jobs of a computer. Name the parts of a computer and build your own model.</p>	Let's get creative! <p>2.1 Create your own dance by developing instructions/algorithm for others to follow.</p> <p>2.2 Binary Bling! Design your own jewellery with a secret message.</p>	Having fun with algorithms <p>3.1 Real life algorithms. Create instructions/algorithm for a friend to make a paper aeroplane or plant a seed. Instructions/algorithm can be pictorial, written or both.</p> <p>3.2 Robot Maze. Can you give precise instructions/algorithm to a friend to escape a maze?</p>	Working with technology <p>4.1 Computers at work. How do computers/technology help us at work? Interview a family member or friend to find out what their job is, what technology they use and how it helps them.</p> <p>4.2 What technology is used in organisations in your community? Choose a farm, hospital, police, hotel, shop or other business. What is the digital technology they use? What skills does the person using it need? Draw a picture showing how these people use technology at work.</p>
Brownies Age 7-10 <p>Choice of unplugged or digital activities for each section.</p> <p>Activities can range from 45 minutes – 2 hours.</p>	What is a computer? <p>1.3 What goes on inside a computer? Research and explore the main internal and external parts of a computer. Name the parts and describe the important jobs they do. Build or draw your own model including labelling inputs and outputs. (unplugged)</p> <p>1.4 What computer are you wearing? Wearable technology is big business, from smart watches to exercise trackers. Research, explore and create a digital or paper presentation or poster about wearable technology today and what it might look like in the future. (digital and unplugged)</p>	Story journeys <p>2.3 Our lives are full of journeys. A walk to school, the park or a friend/relative's house. Reading books about journeys such as Alice in Wonderland, The Wizard of Oz, The Chronicles of Narnia or Lost and Found. Use a story or personal experience to recreate a journey, ensuring each step is in the correct order so others can follow it. (unplugged)</p> <p>2.4 Create a digital presentation, movie or animation that tells a story of a journey such as a residential trip, holiday, or a special visit you've taken part in. Ensure all the steps of the journey are in the correct order and others can follow it. (digital)</p>	Having fun with algorithms <p>3.3 Bake Off. Follow instructions/algorithm of a recipe - pizza, banana bread and create your own unique recipes ensuring each step of your instructions/algorithm is precise. Share your algorithm for your new recipe to your Brownie unit (unplugged)</p> <p>3.4 Design a computer game or animation using Scratch ensuring your algorithm makes sense for the game or animation to work. (digital)</p>	Digital technology careers <p>4.3 Investigate and explore careers in the digital industries. Can you find new types of jobs which are becoming more important (eg Cyber, Data, Digital Health)? What they may look like in the future? Record all your findings and make a presentation to share with your unit.</p> <p>4.4 Invite a guest who works in a digital technology role to visit your Brownie unit and share information about the organisation they work for and what they do. Prepare some questions about what skills they need and how they got into their job.</p>

continued...

How to achieve the challenge

	Topic 1 Research and exploration	Topic 2 Creativity and design	Topic 3 Problem solving/ Computational thinking	Topic 4 Digital technology careers
Guides Age 10-14 Choice of unplugged or digital activities for each section. Activities should take around 2 hours.	Computing technology 1.5 What goes on behind the scenes of your computer? What is the difference between the World Wide Web and the Internet? What are their origins? Research, explore and create a digital information presentation/ fact file to share with your unit. (digital or unplugged) 1.6 How can robots help us? Research some of the ways robots can help us with space exploration, in hospitals, supermarkets, with deliveries and at home. Can you think of how robots can help you now or in the future? Design a robot Share your research and your robot design with your unit as a presentation or fact file. (digital or unplugged)	Creativity and design 2.5 Coding the future of design and clothing. Design your own wearable technology eg. Trainers that flash in time with the music you're listening to or an item of sports clothing to track your fitness levels. You can create a digital representation or artistic drawing of your wearable technology with an explanation of how it works. (digital or unplugged) 2.6 Design a wearable badge or accessory using a BBC Microbit. (digital)	Computational thinking 3.5 Quizzing Champions. You're up against the clock to answer as many questions as you can! Code and challenge your friends to a quiz, ensuring your algorithm is in the correct sequence. (digital) 3.6 Noughts & Crosses Superhero. Impress your friends and family by always winning at X's and O's/ Noughts and Crosses. Write an algorithm/instructions that when used will give you the power to never lose a game of noughts and crosses again! (unplugged)	Digital technology careers 4.5 Research a key woman in computing. This could be a historic pioneer like Ada Lovelace or a modern-day role model like Sheryl Sandberg. Create a digital or paper presentation to show what she has achieved and why you think she is inspiring. 4.6 Choose a digital product like an app, website or game. Research the different jobs involved in making that product and some of the skills required. Create a presentation, digital or paper to show the different stages of making the product and related jobs and skills.
Rangers Age 14-18 Choice of unplugged or digital activities for each section. Activities should take around 2 hours.	Computing technology 1.7 Where would we be without computers? Research and explore how computers changed WWII and future communication. What was the name of the first ever computer and what role did computers play in Bletchley Park in bringing WWII to an end. Share your knowledge with your unit to stimulate discussions. (digital and unplugged) 1.8 The evolving link between people and machines. Research and explore the possible future medical applications of computer interfaces and how this can be used to help people with disabilities. Share your findings and ideas with your unit to stimulate discussions. (digital and unplugged)	Creativity and design 2.7 Where does our power come from? Renewables and climate change are real world issues. Create a presentation detailing the sources including the positives and negatives of renewable energy eg. Wind, Tidal, Solar, Carbon. (digital or unplugged) 2.8 Mixing beats and making music. Explore the creative and design process of music making. Create pieces of music using three pieces of software – Incredibox, Isle of Tune and Ear Sketch. (digital)	Computational thinking 3.7 Become an app developer. Design and build a working app for mobiles to convey what you've learned about different renewable technologies and the benefits and drawbacks of each. (digital) 3.8 Become a poetry programmer. Work with Ada Lovelace, the woman who created the world's first ever computer algorithm to create your own poetry generator! (digital)	Digital technology careers 4.7 Digital jobs and skills. Identify different jobs in technology and pick one to research in more detail. What does that job involve and what skills are required? Identify the soft skills as well as the technical/hard skills. Do you have any of these skills? Share your findings with your unit in the form of a paper or digital presentation or fact file. 4.8 Where are digital skills needed? What careers are open to you within the media, finance, health and gaming industries by learning digital skills? Share your findings with your unit in the form of a paper or digital presentation or fact file.

Topic 1

Research and exploration

Rainbows

What is a computer?

1.1 Explore how computers are used and how they help us.

Computers are all around us, in our homes, shops, hospitals, banks and many, more places. Can you think about how computers are used and help us at work and at play? Ask an adult to help you identify some of the uses of computers in the following places:

- the supermarket
- home
- shops
- school
- bank
- traffic lights.

Can you identify other places where computers are used and how they help us? Can you also identify how computers have changed over the years?

Share this information with your Rainbow unit and ask if they have any other examples of how computers are used to help us.

If you have access to a computer and the internet you might want to look at CBeebies, Nina and the Neurons, Computers are all around us -

<https://www.bbc.co.uk/cbeebies/watch/nina-and-the-neurons-computers-song>

1.2 The special jobs of a computer. Name the parts and build your own model.

A good way to understand computers is to be able to name the different parts and understand the special job of each part of a computer. Can you name the different parts of a computer you have used?

Can you build a model of a computer and label it? You'll need to use some recycled materials such as different sizes of boxes, card, paper, pens, pencils and scissors.

BBC Bitesize – Name the different parts of a computer -

<http://www.bbc.co.uk/guides/z9myvcw>

Topic 1

Research and exploration

Brownies

What is a computer?

1.3 What goes on inside a computer?

Computers come in all different shapes and sizes. They are also shrinking in size and can be built into and embedded in almost anything. Almost every computer we use works in the same way with inputs and outputs.

Can you identify how computers handle data? What are the ways we can input data into a computer? Where is that data processed? What are the different outputs that allow us to see or hear data or information from the computer?

Identify the input, process and output parts of a computer you have used. Can you show how the data moves around inside a computer?

Can you build a model of a computer including the parts inside, and label it? You'll need to use some recycled materials such as different sizes of boxes, card, paper, pens, pencils and scissors.

BBC Bitesize – Input, Process and Output devices

<https://www.bbc.com/education/guides/zqg9q6f/revision/1>

1.4 What computer are you wearing?

Computers that you use are no longer great big machines that take up lots of space on a table – just think of tablets, smartphones, watches or fitness trackers. These are all computers that we can carry around with us.

Can you explore an item of technology that you could wear? For example, a fitness tracker or maybe something that is worn to keep a check on your health? You can work with a friend, family member, parent or carer on this task. Share your research with your Brownie unit and ask if they have any other examples of computer technology that can be worn.

If you can access a computer, the links below may give you some more ideas?

World's tiniest computer

<https://bit.ly/2MkBo1r>

Wearable Technology

<https://www.bbc.co.uk/news/topics/cngjnjlwr13t/wearable-technology>

Topic 1

Research and exploration

Guides

Computing Technology

1.5 What goes on behind the scenes of a computer?

Computers are all easily connected to online services and many devices are now part of the Internet of Things.

Online access to a huge amount of information is something we expect, from sitting in a café, on a bus or train, at home or in school.

We often hear of the World Wide Web (WWW) and the Internet, but what is the difference between the World Wide Web and the Internet? What are their origins?

Research, explore and create a digital information presentation/fact file to share with your Guide unit about the differences between the WWW and the Internet and the origins of both.

During your research you may also want to think of the advantages and disadvantages of almost instant online access and what actually is the Internet of Things. Think how the Internet of Things could bring benefits or challenges to your everyday life.

If you can access a computer, the links below may help:
WWW and Internet.

<http://www.bbc.co.uk/guides/z2nbgk7>

Internet of Things

<https://www.bbc.com/education/guides/zp9jpv4/revision/2>

Using the web safely

<http://www.bbc.co.uk/guides/zym3b9q>

Topic 1

Research and exploration

1.6 The rise of the robots

Robots are increasingly used in industry but are also beginning to be seen in hospitals, care homes, hotels, home deliveries and more.

Can you think of the positive and negative ways robots are currently used?

Can you think of what a shop, or hotel, or hospital may look like in 10 years' time?

By asking friends, family members, carers, research the Internet, explore some of the ways robots are currently used and how they may be used in the future. Can you design a robot that you think could make your life better or can you design a robot that could help others? Share your research and your robot design with your Guide unit as a presentation or fact file. This can be done digitally or away from a computer using paper and pens.

If you have access to a computer these websites may be of help with the activity:

Rise of the Robots (synopsis)

<https://www.theguardian.com/books/2015/oct/01/the-rise-of-robots-humans-need-not-apply-review>

BBC News: Robotics.

<https://www.bbc.co.uk/news/topics/c8nq32jw88jt/robotics>

BBC: Why are we fascinated by robots?

<https://bbc.in/2oXld0e>

Topic 1

Research and exploration

Rangers

Computing technology

1.7 Where would we be without computers?

Research and explore how computers changed World War II (WWII) and future communication. What was the name of the first ever computer and what role did computers play in Bletchley Park in bringing WWII to an end?

In this activity, research historical characters working at Bletchley Park during WWII and how the work the women and men carried out under tremendous pressure changed the outcome of the war. Can you identify the key females, “Bletchleyette’s” and report on what life would have been like for those women and the other extraordinary female codebreakers? Can you find out the contribution to computing science made by Alan Turing?

Share your knowledge as a fact file or presentation with your unit to stimulate discussions.

These websites will help with your research:

BBC Teach. How computers changed WWII and future communication

<https://bit.ly/2lzc8JD>

The Telegraph: The incredible female codebreakers of Bletchley Park

<https://bit.ly/2IRlwVe>

Women Codebreakers

<https://www.bletchleyparkresearch.co.uk/research-notes/women-codebreakers/>

Topic 1

Research and exploration

1.8 The evolving links between people and machines

Look back at old black and white pictures or movies and you will see machines being operated by humans, lots of levers to pull and push, lots of steam and smoke and noise. Fast forward to today and machines are quiet, clean and doing almost all of the work, with the human involvement much reduced and probably centred on ensuring the machine is operating correctly or programming its actions.

The next advance is using technologies such as Augmented Reality (AR) and Virtual Reality (VR) but how do we make good use of these technologies to help us? Research and explore the possible future medical applications of computer interfaces and how this can be used to help people with disabilities.

Share your findings and ideas with your unit to start a discussion. This activity will help you understand how these technologies are used in the healthcare industry and will benefit everyone.

These websites will help you with your research:

BBC Teach: Cybernetics.

<https://bit.ly/2lvvEXe>

BBC: Mixed reality used in Operating Theatres.

<https://bbc.in/2lvniPk>

The Express: VR benefits Dementia patients.

<https://bit.ly/2yEZnX8>

Topic 2

Creativity and design

Rainbows

Let's get creative!

2.1 Create your own dance.

Computers work by following a set of instructions. We call this set of instructions an algorithm. Can you say this word algorithm and share this new word with a friend, family member, carer or Rainbow leader? Computer games follow a precise algorithm (set of instructions) and these algorithms are made by humans. Can you think of algorithms that you use in the world around you? A recipe is an algorithm. Can you think of other algorithms?

Let's create our own algorithm! You are going to create an algorithm (set of instructions) for a new dance and you will be able to teach it very quickly to your friends, family, carers or Rainbow unit. Make sure your algorithm is correct at every step!

You can use drawings or words to design your own dance algorithm for others to follow.

Try this dance algorithm to help get you started.

1. Stand straight and look forward
2. Lift both hands above your head
3. Turn a complete circle clockwise
4. Lower your hands together until out in front of you
5. Take 1 step to the left
6. Put your hands by your side
7. Take 1 step to the right.

Was the algorithm easy to follow? Can you change it?

Can you design a dance with a friend and then show it to your Rainbow group, maybe some of them would like to try it? What happens if they don't follow your algorithm exactly?

Topic 2

Creativity and design

If you have access to a computer, the links will help with this activity
Stand Up Sit Down Keep Moving

<https://www.youtube.com/watch?v=BsjlBiy99Tg>

Education Scotland Create a dance

<https://bit.ly/2BULqo2> (download Early Level > Create a dance)

2.2 Binary Bling!

Design your own jewellery with a secret message.

Messages are sent around a computer in code, and this code is called Binary. When you type into a computer your words and numbers are changed into Binary. The computer works with the binary code and when it needs to show you something on screen, it changes the code back into letters and numbers you can read. This is all done very fast.

For this activity you are going to create a piece of jewellery that will have a secret message that only those who have done their Digital Scotland challenge badge can de-code.

If you have access to a computer this link will help you create your own binary bling.

<https://code.org/curriculum/course2/14/Teacher>

Here is your secret code sheet. Have a look at this video to see how these girls use the secret code to make bracelets <https://bit.ly/2K7sTKJ>

A	■□■ ■■■□	N	■□■ ■■■□
B	■□■ ■■■□	O	■□■ ■■■□
C	■□■ ■■■□	P	■□■ ■■■□
D	■□■ ■■■□	Q	■□■ ■■■□
E	■□■ ■■■□	R	■□■ ■■■□
F	■□■ ■■■□	S	■□■ ■■■□
G	■□■ ■■■□	T	■□■ ■■■□
H	■□■ ■■■□	U	■□■ ■■■□
I	■□■ ■■■□	V	■□■ ■■■□
J	■□■ ■■■□	W	■□■ ■■■□
K	■□■ ■■■□	X	■□■ ■■■□
L	■□■ ■■■□	Y	■□■ ■■■□
M	■□■ ■■■□	Z	■□■ ■■■□

Topic 2

Creativity and design

Brownies

Story journeys

2.3 Recreate a story journey.

Our lives are full of journeys such as a walk to school, the park or a friend or relatives house. Reading books and stories are also full of journeys such as Alice in Wonderland, The Wizard of Oz, The Chronicles of Narnia or Harry Potter.

Use a story you have read or a personal experience to recreate a journey, ensuring each step is in the correct order so others can follow it. The steps you are creating can also be called an algorithm. If the steps to your journey are not in the correct order then your friend, family member, carer or Brownie unit will not be able to follow your journey.

Create your journey algorithm digitally or unplugged. You can draw each step of the journey or write about it. Share your journey algorithm with your Brownie unit.

Education Scotland download resources for Early Level - A Story Map -

<https://bit.ly/2BULqo2>

2.4 Recreate a personal journey.

Design and create a digital presentation, movie or animation that tells a story of a journey such as a residential trip, holiday, or a special visit you've taken part in. You will have to ensure the algorithm for your presentation or animation is in the correct order to ensure your Brownie unit can follow it.

If you have taken photos of your trip, holiday or journey you will have to organise these photos into the correct order. This can be done by date or time the pictures were taken or by location.

You may want to think of some music that brings back memories of the journey, and add this to the finished story, remember to tell everyone who composed the music in your credits.

Share the finished story with your Brownie unit and ask them to retell the steps of your journey to see if they can recreate your journey algorithm.

Education Scotland download resources for Early Level - A Story Map -

<https://bit.ly/2BULqo2> (Adapt this resource for a personal journey)

Topic 2

Creativity and design

Guides

Creativity and design

2.5 Coding the future of design and clothing

Embedding computers into everyday objects requires skills in creativity and design. Think about the way you could incorporate computer technology into clothing or wearable devices. Can you design your own wearable technology? For example, trainers that flash in time with the music you're listening to or an item of sports clothing to track your fitness levels.

You can see sketch ideas for new projects here to inspire you -

<http://luxmag.com/articles/the-future-of-wearable-technology-in-pictures>

Create a portfolio of ideas and sketches and share with your unit. Ask if they have any other ideas, or suggestions on how your designs could be extended.

Use this video to inspire you -

BBC Teach: The Virtual Catwalk

<https://bit.ly/2I7BJXV>

2.6 Design a wearable badge or accessory

Microbits can be used for all different kinds of cool creations, from robots to musical instruments. If you haven't got a Microbit ask your school to provide you with one to create your own wearable digital badge or accessory.

Creating your wearable badge or accessory may include how the Microbit and the battery box will be attached to your clothes, or it may need a bracelet designed to hold it in place. This website will help design your badge.

<https://codeclubprojects.org/en-GB/microbit/interactive-badge/>

There are also lots of Microbit design projects this on this site -

<https://makecode.microbit.org/>

Present your final, fantastic wearable tech to your Guide unit and take them through the algorithm you wrote to make your badge or accessory work.

Topic 2

Creativity and design

Rangers

Creativity and design

2.7 Where does our power come from?

Computing technology allows us to look and hopefully find creative and sustainable solutions to many of the serious issues that are affecting our fragile planet. We need to find solutions for clean energy generation, to provide clean fresh water, to reverse the effects of global warming and climate change, to care for an ageing population and many more.

Can you find out by researching where the power for your house comes from? Is renewable energy part of the power that is delivered to your home?

Research the sources of renewable energy in Scotland, UK and worldwide. Create a presentation to share with your unit stating the sources of your research and information.

BBC Bitesize What is renewable and non-renewable energy -
<http://www.bbc.co.uk/guides/ztxwqty>

BBC Bitesize Renewable energy -
<https://www.bbc.com/education/guides/zsmpk7h/revision/1>

Topic 2

Creativity and design

2.8 Anyone can be a rock star! Mixing beats and making music.
(no musical experience needed)

In the music world computers are extensively used, from recording your initial ideas for a song to creating a fully digitised recording studio. In this activity unleash your inner musician by using appropriate software to make a digital recording.

Research and explore the creative and design process of music making. Create pieces of music using these suggested pieces of software – Incredibox, Isle of Tune and Ear Sketch. Share your masterpiece with other Rangers and discuss together how you could further develop the tune.

Incredibox.

<http://www.incredibox.com/gb>

Isle of Tune

<http://isleoftune.com/>

Ear Sketch.

<http://earsketch.gatech.edu/landing/#/>

Ed Scot.

<https://bit.ly/2BULqo2>

Topic 3

Problem solving and computational thinking

Rainbows

Having fun with algorithms (an algorithm is a precise set of step by step instructions).

3.1 Real life algorithms.

In Computing Science we call a set of precise instructions an Algorithm. Can you draw or write an algorithm (a set of instructions) that your family or friends or Rainbow unit can follow?

Here are a few examples to get you started -

Could you write or draw an algorithm to help with planting a seed?

Could you write or draw an algorithm to help a friend create the best paper aeroplane?

Could you write or draw an algorithm to help a little brother or sister brush their teeth?

If you have access to a computer here are a few videos to watch to help with this activity.

Code.org: Paper aeroplanes.

<https://studio.code.org/s/course2/stage/2/puzzle/1>

Code.org: Plant a seed

<https://bit.ly/2tB8S40>

Topic 3

Problem solving and computational thinking

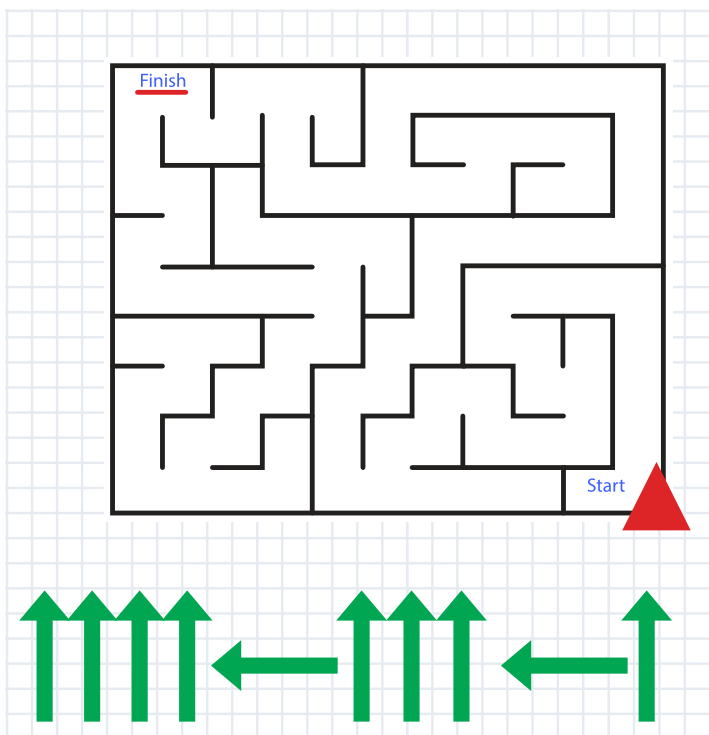
3.2 Robot maze.

With a friend draw a maze, it can be as easy or difficult as you like.

Can you now draw an algorithm using arrows (up, down, left, right) that will give the escape instructions to your friend?

Can you make changes to your algorithm to find a faster route out the maze?

Here is an example with the first 10 moves shown



If you have access to a Beebot you could also program it to work its way through your maze.

See an example of a maze created for a Beebot - <https://youtu.be/9KNfgmD-PVM>

Topic 3

Problem solving and computational thinking

Brownies

Having fun with algorithms (a precise set of instructions).

3.3 Bake off and algorithms

We have seen this word algorithm a few times now, and you have probably found out how you have to get the algorithm correct, if you want to get the results you expect.

If you have access to a cooker this is a great algorithm to try, with some help from an adult.

Can you follow the recipe/algorithm, for a delicious cake – maybe muffins, cupcakes or banana bread and share the results with your Brownie unit?

Can you slightly alter the algorithm to create your own unique recipe, making sure each step of your algorithm is correct? Share the algorithm/recipe with your Brownie unit.

3.4 Design a computer game.

Can you think of the next wacky computer game that will be on everyone's phone or tablet?

You don't really need a computer for this task, just let your imagination run free with ideas for new games, share your ideas with your Brownie group, and decide on one game to develop.

Draw and storyboard your design for the game, showing how it is played, the various levels, characters, backgrounds and music?

If you do have access to a computer or tablet you may want to try out your game ideas using coding software such as Scratch.

Here are some ideas for you to get started with your game designs.

Code Club Project game

<https://codeclubprojects.org/en-GB/scratch/ghostbusters/>

Code Club Animation

<https://codeclubprojects.org/en-GB/scratch/lost-in-space/>

Topic 3

Problem solving and computational thinking

Guides

Computational thinking

An algorithm is a set of step by step instructions. In school you might be investigating algorithms and looking to solve particular problems. Each problem relies on your computational thinking skills and breaking down big problems into smaller, easily solved problems.

3.5 Quizzing champions

CodeClub Brain Game:

<https://codeclubprojects.org/en-GB/scratch/brain-game/>

You're up against the clock to answer as many questions as you can! Code and challenge your friends to a quiz.

Can you think of the questions to ask? How do you let your friend know the answer is correct, can you work out how to keep a score of the correct answers and can you display the correct answer if a wrong answer is given? Lots to think about in this activity, but so much fun once you work out the algorithm. You can reuse the algorithm for lots of different quizzing activities.

3.6 Noughts and crosses superhero

Impress your friends and family by always winning at X's and O's/Noughts and Crosses.



With lots of practice with a friend, play lots of X and O games and try to work out the algorithm that when you follow it exactly will give you the power never to lose a game?

Think carefully about all the places that an X or O is placed during the game, and you will soon realise there are only 5 steps in the algorithm. Get your thinking hats on!

Give the finished algorithm to friends in your Guide unit and get them to test it.

CS4Fun -

<http://www.cs4fn.org/algorithms/noughtscrosses.html>

Topic 3

Problem solving and computational thinking

Rangers

Computational thinking

3.7 Become an app developer.

We often reach to our mobile phones and tablets to get the latest information, from online sources or from information contained in an app, which does not always rely on an online connection.

Can you design and build a working app for a mobile phone or tablet to inform users about the various types of renewable energy sources?

Show your completed app to your Ranger unit, and through discussion think of other useful apps you could develop.

The link below has some great information about how you should approach this task.

Creating a mobile app:

<https://www.youtube.com/watch?v=inAB7jX64eE&feature=youtu.be>

3.8 Poetry generator.

Computers can be programmed to do lots of things, but can you create a poetry generator?

Can you use your coding skills to write an interactive program that will generate poetry based on lists of words you provide! It maybe won't rival the poetry of Kathleen Jamie or Rabbin Burns, but it will be fun.

Click on the link below to work with Ada Lovelace, the woman who created the world's first ever computer algorithm to create your very own poetry generator!

Ada's poetry generator:

<https://codeclubprojects.org/en-GB/scratch/poetry-generator/>

Topic 4

Digital technology careers

Rainbows

Working with technology.

4.1 Computers at work.

How do computers/technology help us at work? Can you ask a family member or friend to tell you what their job is and if they use computers? Ask how they use the computer at work and how it helps them.

Use the information you have collected and maybe add to this by looking in magazines or books about jobs to create a digital presentation or paper fact file to demonstrate some of the different jobs people do with computers at work and share with your Rainbow unit.

4.2 What technology is used in business near me?

With your Rainbow leader, choose an interesting job in your community. It could be a farm, hospital, police station, hotel, shop or other business. Can you find out what digital technology they use to do their job? What skills does the person using it need?

You could then draw a picture or write a story to share with your Rainbow unit about how technology is used in your chosen job.

Topic 4

Digital technology careers

Brownies

Digital technology careers

4.3 Investigate and explore careers in the digital industries.

Job opportunities in digital industries are growing, and the skills required are changing. What digital skills do I need?

With a friend or family use online and offline resources to explore careers in the digital industries.

Can you find new types of jobs which are becoming more important, for example cyber, data, digital health?

What might these jobs look like in the future? Record all your findings and make a presentation to share with your unit.

These websites can help you with your research:

My World of Work website:

www.myworldofwork.co.uk

Digital World careers website:

www.digitalworld.net

Skills Development Scotland Thriving in the Future video:

<https://www.youtube.com/watch?v=DjfM9LKBBhE>

4.4 Let's hear from an expert

Invite a guest who works in a digital technology role to visit your Brownie unit and share information about the organisation they work for and what they do. Prepare some questions to ask them about what skills they need and how they got into their job.

After the meeting work together with your Brownie unit to create a digital presentation to show how well you understand the skills required to work in an industry where technology is used.

Topic 4

Digital technology careers

Guides

Digital technology careers

4.5 Girls in technology are and always have been awesome!

Research a key woman in computing/technology. This could be a historic pioneer like Ada Lovelace or a modern-day role model like Sheryl Sandberg. Create a digital or paper presentation to show what she has achieved and why you think she is inspiring.

These websites can help you with your research:

Inspirational women in tech:

<https://www.digitalworld.net/content/inspirational-women-tech>

Amazing women in tech:

<http://www.liverpoolgirlgeeks.co.uk/6-women-tech-need-know/>

Digital World website blog has articles from females working in tech:

<https://www.digitalworld.net/blog>

4.6 Technology is not all coding!

Choose a digital product like an app, website or game. Research the different jobs involved in making that product and some of the skills required. Create a presentation, digital or paper to show the different stages of making the product and related jobs and skills.

These websites can help you with your research:

Careers in digital (Digital World):

<https://www.digitalworld.net/careers>

Tech jobs that don't need code:

<https://bit.ly/2lxKSet>

Topic 4

Digital technology careers

Rangers

Digital technology careers

This activity may also help with your school work as you make subject choices. Finding out about career options and the different skills require will give you valuable information.

4.7 Taking a closer look at digital skills

Identify different jobs in technology and pick one to research in more detail. What does that job involve and what skills are required? Identify the soft skills as well as the technical/hard skills. Do you have any of these skills? Share your findings with your unit in the form of a paper or digital presentation or fact file.

These websites can help with your research:

Careers in technology (Digital World):

<https://www.digitalworld.net/careers>

My World of Work website:

www.myworldofwork.co.uk

Apprenticeships in digital technology:

<https://www.apprenticeships.scot/digital-technology-apprenticeships>

4.8 Where are my skills needed?

What careers are open to you by learning digital skills? Take a look within the digital media, finance, healthcare, energy, manufacturing and gaming industries. Share your findings with your unit in the form of a paper or digital presentation or fact file.

These websites can help with your research:

Careers in technology (Digital World):

<https://www.digitalworld.net/careers>

My World of Work website:

www.myworldofwork.co.uk

Explore people, employers and Scottish innovation in technology:

<https://www.digitalworld.net/explore>

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Girlguiding Scotland is the leading organisation for girls and young women in Scotland, helping around 50,000 young members grow in confidence, reach for the stars, have fun and be a powerful force for good.

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