

technocamps

Fully-funded

STEM WORKSHOPS

for schools in Wales



We offer FREE engaging and innovative workshops in English or Welsh adaptive to year topics. Workshops cover STEM subjects underpinned by Computer Science utilising Scratch and other programming languages to deliver problem-solving and computational thinking which can be fully integrated into the new curriculum for Wales.

www.technocamps.com

Year 1 and 2

Foundation Phase Carousel

This session works with small groups of pupils for a maximum of 30 minutes per group. They will learn the fundamentals of programming through fun games and problem solving activities. A space to work with the pupils is required.

Year 3 to 6

Innovation and Exploration (Unplugged)

This session investigates the three steps of innovation: Discovery, Development and Distribution. Learners will delve into the evolution of technology before discussing the positive and negative impacts of different types of technology. The session will culminate with learners designing on paper their own technology to solve a problem (this can be linked to a class topic/theme).

Year 3 to 6

Machine Learning

Have you ever asked yourself how does Alexa understand what I ask her? Or would you trust a machine to make life changing decisions for you? In this session you will discover how Machine Learning is being used in a variety of different ways from speech recognition to Google maps. You will then develop your knowledge regarding appropriate and non-appropriate data when training a machine before implementing your own Machine Learning Scratch game.

Year 4 to 11

Computational Thinking

Focusing on the 4 strands of computational thinking, this session will provide learners with key skills that can be applied in all walks of life. Topics will include algorithms, abstraction, decomposition and pattern recognition. By the end of the session, learners will be able to use the skills they have learnt to solve problems in fun ways.

Year 4 to 9

Robotics (Requires use of a projector)

During this workshop learners will initially discuss the pros and cons of using robots for tasks before building their own LEGO Spike robots. Once built they will be shown how to program the robot using basic block coding and then will be set a variety of challenges including navigating a maze. This workshop has proven to be beneficial in developing the resilience of learners as they broaden both their team building and problem-solving skills.

An extension activity can be added where learners will programme the robots to become recycling robots able to distinguish between different colours and sort them accordingly.

Year 4 to 8

The White Feather (KS2) and Cryptography (KS3)

We have a range of different cryptography workshops that can be adapted to suit a wide range of ages. The workshop introduces learners to cryptographic techniques both in ancient history and during the modern era. The learners will learn how to encode and decode using many different ciphers and can test their knowledge by completing our virtual version of the Break into the Box activity. By understanding and implementing these techniques, they will strengthen their logical thinking and mathematical skills.

Year 4 to 8

Introduction to Scratch

This workshop introduces learners to Scratch online programming whilst designing a basic game. They will learn how to draw shapes, add in a scoring system and a timer to model a basic computer/app game. This session can be linked to your current termly theme. This session will require access to a computer and to scratch.mit.edu

Year 5 to 9

Technology, Ethics and The Future

This focuses on the evolution of technology and the ethical issues surrounding technology and its future developments. Learners will have to think outside the box about how different technologies can be 'smart' and how they can help us in the world today. An extension activity can be added but will require computer access. Learners will either build electronic circuits to replicate smart lights or use robotics to imitate autonomous vehicles, whilst considering the ethical concerns.

Year 5 to 8

Networks and Communication

In this workshop we explore the many thousands of invisible signals passing through the air around us. We discuss different types of network from WiFi to Telegraph and explore different ways of transmitting both sound waves and electrical waves. Following an introduction to the Electromagnetic Spectrum we put our newfound knowledge into practice by programming Micro:Bits to send and receive on a DIY network.

Year 5 to 9

Modelling Zombies

Have you ever wondered what would happen if a Zombie virus began spreading across the nation? Is it possible to stop the spread, how would you predict how many people might get infected and what measures could you put in place to slow the spread? As part of this workshop, learners will learn about the concept of disease modelling through a variety of fun activities and explore their links to global pandemics.

Year 5 and 6

Scratch Ecosystems

This workshop develops learners' knowledge of ecosystems, in particular, food chains. They will broaden their knowledge by using Scratch by producing a game which is a simulation involving a habitat containing predators and prey. By the end of the session, they will have learnt how to add in predators and prey, and the effect of adding in extra predators on their habitat.

Year 5 to 8

Python Maths

An introduction to Python in a visual and artistic way. This session introduces the Python programming language which learners will learn and explore through the use of Turtle. learners will learn the initial commands and improve their computational thinking skills as they develop their ability to program. The session evolves to look at more complicated tools that are used throughout computer science such as for-loops, if statements and user feedback. MAT learners will move on to using lists and Python's random library to do some quite advanced programming.

Year 5 to 8

Why do people move?

This session starts with a discussion on migration and the factors that affect this. The session can be linked to The Andorra Start and World War 2. Learners will then use Scratch to model the effects of money, employment, war and family on populations within an area.

Year 5 to 7

Butterfly Hunter

Born in Wales, Alfred Russel Wallace came up with the theory of evolution at the same time as Charles Darwin after stumbling upon an unusual beetle in the Neath Valley. This workshop explores DNA and how this causes variation in a population. Learners will then design their own butterfly game in Scratch to model the process of natural selection.

Year 5 to 7

Explore the Solar System

In this session pupils will initially learn the order of the planets and investigate how this links to their orbits. Following this they will design their own Solar System in Scratch.

Year 6 to 8

Modelling Molecules

Everything is made of particles! This workshop will firstly develop learners' knowledge of atoms by using Scratch to animate the three states of matter: solid, liquid and gas. They will then discover the reactivity series and how we can use this to model displacement reactions using Scratch.

Year 4 to 8

We offer a range of different micro:bit workshops:

Micro:bit Climate Control

Find out the importance of microclimates in a world facing climate change. Learn how to use micro:bits to measure your local microclimate and the benefits of doing so. Discover how you can even use a micro:bit to control your microclimate to benefit you and your health.

Electrifying micro:bit

Take micro:bits to the next level by using them as part of a larger circuit! Discover how electricity flows through the micro:bit allowing each component to work, and wire up the micro:bit to test the conductivity of different materials - including you!

Micro:bit Health & Wellness

Discover the usefulness of technology in monitoring your personal health and wellbeing. Use a micro:bit to code various health focused technologies - breathing exercises, mental health monitors, pedometers and more! You'll be coding your way to a healthier lifestyle in no time!

Micro:bit Conservation Coding

Investigate the ways in which humans can affect the wellbeing of animals within our modern world. Use this knowledge to investigate how we can use technology to help animals and limit the damage we cause! From fighting light pollution to counting wild species, you will learn how to code your way to conservation!

Micro:bit Magical Maths

In teams of three build yourselves a maths game using micro:bits! Step by step we will add more features to our game so that by the end of the session we have a fully functioning maths game to play. Improve your digital skills by implementing new features and fixing problems in our code - all while doing incidental maths!

Micro:bit Morse Code

Do you know morse code? Get ready to learn it by sending your very own secret codes! Discover how you can use radio signals to have your micro:bits communicate with each other, then use this knowledge to build yourself a morse code transmitter and receiver. Start sending secret messages across the class and become an expert at decoding them! This session can be linked to our Cryptography and White Feather workshops.

Musical micro:bits:

Let out your inner composer and become the new micro:bithoven! Use your coding skills to program your own melodies - one note (and chord) at a time. Discover the world of music and begin changing octaves to alter the pitch as you play. Don't worry teachers - we'll begin by learning how to wire a pair of headphones to the micro:bit!

Year 7 to 9

Rocket Design

Learn the importance of 3D design and precision engineering in the modern world. The learners will begin with two hands on rocket experiments to stimulate the discussion on rocket design and flight. They will then take this knowledge and utilise 3D design software to produce the perfect rocket!

Year 7 to 9

Greenfoot Ecosystems

This workshop develops learners' knowledge of ecosystems - food chains in particular. They will broaden their knowledge on the Java-based Greenfoot environment by producing a game which is a simulation involving a habitat containing predators and prey. They should be able to answer: What effect would adding more predators or prey have on the ecosystem? What happens if there is a shortage of producers?

Year 8 upwards

Arduino - Making SMART devices

Learners will design and build a smart device using an Arduino microprocessor. Initially they will use a virtual environment called tinkerCAD before implementing the same circuits using real components and testing the device in their classroom.

Year 8 and 9

Pyth (Scratch to Python)

Transition students from Scratch block-based programming to Python text programming through the use of Pyth, a tool to aid students by making games in scratch and converting them to Python.

Year 9 to 13:

Snap! Climate Change

Get ready for degree level data analysis - conveniently simplified with block-based programming! 'Snap!' is a Scratch like software built to teach the foundations and concepts of data analysis. We will begin to analyse multiple public data sets such as sea level, surface temperature and atmospheric CO₂ - intuitively discovering how to sort, filter, group and graph the data! Each additional block will show you how your data has been manipulated, giving you a step by step understanding of the functions you use. With a full day session, you can even begin to display your data in intuitive ways - using colourful data visualisation methods to understand the data!

Year 9 to 11

Introduction to Game Maker

This session gives an introduction to designing and programming their own games using GameMaker Studio 2. The skills and concepts covered mirror what is used in the Games industry when designing games and implementing common features in basic platform/arcade games (on a smaller scale of course!) This will also be an excellent CPD opportunity for teaching staff looking to upskill for the Digital Technology qualifications. Requirements: GameMaker installed and available for the learners to use.

Year 9 to 11

Web Development using Dreamweaver

This session gives an introduction to the concepts of developing websites and applying these to create their own using Adobe Dreamweaver. The learners will become familiar with both the Dreamweaver software as well as HTML development to allow them to implement their web designs. This will also be an excellent CPD opportunity for teaching staff looking to upskill for the Digital Technology qualifications. Requirements: Adobe Dreamweaver installed and available for the learners to use.

Year 9 to 11

Adobe Animate

This session gives an introduction to the concepts of animation and applying these to create their own using Adobe Animate. The learners will learn to use the software and various animation techniques to allow their creativity to flourish. This will also be an excellent CPD opportunity for teaching staff looking to upskill for the Digital Technology qualifications. Requirements: Adobe Animate installed and available for the learners to use.

Year 10 and 11

Boolean Algebra

This session teaches GCSE/A Level learners everything they need to know about Boolean Algebra and how it underpins computer science. The first session looks at the 4 main Boolean Algebra operators OR, AND, NOT and XOR and how to visualise these working using a simple circuit simulator. The second session builds on these 4 operators and teaches learners about the laws of Boolean Algebra to simplify Boolean expressions.

Year 10 and 11
GCSE Greenfoot

This session is aimed at GCSE Computer Science learners to give them an introduction to object oriented programming and teach them everything they need to know for a typical Greenfoot question in their Unit 2 exam. The session will look into what object-oriented programming is and why we use it before completing a follow-along Greenfoot tutorial where learners will learn the following, but not limited to: how to create a new world, populate it with characters, make the characters move randomly and with the keyboard, remove characters when two characters collide, add sounds to the program and add a counter to the program.

Year 10 and 11
Assembly Language and LMC

Both of these sessions are aimed at GCSE Computer Science learners to give them an introduction to computer architecture and hardware. This also links to low level programming using the LMC simulator to teach them all they need to know for the topic within Computer Science GCSE. One session focuses on the Von neumann architecture and how this relates to the hardware found in a generic computer. The other session looks at assembly language programming in the Little Man Computer simulator and will develop learners' understanding of assembly language instructions such as input and output, storing and loading, adding and subtracting as well as the various forms of branching.

Year 10 and 11
Algorithms

Learn key sorting algorithms such as Bubble and Merge Sort, and implement them as an algorithm and pseudocode.

Year 9 to 11
Premier Rush Pro

An overview of Adobe Premiere Rush, a video editing suite created by Adobe. Learn to add video clips and sound clips, manipulate these clips with colour correction and add text and transitions.

If you would like to book a workshop please email:

info@technocamps.com

www.technocamps.com

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