technola

TECHNOLA COMPUTING

Programme of Study and Progression

TECHNOLA COMPUTING

1. Course Overview

Technola Computing incorporates coding, robotics, computer hardware and research projects to stimulate and challenge pupils whilst fulfilling the criteria of the Computing national curriculum for Key Stages 1 and 2 in England. The course also covers many aspects of the PSHE national curriculum (1) in relation to managing online behaviour, relationships, and internet safety. Pupils are equipped with the skills necessary to thrive in an increasingly digital society and to keep themselves safe in their online interactions.

Pupils learn the value of a multidisciplinary approach as they develop their logic and creativity through tasks that require them to draw on their mathematical, scientific and design and technology skills. Each child creates programs, systems and a range of content as evidence of their progress and attainment. Pupils work with a partner on iPads and learn how to navigate iOS, IT skills, and how to save and organise work in a logical manner. Our team of expert Technola instructors work closely with pupils to help tailor the course to individual strengths and needs, with a high degree of flexibility and autonomy focused on creating the best outcomes for each child.

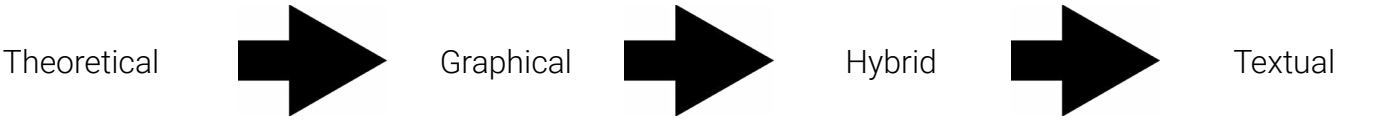
(1) This document refers to the PSHE national curriculum as per the PSHE Association, which is funded by, and recommended by the Department of Education (https://www.pshe-association.org.uk/curriculum-and-resources/resources/programme-study-pshe-education-key-stages-1%E2%80%935)

2. Key Themes

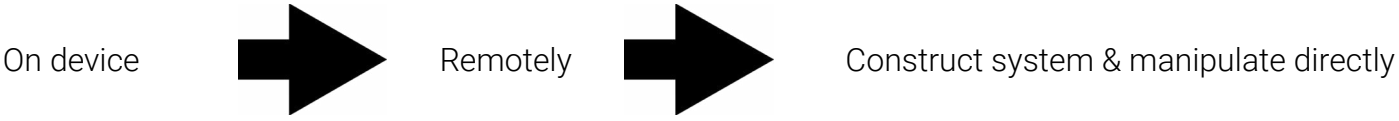
Technola Computing is divided into two key strands: **Computer Science** and **Information Technology and Digital Literacy**. In addition, there are several other key themes that underpin the course and its structure.

Computer Science

1. Programming languages:



2. Controlling physical and simulated systems:



3. Debugging:

Technola Computing teaches debugging as an integral part of all its courses. Debugging is a fundamental part of the coding process that occurs naturally as programmers make mistakes and take steps to rectify them. Technola teaches pupils to problem-solve by encouraging pupils to have a go, make mistakes, and learn how to fix them.

Information Technology & Digital Literacy

1. Content:

Consume → Interact → Create → Research & Create

2. Internet Safety:

Embedded → Distinct

3. Assessment

Formative

We use formative assessment to inform and shape classroom practice on a daily basis, as well as **technology enhanced learning** to enable pupils and Technola Instructors to understand and evaluate progress in real time.

1. Self and peer-assessment:

Pupils work in small groups and develop collaborative and reflective skills. **Peer-assessment** is built-in to encourage evaluation of strengths and areas for development. Pupils contribute to small group and whole class **electronic journals** as a means of self-evaluation and to document learning progression. Class journals are updated every session, with extra information added at significant milestones for group achievements. Authorised members of staff have access to the journals throughout, with access details provided in your bespoke course pack. Pupils identify what they need to learn and where they need support.

2. Class discussion:

We use whole-class discussion as the basis for many starter and plenary activities. Using iPads, Technola Instructors deliver **snap questions** to pupils during lessons and receive **near-simultaneous feedback and data** that illustrate pupil understanding. This real time data is used to immediately cover any gaps in knowledge or increase complexity, and to assess whether any aspect of the curriculum requires greater focus or support.

3. Automatic feedback:

Though the use of **iPads and cutting-edge software** pupils receive instant, in-app feedback on their work. Pupils work with our expert instructors and are supported in developing resilience by finding solutions to problems by themselves.

Summative

Summative assessment is carried out via a combination of controlled **progress quizzes** and **practical exercises** assigned on an individual basis.

Our progress quizzes enable us to differentiate and to demonstrate individual development. Through communication with school subject leads, we also use these quizzes formatively to stretch and support individual pupils with their projects.

You will receive evidence of completed practical exercises and quiz results via an online sharing solution such as DropBox (TBC). This will be accompanied by a spreadsheet containing red, amber, green (*RAG*) ratings against age-related expectations (*ARE*) for each pupil. Work will be returned to you as soon as possible after the conclusion of each term.

Please provide us with complete class lists as soon as possible for us to set this up in good time.

SCHEDULE OF TEACHING

St Mary's R.C Primary School

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Digital Literacy CX4 *Pages 108-125*	C34 *(P. 110)* C44 *(P. 114)* C54 *(P. 118)* C64 *(P. 122)*	**ICT** CX5 *Pages 126-143*	C35 *(P. 128)* C45 *(P. 132)* C55 *(P. 136)* C65 *(P. 140)*	**Cross-Curricular Technology** CX6 *Publishing July 2022*	C36 C46 C56 C66

YEAR 1

Autumn 1 - Summer 1

C11

Module Code: C11

Key Stage: 1

Intended Year Group: 1

Curriculum Area: Digital Literacy

Pupil-Facing Title: There's an app for that!

1. Module Overview

The first module in the Computing curriculum teaches pupils how to use and navigate an iPad. Children learn iPad gestures such as zooming and swiping and learn how to lock and unlock the device. They learn how to control volume, to take photos, and to use these photos for different purposes. Considerable time is dedicated to teaching pupils how to save and organise information in an appropriate format so that it can be easily retrieved.

The main focus of this module is to teach children that iPads can be used for a huge variety of different purposes and that there are all sorts of apps that do this. Pupils use apps specifically designed for teaching iPad gestures, for taking and animating photos, for sketching, for typing, for creating original music, and for putting together virtual books. They learn that, for example, music can be made electronically and start to learn how to type on a QWERTY keyboard. Pupils discuss how useful these skills are in wider society and start to realise the importance of being IT literate.

To finish the module, pupils create an interactive and personal poster tying together all of the IT skills they have learnt over the half-term, showing what they did in their summer holidays. By the end of this module pupils have been taught the skills necessary for progression onto the Computing course. They are able to use iPads for a wide variety of skills and understand how the iPad is a tool which can be used in different ways to achieve very different outcomes.

2. Learning Objectives

Primary

- Learn that an iPad can be used to do lots of different things.
- Navigate an iPad using simple functions.
- Use a variety of apps to create different content.
- Start learning basic keyboard and typing skills.
- Use the skills taught in this module to create a poster.

Secondary

- Realise that IT skills can be used together to create more interesting products.
- Work together with a partner.
- Offer constructive feedback to a partner.
- Respond appropriately to feedback from a partner.

3. National Curriculum Links

Pupils should be taught to:

- use technology purposefully to create, organise, store, manipulate and retrieve digital content
- recognise common uses of information technology beyond school

4. Key Vocabulary

1. iPad
2. Swipe
3. Zoom
4. Lock
5. Unlock
6. Volume
7. Save
8. Format
9. File
10. Photo
11. App
12. Typing
13. QWERTY
14. Home Button

C12

Module Code: C12

Key Stage: 1

Intended Year Group: 1

Curriculum Area: Computer Science

Pupil-Facing Title: Computing Level 1

1. Module Overview

For the academic year 2021-22, Computing Level 1 will be offered to both Years 1 and 2 in order to ensure that all pupils receive the same introduction to Computing, regardless of previous teaching in this subject. Pupils who complete Computing Level 1 in Year 1 during 2021-22 will be taught a new module next year when in Year 2.

This module introduces pupils to all things computing and teaches the basic principles behind coding. Pupils use ScratchJr, a visual programming language which is designed to help young children think creatively and to problem-solve. Pupils program their own interactive story in which their character moves through the four seasons and interacts with other characters.

Throughout the module, Technola instructors use a mixture of practical classroom activities and iPad-based learning to teach pupils the links between computing terminology and their real-world equivalents. Pupils' first experience of computational thinking is grounded in something that they're already familiar with – instructions! They explore links between human ***instructions*** and computer ***commands*** by completing practical exercises.

The module begins with a series of exercises inspired by the imagination. From directing the instructor as a robot to creating polar bear playgrounds, pupils explore the use of commands in life and consider the importance of unambiguous instructions in computer science. They learn that ***algorithms*** are sets of commands placed together, and that ***code*** is the overall arrangement of these commands. The class looks at the importance of being clear when writing algorithms and explores the consequences of imprecise coding. Pupils learn how to predict the behaviour of simple programs by looking at code, and to test algorithms before incorporating them into code.

Pupils explore the basics of coding through set exercises, with emphasis placed on efficiency of code; activities are designed to be free-form and pupil paced, with guidance from the Technola instructor throughout. Children learn how to use ***for loops***, ***start and end functions, events,*** and ***delays***. They learn what a ***bug*** is and why things go wrong when code includes bugs. Pupils are taught to ***debug*** programmes using ScratchJr and discover how to fix mistakes in their own work. Building on skills taught in the previous module, they also learn how to save their work in the correct file format.

The hands-on, team, and partner-based approach of the module enables pupils to develop their communication, logic, and reasoning skills throughout. The module concludes with a celebration session in which pupils present their work and participate in peer-assessment, with clear targets produced for progression into the next unit.

2. Learning Objectives

Primary

- Learn that code is a language used to give computers instructions.
- Understand the terms ‘code’, ‘command’, ‘algorithm’ and ‘program’.
- Create a multi-step algorithm to complete a real-world task.
- Use commands to create algorithms for a computer program.
- Learn about ‘for loops’, ‘start and end functions’, ‘events’, and ‘delays’.
- Find a bug in code.
- Follow a debugging strategy.
- Create a multi-step program which follows a brief.
- Offer constructive feedback on a classmate’s project.
- Develop a project in response to a classmate’s feedback.

Secondary

- Understand the importance of precise instructions.
- Relate algorithms to real life situations.
- Recognise the consequences of ignoring bugs.
- Be able to predict computer behaviour based on code.

3. National Curriculum Links

Pupils should be taught to:

- N/A

4. Key Vocabulary

1. Command
2. Instruction
3. Algorithm
4. Code
5. Bug
6. Debug
7. Program
8. Programming
9. Repeat
10. Start
11. End
12. Delay

C13

Module Code: C13

Key Stage: 1

Intended Year Group: 1

Curriculum Area: E-Safety & ICT

Pupil-Facing Title: Safe Surfin’

1. Module Overview

Pupils embark on their digital journeys with an introductory discussion about the internet. As they discover what it means to use online technology through bitesize, weekly sessions (covering topics such as ***Privacy & Security*** and ***Fact & Opinion)***, pupils gradually build a colourful E-Safety book about what they have learnt in the Book Creator app.

Each class comes to understand who a '***Trusted Adult'*** is, and that they should seek their support if something online makes them feel worried, sad, or even just unsure. In tandem with the exercise, pupils learn what kind of behaviour is inappropriate, and how others might feel if they say something unkind. They also recognise that someone may act differently online compared to real life, and why this might be.

With a variety of new skills in tow – from importing images located in the camera roll and digitally drawing their ***Trusted Adult*** in the Book Creator – pupils build their confidence to use technology and the internet as a means for growth, learning, and inspiration.

2. Learning Objectives

- Describe how to behave online in ways that do not upset others and give examples
- Recognise, online or offline, that anyone can say 'no', 'please stop', 'I'll tell', 'I'll ask', to somebody who makes them feel sad, uncomfortable, embarrassed, or upset
- Understand who a 'Trusted Adult' is and that I can seek their support
- Identify how and why someone might appear differently online
- List some of the different ways the internet can be used
- Know to keep personal details 'private' online

3. National Curriculum Links

Pupils should be taught to:

- …use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.
- …use technology purposefully to create, organise, store, manipulate and retrieve digital content

4. Key Vocabulary

1. Privacy
2. Security
3. True/False
4. Import

C14

Module Code: C14

Key Stage: 1

Intended Year Group: 1

Curriculum Area: Digital Literacy

Pupil-Facing Title: Becoming Digital Authors

1. Module Overview

Pupils develop comprehension skills as they experiment with the magic of illustration and description, creating their own spellbinding digital storybook! The module instils an initial understanding of narrative composition as pupils layer drawings with written text, using Book Creator to import an original design.

At the start of the module, instructors inspire pupils to consider their favourite stories, highlighting the importance of bold characters and adventurous storytelling! As budding authors and illustrators, pupils design and draw their own main character, using the app to import the image on to the screen. Pupils manipulate their drawings in Book Creator, crafting a dynamic front cover for their thrilling tale.

The module assessment requires pupils to complete a short story at their own pace, enhancing the main character with added surroundings and drawings. Pupils begin to recognise the importance of signposting within narratives, creating layers between image and text (with a little help from emojis!).

2. Learning Objectives

Primary

- Design a narrative for a short story using a beginning, middle, and end
- Draw an original character, importing the design into an editing app
- Demonstrate multiple iPad gestures: swiping, scrolling, pinching, and dual finger rotation
- Successfully edit my design, changing the size, font, and colour of the image
- Develop my story, adding text and emojis to build the narrative

Secondary

- Assemble a coherent plot, understanding the importance of chronology in storytelling
- Recognise how stories use pacing to increase tension, create drama, and improve characterisation
- Experiment with design ideas, understanding key terms such as font, bold, and italics
- Define key roles in the production of storytelling: illustrator, author, and publisher
- Consider the impact of storytelling, recognising why we gravitate towards certain characters

3. National Curriculum Links

Pupils should be taught to:

- …use technology purposefully to create, organise, store, manipulate and retrieve digital content

4. Key Vocabulary

1. Design
2. Edit
3. Draw
4. Import
5. Front cover
6. Narrative
7. Author
8. Illustrator
9. Publisher
10. Plot

C15

Module Code: C15

Key Stage: 1

Intended Year Group: 1

Curriculum Area: ICT

Pupil-Facing Title: Living with Technology L1

1. Module Overview

Pupils become caring digital ambassadors as they investigate the environmental and societal impact of technology! The module combines an introductory perspective to computing with a progressive outlook towards the future as pupils isolate the fundamentals of what a computer looks like, and how it helps us with everyday life.

At the beginning of the module, pupils identify traditional computers in the surrounding environment; the limits of traditional tools in schools and at home are considered, prompting discussions surrounding the function of various input and output devices. Pupils uncover the accessibility of computing as they use the iPads to photograph a device in the classroom, adding a voiceover description of the object's intended use. Printers, laptop screens, and keyboards become alive with purpose as pupils acknowledge the positive change that technology brings to a learning environment!

Towards the end of the module, pupils think beyond the classroom as technology is considered in the outside world. Pupils identify social problems such as cleaner energy production, imagining how technology could be used to create a healthier future for all. Instructors guide the class through a poster making activity, allowing pupils the opportunity to design their own renewable energy computer.

2. Learning Objectives

Primary

- Identify input and output devices
- Recognise a traditional computer, understanding its function and role within the classroom/ home
- Successfully photograph an example of a computer in the classroom, uploading it to a photo editing app
- Use voiceover to create an interactive image using the editing app
- Consider wider social aspects of technology, connecting computers with the environment
- Produce a poster highlighting a more sustainable use of technology

Secondary

- Understand the function of various traditional computers and how this creates purpose
- Analyse the practical use of devices and how this varies to traditional tools
- Enhance design skills, focusing on photography
- Consider the disparity between different locations and how this impacts access to computing

3. National Curriculum Links

Pupils should be taught to:

- …use technology purposefully to create, organise, store, manipulate and retrieve digital content
- …recognise common uses of information technology beyond school

4. Key Vocabulary

1. Computer
2. Tool
3. Input
4. Output
5. Screen
6. Keyboard
7. Speaker
8. Camera
9. Scanner
10. Printer
11. Voiceover
12. Edit
13. Environment

YEAR 2

Autumn 1 - Summer 1

C21

Module Code: C21

Key Stage: 1

Intended Year Group: 2

Curriculum Area: Computer Science

Pupil-Facing Title: Computing Level 1

1. Module Overview

For the academic year 2021-22, Computing Level 1 will be offered to both Years 1 and 2 in order to ensure that all pupils receive the same introduction to Computing, regardless of previous teaching in this subject. Pupils who complete Computing Level 1 in Year 1 during 2021-22 will be taught a new module next year when in Year 2.

This module introduces pupils to all things computing and teaches the basic principles behind coding. Pupils use ScratchJr, a visual programming language which is designed to help young children think creatively and to problem-solve. Pupils program their own interactive story in which their character moves through the four seasons and interacts with other characters.

Throughout the module, Technola instructors use a mixture of practical classroom activities and iPad-based learning to teach pupils the links between computing terminology and their real-world equivalents. Pupils' first experience of computational thinking is grounded in something that they're already familiar with – instructions! They explore links between human ***instructions*** and computer ***commands*** by completing practical exercises.

The module begins with a series of exercises inspired by the imagination. From directing the instructor as a robot to creating polar bear playgrounds, pupils explore the use of commands in life and consider the importance of unambiguous instructions in computer science. They learn that ***algorithms*** are sets of commands placed together, and that ***code*** is the overall arrangement of these commands. The class looks at the importance of being clear when writing algorithms and explores the consequences of imprecise coding. Pupils learn how to predict the behaviour of simple programs by looking at code, and to test algorithms before incorporating them into code.

Pupils explore the basics of coding through set exercises, with emphasis placed on efficiency of code; activities are designed to be free-form and pupil paced, with guidance from the Technola instructor throughout. Children learn how to use ***for loops***, ***start and end functions, events,*** and ***delays***. They learn what a ***bug*** is and why things go wrong when code includes bugs. Pupils are taught to ***debug*** programmes using ScratchJr and discover how to fix mistakes in their own work. Building on skills taught in the previous module, they also learn how to save their work in the correct file format.

The hands-on, team, and partner-based approach of the module enables pupils to develop their communication, logic, and reasoning skills throughout. The module concludes with a celebration session in which pupils present their work and participate in peer-assessment, with clear targets produced for progression into the next unit.

2. Learning Objectives

Primary

- Learn that code is a language used to give computers instructions.
- Understand the terms ‘code’, ‘command’, ‘algorithm’ and ‘program’.
- Create a multi-step algorithm to complete a real-world task.
- Use commands to create algorithms for a computer program.
- Learn about ‘for loops’, ‘start and end functions’, ‘events’, and ‘delays’.
- Find a bug in code.
- Follow a debugging strategy.
- Create a multi-step program which follows a brief.
- Offer constructive feedback on a classmate’s project.
- Develop a project in response to a classmate’s feedback.

Secondary

- Understand the importance of precise instructions.
- Relate algorithms to real life situations.
- Recognise the consequences of ignoring bugs.
- Be able to predict computer behaviour based on code.

3. National Curriculum Links

Pupils should be taught to:

- N/A

4. Key Vocabulary

1. Command
2. Instruction
3. Algorithm
4. Code
5. Bug
6. Debug
7. Program
8. Programming
9. Repeat
10. Start
11. End
12. Delay

C22

Module Code: C22

Key Stage: 1

Intended Year Group: 2

Curriculum Area: Computer Science

Pupil-Facing Title: Computing Level 2

1. Module Overview

Computing Level 2 builds on skills learnt in Level 1 and allows pupils to delve more deeply into ScratchJr. Here they progress from creating a story to programming their own simple video game with a protagonist and antagonist. Children make a four-part project which involves games and puzzles. They are guided in the project brief but there is plenty of room for originality and creative ideas in terms of how this is interpreted.

Each of the mini games in the project is designed to demonstrate different coding concepts: ***for loops, forever loops, start and end functions, delays, events, messages,*** and ***sequences***. Pupils learn that different ***sequences*** will have different outcomes and consider why it is important to put instructions in a particular order. They find out how more complex problems can be solved by creating algorithms that allow for multiple outcomes to be triggered by single events. They learn how to assign different speeds to different characters and practise using variables. Particular attention is paid to developing ***when events*** i.e., what happens when a certain action is carried out by the user like tapping or bumping. Children learn about using the event block ***messages*** to change the timing of actions happening within the code. Pupils continue to learn about ***bugs*** and ***debugging*** and practise spotting bugs in code before running it. They are encouraged to predict how a program will run by reading code before trying it out. The class learns how to change scenes and how to save work in an appropriate file and format.

As part of this module, Technola instructors continue to use practical real-life games to demonstrate and explain concepts used in coding. Pupils practise responding to computing commands in the classroom, play at being the commander on board a pirate ship, and use physical objects to apply their knowledge about sequences. The class considers what makes a good video game and discuss some of the problems faced in developing new games. At the end of the module, children have the opportunity to play each other's games, offer constructive feedback and celebrate success.

2. Learning Objectives

Primary

- Program a multi-step algorithm using ‘for loops’, ‘start and end functions’, ‘delays’, ‘events’, ‘messages’, and ‘sequences’.
- Use sequencing within an algorithm.
- Find bugs in code and come up with strategies for debugging.
- Explain how events enable us to solve more complex problems with code.
- Offer constructive feedback on a classmate’s project.
- Develop my project in response to a classmate’s feedback.

Secondary

- Explain the meaning of the terms ‘sequence’ and ‘event’ in Computing.
- Create algorithms that solve specific problems.
- Predict how a code will run before seeing it in action.

3. National Curriculum Links

Pupils should be taught to:

- …understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions.
- …create and debug simple programs.
- …use logical reasoning to predict the behaviour of simple programs.

4. Key Vocabulary

Previously Encountered:

1. Command
2. Algorithm
3. Program
4. Programming
5. Code
6. Loop
7. Bug
8. Debug
9. Delay
10. Event

Newly Introduced:

1. Sequence
2. Message

C23

Module Code: C23

Key Stage: 1

Intended Year Group: 2

Curriculum Area: E-Safety & ICT

Pupil-Facing Title: Safe Surfin’

1. Module Overview

In the second ***Safe Surfin'*** module, pupils refine their knowledge of the key weekly topics encountered in Year 1. By learning how to navigate websites (for example, using the 'back' and 'forward' arrows), pupils forge an understanding of online functionality that provides them with enduring and translatable tech skills.

Classes understand how to operate the child-friendly search engine Kiddle, and know what kind of information they can locate with this tool. Pupils grasp the concept of voice-activated searching using devices such as Alexa, Siri, or Google Home, and how this can be an efficient way of finding something out. They also learn to distinguish between something that might be 'made up' or 'real' online, and can explain why someone may want to present something inaccurately.

Pupils upgrade to the Tayasui Sketches app as they draw and label their ***Trusted Adult***, benefiting from a trove of new features, colours and pre-sets. They can also export their drawings into their E-Safety book, allowing them to get to grips with how an iPad works, and the basics of file management.

2. Learning Objectives

- Understand how a search engine works
- Recognise different methods of searching
- Explain what is meant by ‘real’ and ‘make believe’
- Know that not everything I read may be true
- Describe why someone may spread misinformation
- Identify what kind of information I can find online

3. National Curriculum Links

Pupils should be taught to:

- …use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.
- …use technology purposefully to create, organise, store, manipulate and retrieve digital content

4. Key Vocabulary

Previously Encountered:

1. Privacy
2. Security
3. True/False
4. Import

Newly Introduced:

1. Search Engine
2. Voice Activation
3. Navigate
4. Digital Footprint
5. Private Information
6. Appropriate/Inappropriate
7. Cyber-Bullying

C24

Module Code: C24

Key Stage: 1

Intended Year Group: 2

Curriculum Area: Digital Literacy

Pupil-Facing Title: Cubitects

1. Module Overview

Pupils take on the role of digital architects as they design and navigate a project in a 3D design app based on a scene from a book, topic, or poem they are currently studying! The module draws on comprehension skills and spatial imagination as pupils reimagine a landscape through the creative use of technology.

The first part of the module develops design ideas as instructors guide the class through the world-building functions, offering support and encouraging independent thinking. Pupils map out their scene using building blocks whilst experimenting with stickers and effects to add colourful interiors, crafting a 3D image they can navigate!

Towards the end of the module, pupils adjust objects, expressions, and characters within the scene to change the direction of their image. Pupils swap projects, choosing to make or reject alterations to their designs based on peer feedback, encouraging reflective practice. The module assessment blends construction with augmented reality as pupils bring their virtual designs to life in real time within the classroom environment!

2. Learning Objectives

Primary

- Create a 3D impression of a scene from a chosen text or poem
- Use multiple iPad gestures, such as: swipe, pinch, tap, and two-finger gestures to navigate a project
- Offer constructive feedback to a classmate's project
- Develop my project in response to a classmate's feedback
- Exhibit an understanding of how stories can be represented visually

Secondary

- Organise ideas and gain confidence in developing chronological steps to complete a design plan
- Depict a scene from a text in a creative way, furthering my understanding of staging and individual interpretation
- Consider storytelling from different perspectives

3. National Curriculum Links

Pupils should be taught to:

- …use technology purposefully to create, organise, store, manipulate and retrieve digital content

4. Key Vocabulary

1. Build
2. Design
3. Edit
4. Layer
5. Rotate
6. Zoom
7. Camera
8. Augmented Reality
9. 3D
10. Share
11. Software

C25

Module Code: C14

Key Stage: 1

Intended Year Group: 1

Curriculum Area: ICT

Pupil-Facing Title: Living with Technology L2

1. Module Overview

Pupils become discerning computer specialists as they consider the outreach of technology beyond the home! The module builds on previous learning surrounding the function of input and output devices, isolating the ***use cases*** of such devices. Modes of transport, domestic appliances, and lifts in shopping centres are investigated as pupils recognise that not all technology is a computer, and some things that you might not expect are!

At the beginning of the module, pupils are introduced to their first combined input and output device, the iPad's touchscreen. Instructors emphasise the accessibility aspect of these devices in helping non-verbal persons learn in a way that suits their needs. Pupils further discuss the integrated use of computers in an external context as they imagine a scene from a busy shopping centre, focusing on accessible spaces.

The assessment for the module requires pupils to design a poster showcasing their own interpretation of a friendly shopping environment that caters to everyone! Pupils curate alternatives to standardised machines as they experiment with variations of integrated computers, furthering their composition skills.

2. Learning Objectives

Primary

- Identify combined input and output devices
- Recognise non-traditional computers, understanding their wider purpose within the surrounding environment
- Analyse the accessibility of the touchscreen, recognising how it caters to different learning needs
- Design a poster showcasing an inclusive shopping centre

Secondary

- Understand the purpose of non-traditional computers within a wider social context
- Recognise the importance of having different devices for different abilities
- Analyse my access to computers outside the home and how this helps daily activities
- Develop composition skills, expanding my understanding of different spaces

3. National Curriculum Links

Pupils should be taught to:

- …use technology purposefully to create, organise, store, manipulate and retrieve digital content
- …recognise common uses of information technology beyond school

4. Key Vocabulary

1. Embedded computer
2. Combined input-output device
3. Appliance
4. Accessibility

COMPUTER SCIENCE

YEARS 3, 4, 5, & 6

C31

Module Code: C31

Key Stage: 2

Intended Year Group: 3

Curriculum Area: Computer Science

Pupil-Facing Title: Hello, World! Level 1 – Interactive Cards

1. Module Overview

The module begins with the question, ‘what is a computer?’. Pupils examine non-traditional computers, such as smart watches and voice assistants, and explore the commonalities between devices in order to establish a definition of computer.

Pupils are taught that computers follow precise & unambiguous instructions, that code is the language that humans and devices use to communicate with one another, and that they themselves can learn to write code to create programs. Pupils learn that this will enable them to move from the status of digital consumers to digital authors.

Pupils consider that at the core of Computer Science is dynamic interactivity. We explore the concept that, unlike videos, photos, or static text, coding enables the finished product to respond fluently to the wants and needs of the end user.

Whilst KS1 exposed pupils to the basics of coding through controlled exercises with only one correct solution, children now progress to free-form coding. Our Technola instructors work with classes to come up with a project brief and pupils are able to respond to the challenges set by their instructor in a multitude of ways, so as to promote the concept of coding as a form of creative expression.

Pupils begin with a series of challenges that demonstrate the ‘who, when, what’ principle that underpins coding at all levels. They also develop their computing terminology beyond commands and algorithms to include ***objects***, ***concurrency***, and ***events***.

Learning culminates in a two-week challenge that requires pupils to code with a specific purpose in mind: an interactive postcard intended to congratulate their fellow classmates on their first steps to becoming coders! A final peer-assessment and celebration lesson is used to share work and to allow for improvement via constructive feedback and subsequent modifications.

2. Learning Objectives

Primary

- Recognise different types of computers and what they can be used for
- Program a simple algorithm
- Create a multi-step algorithm with a specific audience in mind
- Use one event to control more than one object
- Convert human stories into code and vice versa

Secondary

- Identify the 'Three Ws' at the heart of coding
- Recognise that objects are not always personified characters
- Work to a creative brief independently
- Offer constructive feedback on a classmate's project
- Develop my project in response to a classmate's feedback

3. National Curriculum Links

Pupils should be taught to:

- …design, write and debug programs that accomplish specific goals, including… simulating physical systems…
- …use sequence… and repetition in programs; work with… various forms of input and output
- …use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs

4. Key Vocabulary

Previously Encountered:

1. Command
2. Algorithm
3. Bug
4. Debug

Newly Introduced:

1. Program
2. Event
3. Object
4. Sequence
5. Concurrency (Side-by-Side)
6. Values

C41

Module Code: C41

Key Stage: 2

Intended Year Group: 4

Curriculum Area: Computer Science

Pupil-Facing Title: Hello, World! Level 2 – Cake Factory

1. Module Overview

This module begins by examining examples of repetition in day-to-day life; pupils are introduced to the notion that, whilst humans excel with creative and ever-changing tasks, computers are better at solving problems in which the same process needs to be repeated many times. They consider that embedded computers are all around us, automating mundane tasks to help us with everything from crossing the road to washing our clothes.

Pupils complete a series of coding challenges that are designed to teach them that not all repetition is the same, and that we need a series of different ***loops*** in our coding toolbox to help us solve each unique task as efficiently as possible: ***for loops*** for tasks with a set number of repetitions, ***forever loops*** for tasks that repeat indefinitely, and ***while loops*** for tasks that repeat until a condition is met. ***Functions*** are introduced to tackle problems with unpredictable repetition, all the while emphasising the value of efficiency in code.

We then pose the question: 'how can code help us to solve repetitive problems?'. Pupils use this question as a starting point to write their own program. Each pupil's app must respond accurately to the unknown orders that will be placed by their peers, whilst producing the items they request using as few lines of code as possible!

Throughout the module pupils regularly consider the societal impact of automation: how is it helping to change the world for the better; what problems does it introduce; and should we be taking action today to make automation work for all of us going forward?

2. Learning Objectives

Primary

- Recognise real-world examples of repetition and how computers can be used to automate solutions
- Recognise the benefits and the potential drawbacks of automation upon society
- Program an algorithm that caters to repetition efficiently
- Correctly identify the most suitable loop for a given task
- Incorporate functions into my algorithm to accommodate for unpredictable repetition
- Accurately predict the outcome of an algorithm without running it

Secondary

- Identify smaller patterns within larger trends
- Explain the benefits of loops over coding each individual line manually
- Write computer algorithms to improve the efficiency of human tasks
- Recognise the limitations of loops in code

3. National Curriculum Links

Pupils should be taught to:

- …design, write and debug programs that accomplish specific goals, including… simulating physical systems…
- …use sequence, selection, and repetition in programs; work with… various forms of input and output
- …use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs

4. Key Vocabulary

Previously Encountered:

1. Command
2. Algorithm
3. Sequence
4. Program
5. Event
6. Object
7. Bug
8. Debug
9. Concurrency (Side-by-Side)
10. Values

Newly Introduced:

1. For Loop
2. Loop Forever
3. Loop Until/While
4. Functions
5. Automation
6. Efficiency

C51

Module Code: C51

Key Stage: 2

Intended Year Group: 5

Curriculum Area: Computer Science

Pupil-Facing Title: Hello, World! Level 3 – Game Studio

1. Module Overview

In this module pupils create their own multi-stage video games. Previous modules have enabled them to master the ability to build simple standalone algorithms that accomplish individual goals. In this next step pupils now combine multiple algorithms of moderate complexity to create a program in which various outcomes are possible for the user.

The module begins with play and analysis of the popular computer game, ***Crossy Road***. We work together to establish the main features of the game, as well as which of three states each feature belongs to: ***play state***, ***win state***, or ***lose state***. In previous learning, coded algorithms required the user to follow a simple linear path. This module builds upon this by progressing to the concept of ***conditionals*** to allow the end user choice as to how they progress through someone else's project. Each lesson pupils are presented with a new case study of an emerging technology that is powered by conditionals. From self-driving cars to item-picking factory robots, and smart home technology to facial recognition, pupils learn the value of coding choice so that machines can interact with humans.

The children draw on their mathematical knowledge as they code a chicken to respond to directional instructions from the player, which include avoiding obstacles. Through this, pupils develop an in-depth understanding of ***coordinates*** and ***axis***, ***positive and negative values***, and the relationship between ***speed***, ***distance***, and ***time***. Pupils introduce random integers into their code to make game play more exciting and consider suitable ranges of numbers to ensure that their game remains playable. They are encouraged to continue to identify bugs in their programs and learn how to meet the challenges introduced by the complexity of multi-branch coding. Pupils learn to identify and isolate which branch of their code is problematic so that they can debug it efficiently and without introducing new issues into the functioning part of their code. Once code is fully functional, pupils design and implement cohesive themes for their game using elements like background wallpapers, character choices, and sound effects.

Towards the end of the project, pupils who have successfully completed the task are encouraged to stretch and challenge themselves by expanding their code and adding complexity and features to make their game more unique and fun to play. We use peer assessment to develop and improve pupil games and children are encouraged to reflect as to whether the changes they are making actually improve their work or detract from it.

2. Learning Objectives

Primary

- Create a simple algorithm
- Create multiple algorithms of moderate complexity that are triggered by separate events
- Correctly identify the X and Y axis
- Use coordinates to code multi-directional movement into my algorithm
- Efficiently code instructions that repeat in my algorithm
- Identify the correct loop to use for my specific purpose

Secondary

- Create a cohesive theme for a game
- Analyse a pre-existing game to establish standard game-play features
- Identify and code various states of play in a game
- Code placeholder objects that appear or disappear based on the state of play

3. National Curriculum Links

Pupils should be taught to:

- …design, write and debug programs that accomplish specific goals, including… simulating physical systems; solve problems by decomposing them into smaller parts
- …use sequence, selection, and repetition in programs; work with… various forms of input and output
- …use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs

4. Key Vocabulary

Previously Encountered:

1. Command
2. Algorithm
3. Sequence
4. Program
5. Event
6. Object
7. Bug
8. Debug
9. Concurrency (Side-by-Side)

Newly Introduced:

1. State
2. Transparency
3. Random
4. Range
5. Value
6. Obstacle
7. Loops (for, forever, until)
8. Pixel
9. Positive/Negative
10. Coordinate
11. Axis
12. Conditional

C61

Module Code: C61

Key Stage: 2

Intended Year Group: 6

Curriculum Area: Computer Science

Pupil-Facing Title: Hello, World! Level 4 – Star chaser

1. Module Overview

In this module pupils create their own multi-game platform. Previous modules have enabled them to build simple standalone algorithms that accomplish individual goals. In this next step pupils now combine multiple algorithms of moderate complexity to create a program which allows users to play two different types of video games: one which focuses on moving in straight lines, and one in which characters can move in all directions. We also look at the development of gaming technology from 'Pong' and 'Tetris' to the most up-to-date games available today.

The module begins by demonstrating and analysing a finished version of the multi-game platform which pupils will be creating themselves this half term. The class works together to establish the main features of the games and to identify code which has not yet been used in Hopscotch such as score counters and character reset. It is at this point that real attention is paid to the concept of ***variables***, which allow the user to program for uncertainty and change. Pupils are taught to create logic trees to notate how this progression works in real time.

The first two weeks of the module is focused on programming a title page game. In this game, pupils move a protagonist past coded obstacles to reach a goal that will trigger the start of the next game. Through this, pupils further cement the coding skills they have learnt in previous years.

For the remainder of the module, pupils work on their main game. This features a constantly moving protagonist that users must guide to collect stars that appear randomly throughout the game. Pupils are taught how to use variables to create a score counter that increases after each star has been collected and resets when the protagonist hits the edges of the level. Once complete, pupils decide how they want to include credits in their games based on examples.

Towards the end of the project, pupils who have successfully completed the task are encouraged to stretch and challenge themselves by expanding their code and adding complexity and features to make their game more unique and fun to play. We use peer assessment to develop and improve pupil games and children are encouraged to reflect as to whether the changes they are making actually improve their work or detract from it.

2. Learning Objectives

Primary

- Analyse a pre-existing game to establish standard game play features.
- Learn about the history of video games.
- Create a simple algorithm.
- Write a program that contains multiple algorithms pf moderate complexity which are triggered by separate events.
- Realise that they will need to write different programs to create different styles of game.
- Correctly identify variables.
- Create logic trees to help map logical progression.
- Consolidate coding skills taught throughout Key Stage 2.
- Create a cohesive theme for the game.

Secondary

- Use variables to create a functioning score counter.
- Respond productively to feedback and work to develop and improve a game.

3. National Curriculum Links

Pupils should be taught to:

- …design, write and debug programs that accomplish specific goals, including controlling… physical systems; solve problems by decomposing them into smaller parts
- …use sequence, selection, and repetition in programs; work with variables and various forms of input and output
- …use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.

4. Key Vocabulary

Previously Encountered:

1. Command
2. Algorithm
3. Sequence
4. Program
5. Event
6. Object
7. Bug
8. Debug
9. Concurrency (Side-by-Side)
10. State
11. Transparency
12. Random
13. Range
14. Value
15. Obstacle
16. Loops (for, forever, until)
17. Pixel
18. Positive/Negative
19. Coordinate
20. Axis
21. Conditional

Newly Introduced:

1. Variable
2. Controller

ROBOTICS

YEARS 3, 4, 5, & 6

C32

Module Code: C32

Key Stage: 2

Intended Year Group: 3

Curriculum Area: Computer Science (Robotics)

Pupil-Facing Title: Go, Robot! Level 1 – Communication

1. Module Overview

The module begins with the question, ‘what is a robot?’, with focus on the commonalities between computers and robots. Pupils are taught that amongst their numerous similarities, robots ***must*** include computers in order to operate.

Pupils complete a series of challenges that are designed to introduce them to the different forms of input used to control robots. We start with a draw-canvas program, which translates lines drawn on-screen into movement commands for the robot to mimic through light and movement. Through this process pupils are encouraged to equate on-screen commands with equivalent physical distances in the real world and they learn to translate measurements into code through repetition and trial and error.

The module progresses by introducing the ***block canvas,*** where hybrid-textual code is arranged into pre-formed blocks. Pupils are introduced to the matrix animation feature of the robots, where lights can be combined to create patterns and animations. This gives pupils an overview of light-emitting diode (LED) technology and the red, green, blue (RGB) colour model. The aim here is to pique curiosity through small challenges which allow plenty of room for creative, free-form coding throughout the module.

Learning culminates in a final challenge, consisting of a robot ‘assault course’, in which all aspects of the module are put to the test. Pupils utilise speak, movement, lights, and matrix animation commands in their algorithms. An on-floor vinyl sheet creates a stage for pupils to demonstrate their working code to classmates. In order to complete the course successfully, pupils include specific angles, speed, and distance in their programs, as well as demonstrating the ability to translate physical distance into code.

2. Learning Objectives

Primary

- Recognise differences between computers and robots
- Program inputs using a draw canvas to control a robot's movement
- Program inputs using block code to control a robot's movement
- Demonstrate use of sequencing by combining lights, movements and sounds to create a multi-step algorithm
- Follow a specific brief and create an algorithm capable of guiding a robot through a course

Secondary

- Accurately translate real-life physical distance into code
- Recognise that there are several forms of input humans can use to control robots
- Use movement, sound, and light blocks creatively
- Offer constructive feedback on a classmate's project
- Develop my project in response to a classmate's feedback

3. National Curriculum Links

Pupils should be taught to:

- …design, write and debug programs that accomplish specific goals, including controlling… physical systems…
- …use sequence… and repetition in programs; work with… various forms of input and output
- …use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs
- …understand computer networks including the internet; how they can provide multiple services… and the opportunities they offer for communication…

4. Key Vocabulary

Previously Encountered:

1. Command
2. Algorithm
3. Sequence
4. Program
5. Event
6. Bug
7. Debug
8. Concurrency (Side-by-Side)
9. Values

Newly Introduced:

1. For Loop
2. Loop Forever
3. Robot
4. Angles/Degrees
5. Aim
6. Wait
7. Continue
8. Draw Canvas
9. Block Canvas
10. LED

C42

Module Code: C42

Key Stage: 2

Intended Year Group: 4

Curriculum Area: Computer Science (Robotics)

Pupil-Facing Title: Go, Robot! Level 2 – Robot Factory

1. Module Overview

Pupils create programs to guide a robot around a factory, undertaking various tasks along the way. Pupils must use logical reasoning and their knowledge of ***loops*** and ***functions*** to complete the course in the most efficient way possible.

The module begins by exploring a case study of 3D printers used in the construction industry. Pupils are reminded that it isn't always efficient to write out each line of code individually but are asked to consider what happens if we use a loop to build walls for a house and still require space for windows on certain levels. They consider the benefits and potential drawbacks of robots being used to this degree within our society.

Pupils complete a series of programming challenges aimed to progress and solidify their knowledge of functions within code. In addition to using 'forever loops', 'for loops', and 'while loops', pupils learn to nest functions within larger functions to become the most efficient coders they can be.

The module finishes in a final challenge in which pupils program their robots to make their way around a factory completing different tasks. Certain rooms lend themselves to a specific type of loop (for example transporting five parts along a corridor), whilst other rooms require functions to complete (for example adding car doors to ten cars, each with a different colour). This unique combination of challenges emphasises the value of efficiency in code.

Throughout the module, case studies are regularly examined, giving pupils real-world examples of functions and loops within society. We consider everyday tasks which could be automated, and children get to design their own personal robots to undertake all sorts of routine tasks.

2. Learning Objectives

Primary

- Successfully name, call, and define a function within my program
- Incorporate functions into my algorithm to accommodate unpredictable repetition
- Recognise the benefits and the potential drawbacks of automation upon society
- Program an algorithm that caters to repetition efficiently
- Correctly identify the need for a function over a loop
- Accurately predict the outcome of an algorithm without running it

Secondary

- Nest functions within other functions to increase efficiency
- Write computer algorithms to improve the efficiency of human tasks
- Recognise the limitations of loops in code
- Name examples of loops and functions in the real world

3. National Curriculum Links

Pupils should be taught to:

- …design, write and debug programs that accomplish specific goals, including controlling… physical systems…
- …use sequence, selection, and repetition in programs; work with… various forms of input and output
- …use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs

4. Key Vocabulary

Previously Encountered:

1. Command
2. Algorithm
3. Sequence
4. Program
5. Event
6. Object
7. Bug
8. Debug
9. Concurrency (Side-by-Side)
10. Values
11. For Loop
12. Loop Forever
13. Loop Until/While
14. Automation
15. Efficiency

Newly Introduced:

1. Functions
2. Function (name)
3. Function (define)
4. Function (call)
5. Delay
6. Sensor

C52

Module Code: C52

Key Stage: 2

Intended Year Group: 5

Curriculum Area: Computer Science (Robotics)

Pupil-Facing Title: Go, Robot! Level 3 – Autonomous Vehicles

1. Module Overview

In this module pupils build advanced programs to convert robots into autonomous vehicles. They create code with multiple events and conditionals to tackle problems with unpredictable elements.

The module begins with an overview of automation in the current world, focusing on self-driving cars and their potential impact on society. Pupils are asked questions like 'should we trust self-driving vehicles?', and 'can robots do a better, safer job than humans?'. We then move to an analysis of different types on sensors available to the robotics industry, such as ***cameras***, ***radar***, and ***lidar***.

The next step is seeing whether pupils understand the engineering challenges involved in the development of self-driving cars as they use the robots' ability to communicate with one another via ***infrared*** (IR) transmitters and ***sensors***. Pupils work individually to program robots to come together with the rest of their class to mimic a school of fish. Events and concurrency are programmed into code so that each unit can follow a 'master fish' robot, whilst also evading a 'predator fish' robot.

For the main projects, pupils create algorithms across multiple events to produce a self-driving car program capable of autonomy. Their robots must react to situations like collisions with walls and traffic lights changing, as well as having the ability to evade crashes with other robots. All actions are entirely pre-programmed and give pupils a sense of the vast amount of code included in modern autonomous vehicles.

During the final session of the module, the children demonstrate their programs to the rest of their class. Their robots navigate a three-dimensional town and deal with unpredictable problems such as collisions and traffic lights.

2. Learning Objectives

Primary

- Correctly identify the most suitable event (or conditional) to deal with a potential encounter
- Name multiple types of sensors available to my robot
- Program an algorithm that caters to changing circumstances
- Accurately predict the outcome of a multi-branch algorithm without running it

Secondary

- Discuss examples of pros and cons of autonomous vehicles in today's society
- Break a problem down into smaller parts (decomposition)
- Explain how an infrared sensor works

3. National Curriculum Links

Pupils should be taught to:

- …design, write and debug programs that accomplish specific goals, including controlling… physical systems; solve problems by decomposing them into smaller parts
- …use sequence, selection, and repetition in programs; work with… various forms of input and output
- …use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs

4. Key Vocabulary

Previously Encountered:

1. Command
2. Algorithm
3. Sequence
4. Program
5. Event
6. Object
7. Bug
8. Debug
9. Concurrency
10. Values
11. For Loop
12. Loop Forever
13. Loop Until/While
14. Functions
15. Automation
16. Efficiency

Newly Introduced:

1. Autonomous
2. Controls
3. Logic
4. Conditionals
5. Decomposition
6. Sensor

C62

Module Code: C62

Key Stage: 2

Intended Year Group: 6

Curriculum Area: Computer Science (Robotics)

Pupil-Facing Title: Go, Robot! Level 4 – Physical System Game Development

1. Module Overview

In this module pupils use an advanced hybrid graphical-textual programming language to develop a game that can be played using a physical robot. Pupils use ***variables***, ***conditionals***, and ***comparators*** to create advanced algorithms: these programs are capable of counting, randomising, and resetting so that they create various outcomes for the user.

The module begins with play and analyses of the party game, ***Hot Potato***. The class works together to establish the main features of the game, as well as which of three states each feature belongs to: ***pre state***, ***play state***, or ***lose state***. Pupils create logic trees to notate how this progression works in real time.

As an initial smaller project, pupils create programs to mimic a magic eight ball where questions are presented to a robot and the device is shaken to reveal a random answer. This activity introduces pupils to the concept of variables and makes them consider how they can assist with randomisation in a manageable way. Pupils will subsequently embed this tool into a considerably more complex algorithm during their main project.

We consider that, while humans can easily count upwards, this is a complex skill for a computer. Pupils realise that this must be translated into an algorithm in order to be executed by a computer. They are taught that variables can be assigned and named as placeholders for data and that conditionals can be employed to enable their robot to respond to physical movement, so that when a robot is thrown into the air, code will be triggered. Pupils bring creative flair to their projects with additions such as lights, animations, and sound effects.

Pupils who have successfully completed the task are encouraged to stretch and challenge themselves by expanding their code and adding complexity and features to make their game more unique and fun to play. We use peer assessment to develop and improve pupil games and children are encouraged to reflect as to whether the changes they are making improve or detract from their work.

2. Learning Objectives

Primary

- Define the word ‘variable’ and give examples for its use in programming
- Create and name a variable
- Implement a system using variables which will replicate the process of counting upwards using integers
- Use conditionals in my program to trigger code when specific physical movements are made
- Identify the correct loop to use for my specific purpose

Secondary

- Analyse a pre-existing game to establish standard game-play features
- Identify and code various states of play in a game
- Code my algorithm to randomise an outcome
- Use movements, animations, and sound effects to mimic emotion during the win and lose states of my game

3. National Curriculum Links

Pupils should be taught to:

- …design, write and debug programs that accomplish specific goals, including controlling… physical systems; solve problems by decomposing them into smaller parts
- …use sequence, selection, and repetition in programs; work with variables and various forms of input and output
- …use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs

4. Key Vocabulary

Previously Encountered:

1. Command
2. Algorithm
3. Sequence
4. State
5. Transparency
6. Random
7. Range
8. Value
9. Obstacle
10. Loop Variants
11. Program
12. Event
13. Object
14. Bug
15. Debug
16. Pixel
17. Positive
18. Negative
19. Coordinate
20. Axis
21. Concurrent

E-Safety & ICT

YEARS 3, 4, 5, & 6

Technola E-Safety & ICT educates pupils about the internet and its brilliant potential for communication, creativity and learning, as well as the risks involved and how to respond if encountered. The course is structured in conjunction with the UK Council for Internet Safety's (UKCIS) 'Education for a Connected World' framework, (1) ensuring pupils are equipped with a comprehensive and current understanding of online skills and safety.

The acronym 'MYLO' (***My Life Online***) helps pupils remember to act responsibly with regards to: 'mySelf', 'myFriends', 'myReputation', 'myBehaviour', myHealth' and 'myPrivacy'. This is with a view to maximising pupils' creative potential, while minimising unwanted activity such as online bullying, poor security and/or exposure to strangers.

Pupils begin the course by designing their own campaigns on E-Safety using a word processor, progressing to constructing a dynamic and complex multi-media piece by the course's completion. Our team of expert Technola instructors work closely with pupils to help tailor the course to individual strengths and needs, with a high degree of flexibility and autonomy focused on creating the best outcomes for each child.

Technola E-Safety & ICT comprises of a few key strands:

1. Self-image and Identity
2. Online relationships
3. Online reputation
4. Online bullying
5. Managing online information
6. Health, wellbeing and lifestyle
7. Privacy and security
8. Copyright and ownership

C33

Module Code: C33

Key Stage: 2

Intended Year Group: 3

Curriculum Area: E-Safety & ICT

Pupil-Facing Title: MYLO (My Life Online)

1. Module Overview

Comprising equally of celebration and education, ***My Life Online*** (MYLO) grows pupils' understanding of the internet as a vast resource. They continue their exploration by focusing on the meaning of identity, and how online identities are inextricable from our 'real' selves. Classes gain the confidence to live well and stay safe online, equipped with a range of new E-Safety skills.

Pupils recognise the importance of maintaining a positive contribution to the world around us. A newfound understanding of identity and reputation ensures they are responsible (and vigilant) when online. With many exploring the internet from an early age, it's imperative kids know what to do in the event of difficulty. Pupils equip themselves with '***Stop. Block. Tell.***' - a key plan of action if approached by a stranger online.

The module culminates in a collaborative campaign about the ***Stop. Block. Tell***. response, helping pupils to become 'literate' with a modern word processor (Apple Pages). While learning how to use an array of tools (such as adding shapes, texts and colours) they are also crafting memorable posters, engaging the whole school with their projects and reminding them of how to be safe online.

2. Learning Objectives

- Discover what it means to have an identity, and how our online selves are an aspect of our identity
- Recognise forms of cyber-bullying, how this makes others feel, and how to access support
- Create a digital project with my classmates
- Understand the concept of 'consent' in online contexts
- Know my creative rights and what it means to 'own' content
- Have a healthy attitude towards being online

3. National Curriculum Links

Pupils should be taught to:

- …use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact
- …use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content

4. Key Vocabulary

Previously Encountered:

1. Privacy
2. Security
3. True/False
4. Import
5. Digital Footprint
6. Private Information
7. Appropriate/Inappropriate
8. Cyber-Bullying

Newly Introduced:

1. Consent
2. Ownership/Copyright
3. Opinions/Beliefs
4. Social Media
5. Reputation

C43

Module Code: C43

Key Stage: 2

Intended Year Group: 4

Curriculum Area: E-Safety & ICT

Pupil-Facing Title: MYLO (My Life Online)

1. Module Overview

The second instalment of MYLO empowers pupils to develop their critical skills, recognising that a belief being shared does not mean it is true. Pupils understand technology's potential to be both a positive and negative force depending on its application, informing their E-Safety posters which grow in technical complexity.

Pupils grasp what it means to behave responsibly when online. This takes the form of identifying whether certain content can or cannot be reused; locating copyright-free content; and how to stay safe having fun in social, online environments. They also develop an awareness of their ***digital footprint***, learning that their online activities are never fully private.

Pupils learn to differentiate between positive and negative online behaviour by analysing social media messages in groups. These ideas contribute to their fourth module poster, ***Be Kind Online***, working with new tools such as featuring external imaging, changing fonts, and creating a table of information.

2. Learning Objectives

- Understand how online actions contribute to my identity
- Remain critical, even of shared opinion
- Recognise when someone is upset, hurt or angry online
- Identify which online activities are appropriate
- Know my creative rights
- Understand that online bullying is still bullying

3. National Curriculum Links

Pupils should be taught to:

- …use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact
- …use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content

4. Key Vocabulary

Previously Encountered:

1. Privacy
2. Security
3. True/False
4. Import
5. Digital Footprint
6. Private Information
7. Appropriate/Inappropriate
8. Cyber-Bullying
9. Consent
10. Ownership/Copyright
11. Opinions/Beliefs
12. Social Media
13. Reputation

Newly Introduced:

1. Scepticism
2. Opinion
3. Critical
4. Supervision

C53

Module Code: C53

Key Stage: 2

Intended Year Group: 5

Curriculum Area: E-Safety & ICT

Pupil-Facing Title: MYLO (My Life Online)

1. Module Overview

It can be easy for young people to think that their online behaviour doesn't count; pupils learn the tangible nature of their digital actions, for example that online bullying is still bullying. Expanding with their skills, their E-Safety projects graduate to a multi-media format, incorporating websites, social posts, word processor documents, images, and sound effects.

Pupils develop new abilities, such as verifying the identity of anyone they might encounter online. As part of this they learn that there are people online who do not have good intentions, which kinds of spaces they should remain ***vigilant*** in to protect themselves, and how someone can manipulate their identity. Pupils adopt a healthy '***scepticism'*** and a critical eye for information, helping prevent confusion, and keeping them safe and secure.

The potency of technology means young people should stay mindful. Pupils understand how techniques such as 'Screen Time' and choosing content with positive messaging can be beneficial for their mental health. With this module's project focusing on ***Health, Wellbeing and Lifestyle***, classes now learn skills such as overlapping content with layer management and defining font pre-sets within their projects.

2. Learning Objectives

- Know that online bullying is still bullying
- Recognise that not everyone online is a friend
- Understand app permissions
- Remember tips to stay well online
- Explain app permissions and give some examples
- Describe how identity can be altered online

3. National Curriculum Links

Pupils should be taught to:

- …use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact
- …use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content

4. Key Vocabulary

Previously Encountered:

1. Privacy
2. Security
3. True/False
4. Import
5. Digital Footprint
6. Private Information
7. Appropriate/Inappropriate
8. Cyber-Bullying
9. Consent
10. Ownership/Copyright
11. Opinions/Beliefs
12. Social Media
13. Reputation
14. Online/Offline Identity
15. Scepticism
16. Opinions
17. Critical
18. Supervision

Newly Introduced:

1. Altered/Copied Identity
2. Critical Evaluation
3. Sceptical

C63

Module Code: C63

Key Stage: 2

Intended Year Group: 6

Curriculum Area: E-Safety & ICT

Pupil-Facing Title: MYLO (My Life Online)

1. Module Overview

The MYLO journey completes by matching the sophistication of online tech pupils may be using at their age, such as online gaming, YouTube, and social media. A new understanding of '***persuasive design'*** aids them in recognising how content is geared to transfix. Pupils achieve a comprehensive outlook of the online landscape with a complex and informative poster to match.

Classes understand that even things shared privately can hurt others. Pupils recognise the importance of challenging harmful representations (for example of different cultures, ability levels, genders, or sexualities). Pupils are also taught how to screenshot and hyperlink, a tool which can be helpful in the event of cyberbullying.

Learning about online security facilitates optimal wellness in pupils' exploration, protecting their '***digital personality'***. Pupils learn to reference online sources, building their understanding of content ownership, and providing a foundation for academic referencing in the years to come. Their final posters on the theme of ***Identity*** demonstrate how to keep their identities private, adding transparency, text art and clipping masks to their digital skillset.

2. Learning Objectives

- Recognise the features and impact of persuasive design
- Reference different material
- Understand how some content can encourage fixation
- Acknowledge that ‘private’ jokes can have physical consequences
- Critically evaluate representations of different people
- Describe how things shared privately can have consequences for others

3. National Curriculum Links

Pupils should be taught to:

- …use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact
- …use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content

4. Key Vocabulary

Previously Encountered:

1. Privacy
2. Security
3. True/False
4. Import
5. Digital Footprint
6. Private Information
7. Appropriate/Inappropriate
8. Cyber-Bullying
9. Consent
10. Ownership/Copyright
11. Opinions/Beliefs
12. Social Media
13. Reputation
14. Online/Offline Identity
15. Scepticism
16. Opinions
17. Critical
18. Supervision
19. Altered/Copied Identity
20. Critical Evaluation

Newly Introduced:

1. Persuasive Design
2. Anonymity
3. Privacy Settings
4. Intention
5. Interpretation
6. Reporting
7. Capturing Content

Digital Literacy

YEARS 3, 4, 5, & 6

C34

Module Code: C34

Key Stage: 2

Intended Year Group: 3

Curriculum Area: Digital Literacy

Pupil-Facing Title: 3D Design

1. Module Overview

Pupils take on the role of digital architects as they design and navigate a project in a 3D design app based on a scene from a book or poem they are currently studying! The module draws on comprehension skills and spatial imagination as pupils reimagine a landscape through the creative use of technology.

The first part of the module develops design ideas as instructors guide the class through the world-building functions, offering support and encouraging independent thinking. Pupils map out their scene using building blocks whilst applying the inventory function to add interiors, crafting a 3D image they can navigate!

Towards the end of the module, pupils adjust objects, expressions and characters within the scene to change the direction of their image. Pupils swap projects, choosing to make or reject alterations to their designs based on peer feedback, developing autonomous thinking.

2. Learning Objectives

Primary

- Create a 3D impression of a scene from a chosen text or poem
- Use multiple iPad gestures, such as: swipe, pinch, tap, and two-finger gestures to navigate a project
- Offer constructive feedback to a classmate's project
- Develop my project in response to a classmate's feedback
- Exhibit an understanding of how stories can be represented visually

Secondary

- Organise ideas and gain confidence in developing chronological steps to complete a design plan
- Depict a scene from a text in a creative way, furthering my understanding of staging and individual interpretation
- Consider storytelling from different perspectives

3. National Curriculum Links

Pupils should be taught to:

- …select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information

4. Key Vocabulary

1. Building
2. Designing
3. Editing
4. Share
5. Shading
6. Software
7. Alignment

C44

Module Code: C44

Key Stage: 2

Intended Year Group: 4

Curriculum Area: Digital Literacy

Pupil-Facing Title: Sphero Movie Trailer!

1. Module Overview

Pupils advance their storytelling and coding skills as they pioneer a trailer for their own blockbuster! The module connects spatial imagination with narrative design as pupils curate a film trailer using iMovie, coding a Sphero to enact a dynamic sequence that showcases independent thinking and enterprising teamwork.

This module is the first opportunity for children to work with multiple devices within a single group. Half of the group code the Sphero whilst the other members direct the campaign, using iMovie to shoot footage which can be dragged and dropped into a complete action sequence. Using the Sphero, pupils code the device to enact and record the movement, developing a strategy between both teams.

The assessment diversifies design skills as pupils collaborate to produce a directorial debut which is exported and shared to the wider school community! Instructors move between groups offering insight and support on each film as pupils discuss and assign roles to each member. Pupils recognise the importance of incorporating different perspectives as they join teams to edit their trailer, rearranging clips in different templates to experiment with story formation

2. Learning Objectives

Primary

- Create a movie trailer using iMovie, importing and editing footage across multiple apps
- Develop and storyboard ideas to fit a specific genre
- Operate a simple video camera and record useable footage
- Operate a robot in response to a classmate's direction
- Organise my ideas in a coherent way, dividing my project into manageable tasks

Secondary

- Recognise the importance of clear instructions when coding the Sphero
- Understand permissions involved with recording footage of other people, acting respectfully and responsibly
- Adapt my working style for independent and group tasks
- Gain confidence in developing my ideas and explaining them within a group
- Discuss why schools and other organisations have strict policies over filming

3. National Curriculum Links

Pupils should be taught to:

- …select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information
- …design, write and debug programs that accomplish specific goals, including controlling… physical systems; solve problems by decomposing them into smaller parts
- …use sequence, selection, and repetition in programs; work with variables and various forms of input and output
- …use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs

4. Key Vocabulary

1. Code
2. Algorithm
3. Sequence
4. Command
5. Import
6. Program
7. Event
8. Object
9. Concurrency (Side-by-Side)
10. Direct
11. Coordinate

C54

Module Code: C54

Key Stage: 2

Intended Year Group: 5

Curriculum Area: Digital Literacy

Pupil-Facing Title: Still Image Editing

1. Module Overview

Pupils develop their composition skills as they discover the wizardry of image manipulation! This module combines spatial imagination with design handling as pupils correct, construct and conceptualise an original idea using an advanced photo editor.

The first part of the module develops creative practice as pupils use brushing tools to blur and sharpen an image provided by the instructor, applying presets to different layers. Pupils progress their understanding of visual arrangement, enhancing a photo through transparency tools. Editing skills are developed through photography as pupils use the iPad to snap a lively shot of their surroundings before importing the file. Pupils manipulate the image by removing the background, refining angles and blurring elements to create an enhanced image, transforming their understanding of framing and perspective!

The assessment for the module isolates an understanding of imagery as pupils use the text and layering features to modify their own picture. Pupils import a copy of their favourite photo (pet, place or person!) and apply a clipping mask; words become visual tools as the image is revealed through text.

2. Learning Objectives

Primary

- Use photo editing software to crop photographs and add effects
- Enhance the perspective of an image
- Review images on a camera and delete unwanted images
- Source media assets from various sources; download stock images from the internet, paying close attention to copyright laws and ownership rights

Secondary

- Use creative expression to make informed choices with regards to page layout, font, and theming
- Gain confidence in developing my ideas
- Prioritise tasks when working independently
- Recognise the potential problems of image manipulation

3. National Curriculum Links

Pupils should be taught to:

- …select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information

4. Key Vocabulary

1. Photography
2. Manipulating
3. Transparency
4. Search provider
5. Responsibility
6. Typography
7. Page layout
8. Import
9. Editing

C64

Module Code: C64

Key Stage: 2

Intended Year Group: 6

Curriculum Area: Digital Literacy

Pupil-Facing Title: Arthouse Animation!

1. Module Overview

Pupils consolidate previous learning as they take on the role of intrepid project designers, producing a conceptual short film that showcases collaboration, critical thinking, and file management. The module extends spatial imagination and narrative design as pupils combine different media, exporting animations and filmed footage to create their own arthouse production!

At the start of the module, instructors guide the class through an animation app as pupils design, duplicate, and rotate different threads, creating unique animations that bring their ideas to life on screen. Pupils successfully play their animations, experimenting with loops and rhythm as they cultivate individual ideas!

The module assessment requires pupils to export their animations to iMovie as they layer animated designs with filmed footage, using audio voiceover recordings to create a narrative. Pupils evaluate the precision of storytelling as they navigate different apps within a small group, balancing independent work and group feedback to produce a panoramic tale!

2. Learning Objectives

Primary

- Understand the history and functionality of stop motion animation
- Describe ‘frames’ and ‘frames per second’ in the context of animation
- Use creative expression to plan and storyboard an effective animation to represent a story or setting
- Use appropriate theming, soundtrack, sound effects, text, and visual effects to produce a short animation to a brief
- Successfully export an animation to iMovie

Secondary

- Identify a concept to explore through a narrative
- Navigate different apps, using audio and visual techniques to tell a story
- Prioritise tasks, working both individually and within a group
- Discuss the limitations of exporting animation to other design apps
- Recognise the importance of creating equal roles for group members

3. National Curriculum Links

Pupils should be taught to:

- …select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems, and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information

4. Key Vocabulary

1. Photography
2. Typography
3. Page layout
4. Animation
5. Stop motion
6. Frame
7. Frames per second (FPS)
8. Splicing
9. Target audience
10. Import
11. Export
12. File shifting
13. Editing

ICT

YEARS 3, 4, 5, & 6

Having completed the word-processing element of the ICT curriculum during the earlier e-safety modules, pupils now get to grips with spreadsheet and presentation software against a backdrop of societal issues.

Explored through the lens of computing visionaries and trailblazers including, Ada Lovelace, Steve Jobs, Alan Turing, and Katherine Johnson, pupils create data-first presentations that encourage them to engage with complex issues such as under-representation of women in industry, repression and skill appropriation of marginalised communities, and the environmental impact of ***big-tech*** in a free market environment.

C35

Module Code: C35

Key Stage: 2

Intended Year Group: 3

Curriculum Area: ICT & Social Studies

Pupil-Facing Title: Computing Legends: Ada Lovelace

1. Module Overview

Pupils dive into the fascinating life of **Ada Lovelace** as they explore the legacy of the first computer programmer! Drawing on social history and data collection, pupils pinpoint key moments from Lovelace's career and interactions with fellow mathematician, Charles Babbage, as they create their first spreadsheet charting the workings of this brilliant mind; the erasure and subsequent reclaiming of Ada's work is emphasised as pupils consider the limitations of gender in the Victorian period.

Culminating in a simple presentation that celebrates Ada's passion and vision for technology, pupils produce a spreadsheet with the following specification:

Data types: text; images; numbers (general)

Formatting: text formatting; table outlines

Data structure: Simple lists; single category axis

Calculations: N/A, first introduced in C45

Graphing: N/A, first introduced in C45

2. Learning Objectives

Primary

- Identify Ada Lovelace as the first computer programmer
- Analyse the societal restrictions of the Victorian period and how these restrictions limited access to knowledge
- Successfully navigate different mediums whilst collating data
- Input data into a cohesive spreadsheet
- Produce a compelling presentation using the data

Secondary

- Consider our ongoing understanding of past events and how these are subject to new discoveries
- Analyse the reliability of data and different sources
- Learn how to produce spreadsheets in an engaging, accurate way
- Recognise the importance of data when developing a presentation

3. National Curriculum Links

Pupils should be taught to:

- …understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration
- …use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
- …select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of… systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information

4. Key Vocabulary

1. Spreadsheet
2. Cells
3. Rows
4. Columns
5. Data
6. Data quality
7. Formatting
8. Presentation
9. Slides
10. Layers
11. Erasure
12. Societal restrictions

C45

Module Code: C45

Key Stage: 2

Intended Year Group: 4

Curriculum Area: ICT & Social Studies

Pupil-Facing Title: Computing Legends: Steve Jobs

1. Module Overview

Pupils engage with the most dramatic comeback of modern history through the lens of visionary, founder, and Apple CEO, **Steve Jobs**. Hugely progressive and unapologetically capitalist, Jobs forged Apple into the poster child of technology that, at the turn of the twenty-first century, could only have come out of America.

Undeniably world-changing, pupils celebrate the company's long list of successes, including the democratisation of creativity, centrality of accessibility, and top jobs for neuro-atypical thinkers; in examining environmental damage, low-paid labour, and perhaps anti-competitive practices, this rose-tinted view is balanced with an understanding that big industry comes with many societal downsides.

Did you know? The name 'Technola' is derived from a combination of ***technology*** and the ***liberal arts***, inspired by Jobs' mantra that ***"…it's in Apple's DNA that technology alone is not enough. That it's technology married with liberal arts, married with the humanities, that yields us the result that makes our heart sing."***

The module culminates in a presentation that explores Jobs' unwavering foresight, including a spreadsheet with the following specification:

Data types: links, numbers, formulas (pre-defined)

Formatting: data type formatting (i.e. £ vs %, or date vs time)

Data structure: multi-category axis

Calculations: SUM columns and rows

Graphing: pie charts

2. Learning Objectives

Primary

- Identify Steve Jobs as the founder of Apple
- Understand the key stages of Apple's development
- Successfully navigate different resources, collating data
- Input data into a cohesive spreadsheet
- Consider my own relationship to devices and how this makes access to research and entertainment more accessible
- Produce an interactive presentation

Secondary

- Recognise the importance of continual progression within technology
- Analyse the reliability of data and different sources
- Consider the outreach of Apple's design and how this benefits the arts
- Acknowledge the disparity between different communities and how technology works to create more equal opportunities
- Understand the visual benefits of a pie chart when presenting data

3. National Curriculum Links

Pupils should be taught to:

- …understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration
- …use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
- …select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of… systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information

4. Key Vocabulary

1. Links
2. Pre-defined formula
3. Data type
4. Multi-category axis
5. SUM function
6. Pie chart
7. Accessibility
8. Democratisation
9. Neuro-typical/neuro-atypical
10. Equality
11. Capitalism
12. Free market

C55

Module Code: C55

Key Stage: 2

Intended Year Group: 5

Curriculum Area: ICT & Social Studies

Pupil-Facing Title: Computing Legends: Alan Turing

1. Module Overview

In exploring the life and achievements of forerunning computer scientist **Alan Turing**, pupils appreciate what it might have been like to engineer for the British government as an LGBTQ+ person, particularly at a time when homosexuality was illegal. Pupils investigate the relationship between the scientific arena and LGBTQ+ people during Turing's lifetime, grasping the nature of industry inequality.

In mapping prejudicially-determined opportunities, pupils exhibit a presentation that incorporates external graphic design as well as a spreadsheet with the following specification:

Data types: formulas (specified)

Formatting: auto cell shading

Data structure: N/A, no further escalation beyond C45

Calculations: simple formulas

Graphing: bar charts

2. Learning Objectives

Primary

- Identify Alan Turing as the father of computational theory and artificial intelligence
- Understand that marginalised communities have been oppressed and objectified in the pursuit of societal goals
- Successfully navigate different resources, collating data
- Input multiple sets of data into a cohesive spreadsheet
- Produce a complex, interactive presentation

Secondary

- Recognise the importance of representation within technology
- Analyse the reliability of data and different sources
- Consider the progress of inclusivity, whilst acknowledging the fragility or progress and work still to be done
- Acknowledge the disparity between different communities and how technology works to create more equal opportunities
- Understand the visual benefits of a bar chart when presenting data

3. National Curriculum Links

Pupils should be taught to:

- …understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration
- …use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
- …select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of… systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information

4. Key Vocabulary

1. Specified formula
2. Auto formatting
3. Bar chart
4. Appropriation
5. Repression
6. Artificial intelligence
7. Progressive
8. Representation

C65

Module Code: C65

Key Stage: 2

Intended Year Group: 6

Curriculum Area: ICT & Social Studies

Pupil-Facing Title: Computing Legends: Katherine Johnson

1. Module Overview

In this module, classes study formative NASA scientist, **Katherine Johnson**. Pioneering as an African American woman in 1970s America, Johnson's work proved as vital for space technology as it was for women, people of colour, and marginalised peoples everywhere. Pupils collate a range of information from the NASA website about diversity and equality, forming a case study about women in space science throughout history,

The module culminates in pupils graduating to the presentation of a complex multi-media presentation that incorporates a spreadsheet with the following specification:

Data types: N/A, no further escalation beyond C55

Formatting: merged cells, text placement within cells

Data structure: multi-data sets

Calculations: multi-step formulas

Graphing: line charts (multi-data sets)

2. Learning Objectives

Primary

- Identify Katherine Johnson as a trailblazer in space exploration and orbital mechanics
- Understand that women were predominantly responsible for early successes in computing but have since become underrepresented
- Successfully navigate different resources, collating data
- Input multiple sets of data into a multi-table spreadsheet
- Produce a complex, multi-media presentation

Secondary

- Recognise the importance of representation within technology
- Analyse the reliability of data and different sources
- Consider options for removing barriers to entry and sustained success in technology
- Understand the visual benefits of a line chart when presenting data

3. National Curriculum Links

Pupils should be taught to:

- …understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration
- …use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
- …select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of… systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information

4. Key Vocabulary

1. Merged cell
2. Text placement
3. Multi-data sets
4. Multi-step formula
5. Line chart
6. Computer (human job role)
7. Diversity
8. Orbital mechanics
9. Underrepresentation
10. Barriers to entry