

COMPUTING

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[Curriculum teaching resources \(teachcomputing.org\)](https://teachcomputing.org)

In Computing we learn how to safely use digital devices for a variety of purposes and how to create, read and understand code to make devices perform tasks for us.

Computing at Defford

Our Vision

Our Intent

| Faith | Friendship | Fun | Learn | Grow |
|---|---|--|---|---|
| <ul style="list-style-type: none">• To recognize the value in creating and not just consuming digital content• Appreciate the creativity behind digital content• Development confidence in their own abilities at addressing the Computing curriculum | <ul style="list-style-type: none">• To collaborate successfully with others on digital tasks• How to use digital devices to nurture healthy relationships. | <ul style="list-style-type: none">• Develop a passion for using computers as a tool and a creative outlet• To learn how to manage a happy and healthy relationship with digital devices | <ul style="list-style-type: none">• How to stay safe online• Computational thinking• Computer science – abstraction, logic, algorithms, data representation | <ul style="list-style-type: none">• Problem solving skills• Develop skills to self-correct errors and overcome obstacles |

Computing Curriculum threads

| Programming | Computational thinking | Collaboration | Creativity | Computer networks | Online Safety |
|---|---|---|---|---|--|
| <p>Pupils will learn how to communicate with computers through programming. They will develop their knowledge and understanding of how computers understand commands and begin to learn how to streamline commands to communicate effectively with computers for a given purpose.</p> | <p>Pupils will develop their ability to think through a series of commands. They will create series of instructions and debug commands provided to them with increasing understanding of how the outcome and changes produced by changing the commands.</p> | <p>Working together using IT is incredibly important to success in the modern world.</p> <p>Pupils will learn how to use a variety of hardware and software to work together.</p> <p>Pupils will learn appropriate and safe ways of communicating in their computing lessons.</p> | <p>Pupils learn how to create using Computing.</p> <p>Computing is an incredibly creative area of the curriculum and must be seen and taught us such. Pupils will learn to safely consume and create content through the use of a variety of hardware and software.</p> | <p>Pupils will learn about how computers link together. They will develop their knowledge and understanding of the benefits and risks that come through connecting hardware together.</p> | <p>Pupils will learn how they can stay safe online. This will include how they should safely and sensibly use devices to not upset, offend or endanger others as well as keep themselves safe.</p> |

KNOWLEDGE

Technology around us

How to log into the school laptops

How to access key pieces of software.

Basic keys

- space bar
- Enter
- Shift for capital letters

To know what technology we have in the classroom and in our school and how we can use it safely.

How to use a mouse and keyboard or trackpad and keyboard to operate a computer.

Digital painting

What is digital painting, why is it helpful and what tools are commonly found when painting digitally.

How digital tools can be used to recreate work by famous painters ([Art curriculum](#))

VOCABULARY

Digital – storing, using or sending information electronically

Digital art – Artwork produced on an electronic device.

Tool – An option for drawing/painting on a digital platform such as a pencil, brush, shape, rubber.

Fill – A digital tool commonly used to instantly fill in an enclosed area with a single colour.



UNDERSTANDING

What are the common uses of computers in school and beyond.

How to use a computer safely and responsibly in the classroom.

What to do if you get stuck or something goes wrong on a computer in school.

How different tools can be used and combined to create different effects whilst doing digital drawing/painting.

SKILLS

How to turn on and log into school digital devices.

How to access software to support learning.

Develop mouse/trackpad skills

Develop basic typing skills

Making decisions about drawing tools and using them to make images inspired by famous artists.

RATIONALE

Why this? Start by recognizing what we mean of as technology to support all future Computing learning. Digital painting helps develop knowledge of using an app/program and controlled use of mouse or other input.

Why now? This provides pupils with a start to Year A that increases children's knowledge of what learning is all about. Digital painting helps to prepare pupils for using sprites and blocks in coding.



KNOWLEDGE

Digital writing – to know that computers and their keyboards are often used to write.

Common keys on a keyboard and their purpose.

How to change the font of writing.

How to increase and decrease the size of digital writing.

Grouping data

Computers are often used to help us organize information.

Groups are used to help us to organize information. When information is put into groups we normally find it easier to understand and compare.

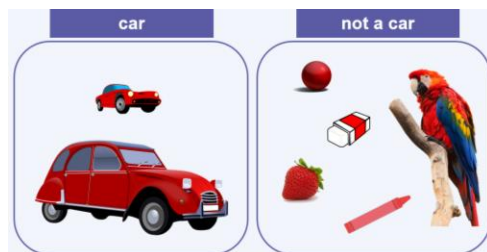
VOCABULARY

Type – to use keys on a keyboard to write digitally.

Font – the style of text whilst writing digitally.

Toolbar – the area of a computer screen with a variety of tools that help us control the computer.

Grouping – Put objects into groups based upon different features eg shape, colour, size.



UNDERSTANDING

What different keys on the board do and how to use keys in combination (shift + letters) to write digitally.

Benefits of writing digitally.

How to choose appropriate ways of grouping information.

How to consider how items have been grouped by looking and comparing groups.

How to use a computer to move objects into groups.



SKILLS

Develop typing to allow pupils to type with increasing speed and accuracy

How to save work to continue another day. – problem with this due to the server

Opening work that was previously saved.

Considering features of objects to help group them.

RATIONALE

Why this? Digital writing supports Writing and grouping Data supports Maths, giving pupils the knowledge to use a computer to support other areas of learning.

Why now? This introduces additional uses of technology and teaches children key skills such as saving, opening and printing documents.



KNOWLEDGE

[Programming A – moving a robot](#)

Programming is what humans do to make computers/digital devices do tasks for them. They do not work unless they have been programmed.

That computers read and follow programs. These need to be carefully sequenced and use the correct language to be understood by the device.

[Programming B – introduction to animation](#)

That BeeBots and Scratch Jr use similar inputs.

That programming will often involve solving a problem. This will sometimes be finding a “better” solution to a problem (in fewer steps).

VOCABULARY

BeeBot – a small robot with button inputs on its back. Commands are placed by pushing the buttons and then they are carried out in the order the buttons were pushed.

Programming – giving a digital device a series of instructions for it to follow.

Direction – Such as forwards, backwards, up, down, left, right, North, South, East or West.

Command – a single instruction given to a digital device.

Scratch Jr – a programming language.

Loop – repeating a command (or series of commands) multiple times

Sprite – Item on a computer that can be programmed.

UNDERSTANDING

Computers need human input to do anything. Humans use programs to give clear, sequences of instructions to digital devices.

Programming involves different computer languages.

A solution can sometimes be improved by reducing the size of the instructions.

How to read and write/input commands on a BeeBot and in Scratch Jr and know in advance what the output will be.

If the output is not as intended, the commands were incorrect and need changing.

Putting the same commands in will result in exactly the same output.

SKILLS

To input a series of commands.

To read commands and interpret what they will result in.

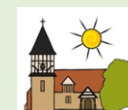
To read a series of commands (program) and spot errors before inputting them.



RATIONALE

Why this? Pupils are now ready to begin using digital devices to create simple programs.

Why now? Programming combines knowledge and skills learnt during Autumn and Spring of Year A.



KNOWLEDGE

How to log into the school laptops

How to access key pieces of software.

Basic keys

- space bar
- Enter
- Shift for capital letters

Examples of IT found in school, our homes and our community.

Different IT equipment is designed to be used for different purposes. Knowing this can help us to make the best choice about what equipment to use.

How to use a device to take a digital photograph

VOCABULARY

[Information technology around us](#)

[Digital photography](#)

eSafety

IT – Information Technology

Digital drawing

Programming

iPad

Laptop

Landscape

Portrait

UNDERSTANDING

What is meant by IT in our world

That IT devices often work together.

We should all have rules for how we use IT. This will help us to use IT safely and healthily.

Different IT equipment is used for different tasks.

The best choice of landscape or portrait for a photo depending on the subject matter of the photo.

The effect that lighting has on photos.

Photos can be changed digitally using software.

SKILLS

To identify examples of IT.

To sort IT by where it can be found

What are these objects?



To choose the appropriate IT equipment that should be used for a variety of tasks.

To use a digital device to take a photograph.

To evaluate what is good/bad about a photo and what change to make to improve it.

To explain choices made when editing an image.

To look for signs that a photo has been altered.

RATIONALE

Why this? Teaches/reminds pupils of safe uses of technology. Photography is accessible to all and shows how technology can be helpful.

Why now? This revisits important learning from Year A or introduces key concepts of IT and digital technology.



KNOWLEDGE

Computers only do anything when they are given a special set of instructions to follow.

Instructions have to be given clearly or computers cannot complete the actions.

How to complete a tally chart to support the counting and gathering of information.

How to read information from a tally chart.

VOCABULARY

Robot algorithms

Algorithm

Sequence

Instructions

Command

Outcome

Beebots

Pictograms

Tally chart

UNDERSTANDING

Two sequences that consist of the same commands can result in different outcomes.

How to read and write simple algorithms for a Beebot (or similar) to follow to achieve a set outcome.

How to read information from a tally chart and pictogram.

When it is not safe to share information online.

SKILLS

To read a sequence of commands and predict the outcome.

To test the sequence and consider if the prediction was correct.

To prepare a sequence of commands to achieve a desired outcome.

To test and debug an algorithm.

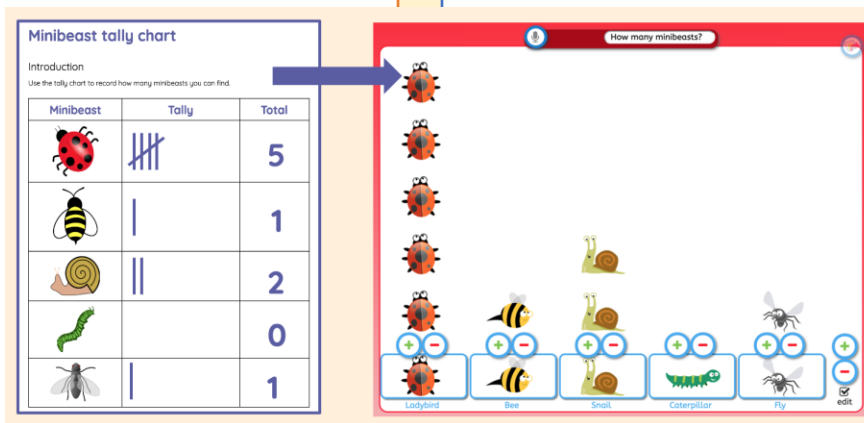
To explain what information is found on a tally chart or pictogram.

To answer questions about the most, the least, more than and less than.

RATIONALE

Why this? Pictograms supports our maths curriculum. Robot algorithms teaches or reinforces the use of sequences of instructions to computers.

Why now? This reminds or prepares pupils for the teaching of coding uses blocks in the summer term.



KNOWLEDGE

[Making music](#)

That sprites can be connected to sounds digitally to help to make digital music.

How modifying a musical sequence on a computer will effect the music played.

[An introduction to quizzes](#)

How to create a quiz using Scratch Jr.

How to use blocks to create programs and how moving them into different positions effects the outcome of the program.

How to read a sequence of blocks to determine what the sequence will do on screen.

VOCABULARY

Rhythm patterns

Instrument

Research

Search

Search engine

Program

Sequence

Background

Sprite



UNDERSTANDING

Digital devices can make sounds and some devices can be used to create music.

That music is a sequence of notes.

That music can be played in different ways.

How different blocks and their position affect a program running and the outcome.

How to rearranging a sequence will affect the outcome on screen.

SKILLS

To use a computer to experiment with pitch.

To refine a musical pattern on a computer.

To create a rhythm/sequence to represent an animal.

To use blocks to create a program. Debugging to consider the correct type of block to use and the impact of the position.

RATIONALE

Why this? This continues to develop pupils' knowledge of different uses of technology. This reminds or introduces the concepts of coding in Scratch Jr.

Why now? Children have the knowledge to now use technology to create their own programs, using code to be creative.



KNOWLEDGE

Connecting computers

That digital devices consist of an input, a process and an output.

Digital devices come in many different forms. Children can identify what are and are not digital devices.

Devices in school are connected together through a network. Our network also allows access to the internet.



Animation

Animation is movement created by seeing different (slightly different) images in quick succession.

How we can use computers to help us capture or create our own images to use in animation.

VOCABULARY

Network – Computers linked locally that allow transfer of information.

Internet – A vast network of computers and other digital devices.

Hardware – Physical device that is or works with a digital device.

Software – Programs on a computer or digital device.

Animation – drawings or models shown in sequence that when switched between rapidly appear to be moving.

Transition – a change of scenes/slides.

Media – a means of communication (newspaper, radio, television, the internet etc)

UNDERSTANDING

How do computers connect to one another?

What benefits and potential risks are there from computers being connected?

How to access and use basic functions of hardware and software.

How animation works and how digital devices can help us to create our own animations.

The importance of positive interactions via digital devices.

How subtle movements between images make for smoother animation.

SKILLS

Practice basic steps to log on and access pieces of software on school laptops/iPads.

Recognise common features of digital devices to help us operate devices we are unfamiliar with (power, volume, home).

Create a sequence of images with slight, incremental alterations that when viewed in quick succession appear to move.

RATIONALE

Why this? This starts to teach pupils how networks operate and share information. Animation builds upon learning in KS1 of making sprites move and make sounds.

Why now? This takes learning on from KS1 to know how digital devices work together. Animation prepares pupils for increasingly complicated programs.



KNOWLEDGE

Desktop publishing

How computers are used to layout and plan pages of information.

What jobs are often involved in desktop publishing; reporters, photographers, graphic designers, editors etc.

How to use templates to layout a plan for a page of information.

Sequencing through coding

What is programming and what does it achieve.

Look at some real-world examples of what coding is used for.

How to use coding to create a simple program that will imitate a simple musical instrument.

Learn how changing the sequence of code can change the outcome.

VOCABULARY

Page orientation – which way around you have the page.

Template – the structure of a page of information.

Publish – to print a copy of a document.

Text and images

Sprite

Sequence

Command

Program

Blocks

UNDERSTANDING

How images and words can communicate. Strong images can quickly provide clear information.

The benefits of desktop publishing, being able to move information around, change its size easily before printing.

How to layout information to make it easy to read.

RATIONALE

Why this? This further develops pupil's knowledge of Digital Writing. Sequencing further develops knowledge of coding.

Why now? This continues to develop knowledge of the uses of technology. Sequencing prepares children for events and actions in the summer term.

SKILLS

How to combine text and images.

How to use desktop publishing software to input and edit both text and images to create a product.

How to print, save and load work.

How to work with others to support the process of creating a product.

Creating good questions to help us to create branching databases and in turn tree structures.

Begin to read code and anticipate what a program will do when it runs.

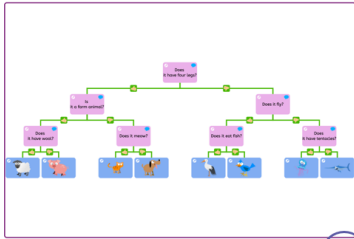
To begin to recognise where computers are using tree structures to make decisions.



KNOWLEDGE

[Branching database - Science](#)

How to ask yes or no questions to help sort items.



These branches can be used to help computers in making decisions. They can follow the paths themselves if programmed to.

Events and actions

The importance of inputs and outputs as a designer/coder rather than just as a user.

How to test code to check for errors.

How to match some code to a desired outcome.

VOCABULARY

Branching database – a database of information that is sorted through answering questions, the answers lead down branching paths.

Attribute – a feature of something (its size, colour, weight etc)

Tree structures – the decision shape of a branching database.

Input

Output

Debugging – testing and reading code to find errors. Then fixing those errors to progress.

UNDERSTANDING

That computers can make use of tree structures to help them to make decisions.

Programming lets us tell computers what to do.

The process of writing/reading and debugging.

The difference between sprites and backgrounds when working in Scratch.

How to transfer a design idea from a thought to a reality using coding.

The importance of testing code. How to test effectively whilst building a program.

SKILLS

Debugging – to begin to watch a program run, spot problems and then look for why the problem may happen, making changes and retesting.

How to begin designing a program, thinking through the process and making it a reality through coding.

RATIONALE

Why this? Branching databases links to and supports learning in science and categorization. Events and actions teaches the importance of reading code.

Why now? Events and actions brings all previous coding learning together ready for upper KS2.



KNOWLEDGE

The internet

Computers are connected in networks. These networks can be connected together through routers to the internet.

Switches are used to control the movement of information between computers. These switches are connected to the internet by routers.

Not everything on the internet is safe or real. How to make safe and sensible decisions about using the internet.

Audio editing

How digital recordings are made.

How digital recordings can be edited.

What podcasts are and how they are made.

VOCABULARY

Internet

Network

Switch

Router

Website

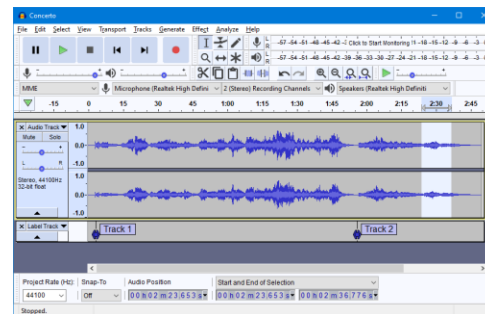
Fake news

Audio

Editing

Podcast

Jingle



UNDERSTANDING

How computers are connected by networks that use switches to control the sharing of information.

Networks can be small (in school) or huge (the internet).

Why it is important to consider what we share online.

What can we use to help us to know what is real on the Internet.

Audio can be recorded digitally and then edited on a digital device.

SKILLS

To make safe choices about what information we share online with who.

To judge what information is real and fake online.

How to edit audio, cutting parts out, ordering clips, combining multiple audio clips over one another.

RATIONALE

Why this? The internet teaches and reminds pupils of how networks work and interact. Audio editing teaches or reminds key knowledge of the important of sequencing and using an app.

Why now? The internet teaches and reminds pupils of safe internet use. Audio editing builds upon previous knowledge of using an application to create, save and share.



KNOWLEDGE

Repetition in shapes

Computers can be coded/programmed by typed commands (similar to blocks used in Scratch).

Computer languages are used by coders to create applications for digital devices.

Repeating is used to get computers to do the same thing lots of times very quickly.

Data logging

Data is everywhere and collecting and using it is important in modern life.

Data is collected and used in many different ways.

VOCABULARY

Programming

Screen turtle (digital/virtual BeeBot)

Data

Data logging

Interval

Download

Sensor

UNDERSTANDING

That computers understand specific languages. We can communicate to them if we know the language.

That data is collected in lots of different ways.

That data is used in lots of different ways.

That data is very valuable and is used by lots of different people in lots of different ways.

How to collect and read data using digital devices.



SKILLS

Code simple commands to draw shapes using Logo and a Screen Turtle.

Read code to know what that code will do when read by a computer.

Debug typed code if the shape does not look right.

Setting up and using a data logger to collect data and then to download it to a computer to read that data and use it.

RATIONALE

Why this? To learn how repeats work in coding. How computers can collect data.

Why now? This revisits and builds upon previous coding learning. Data logging supports maths knowledge and revisits inputs and outputs.



KNOWLEDGE

Repetition in games

How computer code uses loops to repeat commands and some of the uses of this.

How to combine inputs and outputs to create a game using coding on Scratch.

Photo editing

What photo editing is and what sort of changes people/computers can make to images.

How to use photo editing software to change images.

What is composition and how to use it to improve images.

How to combine different techniques to fulfil a design brief.

VOCABULARY

Loop

Repetition

Design

Evaluate

Sprites

Algorithm

Debug

Rotate

Composition

Cloning

Design brief

UNDERSTANDING

How loops can reduce the lines of code used to make an action repeat.

The importance of testing and debugging to ensure an algorithm works as it has been designed to.

Why would people want to edit photos. To improve clarity, to rotate, to avoid distraction etc.

How to make decisions to improve the composition of an image.

RATIONALE

Why this? Repetition in games practices skills from the Spring term in a different form. Photo editing introduces a new form of application and apply new knowledge.

Why now? Repetition in games builds upon knowledge from Repetition of shapes in the Spring. Photo editing reminds and builds upon knowledge of digital photography (Birch B)

SKILLS

Use loops to create code that repeats commands.

To use existing sprites and block code to create a game that uses repeats and loops.

How to edit images to rotate, crop and make simple alterations to images.

