

Computing

Key skills and knowledge by unit



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EYFS – Autumn Term – Programming Bee Bots

Computer Science

- Learning how to explore and tinker with hardware to develop familiarity and introduce relevant vocabulary.
- Using logical reasoning to understand simple instructions and predict the outcome.
- Following instructions as part of practical activities and games.
- Learning to give simple instructions.
- Experimenting with programming a Bee-bot/ Blue-bot and learning how to give simple commands.
- Learning to debug instructions, with the help of an adult, when things go wrong.

Information Technology

- N/A

Digital Literacy

- N/A

Key Knowledge

- To know that you can program a Bee-Bot with some simple commands.
- To understand that debugging means how to fix some simple programming errors.
- To understand that an algorithm is a set of clear and precise instructions.

EYFS – Spring Term – Exploring Hardware

Computer Science

- Learning how to operate a camera to take photographs of meaningful creations or moments.
- Learning how to explore and tinker with hardware to develop familiarity and introduce relevant vocabulary.

Information Technology

- N/A

Digital Literacy

- Recognising that a range of technology is used in places such as homes and schools.

Key Knowledge

- To know that different types of technology can be found at home and in school.
- To know that you can take simple photographs with a camera or iPad.
To know that you must hold the camera still and ensure the subject is in the shot to take a photo.

EYFS – Summer Term – Using a Computer

Computer Science

- Recognising and identifying familiar letters and numbers on a keyboard.
- Developing basic mouse skills such as moving and clicking.

Information Technology

- Using a simple online paint tool to create digital art.

Digital Literacy

- Learning to log in and log out.

Key Knowledge

- To be able to understand what a computer keyboard is and recognise some letters and numbers.
- To know that a mouse can be used to click, drag and create simple drawings.
- To know that to use a computer you need to log in to it and then log out at the end of your session.

Key Stage One – Autumn Term – Improving Mouse Skills

Computer Science

- Learning how to explore and tinker with hardware to find out how it works.
- Learning where keys are located on the keyboard.

Information Technology

- Using a basic range of tools within graphic editing software.
- Developing control of the mouse through dragging, clicking and resizing of images to create different effects.
- Developing understanding of different software tools.
- Recognising devices that are connected to the internet.

Digital Literacy

- Logging in and out and saving work on their own account.

Key Knowledge

- To know that "log in and log out" means to begin and end a connection with a computer.
- To know that a computer and mouse can be used to click, drag, fill and select and also add backgrounds, text, layers, shapes and clip art.
- To know that passwords are important for security.

Key Stage One – Autumn Term – What is a Computer?

Computer Science

- Understanding what a computer is and that it's made up of different components.
- Recognising that buttons cause effects and that technology follows instructions.
- Learning how we know that technology is doing what we want it to do via its output.
- Using greater control when taking photos with cameras, tablets or computers.

Information Technology

- Developing word processing skills, including altering text, copying and pasting and using keyboard shortcuts.
- Using word processing software to type and reformat text.
- Creating and labelling images.
- Learning how computers are used in the wider world.

Digital Literacy

- N/A

Key Knowledge

- To know the difference between a desktop and laptop computer.
- To know that people control technology.
- To know some input devices that give a computer an instruction about what to do (output).
- To know that computers often work together.

Key Stage One – Spring Term – Stop Motion Animation

Computer Science

- Using greater control when taking photos with cameras, tablets or computers.
- Using logical thinking to explore software, predicting, testing and explaining what it does.

Information Technology

- Using software (and unplugged means) to create story animations.

Digital Literacy

- N/A

Key Knowledge

- To understand that an animation is made up of a sequence of photographs.
- To know that small changes in my frames will create a smoother looking animation.
- To understand what software creates simple animations and some of its features e.g. onion skinning

Key Stage One – Spring Term –

Computer Science

- N/A

Information Technology

- N/A

Digital Literacy

- N/A

Key Knowledge

- N/A

Key Stage One – Summer Term – Programming Scratch Jr

Computer Science

- Recognising that buttons cause effects and that technology follows instructions.
- Explaining what an algorithm is.
- Following an algorithm.
- Creating a clear and precise algorithm.
- Learning that programs execute by following precise instructions.
- Incorporating loops within algorithms.
- Using logical thinking to explore software, predicting, testing and explaining what it does.
- Using an algorithm to write a basic computer program.
- Using loop blocks when programming to repeat an instruction more than once.

Information Technology

- Using software (and unplugged means) to create story animations.

Digital Literacy

- N/A

Key Knowledge

- To know that coding is writing in a special language so that the computer understands what to do.
- To understand that the character in ScratchJr is controlled by the programming blocks.
- To know that you can write a program to create a musical instrument or tell a joke.

Key Stage One – Summer Term – Programming Beebots

Computer Science

- Learning how to explore and tinker with hardware to find out how it works.
- Learning where keys are located on the keyboard.
- Learning how to operate a camera to take photos and videos.
- Developing the skills associated with sequencing in unplugged activities.
- Following a basic set of instructions.
- Assembling instructions into a simple algorithm.
- Programming a floor robot to follow a planned route.
- Learning to debug instructions when things go wrong.
- Using programming language to explain how a floor robot works.
- Learning to debug an algorithm in an unplugged scenario.

Information Technology

- Taking and editing photographs.

Digital Literacy

- N/A

Key Knowledge

- To understand the basic functions of a Bee-Bot.
- To know that you can use a camera/tablet to make simple videos.
- To know that algorithms move a Bee-Bot accurately to a chosen destination.

Key Stage One – Online Safety Unit

Computer Science

- N/A

Information Technology

- Recognising devices that are connected to the internet.
- Understanding that we are connected to others when using the internet.
- Understanding some of the ways we can use the internet.
- Recognising common uses of information technology, including beyond school

Digital Literacy

- When using the internet to search for images, learning what to do if they come across something online that worries them or makes them feel uncomfortable.
- Understanding how to interact safely with others online.
- Recognising how actions on the internet can affect others.
- To be able to recognise what a digital footprint is and how to be careful about what we "post".
- Identifying whether information is safe or unsafe to be shared online.
- Learning how to create a strong password.
- Learning to be respectful of others when sharing online and ask for their permission before sharing content.
- Learning strategies for checking if something they read online is true.
- Understanding how to stay safe when talking to people online and what to do if they see or hear something online that makes them feel upset or uncomfortable.

Key Knowledge

- To know that the internet is many devices connected to one another.
- To know what to do if you feel unsafe or worried online - tell a trusted adult.
- To know that people you do not know on the internet (online) are strangers and are not always who they say they are
- To know that to stay safe online it is important to keep personal information safe

- To know that 'sharing' online means giving something specific to someone else via the internet and 'posting' online means placing information on the internet.
- To understand the difference between online and offline.
- To understand what information, I should not post online.
- To know what the techniques are for creating a strong password.
- To know that you should ask permission from others before sharing about them online and that they have the right to say 'no.'
- To understand that not everything I see or read online is true.

Lower Key Stage Two – Autumn Term – Creating Media – Website Design

Computer Science

- N/A

Information Technology

- Building a web page and creating content for it.
- Designing and creating a webpage for a given purpose.
- Using software to work collaboratively with others.

Digital Literacy

- N/A

Key Knowledge

- To know that a website is a collection of pages that are all connected.
- To know that websites usually have a homepage and subpages as well as clickable links to new pages, called hyperlinks.
- To know that websites should be informative and interactive.

Lower Key Stage Two – Autumn Term – Programming Scratch

Computer Science

- Using decomposition to explore the code behind an animation.
- Using repetition in programs.
- Using logical reasoning to explain how simple algorithms work.
- Explaining the purpose of an algorithm.
- Forming algorithms independently
- Using logical thinking to explore more complex software; predicting, testing and explaining what it does.
- Incorporating loops to make code more efficient
- Continuing existing code
- Making reasonable suggestions for how to debug their own and others' code.

Information Technology

- N/A

Digital Literacy

- N/A

Key Knowledge

- To know that Scratch is a programming language and some of its basic functions.
- To understand how to use loops to improve programming.
- To understand how decomposition is used in programming.
- To understand that you can remix and adapt existing code.

Lower Key Stage Two – Spring Term – Journey Inside a Computer

Computer Science

- Understanding what the different components of a computer do and how they work together.
- Drawing comparisons across different types of computers
- Using decomposition to explain the parts of a laptop computer
- Explaining the purpose of an algorithm.

Information Technology

- N/A

Digital Literacy

- N/A

Key Knowledge

- To know the roles that inputs and outputs play on computers.
- To know what some of the different components inside a computer are e.g. CPU, RAM, hard drive, and how they work together.
- To know what a tablet is and how it is different from a laptop/desktop computer.

Lower Key Stage Two – Spring Term – Networks and the Internet

Computer Science

- Learning about the purpose of routers.
- Understanding the role of the key components of a network.
- Understanding that websites & videos are files that are shared from one computer to another.
- Learning about the role of packets.
- Understanding how networks work and their purpose.
- Identifying the key components within a network, including whether they are wired or wireless.
- Recognising links between networks and the internet.
- Learning how data is transferred.

Information Technology

- N/A

Digital Literacy

- N/A

Key Knowledge

- To understand what a network is and how a school network might be organised.
- To know that a server is central to a network and responds to requests made.
- To know how the internet uses networks to share files.
- To know that a router connects us to the internet.
- To know what a packet is and why it is important for website data transfer.

Lower Key Stage Two – Summer Term – Investigating Weather

Computer Science

- Using tablets or digital cameras to film a weather forecast.
- Understanding that weather stations use sensors to gather and record data which predicts the weather.

Information Technology

- Using keywords to effectively search for information on the internet
- Searching the internet for data
- Designing a device which gathers and records sensor data.
- Recording data in a spreadsheet independently.
- Sorting data in a spreadsheet to compare using the 'sort by...' option.
- Understanding that data is used to forecast weather.

Digital Literacy

- N/A

Key Knowledge

- To know that computers can use different forms of input to sense the world around them so that they can record and respond to data ('sensor data').
- To know that a weather machine is an automated machine that respond to sensor data.
- To understand that weather forecasters use specific language, expression and pre-prepared scripts to help create weather forecast films.

Lower Key Stage Two – Summer Term – Further Programming Scratch

Computer Science

- Using decomposition to solve a problem by finding out what code was used.
- Using decomposition to understand the purpose of a script of code.
- Creating algorithms for a specific purpose.
- Coding a simple game.
- Incorporating variables to make code more efficient.
- Remixing existing code.

Information Technology

- N/A

Digital Literacy

- N/A

Key Knowledge

- To understand that a variable is a value that can change (depending on conditions) and know that you can create them in Scratch.
- To know what a conditional statement is in programming.
- To understand that variables can help you to create a quiz on Scratch.

Lower Key Stage Two – Online Safety Unit

Computer Science

- N/A

Information Technology

- Recognising how social media platforms are used to interact
- Understanding why some results come before others when searching.
- Understanding that information found by searching the internet is not all grounded in fact.

Digital Literacy

- Learning to make judgements about the accuracy of online searches.
- Identifying forms of advertising online
- Reflecting on the positives and negatives of time online.
- Identifying respectful and disrespectful online behaviour.
- Recognising that information on the Internet might not be true or correct and that some sources are more trustworthy than others.

Key Knowledge

- To know that not everything on the internet is true: people share facts, beliefs and opinions online
- To understand that the internet can affect your moods and feelings.
- To know that privacy settings limit who can access your important personal information such as your name, age, gender etc
- To know what social media is and that age restrictions apply.
- To understand some of the methods used to encourage people to buy things online
- To understand that technology can be designed to act like or impersonate living things.
- To understand that technology can be a distraction and identify when someone might need to limit the amount of time spent using technology
- To understand what behaviours are appropriate in order to stay safe and be respectful online.

Year 5 – Autumn Term – Search Engines

Computer Science

- N/A

Information Technology

- Developing searching skills to help find relevant information on the internet.
- Learning how to use search engines effectively to find information, focussing on keyword searches and evaluating search returns.
- Learn about different forms of communication that have developed with the use of technology.

Digital Literacy

- Recognising that information on the Internet might not be true or correct and learning ways of checking validity

Key Knowledge

- To know how search engines work.
- To understand that anyone can create a website and therefore we should take steps to check the validity of websites.
- To know that web crawlers are computer programs that crawl through the internet.
- To understand what copyright is.

Year 5 – Spring Term – Stop Motion Animation

Computer Science

- Decomposing animations into a series of images.
- Decomposing a story to be able to plan a program to tell a story.

Information Technology

- Using video editing software to animate.

Digital Literacy

- N/A

Key Knowledge

- To know that decomposition of an idea is important when creating stop-motion animations
- To understand that stop motion animation is an animation filmed one frame at a time using models, and with tiny changes between each photograph
- To know that editing is an important feature of making and improving a stop motion animation.

Year 5 – Summer Term – Programming Music - Scratch

Computer Science

- Predicting how software will work based on previous experience.
- Writing more complex algorithms for a purpose.
- Iterating and developing their programming as they work.
- Confidently using loops in their programming.
- Using a more systematic approach to debugging code, justifying what is wrong and how it can be corrected.
- Writing code to create a desired effect.
- Using a range of programming commands.
- Using repetition within a program
- Amending code within a live scenario.

Information Technology

- Using logical thinking to explore software more independently, making predictions based on their previous experience.
- Using a software programme (Sonic Pi/Scratch) to create music
- Identify ways to improve and edit programs, videos, images etc.

Digital Literacy

- N/A

Key Knowledge

- To know that a soundtrack is music for a film/video and that one way of composing these is on programming software.
- To understand that using loops can make the process of writing music simpler and more effective.
- To know how to adapt their music while performing.

Year 5 – Online Safety Unit

Computer Science

- N/A

Information Technology

- N/A

Digital Literacy

- Identifying possible dangers online and learning how to stay safe
- Evaluating the pros and cons of online communication.
- Recognising that information on the Internet might not be true or correct and learning ways of checking validity
- Learning what to do if they experience bullying online.
- Learning to use an online community safely

Key Knowledge

- To know different ways, we can communicate online.
- To understand how online information can be used to form judgements
- To understand some ways to deal with online bullying.
- To know that apps require permission to access private information and that you can alter the permissions.
- To know where I can go for support if I am being bullied online or feel that my health is being affected by time online.

Year 6 – Autumn Term – Bletchley Park

Computer Science

- Learning about the history of computers and how they have evolved over time.
- Using past experiences to help solve new problems.
- Writing increasingly complex algorithms for a purpose
- Debugging quickly and effectively to make a program more efficient.
- Remixing existing code to explore a problem.
- Changing a program to personalise it.
- Evaluating code to understand its purpose.
- Predicting code and adapting it to a chosen purpose.

Information Technology

- Using search and word processing skills to create a presentation.
- Understanding how search engines work.

Digital Literacy

- Understanding the importance of secure passwords and how to create them
- Using search engines safely and effectively

Key Knowledge

- To understand the importance of having a secure password and what "brute force hacking" is.
- To know that the first computers were created at Bletchley Park to crack the Enigma code to help the war effort in World War 2
- To know about some of the historical figures that contributed to technological advances in computing.
- To understand what techniques are required to create a presentation using appropriate software

Year 6 – Spring Term – History of Computers (Bletchley Park 2)

Computer Science

- Learning about the history of computers and how they have evolved over time.
- Using the understanding of historic computers to design a computer of the future

Information Technology

- Using search and word processing skills to create a presentation.
- Planning, recording and editing a radio play.
- Creating and editing sound recordings for a specific purpose.

Digital Literacy

- N/A

Key Knowledge

- To know that radio plays are plays where the audience can only hear the action so sound effects are important.
- To know that sound clips can be recorded using sound recording software.
- To know that sound clips can be edited and trimmed.

Year 6 – Summer Term – Skills Showcase

Computer Science

- Using past experiences to help solve new problems.
- Writing increasingly complex algorithms for a purpose.
- Debugging quickly and effectively to make a program more efficient.
- Remixing existing code to explore a problem.
- Changing a program to personalise it.
- Evaluating code to understand its purpose.
- Predicting code and adapting it to a chosen purpose.

Information Technology

- Using logical thinking to explore software independently, iterating ideas and testing continuously.
- Creating and editing videos, adding multiple elements: music, voiceover, sound, text and transitions.
- Using design software TinkerCAD to design a product.
- Creating a website with embedded links and multiple pages.
- Understanding how search engines work.

Digital Literacy

- Using search engines safely and effectively.

Key Knowledge

- To know what designing an electronic product involves.
- To know which programming software/ language is best to achieve a purpose
- To know the building blocks of computational thinking e.g. sequence, selection, repetition, variables and inputs and outputs

Year 6 – Online Safety Unit

Computer Science

- N/A

Information Technology

- N/A

Digital Literacy

- Learning about the positive and negative impacts of sharing online
- Learning strategies to create a positive online reputation.
- Understanding the importance of secure passwords and how to create them
- Learning strategies to capture evidence of online bullying in order to seek help.
- Recognising that updated software can help to prevent data corruption and hacking

Key Knowledge

- To know that a digital footprint means the information that exists on the internet as a result of a person's online activity
- To know what steps are required to capture bullying content as evidence
- To understand that it is important to manage personal passwords effectively.
- To understand what it means to have a positive online reputation
- To know some common online scams