

Computing Curriculum Progression

Implementation

- All pupils have a discrete Computing lesson weekly, delivered by the class teacher using the Teach Computing curriculum. A rolling
 programme devised by the Computing Lead is followed, with each year comprising of units covering the areas of Computing Systems
 and Networks, Creating Media, Data and Information and Programming, with E-Safety woven within this.
- All children have their own Google Drive accounts which begin in EYFS, and stay with them for their learning journey at Cockwood. This account is used to store learning online, access homework from home and to use Google Classroom for online communicating with their class.
- All children across the school have access to Chromebooks, iPads, Microbits and Crumbles for their Computing lessons, with all children actively engaging with these new technologies.
- Our school Digital Leaders meet weekly with STEM ambassador Paula Taylor to be upskilled with technologies such as Microbits and Raspberry Pis. They then use these new skills to teach their friends and lead sessions with Key Stage 2 pupils.
- We have a school blog which is becoming more popular, and is used by pupils to share their school learning whilst honing their skills of creating digitally and uploading content. The blog can be contributed to by any child.
- Computational thinking is promoted greatly throughout our curriculum, with each lesson beginning with a 'BEBRAS' challenge card, which utilises problem solving skills, logical reasoning and computational thinking.
- We actively engage with Coran Coding workshops, Code-a-longs, and Google Internet Legends resources, whilst implementing Barefoot Computing resources where appropriate.

Meeting the needs of all children

- All children have a discrete Computing lesson weekly, where they have hands-on computing experience, whilst learning about the skills and concepts behind this.
- All pupils, regardless of background, socioeconomic status, gender and ethnicity, have access to a wealth of resources and are expected to engage with Computing lessons weekly
- Teachers are aware of the abilities of children within their class, and lessons always begin with an appropriate starting point for their pupils. Lessons use small steps of learning to ensure full understanding.
- Teaching assistant support is used to help those who may struggle with using physical technology, and those that are Gifted and Talented are able to join our Digital Leaders and Code Club to extend their repertoire and understanding.
- During Lockdown, we allowed families to borrow technology in order to ensure that children could access their learning from home

Resources

- We use the Teach Computing curriculum for our Computing lessons, spread across a 3 year rolling programme. Across this 3 year rolling programme, children experience all the vital components of Computing across the year groups.
- We have 2 class sets of iPads, a number of Chromebooks, Microbits, Crumbles and a data logger.
- Paula Taylor, STEM Ambassador, who visits our Digital Leaders weekly
- School blog on the platform edublogs.
- Coran Coding workshops, Google Internet Legends Assemblies and resources, Barefoot resources
- BEBRAs challenge cards

| | Computing Systems and Networks | Creating Media | Data and Information | Programming | Computational Thinking |
|--------|---|---|---|--|---|
| Year 1 | To identify technology To identify a computer and its main parts To use a mouse in different ways To use a keyboard to type To use the keyboard to edit text To create rules for using technology responsibly | To describe what different freehand tools do To use the shape tool and the line tools To make careful choices when painting a digital picture To explain why I chose the tools I used | Grouping data To label objects To identify that objects can be counted To describe objects in different ways To count objects with the same properties To compare groups of objects To answer questions about groups of objects | To explain what a given command will do To act out a given word To combine forwards and backwards commands to make a sequence To combine four direction commands to make sequences | I can debug simple algorithms I understand that algorithms are implemented as programs on digital devices |

| Year 2 | Information technology | Digital photography | Pictograms | Robot algorithms | • I can write algorithms for |
|--------|---------------------------|-----------------------------|--------------------------------|----------------------------------|---|
| | around us | To know what devices can | To recognise that we can | To describe a series of | everyday tasks |
| | To recognise the uses and | be used to take | count and compare objects | instructions as a sequence | I can use logical reasoning |
| | features of information | photographs | using tally charts | To explain what happens when | to predict the outcome of |
| | technology | To use a digital device to | To recognise that objects can | we change the order of | algorithms |
| | To identify information | take a photograph | be represented as pictures | instructions | • I understand |
| | technology in the home | To describe what makes a | To create a pictogram | To use logical reasoning to | decomposition is breaking |
| | To identify information | good photograph | To select objects by attribute | predict the outcome of a program | objects/processes down |
| | technology beyond school | To decide how photographs | and make comparisons | (series of commands) | • I can implement simple |
| | To explain how | can be improved | To recognise that people can | To explain that programming | algorithms on digital |
| | information technology | To use tools to change an | be described by attributes | projects can have code and | devices (Bee Bots, Apps: |
| | benefits us To show how | image | To explain that we can present | artwork | Daisy the Dino) |
| | to use information | To recognise that images | information using a computer | To design an algorithm | • I can debug algorithms |
| | technology safely | can be changed | | To create and debug a program | |
| | To recognise that choices | | | that I have written | |
| | are made when using | Making music | | | |
| | information technology | To say how music can make | | Introduction to quizzes | |
| | | us feel | | To explain that a sequence of | |
| | | To identify that there are | | commands has a start | |
| | | patterns in music | | To explain that a sequence of | |
| | | To describe how music can | | commands has an outcome | |
| | | be used in different ways | | To create a program using a | |
| | | To show how music is | | given design | |
| | | made from a series of | | To change a given design | |
| | | notes To create music for a | | To create a program using my | |
| | | purpose | | own design To decide how my | |
| | | To review and refine our | | project can be improved | |
| | | computer work | | | |

| Year 3 | Connecting computers | Stop-frame animation | Branching databases | Sequence in music | • I can create algorithms for |
|--------|---------------------------|---|-----------------------------------|-------------------------------------|---------------------------------|
| | | To explain that animation is | | To explore a new programming | use when programming |
| | devices function | a sequence of drawings or | yes/no answers | environment | • I can decompose tasks |
| | To identify input and | photographs | To identify the object attributes | I can identify that each sprite is | (such as animations) into |
| | output devices | To relate animated | needed to collect relevant | controlled by the commands I | separate steps to create an |
| | To recognise how digital | movement with a sequence | data | choose | algorithm |
| | devices can change the | of images | To create a branching | To explain that a program has a | • I understand abstraction is |
| | way we work | 1 · · · · · · · · · · · · · · · · · · · | | start | focusing on important |
| | To explain how a | To identify the need to work | | 1 5 1 | information |
| | computer network can be | | | | • I can identify patterns in an |
| | used to share information | | | To change the appearance of my | |
| | | | | project To create a project from a | repetition in algorithms |
| | | | | task description | |
| | | , • | To compare the information | | |
| | , , | | 1 | Events and actions | |
| | components of a network | | branching database | To explain how a sprite moves in | |
| | | Desktop publishing | | an existing project | |
| | | To recognise how text and | | To create a program to move a | |
| | | images convey information | | sprite in four directions | |
| | | To recognise that text and | | To adapt a program to a new | |
| | | layout can be edited | | context | |
| | | To choose appropriate page | | To develop my program by | |
| | | settings | | adding features To identify and fix | |
| | | To add content to a desktop | | bugs in a program | |
| | | publishing publication | | To design and create a | |
| | | To consider how different | | maze-based challenge | |
| | | layouts can suit different | | | |
| | | purposes | | | |
| | | To consider the benefits of | | | |
| | | desktop publishing | | | |

| Year 4 | The internet |
|--------|-------------------------|
| | To describe how networ |
| | physically connect to |
| | other networks |
| | To recognise how |
| | networked devices make |
| | up the internet |
| | To outline how websites |
| | can be shared via the |
| | World Wide Web |
| | To describe how conten |
| | can be added and |
| | accessed on the World |
| | Wide Web |
| | To recognise how the |
| | content of the WWW is |
| | created by people |
| | To evaluate the |
| | consequences of |
| | unreliable content |
| | |
| | |

Audio editina

rks To identify that sound can be digitally recorded To use a digital device to record sound te To explain that a digital To explain that audio can be collects 'data points' from changed through editing nt of audio can be combined and played together To evaluate editing choices data needed to answer made

Photo editing

To explain that digital images can be changed To change the composition of an image To describe how images can be changed for different uses To make good choices when selecting different tools To recognise that not all images are real To evaluate how changes can improve an image

Data logging

To explain that data gathered lover time can be used to lanswer questions To use a digital device to collect data automatically recording is stored as a file To explain that a data logger lsensors over time To show that different types To use data collected over a long duration to find information To identify the lauestions To use collected data to answer questions

Repetition in shapes

To identify that accuracy in programming is important To create a program in a text-based language To explain what 'repeat' means To modify a count-controlled loop • I can use simple selection to produce a given outcome To decompose a program into lparts To create a program that uses

count-controlled loops to produce

Repetition in games

la given outcome

To develop the use of count-controlled loops in a different programming lenvironment To explain that in programming there are infinite loops and count controlled loops To develop a design which lincludes two or more loops which run at the same time To modify an infinite loop in a given program To design a project that includes repetition To create a project that includes repetition

- I can use abstraction to focus on what's important in my design
- I can write increasingly more precise algorithms for use when programming.
- in algorithms
- I can use logical reasoning to detect and correct errors in programs

| Yea | ar 5 | Sharing information To explain that computers can be connected together to form systems To recognise the role of computer systems in our lives To recognise how information is transferred over the internet To explain how sharing information online lets people in different places work together To contribute to a shared project online To evaluate different ways of working together online |
|-----|------|---|
| | | l |

Video editina To recognise video as moving pictures, which can information include audio To identify digital devices that can record video To capture video using a digital device an effective video To identify that video can be To explain that computer improved through reshooting and editing To consider the impact of the choices made when making and sharing a video real-world questions Vector drawing

To identify that drawing tools can be used to broduce different outcomes To create a vector drawing by combining shapes To use tools to achieve a desired effect To recognise that vector drawings consist of layers To group objects to make them easier to work with To evaluate my vector drawing

Flat-file databases To use a form to record To compare paper and computer-based databases To outline how grouping and then sorting data allows us to lanswer questions To recognise the features of To explain that tools can be lused to select specific data programs can be used to compare data visually To apply my knowledge of a database to ask and answer

Selection in physical computing To control a simple circuit

connected to a computer To write a program that includes count-controlled loops To explain that a loop can stop lwhen a condition is met. eq Inumber of times To conclude that a loop can be lused to repeatedly check whether algorithms work la condition has been met To design a physical project that includes selection To create a controllable system Ithat includes selection

Selection in games

To explain how selection is used in computer programs To relate that a conditional Istatement connects a condition lto an outcome To explain how selection directs the flow of a program To design a program which uses selection To create a program which uses selection To evaluate my program

- I can solve problems by decomposing them into smaller parts
- I can use selection in algorithms
- I can recognise the need for conditions in repetition within algorithms
- I can use logical reasoning to explain how a variety of
- I can use logical reasoning to detect and correct errors in algorithms
- I can evaluate my work and identify errors

Year 6 Communication

To identify how to use a search engine To describe how search engines select results To describe how search lenaines select results To explain how search results are ranked To recognise why the order of results is important, and to whom To recognise how we communicate using technology To evaluate different methods of lonline communication

Web page creation

To review an existing website and consider its structure To plan the features of a web page To consider the ownership and use of images (copyright) To recognise the need to preview pages To outline the need for a navigation path To recognise the implications of linking to content owned by other people

3D modelling

To use a computer to create and manipulate threedimensional (3D) digital obiects To compare working digitally with 2D and 3D graphics To construct a digital 3D model of a physical object To identify that physical objects can be broken down into a collection of 3D shapes To design a digital model by combining 3D objects To develop and improve a

Spreadsheets

To identify guestions which can be answered using data described using data To explain that formula can be To choose how to improve a used to produce calculated ldata To apply formulas to data, including duplicating To create a spreadsheet to lplan an event To choose suitable ways to lpresent data

Variables in games

To define a 'variable' as something that is changeable To explain that objects can be To explain why a variable is used |• I can write precise in a program game by using variables To design a project that builds on a given example To use my design to create a project To evaluate my project

Sensina

To create a program to run on a controllable device To explain that selection can control the flow of a program To update a variable with a user input To use an conditional statement to compare a variable to a value To design a project that uses inputs and outputs on a controllable device To develop a program to use inputs and outputs on a controllable device

- I can recognise, and make use, of patterns across programming projects algorithms for use when
- programming • I can identify variables needed and their use in selection and repetition
- I can decompose code into sections for effective debugging
- I can critically evaluate my work and suggest improvements

digital 3D model

<u>Digital Literacy/ E-Safety Objectives from 'Education for a Connected World' at Cockwood School</u>

| | Self Image and Identity | Online Relationships | Online Reputation | Online Bullying | Managing Online Information | Health, Well-being and Lifestyle |
|--------|--|--|---|---|--|--|
| EYFS | • I can recognise that I can say 'no' / 'please stop' / 'I'll tell' / 'I'll ask' to somebody who asks me to do something that makes me feel sad, embarrassed or upset. • I can explain how this could be either in real life or online | I can recognise some ways in which the internet can be used to communicate I can give examples of how I (might) use technology to communicate with people I know | I can identify ways that I can put information on the internet. | I can describe ways that some people can be unkind online. I can offer examples of how this can make others feel. | I can talk about how I can use the internet to find things out. I can identify devices I could use to access information on the internet. I can give simple examples of how to find information (e.g. search engine, voice activated searching). | I can identify rules that help keep us safe and healthy in and beyond the home when using technology. I can give some simple examples. |
| Year 1 | I can recognise that there may be people online who could make me feel sad, embarrassed or upset. If something | • I can use the internet with adult support to communicate with people I know. • I can explain why it is important to be considerate | I can recognise that information can stay online and could be copied. I can describe what information I should not put | • I can describe how to behave online in ways that do not upset others and can give examples. | I can use the internet to find things out. I can use simple keywords in search engines I can describe and demonstrate | • I can explain rules to keep us safe when we are using technology both in and beyond the home. • I can give examples of |

| | happens that makes me feel sad, worried, uncomfortable or frightened I can give examples of when and how to speak to an adult I can trust | and kind to people online. | online without asking a trusted adult first | | how to get help from a trusted adult or helpline if I find content that makes me feel sad, uncomfortable worried or frightened. | some of these rules. |
|--------|---|--|---|---|---|---|
| Year 2 | I can explain how other people's identity online can be different to their identity in real life. I can describe ways in which people might make themselves look different online. I can give examples of issues online that might make me feel sad, worried, uncomfortable or frightened; I can give examples of how I might get help. | I can use the internet to communicate with people I don't know well (e.g. email a penpal in another school/country). I can give examples of how I might use technology to communicate with others I don't know well. | • I can explain how information put online about me can last for a long time. • I know who to talk to if I think someone has made a mistake about putting something online. | I can give examples of bullying behaviour and how it could look online. I understand how bullying can make someone feel. I can talk about how someone can/would get help about being bullied online or offline. | I can use keywords in search engines. I can demonstrate how to navigate a simple webpage to get to information I need (e.g. home, forward, back buttons; links, tabs and sections). I can explain what voice activated searching is and how it might be used (e.g. Alexa, Google Now, Siri). I can explain the difference | I can explain simple guidance for using technology in different environments and settings. I can say how those rules/guides can help me |

| | | | | | between things that are imaginary, 'made up' or 'make believe' and things that are 'true' or 'real'. I can explain why some information I find online may not be true. | |
|--------|---|--|--|---|--|---|
| Year 3 | I can explain what is meant by the term 'identity'. I can explain how I can represent myself in different ways online. I can explain ways in which and why I might change my identity depending on what I am doing online (e.g. gaming; using an avatar; social media). | I can describe ways people who have similar likes and interests can get together online. I can give examples of technology-specific forms of communication (e.g. emojis, acronyms, text speak). I can explain some risks of communicating online with others I don't know well. I can explain how my and other | I can search for information about myself online. I can recognise I need to be careful before I share anything about myself or others online. I know who I should ask if I am not sure if I should put something online. | I can explain what bullying is and can describe how people may bully others. I can describe rules about how to behave online and how I follow them. | I can use key phrases in search engines. I can explain what autocomplete is and how to choose the best suggestion. I can explain how the internet can be used to sell and buy things I can explain the difference between a 'belief', an 'opinion' and a 'fact'. | • I can explain why spending too much time using technology can sometimes have a negative impact on me; I can give some examples of activities where it is easy to spend a lot of time engaged (e.g. games, films, videos). |

| people's feelings |
|---|
| can be hurt by |
| what is said or |
| written online. |
| • I can explain |
| |
| why I should be |
| careful who I trust |
| online and what |
| information I can |
| trust them with. I |
| can explain why I |
| can take back my |
| trust in someone |
| or something if I |
| feel nervous, |
| uncomfortable or |
| worried. |
| • I can explain |
| what it means to |
| 'know someone' |
| online and why |
| this might be the state of the |
| different from |
| knowing |
| someone in real |
| life. I can explain |
| what is meant by |
| 'trusting someone |
| online'. I can |
| explain why this |
| is different from |
| 'liking someone |
| online'. |
| Stilling. |

| h ii c ii h c r a ii c | I can explain how my online identity can be different to the identity I present in 'real life'. Knowing this, I can describe the right decisions about how I interact with others and how others perceive me. | • I can describe strategies for safe and fun experiences in a range of online social environments • I can give examples of how to be respectful to others online. | I can describe how others can find out information about me by looking online. I can explain ways that some of the information about me online could have been created, copied or shared by others. | I can identify some online technologies where bullying might take place. I can describe ways people can be bullied through a range of media (e.g. image, video, text, chat). I can explain why I need to think carefully about how content I post might affect others, their feelings and how it may affect how others feel about them (their reputation). | I can analyse information and differentiate between 'opinions', 'beliefs' and 'facts'. I understand what criteria have to be met before something is a 'fact'. I can describe how I can search for information within a wide group of technologies (e.g. social media, image sites, video sites). I can describe some of the methods used to encourage people to buy things online (e.g. advertising offers; in-app purchases, pop-ups) and can recognise some of these when they appear | I can explain how using technology can distract me from other things I might do or should be doing. I can identify times or situations when I might need to limit the amount of time I use technology. I can suggest strategies to help me limit this time. |
|---|---|---|---|--|--|---|
|---|---|---|---|--|--|---|

| | | | | | I can explain that some people I 'meet online' (e.g. through social media) may be computer programmes pretending to be real people. I can explain why lots of people sharing the same opinions or beliefs online does not make those opinions or beliefs true. | |
|--------|---|---|---|--|--|---|
| Year 5 | I can explain how identity online can be copied, modified or altered. I can demonstrate responsible choices about my online identity, depending on context. | I can explain that there are some people I communicate with online who may want to do me or my friends harm. I can recognise that this is not my/our fault. I can make positive contributions and be part of online communities. I can describe | I can search for information about an individual online and create a summary report of the information I find. I can describe ways that information about people online can be used by others to make judgments about an individual. | I can recognise when someone is upset, hurt or angry online. I can describe how to get help for someone that is being bullied online and assess when I need to do or say something or tell someone. I can explain how to block abusive users. I can explain | I can use different search technologies. I can evaluate digital content and can explain how I make choices from search results. I can explain key concepts including: data, information, fact, opinion belief, true, false, valid, reliable and | I can describe ways technology can affect healthy sleep and can describe some of the issues. I can describe some strategies, tips or advice to promote healthy sleep with regards to technology |

| anything online. • I can explain why some |
|--|
|--|

| | | | | | information I find online may not be honest, accurate or legal. • I can explain why information that is on a large number of sites may still be inaccurate or untrue. I can assess how this might happen (e.g. the sharing of misinformation either by accident or on purpose). | |
|--------|---|---|---|--|--|---|
| Year 6 | I can describe ways in which media can shape ideas about gender. I can identify messages about gender roles and make judgements based on them. I can challenge and explain why it is important to reject inappropriate messages about | I can show I understand my responsibilities for the well-being of others in my online social group. I can explain how impulsive and rash communications online may cause problems (e.g. flaming, content produced in live streaming). | I can explain how I am developing an online reputation which will allow other people to form an opinion of me. I can describe some simple ways that help build a positive online reputation | I can describe how to capture bullying content as evidence (e.g screen-grab, URL, profile) to share with others who can help me. I can identify a range of ways to report concerns both in school and at home about online bullying. | • I can use search technologies effectively. • I can explain how search engines work and how results are selected and ranked. • I can demonstrate the strategies I would apply to be discerning in evaluating digital content. | I can describe common systems that regulate age-related content (e.g. PEGI, BBFC, parental warnings) and describe their purpose. I can assess and action different strategies to limit the impact of technology on my |

| gender online. • I can describe issues online that might make me or others feel sad, worried, uncomfortable or frightened. I know and can give examples of how I might get help, both on and offline. • I can explain why I should keep asking until I get the help I need. | I can demonstrate how I would support others (including those who are having difficulties) online. I can demonstrate ways of reporting problems online for both myself and my friends. | | h in b cie • h si p a d iii 'n a a m th a 'a • d si e a e vi a w si in • fli | I can describe now some online of promation can be opinion and can offer examples. I can explain now and why some people may present 'opinions' as 'facts'. I can define the terms influence', manipulation' and explain how I might encounter these online (e.g. advertising and ad targeting'). I can demonstrate strategies to enable me to enalyse and evaluate the validity of 'facts' and I can explain why using these extrategies are important. I can identify, lag and report nappropriate | health (e.g. night shift mode, regular breaks, correct posture, sleep, diet and exercise). • I can explain the importance of self regulating my use of technology; I can demonstrate the strategies I use to do this (e.g. monitoring my time online, avoiding accidents). |
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| | l | 11 | |
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Assessing Computing

- Progress within Computing can be seen both within Computing knowledge, computational thinking and physical computing, and teachers assess all of these areas.
- Target Tracker is used to formally assess pupils against Computing objectives every term, and shows coverage and attainment
- Children use their Google Drive accounts on the Chromebooks to save any work their complete within their online files. This over time creates a bank of work that shows their progress over time. Children are also encouraged to print their work to keep and put within the Big Book of Computing
- Classes each have their own 'Big Book of Computing' which is used as a scrapbook of learning. This book shows the knowledge and content of each lesson, and provides children with a vehicle for reflection upon their learning and a collaborative space to share progress. Any work completed online can be printed and then kept in here, with children sharing their learning and the processes used to get to the end product.
- Teachers encourage pupils to work independently, which shows attainment and progress. Tinkering, trouble shooting and trial and error is incredibly promoted, and this success isn't necessarily defined by reaching the end point of a task. Teachers are aware of the processes involved, and take time to appreciate choices made and the computational thinking and complexity involved within the finished product.
- Oracy is promoted within Computing, and is used as a vehicle for computational thinking and logical reasoning, particularly when using the BEBRAs challenge cards. The way that children explore and explain the answers to these cards are noted by teachers, as they support the understanding each child has of computing processes.

Impact

Throughout our Computing provision, our aim is to prepare our children for the modern technical world, which has technologies that are evolving day by day. Through promoting problem solving, reasoning and tinkering, we are creating resilient students that are not afraid to approach complex problems and algorithms, knowing that there are several ways it can be approached. By giving the children opportunities to create digitally, whilst learning about computing systems, how to stay safe online and how to code successfully, we are creating robust learners who use digital technologies confidently and with purpose. Through regular and thorough teaching around online safety and the digital world, we aim to equip children with the tools needed to use the internet safely and responsibly, allowing them to reap the benefits of online tools without the worry of the unknown. We aim to inspire all children to consider roles within technology as they enter the adult world, with role models like STEM ambassadors proving that roles within this sector are plentiful and an integral part of our evolving society.