GREAT HEIGHTS ACADEMY TRUST

RAYNVILLE ACADEMY

Computing

This document outlines the expectations of how we teach and monitor the Computing curriculum at Raynville: progression across year groups and consistency across the school.

Teaching Computing at Raynville Academy

Computing Curriculum Statement

Through our computing curriculum at Raynville Academy, we aim to give our pupils the life-skills that will enable them to embrace and utilise new technology in a creative, as well as responsible and safe way. The technology of today's age is growing and changing at an incredibly fast pace, and it is essential that our pupils have the right to learning experiences that balance all aspects of Computing, to allow them to flourish.

As stated in the National Curriculum Computing programmes of study, having access to a strong computing education across EYFS, KS1 and KS2, will allow our pupils to "*use computational thinking and creativity to understand and change the world*" – at Raynville we take great pride in the world-changers that we are helping to create, and know that our students deserve the best start in navigating the technological world that we live in.

Intent

At Raynville, we believe that our pupils deserve to learn within a rich, inclusive and safe environment. Through a rich, engaging and modern Computing curriculum, we aim to help our students make healthy life choices while online as well as instilling positive personal and social attitudes, ensuring they have the skills and knowledge to enable them to achieve all the criteria of what we believe makes a successful digital citizen.

Communication is a key priority within all aspects of our curriculum, and this continues throughout computing – students are encouraged to work collaboratively with each other on projects such as pair programming, as well as utilizing peer instruction on tasks.

We consistently promite respect for ourselves, others and the environment through our e-safety work, and engage each year with Safer Internet Day. Annually, across the week where this falls, we ensure we create lots of opportunities for discussion, as well as providing the information our students need to become independent and reslient in their online lives.

What does teaching Computing look like in Raynville?

Pupils are introduced to a wide range of technology, including Beebots, ipads, laptops, interactive whiteboards, microbits and Crumble bots, to allow them to always be improving and developing their ideas and skills. The sequence of learning develops pupils' understanding of how digital technology and other computational systems are designed, programmed and operated. The use of our technology within school, helps provide a rich and inspiring curriculum, where our students are able to get "hands on".

We believe that Computing enhances our teaching and learning in many invaluable ways, and so we aim to use our computing skills in as many subjects as possible – such as History quizes through Kahoot or using ipads as a learning resource within phonics. We encourage our pupils to be creative, innovative, reslient and resourceful across all lessons – as we know that being critical thinkers will empower our students to become more digitally literate. We believe that when our students see computing skills being used across the entire curriculum, this enables them to gain confidence through effective modelling, as well as providing opportunities for further discussion.

E-Safety

For E-Safety, at Raynville we follow Project Evolve as a scheme. This scheme provides activities where young people aren't told what to do and what not to

do, but rather provides the right opportunity for discussion; prompted by appropriate questions accompanied by honest and useful information to shape thinking and challenge misconceptions.

The scheme is based on UKCIS framework "Education for a Connected World" (EFACW), and covers knowledge, skills, behaviours and attitudes across eight strands of our online lives, from EYFS through to KS2. These outcomes or competencies are mapped to age and are progressive in nature.

This occurs as planned focuses throughout the academic year, particularly around Safer Internet Day each February. During the school year, children are routinely taught and reminded about good practise whenever appropriate across the curriculum, and when there are any issues that arise during the school year related to e-safety (such as a new trend that may be harmful in nature), teachers respond to this accordingly. This ensures that the inclusive and safe environment which we instill throughout the school feeds into our students' online lives, enabling them to make positive and healthy life choices.

Around Safer Internet Day, we will also be inviting parents in for an Open Evening around E-Safety, to ensure that our children are safe online, giving parents the tools to properly monitor and protect their children's online activities. This has been delayed due to COVID-19, but will occur as soon as it is safe and healthy to do so.

Digital Leaders

Launching in 2022, we will be introducing our first Digital Leaders. These are elected students in years 5 and 6, who will assist and promote other students to become successful digital citizens. Some of their duties will include helping KS1 logging into computers during their lessons, gathering equipment and assisting teachers in setting up, helping to run our E-Safety Open Evening, and helping other students become excited about our computing curriculum, enhancing it further through the use of pupil voice.

Evidencing

Evidence for Computing will be gathered through the use of Seesaw. This is a programme that students are very comfortable with, after having used it during Lockdowns. This allows students to learn how to save and upload their work right from KS1, developing the important skills needed to work in a technological advanced society. It also allows students to add voice notes to

their work, ensuring that even those who may struggle with other subjects have access to a fair and inclusive computing curriculum.

The school target tracker will be used to monitor progress on a termly bases. This should also be used to address gaps in learning, and to inform future planning.

Pupil interviews will be conducted throughout the year, particularly in the lead up to E-Safety week, to ensure that teaching and learning is informed by our students, and has our students at the heart of everything we do.

Marking and Feedback is quick and easy through Seesaw, which allows teachers to add comments, assess their learning, and also allows students to respond to their comment to further their learning.

Differentiation

Within the 12 core princibles of teaching Computing, which is evident throughout our Computing scheme, differentiation is built in at various stages of the lesson, and ensures that students are supported, engaged and challenged appropriately. Within a lesson, differentiation may be seen through having individual learning outcomes or tasks, to ensure that all students make progress at their level, and those who struggle are appropriately supported and guided.

Additional timing is also provided throughout the lesson to those students who need it, while ensuring that pupuls are focuses and remained on task.

We also make use of collaborative differentiation, as working collaboratively is one of the core strands that run through our curriculum. This allows students to shine through supporting their classmates, but also ensuring that their areas of weakness are supported and developed.

To help provide this, our scheme of work for 2021-2022 uses DFE funded Teach Computing (https://teachcomputing.org) which has been customised for schools to include relevent digital and learning resources.

Through the NCCE scheme, our computing curriculum is underpinned by the 12 principles of Computing Pedagogy:

- Leading with concepts – supporting pupils in the acquisition of knowledge throigh the use of key concepts, terms and vocabulary

- Unplug, unpack, repack – teaching new concepts by first unpacking complex terms and ideas, exploring these in unplugged and familiar contexts, then repacking this new understanding into the original concept
- Creating projects – using project-based learning activities to provide pupils with the opportunity to apply and consolidate their knowledge and understanding
- Challenging misconceptions – using formative questioning to uncover misconceptions and adapting teaching to address them as the occur
- Careful structuring of lessons – using supportive frameworks when planning lessons such as PRIMM (Predict, Run, Investigate, Modify, Make) and Use-Modify-Create
- Working together – encouraging collaboration, specifically using pair programming and peer instruction, as well as structured group tasks.
- Modeling everything – teachers use modeling to show new processes or practises – from debugging vode to binary number conversions.
- Adding variety – providing activities with different levels of direction, scaffolding and support which promotes active learning
- Making it concrete – bringing abstract concepts to life with real-world, contextual examples and a focus on interdependencies with other curriculum subjects.
- Reading and exploring code first – when teaching programming, teachers focus first on code "reading" activities, before code writing.
- Getting hands-on – using physical computing and offering activities that provide tactile and sensory experiences in order to enhance learning, such as through exploratory projects
- Fostering program comprehension – using a variety of activities to consolodidate knowledge and understanding of the function and structure of programs, such as debugging, tracting etc.

With these 12 core princibles interwoven throughout our curriculum, we aim to inspire our pupils to become successful digital citizens – equipped with the skills they need, as well as the resilience and drive to learn more as technology continually and rapidly adapts.

Progression of Computing skills throughout the school

EYFS

While the EYFS framework does not have an explicit computing strand within it, at Raynville we know the importance of building a strong foundation at an early age. The most relevant statements for computing are taken from the following areas of learning:

- Personal, Social and Emotional Development
- Physical Development
- Understanding the World
- Expressive Arts and Design

Computing			
Three and Four-Year-Olds	Personal, Social and Emotional Development		• Remember rules without needing an adult to remind them.
	Physical Development		• Match their developing physical skills to tasks and activities in the setting.
	Understanding the World		• Explore how things work.
Reception	Personal, Social and Emotional Development		• Show resilience and perseverance in the face of a challenge. • Know and talk about the different factors that support their overall health and wellbeing: - sensible amounts of 'screen time'.
	Physical Development		• Develop their small motor skills so that they can use a range of tools competently, safely and confidently.
	Understanding the world		• The 'Technology' strand has been removed, though it is still expected that children will be introduced to appropriate technology and use it within their provision. • Look at images of familiar situations in the past, such as homes, schools, and transport. Talk about experiences that are familiar to them and how these may have differed in the past.
	Expressive Arts and Design		• Explore, use and refine a variety of artistic effects to express their ideas and feelings.
ELG	Personal, Social and Emotional Development	Managing Self	• Be confident to try new activities and show independence, resilience and perseverance in the face of challenge. • Explain the reasons for rules, know right from wrong and try to behave accordingly.
	Expressive Arts and Design	Creating with Materials	• Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.

Key Stage 1 and 2

Our curriculum for KS1 and 2 are based on a spiral curriculum. This means that each of the themes are revisited regularly (at least once in each year group),

and pupils revisit each theme through a new unit that consolidates and builds on prior learning within that theme.

This style of curriculum design reduces the amount of knowledge lost through forgetting, as the topics are revisited yearly. It also ensures that connections are made even if different teachers are teaching the units.

The progression of these skills throughout the school years can be seen in the table below.

Computing Systems and Networks	
Year 1	**Technology around us** 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
Year 2	**Information technology around us** To recognise the uses and features of information technology To identify information technology in the home To identify information technology beyond school To explain how information technology benefits us To show how to use information technology safely To recognise that choices are made when using information technology
Year 3	**Connecting computers** To explain how digital devices function To identify input and output devices To recognise how digital devices can change the way we work To explain how a computer network can be used to share information To explore how digital devices can be connected To recognise the physical components of a network
Year 4	**The internet** To describe how networks 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 content 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
Year 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
Year 6	**Communication** To identify how to use a search engine To describe how search engines select results To describe how search engines 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 online communication

Creating Media	
Year 1	**Digital painting** 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 To use a computer on my own to paint a picture To compare painting a picture on a computer and on paper **Digital writing** To use a computer to write To add and remove text on a computer To identify that the look of text can be changed on a computer To make careful choices when changing text To explain why I used the tools that I chose To compare writing on a computer with writing on paper
Year 2	**Digital photography** To know what devices can be used to take photographs To use a digital device to take a photograph To describe what makes a good photograph To decide how photographs can be improved To use tools to change an image To recognise that images can be changed **Making music** To say how music can make us feel To identify that there are patterns in music To describe how music can be used in different ways To show how music is made from a series of notes To create music for a purpose To review and refine our computer work
Year 3	**Stop-frame animation** To explain that animation is a sequence of drawings or photographs To relate animated movement with a sequence of images To plan an animation To identify the need to work consistently and carefully To review and improve an animation To evaluate the impact of adding other media to an animation **Desktop publishing** To recognise how text and images convey information To recognise that text and layout can be edited To choose appropriate page settings To add content to a desktop publishing publication To consider how different layouts can suit different purposes To consider the benefits of desktop publishing

Year 4	**Audio editing** To identify that sound can be digitally recorded To use a digital device to record sound To explain that a digital recording is stored as a file To explain that audio can be changed through editing To show that different types of audio can be combined and played together To evaluate editing choices 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"
Year 5	**Video editing** To recognise video as moving pictures, which can include audio To identify digital devices that can record video To capture video using a digital device To recognise the features of an effective video To identify that video can be improved through reshooting and editing To consider the impact of the choices made when making and sharing a video **Vector drawing** To identify that drawing tools can be used to produce 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
Year 6	**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 three-dimensional (3D) digital objects 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 digital 3D model

Data and Information

Year 1	**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
Year 2	**Pictograms** To recognise that we can count and compare objects using tally charts To recognise that objects can be represented as pictures To create a pictogram To select objects by attribute and make comparisons To recognise that people can be described by attributes To explain that we can present information using a computer
Year 3	**Branching databases** To create questions with yes/no answers To identify the object attributes needed to collect relevant data To create a branching database To identify objects using a branching database To explain why it is helpful for a database to be well structured To compare the information shown in a pictogram with a branching database
Year 4	**Branching databases** To create questions with yes/no answers To identify the object attributes needed to collect relevant data To create a branching database To identify objects using a branching database To explain why it is helpful for a database to be well structured To compare the information shown in a pictogram with a branching database
Year 5	**Flat-file databases** To use a form to record information To compare paper and computer-based databases To outline how grouping and then sorting data allows us to answer questions To explain that tools can be used to select specific data To explain that computer programs can be used to compare data visually To apply my knowledge of a database to ask and answer real-world questions
Year 6	**Spreadsheets** To identify questions which can be answered using data To explain that objects can be described using data To explain that formula can be used to produce calculated data To apply formulas to data, including duplicating To create a spreadsheet to plan an event To choose suitable ways to present data

Programming	
Year 1	**Moving a robot** 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 To plan a simple program To find more than one solution to a problem **Introduction to animation**

	To choose a command for a given purpose To show that a series of commands can be joined together To identify the effect of changing a value To explain that each sprite has its own instructions To design the parts of a project To use my algorithm to create a program
Year 2	**Robot algorithms** To describe a series of instructions as a sequence To explain what happens when we change the order of instructions To use logical reasoning to predict the outcome of a program (series of commands) To explain that programming projects can have code and artwork To design an algorithm To create and debug a program that I have written **Introduction to quizzes** To explain that a sequence of commands has a start To explain that a sequence of commands has an outcome To create a program using a given design To change a given design To create a program using my own design To decide how my project can be improved
Year 3	**Sequence in music** To explore a new programming environment I can identify that each sprite is controlled by the commands I choose To explain that a program has a start To recognise that a sequence of commands can have an order To change the appearance of my project To create a project from a task description **Events and actions** To explain how a sprite moves in an existing project To create a program to move a sprite in four directions To adapt a program to a new context To develop my program by adding features To identify and fix bugs in a program To design and create a maze-based challenge
Year 4	**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 to produce a given outcome To decompose a program into parts To create a program that uses count-controlled loops to produce a given outcome **Repetition in games** To develop the use of count-controlled loops in a different programming environment To explain that in programming there are infinite loops and count controlled loops To develop a design which includes 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
Year 5	**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 when a condition is met, eg number of times

	To conclude that a loop can be used to repeatedly check whether a condition has been met To design a physical project that includes selection To create a controllable system that includes selection **Selection in games** To explain how selection is used in computer programs To relate that a conditional statement connects a condition to 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
Year 6	**Variables in games** To define a 'variable' as something that is changeable To explain why a variable is used in a program To choose how to improve a 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 **Sensing** 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

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