



Rayner Stephens
HIGH SCHOOL

Curriculum
Intent
for
Computing

A Computing Curriculum for Life improves life skills and life chances through developing knowledge and understanding of Computing and Digital Literacy. We aim to prepare our students for their future by giving them the opportunities to gain knowledge and develop skills that will equip them for an ever changing digital world.

Overall, the computing learning journey creates digital citizens confident in computational thinking and skilled in workplace software. Computing builds resilience, as things go wrong and we need to start again. Resilience is a life skill valuable not just to school but the real world. This allows Rayner students to leave with a mindset and skillset prepared for whatever adventure they choose.

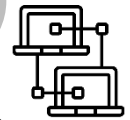


Computing Learning Journey

Apprenticeships
An IT apprenticeship is a real job in technology that provides you with training, industry-recognised qualifications and a salary.



Computing @ ASFC
Jameside College
Computer Science A level
Digital Games Production Diploma



Physical computing:
Combine sequence, selection, iteration, and function/method calls to control the flow of program execution.



Modelling data, spreadsheets:
Sorting and filtering data and using formulas and functions in spreadsheet software

History of Computing
Exploring the development of Computing through time. Including digital literacy key skills.



Programming essentials in Scratch:
Applying the programming constructs of sequence, selection and iteration in Scratch



Impact of technology:
collaborating online respectfully:
Introduction to the computer room and how to use the school network appropriately. Identifying how to use online collaboration tools respectfully

WELCOME TO COMPUTING AT RSHS

YEAR
7

Vector Graphics:
Understand the processes involved in creating graphics and creating own in Photoshop



Programming essentials in Scratch:
Reviewing Scratch functionality. Focus: Variables, Logic, Loops and Conditional Statements.



YEAR
8

Graphics/Animation & Cyber Security:
Creating digital products in Photoshop about cyber safety & security.

Business & Real World:
Introduction to Business Studies: Market Research and finance

Logic & Binary:
Introduction to logic and binary using truth tables and logic gates

Physical computing:
Write simple programs that use these components to interact with the physical world



YEAR
9

Introduction to Python programming:
Applying the programming constructs of sequence, selection and iteration in Python



Programming essentials in Scratch:
Create subroutines, develop understanding of decomposition, learn how to create and use lists, and build problem-solving skills.

Representation of Data:
Number bases, converting between number bases, units of information, binary arithmetic, character encoding, representing images, representing sound, data compression

YEAR
10

Computer Systems :
Hardware and software, Boolean logic, Software classification, classification of programming languages and translators, Systems architecture.

Computer Networks:
Defining a computer network and network protocols, describing types of networks and topologies, network security, describing the 4 layer TCP/IP model.

Algorithms:
Understanding what algorithms are, determining the purpose of algorithms in the format of both flowcharts and pseudocode

Cyber Security :
Purpose of cyber security, threats, social engineering, malicious code, methods to detect and prevent cyber threats



POST
16

University
A systematic study of algorithmic processes that describe and transform information



Careers
Software Developer
Applications Programmer
Systems Programmer
Multimedia Programmer
Systems Analyst

Relational databases and structured query language:
Concepts of databases and relational databases, Structured Query Language (SQL) key commands

Programming:
Data types, programming concepts, Arithmetic operations, Relational operations, Boolean operations, data structures, Input/output, String Handling, Random number generation, structured programming and subroutines, Robust and secure programming.

Ethical, Legal, Environmental :
Current ethical, legal and environmental impacts and risks of digital technology



YEAR
11

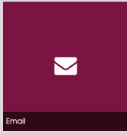
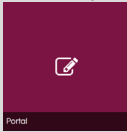


Year 7 – Computing 2022-23

Curriculum intent	<p>The aim of the curriculum is that through the delivery of the schemes of work, students are guided to becoming digital citizens, able to develop understanding of some of the key concepts required as the foundational building blocks necessary to build knowledge and foster a love of learning about computing.</p> <p>Students receive a mixture of both ICT and Computing related units of work in order to bridge any gaps presented from the Primary curriculum received, address any misconceptions and further stretch student understanding of identified key concepts. Students receive a mixture of practical and theory based lessons that include opportunities for students to develop their independent learning, collaboration and discussion skills.</p>				
Term	Topic 1 (Week 1-9)	Topic 2 (Week 10-18)	Topic 3 (Week 19-27)	Topic 4 (Week 26-35)	Topic 5 (Week 36-39)
Knowledge	<p><u>Intro to Network, E-Mail and E-Safety</u> Students will explore the school network and how to use it safely. They will explore e-safety dangers and ways to stay e-safe. Key digital literacy skills in Microsoft Word.</p>	<p><u>Block based programming</u></p> <p>Students will explore the skills required to create a basic computer programme using Scratch programming language. The main programming concepts covered in this unit are sequencing, variables, selection, and count-controlled iteration.</p> <p>Key digital literacy skills in Microsoft Word</p>	<p><u>Understanding Computers</u></p> <p>Introduction to cryptography. Outlines the importance of coding and impact of deciphering codes during WW2.</p> <p>A focus on computer systems and networks to cover hardware and software, input, output and storage devices. Introduction to the four cornerstones of computing decomposition, pattern recognition, abstraction and algorithm and an introduction to key computing terms</p>	<p><u>Modelling data – spreadsheets:</u></p> <p>Introduction for students to spreadsheets and the concept of cell referencing. They will collect, analyse, and manipulate data, before turning it into graphs and charts.</p>	<p><u>IDEA Award</u></p> <p>The Inspiring Digital Enterprise Award (IDEA) to develop digital, enterprise and employability skills for free.</p> <p>Online challenges, to achieve career-enhancing badges and consolidate learning across the topics and build on work place skills to create digital citizens</p>

			sequence, selection and iteration. Key digital literacy skills in PowerPoint.		
Skills	Key Software Skills: E-Mail, Search Engines, Presentation	Key Skills: Programming	Key Software Skills: PowerPoint	Key Software Skills: Excel, Numeracy	Key Software Skills: Word Processing, Creativity, Coding
Assessments	Teacher Q&A, Student oracy opportunities Teacher learning analysis mid-way through the completion of task and provide feedback the following lesson Peer assessment Self assessment End of unit Teacher assessment. Teacher learning analysis, provide feedback the following session.	Teacher Q&A, Student oracy opportunities Teacher learning analysis mid-way through the completion of task and provide feedback the following lesson Peer assessment Self assessment End of unit Teacher assessment. Teacher learning analysis, provide feedback the following session.	Teacher Q&A, Student oracy opportunities Teacher learning analysis mid-way through the completion of task and provide feedback the following lesson Peer assessment Self assessment End of unit Teacher assessment. Teacher learning analysis, provide feedback the following session.	Teacher Q&A, Student oracy opportunities Teacher learning analysis mid-way through the completion of task and provide feedback the following lesson Peer assessment Self assessment End of unit Teacher assessment. Teacher learning analysis, provide feedback the following session.	Teacher Q&A, Student oracy opportunities IDEA badges
Enrichment	Coding & Minecraft club IDEA Award	Coding & Minecraft club IDEA Award	Coding & Minecraft club IDEA Award	Coding & Minecraft club IDEA Award	Coding & Minecraft club IDEA Award

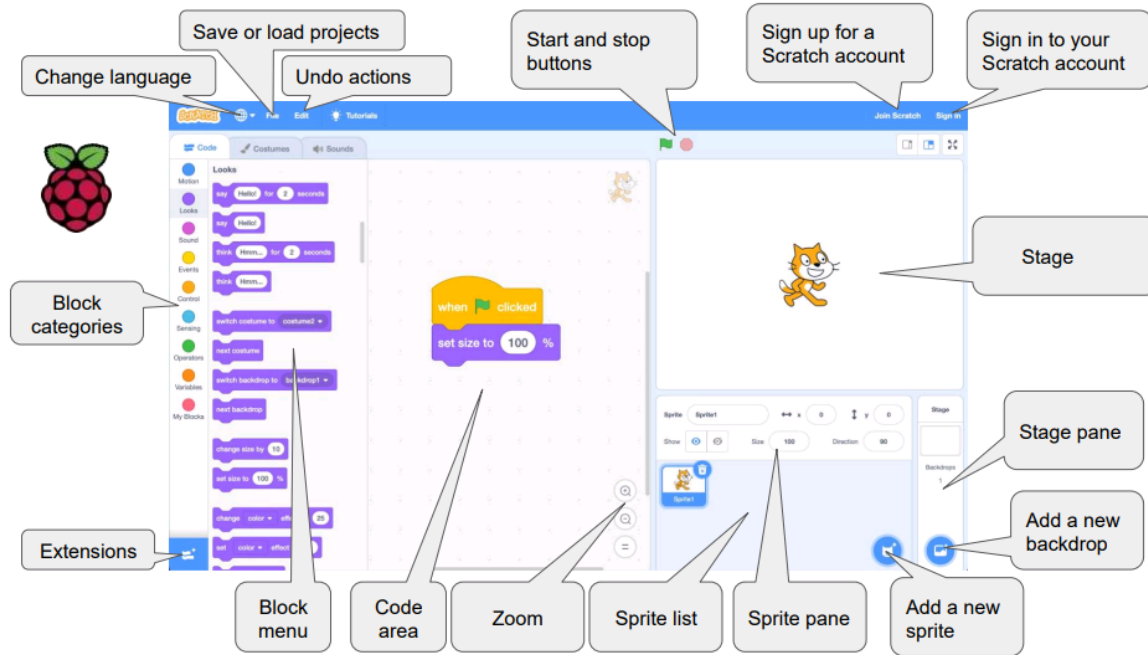
Year 7 Computing Autumn Term Knowledge Organiser Accessing the Network E-Safety

Key Vocabulary:			Accessing the network & E-Safety		E-Safety	
1	Password	A Password is a word, phrase, or string of characters intended to allow access to a users individual area. This must be kept secret and not shared.	8	How to log on to school network:	13	What are the dangers of being online?
				User name: [graduation year] 27Firstname.Surname Password: Your own secret word!		Some of the possible dangers of being online are: <ul style="list-style-type: none"> • Strangers - Exposure to inappropriate / illegal content • Fraud (identity / financial) • Viruses • Cyberbullying
2	Digital Footprint	A digital footprint is the trail of information you leave behind when you use the internet.	9	How to access school email:	14	Digital Footprint:
				To access your school email at home, go to the school website and scroll down to this button		The things you share online will stay there forever like a path where you have been. With every new profile, tweet or photo you post online, you are adding to a digital footprint. People that know you, and people who don't, can see it and learn a lot from it.
3	Digital Citizen	Digital citizenship is the set of behaviors and standards that a person practices while utilizing technology responsibly and professionally.				
				User: [[graduation year] 27Firstname.Surname@rshs.spt.ac.uk Password: Same secret word as logging on at school	15	What is Cyberbullying?
4	Personal information	Personal information is a person's name, address, phone number or email address.	10	Who can see my school email & network area:		Cyber bullying is when someone uses the internet, mobile phone or tablet to intentionally hurt someone.
				Your school email can be viewed by the School Network Manager and technician. Emails are monitored and automatically scanned for inappropriate content. There are consequences for anyone misusing the school email system. Email use is monitored to ensure appropriate use and to protect learners from unsuitable content.	16	Being a Digital Citizen:
5	E-Safety	E-safety is the safe and responsible use of technology.	11	How to access network remotely via portal:		Being a responsible digital citizen means having the online social skills to take part in online community life in an ethical and respectful way.
				To access your school email at home, go to the school website and scroll down to this button. Use the same logging on details as you would in school.		Responsible digital citizenship also means: <ul style="list-style-type: none"> • behaving lawfully – for example, it's a crime to hack, steal, illegally download or cause damage to other people's work, identity or property online • protecting your privacy and that of others • recognising your rights and responsibilities when using digital media • thinking about how your online activities affect yourself, other people you know, and the wider online community.
6	Cyber Bullying	Cyberbullying is the use of technology including mobile phones, instant messaging, e-mail, chat rooms or social networking sites such as Facebook and Twitter to harass, threaten or intimidate someone.				
				User: [graduation year] 27Firstname.Surname Password: Same secret word as logging on at school		
7	Consequences	A consequence is something that happens as a result of your actions.				







Year 7 Computing Autumn Term Knowledge Organiser Block Based Coding in Scratch

Key Vocabulary:

1	Scratch	Scratch is a block based programming language.
2	Blocks	Scratch bricks that we can use to code algorithms
3	Computational thinking	Solving problems with or without a computer
4	Sequence	Running instructions in order
5	Selection	Making choices
6	Iteration	Repeating steps/Doing the same thing more than once
7	Input	Data or information going into a computer
8	Process	Computer thinks about the information
9	Output	Computer produces a result
10	Program -	A program is a set of instructions that tell a computer what to do.
11	Algorithm	a sequence of instructions that can be processed by a computer



Blocks in Scratch:

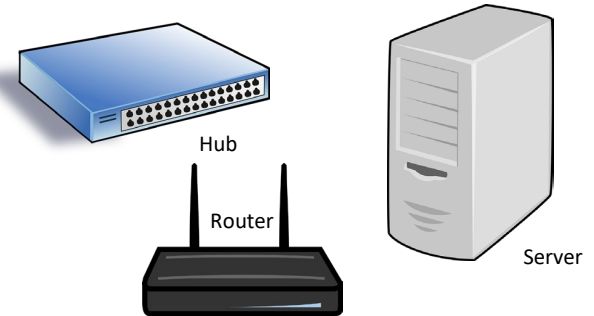
Hat block		Starts each sequence of instructions. It has a rounded top and a bump at the bottom to snap into other blocks below itself.
Stack block		Performs the main instructions. It has a notch at the top and a bump at the bottom to snap into other blocks above and below itself.
Boolean block		These contain statements which can be either true or false. They fit inside other blocks, so that those blocks can behave differently depending on if the statement is true or false.
Reporter block		These have rounded edges on both sides and fit within other blocks to provide a value such as numbers or text. For example, you can use a block to get the position of a sprite so that you can use that value in other blocks.
C block		These are also known as wrap blocks. You can use these blocks to control if and when to run the blocks that you have placed inside them.
Cap block		You use the cap blocks at the end of a set of instructions. They have a notch at the top to snap into other blocks and a rounded bottom so that you can't snap other blocks onto it.

Year 7 Computing History of Computing & Introduction to Networks

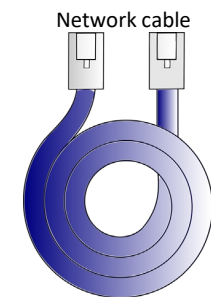
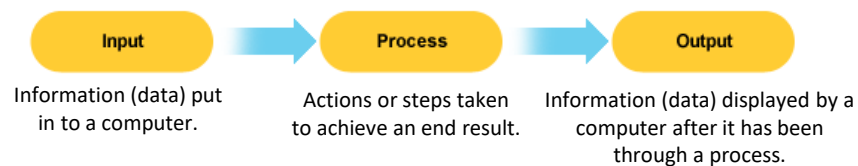
Key Vocabulary:		
1	Cryptography:	The art of writing or solving codes.
2	Decipher:	Convert (a text written in code, or a coded signal) into normal language.
3	Hardware:	Parts of a computer system you can physically hold and touch.
4	Software:	The programs on a computer you cannot physically hold and touch.
5	Input:	Information (data) put in to a computer.
6	Process:	Actions or steps taken to achieve an end result.
7	Output:	Information (data) displayed by a computer after it has been through a process.
8	Wired	Wired networks send data along cables.
9	Wireless	Wireless networks send data through the air using radio waves.
10	Bandwidth	Amount of data that can be moved from one point to another in a given time.

Key Vocabulary:		
11	Bandwidth	Amount of data that can be moved from one point to another in a given time.
12	Buffering	Data arriving slower that it is being processed
13	IP address	A unique address for every device on the internet
14	Packet	Networks send/receive messages in units called packets
15	Protocol	All methods of communication need rules in place in order to pass on the message successfully. These sets of rules are called 'protocols'
16	Network Hardware	Physical equipment required to set up a network

Key Vocabulary:		
17	Hub	Connects a number of computers together. Ports allow cables to be plugged in from each connected computer.
18	Sever	A powerful computer which provides services to a network
19	Cable	Used to connect different devices together. They are often made up of a number of wires.
20	Router	Used to connect two separate networks together across the internet



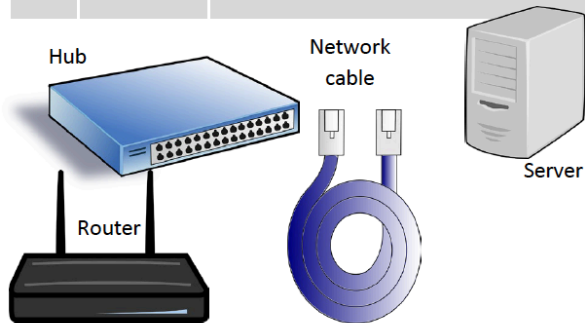
How Computers process information



Year 7 Computing Summer Term Knowledge Organiser History of Computing & Introduction to Networks

Key Vocabulary:

1	Cryptography:	The art of writing or solving codes.
2	Decipher:	Convert (a text written in code, or a coded signal) into normal language.
3	Hardware:	Parts of a computer system you can physically hold and touch.
4	Computer network	Two or more computers are connected together to allow them to communicate, share resources such as files and printers.
5	Network Hardware	Physical equipment required to set up a network
6	Hub	Connects a number of computers together. Ports allow cables to be plugged in from each connected computer.
7	Server	A powerful computer which provides services to a network
8	Cable	Used to connect different devices together. They are often made up of a number of wires.
9	Router	Used to connect two separate networks together across the internet



10 Cryptography

Cryptography is derived from the Greek word 'kryptos' which means hidden or secret

Cryptography is thought to date back to the Egyptians and their use of hieroglyphics.

Julius Caesar developed the first modern cipher.

It is known as the 'Caesar cipher'

Each character in the message is replaced by the character three positions ahead of it in the alphabet

11 How Computers were used during WW2

The Germans developed a computer called Enigma to send secret messages between troops

Colossus was the name of a set of computers developed by British code breakers in 1943-1945

The Colossus computers were used to help decipher intercepted messages that had been encrypted using ENIGMA

Colossus helped to crack the German coded messages, without this the messages were unreadable

12 Bus networks

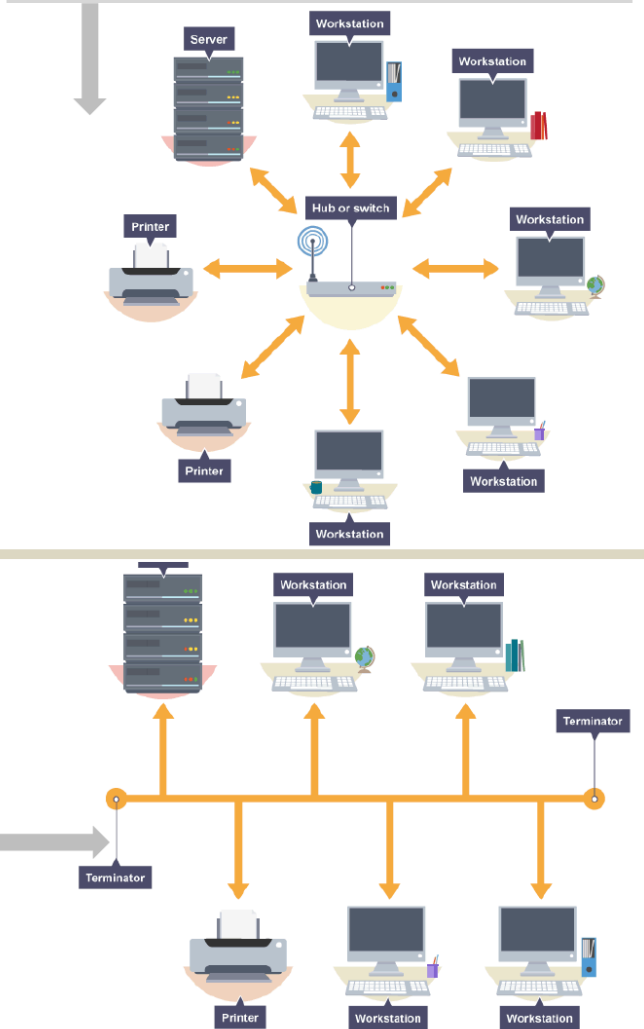
In a bus topology, all nodes in the network are connected directly to a central cable that runs up and down the network - this cable is known as the backbone.

Data is sent up and down the backbone until it reaches the correct node.

13 Star networks

Star topologies are used in many networks, large and small.

In a star topology, all nodes indirectly connect to each other through one or more switches. The switch acts as a central point through which all communications are passed.



Year 7 Computing Summer Term Knowledge Organiser

Spreadsheet

1 A spreadsheet file is made up of one workbook and multiple worksheets. Worksheets appear as tabs at the bottom of a workbook. They can be reordered and renamed.

Formatting

2 A well-formatted spreadsheet is easy to read. Spreadsheet programs have plenty of formatting features.

Adjusting column width and row height
To adjust a column's width or a row's height, move your mouse cursor between two columns or rows. Click and drag to resize.

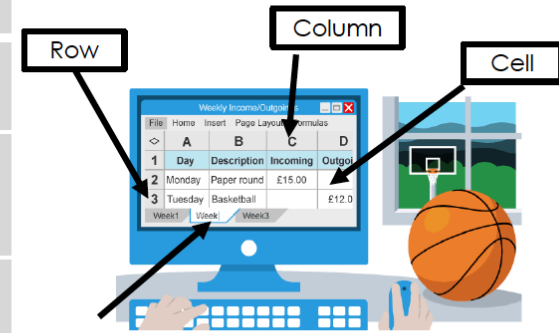
To automatically resize a row to fit the data entered in a cell, double-click between the current row and the row after it.

Arithmetic Operators

3	*	MULTIPLY
4	/	DIVISION
5	+	ADDITION
6	-	SUBTRACT
7	=	EQUAL TO
8	>	GREATER THAN
9	<	LESS THAN
10	>=	GREATER THAN EQUAL TO
11	<=	LESS THAN EQUAL TO
12	<>	NOT EQUAL TO

Key Vocabulary:

13	Cell	A cell reference is the name given to a cell to uniquely identify it. E.g. E4
14	Row	A row is several data banks (cells) laid out horizontally in a table or spreadsheet. X GOES ACROSS
15	Column	A column is several data banks (cells) laid out vertically in a table or spreadsheet. Y IN THE SKY
16	Conditional	Cells, rows, or columns can be formatted to change text or background color if they meet certain conditions
17	Absolute	An absolute cell reference ensures that 1 cell always remains constant even when autofill is used. E.g. \$E\$4
18	Function	A function is a predefined formula that performs calculations using specific values in a particular order.



Worksheet

19	Formula	Only use when creating a calculation between 2 cells.
20	Relative	Relative references change when a formula is copied to another cell.
21	Sort	Sorting data organises it in a specific way e.g. alphabetically
22	Filter	Filtering data makes it easy for us to find one specific piece of data without having to look through every piece of data
23	Autofill	Automatically fill a series of data in your worksheet.
24	Chart	Adds a graph to the spreadsheet

