



Computing Curriculum and Progression of Skills

BHJS's Computer Curriculum is designed to help children progress throughout the year and across their four years in KS2. The curriculum is split into units which are spread out two per term. They are planned to develop the 3 main strands of Computing: Computer Science, Information Technology and Digital Literacy (explained below).

We have adopted and adapted Teach Computing units along with an external provider who teaches our programming units. Each unit takes one strand as its focus, but there are opportunities throughout to progress their knowledge of the other strands. Each unit is carefully planned to support progression of knowledge and skills, to highlight key vocabulary and to ensure they link to the National Curriculum.

The children are given access to various software stored on either our computers or the internet. Our main operating system is Windows 10. Children will work with various forms of input and output, including our computing suite, laptops with trackpads and touch screens, ipads and physical programming devices such as Ozobots, Spheros and Microbits. The subject of Computing is much younger than many other subjects, and as such, the curriculum is reviewed each year and changes are made as necessary.

Computer Science

Computer Science is about developing the children's ability to program computers to solve problems. Our units develop their understanding of what a computer is, how its constituent parts function together as a whole, how they connect together in networks and how we can program them. Our units develop computational thinking skills so they can design algorithms that a computer can follow to solve a particular problem.

The **National Curriculum** objectives for this strand:

- Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
- Use sequence, selection, and repetition in programs; work with variables and various forms of input and output
- Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs
- Understand computer networks including the internet; how they can provide multiple services, such as the World Wide Web
- Appreciate how [search] results are selected and ranked

Information Technology

Information Technology means devices that can process data given to them by a user or a sensor. Modern computers can process huge amounts of information they get through various inputs and then output them as text, images, audio or video. Our units develop the children's ability to use different devices and their software to create and edit digital content, progressing over time with their use of each type. They will develop their knowledge in how to store and organise their information, how to communicate and collaborate using the internet and the WWW and how to search for information effectively.

The **National Curriculum** objectives for this strand:

- Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information
- Use search technologies effectively

Digital Literacy

Digital Literacy builds on the skills you gain when you learn to use different types of technology and their software. To be an effective user of computers you have to make good judgements. Our units promote the positive reasons to use information technology while highlighting the negatives that they might encounter. They will be encouraged to be alert to the possible dangers and be alive to how amazing information technology really can be.

The **National Curriculum** objectives for this strand:

- Understand the opportunities networks offer for communication and collaboration
- Be discerning in evaluating digital content
- Use technology safely, respectfully and responsibly;
- recognise acceptable/unacceptable behaviour;
- identify a range of ways to report concerns about content and contact

Areas of Study	Year 3	Year 4	Year 5	Year 6
	Computer Science, Information Technology, Digital Literacy			
Autumn 1	Computing systems and networks – Connecting computers Additional lessons implemented to support the transition from the infant school focusing on mouse and keyboard skills.	Computing systems and networks – The Internet links to SMART – Is information reliable?	Computing systems and networks – Communication and collaboration	Creating Media – webpage creation The webpage will be on e-safety – links to SMART
Autumn 2	Programming with Ozobots – learning what code is, what algorithms are and how to use sequences to write them.	Creating Media – desktop publishing	Creating Media – introduction to vector graphics	Creating Media – stop frame animation BHJS unit to support combining images, audio and text to create a moving image.
Spring 1	Creating Media – Authoring – BHJS unit to develop keyboard and mouse skills when creating, formatting and presenting digital content.	Data Handling – data over time	Programming with Spheros – continue their work with sequence, repetition and selection and introduce variables and functions	Creating Media – 3-D modelling
Spring 2	Digital Literacy – Primary school ready – be SMART	Digital Literacy – emails, passwords and data protection	Programming – BHJS additional unit working with the Scratch programming language. Linked to DT to make a light box with micro:bits.	Programming with Spheros –
Summer 1	Creating Media – digital images	Programming with Ozobots – develop understanding of sequence and introduce repetition and selection (also known as conditionals)	Data Handling – flat-file databases	Computing systems and networks – Searching the internet
Summer 2	Data Handling – branching databases	Creating Media – video production	Creating Media – audio production – BHJS additional unit to support combining audio with images and text.	Data Handling – spreadsheets
E-safety linked to SMART	Introduce SMART to help children stay safe online. Focus on SAFE. Online safety and online content	Recap on SMART to help children stay safe online. Focus on ACCEPT and RELIABLE. E-mail Safety and Use. Online safety and social media platforms	Recap on SMART to help children stay safe online. Focus on TELL. Reference Summer Term PSHE Curriculum	Recap on SMART to help children stay safe online. Focus on MEET. Online safety and Online Gaming the story of Breck Bednar
Computer Science: Computational Thinking	Debug - Find and correct errors; Tinker – To explore and experiment.	Decomposition – Breaking a problem down into smaller parts;	Pattern Seeking – Finding similarities in algorithms and systems;	Abstraction – Taking unnecessary detail out of a problem to make it easier to solve;

Effective Searching	Linked to topic work such as History research	Linked to topic work such as History research	Linked to topic work such as History research	Linked to topic work such as History research
Progression of Skills				
Computing Systems and Networks	Learning graphs are provided as part of each unit and demonstrate progression through concepts and skills. In order to learn some of those concepts and skills, pupils need prior knowledge of others, so the learning graphs show which concepts and skills need to be taught first and which could be taught at a different time. Key skills are outlined below.			
	Year 3	Year 4	Year 5	Year 6
	<p>National Curriculum Understand computer networks including the internet; how they can provide multiple services, such as the World Wide Web; and the opportunities they offer for communication and collaboration</p> <p>Use sequence, selection, and repetition in programs; work with variables and various forms of input and output</p> <p>Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</p>	<p>National Curriculum Understand computer networks including the internet; how they can provide multiple services, such as the World Wide Web; and the opportunities they offer for communication and collaboration</p> <p>Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</p> <p>Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</p> <p>Use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</p>	<p>National Curriculum Understand computer networks including the internet; how they can provide multiple services, such as the World Wide Web; and the opportunities they offer for communication and collaboration</p> <p>Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</p> <p>Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</p> <p>Use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</p>	<p>National Curriculum Understand computer networks including the internet; how they can provide multiple services, such as the World Wide Web; and the opportunities they offer for communication and collaboration</p> <p>Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</p>
Skills Taught	Year 3	Year 4	Year 5	Year 6
	To identify input and output To explain that a computer system accepts an input and processes it to produce an output To explain how a computer network can be used to share information	To describe how networks connect to other networks To describe the types of content/media that can be added, created, and shared on the World Wide Web To outline how information can be shared via the World Wide Web	To outline methods of communicating and collaborating using the internet To evaluate different methods of online communication and collaboration To decide what you should and should not share online	To describe the input and output of a search engine To demonstrate that different search terms produce different results To evaluate the results of search terms

	To explain the role of a switch, server and wireless access point in a network To identify network devices around me To explain how networks can be connected to other networks	To explain how the content of the WWW is created, owned, and shared by people To evaluate the reliability of content and the consequences of unreliable content	To choose methods of internet communication and collaboration for given purposes	To describe how to access the World Wide Web To explain the benefits of the World Wide Web
Unit Intent	Year 3 Learners will develop their understanding of digital devices, with an initial focus on inputs, processes, and outputs. They will also compare digital and non-digital devices. Next, learners will be introduced to computer networks, including devices that make up a network's infrastructure, such as wireless access points and switches. Finally, learners will discover the benefits of connecting devices in a network.	Year 4 Learners will apply their knowledge and understanding of networks, to appreciate the internet as a network of networks which need to be kept secure. They will learn that the World Wide Web is part of the internet, and will be given opportunities to explore the World Wide Web for themselves in order to learn about who owns content and what they can access, add, and create. Finally, they will evaluate online content to decide how honest, accurate, or reliable it is, and understand the consequences of false information.	Year 5 Learners explore how data is transferred over the internet. Learners initially focus on addressing, before they move on to the makeup and structure of data packets. Learners then look at how the internet facilitates online communication and collaboration; they complete shared projects online and evaluate different methods of communication. Finally, they learn how to communicate responsibly by considering what should and should not be shared on the internet.	Year 6 Learners discover how information is found on the World Wide Web, through learning how search engines work (including how they select and rank results) and what influences searching, and through comparing different search engines.
	Year 3 1 How does a digital device work? 2 What parts make up a digital device? 3 How do digital devices help us? 4 How am I connected? 5 How are computers connected? 6 What does our school network look like?	Year 4 1 Connecting networks 2 What is the internet made of? 3 Sharing information 4 What is a website? 5 Who owns the web? 6 Can I believe what I read?	Year 5 1 Internet addresses 2 Data packets 3 Working together 4 Shared working 5 How we communicate 6 Communicating responsibly	Year 6 1 Searching the web 2 Selecting search results 3 How search results are ranked 4 How are searches influenced?
Unit Implementation (Short Term Plans outline more detail for each objective)	Year 3 1 I can explain how digital devices function (input, process and output) 2 I can identify input and output devices 3 I can recognise how digital devices can change the way that we work 4 I can explain how a computer network can be used to share information 5 I can explore how digital devices can	Year 4 1 I can describe how networks physically connect to other networks 2 I can recognise how networked devices make up the internet 3 I can outline how websites can be shared via the World Wide Web	Year 5 I can explain the importance of internet addresses I can recognise how data is transferred across the internet I can explain how sharing information online can help people to work together I can evaluate different ways of working together online	Year 6 1 I can identify how to use a search engine 2 I can describe how search engines select results 3 I can explain how search results are ranked 4 I can recognise why the order of results is important, and to whom
Unit Impact				

	<p>be connected</p> <p>6 I can recognise the physical components (hardware) of a network</p> <p>7 I can identify the benefits of computer networks</p>	<p>4 I can describe how content can be added and accessed on the World Wide Web</p> <p>5 I can recognise how the content of the WWW is created by people</p> <p>6 I can evaluate the consequences of unreliable content</p>	<p>I can recognise how we communicate using technology</p> <p>I can evaluate different methods of online communication</p>	
Key Questions	<p>Year 3</p> <p>How does a digital device work?</p> <p>What parts make up a digital device?</p> <p>How do digital devices help us?</p> <p>How am I connected?</p> <p>How are computers connected?</p> <p>What does our school network look like?</p>	<p>Year 4</p> <p>How do networks connect with other networks?</p> <p>What is the internet made of?</p> <p>How can information be shared via the WWW?</p> <p>What is a website?</p> <p>Who owns the web?</p> <p>Can I believe what I read?</p>	<p>Year 5</p> <p>How is information transferred across the internet?</p> <p>What does protocol mean?</p> <p>How does sharing information online let people in different places work together?</p> <p>What is the best way to work collaboratively online?</p>	<p>Year 6</p> <p>How do you use a search engine?</p> <p>How do search engines select results?</p> <p>How are search results ranked?</p> <p>How are searches influenced?</p> <p>How can we communicate effectively using technology?</p>
	Key Vocabulary	<p>Year 3</p> <p>digital device, input, process, output, program, digital, non-digital, connection, network, switch, server, wireless access point, cables, sockets</p>	<p>Year 4</p> <p>internet, network, router, security, switch, server, wireless access point (WAP), website, web page, web address, routing, web browser, World Wide Web, content, links, files, use, download, sharing, ownership, permission, information, accurate, honest, content, adverts</p>	<p>Year 5</p> <p>communication, protocol, data, address, Internet Protocol (IP), Domain Name Server (DNS), packet, header, data payload, chat, explore, slide deck, reuse, remix, collaboration, internet, public, private, oneway, two-way, one-to-one, one-to-many.</p>
Assessment	<p>Year 3</p> <p>Formative assessment opportunities are highlighted in each of the lesson plan documents. For summative assessment, please see the summative assessment document of multiple choice questions for this unit.</p>	<p>Year 4</p> <p>Formative assessment opportunities are highlighted in each of the lesson plan documents. For summative assessment, please see the summative assessment document of multiple choice questions for this unit.</p>	<p>Year 5</p> <p>Formative assessment opportunities are highlighted in each of the lesson plan documents. For summative assessment, please see the summative assessment document of multiple choice questions for this unit.</p>	<p>Year 6</p> <p>Formative assessment opportunities are highlighted in each of the lesson plan documents. For summative assessment, please see the summative assessment document of multiple choice questions for this unit.</p>

	Year 3	Year 4	Year 5	Year 6
Help	<p>What are inputs and outputs? https://www.bbc.co.uk/bitesize/topics/zs7s4wx/articles/zx8hqv4 https://www.bbc.co.uk/teach/class-clips-video/computing-ks2-input-output/zf3fp4j</p> <p>Getting creative with computers https://www.bbc.co.uk/bitesize/topics/zf2f9j6/articles/zmsjmbk</p> <p>What is a computer network? https://www.bbc.co.uk/bitesize/topics/zs7s4wx/articles/z78nydm https://www.bbc.co.uk/teach/class-clips-video/computing-ks2-computer-networks/zf67wnb</p>	<p>How does the internet work? https://www.bbc.co.uk/bitesize/topics/zs7s4wx/articles/z3tbqk7</p> <p>What is the world wide web? https://www.bbc.co.uk/bitesize/topics/zs7s4wx/articles/z2nbgk7</p> <p>How do search engines work? https://www.bbc.co.uk/bitesize/topics/zs7s4wx/articles/ztbjq6f</p> <p>Is information on the web always reliable? https://www.bbc.co.uk/bitesize/topics/zv63d2p/articles/zt9thyc</p>	<p>What is a computer network? https://www.bbc.co.uk/bitesize/topics/zs7s4wx/articles/z9n6p4j https://www.bbc.co.uk/teach/class-clips-video/computing-ks2-computer-networks/zf67wnb</p> <p>The Internet https://www.bbc.co.uk/bitesize/topics/zs7s4wx/articles/zjbf3j6</p> <p>What are digital communication systems? https://www.bbc.co.uk/bitesize/topics/zv63d2p/articles/z9r72hv</p> <p>Collaborating using IT https://www.bbc.co.uk/bitesize/topics/zv63d2p/articles/zfwmh4j</p>	<p>How do search engines work? https://www.bbc.co.uk/bitesize/topics/zs7s4wx/articles/ztbjq6f</p> <p>Search technologies https://www.bbc.co.uk/bitesize/topics/zs7s4wx/articles/znhmtrd https://www.bbc.co.uk/teach/class-clips-video/computing-ks2-search-technologies/zwshxbk</p>
Inclusion and Ambitious	<p>The Teach Computing units adopted and adapted by BHJS have been written to support all pupils. Each lesson is sequenced so that it builds on the learning from the previous lesson, and where appropriate, activities are scaffolded so that all pupils can succeed and thrive. Scaffolded activities provide pupils with extra resources, such as visual prompts, to reach the same learning goals as the rest of the class. Exploratory tasks foster a deeper understanding of a concept, encouraging pupils to apply their learning in different contexts and make connections with other learning experiences. As well as scaffolded activities, embedded within the lessons are a range of pedagogical strategies (defined in the ‘Pedagogy’ section of this document), which support making computing topics more accessible.</p>			
Research-informed	<p>The subject of computing is much younger than many other subjects, and as such, there is still a lot more to learn about how to teach it effectively. To ensure that teachers are as prepared as possible, the Teach Computing Curriculum builds on a set of pedagogical principles which are underpinned by the latest computing research, to demonstrate effective pedagogical strategies throughout. To remain up-to-date as research continues to develop, every aspect of the Teach Computing Curriculum is reviewed each year and changes are made as necessary</p>			