

Our Computing Curriculum



Our Assessment Overview linked to detailed adapted Schemes of Work Assessed using triangulated assessment three times a year and against end of year						
Assessment strands	Strand 1	Strand 2	Strand 3	Strand 4	Strand 5	Strand 6
DT 1-2 blocked	IPC milepost skills	User and purpose	Design and make	Tools and skills	Safety	Big Ideas
History 1-2 blocked	IPC milepost skills	Chronological understanding	Historical depth and knowledge	Historical Enquiry Interpretations of history		Big Ideas
Geography 1-2 blocked	IPC milepost skills	Locational Knowledge	Place Knowledge	Human and physical Geography	Fieldwork and geography skills	Big Ideas Linking concepts across multiple subjects
Art 1-2blocks	IPC milepost skills	Colour Pattern Tone	Technique	Texture and form	Artists and Art from around the world	Big Ideas
Music Ongoing Skills focus	Singing /Play	Listen and appreciation History of music *Key composer knowledge linked to historical periods	Interrelated dimensions Rhythm Pulse Pitch Texture Timbre Dynamics *Chords	Composition and notation	Improvisation	Performance
Science 2-3 Per year	IPC milepost skills	Working scientifically	Biology Anatomy Adaptation Botany	Physics and Chemistry	Materials, states rock and soil formation	Big Ideas
PSHE Ongoing	Changes	Relationships	Differences	Healthy me	Aspirations (dreams and goals)	RSE SEP: 2020
GAMES Ongoing Skills focus	Running /Jumping /Throwing /Catching				Participation and applying skills Competitive games Attack and defence	Health and fitness including mental health and lifestyle choices
GYM/ Dance Ongoing	Movement, pattern Balance		Agility Coordination and flexibility		Personal performance /Group performance Health, Fitness and Lifestyle	
Swim Blocked	Swimming to NC; stand-alone block					
MFL KS2 Ongoing	Oracy		Literacy		Intercultural understanding	
RE Ongoing	Making Sense of beliefs		Understanding the impact		Making Connections	
Computing Ongoing	Computer science online safety			Information technology online safety		Digital Literacy –including online safety
Our curriculum must: - Have International/SMSC/British values dimensions - Be cyclical - Build in first hand experiences - Reinforces the schools values : AFTER - Have a heavy focus on subject specific vocabulary, learning vocabulary (Blooms WoW) and expected vocabulary (related to spelling) Pupil Discussion in groups and 1:1) Because this is how we know our children learn best				Assessment methodology: - Ongoing assessment via short summative low stakes tests/tasks - Focussed practical activities and sequenced activities observed (FPTs) - Cumulative work individual or group piece, including project based on task centric - Collaborative work/Performance/Demonstration 1:1 or group discussion -questioning - Ongoing assessment formative-including home study or targeted observation		

COMPUTING AT THE VALLEY COMMUNITY PRIMARY SCHOOL

Introduction

COMPUTING INTENT:

‘A high-quality computing education equips pupils to use computational thinking and creativity to understand and change the world.’

Computing Programme of Study, DfE, 2013

1.1 Why Computing matters

Computing skills can equip learners with the key skills needed to learn and use technology safely and purposely in a manner that will serve them in their lives. The ever-changing advances in technology mean that not only do children require the tools with which they can stay safe online but to also be literate in the use of technology at and beyond school. This is particularly pertinent due to STEAM type careers accounting for the majority of new job roles created within industry. At the Valley Community Primary School, we deliver a challenging curriculum that contextualise aspects of future careers to the children but also use software and programs which are used in the outside world. Not only are pupils challenged but they are required to appreciate the different elements of computing and to develop as positive digital citizens.

Our teaching vehicle is closely ascribed to the key skills/knowledge as exemplified in the Switched on Computing Scheme (by Rising Stars) combined with explicit activities and cross referencing to ensure the National Curriculum is met.

1.2 The Nature of Computing

The National Curriculum equips pupils to use computational thinking and creativity to understand and change the world. Computing has deep links with mathematics, science and design and technology, and provides insights in to both natural and artificial systems.

There is a focus on computational thinking and creativity, as well as opportunities for creative work in programming and digital media. There are three main aspects of the computing curriculum: Computer Science (‘CS’), Information Technology (‘IT’) and Digital Literacy (‘DL’).

Computer science, in which pupils are taught the principles of information and computation, how digital systems work and how to put knowledge to use through programming. Building on this knowledge and understanding, pupils are equipped to use information technology to create programs, systems and a range of content. Computing also ensures that pupils become digitally literate – able to use, and express themselves and develop their ideas through, information and communication technology – at a level suitable for the future workplace and active participants in a digital world.

1.3 The National Curriculum – Purpose of Study

A high-quality Computing education equips pupils to use computational thinking and creativity to understand and change the world. Computing has deep links with mathematics, science, and design and technology, and provides insights into both natural and artificial systems. The core of computing is computer science, in which pupils are taught the principles of information and computation, how digital systems work, and how to put this knowledge to use through programming. Building on this knowledge and understanding, pupils are equipped to use information technology to create programs, systems and a range of content. Computing also ensures that pupils become digitally literate – able to use, and express themselves and develop their ideas through, information and communication technology – at a level suitable for the future workplace and as active participants in a digital world.

1.3.1 Early Years

Planning for Computing in the Early Years needs to be considered carefully if children are to begin to gain confidence in the use of a variety of technologies as soon as they start attending Nursery. A range of appropriate hardware, software and activities needs to be offered.

It is important to give children a broad, play-based experience of IT in a range of contexts, including off-computer activities and outdoor play. Computing is not just about computers. Early years learning environments should feature IT scenarios based on experiences in the real world, such as role play.

1.3.2 Key Stage 1

By the end of key stage 1 pupils are taught to:

- understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following a sequence of instructions
- write and test simple programs
- use logical reasoning to predict the behaviour of simple programs

- organise, store, manipulate and retrieve data in a range of digital formats
- Communicate safely and respectfully online, keeping personal information private, and recognise common uses of information technology beyond school.

1.3.3 Key Stage 2

By the end of key stage 2 pupils are taught to:

- design and write 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; generate appropriate inputs and predicted outputs to test programs.
- use logical reasoning to explain how a simple algorithm works 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; and the opportunities they offer for communication and collaboration
- describe how internet search engines find and store data; use search engines effectively; be discerning in evaluating digital content; respect individuals and intellectual property; use technology responsibly, securely and safely
- Select, use and combine a variety of software (including internet services) on a range of digital devices to accomplish given goals, including collecting, analysing, evaluating and presenting data and information.

1.4 Intent Statements

The Valley Community Primary School's Computing Curriculum is broad and ambitious, and designed to give all our pupils, particularly those that are disadvantaged and pupils with SEND, the knowledge and cultural capital they need to succeed in life.

We will ensure that all pupils:

- can understand and apply the fundamental principles of computer science, including logic, algorithms and data representation;
- can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems;

- can evaluate and apply information technology, including new or familiar technologies, analytically to solve problems; and
- are responsible, competent, confident and creative users of information and communication technology.

Computing is concerned with how computers and computer systems work, and how they are designed and programmed. Pupils studying computing will gain an understanding of computational systems of all kinds, whether or not they include computers. Computational thinking provides insights into many areas of the curriculum and influences work at the cutting edge of a wide range of disciplines.

The use of computers and computer systems is an integral part of the National Curriculum and knowing how they work is a key life skill. In an increasingly digital world, there now exists a wealth of software, tools and technologies that can be used to communicate, collaborate, express ideas and create digital content. Computers tablets, programmable robots, digital and video cameras are a few of the tools used to acquire, organise, store, manipulate, interpret, communicate and present information.

At the Valley Community Primary School we recognise that pupils are entitled to a broad and balanced computing education with a structured, progressive, approach to the learning how computer systems work, the use of IT and the skills necessary to become digitally literate and participate fully in the modern world. The purpose of this policy is to state how the school intends to make this provision.

1.5 Entitlement to the Computing Curriculum

All children should have access to the use of computing technologies regardless of gender, race, cultural background or physical or sensory disability. Where use of school computers proves difficult for a child because of a disability, the school will endeavour to provide specialist equipment and software to enable access. Children with learning difficulties can also be given greater access to the whole curriculum through the use of these technologies. Their motivation can be heightened and they are able to improve the accuracy and presentation of their work. This, in turn, can raise self-esteem.

Children gain confidence, control and language skills through opportunities such as 'programming' each other using directional language to find toys/objects, creating artwork using digital drawing tools and controlling programmable toys. Outdoor exploration is an important aspect and using digital recording devices such as video recorders, cameras and

microphones can support children in developing communication skills. This is particularly beneficial for children who learn English as an additional language.

Organisation for Teaching

Staff are responsible for their own classroom organisation which should be appropriate to the age group they teach.

Staff will need to be creative with organising lessons to ensure resources are used to their full potential and enthusiasm for the subject is communicated effectively.

The Computing Suite is timetabled so that all year groups have access to the laptops available in the suite at least once each week. Each year group also has an allocation of laptops with a minimum of 12 laptops available for use for each year group. The school also has a bank of tablets available for use by classes.

Long, Medium and Short Term Planning

The school has an agreed long and medium term plan in place. Short term plans are provided as a guide. It is the responsibility of individual teachers to ensure that they adapt the Scheme to meet the needs of all pupils in a particular class.

Cross-curricular Links

Computing can enrich learning in other subjects. Some brief (simple) examples include:

- English – producing a typed piece of written work to persuade
- History – research on a significant individual or event
- Maths – use of data and charts
- Music – using software to create sounds and compositions
- Geography – use of digital mapping websites and apps
- Science – producing an informative presentation on the solar system

Time Allocation for the Subject

Computing is taught weekly in all classes for a minimum of 60 minutes.

Equal Opportunities and Special Educational Needs (SEN)

At The Valley School we adapt the curriculum to make it accessible to all pupils. This involves adapting the curriculum content, methods by which it is taught, teaching sequence

or resources. Our highly trained and dedicated staff know that true inclusion does not just happen in core subjects, but throughout the whole curriculum.

Computing is an entitlement for all pupils. Teachers at the Valley provide each child with appropriate learning challenges. They are aware of and respond to the diverse needs of each pupil, so that the experiences they have are rewarding and demonstrate achievement. Reasonable adjustments will be made so that each child can reach their full potential involving all the spectrum of SEN; adaptations to instruments or equipment may need to be made to allow for physical needs; opportunities to extend skills for the more able children. Equal opportunities will be supported by all staff. All children regardless of gender, ability or disability will be encouraged by staff to take an active part in lessons and to the best of their abilities.

Our inclusion practices include:

- Schemes of work in the short, mid and long-term, with clearly defined milestones and practical objectives exemplified clearly
- Pre-teaching key concepts and language
- Post-teaching to consolidate
- Supporting accessibility by understanding by focusing on key vocabulary
- Using ICT technology, apps, video and computer based technologies where appropriate
- Waves of intervention that focus on Basic Skills and language proficiency that supports wider curriculum accessibility

General Adjustments:

- Visual prompts
- Scaffolded learning
- Collaborative learning structures
- Focus on meta-cognition
- Always check they have understood
- Ensure directions are clear and concise.
- Chunk instructions into smaller parts
- Use a visual means of displaying instructions.
- Avoid giving multiple commands.
- Show visuals, actions or symbols to support key words.
- Reactivation of prior learning

- Explaining in more accessible language
- Explicit referencing to skills and knowledge
- Targeted questioning
- With reluctant talkers ask them to comment on what they are learning rather than phrase as a specific question.
- Give warning and extra processing time when asking a question. “When we have read / watched ...I am going to ask you...” or Ask them question then say “Think about it whilst I ask Then I will come back to you”
- Give at least 15 second respond time.
- Always model back the grammatically correct version of the sentence or model in a sentence

Computing Specific Adjustments

Please refer to Computing with SEN section.

Assessment, Recording and Reporting Procedures

Evidence

The class teacher must gather evidence of what has been done in class in relation to developing skills. When possible, teachers should encourage the saving of work by pupils. Photographs and video should be put into the Computing evidence folder on the T drive.

Reporting to Parents

This is done through Parents’ Evenings and the annual written report.

Assessment

Staff will need to ensure that during lessons they observe children as they are working with them. This is in order to make assessments that support the next step in learning and so that progress is monitored. Objectives achieved are recorded on Educater, the school’s tracking system. This is completed at least once per term.

Related Policies

Teaching and Learning Policy

Curriculum Policy

Assessment Policy

Computing Policy

Online Safety Policy

Child Protection Policy

Digital Citizenship – The Valley Approach

Systemic documents

Key documents held in house and maintained by subject leaders that promote, monitor and support this subject development.

- Position statement
- Action and/or development plan
- External and/or Internal Data Profiles
- Impact statement
- Monitoring plan
- Documents that support exemplification of standards
- Computing Policy (and further supplementary policies)

Reception Computing Overview – Linking ‘Switched on in the Early Years’ to the EYFS Framework 2021

The Early Years Foundation Stage (EYFS) – Context

The Early Years Foundation Stage (EYFS) sets the standards that all early years’ providers must meet to ensure that children learn and develop well and are kept healthy and safe. It promotes teaching and learning to ensure children’s ‘school readiness’ and gives children the broad range of knowledge and skills that provide the right foundation for good future progress through school and life.

The Valley School’s EYFS provision seeks to provide:

- Quality and consistency, so that every child makes good progress and no child gets left behind
- A secure foundation through planning for the learning and development of each individual child, and assessing and reviewing what they have learned regularly
- Partnership working between practitioners and with parents and/or carers
- Equality of opportunity and anti-discriminatory practice, ensuring that every child is included and supported

The EYFS specifies requirements for learning and development and for safeguarding children and promoting their welfare. The learning and development requirements cover:

- The areas of learning and development which must shape activities and experiences (educational programmes) for children
- The early learning goals that help children work towards the knowledge, skills and understanding children should have at the end of the academic year in which they turn five
- Assessment arrangements for measuring progress (and requirements for reporting to parents and/or carers)

The Seven Areas of Learning and Development

There are seven areas of learning and development that must shape educational programmes in all early years settings. All areas of learning and development are important and inter-connected.

Three areas (known as **prime areas**) are particularly important for building a foundation for igniting children’s curiosity and enthusiasm for learning, forming relationships and thriving. These are:

- communication and language
- physical development
- personal, social and emotional development

The Valley also supports children in four specific areas, through which the three prime areas are strengthened and applied (known as the **specific areas**). These areas are:

- literacy
- mathematics
- understanding the world
- expressive arts and design

At the Valley, education must involve activities and experiences for children, as set out under each of the areas of learning.

Communication and Language

The development of children's spoken language underpins all seven areas of learning and development. Children's back-and-forth interactions from an early age form the foundations for language and cognitive development. The number and quality of the conversations they have with adults and peers throughout the day in a language-rich environment is crucial. By commenting on what children are interested in or doing, and echoing back what they say with new vocabulary added, practitioners will build children's language effectively. Reading frequently to children, and engaging them actively in stories, non-fiction, rhymes and poems, and then providing them with extensive opportunities to use and embed new words in a range of contexts, will give children the opportunity to thrive. Through conversation, story-telling and role play, where children share their ideas with support and modelling from their teacher, and sensitive questioning that invites them to elaborate, children become comfortable using a rich range of vocabulary and language structures.

Personal, Social and Emotional Development

Children's personal, social and emotional development (PSED) is crucial for children to lead healthy and happy lives, and is fundamental to their cognitive development. Underpinning their personal development are the important attachments that shape their social world. Strong, warm and supportive relationships with adults enable children to learn how to understand their own feelings and those of others. Children should be supported to manage emotions, develop a positive sense of self, set themselves simple goals, have confidence in their own abilities, to persist and wait for what they want and direct attention as necessary. Through adult modelling and guidance, they will learn how to look after their bodies, including healthy eating, and manage personal needs independently. Through supported interaction with other children, they learn how to make good friendships, co-operate and resolve conflicts peaceably. These attributes will provide a secure platform from which children can achieve at school and in later life.

Physical Development

Physical activity is vital in children's all-round development, enabling them to pursue happy, healthy and active lives. Gross and fine motor experiences develop incrementally throughout early childhood, starting with sensory explorations and the development of a child's strength, co-ordination and positional awareness through tummy time, crawling and play movement with both objects and adults. By creating games and providing opportunities for play both indoors and outdoors, adults can support children to develop their core strength, stability, balance, spatial awareness, co-ordination and agility. Gross motor skills provide the foundation for developing healthy bodies and social and emotional well-being. Fine motor control and precision helps with hand-eye co-ordination, which is later linked to early literacy. Repeated and varied opportunities to explore and play with small world activities, puzzles, arts and crafts and the practice of using small tools, with feedback and support from adults, allow children to develop proficiency, control and confidence.

Literacy

It is crucial for children to develop a life-long love of reading. Reading consists of two dimensions: language comprehension and word reading. Language comprehension (necessary for both reading and writing) starts from birth. It only develops when adults talk with children about the world around them and the books (stories and non-fiction) they read with them, and enjoy rhymes, poems and songs together. Skilled word reading, taught later, involves both the speedy working out of the pronunciation of unfamiliar printed words (decoding) and the speedy recognition of familiar printed words. Writing involves transcription (spelling and handwriting) and composition (articulating ideas and structuring them in speech, before writing).

Mathematics

Developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically. Children should be able to count confidently, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers. By providing frequent and varied opportunities to build and apply this understanding - such as using manipulatives, including small pebbles and tens frames for organising counting - children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built. In addition, it is important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures. It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes.

Understanding the World

Understanding the world involves guiding children to make sense of their physical world and their community. The frequency and range of children's personal experiences increases their knowledge and sense of the world around them – from visiting parks, libraries and museums to meeting important members of society such as police officers, nurses and firefighters. In addition, listening to a broad selection of stories, non-fiction, rhymes and poems will foster their understanding of our culturally, socially, technologically and ecologically diverse world. As well as building important knowledge, this extends their familiarity with words that support understanding across domains. Enriching and widening children's vocabulary will support later reading comprehension.

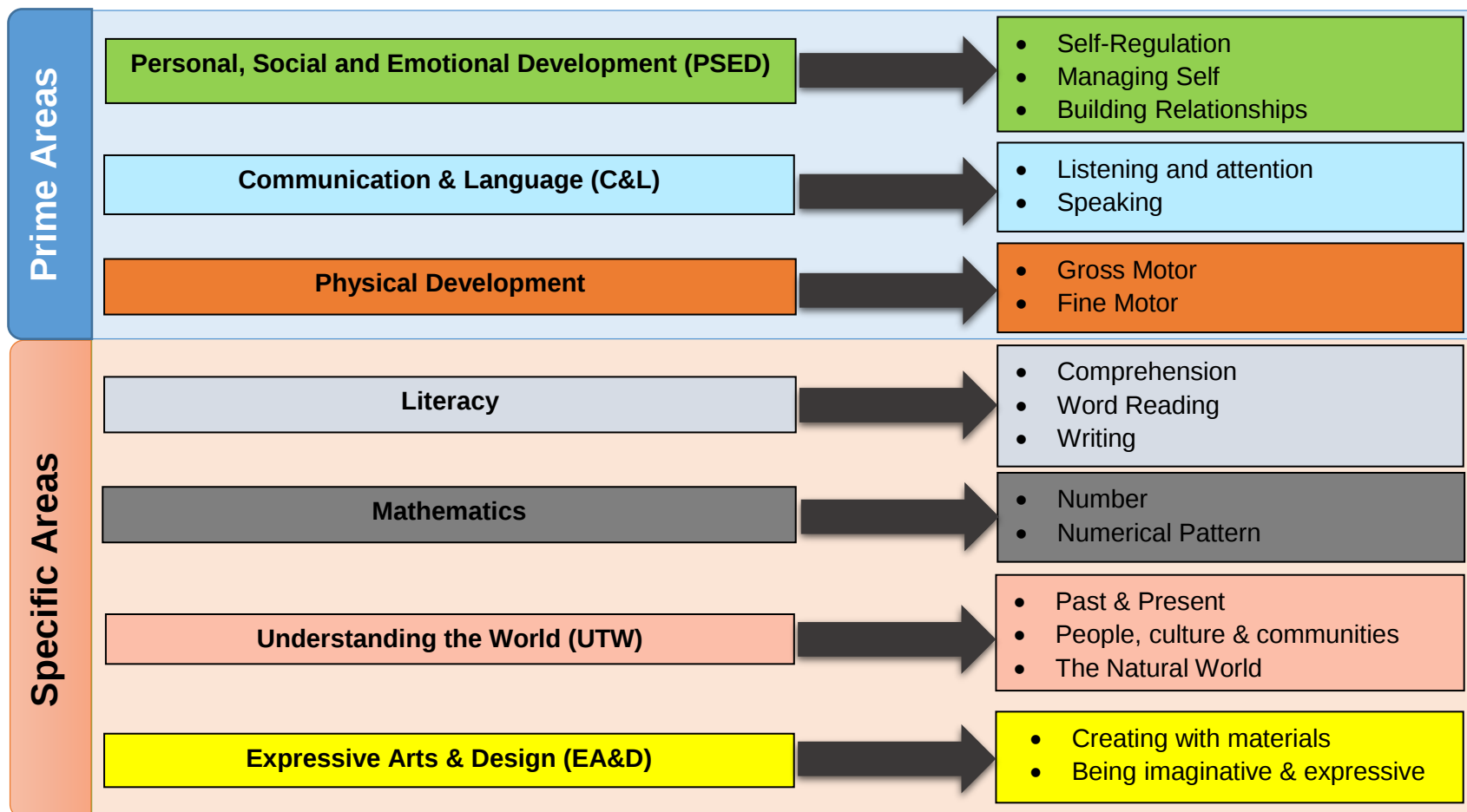
Expressive Arts and Design

The development of children's artistic and cultural awareness supports their imagination and creativity. It is important that children have regular opportunities to engage with the arts, enabling them to explore and play with a wide range of media and materials. The quality and variety of what children see, hear and participate in is crucial for developing their understanding, self-expression, vocabulary and ability to communicate through the arts. The frequency, repetition and depth of their experiences are fundamental to their progress in interpreting and appreciating what they hear, respond to and observe.

Early Learning Goals & The Seven Key Areas of Learning:

The level of development children should be expected to have attained by the end of the EYFS is defined by the early learning goals (ELGs) as set out below. The ELGs should not be used as a curriculum or in any way to limit the wide variety of rich experiences that are crucial to child development, from being read to frequently to playing with friends. Instead, the ELGs are used to support teachers to make a holistic, best-fit judgement about a child's development, and their readiness for year 1.

When forming a judgement about whether an individual child is at the expected level of development, teachers should draw on their knowledge of the child and their own expert professional judgement. This is sufficient evidence to assess a child's individual level of development in relation to each of the ELGs. Sources of written or photographic evidence are not required, and teachers are not required to record evidence.



ACTIVITY		AREA OF DEVELOPMENT	LEARNING OUTCOME	SUGGESTED TOOLS
Continuous Basic skills		UTW	The children become confident using a keyboard and become familiar with different parts of a laptop. They also begin to use a mouse.	Laptop (computing suite)
Autumn 1	We have feelings	PSED- self regulation	Children talk about how they and others are feeling, talk about their own and others' feelings and behaviours.	Digital cameras, iPad camera.
	We have confidence	PSED- managing self	The children have confidence to speak in a familiar group.	Computer/laptop, microphone.
	We can take turns	PSED- building relationships	The children can play cooperatively, taking turns with others. They also form positive relationships with adults.	IWB, computer, iPad 2simple (Simple City)
	We are successful	PSED- self-regulation	The children are confident to try new activities and say why they like some activities more than others.	Camera, computer/laptop, printer
Autumn	We are talkers	C&L- speaking	The children use talk to organise, sequence and clarify thinking, ideas, feelings and events and can express themselves effectively.	Computer, laptop, iPad video

	We can email	Literacy – Writing	The children can write short captions which can be read by themselves and others with some words phonetically plausible.	Laptop/computer, 2Simple (2Email)
	We can email	Literacy – Writing	The children can write short captions which can be read by themselves and others with some words phonetically plausible.	Laptop/computer, 2Simple (2Email)
	We are film producers	EA&D – Being Imaginative & expressive	They represent their own ideas and feelings through role play and stories.	Computer/laptop, iPad
	We are film producers	EA&D – Being Imaginative & expressive	They represent their own ideas and feelings through role play and stories.	Computer/laptop, iPad

ACTIVITY		AREA OF DEVELOPMENT	LEARNING OUTCOME	SUGGESTED TOOLS
Continuous Basic skills		UTW	The children become confident using a keyboard and become familiar with different parts of a laptop. They also begin to use a mouse.	Laptop (computing suite)
Spring 1	We are shape makers	Non-statutory	The children to use everyday language to talk about size and position. They explore the characteristics of everyday objects and use mathematical language to describe them.	IWB
	We can listen	C&L- Listening and Attention	The children listen to a range of situations. They give their attention to what others say and respond even when engaging in another activity.	Walkie Talkies/ Telephone.

	We are creative	EA&D- creating with materials	Children can safely use and explore a variety of materials, tools and techniques with colour, design and texture.	Tizzys's first Tools/ Simple2paint IWB/IPad/Laptop
	We can follow instructions	PSED- Managing Self	The children follow instructions involving several instructions. They can ask 'how' and 'why' questions about their experiences.	IPad Voice Recorder (laptop)
	We can understand messages	Literacy- Word Reading	The children follow instructions and respond to 'how' and 'why' questions.	iPad Audacity Microwave, digital kitchen scales, computer, laptop, sound recorder
Spring 2	We can drive	Physical Development- Gross Motor	Children negotiate space successfully, adjusting speed or changing directions to avoid obstacles.	Computer/laptop Traffic lights, petrol pump, role play props
	We are DJs	Physical Development- Gross Motor	Children show good control and coordination in large and small movements.	Internet, Microsoft Word IWB Flashing Lights, Microphone
	We can exercise	PSED- Managing Self	Children know that physical exercise make an important contribution to a healthy lifestyle.	Laptop, online countdown clock/ countdown clock Forehead thermometers, talking tins/pegs
	We are healthy	Physical Development- Health and Self Care	Children know that physical exercise is important and can talk about ways to keep healthy and safe.	Microsoft word, IWB

ACTIVITY		AREA OF DEVELOPMENT	LEARNING OUTCOME	SUGGESTED TOOLS
Continuous Basic skills		UTW	The children become confident using a keyboard and become familiar with different parts of a laptop. They also begin to use a mouse.	Laptop (computing suite)
Summer 1	We are shape makers	Non-statutory	The children to use everyday language to talk about size and position. They explore the characteristics of everyday objects and use mathematical language to describe them.	IWB
	We are digital readers	Literacy- Word reading	The children read and understand simple sentences, which can be read by themselves and others. Children to use phonics to help them spell words correctly.	CBeebies Story Time/ 2SimpleStoryTime iPad/Laptop
	We are community members	UTW- Past and Present	The children talk about past and present events in their own lives and in the lives of their family members.	Laptop, IPad, Talking pegs, camera/video camera Audacity, Microsoft word, Tizzy's First Tools.
	We can Count	Mathematics: Numbers	Children can count reliably 1-20 place them in order and talk about more and less.	Programmable toy (Beebots)
	We are Designers	Non-statutory	Children to use everyday language about position and distance.	Programmable toy (Beebots)

Summer 2	We can Blog	Literacy: Writing	The children should use their phonetic knowledge to write words that match their spoken sounds. They can write simple sentences that are read by themselves and others.	Blogging Tool, Blog examples Laptop/Computer
	We can observe	UTW- The Natural World	The children know similarities and differences in relation to objects, materials and living things.	Digital microscope software, Handheld microscope. Computer/Laptop
	We are game players	UTW	Children recognise that technology is used in the home and all around us. They select and use particular technology for different purposes.	2simple2Paint/2Simple2Draw IWB/Computer/iPad
	We can record soundtracks	EA&D- Being imaginative & expressive	They represent their own ideas thoughts and feelings	Audacity Computer/laptop

Years 1-6 National curriculum: Computing Programmes of Study

Attainment targets

By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.

Key stage 1

Pupils should be taught to:

- understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions
- create and debug simple programs
- use logical reasoning to predict the behaviour of simple programs
- use technology purposefully to create, organise, store, manipulate and retrieve digital content
- recognise common uses of information technology beyond school
- use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.

Key stage 2

Pupils should be taught to:

- 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; and the opportunities they offer for communication and collaboration
- use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
- 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 technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

An Explanation of the Programme of Study (POS NC 2014)

The NC Computing Programme of Study ('POS') distinguishes between end of KS1 and end of KS2 foci. These foci are not broken down into year groups or even into the different strands contained within Computing.

For ease of reference, each focus has been allocated a NC Code for internal purposes using NC COM codes. For example, COM1 includes the following focus: 'understand what algorithms are; and how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions.' This focus in itself, cannot be taught and understood as one distinct element. The reality is that it is not and there are at least 3 elements to that focus. Each element has been highlighted in colour above for reference. It is only once a learner has benefitted from excellent delivery, learning and understanding that they are able to piece together the relationships between the 3 elements contained in that focus.

Understanding the Programme of Study (NC 2014)

To implement the POS, the Computing Curriculum can be broken down into 3 main strands.

- Strand 1 – Computer Science ('CS')
- Strand 2 – Information Technology ('IT')
- Strand 3 – Digital Literacy ('DL')

These 3 main strands can then be divided into further sub-strands or topic areas as follows:

MAIN STRANDS	SUB-STRANDS/TOPIC AREAS
Computer Science (CS)	Problem solving (CS1) Programming (CS2) Logical thinking (CS3)
Information Technology (IT)	Creating content (IT1) Searching (IT2) –within KS2 POS only
Digital Literacy (DL)	E-safety (DL1) Using IT beyond school (DL2)

The coverage of each sub-strand/topic area for each year group can be seen in the table below.

Topic Area		Internal Code	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Problem solving		CS1	✓	✓	✓	✓	✓	✓
Programming		CS2	✓	✓	✓	✓	✓	✓
Logical thinking		CS3	✓	✓	✓	✓	✓	✓
Creating content		IT1	✓	✓	✓	✓	✓	✓
Searching		IT2	Not in KS1 POS	Not in KS1 POS	✓	✓	✓	✓
Digital literacy	Online safety	DL1	✓	✓	✓	✓	✓	✓
	Using IT beyond school	DL2	✓	✓	✓	✓	✓	✓

Delivery of the Computing Curriculum

Insofar as the delivery of the NC Computing POS is concerned, the School uses the 'Switched on Computing' Scheme as its vehicle to deliver the curriculum. This Scheme is guaranteed to fully meet all needs of the POS and has been created and written by Computing at School alongside a vast number of leading educational organisations.

Switched on Computing is a new scheme of work for computing. The units cover computer science, including programming, information technology and digital literacy.

The materials are the result of collaboration between **Rising Stars, Miles Berry** of the University of Roehampton, who was part of the drafting groups who drew up the computing curriculum, and experienced advisors and inspectors from **Havering Education Services**. The scheme is endorsed by both **Computing At School** and **Naace**, with **Dr John Woollard**, University of Southampton, acting as computing consultant for the former.

The following pages provide an overview of where the foci of the POS are being delivered across the Switched on Computing units throughout school. These pages confirm coverage of the National Curriculum.

Computer Science (CS)

Programme of study focus:	NC CODE	STRAND REF	Y1 SOC UNITS	Y2 SOC UNITS
▪ understand what algorithms are; and	COM1	CS1A	1.1 1.2 1.4	2.1 2.2
▪ how they [algorithms] are implemented as programs on digital devices;		CS1B	1.1 1.2	2.1 2.2
▪ that programs execute by following precise and unambiguous instructions		CS1C	1.1 1.2	2.1 2.2
▪ create and debug simple programs	COM2	CS2	1.1	2.1 2.2
▪ use logical reasoning to predict the behaviour of simple programs	COM3	CS3		

Information Technology (IT)

Programme of study focus:	NC CODE	STRAND REF	Y1 SOC UNITS	Y2 SOC UNITS
▪ use technology purposefully to create, organise, store, manipulate and retrieve digital content	COM4	IT1	1.2 1.3 1.5 1.4 (create & manipulate only) 1.6	2.3 2.4 2.5 2.6

Digital Literacy (DL)

Programme of study focus:	NC CODE	STRAND REF	Y1 SOC UNITS	Y2 SOC UNITS
▪ recognise common uses of information technology beyond school	COM5	DL1	1.2 1.3 1.5 1.6	All units
▪ use technology safely and respectfully;	COM6	DL2A	1.2 1.3 1.4 1.5 1.6	2.3
▪ keeping personal information private		DL2B	1.2 1.3 1.4 1.5 1.6	2.2 2.4 2.5 2.6
▪ identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies		DL2C	1.4 1.5 1.6	2.1

Key stage 2 Pupils should be taught to:

Computer Science (CS)

Programme of study focus:	NC CODE	STRAND REF	Y3 UNITS	Y4 UNITS	Y5 UNITS	Y6 UNITS
design, write and debug programs that accomplish specific goals, including...	COM7	CS1A	3.1 3.2	4.1 4.2	5.1	6.1 6.5 6.4 6.5
controlling or simulating physical systems		CS1B	3.1 3.2	4.1 4.2	5.1	6.1 6.4 6.5
solve problems by decomposing them into smaller parts		CS1C	3.1 3.3 3.6	4.1 4.2 4.5 4.6	5.1 5.6	6.1
use sequence, selection, and repetition in programs;	COM8	CS2A	3.1 3.2	4.1 4.2 4.3	5.1 5.3	6.1 6.2 6.5
work with variables and		CS2B	3.1 3.2	4.1 4.2 4.3 4.6	5.1 5.3	6.1 6.2 6.5
various forms of input and output		CS2C	3.1 3.2 3.3	4.1 4.2 4.3 4.6	5.1 5.6	6.1 6.2 6.4 6.5
use logical reasoning to explain how some simple algorithms work and	COM9	CS3A	3.1 3.2 3.3	4.1 4.2 4.3	5.1 5.2 5.3	6.1 6.4 6.5
to detect and correct errors in algorithms and programs		CS3B	3.1 3.2	4.1 4.2 4.3	5.1 5.3	6.4 6.5
understand computer networks including the internet;	COM10	CS4A	3.4 3.5 3.6	4.3 4.4 4.5	5.2 5.4 5.5	6.4
[understand] how they can provide multiple services, such as the world wide web; and		CS4B	3.4 3.5	4.4 4.5	5.2 5.4 5.5	6.3 6.4 6.5
and the opportunities they offer for communication and collaboration		CS4C	3.5 3.6	4.3 4.4 4.5	5.4 5.5	6.6

Information Technology (IT)

Programme of study focus:	NC CODE	STRAND REF	Y3 UNITS	Y4 UNITS	Y5 UNITS	Y6 UNITS
▪ use search technologies effectively,	COM11	IT1A	3.4	4.5	5.3 5.4	6.3
▪ appreciate how results are selected and ranked, and		IT1B	3.4	4.6	5.4	6.3 6.4 6.6
▪ be discerning in evaluating digital content		IT1C	3.1 3.3 3.6	4.3 4.5	5.3 5.4 5.5 5.6	6.3 6.4 6.6
▪ select, use and combine a variety of software (including internet services) on a range of digital devices	COM12	IT2A	3.3 3.4 3.5 3.6	4.3 4.4 4.5 4.6	5.1 5.3 5.4 5.5 5.6	6.3 6.4 6.5 6.6
▪ design and create a range of programs, systems and content that accomplish given goals, including		IT2B	3.3 3.4 3.5 3.6	4.3 4.4 4.5 4.6	5.1 5.3 5.4 5.6	6.3 6.4 6.5
▪ collecting, analysing, evaluating and presenting data and information.		IT2C	3.3 3.5 3.6	4.3 4.4 4.5 4.6	5.3 5.4 5.5 5.6	6.3

Digital Literacy (DL)

Programme of study focus:	NC CODE	STRAND REF	Y3 UNITS	Y4 UNITS	Y5 UNITS	Y6 UNITS
▪ use technology safely, respectfully and responsibly;	COM13	DL1A	All units	All units	All units	All units
▪ recognise acceptable/unacceptable behaviour;		DL1B	All units	All units	All units	All units
▪ identify a range of ways to report concerns about content and contact.		DL1C	All units	All units	All units	All units

The Valley Community Primary School Computing Long Term Planning

Online safety units

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
Autumn 1	1.1 We are Year 1 rule writers	2.1 We are Year 2 rule writers	3.1 We are Year 3 rule writers	4.1 We are Year 4 rule writers	5.1 We are Year 5 rule writers	6.1 We are online safety ambassadors
	1.1 We are treasure hunters (CS) Using programmable toys	2.1 We are astronauts (CS) Programming on screen	3.1 We are programmers (CS, IT, DL) Programming an animation	4.1 We are software developers (CS) Developing a simple educational game	5.1 We are game developers (CS) Developing an interactive game	6.1 We are adventure gamers (CS) Making a text-based adventure game
Autumn 2	1.2 We are kind and thoughtful	2.2 We are not online bullies	3.2 We are digital friends	4.2 We are standing up to peer pressure	5.2 We are responsible for our online actions	6.2 We will not share inappropriate images
	1.2 We are TV chefs (IT, DL, CS) Filming the steps of a recipe	2.2 We are games testers (CS) Exploring how computer games work	3.2 We are bug fixers (CS, DL) Finding and correcting bugs in programs	4.2 We are toy designers (CS) Prototyping an interactive toy	5.2 We are cryptographers (CS) Cracking codes	6.2 We are computational thinkers (CS) Mastering algorithms for searching, sorting and mathematics
Spring 1	1.3 We are responsible internet and device users	2.3 We are safe searchers	3.3 We are internet detectives	4.3 We are aware that our digital content lasts forever	5.3 We are content evaluators	6.3 We are safe social networkers
	1.3 We are painters (IT, DL) Illustrating an eBook	2.3 We are photographers (IT, DL) Taking better photos	3.3 We are presenters (IT, CS) Videoing performance	4.3 We are musicians (IT, CS) Producing digital music	5.3 We are artists (IT, CS) Fusing geometry and art	6.3 We are advertisers (IT, DL) Creating a short television advert
Spring 2	1.4 We are information protectors	2.4 We are code masters	3.4 We are aware of our digital footprint	4.4 We are online risk managers	5.4 We are protecting our online reputation	6.4 We are respectful of others
	1.4 We are collectors (IT, DL) Finding images using the web	2.4 We are researchers (IT, DL) Researching a topic	3.4 We are vloggers (IT, DL, CS) Making and sharing a short screencast presentation	4.4 We are HTML editors (CS, IT) Editing and writing HTML	5.4 We are web developers (IT, CS) Creating a website about cyber safety	6.4 We are network technicians (CS) Exploring computer networks including the internet
Summer 1	1.5 We are good digital citizens	2.5 We are online behaviour experts	3.5 We are netiquette experts	4.5 We are respectful of digital rights and responsibilities	5.5 We are respectful	6.5 We are online safety problem solvers
	1.5 We are storytellers (IT, DL) Producing a talking book	2.5 We are detectives (IT, DL) Collecting clues	3.5 We are communicators (IT, CS, DL) Communicating safely on the internet	4.5 We are co-authors (IT, CS, DL) Producing a wiki	5.5 We are bloggers (IT, CS) Sharing experiences and opinions	6.5 We are travel writers (CS) Using media and mapping to document a trip
Summer 2	1.6 We are responsible gamers	2.6 We are game raters	3.6 We are avatar creators	4.6 We are careful when talking to virtual friends	5.6 We are game changers	6.6 We are safe gaming experts
	1.6 We are celebrating (IT, DL) Creating a card digitally	2.6 We are zoologists (IT, DL) Collecting data about bugs	3.6 We are opinion pollsters (IT, CS, DL) Collecting and analysing data	4.6 We are meteorologists (IT, CS) Presenting the weather	5.6 We are architects (IT) Creating a virtual space	6.6 We are publishers (IT) Creating a yearbook or magazine

The Valley Community Primary School Computing Medium Term Planning

YEAR 1 SOC Units	Expectations / Objectives	Strand	NC POS Focus (KS1)
1.1 We are treasure hunters Using programmable toys	• Understand that a programmable toy can be controlled by inputting a sequence of instructions.	CS1A	• Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions. (CS1A, CS1B, CS1C) • Create and debug simple programs (CS2) • Use logical reasoning to predict the behaviour of simple programs. (CS3)
	• Develop and record sequences of instructions as an algorithm.	CS1B	
	• Program the toy to follow their algorithm.	CS1C	
	• Debug their programs.	CS2	
	• Predict how their programs will work.	CS3	
1.2 We are TV chefs Filming the steps of a recipe IT, DL, ASPECTS OF	• Break down a process into simple, clear steps, as in an algorithm.	CS1A	• Understand what algorithms are. (CS1A) • Use technology purposefully to create, organise, store, manipulate and retrieve digital content. (IT1) • Recognise common uses of information technology beyond school. (DL1) • Use technology safely and respectfully, keeping personal information private (DL2A, DL2B)
	• Use different features of a video camera.	IT1	
	• Use a video camera to capture moving images.	DL1	
	• Develop collaboration skills.	DL2A	
	• Discuss their work and think about how it could be improved.	DL2B	
1.3 We are painters Illustrating an eBook IT, DL	• Use the web safely to find ideas for an illustration.	IT1	• Use technology purposefully to create, organise, store, manipulate and retrieve digital content. (IT1) • Use technology safely and respectfully, keeping personal information private (DL2A, DL2B)
	• Select and use appropriate painting tools to create and change images on the computer.	DL2A	
	• Understand how this use of ICT differs from using paint and paper.	DL2B	
	• Create an illustration for a particular purpose.		
	• Know how to save, retrieve and change their work.		
	• Reflect on their work and act on feedback received.		
1.4 We are collectors Finding images using the web IT, DL	• Find and use pictures on the web.	DL1	• Recognise common uses of information technology beyond school. (DL1) • Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies. (DL2A, DL2B, DL2C) • Use technology purposefully to create and manipulate digital content. (IT1) • Understand what algorithms are (CS1A)
	• Know what to do if they encounter pictures that cause concern.	DL2A	
	• Group images on the basis of a binary (yes/no) question.	DL2B	
	• Organise images into more than two groups according to clear rules.	DL2C	
	• Sort (order) images according to some criteria.	IT1	
	• Ask and answer binary (yes/no) questions about their images.	CS1A	
1.5 We are storytellers Producing a talking book IT, DL	• Use sound recording equipment to record sounds.	IT1	• Use technology purposefully to create, organise, store, manipulate and retrieve digital content. (IT1) • Recognise common uses of information technology beyond school. (DL1) • Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies. (DL2A, DL2B, DL2C)
	• Develop skills in saving and storing sounds on the computer.	DL1	
	• Develop collaboration skills as they work together in a group.	DL2A	
	• Understand how a talking book differs from a paper-based book.	DL2B	
	• Talk about and reflect on their use of ICT.	DL2C	
	• Share recordings with an audience.		
1.6 We are celebrating Creating a card digitally IT, DL	• Develop basic keyboard skills, through typing and formatting text.	IT1	• Use technology purposefully to create, organise, store, manipulate and retrieve digital content. (IT1) • Recognise common uses of information technology beyond school. (DL1) • Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies. (DL2A, DL2B, DL2C)
	• Develop basic mouse skills.	DL1	
	• Use the web to find and select images.	DL2A	
	• Develop skills in storing and retrieving files.	DL2B	
	• Develop skills in combining text and images.	DL2C	
	• Discuss their work and think about whether it could be improved.		

YEAR 2 SOC Units	Expectations / Objectives	Strand	NC POS Focus (KS1)
2.1 We are astronauts Programming on screen CS	• Have a clear understanding of algorithms as sequences of instructions. • Convert simple algorithms to programs. • Predict what a simple program will do. • Spot and fix (debug) errors in their programs.	CS1A CS1B CS1C CS2 CS3 DL1 DL2C	• Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions. (CS1A, CS1B, CS1C) • Create and debug simple programs. (CS2) • Use logical reasoning to predict the behaviour of simple programs. (CS3) • Recognise common uses of information technology beyond school. (DL1) • Identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies. (DL2C)
2.2 We are games testers Exploring how computer games work CS	• Describe carefully what happens in computer games. • Use logical reasoning to make predictions of what a program will do. • Test these predictions. • Think critically about computer games and their use. • Be aware of how to use games safely and in balance with other activities.	CS1A CS1B CS1C CS3 DL1 DL2B	• Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions. (CS1A, CS1B, CS1C) • Use logical reasoning to predict the behaviour of simple programs. (CS3) • Recognise common uses of information technology beyond school. (DL1) • Use technology safely and respectfully, keeping personal information private. (DL2B)
2.3 We are photographers Taking better photos IT, DL	• Use a digital camera or camera app. • Take digital photographs. • Review and reject or rate the images they take. • Edit and enhance their photographs. • Consider the technical and artistic merits of photographs. • Select their best images to include in a shared portfolio.	IT1 DL1 DL2A	• Use technology purposefully to create, organise, store, manipulate and retrieve digital content. (IT1) • Recognise common uses of information technology beyond school. (DL1) • Use technology safely and respectfully. (DL2A)
2.4 We are researchers Researching a topic IT, DL	• Develop collaboration skills through working as part of a group. • Develop research skills through searching for information on the internet. • Improve note-taking skills through the use of mind mapping. • Develop presentation skills through creating and delivering a short multimedia presentation.	IT1 DL1 DL2B	• Use technology purposefully to create, organise, store, manipulate and retrieve digital content. (IT1) • Recognise common uses of information technology beyond school. (DL1) • Keeping personal information private. (DL2B)
2.5 We are detectives Collecting clues IT, DL	• Understand that email can be used to communicate. • Develop skills in opening, composing and sending emails. • Gain skills in opening and listening to audio files on the computer. • Use appropriate language in emails. • Develop skills in editing and formatting text in emails. • Be aware of online safety issues when using email.	IT1 DL1 DL2B	• Use technology purposefully to create, organise, store, manipulate and retrieve digital content. (IT1) • Recognise common uses of information technology beyond school. (DL1) • Keeping personal information private. (DL2B)
2.6 We are zoologists Collecting data about bugs IT, DL	• Sort and classify a group of items by answering questions. • Collect data using tick charts or tally charts. • Use simple charting software to produce pictograms and other basic charts. • Take, edit and enhance photographs. • Record information on a digital map.	IT1 DL1 DL2B	• Use technology purposefully to create, organise, store, manipulate and retrieve digital content. (IT1) • Recognise common uses of information technology beyond school. (DL1) • Keeping personal information private. (DL2B)

YEAR 3 SOC Units	Expectations / Objectives	Strand		NC POS Focus (KS2)
3.1 We are programmers Programming an animation CS, ASPECTS OF IT AND DL	Create an algorithm for an animated scene in the form of a storyboard.	CS1A	CS3A	- Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems and solve problems by decomposing them into smaller parts. (CS1A, CS1B, CS1C) - Use sequence, selection and repetition in programs; work with variables and various forms of input and output. (CS2A, CS2B, CS2C) - Use logical reasoning to detect and correct errors in algorithms and programs. (CS3A, CS3B) - Be discerning in evaluating digital content. (IT1C)
	Write a program in Scratch to create the animation.	CS1B	CS3B	
	Correct mistakes in their animation programs.	CS1C	IT1C	
3.2 We are bug fixers Finding and correcting bugs in programs CS, ASPECTS OF DL	Develop a number of strategies for finding errors in	CS2A	DL1A	- Debug programs that accomplish specific goals including controlling or simulating physical systems. (CS1A, CS1B) - Use sequence, selection, and repetition in programs; work with variables and various forms of input and output. (CS2A, CS2B, CS2C) - Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs. (CS3A, CS3B)
	Build up resilience and strategies for problem solving.	CS2B	DL1B	
	Increase their knowledge and understanding of Scratch.	CS2C	DL1C	
3.3 We are presenters Videoing performance IT, ASPECTS OF CS	Gain skills in shooting live video, such as framing shots, holding the camera steady, and reviewing.	CS1C	DL1A	- Solve problems by decomposing them into smaller parts. (CS1C) - Use logical reasoning to explain how some simple algorithms work. (CS3A) - Be discerning in evaluating digital content. (IT1C) - 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. (IT2A, IT2B, IT2C) - Work with various forms of input and output. (CS2C)
	Edit video, including adding narration and editing clips by setting in/out points.	CS3A	DL1B	
	Understand the qualities of effective video, such as the importance of narrative, consistency, perspective and scene length.	CS2C	DL1C	
3.4 We are vloggers Making and sharing a short screencast presentation IT, ASPECTS OF DL AND CS	Use a search engine to learn about a new topic.	IT1C	IT2A	- Understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web. (CS4A, CS4B) - Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content. (IT1A, IT1B, IT1C) - Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of content that accomplish given goals, including collecting, analysing, evaluating and presenting information. (IT2A, IT2B, IT2C)
	Plan, design and deliver an interesting and engaging presentation.	IT1A	IT1B	
	Search for and evaluate online images.	IT1B	IT1C	
	Create their own original images.	IT1C	IT2A	
	Create a video slidecast of a narrated presentation.	IT2A	IT2B	
	Develop understanding of how the internet, the web and search engines work.	IT2B	IT2C	
3.5 We are communicators Communicating safely on the internet IT, ASPECTS OF CS AND DL	Develop a basic understanding of how email works.	CS4A	DL1A	- 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. (CS4A, CS4B, CS4C) - 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. (IT2A, IT2B, IT2C)
	Gain skills in using email.	CS4B	DL1B	
	Be aware of broader issues surrounding email, including 'netiquette' and online safety.	CS4C	DL1C	
	Work collaboratively with a remote partner.	IT2A	IT2B	
	Experience video conferencing.	IT2B	IT2C	
3.6 We are opinion pollsters Collecting and analysing data IT, ASPECTS OF CS AND DL	Understand some elements of survey design.	CS1C	DL1A	- Solve problems by decomposing them into smaller parts. (CS1C) - Be discerning in evaluating digital content. (IT1C) - 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. (IT2A, IT2B, IT2C) - Understand computer networks, including the internet; how they provide multiple services, such as the worldwide web; and the opportunities for communication and collaboration. (CS4A, CS4B, CS4C)
	Understand some ethical and legal aspects of online data collection.	IT1C	DL1B	
	Use the web to facilitate data collection.	IT2A	DL1C	
	Gain skills in using charts to analyse data.	IT2B	IT2C	
	Gain skills in interpreting results.	IT2C	CS4A	
		CS4B	CS4C	

YEAR 4 SOC Units	Expectations / Objectives	Strand		NC POS Focus (KS2)
4.1 We are software developers Developing a simple educational game CS	Develop an educational computer game using selection and repetition.	CS1A	CS3A	- Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems and solve problems by decomposing them into smaller parts. (CS1A, CS1B, CS1C) - Use sequence, selection, and repetition in programs; work with variables and various forms of input and output. (CS2A, CS2B, CS2C) - Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs. (CS3A, CS3B)
	Understand and use variables.	CS1B	CS3B	
	Start to debug computer programs.	CS1C	DL1A	
	Recognise the importance of user interface design, including consideration of input and output.	CS2A CS2B CS2C	DL1B DL1C	
4.2 We are toy designers Prototyping an interactive toy CS	Design and make an on-screen prototype of a computer-controlled toy.	CS1A	CS3A	- Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems and solve problems by decomposing them into smaller parts. (CS1A, CS1B, CS1C) - Use sequence, selection, and repetition in programs; work with variables and various forms of input and output. (CS2A, CS2B, CS2C) - Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs. (CS3A, CS3B)
	Understand different forms of input and output (such as sensors, switches, motors, lights and speakers).	CS1B CS1C	CS3B DL1A	
	Design, write and debug the control and monitoring program for their toy.	CS2A CS2B CS2C	DL1B DL1C	
4.3 We are musicians Producing digital music IT, CS	Use one or more programs to edit music.	CS2A	T1C	- Use sequence, selection, and repetition in programs; work with variables and various forms of input and output. (CS2A, CS2B, CS2C) - Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs. (CS3A, CS3B) - Understand computer networks including the internet; and the opportunities they offer for communication and collaboration. (CS4B, CS4C) - Be discerning in evaluating digital content. (IT1C) - 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. (IT2A, IT2B, IT2C)
	Create and develop a musical composition, refining their ideas through reflection and discussion.	CS2B CS2C	T2A T2B	
	Develop collaboration skills.	CS3A	T2C	
	Develop an awareness of how their com.//position can enhance work in other media.	CS3B CS4B CS4C	DL1A DL1B DL1C	
4.4 We are HTML editors Editing and writing HTML CS, IT	Understand some technical aspects of how the internet makes the web possible.	CS4A	DL1A	- 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. (CS4A, CS4B, CS4C) - 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. (IT2A, IT2B, IT2C)
	Use HTML tags for elementary mark up.	CS4B	DL1B	
	Use hyperlinks to connect ideas and sources.	CS4C	DL1C	
	Code up a simple web page with useful content.	IT2A		
4.5 We are co-authors Producing a wiki IT, ASPECTS OF CS AND DL	Understand some of the risks in using the web.	IT2B IT2C		- Solve problems by decomposing them into smaller parts. (CS1C) - 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. (CS4A, CS4B, CS4C) - Use search technologies effectively and be discerning in evaluating digital content. (IT1A, IT1C) - 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. (IT2A, IT2B, IT2C)
4.6 We are meteorologists Presenting the weather IT, ASPECTS OF CS	Understand the conventions for collaborative online work, particularly in wikis.	CS1C	DL1A	- Solve problems by decomposing them into smaller parts. (CS1C) - 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. (CS4A, CS4B, CS4C) - Use search technologies effectively and be discerning in evaluating digital content. (IT1A, IT1C) - 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. (IT2A, IT2B, IT2C)
	Be aware of their responsibilities when editing other people's work.	CS4A	DL1B	
	Become familiar with Wikinedia including potential problems associated with its use	CS4B	DL1C	
	Practise research skills.	CS4C		
4.6 We are meteorologists Presenting the weather IT, ASPECTS OF CS	Write for a target audience using a wiki tool.	IT1A		- Solve problems by decomposing them into smaller parts. (CS1C) - Work with variables and various forms of input and output. (CS2B, CS2C) - Appreciate how results are selected and ranked. (IT1B) - 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. (IT2A, IT2B, IT2C)
	Develop collaboration skills.	IT1C		
	Develop proofreading skills.			
4.6 We are meteorologists Presenting the weather IT, ASPECTS OF CS	Understand different measurement techniques for weather, both analogue and digital.	CS1C	DL1A	- Solve problems by decomposing them into smaller parts. (CS1C) - Work with variables and various forms of input and output. (CS2B, CS2C) - Appreciate how results are selected and ranked. (IT1B) - 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. (IT2A, IT2B, IT2C)
	Use computer-based data logging to automate the recording of some weather data.	CS2B	DL1B	
	Use spreadsheets to create charts	CS2C	DL1C	
	Analyse data, explore inconsistencies in data and make predictions	IT1B		
4.6 We are meteorologists Presenting the weather IT, ASPECTS OF CS	Practise using presentation software and, optionally, video.	IT2A		- Solve problems by decomposing them into smaller parts. (CS1C) - Work with variables and various forms of input and output. (CS2B, CS2C) - Appreciate how results are selected and ranked. (IT1B) - 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. (IT2A, IT2B, IT2C)
		IT2B		
		IT2C		

YEAR 5 SOC Units	Expectations / Objectives	Strand		NC POS Focus (KS2)
5.1 We are game developers Developing an interactive game CS	Create original artwork and sound for a game.	CS1A	CS3A	- Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. (CS1A, CS1B, CS1C) - Use sequence, selection, and repetition in programs; work with variables and various forms of input and output. (CS2A, CS2B, CS2C) - Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs. (CS3A, CS3B) - 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. (IT2A, IT2B)
	Design and create a computer program for a computer game, which uses sequence, selection, repetition and variables.	CS1B	CS3B	
	Detect and correct errors in their computer game.	CS1C	IT2A	
	Use iterative development techniques (making and testing a series of small changes) to improve their game.	CS2A	IT2B	
5.2 We are cryptographers Cracking codes CS	Be familiar with semaphore and Morse code.	CS2B	DL1A	- Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs. (CS3A, CS3B) - 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. (CS4A, CS4B, CS4C)
	Understand the need for private information to be encrypted.	CS2C	DL1B	
	Encrypt and decrypt messages in simple ciphers.	CS3A	DL1C	
	Appreciate the need to use complex passwords and to keep them secure.	CS4A		
5.3 We are artists Fusing geometry and art IT, ASPECTS OF CS	Have some understanding of how encryption works on the web.	CS4B		- Use sequence, selection, and repetition in programs; work with variables. (CS2A, CS2B) - Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs. (CS3A, CS3B) - Be discerning in evaluating digital content. (IT1C) - 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. (IT2A, IT2B, IT2C)
	Develop an appreciation of the links between geometry and art.	CS4C		
	Become familiar with the tools and techniques of a vector graphics package.	CS2A	DL1A	
	Develop an understanding of turtle graphics.	CS2B	DL1B	
5.4 We are web developers Creating a website about cyber safety IT, ASPECTS OF CS	Experiment with the tools available, refining and developing their work as they apply their own criteria to evaluate it and receive feedback from their peers.	CS3B	DL1C	- 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. (CS4A, CS4B, CS4C) - Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content. (IT2A, IT2B, IT2C) - 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. (IT2A, IT2B, IT2C)
	Develop some awareness of computer-generated art, in particular fractal-based landscapes.	IT2A		
	Develop their research skills to decide what information is appropriate.	IT2B		
	Understand some elements of how search engines select and rank results.	IT2C		
5.5 We are bloggers Sharing experiences and opinions IT, ASPECTS OF CS	Question the plausibility and quality of information.	IT1A	DL1A	- 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. (CS4A, CS4B, CS4C) - Be discerning in evaluating digital content. (IT1C) - Select, use and combine a variety of software (including internet services) on a range of digital devices to including collecting, analysing, evaluating and presenting data and information. (IT2A, IT2B, IT2C)
	Develop and refine their ideas and text collaboratively.	IT1B	DL1B	
	Develop their understanding of online safety and responsible use of technology.	IT1C	DL1C	
	Become familiar with blogs as a medium and a genre of writing.	CS4A	DL1A	
5.6 We are architects Creating a virtual space IT	Create a sequence of blog posts on a theme.	CS4B	DL1B	- Solve problems by decomposing them into smaller parts. (CS1C) - Be discerning in evaluating digital content. (IT1C) - 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. (IT2A, IT2B, IT2C).
	Incorporate additional media.	CS4C	DL1C	
	Comment on the posts of others.	IT2A		
	Develop a critical, reflective view of a range of media, including text.	IT2C		
5.6 We are architects Creating a virtual space IT	Understand the work of architects, designers and engineers working in 3D.	CS1C	DL1A	- Solve problems by decomposing them into smaller parts. (CS1C) - Be discerning in evaluating digital content. (IT1C) - 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. (IT2A, IT2B, IT2C).
	Develop familiarity with a simple CAD (computer aided design) tool.	IT1B	DL1B	
	Develop spatial awareness by exploring and experimenting with a 3D virtual environment.	IT2A	DL1C	
	Develop greater aesthetic awareness.	IT2B		

YEAR 6 SOC Units	Expectations / Objectives	Strand		NC POS Focus (KS2)
6.1 We are adventure gamers Making a text-based adventure game CS	Learn some of the syntax of a text-based programming language.	CS1A	CS3A	- Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. (CS1A, CS1B, CS1C) - Use sequence, selection and repetition in programs; work with variables and various forms of input and output. (CS2A, CS2B, CS2C) - Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs. (CS3A, CS3B)
	Use commands to display text on screen, accept typed user input, store and retrieve data using variables and select from a list.	CS1B	CS3B	
	Plan a text-based adventure with multiple 'rooms' and user interaction.	CS1C	DL1A	
	Thoroughly debug the program.	CS2A CS2B CS2C	DL1B DL1C	
6.2 We are computational thinkers Mastering algorithms for searching, sorting and mathematics CS	Develop the ability to reason logically about algorithms.	CS1A	DL1A	- Design, write and debug programs that accomplish specific goals. (CS1A) - Use sequence, selection and repetition in programs; work with variables and various forms of input and output. (CS2A, CS2B, CS2C) - Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs. (CS3A, CS3B)
	Understand how some key algorithms can be expressed as programs.	CS2A	DL1B	
	Understand that some algorithms are more efficient than others for the same problem.	CS2B	DL1C	
	Understand common algorithms for sorting and searching.	CS2C		
	Appreciate algorithmic approaches to problems in mathematics.	CS3A CS3B		
6.3 We are advertisers Creating a short television advert IT, DL	Think critically about how video is used to promote a cause.	CS4B	IT2A	- Understand how computer networks can provide multiple services, such as the world wide web (CS4B) - Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content. (IT1A, IT1B, IT1C) - 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. (IT2A, IT2B, IT2C)
	Storyboard an effective advert for a cause.	IT1A	IT2B	
	Work collaboratively to shoot suitable original footage and source additional content, acknowledging intellectual property rights.	IT1B	IT2C	
	Work collaboratively to edit the assembled content to make an effective advert.	IT1C	DL1A DL1B DL1C	
6.4 We are network technicians Exploring computer networks including the internet CS	Appreciate that computer networks transmit and receive information digitally.	CS1A	DL1A	- Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems. (CS1A, CS1B) - Work with various forms of input and output. (CS2C) - Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs. (CS3A, CS3B) - Understand computer networks including the internet; how they can provide multiple services, such as the world wide web. (CS4A, CS4B) - Be discerning in evaluating digital content (IT1C) - 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. (IT2A, IT2B)
	Understand the basic hardware needed for computer networks to work.	CS1B	DL1B	
	Understand key features of internet communication protocols.	CS2C	DL1C	
	Develop a basic understanding of how domain names are converted to numerical IP addresses.	CS3A CS3B CS4A CS4B IT2A IT2B		
6.5 We are travel writers Using media and mapping to document a trip CS	Research a location online using a range of resources appropriately.	CS1A	DL1A	- Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems. (CS1A, CS1B). - Use sequence, selection and repetition in programs; work with variables and various forms of input and output. (CS2A, CS2B, CS2C) - Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs. (CS3A, CS3B) - Understand how computer networks can provide multiple services, such as the world wide web (CS4B) - 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. (IT2A, IT2B)
	Understand the safe use of mobile technology, including GPS.	CS1B	DL1B	
	Capture images, audio and video while on location.	CS2A	DL1C	
	Showcase shared media content through a mapping layer.	CS2B CS2C CS3A CS3B CS4B		
6.6 We are publishers Creating a yearbook or magazine IT	Manage or contribute to large collaborative projects, facilitated using online tools.	CS4C	DL1A	- Understand the opportunities computer networks offer for communication and collaboration. (CS4C) - appreciate how search results are selected and ranked, and be discerning in evaluating digital content. (IT1B, IT1C) - Select, use and combine a variety of software (including internet services) on a range of digital devices. (IT2A)
	Write and review content.	IT1B	DL1B	
	Source digital media while demonstrating safe, respectful and responsible use.	IT1C	DL1C	
	Design and produce a high-quality print document.	IT2A		

Teaching Vocabulary for Pupils (Computing)

YEAR 1	Unit:1 We Are Treasure Hunters Specific to unit: algorithm, debug, instructions, predict, program/programming, robot, treasure, predict Unit:2 We Are TV Chefs Specific to unit: algorithm, clip, edit, film, instructions, recipe, robot, video camera Unit:3 We Are Painters Specific to unit: character, eBook, edit, illustration, traditional tale, images, save Unit:4 We Are Collectors Specific to unit: algorithm, copyright, e-safety, mammal, permission, personal, private Unit:5 We Are Story Tellers Specific to unit: audio book, copyright, microphone, record/recording, sound effects, talking book Unit:6 We Are Celebrating Specific to unit: celebrate, copyright, edit, greeting, keyboard, save, type, format
YEAR 2	Unit:1 We Are Astronauts Specific to unit: algorithm, instructions, predict, problem, program, robot, Scratch, sprite, debug Unit:2 We Are Games Testers Specific to unit: algorithm, predict, rules, Scratch, test, logical reasoning Unit:3 We Are Photographers Specific to unit: camera, image, pixels, portfolio, theme, edit, enhance Unit:4 We Are Researchers Specific to unit: Google, mind map, presentation, research, search, search engine Unit:5 We Are Detectives Specific to unit: address, attachment, database, evidence, email, fact file, safety Unit:6 We Are Zoologists Specific to unit: chart, classification, key, data, database, tally chart, tick chart
YEAR 3	Unit:1 We Are Programmers Specific to unit: algorithm, animation, input, output, program, script, storyboard Unit:2 We Are Bug Fixers Specific to unit: algorithm, bugs, debug, instruction, program, script Unit:3 We Are Presenters Specific to unit: audio, close-up, editing, footage, panning, shooting, video camera, zooming Unit:4 We Are Vloggers Specific to unit: vlogging, search, engine, internet, presentation, narration, Creative Commons, copyright, images, audio, screencast Unit:5 We Are Communicators Specific to unit: attachment, email, e-safety, spam, spoofed, link, video conference, virus Unit:6 We Are Opinion Pollsters Specific to unit: chart, data, graph, opinion, questions, rating, scale, research, survey
YEAR 4	Unit:1 We Are Software Developers Specific to unit: debug, input, interface, output, program, prototype, repetition, variable Unit:2 We Are Toy Designers Specific to unit: algorithm, debug, input, interactive, output, "pitch", prototype, simulation Unit:3 We Are Musicians Specific to unit: audio, composition, copyright, digital, instruments, pitch, sample, sequencing, software Unit:4 We Are HTML Editors Specific to unit: code, HTML, HTTP (hyper text transfer protocol), hyperlink, tag, URL, web page Unit:5 We Are Co-Authors Specific to unit: edit, information, mind map, reliable, style, wiki, Wikipedia's Five pillars Unit:6 We Are Meteorologists Specific to unit: chart, data-logging, forecast, graph, measurement, prediction, spreadsheet, temperature

YEAR 5	Unit:1 We Are Game Developers Specific to unit: algorithm, debugging, code, programming, sprites, storyboard Unit:2 We Are Cryptographers Specific to unit: binary, code, cipher, decrypt, encrypt, Morse code, password, security, semaphore Unit:3 We Are Artists Specific to unit: geometric, landscape, op art, sprite, symmetry, tessellation Unit:4 We Are Web Developers Specific to unit: bias, e-safety, Page Rank, revision, history, search engine Unit:5 We Are Bloggers Specific to unit: audience, blog, blogroll, copyright, dashboard, hyperlinks Unit:6 We Are Architects Specific to unit: 3D, animation, gallery, navigation, screencast, sculpture
YEAR 6	Unit:1 We Are Adventure Gamers Specific to unit: Python, repetition, variable, selection, print, procedure, syntax Unit:2 We Are Computational Thinkers Specific to unit: algorithm, flowchart, pseudocode, linear search, random search, binary search, selection, sort, quicksort Unit:3 We Are Advertisers Specific to unit: footage, rough, cut, storyboard, advert, Creative Commons, video camera, rushes of footage, final cut Unit:4 We Are Network Technicians Specific to unit: command prompt, internet IP address, packet of data, the web, webserver, network, Domain Name Service (DNS) Unit:5 We Are Travel Writers Specific to unit: geotagging, GPS, route, location, tracklog, smartphone, map, metadata Unit:6 We Are Publishers Specific to unit: Desktop publishing (DTP), magazine, yearbook, collaboration, design, images, typeface, layout

and pupils with Special Educational Needs

September 2014 saw a revised National Curriculum come into effect under which 'ICT' has become 'computing', bringing a greater emphasis on programming, coding and computational thinking, under the umbrella term of Computer Science. The two other strands – Digital Literacy and Information Technology – deal with the acquisition and application of the skills necessary to be competent and confident users of all sorts of digital technologies.

Computing is an enabler for children with SEN. Whatever their difficulties, technology can help them to learn, both by making the curriculum accessible and by letting them work to their strengths. To experience the advantages computing brings, children need to be taught the necessary skills and knowledge to use it well; *Switched on Computing* does this.

Switched on Computing offers the necessary materials to cover the breadth of the computing curriculum, and to give all pupils rich and meaningful learning experiences. For those with special educational needs (SEN) it can be used as a framework that can guide their teachers in ensuring that they too are included in the challenges and opportunities it presents.

Switched on Computing works for children with SEN for several reasons:

- **A familiar structure** – the schemes of work follow a similar pattern, with clear outcomes and well-signposted activities, that set a good pace for learning
- **Built-in progression** – from term to term, and from year to year, developing skills are built on and returned to, enabling children to learn them fully
- **Flexible guidelines** – activities are supported at first with posters, and later on with task sheets, that can be freely edited to focus on a child's particular learning needs
- **A bank of resources** – a range of media, including images and sound effects, are provided so children won't get distracted searching for them, and you can decide how many or how few they get to choose from
- **Support for assessment** – as well as sentence starters to help children reflect on what they have learned, a series of statements help teachers to determine what level they are working at.

Challenges and opportunities for SEN

There is some debate about just what these curriculum changes mean for children and young people with special educational needs. Is 'computational thinking' really something we should expect them to engage with when they are struggling to get the hang of phonics? Or should they be trying to write lines of code when they find getting a sentence down daunting enough? And is learning how to control a robot appropriate for learners who find understanding and controlling emotions an everyday challenge?

The answer to these questions has to be, "Yes". The National Curriculum is an entitlement for all children.

Just as with literacy, all children need to be both consumers and creators. We accept that learning to read is only part of the path to literacy – we also teach them to write. Almost all children will play video games, surf the web, use devices controlled by programs, such as washing machines and microwaves, so they should also have some understanding of how to make or control these programs themselves.

Perhaps the most persuasive reason for engaging learners with SEN is that the discipline of Computer Science – of sequencing, precision, problem-solving, controlling and commanding – offers skills and understanding that could be applied for wider learning too:

- **Programming** is itself a language, with elements of vocabulary, grammar and syntax that have to be used accurately to achieve the desired result; just as with spoken language.
- **Coding** is those elements that are needed to create the program, proficiency with which leads to successful programming, just as learning words and sequencing them correctly is the key to being understood through language.
- **Computational thinking** is about using logic and reason to work something out, putting things in an order and realising what's gone wrong if it doesn't work out as we expected. A skill not just for educational success but for many aspects of our lives, such as creating and maintaining relationships.

How computing skills help

By providing children with alternative ways to demonstrate their learning, computing can help harness their creativity and give a true picture of what they are capable of, as well as boosting their confidence and self-esteem.



Good starting points for using *Switched on Computing* with children with SEN

Animation	<i>Unit 3.1</i> <i>We are animators</i>	As a visual medium, it doesn't necessarily need words to get a story across. They can develop language skills by getting children to think about the sequence of the story, the way in which characters speak, and to develop a sense of audience.
Videos	<i>Unit 1.2</i> <i>We are TV chefs</i> <i>Unit 3.3</i> <i>We are presenters</i> <i>Unit 6.6</i> <i>We are marketers</i>	Offer similar opportunities to animation, with the added advantage that children can assess their own performance. They can watch their presentation, listen to their voice and critique their choice of language, rehearsing and retaking until they are happy that they are clear and can be understood. Children who are developing language skills can choose to use other ways of communicating, such as mime or sign language. It is also a very useful activity for group work because films require a team of people to make them: from actors to camera and sound crews, directors, scriptwriters and designers. Everyone has to play their part to get a successful outcome.
Mindmaps	Used in units throughout	Provide a conceptual framework to structure their learning. They are often recommended as a way to help dyslexic children organise their thoughts, and are beneficial for visual learners who can make and see connections. Mindmaps have the added benefit of helping pupils to break down large problems into smaller ones: the computational thinking concept known as decomposition. It is not only text and images that can be added to a mindmap. Sound, video and links to other files or websites can also be used to provide a dynamic, multimedia creation.

Assessment

Switched on Computing provides guidance for assessing pupils against the statements of the computing Programme of Study.

Assessment statements are grouped into: 'all children should', 'most children should' and 'some children should'. Children with SEN may not have achieved the 'all children should' statements listed, but it is easy enough to track back further to find more appropriate statements in earlier year groups, due to the repeated content strands that run through all year groups.

Each task comes with downloadable self-assessment tools for children to use. These can be customised, narrowing the focus to particular knowledge and skills, or with graphics and symbols inserted to help children independently reflect on what they have learned.

There are also very useful self-assessment sheets for each unit, asking key questions and providing space to insert an image, a screen-capture or photo to help remember or explain what was covered.

An inclusive approach

Within the structure of *Switched on Computing* is a number of ways in which lessons can be differentiated so that those who are challenged by the content, or indeed those that need a greater challenge, can be accommodated.

Each unit has an 'Inclusion' section which provides ideas for how to be sensitive to different aspects of SEN, or for learners for whom English is not their first language. The 'Getting Ready' box also highlights things to think about before getting started, such as making sure Teaching Assistants are fully briefed.

The structured, developmental approach of the units is a big help too. As pupils progress up the school, so units will build on learning from previous years. If necessary, these earlier units can be revisited to provide a framework for differentiation. For instance, if the learning expectations of *Unit 5.1 – We are game developers* are inappropriate, then maybe those of *Unit 3.1 – We are programmers* could help ensure all children are included. Similarly *Unit 6.3 – We are market researchers* could, for one or two of the class, draw upon *Unit 3.6 We are opinion pollsters*.

Resourcing

Switched on Computing is a scheme of work that is not linked to any particular software titles. It advises throughout what programs might be suitable, but it is never prescriptive. For children with SEN this means that some programs which are not mentioned, but are commonly available on school networks, could be used.

Switched on Computing gives children the opportunity to demonstrate their learning, to share their ideas and to communicate their thoughts and feelings in the ways that suit them best. As well as writing, they can choose to shoot a film, narrate a presentation, create a photo montage, make an animation, post a blog, develop a game, produce music or even publish a website. Every child can find a way to express themselves, and to show what they know.

John Galloway

September 2014

Online Safety – A Brief Overview

Key note: Please refer to the related policies, particularly the Online Safety Policy, Digital Citizenship Policy and Child Protection Policy (referred to earlier on in this document) for further details.

These are the key principles of the teaching of digital citizenship at the Valley:

1. The school's teaching of digital citizenship is embedded within the Switched on Computing scheme.
2. The school also teaches specific lessons on digital citizenship which are threaded throughout the Jigsaw scheme.
3. The school recognises the increased risks identified regarding online grooming and radicalisation and teaches specific lessons each half term on aspects of digital citizenship so that pupils are armed with the attitudes and skills to remain safe online, recognise when the internet can be useful and fulfil the potential to be positive digital citizens.
4. The school participates in Safer Internet Day each year.
5. The school has invited the NSPCC to support parents and pupils through workshops, every 3 years in line with the NSPCC's commitments. Support from the NSPCC will continue post-Covid. This may take the form of school staff delivering sessions using NSPCC guidance and support.
6. The school has an online safety policy devised by the Council's child protection team in conjunction with Bolton Schools ICT. The latter provide filtering, firewall and virus protection services to school devices – please refer to the Online Safety Policy for further information.

Why is it so important?

Online safety is a whole school issue. There is a whole school approach to developing pupils as positive digital citizens, including arming them with strategies to stay safe online both at school and at home. Used well, the internet can be amazing but children may be exposed to sites, people and situations that we would prefer they avoid when they freely surf, game and chat. Parents are often concerned about their child's safety online, but even the most protective are sometimes unaware of how easily young people can access inappropriate or dangerous material through the internet, even using sites or programmes (especially games) that may appear safe.

At the Valley, pupils are taught about being safe online and enabling them to be aware of the risks in an age-appropriate way, ensuring that we enable discernment about safety without causing disproportionate alarm. Pupils are encouraged to talk about their online activity in the same way that we talk about other issues, to ensure a safe and supportive classroom environment in which to share ideas, experiences and worries. It is vital that children and young people fully understand how to keep

themselves safe online and what to do and who to speak to if they feel in any way uncomfortable. The Valley School's approach supports children in recognising and understanding this.

At the Valley, we work with pupils to enable them with strategies to eliminate or minimise risk and have strategies for reporting issues but to also highlight the ways in which the online world can be used positively and enable our pupils to contribute positively as digital citizens.

Our Approach to Digital Citizenship at the Valley:

The school has a multi-faceted approach to teaching online safety and developing the positive digital citizens of tomorrow.

Within the curriculum, Digital Citizenship is taught through the following vehicles/subject areas:

- Switched on Online Safety (Computing) – delivered through specific lessons each half term using the Switched on Online Safety scheme
- Switched on Computing (Computing) – delivered and embedded throughout the Switched on Computing scheme
- Jigsaw (PSHE) – delivered and embedded across the scheme
- Specific school events, such as Safer Internet Day, Anti-Bullying Week and visits/assemblies/workshops from external organisations such as the NSPCC

Delivery in Computing – Switched on Online Safety & Switched on Computing

The school's long term plan for Computing sets out teaching units for years 1 to 6. The units are taught half termly and are taken from the Switched on Online Safety scheme. Planning and teaching of lessons is supported by the scheme which outlines the learning focus for each unit.

The details of the Switched on Online Safety units are below:

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
Autumn 1	1.1 We are Year 1 rule writers	2.1 We are Year 2 rule writers	3.1 We are Year 3 rule writers	4.1 We are Year 4 rule writers	5.1 We are Year 5 rule writers	6.1 We are online safety ambassadors
Autumn 2	1.2 We are kind and thoughtful	2.2 We are not online bullies	3.2 We are digital friends	4.2 We are standing up to peer pressure	5.2 We are responsible for our online actions	6.2 We will not share inappropriate images
Spring 1	1.3 We are responsible internet and device users	2.3 We are safe searchers	3.3 We are internet detectives	4.3 We are aware that our digital content lasts forever	5.3 We are content evaluators	6.3 We are safe social networkers
Spring 2	1.4 We are information protectors	2.4 We are code masters	3.4 We are aware of our digital footprint	4.4 We are online risk managers	5.4 We are protecting our online reputation	6.4 We are respectful of others
Summer 1	1.5 We are good digital citizens	2.5 We are online behaviour experts	3.5 We are netiquette experts	4.5 We are respectful of digital rights and responsibilities	5.5 We are respectful	6.5 We are online safety problem solvers
Summer 2	1.6 We are responsible gamers	2.6 We are game raters	3.6 We are avatar creators	4.6 We are careful when talking to virtual friends	5.6 We are game changers	6.6 We are safe gaming experts

Online Safety Roadmaps (Years 1-6)

The online safety roadmaps below demonstrate where aspects of digital citizenship are discussed, taught and embedded throughout computing lessons. For details of coverage within Jigsaw PSHE lessons, please refer to Digital Citizenship – The Valley Approach document.

YEAR 1	ONLINE SAFETY COVERAGE
Unit 1.1 We are treasure hunters	The children learn to use simple programmable toys safely and sensibly, as well as showing respect for the work of their peers. Web access is supervised and safe practices are encouraged. Similarly, any filming is done with appropriate consent and assent.
Unit 1.2 We are TV chefs	The pupils learn how to use digital video cameras safely and to show respect to those they are filming, including recognising the need for consent and assent. The importance of not sharing videos more widely than is appropriate is considered, as is the need to exclude information that might identify individuals from video recordings. When using the web, pupils learn to turn the screen off and tell their teacher if they encounter material that concerns them. The pupils also start to learn about copyright, recognising that they own the copyright in their original work and that this cannot be published or copied without their permission.
Unit 1.3 We are painters	In searching for images on the web, pupils work initially from a set of carefully chosen sites. They again learn that they should turn the screen off and tell their teacher if they encounter material that concerns them. If work is uploaded to a public area, the importance of protecting the children's identities is recognised, as is their intellectual property rights over their original work. An extension activity provides an initial opportunity for the children to learn some aspects of using email safely.
Unit 1.4 We are collectors	As pupils will be working with the web and searching for images, they'll need to make sure they use this technology safely, as well as showing respect for others' intellectual property through observing copyright conditions. The pupils are taught to turn the screen off and let their teacher know if they have any concerns over content they encounter. The pupils are also introduced to the school's Acceptable Use Policy, if they haven't already had this explained to them.
Unit 1.5 We are storytellers	The pupils learn to use audio recorders or microphones and audio recording software safely and sensibly. The pupils need to be aware of copyright material, and show appropriate respect for the owners of intellectual property when using technology. Regard is shown for appropriate consent and assent, school policies and third party terms and conditions if the pupils' stories are uploaded to external websites.
Unit 1.6 We are celebrating	The pupils have an opportunity to search for images on the web, and again learn to use technology safely, switching off the screen if they have concerns, and reporting these to their teacher. The pupils are taught to respect the copyright conditions associated with any third party images they use. Pupils only use photos of themselves if appropriate permission is in place. If children share their work, then attention is paid to protecting their identity and copyright. If they send cards by email they use a class address and consider some aspects of using email safely.

YEAR 2	ONLINE SAFETY COVERAGE
Unit 2.1 We are astronauts	The pupils must let their teacher know if they encounter inappropriate material when they search the web. If the pupils use third-party images in their projects, they should use images with public domain or Creative Commons licences. The pupils may upload their projects to the Scratch website, if they have registered for accounts using a parent's e-mail address. They learn to observe MIT's terms and condition.
Unit 2.2 We are games testers	There are concerns about the violent nature of some games. Choosing games wisely, including observing PEGI age restrictions and playing in moderation, are aspects of the safe and respectful use of technology that pupils learn about in this unit. As in Unit 2.1, the pupils may upload their projects to the Scratch website, if they have registered for accounts using a parent's e-mail address. Comments on the Scratch website are not moderated before they appear, although the pupils can report any which are inappropriate. This provides an opportunity to learn about where to go for help and support when they have concerns about content or contact.
Unit 2.3 We are photographers	The children learn that once images are posted online, it's impossible to control what happens to them. Facial recognition software and geotagging mean that those posting images might inadvertently fail to keep some personal information private. The children learn how to minimise these risks, and learn what they should do if they have concerns about images they encounter on the web. The children also learn about what is acceptable and unacceptable to photograph, for example, that it is usually not a good idea to take or share photographs in which children can be identified, or that might reflect badly on the school.
Unit 2.4 We are researchers	The pupils consider how to stay safe while researching online, and show respect for others' ideas and intellectual property by citing their sources, and using licensed images. Safe search filters are in place for using Google or Bing and school internet access is filtered.
Unit 2.5 We are detectives	The pupils learn about some of the risks associated with email. They learn that attached files can contain viruses or other harmful programs, that email addresses and embedded links can be 'spoofed', and that 'spam' is a common problem. It is recommended that all emails are sent and received via a single class email address. The password for this account is not shared with children. If the children do use individual accounts, they'll need to keep their account details private and share their email address only with people they know and trust.
Unit 2.6 We are zoologists	The pupils again learn that when sharing photographs and geo-location information online they need to consider the importance of keeping personal information private; they achieve this by not including names or photographs of people. The pupils are taught to respect rules for using digital equipment when out of the classroom, to ensure the equipment is kept safe and that they are not so focused on using it that they become unaware of risks around them.

YEAR 3	ONLINE SAFETY COVERAGE
Unit 3.1 We are programmers	The pupils need to consider copyright when sourcing images for their programs and/or uploading their own work to the Scratch community site. Searching for content for programs or viewing others' cartoons also offers an opportunity to develop safe search habits. If the pupils participate in the Scratch community, they need to think about what information they can share and how to participate positively in an online community, as well as obtaining parental permission.
Unit 3.2 We are bug fixers	The pupils could consider the implications of bugs in software. Participating in the Scratch community would enable the pupils to help others with their projects as well as allowing them to receive help on their own. Participation requires parental permission, and the pupils should consider what behaviour is acceptable online.
Unit 3.3 We are presenters	In filming one another, the pupils need to ensure that the appropriate permission has been obtained, and that they act respectfully and responsibly when filming, editing and presenting their work. The pupils should think through the implications of videos being made available on the school network or more widely via the internet. They should discuss why schools and other organisations have strict policies over filming.
Unit 3.4 We are vloggers	Pupils learn that everything they do online leaves a trail, culminating in their digital footprint. They discover the use of safe search modes or child friendly search engines, and learn what to do if they meet inappropriate content. They also become familiar with intellectual property rights, including Creative Commons Licenses, and the importance of acknowledging other people's work. Pupils learn that they should seek permission before taking photographs.
Unit 3.5 We are communicators	The pupils should think about the safe use of email. They learn how email can be used positively. They become aware of some of its risks, including malware attachments, hacked accounts, spam and spoofed links, but also learn how their exposure to such risks can be reduced. They consider the importance of introductions in extending circles of trust. They learn how video conferencing can be used positively, to support learning with a known partner.
Unit 3.6 We are opinion pollsters	The pupils learn some of the legal and ethical requirements for designing online surveys and processing data. They also consider what information it would be appropriate for them to give in an online survey, and some implications of data processing. The pupils can use online tools for collaborating on survey design and analysis, considering how to use these appropriately. The survey itself could address issues of the pupils' attitudes to online safety.

YEAR 4	ONLINE SAFETY COVERAGE
Unit 4.1 We are software developers	The pupils need to consider copyright when sourcing images or media for their programs and/or uploading their own work to the Scratch community site. Searching for content for their programs or viewing others' games also offers an opportunity to develop safe search habits. If the pupils participate in the Scratch community, they need to think about what information they can share and how to participate positively in an online community, as well as obtaining parental permission.
Unit 4.2 We are toy designers	The pupils again need to think carefully about copyright in sourcing images and other media for their toy prototypes and presentations, or if uploading their own work to the Scratch community. If the pupils do participate in the online Scratch community, they should think through how to do so in a safe and responsible manner, and should obtain their parents' consent. If the pupils link their programs to hardware, they need to take care to work safely with a range of tools and electronic equipment.
Unit 4.3 We are musicians	The pupils need to think about copyright when sourcing audio or publishing their own compositions. They are encouraged to use Creative Commons licensed content if working with others' audio files. There's an opportunity to discuss how copyright relates to music performed in school as well as illegal downloading and sharing of copyrighted music.
Unit 4.4 We are HTML editors	The pupils learn how easy it is to create content for the web. The unit provides an opportunity to address some of the risks of using the web, and how pupils could best keep themselves safe while doing so. They learn how easily web pages can be modified, which provides an opportunity to consider the reliability of web-based content.
Unit 4.5 We are co-authors	The pupils learn about Wikipedia, considering some strategies for evaluating the reliability of online content as well as the rules and processes that the Wikipedia community has evolved. The pupils develop a shared wiki, thinking carefully about how to do so safely and responsibly, and considering what conduct is appropriate when collaborating on a shared resource.
Unit 4.6 We are meteorologists	The pupils consider the importance of obtaining and using accurate data for any information-processing work. If the pupils film one another, they need to ensure appropriate permission is obtained and that recordings are made, edited and shown in safe, respectful and responsible ways. The pupils should think carefully about the implications of uploading their films to the school network or to the internet.

YEAR 5	ONLINE SAFETY COVERAGE
Unit 5.1 We are game developers	The pupils need to consider copyright when sourcing images or media for their games and/or uploading their own work to the Scratch community site. Searching for content for their games or viewing others' games also offers an opportunity to develop safe search habits. If the pupils participate in the Scratch community, they need to think about what information they can share and how to participate positively in an online community, as well as obtaining parental permission. The pupils might also consider some personal implications of playing games, perhaps including violent computer games.
Unit 5.2 We are cryptographers	The pupils learn how information can be communicated in secret over open channels, including the internet, using cryptography. They learn about the public key system used to sign and encrypt content on the web, and how they can check the security certificates of encrypted websites. They learn about the importance of password security for online identity and consider what makes a secure password.
Unit 5.3 We are artists	The unit provides an opportunity to reinforce messages around safe searching and evaluating the quality of online content. If the pupils upload their work for others to see, they should consider the importance of protecting personal information as well as recognising that they are sharing their own copyrighted work with an audience.
Unit 5.4 We are web developers	Online safety forms the focus of this unit, with the pupils working collaboratively to develop a website in which they present their own authoritative content on a broad range of issues around the safe and responsible use of technology. In doing so, they consider the reliability and bias of online content, how to contribute positively to a shared resource, and how to use search engines safely and effectively.
Unit 5.5 We are bloggers	The pupils write content for their own or a shared blog, thinking carefully about what can be appropriately shared online. They consider issues of copyright and digital footprint as well as what constitutes acceptable behaviour when commenting on others' blog posts. The pupils also think about the importance of creating high-quality online content and become more discerning in evaluating content as they review others' blogs. If the pupils' blogs are publicly accessible, it is important that any comments are moderated by their teacher; it is worth discussing with the pupils why the comments should be moderated.
Unit 5.6 We are architects	The pupils should observe good practice when searching for and selecting digital content. If the pupils choose to locate their 3D models geographically, they should avoid sharing private information. The pupils should think about copyright when adding content to their model or publishing images or videos of their model.

YEAR 6	ONLINE SAFETY COVERAGE
Unit 6.1 We are adventure gamers	Pupils learn to program a simple text-based adventure game in Python. It's important that pupils do not have admin privileges on their computers as Python can be used to provide access to shell/operating system commands. An alternative is to use the trinket.io online Python interpreter: the pupils need to observe terms and conditions and the usual precautions about not sharing information publicly. If the pupils base their games on published stories, they need to show respect for intellectual property in those works.
Unit 6.2 We are computational thinkers	The pupils learn about some common algorithms, recognising that more efficient solutions to the same problem can reduce the impact of computation on energy and other resources. They remix code on Scratch and Snap! websites, as permitted by Creative Commons licences for the code they work with, in much the same way as they might modify open source software. Pupils who wish to register for accounts on these sites need to observe the associated terms and conditions, which typically require parental consent.
Unit 6.3 We are advertisers	The pupils create short advertising videos. They learn the importance of observing school policy in relation to videoing, and the need to obtain consent. They think carefully about the implications of sharing content publicly on sites such as YouTube and consider how such publication would limit what they might include in their advert. They recognise the need to use video search platforms in restricted or education specific modes and bring to mind what they should do if they encounter inappropriate content. They learn to respect the intellectual property rights of others, and the need to observe licence terms for any content they do not create themselves.
Unit 6.4 We are network technicians	The pupils learn about how networks, including the internet, operate. They learn that data transmitted via the internet is not always encrypted. They consider some of the implications for privacy, e.g. their 'digital footprint' associated with using the internet. They become aware of the importance of DNS for safe use of the internet. They have the opportunity to use command line diagnostic tools safely and responsibly. They create posters or other documents to share their knowledge with others.
Unit 6.5 We are travel writers	The pupils take photographs, video and audio recordings on an educational visit. They should do so in accordance with school policy and any regulations of the venue for their visit. They should make sure they have permission if they are photographing a person, and of the landowner if on private property. Pupils learn about geotagging GPS location data in photographs and smartphone tracklogs, and consider the privacy implications of this. Pupils think carefully about what media, metadata and information it is safe, respectful and responsible to share publicly. There is the opportunity in this unit for pupils to use their own smartphones or tablet computers, which should be done in accordance with relevant school policies.
Unit 6.6 We are publishers	The pupils create a school magazine or yearbook. They consider carefully the implications of including photographs of pupils in their work, recognising that typically names would not be used in captions and that they should have permission to publish any pictures they use. They respect school policies and relevant legislation. They also recognise that intellectual property exists in other pupils' work and that this should be respected, so include such excerpts only with permission. They also learn that sensitive personal information should not be included in publications such as these, thinking carefully about what this means in practice.

Cross-Curricular Opportunities

The following documents indicate areas where the scheme allows for cross-curricular subject links.

UNIT	SUBJECT LINKS										
	English	Maths	Science	PE	Art and design	D&T	Geography	History	Music	RE	PSHE
1.1 We are treasure hunters Using programmable toys	✓✓✓	✓✓✓		✓		✓	✓✓✓	✓✓✓			✓✓✓
1.2 We are TV chefs Filming the steps of a recipe	✓✓✓	✓✓✓	✓✓✓	✓	✓✓✓	✓✓			✓	✓	✓✓✓
1.3 We are painters Illustrating an eBook	✓✓✓	✓	✓	✓	✓✓✓	✓	✓	✓✓✓	✓	✓	
1.4 We are collectors Finding images using the web	✓✓✓	✓✓✓	✓✓✓		✓		✓				✓✓✓
1.5 We are storytellers Producing a talking book	✓✓✓	✓	✓		✓✓	✓	✓	✓✓	✓✓✓	✓	✓✓✓
1.6 We are celebrating Creating a card digitally	✓✓✓				✓✓✓	✓		✓	✓✓✓	✓✓✓	✓✓✓

- ✓ Some links to the curriculum area
- ✓✓ Many links to the curriculum area
- ✓✓✓ Links to the curriculum area included in *Switched on Computing* planning

UNIT	SUBJECT LINKS										
	English	Maths	Science	PE	Art and design	D&T	Geography	History	Music	RE	PSHE
2.1 We are astronauts Programming on screen	✓✓✓	✓✓✓	✓✓	✓	✓✓✓	✓✓✓	✓	✓			
2.2 We are games testers Exploring how computer games work	✓✓✓	✓✓	✓✓✓		✓✓	✓✓			✓		✓
2.3 We are photographers Taking better photos	✓	✓✓✓	✓✓	✓	✓✓✓	✓	✓✓	✓✓	✓	✓	✓
2.4 We are researchers Researching a topic	✓✓✓	✓	✓	✓	✓	✓	✓	✓✓✓	✓	✓	✓
2.5 We are detectives Collecting clues	✓✓✓		✓✓		✓			✓✓	✓	✓	✓✓
2.6 We are zoologists Collecting data about bugs	✓✓	✓✓✓	✓✓✓	✓	✓	✓	✓✓✓	✓			✓

- ✓ Some links to the curriculum area
- ✓✓ Many links to the curriculum area
- ✓✓✓ Links to the curriculum area included in *Switched on Computing* planning

UNIT	SUBJECT LINKS											
	English	Maths	Science	PE	Art and design	D&T	Geography	History	Music	Languages	RE	PSHE
3.1 We are programmers Programming an animation	✓✓✓	✓	✓✓	✓	✓✓✓	✓	✓	✓	✓✓✓	✓✓✓	✓	✓
3.2 We are bug fixers Finding and correcting bugs in programs	✓✓✓	✓✓✓	✓✓✓			✓						
3.3 We are presenters Videoling performance	✓✓✓	✓✓✓		✓✓✓					✓✓			
3.4 We are vloggers Making and sharing a short screencast presentation	✓✓✓	✓	✓	✓	✓✓	✓	✓	✓	✓	✓	✓	✓
3.5 We are communicators Communicating safely on the internet	✓✓✓			✓✓✓	✓✓✓		✓✓	✓✓✓	✓✓✓	✓✓✓		✓
3.6 We are opinion pollsters Collecting and analysing data	✓✓✓	✓✓✓									✓	✓✓✓

- ✓ Some links to the curriculum area
- ✓✓ Many links to the curriculum area
- ✓✓✓ Links to the curriculum area included in *Switched on Computing* planning

UNIT	SUBJECT LINKS											
	English	Maths	Science	PE	Art and design	D&T	Geography	History	Music	Languages	RE	PSHE
4.1 We are software developers Developing a simple educational game	✓✓✓	✓✓✓	✓		✓✓	✓	✓	✓	✓	✓✓✓	✓	✓
4.2 We are toy designers Prototyping an interactive toy	✓✓✓	✓	✓		✓✓	✓✓✓			✓✓✓			✓
4.3 We are musicians Producing digital music	✓	✓✓✓		✓			✓	✓	✓✓✓		✓	✓
4.4 We are HTML editors Editing and writing HTML	✓✓✓				✓	✓		✓✓✓				
4.5 We are co-authors Producing a wiki	✓✓✓		✓		✓		✓✓	✓✓	✓	✓✓	✓✓	✓✓
4.6 We are meteorologists Presenting the weather	✓✓✓	✓✓✓	✓✓✓		✓	✓	✓✓✓	✓	✓	✓		

- ✓ Some links to the curriculum area
- ✓✓ Many links to the curriculum area
- ✓✓✓ Links to the curriculum area included in *Switched on Computing* planning

UNIT	SUBJECT LINKS											
	English	Maths	Science	PE	Art and design	D&T	Geography	History	Music	Languages	RE	PSHE
5.1 We are game developers Developing an interactive game	✓✓	✓✓	✓✓	✓	✓✓✓	✓	✓	✓	✓✓✓		✓	✓
5.2 We are cryptographers Cracking codes	✓✓	✓✓✓	✓✓✓			✓✓✓		✓✓✓				✓✓✓
5.3 We are artists Fusing geometry and art		✓✓✓	✓	✓✓✓	✓✓✓		✓✓	✓		✓	✓✓✓	
5.4 We are web developers Creating a web page about cyber safety	✓✓✓	✓	✓	✓	✓	✓	✓	✓✓✓	✓	✓	✓	✓✓
5.5 We are bloggers Sharing experiences and opinions	✓✓✓		✓		✓	✓	✓	✓✓✓	✓	✓	✓	✓
5.6 We are architects Creating a virtual space		✓✓✓	✓✓✓		✓✓✓	✓✓	✓					

- ✓ Some links to the curriculum area
- ✓✓ Many links to the curriculum area
- ✓✓✓ Links to the curriculum area included in *Switched on Computing* planning

UNIT	SUBJECT LINKS											
	English	Maths	Science	PE	Art and design	D&T	Geography	History	Music	Languages	RE	PSHE
6.1 We are adventure gamers Making a text-based adventure game	✓✓✓	✓	✓✓				✓✓	✓✓		✓	✓	✓
6.2 We are computational thinkers Mastering algorithms for searching, sorting and mathematics	✓✓	✓✓✓								✓		
6.3 We are advertisers Creating a short television advert	✓✓✓	✓✓✓	✓	✓	✓	✓✓	✓	✓	✓	✓	✓	✓✓✓
6.4 We are network technicians Exploring computer networks including the internet	✓✓✓	✓	✓✓			✓✓	✓✓					✓✓✓
6.5 We are travel writers Using media and mapping to document a trip	✓✓✓	✓✓✓	✓	✓	✓✓✓	✓	✓✓✓	✓	✓	✓	✓	✓
6.6 We are publishers Creating a yearbook or magazine	✓✓✓	✓	✓	✓	✓✓✓	✓	✓	✓	✓	✓	✓	✓

- ✓ Some links to the curriculum area
- ✓✓ Many links to the curriculum area
- ✓✓✓ Links to the curriculum area included in *Switched on Computing* planning

Switched on Computing - Progression of skills and knowledge

YEAR	STRAND						Progression of skills and knowledge 
	Programming	Computational thinking	Creativity	Computer networks	Communication/collaboration	Productivity	
	Planning, writing and testing computer programs for digital devices, from floor turtles to tablets.	Some of the computer science foundations – particularly algorithms, logical reasoning and decomposing problems into smaller parts.	Creating and refining original content using digital tools across a range of media.	Using and understanding the internet, the web and search engines, effectively and safely.	Making the most of computers and the internet for communicating with one or many, and working together on projects.	Collecting and analysing data and information using computers; organising, manipulating and presenting this to an audience.	
1	ENHANCED	ENHANCED	ENHANCED	NEW	ENHANCED	ENHANCED	
	Unit 1.1 – We are treasure hunters	Unit 1.2 – We are TV chefs	Unit 1.3 – We are painters	Unit 1.4 – We are collectors	Unit 1.5 – We are storytellers	Unit 1.6 – We are celebrating	
2	ENHANCED	NEW	NEW	ENHANCED	ENHANCED	ENHANCED	
	Unit 2.1 – We are astronauts	Unit 2.2 – We are games' testers	Unit 2.3 – We are photographers	Unit 2.4 – We are researchers	Unit 2.5 – We are detectives	Unit 2.6 – We are zoologists	
3	ENHANCED	NEW	ENHANCED	NEW	ENHANCED	ENHANCED	
	Unit 3.1 – We are programmers	Unit 3.2 – We are bug fixers	Unit 3.3 – We are presenters	Unit 3.4 – We are network engineers	Unit 3.5 – We are communicators	Unit 3.6 – We are opinion pollsters	
4	NEW	NEW	ENHANCED	NEW	ENHANCED	ENHANCED	
	Unit 4.1 – We are software developers	Unit 4.2 – We are toy designers	Unit 4.3 – We are musicians	Unit 4.4 – We are html editors	Unit 4.5 – We are co-authors	Unit 4.6 – We are meteorologists	
5	NEW	NEW	ENHANCED	ENHANCED	ENHANCED	ENHANCED	
	Unit 5.1 – We are game developers	Unit 5.2 – We are cryptographers	Unit 5.3 – We are artists	Unit 5.4 – We are web developers	Unit 5.5 – We are bloggers	Unit 5.6 – We are architects	
6	NEW	NEW	NEW	NEW	NEW	NEW	
	Unit 6.5 – We are mobile app developers	Unit 6.2 – We are project managers	Unit 6.6 – We are marketers	Unit 6.1 – We are app planners	Unit 6.4 – We are interface designers	Unit 6.3 – We are market researchers	

Assessment Guidance

The following tables outline the National Curriculum objectives covered within each Switched on Computing unit. Each teacher is able to use these to complete assessment references for each child on the school's internal assessment system (Educater).

YEAR 1	EDUCATER/NC OBJECTIVES MET	
Unit 1.1 We are treasure hunters Using programmable toys	- Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions. - Create and debug simple programs. - Use logical reasoning to predict the behaviour of simple programs.	KEY TO OBJECTIVES/STRANDS: COMPUTING SCIENCE DIGITAL LITERACY INFORMATION TECHNOLOGY
Unit 1.2 We are TV chefs Filming the steps of a recipe	- Understand what algorithms are. - Use technology purposefully to create, organise, store, manipulate and retrieve digital content. - Recognise common uses of information technology beyond school. - Use technology safely and respectfully, keeping personal information private.	
Unit 1.3 We are painters Illustrating an eBook	- Use technology purposefully to create, organise, store, manipulate and retrieve digital content. - Use technology safely and respectfully, keeping personal information private.	
Unit 1.4 We are collectors Finding images using the web	- Recognise common uses of information technology beyond school. - Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies. - Use technology purposefully to create and manipulate digital content. - Understand what algorithms are.	
Unit 1.5 We are storytellers Producing a talking book	- Use technology purposefully to create, organise, store, manipulate and retrieve digital content. - Recognise common uses of information technology beyond school. - Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.	
Unit 1.6 We are celebrating Creating a card digitally	- Use technology purposefully to create, organise, store, manipulate and retrieve digital content. - Recognise common uses of information technology beyond school. - Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.	

YEAR 2	EDUCATER/NC OBJECTIVES MET	KEY TO OBJECTIVES/STRANDS: COMPUTING SCIENCE DIGITAL LITERACY INFORMATION TECHNOLOGY
Unit 2.1 We are astronauts Programming on screen	• Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions. • Create and debug simple programs. • Use logical reasoning to predict the behaviour of simple programs. • Recognise common uses of information technology beyond school. • Identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.	
Unit 2.2 We are games testers Exploring how computer games work	• Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions. • Use logical reasoning to predict the behaviour of simple programs. • Recognise common uses of information technology beyond school. • Use technology safely and respectfully, keeping personal information private.	
Unit 2.3 We are photographers Taking better photos	• Use technology purposefully to create, organise, store, manipulate and retrieve digital content. • Recognise common uses of information technology beyond school. • Keeping personal information private.	
Unit 2.4 We are researchers Researching a topic	• Use technology purposefully to create, organise, store, manipulate and retrieve digital content. • Recognise common uses of information technology beyond school. • Keeping personal information private.	
Unit 2.5 We are detectives Collecting clues	• Use technology purposefully to create, organise, store, manipulate and retrieve digital content. • Recognise common uses of information technology beyond school. • Keeping personal information private.	
Unit 2.6 We are zoologists Collecting data about bugs	• Use technology purposefully to create, organise, store, manipulate and retrieve digital content. • Recognise common uses of information technology beyond school. • Keeping personal information private.	

YEAR 3	EDUCATER/NC OBJECTIVES MET	
Unit 3.1 We are programmers Programming an animation	• Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems and 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 detect and correct errors in algorithms and program. • Be discerning in evaluating digital content.	KEY TO OBJECTIVES/STRANDS: COMPUTING SCIENCE DIGITAL LITERACY – COVERED ACROSS ALL UNITS INFORMATION TECHNOLOGY
Unit 3.2 We are bug fixers Finding and correcting bugs in programs	• Debug programs that accomplish specific goals including controlling or simulating physical systems. • 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.	
Unit 3.3 We are presenters Videoing performance	• Solve problems by decomposing them into smaller parts. • Use logical reasoning to explain how some simple algorithms work. • Be discerning in evaluating digital content. • 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. • Work with various forms of input and output.	
Unit 3.4 We are vloggers Making and sharing a short screencast presentation	• Understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web. • Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content. • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of content that accomplish given goals, including collecting, analysing, evaluating and presenting information.	
Unit 3.5 We are communicators Communicating safely on the internet	• 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. • 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.	
Unit 3.6 We are opinion pollsters Collecting and analysing data	• Solve problems by decomposing them into smaller parts. • Be discerning in evaluating digital content. • 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. • Understand computer networks, including the internet; how they provide multiple services, such as the worldwide web; and the opportunities for communication and collaboration.	

YEAR 4	EDUCATER/NC OBJECTIVES MET	
Unit 4.1 We are software developers Developing a simple educational game	• Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems and 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.	KEY TO OBJECTIVES/STRANDS: COMPUTING SCIENCE DIGITAL LITERACY – COVERED ACROSS ALL UNITS INFORMATION TECHNOLOGY
Unit 4.2 We are toy designers Prototyping an interactive toy	• Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems and 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.	
Unit 4.3 We are musicians Producing digital music	• 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; and the opportunities they offer for communication and collaboration. • Be discerning in evaluating digital content. • 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.	
Unit 4.4 We are HTML editors Editing and writing HTML	• 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. • 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.	
Unit 4.5 We are co-authors Producing a wiki	• Solve problems by decomposing them into smaller parts. • 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. • Use search technologies effectively and be discerning in evaluating digital content. • 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.	
Unit 4.6 We are meteorologists Presenting the weather	• Solve problems by decomposing them into smaller parts. • Work with variables and various forms of input and output. • Appreciate how results are selected and ranked. • 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.	

YEAR 5	EDUCATER/NC OBJECTIVES MET	
Unit 5.1 We are game developers Developing an interactive game	• 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. • 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.	KEY TO OBJECTIVES/STRANDS: COMPUTING SCIENCE
Unit 5.2 We are cryptographers Cracking codes	• 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; and the opportunities they offer for communication and collaboration.	DIGITAL LITERACY – COVERED ACROSS ALL UNITS
Unit 5.3 We are artists Fusing geometry and art	• Use sequence, selection, and repetition in programs; work with variables. • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs. • Be discerning in evaluating digital content. • 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.	INFORMATION TECHNOLOGY
Unit 5.4 We are web developers Creating a website about cyber safety	• 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. • Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content. • 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.	
Unit 5.5 We are bloggers Sharing experiences and opinions	• 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. • Be discerning in evaluating digital content. • Select, use and combine a variety of software (including internet services) on a range of digital devices to including collecting, analysing, evaluating and presenting data and information.	
Unit 5.6 We are architects Creating a virtual space	• Solve problems by decomposing them into smaller parts. • Be discerning in evaluating digital content. • 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.	

YEAR 6	EDUCATER/NC OBJECTIVES MET	
Unit 6.1 We are adventure gamers Making a text-based adventure game	• 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.	KEY TO OBJECTIVES/STRANDS: COMPUTING SCIENCE DIGITAL LITERACY – COVERED ACROSS ALL UNITS INFORMATION TECHNOLOGY
Unit 6.2 We are computational thinkers Mastering algorithms for searching, sorting and mathematics	• Design, write and debug programs that accomplish specific goals. • 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.	
Unit 6.3 We are advertisers Creating a short television advert	• Understand how computer networks can provide multiple services, such as the World Wide Web. • Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content. • 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.	
Unit 6.4 We are network technicians Exploring computer networks including the internet	• Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems. • Work with 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. • Be discerning in evaluating digital content. • 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.	
Unit 6.5 We are travel writers Using media and mapping to document a trip	• Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems. • 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 how computer networks can provide multiple services, such as the World Wide Web. • 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.	
Unit 6.6 We are publishers Creating a yearbook or magazine	• Understand the opportunities computer networks offer for communication and collaboration. • Appreciate how search results are selected and ranked, and be discerning in evaluating digital content. • Select, use and combine a variety of software (including internet services) on a range of digital devices.	