Subject: Computing

Intent

A love of learning and the success of every child at the heart of all we do
The aim of our Curriculum is for all our pupils to leave The Topsham School as citizens of the future, with the skills needed to succeed in every part of their lives.
At The Topsham School we offer a high-quality computing education that 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. *National Curriculum 2013*

Implementation:

A love of learning and the success of every child at the heart of all we do
The aim of our Curriculum is for all our pupils to leave The Topsham School as citizens of the future, with the skills needed to succeed in every part of their lives.
High Quality Planning
Substantive Knowledge and Experiences in Computing ● To ensure progression and continuity over the time a pupil is at primary school, they will engage with the three themes of Computing; Digital Literacy, Computer Science and ICT ● Projects could be linked to other areas of the curriculum, perhaps using themes from the school's 'creative curriculum' to suggest related computing topics. *National Curriculum September 2013.* ➢ can understand and apply the fundamental principles and concepts of computer science, including abstraction, 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 unfamiliar technologies, analytically to solve problems ➢ are responsible, competent, confident and creative users of information and communication technology.
Disciplinary knowledge and Critical thinking skills in Computing ***Adapted from A Curriculum Framework for Computer Science and Information Technology https://www.computingatschool.org.uk/*** Computing is a practical subject, in which invention and resourcefulness are encouraged. The ideas of computing are applied to understanding real-world systems and creating purposeful

products. This combination of principles, practice and invention makes computing an extraordinarily useful and intensely creative subject, suffused with excitement, both visceral ('it works!') and intellectual ('that is so beautiful').

Computing at School/ NAACE.
https://www.computingatschool.org.uk/
  ➢ Pupils will learn computer science far more effectively by writing programs to show to others.
  ➢ Pupils will learn to use information technology more effectively if they're doing something creative, such as making a presentation, website or video, especially if this is to be shown to others.
  ➢ Pupils will develop a richer digital literacy if they document what they know and learn for others through blog posts, audio recordings or screencasts.

Metacognition: Developing and supporting Positive Attitudes to Learning Computing

The curiosity, creativity and courage that we will encourage should endure as they move on through education and into adult life. To fully exploit the opportunities that current and future technology offers them, pupils will draw on the understanding of computing provided to them, as well as confidence gained through working on a range of meaningful projects throughout their primary education.

Through this we provide a consistent approach to planning for our curriculum which builds on prior learning, supports children see connections, challenges and facilitates higher level thinking skills and supports children understand how they learn and what they need to do themselves to achieve and succeed.

High Quality Teaching and Learning in EVERY subject

Assessment for Learning	Appropriate Pitch: age and stage appropriate for all children	Appropriate Match including high expectations and challenge for all	Subject Knowledge including modelling and teaching subject specific vocabulary and promoting READING	Promotes and develops Metacognition

A successful Computing lesson will include:

  ● Primary teachers will equip pupils with high level skills in using ICT, preparing them to apply these across the curriculum.
  ● To offer a broad and balanced curriculum that prepares pupils to 'use computational thinking and creativity to understand and change the world' (National Curriculum)
  ● The role of the teacher extends beyond setting the challenge and providing support in projects, to helping pupils understand the ideas that lie at the heart of the creative work in which they're engaged, and to helping pupils make the connection between these concepts.

Through this we create a supportive learning ethos for both teachers and children and enable all stakeholders to have a clear and consistent understanding of how we teach and support children achieve and succeed our curriculum intent.

T	O	P	S	H	A	M
Trust and Respect	Opportunities for all	Partnerships	Success	Health and Happiness	Aspiration and Attitudes to learning	Motivated

Children will become responsible, competent, confident and creative users of information and communication technology.

Through this, we create a safe, secure learning environment where all stakeholders have shared and consistent understanding of our Values and positive behaviours expected within our school that support everyone learn, succeed and achieve.

High Quality, Enabling Environment

Working wall showing progression of sequence	Tiered Vocabulary used as part of display	Learning Powers clearly linked to learning sequence of Working Wall	Children independently access high quality resources

Evidence of children's learning will be held online through the programs that we use. There will also be evidence through Google classroom, and in other curriculum books if children use hardware to support their learning in other subjects.

Through this we provide an exciting, inclusive learning environment that promotes and makes learning visible to both teachers and children, enables independence and celebrates the learning process

Impact:

Monitoring and Supporting High Quality Planning and Timetabling
Planning sequences to be looked at to ensure computing is visible and prominent throughout the school.
Continue to use Scomis as hardware support for all staff.
Computing Leads to be available to offer support with teaching/ hardware.

Through this we aim for planning to be consistent across the school, at the appropriate pitch for each stage and phase and offer equal opportunities for ALL children to make progress through the year.

Monitoring and supporting High Quality Teaching and Learning
Digital Literacy - Natterhub - sequences and data about each pupil is held online
ICT - Evidence through planning across the school that hardware is accessed.
Computer Science - Discovery Education - sequences and data about each pupil held online.

Through this we aim to ensure teachers have the skills, subject knowledge and confidence to teach all areas of the curriculum and so ensure the progress and success of ALL children in every area of their learning

Monitoring and Measuring Progress through assessment and published data
Digital Literacy - Natterhub - sequences and data about each pupil is held online
ICT- Evidence through planning across the school that hardware is accessed.
Computer Science- Discovery Education - sequences and data about each pupil held online.

Revisiting these areas in each year will ensure both continuity and progression for pupils, and make it easier to plan any individual units of work. There should be a clear sense of what pupils have already experienced, and what subsequent steps in learning are likely to involve.

Through this, we understand the needs of ALL of our children and use this information to identify next steps and match learning need to ensure children make progress

School Improvement Priorities
Next steps 2021-2022
1. Updating hardware across the school
2. Ensuring the planning and teaching shows progression of key skills as well as knowledge of online safety
3. Monitoring the teaching and quality of Computing across the school ensuring that all children have equal opportunities and that the progression of skills is evident in the work the children produce.

Progression of knowledge and skills: Computing

	By the end of EYFS, children will have:	
	Developed the following skills:	**Have gained the following knowledge:**
Early Years	Children recognise that a range of technology is used in places such as homes and schools. They select and use technology for particular purposes	Whilst children are developing their understanding of these technologies, practitioners should be drawing their attention to the technology that's being used in the world around them, from mobile phones to pedestrian crossings. Practitioners should also provide a positive role model by showing children that adults use technology for their own purposes and by talking to the children about the value they place on this use. Role-play should therefore be resourced carefully and include all the appropriate technologies that one would find in real life. Children should learn behaviours that will keep them safe when using the Internet

By the end of **Early Years** pupils will have experienced the following:
Children will 'play' with technologies, exploring how they work and what they do; children will then use these technologies for a range of purposes under the direction a practitioner; and finally children will choose to use technologies from the continuous provision, making decisions for themselves about when and which technologies, and this use will be meaningful and purposeful.

		Developed the following skills:	Have gained the following knowledge:
Year 1/2	**COMPUTER SC I ENCE**	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	For instance: Pupils learn to program a basic floor turtle such as a BeeBot to navigate increasingly complex routes and are able to debug their instructions when the turtle does not reach the intended destination. Pupils learn to program an onscreen app such as BeeBot or Kodable to complete a set task and are able to debug their instructions when the turtle does not reach the intended destination. Pupils use a more complex turtle with standard units to navigate increasingly complex routes, and are able to debug their instructions when the turtle does not reach the intended destination. Extension - Pupils learn to use a simple graphical programming language such as Logo, Scratch or Turtle to navigate around the screen. Extension - Pupils create a 3D environment, using a graphical language such as Kodu. They link this to a story such as an island adventure.

		Recognise common uses of information technology beyond school	Pupils learn about some of the uses of the internet.
	D **I** **G** **I** **TA** **L** **L** **I** **TERACY**	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.	For instance: Pupils learn that the Internet is a great place to develop rewarding online relationships and learn to recognise websites that are good for them to visit; but they also learn to be cautious and to check with a trusted adult before sharing private information. Pupils are introduced to the concept that real people send messages to one another on the Internet and learn how messages are sent and received. They recognise that it may be difficult to distinguish between someone who is real and someone who is not. Pupils are introduced to the basics of online searching. Pupils learn to explore websites and to say whether they like them or not and why

	I CT	Use technology purposefully to create, organise, store, manipulate and retrieve digital content	For instance: Digital Publishing: Pupils learn to use basic word processing package and to write and illustrate a short story. Presentation: Pupils learn to make simple presentations. Graphics: Pupils learn to create a simple digital painting. Animations: Pupils learn to make a simple animation for instance in Puppet Pals. Media: Pupils learn to use digital cameras and microphones for a purpose. Working with data: Pupils learn to create and use a pictogram. Modelling: Pupils explore online simulations such as Charlie Chimp.

By the end of **KS1**, pupils will have experienced the following
Technology in action and for a relevant purpose, presenting their work using the correct device/programme, programming robotics, recording themselves (visual and audio) and using IT to enhance their learning 'above the line.

		Developed the following skills:	Have gained the following knowledge:
Year 3/4	**COMPUTER SC I ENCE**	Design, write and debug programs that accomplish specific goals; including controlling or simulating physical systems and solving problems by decomposing them into smaller parts	For instance: Pupils learn to use graphical programming language, such as Scratch or Logo to draw regular 2D shapes. Pupils add loops or procedures to create a repeating pattern.

		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	Pupils learn to sequence instructions, for instance to create an animation using Scratch, or by using the timing features in PowerPoint. Pupils write a simple algorithm, for instance to create a basic traffic light sequence. They then use flowcharting software (such as Go or Flowgo) to create a simple program to control an onscreen icon. Extension - Pupils create a simple game using a graphical language such as Kodu or Scratch
		Recognise common uses of information technology beyond school	Pupils learn to collaborate electronically by blogging - mailing and working on shared documents.
	D **I** **G** **I** **TAL** **L** **I** **TERACY**	Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	For instance: Pupils learn that the Internet is a great place to develop rewarding online relationships and learn to recognise websites that are good for them to visit; but they also learn to be cautious and to check with a trusted adult before sharing private information. Pupils learn to make good passwords for their accounts, learn about spam and how to deal with it. They begin to understand the implications for the information that they share online and how some websites might use that information without their knowledge. Pupils are introduced to their roles as digital citizens in an online community, where they reflect on how they are responsible not only for themselves but for

| | | | others, in order to create a safe and comfortable environment.

Pupils learn that the Internet is a public space and then develop the skills to protect their privacy and respect the privacy of others.

Pupils explore how they interact with others and are introduced to the concept of cyberbullying. They also learn how to communicate to be a responsible member of a connected culture effectively in order to prevent miscommunication. |
| | | use search technologies effectively, appreciate how results are selected and ranked and be discerning in evaluating digital content | For instance:
Pupils are introduced to the basics of online searching, including how to use effective keywords. They also learn to conduct searches that provide them with the most helpful and relevant information. |

I CT	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	For instance: Digital Publishing: Pupils learn how to use software to create an e-book, brochure or poster on a given subject. Presentations: Pupils learn to write and deliver a presentation on a given subject. Graphics: Pupils learn how to take, adapt or create images to enhance or further develop their work. Animations: Pupils learn how to develop a storyboard and then create a simple animation using for instance 'Puppet Pals' or 'Stop Motions' Animation'. Sound and video: Pupils record and edit media to create a short sequence. Working with data: Pupils learn to search, sort and graph information.

By the end of **LKS2**, pupils will have... Experienced the following
Technology in action and for a relevant purpose, presenting their work using the correct device/programme, recording themselves, programming robotics, and using IT to enhance their learning 'above the line'.

		By the end of year, pupils will have...	
		Developed the following skills:	**Have gained the following knowledge:**
Year 5/6	**COMPUTER SCIENCE**	Design, write and debug programs that accomplish specific goals; including controlling or simulating physical systems and solving 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	For instance: Pupils write a simple algorithm, for instance to create a basic traffic light sequence. They then use flowcharting software (such as Go or Flowgo) to create a simple program to control an onscreen icon. They are able to explain how their program works Pupils create a computer game, using a graphical language such as Scratch or Kodu. Extension – Pupils learn to use and program a raspberry pi to complete a basic task
		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	For instance: Pupils learn to collaborate electronically by blogging - mailing, and working on shared documents. This can be extended to working with other schools. Pupils learn that connected devices exchange packets of data and this can convey a range of information from a text to a video call.
	DIGITAL LITERACY	Use technology safely, respectfully and responsibly; recognise acceptable/ unacceptable behaviour; identify a range of ways to report concerns about content and contact	For instance: Pupils learn that the internet is a great place where online relationships can be developed. They compare and contrast online friends and real life, face to face friends and learn how to respond if an online friend asks them a personal question. Pupils learn to create secure passwords for their accounts, learn about spam and how to deal with it, and

| | | | decode website privacy policies, understanding the implications for the info that they share online.

Pupils explore their roles as digital citizens in an online community, where they reflect on their responsibilities and learn that good digital citizens are responsible and respectful in the digital world.

Pupils begin to explore the nature of online audiences and permanency of information online. They begin to understand the significance of published information and personal information.

Pupils understand what it means to be a good digital citizen as they interact with others online by understanding how to prevent and respond to cyberbullying. They also learn how to communicate effectively to prevent miscommunication in order to be a responsible member of a connected culture.

Pupils begin to consider the impact of their online presence on their own self- image and the way others see them and explore how to construct a positive online profile.

Pupils learn the 'do's and don'ts' of copying and pasting information to avoid plagiarism. They learn how to avoid plagiarism by putting information in their own words, putting excerpted information into quotes, and providing citations. They learn to show respect for other people's creations by giving them credit. |
|---|---|---|---|

		Use search technologies effectively, appreciate how results are selected and ranked and be discerning in evaluating digital content	For instance: Pupils explore issues relating to online searching, including how to use effective keywords, using directories and subject categories, and how to analyse the usefulness and relevancy of the results. They learn to conduct searches that provide them with the most helpful and relevant information. Pupils develop skills for evaluating websites, online information and advertising by rating the trustworthiness and usefulness of websites, and learning to identify the different types of online advertising.
	ICT	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	For instance: Digital Publishing: Pupils learn how to use software to create an e-book, brochure or poster on a given subject, incorporating a range of media. Presentations: Pupils learn to write and deliver a presentation, incorporating a range of media. Graphics: Pupils learn how to take, adapt or create images to enhance or further develop their work and incorporate it in a wider project. Animations: Pupils learn how to develop a storyboard and then create a simple animation using for instance Puppet pals' or 'Stop Motions Animation' - this may be extended by editing the final product in using video editing software.

| | | Sound and video: Pupils record and edit media to create a short sequence - extended by editing the final product in using video editing software.

Working with data: Pupils learn to search, sort and graph information.

Modelling: Pupils learn how to use a spreadsheet to model data. |
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By the end of **UKS2**, pupils will have... Experienced the following
Technology in action and in the work place (3D printing), links with Exeter University and secondary schools, programming robotics, presenting their work using the correct device/programme, recording themselves, and using IT to enhance their learning 'above the line'.