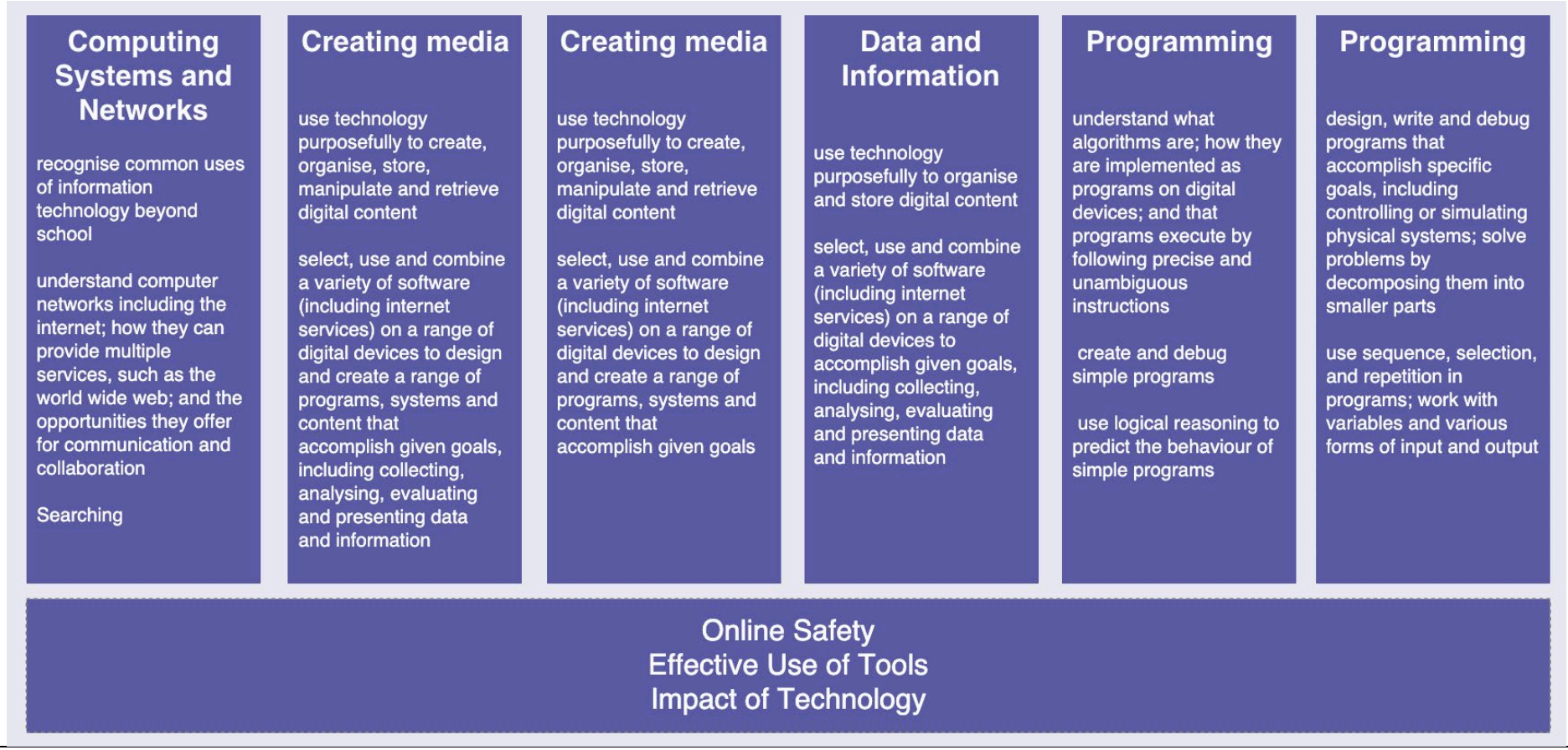
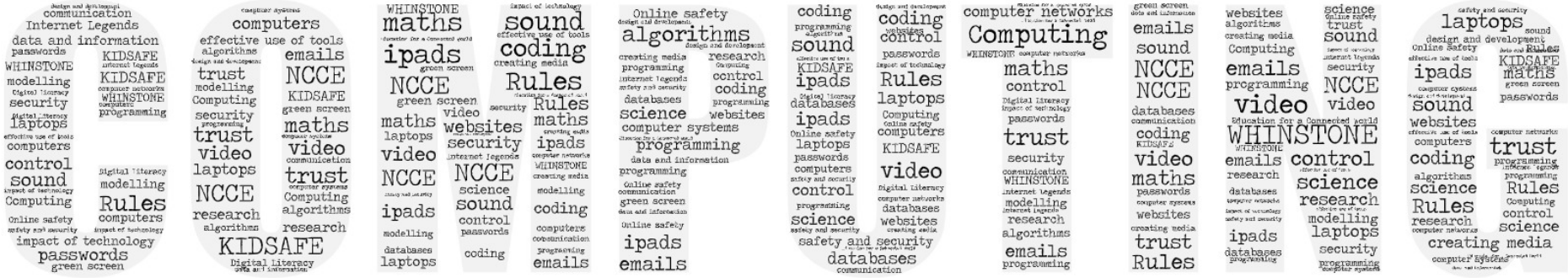
Whinstone Primary School Year 6 Computing

Computing Statement of Intent

Advances in technology impacts on all our lives. Through teaching computing, we aim to equip our children to participate in a rapidly changing world where work and leisure activities are increasingly transformed by technology. It is our intention to enable children to find, explore, analyse, exchange and present information. With the knowledge that Computing will undoubtedly continue to form a major part of the children's lives at home, in further education and places of work, we ensure that the experiences and abilities that the children develop at Whinstone are effective and transferrable life skills. We ensure that online safety learning outcomes are interpreted within contexts that are relevant to the learner's experience and are achieved through learning that is matched to the readiness of the learner. We help our children to become creative at computing through the development of the Key Concepts in computing:



■ Algorithms — Be able to comprehend, design, create, and evaluate algorithms
■ Computer networks — Understand how networks can be used to retrieve and share information, and how they come with associated risks
■ Computer systems — Understand what a computer is, and how its constituent parts function together as a whole
■ Creating media — Select and create a range of media including text, images, sounds, and video
■ Data and information — Understand how data is stored, organised, and used to represent real-world artefacts and scenarios
■ Design and development — Understand the activities involved in planning, creating, and evaluating computing artefacts
■ Effective use of tools — Use software tools to support computing work
■ Impact of technology — Understand how individuals, systems, and society as a whole interact with computer systems
■ Programming — Create software to allow computers to solve problems
■ Safety and security — Understand risks when using technology, and how to protect individuals and systems The taxonomy provides categories and an organised view of content to encapsulate the discipline of computing. Whilst all strands are present at all phases, they are not always taught explicitly.



Computing KS2 National Curriculum

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.

Computing Implementation

Computing is taught as an area of learning, as well as integrated with other curriculum areas where appropriate. There is also flexibility to seize opportunities to celebrate and acknowledge significant events.

Year 6 Computing Implementation – Key Concepts
The Key Concepts of Computing at Whinstone are: - Computer Systems and Networks - Creating Media - Data and Information - Programming - Safety and Security (Whilst all strands are present at all phases, they are not always taught explicitly.)

In Year 6 Computing is taught in discrete lessons under the following broad unit headings:					
Autumn 1	**Autumn 2**	**Spring 1**	**Spring 2**	**Summer 1**	**Summer 2**
Computer Systems and Networks Communication	**Data and Information** Spreadsheets	**Programming A** Variables in games	**Programming B** Sensing	**Creating Media** 3D modelling	**Creating Media** Webpage design

Topic Specific Vocabulary					
Computer Systems and Networks Communication	**Data and Information** Spreadsheets	**Programming A** Variables in games	**Programming B** Sensing	**Creating Media** 3D modelling	**Creating Media** Webpage design
Search, search engine, Google, Bing, Yahoo!, Swisscows, DuckDuckGo, refine, Index, crawler, bot, ranking, search engine optimisation, links, web crawlers, searching, content creator, selection, communication, internet, searching, ranking, public, private, one-way, two-way, one-to-one, one-to-many, SMS, email, WhatsApp, blog, YouTube, Twitter, BBC Newsround	Spreadsheet, data, data heading, data set, cells, columns and rows, data item, data set, object, spreadsheet application, format, common attribute, formula, calculation, input, output, cell reference, calculate, operation, range, duplicate, sigma, propose, question, organised, graph, chart, evaluate, results, comparison, questions, software, tools	Variable, change, name, value, set, design, event, design, algorithm, code, task, artwork, program, project, test, debug, improve, evaluate, share	Variable, change, name, value, set, design, event, design, algorithm, code, task, artwork, program, project, test, debug, improve, evaluate, share	2D, 3D, 3D object, 3D space, view, resize, colour, lift, Rotate, position, select, duplicate, Dimensions, placeholder, hole, group, ungroup, design, modify, evaluate, improve	Website, web page, browser, media, Hypertext Markup Language (HTML), logo, layout, header, purpose, copyright, fair use, web page, home page, preview, evaluate, device, Weebly education (instead of Google Sites), breadcrumb trail, navigation, hyperlink, subpage, evaluate, implication, external link, embed

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Key Concepts

These key concepts, knowledge and vocabulary will be taught and reinforced through the development of these specific skills. These Key Concepts and vocabulary will be revisited and repeated throughout a child's journey of Computing at Whinstone.

**Safety and Security links to lessons are in RED. Online Safety Strands are taken from the UKCCIS document 'Education for a Connected World' (June, 2020)*

Computer Systems and Networks Communication	Data and Information Spreadsheets	Programming A Variables in games	Programming B Sensing	Creating Media 3D modelling	Creating Media Webpage design
To identify how to use a search engine Managing online information Online reputation	To identify questions which can be answered using data	To define a 'variable' as something that is changeable	To create a program to run on a controllable device	To use a computer to create and manipulate three-dimensional (3D) digital objects Privacy and security	To review an existing website and consider its structure Copyright and ownership Online relationships
To describe how search engines select results	To explain that objects can be described using data	To explain why a variable is used in a program	To explain that selection can control the flow of a program	To compare working digitally with 2D and 3D graphics	To plan the features of a web page
To explain how search results are ranked	To explain that formula can be used to produce calculated data	To choose how to improve a game by using variables	To update a variable with a user input	To construct a digital 3D model of a physical object	To consider the ownership and use of images (copyright)
To recognise why the order of results is important, and to whom	To apply formulas to data, including duplicating	To design a project that builds on a given example	To use an conditional statement to compare a variable to a value	To identify that physical objects can be broken down into a collection of 3D shapes	To recognise the need to preview pages
To recognise how we communicate using technology	To create a spreadsheet to plan an event	To use my design to create a project	To design a project that uses inputs and outputs on a controllable device	To design a digital model by combining 3D objects	To outline the need for a navigation path
To evaluate different methods of online communication	To choose suitable ways to present data	To evaluate my project	To develop a program to use inputs and outputs on a controllable device	To develop and improve a digital 3D model	To recognise the implications of linking to content owned by other people

Computing Impact

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At the end of each topic teachers will evaluate what knowledge and skills pupils have gained within the Key Concepts. Please see the grid below this one for the 'Education for a Connected World' specific 'I can' statements for meeting expectations. Links are shown here but all aspects of the 'Safety and Security' strand will be covered over the school year within assemblies, extra sessions and PHSE lessons.

SKILLS	Learning Objective	Meeting expectations	Education for a Connected World links
Computer Systems and Networks Communication	To identify how to use a search engine	- I can compare results from different search engines - I can complete a web search to find specific information - I can refine my search	- Managing online information - Online reputation
	To describe how search engines select results	- I can explain why we need tools to find things online - I can recognise the role of web crawlers in creating an index - I can relate a search term to the search engine's index	
	To explain how search results are ranked	- I can explain that a search engine follows rules to rank relevant pages - I can explain that search results are ordered - I can suggest some of the criteria that a search engine checks to decide on the order of results	
	To recognise why the order of results is important, and to whom	- I can describe some of the ways that search results can be influenced - I can explain how search engines make money - I can recognise some of the limitations of search engines	
	To recognise how we communicate using technology	- I can choose methods of communication to suit particular purposes - I can explain the different ways in which people communicate - I can identify that there are a variety of ways of communicating over the internet	
	To evaluate different methods of online communication	- I can compare different methods of communicating on the internet - I can decide when I should and should not share - I can explain that communication on the internet may not be private	
Data and Information Spreadsheets	To identify questions which can be answered using data	- I can answer questions from an existing data set - I can ask simple relevant questions which can be answered using data - I can explain the relevance of data headings	
	To explain that objects can be described using data	- I can apply an appropriate number format to a cell - I can build a data set in a spreadsheet application - I can explain what an item of data is	
	To explain that formula can be used to produce calculated data	- I can construct a formula in a spreadsheet - I can explain the relevance of a cell's data type - I can identify that changing inputs changes outputs	

	To apply formulas to data, including duplicating	- I can apply a formula to multiple cells by duplicating it - I can create a formula which includes a range of cells - I can recognise that data can be calculated using different operations	
	To create a spreadsheet to plan an event	- I can apply a formula to calculate the data I need to answer questions - I can explain why data should be organised - I can use a spreadsheet to answer questions	
	To choose suitable ways to present data	- I can produce a graph - I can suggest when to use a table or graph - I can use a graph to show the answer to questions	
Programming A Variables in games	To define a 'variable' as something that is changeable	- I can explain that the way that a variable changes can be defined - I can identify examples of information that is variable - I can identify that variables can hold numbers or letters	
	To explain why a variable is used in a program	- I can explain that a variable has a name and a value - I can identify a program variable as a placeholder in memory for a single value - I can recognise that the value of a variable can be changed	
	To choose how to improve a game by using variables	- I can decide where in a program to change a variable - I can make use of an event in a program to set a variable - I can recognise that the value of a variable can be used by a program	
	To design a project that builds on a given example	- I can choose the artwork for my project - I can create algorithms for my project - I can explain my design choices	
	To use my design to create a project	- I can choose a name that identifies the role of a variable - I can create the artwork for my project - I can test the code that I have written	
	To evaluate my project	- I can extend my game further using more variables - I can identify ways that my game could be improved - I can share my game with others	
Programming B Sensing	To create a program to run on a controllable device	- I can apply my knowledge of programming to a new environment - I can test my program on an emulator - I can transfer my program to a controllable device	
	To explain that selection can control the flow of a program	- I can determine the flow of a program using selection - I can identify examples of conditions in the real world - I can use a variable in an if… then… else… statement to select the flow of a program	
	To update a variable with a user input	- I can experiment with different physical inputs - I can explain that if you read a variable, the value remains - I can use a condition to change a variable	

	To use an conditional statement to compare a variable to a value	- I can explain the importance of the order of conditions in else if statements - I can modify a program to achieve a different outcome - I can use an operand (e.g. <>=) in an if… then… statement	
	To design a project that uses inputs and outputs on a controllable device	- I can decide what variables to include in a project - I can design the algorithm for my project - I can design the program flow for my project	
	To develop a program to use inputs and outputs on a controllable device	- I can create a program based on my design - I can test my program against my design - I can use a range of approaches to find and fix bugs	
Creating Media 3D modelling	To use a computer to create and manipulate three-dimensional (3D) digital objects	- I can discuss the similarities and differences between 2D and 3D shapes - I can explain why we might represent 3D objects on a computer - I can select, move, and delete a digital 3D shape	- Privacy and security
	To compare working digitally with 2D and 3D graphics	- I can change the colour of a 3D object - I can identify how graphical objects can be modified - I can resize a 3D object	
	To construct a digital 3D model of a physical object	- I can position 3D objects in relation to each other - I can rotate a 3D object - I can select and duplicate multiple 3D objects	
	To identify that physical objects can be broken down into a collection of 3D shapes	- I can create digital 3D objects of an appropriate size - I can group a digital 3D shape and a placeholder to create a hole in an object - I can identify the 3D shapes needed to create a model of a real-world object	
	To design a digital model by combining 3D objects	- I can choose which 3D objects I need to construct my model - I can modify multiple 3D objects - I can plan my 3D model	
	To develop and improve a digital 3D model	- I can decide how my model can be improved - I can evaluate my model against a given criterion - I can modify my model to improve it	
Creating Media Webpage design	To review an existing website and consider its structure	- I can discuss the different types of media used on websites - I can explore a website - I know that websites are written in HTML	- Copyright and ownership - Online relationships
	To plan the features of a web page	- I can draw a web page layout that suits my purpose - I can recognise the common features of a web page - I can suggest media to include on my page	

	To consider the ownership and use of images (copyright)	- I can describe what is meant by the term 'fair use' - I can find copyright-free images - I can say why I should use copyright-free images	
	To recognise the need to preview pages	- I can add content to my own web page - I can evaluate what my web page looks like on different devices and suggest/make edits. - I can preview what my web page looks like	
	To outline the need for a navigation path	- I can describe why navigation paths are useful - I can explain what a navigation path is - I can make multiple web pages and link them using hyperlinks	
	To recognise the implications of linking to content owned by other people	- I can create hyperlinks to link to other people's work - I can evaluate the user experience of a website - I can explain the implication of linking to content owned by others	

Online Safety and Security Strands are taken from the UKCCIS document 'Education for a Connected World' (June, 2020)

SKILLS	Learning Objective	Meeting expectations
Online safety and security	Self-image and identity	-I can identify and critically evaluate online content relating to gender, race, religion, disability, culture and other groups, and explain why it is important to challenge and reject inappropriate representations online. -I can describe issues online that could make anyone feel sad, worried, uncomfortable or frightened. I know and can give examples of how to get help, both on and offline. -I can explain the importance of asking until I get the help needed.
	Online relationships	-I can explain how sharing something online may have an impact either positively or negatively. -I can describe how to be kind and show respect for others online including the importance of respecting boundaries regarding what is shared about them online and how to support them if others do not. -I can describe how things shared privately online can have unintended consequences for others. e.g. **screen-grabs**. -I can explain that taking or sharing inappropriate images of someone (e.g. embarrassing images), even if they say it is okay, may have an impact for the sharer and others; and who can help if someone is worried about this.
	Online reputation	-I can explain the ways in which anyone can develop a positive online reputation. -I can explain strategies anyone can use to protect their '**digital personality**' and online reputation, including degrees of **anonymity**.
	Online bullying	-I can describe how to capture bullying content as evidence (e.g **screen-grab**, **URL**, **profile**) to share with others who can help me. -I can explain how someone would report online bullying in different contexts.

	Managing online information	-I can explain how search engines work and how results are selected and ranked. -I can explain how to use search technologies effectively. -I can describe how some online information can be opinion and can offer examples. -I can explain how and why some people may present 'opinions' as 'facts'; why the popularity of an opinion or the personalities of those promoting it does not necessarily make it true, fair or perhaps even legal. -I can define the terms 'influence', 'manipulation' and 'persuasion' and explain how someone might encounter these online (e.g. advertising and '**ad targeting**' and targeting for **fake news**). -I understand the concept of **persuasive design** and how it can be used to influences peoples' choices. -I can demonstrate how to analyse and evaluate the validity of 'facts' and information and I can explain why using these strategies are important. -I can explain how companies and news providers target people with online news stories they are more likely to engage with and how to recognise this. -I can describe the difference between on-line **misinformation** and **dis-information**. -I can explain why information that is on a large number of sites may still be inaccurate or untrue. I can assess how this might happen (e.g. the sharing of misinformation or disinformation). -I can identify, flag and report inappropriate content.
	Health, well-being and lifestyle	-I can describe common systems that regulate age-related content (e.g. **PEGI**, **BBFC**, parental warnings) and describe their purpose. -I recognise and can discuss the pressures that technology can place on someone and how / when they could manage this. -I can recognise features of **persuasive design** and how they are used to keep users engaged (current and future use). -I can assess and action different strategies to limit the impact of technology on health (e.g. **night-shift mode**, regular breaks, correct posture, sleep, diet and exercise).
	Privacy and security	-I can describe effective ways people can manage passwords (e.g. storing them securely or saving them in the browser). -I can explain what to do if a password is shared, lost or stolen. -I can describe how and why people should keep their software and apps up to date, e.g. auto updates. -I can describe simple ways to increase privacy on apps and services that provide privacy settings. -I can describe ways in which some online content targets people to gain money or information illegally; I can describe strategies to help me identify such content (e.g. **scams**, **phishing**). -I know that online services have **terms and conditions** that govern their use.
	Copyright and ownership	-I can demonstrate the use of search tools to find and access online content which can be reused by others. -I can demonstrate how to make references to and acknowledge sources I have used from the internet.