Sheffield Primary Computing Progression Framework

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Improving outcomes . Embracing technology

This progression framework has been created to accompany the Sheffield Primary Computing Scheme of Work, although it will be useful to any primary computing teacher to understand the progression of skills and knowledge in the computing curriculum at KS1 & 2.

The following documents show a general overview of progression in the 6 strands of the scheme of work, plus the online safety and digital literacy themes that are embedded across the scheme:

Strand 0	What is a Computer?
Strands 1 & 2	Communicating: Text, Images & Multimedia
Strand 3	Understanding & Sharing Data
Strands 4 & 5	Programming & Computational Thinking
Online Safety & Digital Literacy	

The bands of progression are as follows:

FS2 — Pupils working at Foundation Stage 2 level (for guidance only, for progression beyond the Early Learning Goals)

KS1 — Pupils working at KS1 level

LKS2 — Pupils working at Lower KS2 level

UKS2 — Pupils working at Upper KS2 level

The statements reference two documents, with additional elements relating directly to the content of the Sheffield Scheme of Work:

- The Revised P Scales for Computing by Elliott, Galloway, Medhurst & Paveley – an attempt by educators across the country to create a set of P Scales statements that better reflect the Computing programs of study. This is reflected in the FS2 statements.

- The Computing Progression Pathways document by Mark Dorling & Matthew Walker © 2014, showing progress for pupils working at KS1 and above.

STRAND o

Key Skills: What is a Computer?

Please note that some statements assume access to a school network via PCs - adapt as necessary for alternative technology use.

Pupils:

FS2

- Use different digital devices
- Recognise that you can access content on a digital device
- Use a mouse, touchscreen or appropriate access device to target and select options on screen
- Recognise a range of digital devices
- Recognise the basic parts of a computer, e.g. mouse, screen, keyboard
- Recognise key parts of a keyboard, e.g. spacebar, numbers and letters
- Select a digital device to fulfil a specific task, e.g. to take a photo
- Recognise that information and media can be stored on a digital device, e.g. they ask to view a photo that has been taken on a tablet

KS1

- Name a range of digital devices
- Use a range of input devices, e.g. mouse, keyboard, touchscreen
- Recognise that you can find information from a website
- Use a simple password when logging on, where relevant
- Explain what the basic parts of a computer are used for, e.g. mouse, screen, keyboard
- Recognise that you can share digital content
- Identify and use a range of input devices, e.g. mouse, keyboard, microphone, touchscreen
- Recognise and use a range of output devices, e.g. printer, speakers, monitor/screen
- Recognise that a range of devices contain computers, e.g. washing machine, car, laptop
- Know where to save and open work
- Explain that you can use a search engine to find information
- Recognise that all devices, programs, websites, apps and games are designed and manufactured by real people to fulfil specific tasks

STRAND o

Pupils:

Lower KS2

- Open and save a file to a suitable folder
- Use suitable file names when saving work
- Use a search engine to find information using keyword searches
- Recognise that school computers are connected (if on a network)
- Type using more than one finger
- Recognise you can organise files using folders
- Delete, move and copy files
- Use right-click, left-click and double-click appropriately on a mouse
- Use a search engine to find specific information
- Know how to copy text and images into a another document
- Remember an individual password

Upper KS2

- Use the keyboard confidently to type at a suitable pace
- Use common keyboard shortcuts
- Create and use a strong password where appropriate
- Organise files effectively using folders
- Use more advanced searching techniques when using a search engine
- Explain that different devices can have different operating systems, and can give examples, e.g. Windows, iOS, Android
- Name the main functions of an operating system
- Recognise common file types and extensions

STRANDS 1&2

Communicating: Text, Images & Multimedia

Pupils:

FS2

- Use technology to explore and access digital content
- Operate a digital device with support to fulfil a task
- Create simple digital content, e.g. digital art
- Choose media to convey information, e.g. image for a poster
- Choose a digital device from a selection to complete a specific task

KS1

- Select media (e.g. images, video, sound) to present information on a topic
- Recognise that you can edit and change digital content
- Select basic options to change the appearance of digital content
- Combine media with support to present information, e.g. text and images
- Apply edits to digital content to achieve a particular effect
- Plan out digital content
- Present ideas and information by combining media independently
- Talk about what makes digital content good or bad
- Edit digital content to improve it

STRANDS 1&2

Pupils:

Lower KS2

- Edit existing media to make new content with an awareness of copyright
- Evaluate existing and their own digital content
- Edit digital content to improve it according to feedback
- Design and create digital content for a specific purpose
- Collaborate with peers using online tools, e.g. blogs, Google Drive, Office 365
- Collect, organise and present information effectively using a range of media
- Use a range of tools to edit and enhance media for a particular effect

Upper KS2

- Identify and use appropriate hardware and software to fulfil a specific task
- Remix and edit a range of existing and their own media to create content
- Recognise the audience when designing and creating digital content
- Recognise the benefits of using technology to collaborate with others
- Are aware of a range of Internet services, e.g. email, VOIP (Voice Over Internet Protocol e.g. Skype, FaceTime), World Wide Web, and what they do
- Select, combine and use Internet services to fulfil a purpose
- Identify success criteria for creating digital content for a given purpose and audience
- Evaluate their own content against success criteria and make improvements accordingly

STRAND 3

Understanding & Sharing Data

Pupils:

FS2

- Access content in a range of formats, e.g. image, video, audio
- Sort familiar objects into 1 or more categories
- Answer basic questions about information displayed in images, e.g. more or less
- Can distinguish between text, image, video and audio content
- Collect simple data (e.g. likes/dislikes) on a topic
- Can present simple data using images, e.g. number of animals

KS1

- Identify an object by asking yes/no questions
- Recognise charts, tables or branching databases and understand why we use them
- Explain information shown in a simple chart, pictogram, infographic or database
- Use specific software to create simple charts
- Collect data on a topic (eye colour, pets etc.)
- Present data in a pictogram independently
- Identify an object using a branching database
- Recognise an error in a branching database.
- Create a branching database using pre-prepared images and questions
- Find out similar information in different formats, e.g. text, video, audio
- Explain how different formats communicate information and their benefits
- Independently plan out and create a branching database
- Evaluate a given branching database and suggest improvements
- Recognise that the questions you ask are important, when collecting data

STRAND 3

Pupils:

Lower KS2

- Appreciate that different programs work with different types of data, e.g. text, number
- Explore a record database to find out information
- Know that there is a difference between data and information
- Use filters in a database to find out specific information
- Name the benefits of using a computer to create charts and databases
- Explain that information can be stored and shared on the Internet
- Recognise that search engines store information in databases
- Design a questionnaire and collect a range of data on a theme
- Enter data into a database package and test
- Draw conclusions from information stored in a database, table or chart
- Recognise that the Internet is made up of computers from all around the world connected together
- Recognise that that school computers are connected together in a network
- Recognise that we use a web browser to access information stored on the Internet
- Present data in a number of different ways to convey information

Upper KS2

- Explain the difference between data and information.
- Explain the difference between the Internet and the World Wide Web
- Explain the basics of how search engines work, and that different search engines may give different results
- Perform complex searches for information using advanced settings in search engines
- Recognise the benefits and risks of sharing data online
- Recognise what a spreadsheet is and what it is used for
- Use simple formulae in a spreadsheet to find out information from a set of data
- Collect data for a purpose and plan out a spreadsheet to present it effectively, using relevant formulae
- Analyse and evaluate data and information in a spreadsheet, chart or database
- Recognise that poor quality data leads to unreliable results
- Analyse and evaluate data and information in a spreadsheet, chart or database

STRANDS 4&5

Programming & Computational Thinking

Pupils:

FS2

- Explore technology
- Repeat an action with technology to trigger a specific outcome
- Recognise the success or failure of an action
- Follow simple instructions to control a digital device
- Try alternative approaches to achieve a goal
- Recognise that we control computers
- Input a short sequence of instructions to control a device

KS1

- Recognise that computers don't have a brain
- Explain that we control computers by giving them instructions
- Create a simple program e.g. to control a floor robot
- Create a simple algorithm
- Predict the outcome of a simple algorithm or program
- Explain what an algorithm is
- Recognise that the order of instructions in an algorithm is important
- Debug an error in a simple algorithm or program e.g. for a floor robot
- Explain that computers have no intelligence and we have to program them to do things
- Recognise that instructions in an algorithm need to be clear and unambiguous
- Identify and correct errors in a given algorithm or program, and understand the term debugging
- Explain what an algorithm is, and that when inputted on a computer it is called a program.
- Evaluate the success of an algorithm or program
- Plan out a program by creating an algorithm

STRANDS 4&5

Pupils:

Lower KS2

- Successfully modify an existing program
- Identify repeated steps in a program or algorithm
- Predict the outcome of a more complex program, e.g. in Scratch or Logo
- Use a count-controlled loop (e.g. repeat 3 times) to make a program more efficient
- Recognise and use *forever* loops in a program
- Create a program using a range of events/inputs to control what happens
- Recognise that we can decompose a problem into smaller parts to help solve it
- Recognise selection in a program or algorithm
- Use selection in algorithms in programs to alter what happens when a condition changes, e.g. *if…then…*
- Design a program for a purpose. Decompose into parts and create an algorithm for each one
- Recognise common mistakes in programs and how to correct them

Upper KS2

- Name a range of sensors in physical systems
- Recognise that different solutions exist for the same problem
- Predict what will happen in a program or algorithm (i.e. change of output) when the input changes (e.g. sensor, data or event)
- Use two-way selection in programs and algorithms, i.e. *if… then… else…*
- Recognise variables in a program and what they do
- Create programs including *repeat until* loops
- Create simple variables, e.g. to keep score or remove lives in a game
- Evaluate a program and make improvements to the code or design accordingly
- Design and program a physical system containing a sensor
- Recognise and use procedures (sub-routines) in programs
- Plan out a program in detail, including task, algorithm, code and execution level
- Use nested selection statements in a program or algorithm effectively.
- Combine a variable with relational operators (< = >) to determine when a program changes, e.g. *if score > 5, say "well done".*
- Recognise key concepts (sequence, selection, repetition and variables) in a range of languages and contexts

Online Safety & Digital Literacy

Please note that these are the main themes that fit in Computing, but may also be covered in PSHE. This is not the complete progression in Online Safety – please also see the Sheffield Online Safety Curriculum for more detail.

Pupils:

FS2

- Are aware that some online content is inappropriate
- Are aware that information can be public or private
- Recognise inappropriate content and know to tell an appropriate adult
- Can describe what makes a good friend

KS1

- Recognise that you can share digital content online
- Know what personal information is and the need to keep it private
- Know who to tell if concerned about content or contact online
- Recognise that digital content belongs to the person who first created it
- Save and reuse digital content found online
- Recognise why we use passwords
- Can remember a simple password and know not to tell anyone
- Recognise what makes a good online friend and the need to be kind and thoughtful online as in the real world
- Can identify rules to add to an acceptable use policy for the class
- Explain that spending a long time in front of a computer screen can be unhealthy
- Know that when we share content online, we might not be able to delete it
- Know that not all information found online is true
- Recognise that the digital content we make belongs to us and others need to ask permission to use it

Online Safety & Digital Literacy

Pupils:

Lower KS2

- Recognise that we can search for information in a variety of ways and that we influence the outputs of searches depending on our input
- Know different ways of reporting unacceptable content and contact online
- Recognise when to share personal information and when not to
- Explain that games and films have age ratings, and what that means
- Know that people can give permission for others to use their content e.g. using Creative Commons.
- Are aware that some people lie about who they are online
- Recognise what kind of websites are trustworthy sources of information
- Can rate a game or film they have made and explain their rating
- Explain the benefits of a good password
- Recognise the benefits and risks of different apps and websites
- Understand that the media can portray groups of people differently

Upper KS2

- Know where to find copyright free images and audio, and why this is important
- Demonstrate responsible use of online services and technologies, and know a range of ways to report concerns
- Critically evaluate websites for reliability of information and authenticity
- Understand what makes a strong password and why this is important at school and in the wider world
- Become increasingly savvy online consumers: know that algorithms are used to track online activities with a view to targeting advertising and information
- Know that there are laws around the purchase of games; the production, sending and storage of images; what is written online; and around online gambling