'Let your light shine as you grow'

Subject Leader Skills Progression	
Subject: Computing	**Subject Leader: Conor Clarke**

A Reception Computer Scientist		
• I can understand and verbalise e-safety. • I can use the internet with adult supervision to find and retrieve information of interest to them • I can know that information can be retrieved from digital devices and the internet • I can develop digital literacy skills by being able to access, understand, and interact with a range of technologies • I can select and use technology for different purposes	• I can understand that there is a range of technology in places such as home and schools (computer, phone, camera, iPad, laptop and tv) • I can use a mouse and keyboard • I can create a video recording or draw a picture on a screen using an app • I can take a photograph on a digital camera and/or an Ipad • I can operate simple equipment such as a DVD player, use a remote control and use touch screen devices	• I can make toys move or the sound or picture images on toys work by pressing switches or touching the screen I can cause things to happen in computer software • I can complete a simple programme on an electronic device (such as beebots) • I can use a simple programme that is put on an interactive whiteboard for me

A Year 1 Computer Scientist	A Year 2 Computer Scientist	A Year 3 Computer Scientist
<u>Computing Systems and Networks</u> • I can identify what technology is and how it is used in school • I can explain the uses of technology • I can name the parts of a computer • I can log onto a computer • I can use the mouse to click and drag • I can type using the keyboard • I can save my work to a file • I can open my work from a file • I can delete letters on the keyboard • I can explain how to stay safe online <u>Creating Media - Drawing</u> • I can use a mouse to draw a picture • I can use the shape and line tools to draw	<u>Computing Systems and Networks</u> • I can identify examples of computers I can describe some uses of computers I can sort school IT by its use I can identify that some IT can be used in more than one way • I can use more than one IT device together • I can list rules for using IT safely <u>Creating Media – Pictures and Music</u> • I can take a clear picture on a device • I can use different lighting to alter a picture • I can add effects to a picture • I can recognise when pictures have been altered	<u>Computing Systems and Networks</u> • I can explain that digital devices accept inputs • I can explain that digital devices produce outputs • I can follow a process • I can classify input and output devices • I can design a digital device • I can describe a simple process • I can recognise different connections • I can explain how messages are passed through multiple connections • I can discuss why we need a network switch • I can recognise that a computer network is made up of a number of devices • I can demonstrate how information can be passed between devices

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- I can create shapes of different colour for a picture
- I can change colour and brush sizes
- I can recreate the work of an artist using IT media

Document Skills

- I can open a word processor
- I can identify the backspace, enter and spacebar keys.
- I can write a message about myself on a word processor
- I can use the number keys
- I can type in capital letters
- I can make text bold, italic and underlined
- I can select a word by double clicking
- I can select text by clicking and dragging
- I can change the font style
- I can use the 'undo' function

Data and information

- I can label and group objects
- I can understand the term 'property' of an object and how this can be used to group them
- I can create questions and record digitally what I have found
- I can use data to answer questions

Programming - Beebots

- I can predict the outcome of a command on a device

- I can create my own music using IT

Document Skills

- I can identify the backspace, enter and spacebar keys.
- I can write a message about myself on a word processor
- I can type in capital letters
- I can make text bold, italic and underlined
- I can select text by clicking and dragging
- I can change the font style
- I can use the 'undo' function
- I can copy and paste words from one place to another

Data and information

- I can record data
- I can enter data onto a computer
- I can represent data in pictogram form using a computer
- I can understand the term 'attribute' and how it can be used to group objects
- I can share my findings using a computer to aid my presentation
- I can consider what information should not be shared online

Programming – Beebots

- I can follow instructions when running a command
- I can write clear instructions for someone else to run my algorithm

- I can explain the role of a switch, server, and wireless access point in a network
- I can identify how devices in a network are connected together
- I can identify networked devices around me
- I can identify the benefits of computer networks

Creating media – Animation

- I can explain why little changes are needed for each frame in an animation
- I can create a storyboard
- I can use onion skinning to help me make small changes between frames
- I can review a sequence of frames to check my work
- I can add other media to my animation
- I can evaluate the quality of my animation
- I can improve my animation based on feedback

Document Skills

- I can use the keyboard to type
- I can change font style, size, and colours for a given purpose
- I can edit text
- I can explain that text can be changed to communicate more clearly
- I can define the term 'page orientation'
- I can recognise placeholders and say why they are important

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- I can match a command to an outcome
- I can run a command on a device
- I can run a sequence of commands on a device
- I can explain what my program should do
- I can debug my program if it does not run correctly
- I can create two different programs that will have the same final outcome/destination

Programming – ScratchJr

- I can use commands to move a sprite
- I can compare different programming tools
- I can use a 'Start' block in my program
- I can change values to create a specific outcome
- I can add and remove sprites
- I can create an algorithm for a sprite
- I can test and debug my programs

- I can understand the importance of order sequence within an algorithm
- I can predict the outcome of an algorithm
- I can create a floormat for a Beebot
- I can create an algorithm to meet a goal
- I can test and debug my program

Programming – ScratchJr

- I can identify the start of a sequence
- I can explain how two sequences could have the same outcome
- I can predict how a sprite's code will make the sprite act in a program
- I can choose characters and backgrounds for my design
- I can create an algorithm for a sprite
- I can build block sequences
- I can evaluate my program

- I can create a graphic design template for a particular purpose
- I can copy and paste images
- I can delete content
- I can identify the uses of desktop publishing in the real world

Data and Information

- I can make up a yes/no question about a collection of objects
- I can create two groups of objects separated by one attribute
- I can create a group of objects within an existing group
- I can arrange objects into a tree structure
- I can select objects to arrange in a branching database
- I can test my branching database to see if it works
- I can compare two branching database structures
- I can create questions that will enable objects to be uniquely identified
- I can create a branching database that reflects my plan
- I can work with a partner to test my identification tool
- I can suggest real-world uses for branching databases

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		<u>Programming – Scratch</u> • I can identify the objects in a Scratch project • I can create a program following a design • I can start a program in different ways • I can explain that the objects in my project will respond exactly to the code • I can explain what a sequence is • I can combine sound commands • I can create a sequence of connected commands • I can decide the actions for multiple sprites in a program • I can implement my algorithm as code • I can explain the relationship between an event and an action • I can program movement • I can use a programming extension • I can test a program against a given design • I can match a piece of code to an outcome

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A Year 4 Computer Scientist	A Year 5 Computer Scientist	A Year 6 Computer Scientist
<u>Computing Systems and Networks</u> • I can describe the internet as a network of networks • I can demonstrate how information is shared across the internet • I can discuss why a network needs protecting • I can recognise that the World Wide Web contains websites and web pages • I can describe where websites are stored when uploaded to the WWW • I can describe how to access websites on the WWW • I can describe how someone could add content to the WWW • I can explain that not everything on the World Wide Web is true • I can explain why I need to think carefully before I share or reshare content • I can stay safe online <u>Creating Media – Audio file</u> • I can identify the input and output devices used to record and play sound • I can use a computer to record audio • I can inspect the soundwave view to know where to trim my recording	<u>Computing Systems and Networks</u> • I can explain that systems are built using a number of parts • I can describe that a computer system features inputs, processes, and outputs • I can explain that computer systems communicate with other devices • I can identify tasks that are managed by computer systems • I can identify the human elements of a computer system • I can make use of a web search to find specific information • I can refine my web search • I can compare results from different search engines • I can recognise the role of web crawlers in creating an index • I can relate a search term to the search engine's index • I can explain that a search engine follows rules to rank results • I can give examples of criteria used by search engines to rank results • I can describe some of the ways that search results can be influenced	<u>Computing Systems and Networks</u> • I can complete a web search to find specific information • I can refine my search • I can compare results from different search engines • I can recognise the role of web crawlers in creating an index • I can relate a search term to the search engine's index • I can explain that a search engine follows rules to rank relevant pages • I can suggest some of the criteria that a search engine checks to decide on the order of results • I can describe some of the ways that search results can be influenced • I can recognise some of the limitations of search engines • I can explain how search engines make money • I can identify that there are a variety of ways of communicating over the internet • I can choose methods of communication to suit particular purposes • I can decide when I should and should not share

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- I can save my project so the different parts remain editable
- I can open my project to continue working on it
- I can arrange multiple sounds to create the effect I want
- I can explain the difference between saving a project and exporting an audio file
- I can suggest improvements to an audio recording

Creating Media - Image Editing

- I can rotate an image
- I can use photo editing software to crop an image
- I can experiment with different colour effects
- I can remove parts of an image using cloning
- I can use a range of tools to copy between images
- I can experiment with tools to select and copy part of an image
- I can explain why photos might be edited
- I can create a project that is a combination of other images
- I can evaluate whether an image is real

Data Information

- I can choose a data set to answer a given question
- I can recognise some of the limitations of search engines
- I can explain how search engines make money

Creating Media – Vector images

- I can recognise that vector drawings are made using shapes
- I can experiment with the shape and line tools
- I can discuss how vector drawings are different from paper-based drawings
- I can identify the shapes used to make a vector drawing
- I can explain that each element added to a vector drawing is an object
- I can move, resize, and rotate objects I have duplicated
- I can use the zoom tool to help me add detail to my drawings
- I can explain how alignment grids and resize handles can be used to improve consistency
- I can modify objects to create a new image
- I can change the order of layers in a vector drawing
- I can use layering to create an image
- I can copy part of a drawing by duplicating several objects
- I can group and ungroup objects

Creating Media - Video editing

- I can explain that communication on the internet may not be private

Creating Media

- I can add 3D shapes to a project
- I can view 3D shapes from different perspectives
- I can move 3D shapes relative to one another
- I can resize an object in three dimensions
- I can lift/lower 3D objects
- I can recolour a 3D object
- I can rotate objects in three dimensions
- I can duplicate 3D objects
- I can group 3D objects
- I can accurately size 3D objects
- I can show that placeholders can create holes in 3D objects
- I can analyse a 3D model
- I can construct a 3D model based on a design
- I can modify my 3D model to improve it

Creating Media – Webpages

- I can recognise that websites are written in HTML
- I can recognise the common features of a web page
- I can suggest media to include on my page

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- I can identify data that can be gathered over time
- I can use data from a sensor to answer a given question
- I can recognise that a data logger collects data at given points
- I can identify the intervals used to collect data
- I can talk about the data that I have captured
- I can view data at different levels of detail
- I can sort data to find information
- I can propose a question that can be answered using logged data
- I can plan how to collect data using a data logger
- I can use a data logger to collect data
- I can interpret data that has been collected using a data logger
- I can draw conclusions from the data I have collected

Programming – Logo and Scratch

- I can program a computer by typing commands
- I can explain the effect of changing a value of a command
- I can create a code snippet for a given purpose
- I can use a template to create a design for my program

- I can identify features of videos
- I can experiment with different camera angles
- I can create and save video content
- I can store, retrieve, and export my recording to a computer
- I can select the correct tools to make edits to my video
- I can evaluate my video and share my opinions

Data and Information

- I can explain what a field and a record is in a database
- I can navigate a flat-file database to compare different views of information
- I can choose which field to sort data by
- I can group information using a database
- I can combine grouping and sorting to answer specific questions
- I can choose which field and value are required to answer a given question
- I can outline how 'AND' and 'OR' can be used to refine data selection
- I can choose multiple criteria to answer a given question
- I can select an appropriate chart to visually compare data
- I can refine a chart by selecting a particular filter

- I can draw a web page layout that suits my purpose
- I can add content to my own web page
- I can preview what my web page looks like
- I can evaluate what my web page looks like on different devices and suggest/make edits
- I can explain what a navigation path is
- I can describe why navigation paths are useful
- I can make multiple web pages and link them using hyperlinks
- I can create hyperlinks to link to other people's work
- I can use basic HTML and CSS to design a webpage from scratch

Data and Information

- I can enter data into a spreadsheet
- I can explain what an item of data is
- I can apply an appropriate format to a cell
- I can explain which data types can be used in calculations
- I can construct a formula in a spreadsheet
- I can identify that changing inputs changes outputs
- I can calculate data using different operations
- I can create a formula which includes a range of cells

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- I can write an algorithm to produce a given outcome
- I can test my algorithm in a text-based language
- I can identify patterns in a sequence
- I can use a count-controlled loop to produce a given outcome
- I can modify loops to produce a given outcome
- I can choose when to use a count-controlled and an infinite loop
- I can recognise that some programming languages enable more than one process to be run at once
- I can re-use existing code snippets on new sprites
- I can predict the outcome of a program containing a count-controlled loop
- I can choose which values to change in a loop
- I can identify 'chunks' of actions in the real world
- I can use a procedure in a program
- I can design a program that includes count-controlled loops
- I can develop my program by debugging it

- I can ask questions that will need more than one field to answer
- I can refine a search in a real-world context
- I can present my findings to a group

<u>Programming – Crumble Controller</u>

- I can create a simple circuit and connect it to a microcontroller
- I can program a microcontroller to make an LED switch on
- I can explain what an infinite loop does
- I can connect more than one output component to a microcontroller
- I can use a count-controlled loop to control outputs
- I can design sequences that use count-controlled loops
- I can explain that a condition is either true or false
- I can design a conditional loop
- I can program a microcontroller to respond to an input
- I can explain that a condition being met can start an action
- I can identify a condition and an action in my project
- I can use selection (an 'if…then…' statement) to direct the flow of a program
- I can write an algorithm that describes what my model will do

- I can apply a formula to multiple cells by duplicating it
- I can use a spreadsheet to answer questions
- I can apply a formula to calculate the data I need to answer questions
- I can produce a chart
- I can use a chart to show the answer to questions
- I can suggest when to use a table or chart

<u>Programming – Games</u>

- I can explain the way variable changes can be defined
- I can identify that variables can hold numbers or letters
- I can identify a program variable as a placeholder in memory for a single value
- I can explain that a variable has a name and a value
- I can recognise that the value of a variable can be changed
- 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
- I can create algorithms for my project
- I can use variables to extend my game
- I can share my game with others

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	• I can use selection to produce an intended outcome • I can test and debug my project <u>Programming – Quiz</u> • I can recall how conditions are used in selection • I can identify conditions in a program • I can modify a condition in a program • I can use selection in an infinite loop to check a condition • I can identify the condition and outcomes in an 'if… then… else…' statement • I can create a program with different outcomes using selection • I can explain that program flow can branch according to a condition • I can design the flow of a program which contains 'if… then… else…' • I can show that a condition can direct program flow in one of two ways • I can use a design format to outline my project • I can identify the outcome of user input in an algorithm • I can implement my algorithm to create the first section of my program • I can identify the setup code I need in my program	• I can test the code that I have written <u>Programming – Micro:bits</u> • 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 • I can use a variable in an if, then, else statement to select the flow of a program • I can determine the flow of a program using selection • I can use a condition to change a variable • I can experiment with different physical inputs • I can use an operand (e.g. <>=) in an if, then statement • 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 design the algorithm for my project • I can design the program flow for my project • 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

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