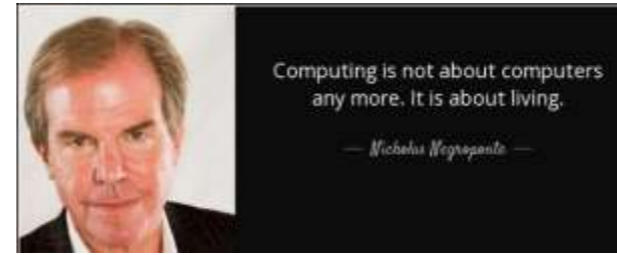




Computing: Intent & Implementation



At Arnbrook, children will 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 the digital world. At the core of our computing curriculum is computer science – the principles of information and computation, how digital systems work and how to put this knowledge to use through programming. We want to empower our pupils to be safe, responsible, discerning and creative users and consumers of digital technologies and have the ability to critically analyse information.

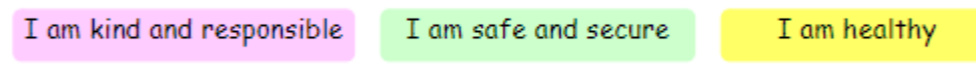
At Arnbrook, we use The Teach Computing Curriculum produced by the National Centre for Computing Education. The units for key stages 1 and 2 are based on a spiral curriculum. This means that each of the themes is revisited regularly (at least once in each year group), and pupils revisit each theme through a new unit that consolidates and builds on prior learning within that theme. This reduces the amount of knowledge lost through forgetting, as topics are revisited yearly.

Computing is taught once a week across Y1-6. Each lesson and unit are sequenced so that it builds on the learning from the previous lesson, and where appropriate, activities are scaffolded so that all pupils can succeed and thrive. Scaffolded activities provide pupils who need additional support with extra resources, such as visual prompts, to reach the same learning goals as the rest of the class. Exploratory tasks foster a deeper understanding of a concept, encouraging all pupils, but especially most able pupils, to apply their learning in different contexts and make connections with other learning experiences. Each term has an online safety focus, with an accompanying assembly and lesson for each year group. Online safety is also woven into computing and wider curriculum lessons where appropriate and relevant.

Each term has an online safety focus, with an accompanying assembly and lesson for each year group. Online safety is also woven into computing and wider curriculum lessons where appropriate and relevant. Online safety information is provided to parents and carers regularly.

| School Context | Response |
|---|---|
| The school deprivation indicator is in quintile 4 (more deprived) of all schools, although the pupil base is in quintile 5 (most deprived) of all schools in terms of deprivation. As a result, many pupils do not have access to electronic devices such as a laptop or tablet or share such devices– school received over 50 DfE devices which were distributed to pupils and families during the pandemic. In addition, families access to high speed internet may be limited – 5G Wifi Cards provided for families during pandemic. | Our computing curriculum gives pupils an opportunity to explore and learn about a range of technologies and programs, including 'hands on' computing with Beebots, Crumble kits and Micro:bit. The school is well resourced in terms of devices; with laptops available for each phase. Devices are used across the curriculum. |
| Some of our pupils & families may have a limited understanding of how to keep themselves safe online. | Each term has an online safety focus, with an accompanying assembly and lesson for each year group. Online safety is also woven into computing and wider curriculum lessons where appropriate and relevant. Online safety information is provided to parents and carers regularly. |

Online safety key concepts are:



Pupils are taught eight specific online 'habits', which are tailored to pupils' age range and understanding (EYFS-KS1- LKS2 – UKS2):



Key concepts and big ideas within our computing curriculum are as follows:

Computing systems and networks - Creating Media - Programming - Data & Information

These four themes are revisited regularly. In addition, learning objectives are separated into ten different strands based on the National Centre for Computing Education's computing taxonomy to ensure comprehensive coverage of the subject. This has been developed through a thorough review of the KS1–4 computing programme of study, and the GCSE and A level computer science specifications across all awarding bodies. All learning outcomes can be described through a high-level taxonomy of ten strands, ordered alphabetically as follows:

- 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 Long Term Plan 2021-22 (Cycle A)

| | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 1 |
|----------------------|---|--------------------------------------|---|--|--|--|
| Online Safety | I am kind & responsible See separate Online Safety LTP for full details | | I am safe See separate Online Safety LTP for full details | | I am healthy See separate Online Safety LTP for full details | |
| EYFS | -Computing will be embedded and used in all of the educational programmes within EYFS. Online Safety -To educate our children to be safe online. -To educate our parents on how to keep their children safe online. Skills -To understand the main purpose of items of technology (eg. Laptops, tablets, mobile phones, Beebots, interactive whiteboards) -To carry out basic operations/processes on different technological equipment to achieve a desired outcome (eg taking a photograph) | | | | | |
| Year 1 | Computing systems and networks – Technology around us | Creating media – Digital photography | Creating media – Digital writing | Data and information – Pictograms | Programming A – Robot algorithms | Programming B – Introduction to animation |
| Year 2 | Computing systems and networks – IT around us | Creating media – Digital painting | Creating media – Making music | Data and information – Grouping data | Programming A – Moving a robot | Programming B – An introduction to quizzes |
| Year 3 | Computing systems and networks – Connecting computers | Creating media – Animation | Creating media – Desktop publishing | Data and information – Branching databases | Programming A – Sequence in music | Programming B – Events and actions |
| Year 4 | Computing systems and networks – The Internet | Creating media – Audio editing | Creating media – Photo editing | Data and information – Data logging | Programming A – Repetition in shapes | Programming B – Repetition in games |
| Year 5/6 | Computing systems and networks – Sharing information | Creating media – Vector drawing | Creating media – Video editing | Data and information – Flat-file databases | Programming A – Selection in physical computing | Programming B – Selection in quizzes |

Computing Long Term Plan 2022-23 (Cycle B)

| | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Spring 2 | Summer 1 |
|----------------------|---|---|---|---|--|---|
| Online Safety | I am kind & responsible See separate Online Safety LTP for full details | | I am safe See separate Online Safety LTP for full details | | I am healthy See separate Online Safety LTP for full details | |
| EYFS | -Computing will be embedded and used in all of the educational programmes within EYFS. Online Safety -To educate our children to be safe online. -To educate our parents on how to keep their children safe online. Skills -To understand the main purpose of items of technology (eg. Laptops, tablets, mobile phones, Beebots, interactive whiteboards) -To carry out basic operations/processes on different technological equipment to achieve a desired outcome (eg taking a photograph) | | | | | |
| Year 1 | Computing systems and networks – Technology around us | Creating media – Digital photography | Creating media – Digital writing | Data and information – Pictograms | Programming A – Robot algorithms | Programming B – Introduction to animation |
| Year 2 | Computing systems and networks – IT around us | Creating media – Digital painting | Creating media – Making music | Data and information – Grouping data | Programming A – Moving a robot | Programming B – An introduction to quizzes |
| Year 3 | Computing systems and networks – Connecting computers | Creating media – Animation | Creating media – Desktop publishing | Data and information – Branching databases | Programming A – Sequence in music | Programming B – Events and actions |
| Year 4 | Computing systems and networks – The Internet | Creating media – Audio editing | Creating media – Photo editing | Data and information – Data logging | Programming A – Repetition in shapes | Programming B – Repetition in games |
| Year 5/6 | Computing systems and networks – Communication | Creating media – 3D Modelling | Creating media – Web page creation | Data and information – Spreadsheets | Programming A – Variables in games | Programming B – Sensing |

Knowledge Builder

Online Safety

- I know how to be safe online.
- My parents know how to keep me safe online.

Skills

- I know that technology is part of everyday life (using and representing devices during role play and continuous provision)
- I know the main purposes of items of technology (eg. Tablets, Beebots, interactive whiteboards)
- I know how to use basic operations/processes on different technological equipment to achieve a desired outcome (eg taking a photograph, playing a game, making things move)
- I know that the technology can be used to find out information.
- I know that technology can be used to communicate.
- I know videos and music can be accessed using technology.

| | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
|----|--|--|--|---|--|--|
| | Computing Systems and Networks | Creating Media | Creating Media | Data and Information | Programming A | Programming B |
| Y1 | <ul style="list-style-type: none"> • I know specific examples of technology in the classroom. • I know how these can help us in the world. • I know the names of the main parts of a computer • I know how to switch on and log into a device • I know how to use a mouse to click and drag • I know how to open a program, click and drag objects and create pictures using a mouse • I know how to type my name on a computer • I know how to save my work to a file • I know how to open my work from a file • I know how to use the arrow keys to move the cursor • I know how to delete letters • I know rules that keep us safe and healthy when we are using technology in and beyond the home and can give examples of some of these rules (Esafety) • I know how these rules will benefit us | <ul style="list-style-type: none"> • I know and understand what different freehand tools do • I know how to make marks and, lines on a screen and explain which tools I used • I know how to use the paint tools to draw a picture • I know and understand how to use the shape tool and the line tool • I know how to make marks with the square and line tools • I know how to make careful choices when painting a digital picture by choosing appropriate shape and make appropriate colour choices • I know how to make dots of colour on the page and change the colour and brush sizes | <ul style="list-style-type: none"> • I can open a word processor • I can recognise keys on a keyboard • I can identify and find keys on a keyboard • I can enter text into a computer • I can use letter, number, and Space keys • I can use Backspace to remove text • I can type capital letters • I can explain what the keys that I have already learnt about do • I can identify the toolbar and use bold, italic, and underline • I can select a word by double-clicking • I can select all of the text by clicking and dragging • I can change the font To explain why I used the tools that I chose <ul style="list-style-type: none"> • I can say what tool I used to change the text • I can decide if my changes have improved my writing • I can use 'Undo' to remove changes • I can make changes to text on a computer • I can explain the differences between typing and writing • I can say why I prefer typing or writing | <ul style="list-style-type: none"> • I can describe objects using labels • I can match objects to groups • I can identify the label for a group of objects • I can count objects • I can group objects • I can count a group of objects • I can describe an object • I can describe a property of an object • I can find objects with similar properties • I can group similar objects • I can group objects in more than one way • I can count how many objects share a property • I can choose how to group objects • I can describe groups of objects • I can record how many objects are in a group • I can decide how to group objects to answer a question • I can compare groups of objects • I can record and share what I have found | <ul style="list-style-type: none"> • I know how to run a command on a device • I know how to match a command to an outcome • I know how to give directions to a floor robot • I know how to start a sequence from the same place • I know how to set and compare forwards and backwards and left and right turns • I know how to debug my program • I can use my knowledge to identify several possible solutions • I know how to plan two programs • I know how to use two different programs to get to the same place | <ul style="list-style-type: none"> • I can find the commands to move a sprite • I can use commands to move a sprite • I can compare different programming tools • I can use more than one block by joining them together • I can use a Start block in a program • I can run my program To identify the effect of changing a value <ul style="list-style-type: none"> • I can find blocks that have numbers • I can change the value • I can say what happens when I change a value • I can show that a project can include more than one sprite • I can delete a sprite • I can add blocks to each of my sprites • I can choose appropriate artwork for my project • I can decide how each sprite will move • I can create an algorithm for each sprite • I can use sprites that match my design • I can add programming blocks based on my algorithm • I can test the programs I have created |

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|----|--|--|---|---|---|---|
| Y2 | <ul style="list-style-type: none"> • I can identify examples and the uses of computers and know that a computer is a part of information technology • I know the purpose of information technology in the home • I know how to move and resize images • I know and can compare examples of information technology • I know how information technology is used in a shop • I know that information technology can be connected | <ul style="list-style-type: none"> • I know what devices can be used to take photographs • I know what to do to capture a digital photo • I understand and can explain the process of taking a good photograph • I know how to take photos in both landscape and portrait format • I understand why a photo looks better in portrait or landscape format • I know and can identify what is wrong with a photograph • I know how to improve a photograph by retaking it • I understand the effect that light can have on a photo • I know how to experiment with different light sources • I know why a picture may be unclear • I know how to use tools to change an image • I know that photos can be changed • I understand how to identify which photos are real and which have been changed | <ul style="list-style-type: none"> • I can identify simple differences in pieces of music • I can describe music using adjectives • I can say what I do and don't like about a piece of music • I can create a rhythm pattern • I can play an instrument following a rhythm pattern • I can explain that music is created and played by humans • I can connect images with sounds • I can use a computer to experiment with pitch • I can relate an idea to a piece of music • I can identify that music is a sequence of notes • I can explain how my music can be played in different ways • I can refine my musical pattern on a computer • I can create a rhythm which represents an animal I've chosen • I can create my animal's rhythm on a computer • I can add a sequence of notes to my rhythm • I can review my work • I can explain how I changed my work • I can listen to music and describe how it makes me feel | <ul style="list-style-type: none"> • I can represent a tally count as a total • I can compare totals in a tally chart • I can enter data onto a computer • I can use a computer to view data in a different format • I can use pictograms to answer simple questions about objects • I can organise data in a tally chart • I can use a tally chart to create a pictogram • I can explain what the pictogram shows • I can tally objects using a common attribute • I can create a pictogram to arrange objects by an attribute • I can answer 'more than'/'less than' and 'most/least' questions about an attribute • I can choose a suitable attribute to compare people • I can collect the data I need • I can create a pictogram and draw conclusions from it • I can use a computer program to present information in different ways • I can share what I have found out using a computer • I can give simple examples of why information should not be shared | <ul style="list-style-type: none"> • I know how to give clear and unambiguous instructions • I know how to create different algorithms for a range of sequences (using the same commands) • I know how to use an algorithm to program a sequence on a floor robot • I know that there can be a difference in outcomes between two sequences that consist of the same commands • I know the importance of comparing my prediction to the program outcome • I know that a 'Mat' can create different and more complex 'routes' for the floor robot • I know how to create an algorithm to meet a goal and programme sequence | <ul style="list-style-type: none"> • I can identify the start of a sequence • I can identify that a program needs to be started • I can show how to run my program • I can predict the outcome of a sequence of commands • I can match two sequences with the same outcome • I can change the outcome of a sequence of commands • I can work out the actions of a sprite in an algorithm • I can decide which blocks to use to meet the design • I can build the sequences of blocks I need • I can choose backgrounds for the design • I can choose characters for the design • I can create a program based on the new design • I can choose the images for my own design • I can create an algorithm • I can build sequences of blocks to match my design • I can compare my project to my design • I can improve my project by adding features • I can debug my program |
| Y3 | <ul style="list-style-type: none"> • I know that digital devices accept inputs and produce outputs • I know how to follow a process to achieve a goal • I know how to classify input and output devices • I know how to describe a simple process • I know how to use digital devices for different activities • I know the similarities and differences between using digital devices and non-digital tools • I know different connections | <ul style="list-style-type: none"> • I know that animation is a sequence of drawings or photographs • I know how an animation/flip book works • I know how to create an effective stop-frame animation • I understand if an animation that is achievable on screen • I know how to create a storyboard • I know how to use onion skinning to help me make small changes between frames • I understand the need to review a sequence of frames to check they work • I know and can explain ways to make my animation better | <ul style="list-style-type: none"> • 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 describe a simple process • I can design a digital device • I can explain how I use digital devices for different activities • I can recognise similarities between using digital devices and using non-digital tools • I can suggest differences between using digital devices and using non-digital tools • I can recognise different connections | <ul style="list-style-type: none"> • I can investigate questions with yes/no answers • 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 select an attribute to separate objects into groups • 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 group objects using my own yes/no questions • I can prove my branching database works • I can create yes/no questions using given attributes | <ul style="list-style-type: none"> • I know the objects in a Scratch project (sprites, backdrops) and that they have different attributes • I know that commands in Scratch are represented as blocks • I know that each sprite is controlled by the commands I choose • I know and can choose a word which describes an on-screen action for my design • I know how to create a program following a design. • I know how to start a program in different ways | <ul style="list-style-type: none"> • I can explain the relationship between an event and an action • I can choose which keys to use for actions and explain my choices • I can identify a way to improve a program • I can choose a character for my project • I can choose a suitable size for a character in a maze • I can program movement • I can use a programming extension • I can consider the real world when making design choices • I can choose blocks to set up my program • I can identify additional features (from a given set of blocks) |

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|----|--|---|---|--|---|---|
| | <ul style="list-style-type: none"> • I know how messages are passed through multiple connections • I know why we need a network switch • I know that a computer network is made up of a number of devices • I know how information can be passed between devices • I know and explain the role of a switch, server, and wireless access point in a network • I know and can identify how devices in a network are connected with one another • I know networked devices around me • I know the benefits of computer networks | <ul style="list-style-type: none"> • To evaluate the impact of adding other media to an animation • I know how to add other media to my animation and can explain why I did this. | <ul style="list-style-type: none"> • 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 • 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 | <ul style="list-style-type: none"> • I can explain that questions need to be ordered carefully to split objects into similarly sized groups • I can compare two branching database structures • I can select a theme and choose a variety of objects • I can create questions and apply them to a tree structure • I can use my branching database to answer questions • I can explain what a pictogram tells me • I can explain what a branching database tells me • I can compare two ways of presenting information | <ul style="list-style-type: none"> • I know how to create a sequence of connected commands • I know that the objects in my project will respond exactly to the code • I know how to combine and order sound commands • I know and can name the objects I will need for a project and the actions for each sprite • I know how to implement my algorithm as code | <ul style="list-style-type: none"> • I can choose suitable keys to turn on additional features • I can build more sequences of commands to make my design work • I can test a program against a given design • I can match a piece of code to an outcome • I can modify a program using a design • I can make design choices and justify them • I can implement my design • I can evaluate my project |
| Y4 | <ul style="list-style-type: none"> • 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 describe networked devices and how they connect • I can explain that the internet is used to provide many services • I can recognise that the World Wide Web contains websites and web pages • I can explain the types of media that can be shared on the WWW • I can describe where websites are stored when uploaded to the WWW • I can describe how to access websites on the WWW • I can explain what media can be found on websites • I can recognise that I can add content to the WWW • I can explain that internet services can be used to create content online • I can explain that websites and their content are created by people | <ul style="list-style-type: none"> • I know that sound can be digitally recorded • I know which digital devices can play audio, record sound, or do both • I understand important inputs and outputs of digital devices that can play audio, record sound, or do both • I know and can explain why I need to consider who owns audio and whether I have the right to reuse it • I know how to use a device to record audio and play back sound • I understand and can discuss what other people include when recording sound for a podcast • I know that a digital recording is stored as a file • I know how to save a digital recording as a file • I know that audio can be changed through editing sections of a recorded file • I know that different types of audio can be combined and played together • I know how to use editing tools to arrange sections of audio | <ul style="list-style-type: none"> • I can identify changes that we can make to an image • I can explore how images can be changed in real life • I can explain the effect that editing can have on an image • I can explain what has changed in an edited image • I can change the composition of an image by selecting parts of it • I can consider why someone might want to change the composition of an image • I can talk about changes made to images • I can choose effects to make my image fit a scenario • I can explain why my choices fit a scenario • I can identify how an image has been retouched • I can give examples of positive and negative effects that retouching can have on an image • I can choose appropriate tools to retouch an image • I can sort images into 'fake' or 'real' and explain my choices • I can combine parts of images to create new images • I can talk about fake images around me | <ul style="list-style-type: none"> • I can choose a data set to answer a given question • I can suggest questions that can be answered using a given data set • I can identify data that can be gathered over time • I can explain what data can be collected using sensors • I can use data from a sensor to answer a given question • I can identify that data from sensors can be recorded • 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 explain that there are different ways to view data • 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 | <ul style="list-style-type: none"> • I know how to program Logo by typing commands and can explain the effect of changing a value of a command • I know how to create a code snippet for a given purpose • I know how to use a template to draw what I want my program to do • I know how to write an algorithm to produce a given outcome and can test my algorithm in a text-based language • I know I can change the effect by changing the number of times a task is repeated • I know that a computer can repeatedly call a procedure • I know how to design a program that includes count-controlled loops • I know how to develop my program by debugging it | <ul style="list-style-type: none"> • I can list an everyday task as a set of instructions including repetition • I can predict the outcome of a snippet of code • I can modify a snippet of code to create 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 choose which action will be repeated for each object • I can explain what the outcome of the repeated action should be • I can evaluate the effectiveness of the repeated sequences used in my program • I can identify which parts of a loop can be changed • I can explain the effect of my changes • I can re-use existing code snippets on new sprites • I can evaluate the use of repetition in a project • I can select key parts of a given project to use in my own design |

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|-------------------|---|--|--|--|--|--|
| | <ul style="list-style-type: none"> • I can suggest who owns the content on websites • I can explain that there are rules to protect content • I can explain that not everything on the World Wide Web is true • I can explain why some information I find online may not be honest, accurate, or legal • I can explain why I need to think carefully before I share or reshare content | <ul style="list-style-type: none"> • I understand that digital recordings need to be exported to share them | <ul style="list-style-type: none"> • I can consider the effect of adding other elements to my work • I can compare the original image with my completed publication • I can evaluate the impact of my publication on others through feedback | <ul style="list-style-type: none"> • I can interpret data that has been collected using a data logger • I can draw conclusions from the data that I have collected • I can explain the benefits of using a data logger | <ul style="list-style-type: none"> • I can develop my own design explaining what my project will do • I can refine the algorithm in my design • I can build a program that follows my design • I can evaluate the steps I followed when building my project | |
| Y5/6 (Cycle A) | <ul style="list-style-type: none"> • 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 explain the benefits of a given computer system • I can recognise that data is transferred using agreed methods • I can explain that networked digital devices have unique addresses • I can explain that data is transferred over networks in packets • I can recognise that connected digital devices can allow us to access shared files stored online • I can send information over the internet in different ways • I can explain that the internet allows different media to be shared • To contribute to a shared project online • I can suggest strategies to ensure successful group work • I can make thoughtful suggestions on my group's work • I can compare working online with working offline • I can identify different ways of working together online | <ul style="list-style-type: none"> • I know that vector drawings are made using shapes • I understand how vector drawings are different from paper-based drawings • I know a vector drawing can be created by combining shapes and that each element is called an object • I know how to move, resize, and rotate objects I have duplicated • I know how to use the zoom tool to help me add detail to my drawings • I know and can explain how alignment grids and resize handles can be used to improve consistency • I know how to modify objects to create different effects • I know that vector drawings consist of layers • I understand and can identify which objects are in the front layer or in the back layer of a drawing • I know how to change the order of layers in a vector drawing • I know how to group to create a single object • I know how to reuse a group of objects to further develop my vector drawing | <ul style="list-style-type: none"> • I can explain that video is a visual media format • I can identify features of videos • I can compare features in different videos • I can identify and find features on a digital video recording device • I can experiment with different camera angles • I can make use of a microphone • I can suggest filming techniques for a given purpose • I can capture video using a range of filming techniques • I can review how effective my video is • I can outline the scenes of my video • I can decide which filming techniques I will use • I can create and save video content • I can store, retrieve, and export my recording to a computer • I can explain how to improve a video by reshooting and editing • I can select the correct tools to make edits to my video • I can make edits to my video and improve the final outcome • I can recognise that my choices when making a video will impact the quality of the final outcome • I can evaluate my video and share my opinions | <ul style="list-style-type: none"> • I can create multiple questions about the same field • I can explain how information can be recorded • I can order, sort, and group my data cards • I can navigate a flat-file database to compare different views of information • I can explain what a 'field' and a 'record' is in a database • I can choose which field to sort data by to answer a given question • I can explain how information can be grouped • I can group information to answer questions • I can combine grouping and sorting to answer more 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 explain the benefits of using a computer to create graphs | <ul style="list-style-type: none"> • I know how to build a simple circuit to connect a microcontroller to a computer (Crumble) • I know how to program a microcontroller to light an LED • I know how to use an infinite loop • I know how to connect more than one output device to a microcontroller • I know how to design sequences for given output devices • I know which output devices I control with a count-controlled loop • I know that a loop can stop when a condition is met, e.g. number of times • I know that a condition is something that can be either true or false (e.g. whether a value is more than 10, or whether a button has been pressed) • I know how to program a microcontroller to respond to an input • I know that a condition being met can start an action • I know how to use selection (an 'if... then...' statement) to direct the flow of a program • I know and can identify a condition to start an action (real world) • I know an algorithm to control lights and a motor for my project | <ul style="list-style-type: none"> • 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 which uses selection to produce different outcomes • 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 outline a given task • 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 test my program • I can share my program with others • I can identify ways the program could be improved • I can identify the setup code I need in my program • I can extend my program further |

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| | <ul style="list-style-type: none"> • I can recognise that working together on the internet can be public or private • I can explain how the internet enables effective collaboration | | | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • I know how to test and debug my project | |
| Y5/6 Cycle B | <ul style="list-style-type: none"> • 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 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 • I can explain that search results are ordered • 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 explain the different ways in which people communicate • 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 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 | <ul style="list-style-type: none"> • 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 • I can identify how graphical objects can be modified • I can resize a 3D object • I can change the colour of a 3D object • I can rotate a 3D object • I can position 3D objects in relation to each other • I can select and duplicate multiple 3D objects • I can identify the 3D shapes needed to create a model of a real-world object • 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 plan my 3D model • I can choose which 3D objects I need to construct my model • I can modify multiple 3D objects • I can decide how my model can be improved • I can modify my model to improve it • I can evaluate my model against a given criterion | <ul style="list-style-type: none"> • I can explore a website • I can discuss the different types of media used on websites • I know 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 • I can draw a web page layout that suits my purpose • I can say why I should use copyright-free images • I can find copyright-free images • I can describe what is meant by the term 'fair use' • 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 explain the implication of linking to content owned by others • I can create hyperlinks to link to other people's work • I can evaluate the user experience of a website | <ul style="list-style-type: none"> • I can collect data • I can suggest how to structure my data • I can enter data into a spreadsheet • I can explain what an item of data is • I can choose an appropriate format for a cell • 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 • I can apply a formula to multiple cells by duplicating it • I can use a spreadsheet to answer questions • I can explain why data should be organised • 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 a question • I can suggest when to use a table or chart | <ul style="list-style-type: none"> • I can identify examples of information that is variable • I can explain that the way a 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 choose the artwork for my project • I can create algorithms for my project • I can explain my design choices • I can create the artwork for my project • I can choose a name that identifies the role of a variable • I can test the code that I have written • I can identify ways that my game could be improved • I can use variables to extend my game • I can share my game with others | <ul style="list-style-type: none"> • 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 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 • 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 explain that if you read a variable, the value remains • I can explain the importance of the order of conditions in else, if statements • I can use an operand (e.g. <=>) in an if, then statement • I can modify a program to achieve a different outcome • 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 • 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 |