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| **Computing Progression of Skills** |
|  | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **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
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| **Control and Programming** | To know that robots and on-screen characters share a common language.  | Be able to use the 'repeat' and 'repeat until' command/block to program a ‘bot’ more efficiently.  | Understand what variables and procedures are in real life and be able to create them within a computer program to store and retrieve data.  | Understand what variables and procedures are in real life and be able to create them within a computer program to store and retrieve data.  |
| To use the repeat command and begin to use procedures to program more efficiently.  | Use a greater range of conditionals including whilst, if else, repeat and until. | Think logically that when x happens y is the result and show this using code, flowcharts, diagrams or explanations.  | Think logically that when x happens y is the result and show this using code, flowcharts, diagrams or explanations.  |
| To amend programs to produce similar outputs e.g. a smaller square.  | Use and change a pre-written procedure.  | Use “say” commands to give information.  | Use “say” commands to give information.  |
| To use conditional statements to enable the character to interact with other characters or sensors (if and when commands).  | Know that procedures can call on other procedures.  | Test and debug regularly.  | Test and debug regularly.  |
|  | To understand the importance of time within a program (e.g. using wait).  | Begin to predict, program, test and amend longer sequences of linked instructions to achieve an intended objective.  | Program and explain what happens when more than one variable changes.  | Program and explain what happens when more than one variable changes.  |
|  | To sequence a list of commands/blocks e.g. to produce a pre-drawn shape or make a robot follow a defined route with repeats and conditional statements.  | Understand that many real-world devices (such as traffic lights, washing machines) are controlled using computer programs.  | Use “and” “or” and “not” blocks to change responses and understand what they do.  | Use “and” “or” and “not” blocks to change responses and understand what they do.  |
|  |  | ​​Be able to make use of external sensors or inputs as part of a linear program e.g. on mouse click, when key pressed, when sound level is greater than etc. | Be able to program responses to inputs from external sensors such as Makey Makey or Picoboards. | Be able to program responses to inputs from external sensors such as Makey Makey or Picoboards. |
|  |  |  | Know when to use “repeat", "repeat until" and "forever if" loops to make programs shorter and more efficient and be able to use them (understanding the differences between them).  | Know when to use “repeat", "repeat until" and "forever if" loops to make programs shorter and more efficient and be able to use them (understanding the differences between them).  |
|  |  |  | Understand what 'events' are such as mouse clicks and broadcasts and use them efficiently within programs to start and stop scripts.  | Understand what 'events' are such as mouse clicks and broadcasts and use them efficiently within programs to start and stop scripts.  |
| **National Curriculum** | Pupils should be taught to:* 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
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| **Modelling,** **Simulations and  Data logging** | Enter data into a computer simulation, change data and observe changes in results.  | ​Understanding sensing devices can be used to monitor changes in environmental conditions and are present in a variety of real-life situations. ​ | To use modelling and simulation software to create realistic or fantasy representations of the real world. | To use modelling and simulation software to create realistic or fantasy representations of the real world. ​ |
| As part of a class investigation, experience the use of a data logger.  | Understand how to take snapshot data with a sensor.  | Choose and use appropriate data loggers to log continuous date for a given purpose. Export and analyse the data. | Choose and use appropriate data loggers to log continuous date for a given purpose. Export and analyse the data. |
|  | Use a data logger in an investigation and share the results. |  |  |
|  | Explore the effect of changing the variables in simulations and games and observe the results.  |  |  |
| **Databases and graphs** | Use information from a given source or from a data logger to generate bar charts to answer questions.  | Be able to collect data from internet research, digital surveys and digital devices including data loggers and tablet devices. ​​ | To organise data by designing fields and records in a database. ​​​  | To organise data by designing fields and records in a database. ​  |
| To choose, print and annotate appropriate graphs, to answer simple questions e.g. bar charts, or pie charts and interpret data.  | Be able to read and interpret bar and line graphs created through data logging, to draw conclusions to experiments. | To be able to Interpret results, using a range of searches and graphs, draw conclusions and analyse the effectiveness of the technology.  | To be able to Interpret results, using a range of searches and graphs, draw conclusions and analyse the effectiveness of the technology. |
| Answer questions by searching and sorting a database or spreadsheet.  | Be able to enter data into a graphing package and use it to create a range of graphs, and to interpret data. | To justify reasons for their choices and explain why other methods were not appropriate. | To justify reasons for their choices and explain why other methods were not appropriate. |
| To understand that ‘yes/no’ questions can be used to divide a set of objects into sub-sets and that a sequence of ‘yes/no’ questions can identify an object.  | Understand that computing can create graphs for different purposes; some are more appropriate and easier to read than others are. | To be able to design questions using keywords, to search a large pre-prepared database.  | To be able to design questions using keywords, to search a large pre-prepared database. |
| Create record cards, (analogue or digital) to store collected information.  | ​Know some real-life examples of branching databases, such as a cinema telephone booking system.  | To be able to search using 'greater and less than', 'equal to' and 'contains'. | To be able to search using 'greater and less than', 'equal to' and 'contains'. |
|  | Transfer records to a pre-prepared digital branching database, online database or spreadsheet.  | Understand that spreadsheets perform calculations.  | To be able to use graphs to provide supporting evidence for their conclusions.  | To be able to use graphs to provide supporting evidence for their conclusions.  |
|  | Enter data into a pre-prepared spreadsheet, change data and observe changes in results.  | Explore the effect of changing the cell values in spreadsheets and use them to make and test predictions.  | To be able to check for accuracy by checking data and looking at graphs.  | To be able to check for accuracy by checking data and looking at graphs.  |
|  |  |  | Add formula to spreadsheets, enter data and use filters to sort information | Add formula to spreadsheets, enter data and use filters to sort information. |
|  |  |  | Add data validation e.g. drop-down lists and conditional formatting to spreadsheets. | Add data validation e.g. drop-down lists and conditional formatting to spreadsheets. |
| **National Curriculum** | Pupils should be taught to:* use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.
* 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
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| **Research: Internet** | Develop key questions to search for specific information to answer a problem.  | Understand that content on the internet can be located efficiently but is not always relevant.  | To be able to search the internet for specific information using tools such as Google Advanced Search (Boolean searches).  | To be able to search the internet for specific information using tools such as Google Advanced Search (Boolean searches).  |
| Identify keywords to narrow searches.  | Use keywords for effective Internet searches.  | To be able to skim read and sift information found online.  | To be able to skim read and sift information found online.  |
| Begin to understand how a search engine locates information and that information is not always suitable.  | Select relevant information (pictures, text, sound and video) to use in other software. | To be able to check information for accuracy. | To be able to identify irrelevant, biased, implausible and inappropriate information. |
|  | Use a range of techniques to navigate a given site.  |  | To be able to identify irrelevant, biased, implausible and inappropriate information. | Use hyperlinks to trail an idea.  |
|  | Use given information to answer specific questions, and evaluate how appropriate a site is.  |  | Use hyperlinks to trail an idea. | To be able to check information for accuracy. ​​ |
|  | Access suitable sites selected by the teacher by following links; share suitable sites with others in the class.  |  | To be able to present findings to a specific audience.  | To be able to present findings to a specific audience. |
|  |  |  | To be able to use a range of search engines and select the most appropriate based on the tools they provide (e.g. Google or Bing). | To be able to use a range of search engines and select the most appropriate based on the tools they provide (e.g. Google or Bing). |
|  |  |  | Use information from internet to make notes and present in a form of their choosing, without using copied/ pasted text  | Use information from internet to make notes and present in a form of their choosing, without using copied/ pasted text. |
| **Online communication** | Experience of other forms of online learning, such as blogs, wikis, quizzes, surveys and video conferencing.  | Be able to upload work to a learning platform and know that it is important to consider the quality of work before posting to be seen by others. ​​  | To be able to upload informative and interesting content to a learning platform including various media. | To be able to upload informative and interesting content to a learning platform including various media. ​​ |
| Begin to upload some work independently to a learning platform.  | Use at least two online learning methods (e.g. online discussion, surveys, quizzes, blogs, wikis, shared online folders, WebQuests) through a learning platform in topic work.  | To be able to initiate and take part in collaborative learning using a variety of methods e.g. email, discussions, quizzes, surveys, blogs, wikis, web quests, video conferencing.  | To be able to initiate and take part in collaborative learning using a variety of methods e.g. email, discussions, quizzes, surveys, blogs, wikis, WebQuests, video conferencing  |
| Explain how to keep safe and the importance of being polite online.  | Use an online platform to give useful and polite feedback to others on their work. | To be able to talk about how to use the social media and internet search engines safely.  | To be able to talk about how to use the social media and internet search engines safely.  |
| To be able to save work in a way that means it is easy to remember and retrieve. | Understand that the school’s Learning Platform is a safe enclosed environment, but it is important to keep passwords and other personal information secure. | To be able to develop and understand rules for personal internet safety.   | To be able to develop and understand rules for personal internet safety. |
|  | Know that the internet has potential dangers and be able to explain how to keep yourself safe online. | To be able to develop and understand code of conduct for online collaboration, and explain what to do in cases of cyberbullying. | To be able to develop and understand code of conduct for online collaboration, and explain what to do in cases of cyberbullying. |
|  | To be able to save work to both personal and shared areas and know the benefits of each.  | To be able to save media from the internet to be uploaded to an online platform.  | To be able to save media from the internet to be uploaded to an online platform.  |
|  |  |  | To be aware that some media is copyrighted and cannot be used without permission.  | To be aware that some media is copyrighted and cannot be used without permission.  |
|  |  |  |  | To be able to save work as a web compatible format for uploading and podcasting; share online.  |
| **National Curriculum** | Pupils should be taught to:* 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
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| **Word Processing/ DTP/ Multimedia** | Independently select and import graphics and sounds from digital cameras and tablet devices, graphics packages, shared areas and the Internet and combine with text.  | Be able to evaluate a range of electronic multimedia, appropriate to task e.g. website, photostory, leaflet, and recognise key features of layout, design and presentation. ​ | Format text to indicate relative importance. Justify text where appropriate. Cut and paste between applications. Delete/insert and replace text to improve clarity and mood. Make corrections using a range of tools (e.g. spell check, find and replace) Develop confidence using both hands when typing.   | Format text to indicate relative importance. Justify text where appropriate. Cut and paste between applications. Delete/insert and replace text to improve clarity and mood. Make corrections using a range of tools (e.g. spell check, find and replace). |
| Organise and present information for a specific audience.  | With support, plan the structure and layout of document/ presentation.  | Select appropriate software for the task/audience.  | Select appropriate software for the task/audience.  |
| Recognise the difference and the advantages and disadvantages between electronic media and printed media.  | When typing, begin to hold two hands over different halves of the keyboard and use more than two fingers to enter text. | Independently, plan structure and layout of multimedia presentation.  | Develop confidence using both hands when typing. Independently, plan structure and layout of multimedia presentation.  |
| Use font sizes and effects appropriately and text boxes, columns, borders, WordArt; cut, copy and paste between applications and use delete, insert and replace: Use spell checker; begin to use more than two fingers to enter text.  |  | To be able to use a multimedia authoring program to organise, refine and present information for a specific audience. | To be able to evaluate and select suitable information and media from a range of electronic resources. |
|  |  | To be able to create a range of hyperlinks to produce a non-linear presentation. | To be able to use a multimedia authoring program to organise, refine and present information for a specific audience. |
|  |  | Through peer assessment and self-evaluation, make suitable improvements. | To be able to create a range of hyperlinks to produce a non-linear presentation. |
|  |  | To be able to evaluate and select suitable information and media from a range of electronic resources. | Through peer assessment and self-evaluation, make suitable improvements. |
| **Paint / Draw / Photo editing** **Animation / Video** | Use editing tools in a paint package for a specific purpose.  | ​Be able to import a photograph, explore the effects which can be created and use a range of visual effects such as filters, hues and painting over photographs to give different effects. ​  | ​To be able to select, copy and paste within and between photographs. ​ ​ | ​To be able to select, copy and paste within and between photographs. ​  |
| Build up images by selecting, copying and pasting within the image.  | Sequence and edit video footage and still images once transferred from a digital camera to computer.  | To be able to explore “airbrush” techniques to improve photographs, such as used in magazines with celebrities.  | To be able to explore “airbrush” techniques to improve photographs, such as used in magazines with celebrities.  |
| Sequence still images and video and use simple editing techniques to create a presentation.  | To add text, sound effects and other graphic effects to video.  | To be able to use different filming techniques and camera angles e.g. zoom, panning, wide shot etc to create different mood/perspective. | To be able to use different filming techniques and camera angles e.g. zoom, panning, wide shot etc to create different mood/perspective. |
|  | Be able to create a stop-frame animation using a camera with built-in stop motion software or an on-screen stop animation package.  | To be able to plan a video or animation by drawing a storyboard. | To be able to plan a video or animation by drawing a storyboard. |
|  | Evaluate and improve digital work with a view to audience and purpose. | Film, create, edit and refine media to ensure quality; present to an audience e.g. cutting and trimming, adjusting volume, pan and zoom effects.  | Film, create, edit and refine media to ensure quality; present to an audience e.g. cutting and trimming, adjusting volume, pan and zoom effects.  |
| **Sound / Podcast / Composition** | Use music software to organise and reorganise sounds.  | Be able to layer sounds using music composition software.  | To be able to select and edit sounds, text, movie clips and other effects to suit purpose and audience.  | ​To be able to select and edit sounds, text, movie clips and other effects to suit purpose and audience. ​ |
| Locate, record, save and retrieve sounds in multimedia software.  | Evaluate and re-record sound recordings where appropriate.  | To be able to collect sounds from a variety of sources (sound editing software, online, digital sound recorder). | To be able to collect sounds from a variety of sources (sound editing software, online, digital sound recorder). |
| Begin to layer sounds using music composition software.  |  | To be able to import sounds, (recorded vocals, samples (digital sound files) and recordings from real instruments) into sound editing software. | To be able to import sounds, (recorded vocals, samples (digital sound files) and recordings from real instruments) into sound editing software  |
|  |  | To be able to layer and edit sounds. | To be able to layer and edit sounds. |