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|  | **Year 1** | **Year 2** | **Year3** | **Year 4** | **Year 5** | **Year 6** |
| **Computer Science** | **Understand what**  **algorithms are; how they are implemented as programs on digital devices; and that programs execute**  **by following precise and**  **unambiguous instructions.**  *Children understand that*  *an algorithm is a set of*  *instructions used to solve*  *a problem or achieve an*  *objective. They know that*  *an algorithm written for a*  *computer is called a program.* | **Understand what**  **algorithms are; how they are implemented as programs on digital devices; and that programs execute**  **by following precise and**  **unambiguous instructions.**  *Children can explain that*  *an algorithm is a set of*  *instructions to complete*  *a task. When* **designing**  **simple programs***, children*  *show an awareness of the*  *need to be precise with their algorithms so that they can be successfully converted into code.* | **Design, write and**  **debug programs that**  **accomplish specific**  **goals, including**  **controlling or simulating**  **physical systems;**  **solve problems by**  **decomposing them into**  **smaller parts.**  *Children can turn a*  *simple real-life situation*  *into an algorithm for a program by deconstructing it into*  *manageable parts.*  *Their design shows that*  *they are thinking of the*  *desired task and how*  *this translates into code.*  *Children can identify*  *an error within their*  *program that prevents*  *it following the desired*  *algorithm and then fix it.* | **Design, write and**  **debug programs that**  **accomplish specific**  **goals, including**  **controlling or simulating**  **physical systems;**  **solve problems by**  **decomposing them into**  **smaller parts.**  *When turning a real-life*  *situation into an*  *algorithm, the children’s*  *design shows that they are thinking of the required task and how to accomplish this in code using coding structures for selection and repetition. Children make more intuitive attempts to debug their own programs.* | **Design, write and**  **debug programs that**  **accomplish specific**  **goals, including**  **controlling or simulating**  **physical systems;**  **solve problems by**  **decomposing them into**  **smaller parts.**  *Children may attempt*  *to turn more complex*  *real-life situations into*  *algorithms for a program*  *by deconstructing it into*  *manageable parts.*  *Children are able to*  *test and debug their*  *programs as they go*  *and can use logical*  *methods to identify*  *the approximate cause*  *of any bug but may*  *need some support*  *identifying the specific*  *line of* **code***.* | **Design, write and**  **debug programs that**  **accomplish specific**  **goals, including**  **controlling or simulating**  **physical systems;**  **solve problems by**  **decomposing them into**  **smaller parts.**  *Children are able to*  *turn a more complex*  *programming task*  *into an algorithm by*  *identifying the important*  *aspects of the task*  *(abstraction) and then*  *decomposing them in a*  *logical way using their*  *knowledge of possible*  *coding structures and*  *applying skills from*  *previous programs.*  *Children test and debug*  *their program as they go*  *and use logical methods*  *to identify the cause of*  *bugs, demonstrating a*  *systematic approach*  *to try to identify a*  *particular line of code*  *causing a* **problem***.* |
| **Create and debug simple**  **programs.**  *Children can work out what is wrong with a simple algorithm when the steps are out of order, e.g.* **The****Wrong Sandwich** *in Purple Mash and can write their own simple algorithm, e.g.* **Colouring in a Bird****activity.** *Children know that an unexpected outcome is due to the code they have created and can make logical*  *attempts to fix the code, e.g.* **Bubbles activity in 2Code***.* | **Create and debug simple**  **programs.**  *Children can create a simple program that achieves a specific purpose. They can also identify and correct some errors, e.g.* **Debug****Challenges: Chimp***.*  *Children’s program designs display a growing awareness of the need for logical, programmable steps.* | **Use sequence, selection**  **and repetition in**  **programs; work with**  **variables and various**  **forms of input and**  **output.**  *Children demonstrate*  *the ability to design*  *and code a program*  *that follows a simple*  *sequence. They experiment with timers*  *to achieve repetition*  *effects in their*  *programs. Children are*  *beginning to understand*  *the difference in the*  *effect of using a timer*  *command rather than a*  *repeat command when*  *creating repetition*  *effects. Children*  *understand how*  *variables can be used to*  *store information while a*  *program is executing.* | **Use sequence, selection**  **and repetition in**  **programs; work with**  **variables and various**  **forms of input and**  **output.**  *Children’s use of timers*  *to achieve repetition*  *effects are becoming*  *more logical and are*  *integrated into their*  *program designs.*  *They understand ‘if*  *statements’ for selection*  *and attempt to combine*  *these with other coding*  *structures including*  *variables to achieve the*  *effects that they design*  *in their programs. As*  *well as understanding*  *how variables can be*  *used to store information*  *while a program is*  *executing, they are able*  *to use and manipulate*  *the value of variables.*  *Children can make use of*  *user inputs and outputs*  *such as ‘print to screen’.*  *e.g.* **2Code.** | **Use sequence, selection**  **and repetition in**  **programs; work with**  **variables and various**  **forms of input and**  **output.**  *Children can translate*  *algorithms that include*  *sequence, selection and*  *repetition into code with*  *increasing ease and*  *their own designs show*  *that they are thinking of*  *how to accomplish the*  *set task in code utilising*  *such structures. They*  *are combining sequence,*  *selection and repetition*  *with other coding*  *structures to achieve*  *their* **algorithm design***.* | **Use sequence, selection**  **and repetition in**  **programs; work with**  **variables and various**  **forms of input and**  **output.**  *Children translate*  *algorithms that include*  *sequence, selection and*  *repetition into code and*  *their own designs show*  *that they are thinking*  *of how to accomplish*  *the set task in code*  *utilising such structures,*  *including nesting*  *structures within*  *each other. Coding*  *displays an improving*  *understanding of*  *variables in coding,*  *outputs such as sound*  *and movement, inputs*  *from the user of the*  *program such as button*  *clicks and the* **value of**  **functions***.* |

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|  | **Use logical reasoning to**  **predict the behaviour of**  **simple programs.**  *When looking at a program,*  *children can read code one line at a time and make good attempts to envision the bigger picture of the*  *overall effect of the program. Children can, for example, interpret where the turtle in* **2Go challenges** *will end up*  *at the end of the program.* | **Use logical reasoning to**  **predict the behaviour of**  **simple programs.**  *Children can identify the*  *parts of a program that*  *respond to specific events*  *and initiate specific actions. For example, they can write a cause and effect sentence of what will happen in a program.* | **Use logical reasoning**  **to explain how some**  **simple algorithms**  **work and to detect**  **and correct errors**  **in algorithms and**  **programs.**  *Children’s designs for*  *their programs show*  *that they are thinking*  *of the structure of a*  *program in logical,*  *achievable steps*  *and absorbing some*  *new knowledge of*  *coding structures. For*  *example, ‘if’ statements,*  *repetition and variables.*  *They make good*  *attempts to ‘step*  *through’ more complex*  *code in order to identify*  *errors in algorithms and*  *can correct this. e.g.*  *traffic light algorithm*  *in* **2Code.** *In programs*  *such as Logo, they can*  *‘read’ programs with*  *several steps and predict*  *the outcome accurately.*  **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.**  *Children can list a range*  *of ways that the internet*  *can be used to provide*  *different methods*  *of communication.*  *They can use some*  *of these methods of*  *communication, e.g.*  *being able to open,*  *respond to and attach*  *files to emails using*  **2Email***. They can*  *describe appropriate*  *email conventions when*  *communicating in this*  *way.* | **Use logical reasoning**  **to explain how some**  **simple algorithms**  **work and to detect**  **and correct errors**  **in algorithms and**  **programs.**  *Children’s designs for*  *their programs show*  *that they are thinking*  *of the structure of a*  *program in logical,*  *achievable steps*  *and absorbing some*  *new knowledge of*  *coding structures. For*  *example, ‘if’ statements,*  *repetition and variables.*  *They can trace code*  *and use step-through*  *methods to identify*  *errors in code and make*  *logical attempts to*  *correct this. e.g. traffic*  *light algorithm in* **2Code***.*  *In programs such as*  *Logo, they can ‘read’*  *programs with several*  *steps and predict the*  *outcome accurately.*  **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.**  Children recognise  the main component  parts of hardware  which allow computers  to join and form a  *network. Their ability to*  *understand the online*  *safety implications*  *associated with the*  *ways the internet can*  *be used to provide*  *different methods*  *of communication is*  *improving.* | **Use logical reasoning**  **to explain how some**  **simple algorithms**  **work and to detect**  **and correct errors**  **in algorithms and**  **programs.**  *When children code,*  *they are beginning to*  *think about their code*  *structure in terms of*  *the ability to debug and*  *interpret the code later,*  *e.g. the use of tabs to*  *organise code and the*  **naming of variables***.*  **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.**  *Children understand*  *the value of computer*  *networks but are*  *also aware of the*  *main dangers. They*  *recognise what personal*  *information is and can*  *explain how this can*  *be kept safe. Children*  *can select the most*  *appropriate form of*  *online communications*  *contingent on audience*  *and digital content, e.g.*  **2Blog**, **2Email**, **Display**  **Boards***.* | **Use logical reasoning**  **to explain how some**  **simple algorithms**  **work and to detect**  **and correct errors**  **in algorithms and**  **programs.**  *Children are able to*  *interpret a program in*  *parts and can make*  *logical attempts to put*  *the separate parts of*  *a complex algorithm*  *together to explain the*  **program as a whole***.*  **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.**  *Children understand*  *and can explain in some*  *depth the difference*  *between the internet*  *and the World Wide*  *Web. Children know*  *what a WAN and LAN*  *are and can describe*  *how they access the*  **internet in school***.* |
| **Information Technology** | **Use technology purposefully**  **to create, organise, store,**  **manipulate and retrieve**  **digital content.**  *Children are able to sort,*  *collate, edit and store simple digital content e.g. children can name, save and retrieve their work and follow simple*  *instructions to access online resources, use Purple Mash* **2Quiz** *example (sorting*  *shapes),* **2Code** *design mode (manipulating backgrounds)*  *or using pictogram software such as* **2Count.** | **Use technology purposefully**  **to create, organise, store,**  **manipulate and retrieve**  **digital content.**  *Children demonstrate an*  *ability to organise data using,*  *for example, a database such as* **2Investigate** *and can retrieve specific data for conducting simple searches. Children are able to edit more complex digital data such as music compositions within* **2Sequence***. Children*  *are confident when creating, naming, saving and retrieving content. Children use a range of media in their digital*  *content including photos, text and sound.* | **Use search technologies**  **effectively, appreciate**  **how results are**  **selected and ranked,**  **and be discerning**  **in evaluating digital**  **content.**  *Children can carry out*  *simple searches to*  *retrieve digital content.*  *They understand*  *that to do this, they*  *are connecting to the*  *internet and using a*  *search engine such as*  *Purple Mash search or*  *internet-wide search*  *engines.* | **Use search technologies**  **effectively, appreciate**  **how results are**  **selected and ranked,**  **and be discerning**  **in evaluating digital**  **content.**  *Children understand*  *the function, features*  *and layout of a search*  *engine. They can*  *appraise selected*  *webpages for credibility*  *and information at a*  *basic level.* | **Use search technologies**  **effectively, appreciate**  **how results are**  **selected and ranked,**  **and be discerning**  **in evaluating digital**  **content.**  *Children search with*  *greater complexity for*  *digital content when*  *using a search engine.*  *They are able to explain*  *in some detail how*  *credible a webpage is*  *and the information it*  *contains.* | **Use search technologies**  **effectively, appreciate**  **how results are**  **selected and ranked,**  **and be discerning**  **in evaluating digital**  **content.**  *Children readily apply*  *filters when searching*  *for digital content. They*  *are able to explain in*  *detail how credible a*  *webpage is and the*  *information it contains.*  *They compare a range*  *of digital content*  *sources and are able*  *to rate them in terms*  *of content quality and*  *accuracy. Children use*  *critical thinking skills in*  *everyday use of online*  *communication.* |
|  |  | **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.**  *Children can collect,*  *analyse, evaluate*  *and present data and*  *information using a*  *selection of software,*  *e.g. using a branching*  *database* **(2Question),**  *using software such as*  **2Graph***. Children can*  *consider what software*  *is most appropriate*  *for a given task. They*  *can create purposeful*  *content to attach to*  *emails, e.g.* **2Respond***.* | **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.**  *Children are able to*  *make improvements*  *to digital solutions*  *based on feedback.*  *Children make informed*  *software choices when*  *presenting information*  *and data. They create*  *linked content using*  *a range of software*  *such as* **2Connect** *and*  **2Publish+***. Children*  *share digital content*  *within their community,*  *i.e. using Virtual* **Display**  **Boards***.* | **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.**  *Children are able to*  *make appropriate*  *improvements to*  *digital solutions based*  *on feedback received*  *and can confidently*  *comment on the success*  *of the solution. e.g.*  *creating their own*  *program to meet a*  *design brief using*  **2Code***. They objectively*  *review solutions from*  *others. Children are able*  *to collaboratively create*  *content and solutions*  *using digital features*  *within software such*  *as collaborative mode.*  *They are able to use*  *several ways of sharing*  *digital content, i.e.*  **2Blog***,* **Display Boards**  *and* **2Email***.* | **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.**  *Children make clear*  *connections to the*  *audience when*  *designing and creating*  *digital content. The*  *children design and*  *create their own blogs*  *to become a content*  *creator on the internet,*  *e.g.* **2Blog***. They are*  *able to use criteria to*  *evaluate the quality of*  *digital solutions and*  *are able to identify*  *improvements, making*  *some refinements.* |
| **Digital Literacy** | **Recognise common uses**  **of information technology**  **beyond school.**  *Children understand what*  *is meant by technology and*  *can identify a variety of*  *examples both in and out*  *of school. They can make a distinction between objects that use modern technology*  *and those that do not e.g. a microwave vs. a chair.* | **Recognise common uses**  **of information technology**  **beyond school.**  *Children can effectively*  *retrieve relevant, purposeful digital content using a search engine. They can apply their learning of effective searching beyond*  *the classroom. They can*  *share this knowledge, e.g.*  **2Publish example template***.Children make links between*  *technology they see around*  *them, coding and multimedia*  *work they do in school e.g.* **animations***,*  **interactive code**  *and* **programs.** |  |  |  |  |
| **Use technology safely**  **and respectfully, keeping**  **personal information**  **private; identify where to**  **go for help and support**  **when they have concerns**  **about content or contact on the internet or other online technologies.**  *Children understand the*  *importance of keeping*  *information, such as their*  *usernames and passwords, private and actively demonstrate this in lessons. Children take ownership of their work and save this in their own private space such as their My Work folder on*  *Purple Mash.* | **Use technology safely**  **and respectfully, keeping**  **personal information**  **private; identify where to**  **go for help and support**  **when they have concerns**  **about content or contact on the internet or other online technologies.**  *Children know the*  *implications of inappropriate*  *online searches. Children*  *begin to understand*  *how things are shared*  *electronically such as*  *posting work to the Purple*  *Mash display board. They*  *develop an understanding of using email safely by using* **2Respond** *activities on Purple Mash and know ways of reporting inappropriate*  *behaviours and content to a trusted adult.* | **Use technology**  **safely, respectfully**  **and responsibly;**  **recognise acceptable/**  **unacceptable**  **behaviour; identify a**  **range of ways to report**  **concern about content**  **and contact.**  *Children demonstrate*  *the importance of having*  *a secure password*  *and not sharing this*  *with anyone else.*  *Furthermore, children*  *can explain the negative*  *implications of failure*  *to keep passwords*  *safe and secure.*  *They understand the*  *importance of staying*  *safe and the importance*  *of their conduct*  *when using familiar*  *communication tools*  *such as* **2Email** *in Purple*  *Mash. They know more*  *than one way to report*  *unacceptable content*  *and contact.* | **Use technology**  **safely, respectfully**  **and responsibly;**  **recognise acceptable/**  **unacceptable**  **behaviour; identify a**  **range of ways to report**  **concern about content**  **and contact.**  Children can explore  key concepts relating  to online safety using  concept mapping  such as **2Connect**.  They can help others  to understand the  importance of online  safety. Children know  *a range of ways of*  *reporting inappropriate*  *content and contact.* | **Use technology**  **safely, respectfully**  **and responsibly;**  **recognise acceptable/**  **unacceptable**  **behaviour; identify a**  **range of ways to report**  **concern about content**  **and contact.**  *Children have a secure*  *knowledge of common*  *online safety rules*  *and can apply this by*  *demonstrating the*  *safe and respectful*  *use of a few different*  *technologies and*  **online services***.*  *Children implicitly relate*  *appropriate online*  *behaviour to their right*  *to personal privacy and*  *mental wellbeing of*  *themselves and others.* | **Use technology**  **safely, respectfully**  **and responsibly;**  **recognise acceptable/**  **unacceptable**  **behaviour; identify a**  **range of ways to report**  **concern about content**  **and contact.**  *Children demonstrate*  *the safe and respectful*  *use of a range of*  *different technologies*  *and online services.*  *They identify more*  *discreet inappropriate*  *behaviours through*  *developing critical*  *thinking, e.g.* **2Respond**  *activities. They*  *recognise the value in*  *preserving their privacy*  *when online for their*  *own and other people’s*  *safety.* |