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| Computing | **Pedagogical Knowledge**  **How do children learn Computing?**  • Children are natural problem solvers and get excited by building and creating. They need meaningful contextualized opportunities to explore, create and manipulate a range of digital artefacts.  **Examples include:**  • Publishing reports, stories and other material they have created  • Making and remixing multimedia objects  • Creating games, puzzles, greetings card etc.  • Controlling physical objects using digital tools  • Unplugged activities to explore computational thinking  **Computing Pedagogical Knowledge**  • Teaching children to be digitally literate needs to go beyond online-safety and cyberbullying. Critical reading of material on the internet is an important skill. Children may believe that there is an authority such a teacher curating search results. It is important that teaching disrupts these misconceptions to allow children to develop views which are more rational.  • The tinkering stage of learning is of particular importance as identifying problems and solving them mirrors the real-world practices of computer programmers.  • Unplugged activities are lessons in computational thinking that do not involve digital technology. They provide important opportunities for children to problems solve using computer science approaches without having to learn how to use a new tool. | | | | | | | | | |
| Y1&2  Cycle A | **Autumn**  **Childhood** | | | **Spring**  **Bright Lights, Big City** | | | **Summer**  **School Days** | | | |
| Unit | COMPUTING SYSTEMS & NETWORKS Digital Literacy IT Around Us  *(Digital Literacy)* | CREATING MEDIA Digital photography  *(Information Technology)* | | CREATING MEDIA Making music  *(Information Technology)* | DATA & INFORMATION Pictograms *(Information Technology)* | | PROGRAMMING Robot algorithms *(Computer Science)* | | | PROGRAMMING Introduction to quizzes *(Computer Science)* |
| Significant person | Steve Jobs  Apple and Pixar |  | |  |  | | Grace Hopper  Computer Scientist | | |  |
| Local Heritage |  |  | |  |  | |  | | |  |
| Y1 | Recognise the uses and features of information technology.  Identify information technology in the home.  Identify information technology beyond school. | Know what devices can be used to take photographs.  Use a digital device to take a photograph.  Describe what makes a good photograph. | | Say how music can make us feel.  Identify that there are patterns in music.  Describe how music can be used in different ways. | Recognise that we can count and compare objects using tally charts.    Recognise that objects can be represented as pictures.  Create a pictogram using given software. | | Describe a series of instructions as a sequence.    Explain what happens when we change the order of instructions.  Use logical reasoning to predict the outcome of a program (series of commands). | | | Explain that a sequence of commands has a start.  Explain that a sequence of commands has an outcome.  Create a program using a given design. |
| Y2 | Explain how information technology benefits us.  Show how to use information technology safely.  Recognise that choices are made when using information technology | Decide how photographs can be improved.  Use tools to change an image.  Recognise that images can be changed. | | Show how music is made from a series of notes.  Create music for a purpose.  Review and refine our computer work. | Select objects by attribute and make comparisons.  Recognise that people can be described by attributes.  Explain that we can present information using a computer. | | Explain that programming projects can have code and artwork.  Design an algorithm.    Create and debug a program that I have written. | | | Change a given design.  Create a program using own design.    Decide how a project can be improved. |
| Y3&4  Cycle A | **Autumn**  **Through The Ages** | | | **Spring**  **Rocks, Relics and Rumbles** | | | **Summer**  **Emperors and Empires** | | | |
| Unit | COMPUTING SYSTEMS & NETWORKS  The internet  *(Digital Literacy)* | CREATING MEDIA  Audio editing  *(Information Technology)* | | CREATING MEDIA  Photo editing  *(Information Technology)* | DATA & INFORMATION  Data logging  *(Information Technology)* | | PROGRAMMING  Repetition in shapes  *(Computer Science)* | | | PROGRAMMING  Repetition in games  *(Computer Science)* |
| Significant person | Tim Berners – Lee  Invented www |  | |  |  | |  | | |  |
| Local Heritage |  | Talk by Tom Chapman on use of technology with music | |  |  | |  | | |  |
| Y3 | Describe how networks physically connect to other networks.  Recognise how networked devices make up the internet.  Outline how websites can be shared via the World Wide Web.  Describe how content can be added and accessed on the World Wide Web.  Recognise how the content of the WWW is created by people.  Evaluate the consequences of unreliable content. | Identify that sound can be digitally recorded.  Use a digital device to record sound.  Explain that a digital recording is stored as a file. | | Explain that digital images can be changed.  Change the composition of an image.  Describe how images can be changed for different uses. | Explain that data gathered over time can be used to answer questions.  Use a digital device to collect data automatically.  Explain that a data logger collects ‘data points’ from sensors over time. | | Identify that accuracy in programming is important.  Create a program in a text-based language.  Explain what ‘repeat’ means. | | | Develop the use of count-controlled loops in a different programming environment.  Explain that in programming there are infinite loops and count controlled loops.  Develop a design which includes two or more loops which run at the same time. |
| Y4 | Describe how networks physically connect to other networks.  Recognise how networked devices make up the internet.  Outline how websites can be shared via the World Wide Web.  Describe how content can be added and accessed on the World Wide Web.  Recognise how the content of the WWW is created by people.  Evaluate the consequences of unreliable content. | Explain that audio can be changed through editing.  Show that different types of audio can be combined and played together.  Evaluate editing choices made. | | Make good choices when selecting different tools.  Recognise that not all images are real.  Evaluate how changes can improve an image. | Use data collected over a long duration to find information.  Identify the data needed to answer questions.  Use collected data to answer questions. | | Modify a count-controlled loop to produce a given outcome.  Decompose a program into parts.  Create a program that uses count-controlled loops to produce a given outcome. | | | Modify an infinite loop in a given program.  Design a project that includes repetition.  Create a project that includes repetition. |
| Y5&6  Cycle A | **Autumn**  **Dynamic Dynasties** | | | **Spring**  **Sow Grow and Farm** | | | **Summer**  **Groundbreaking Greeks** | | | |
| Unit | COMPUTING SYSTEMS & NETWORKS  Communication  *(Digital Literacy)* | | CREATING MEDIA  3D modelling  *(Information Technology)* | CREATING MEDIA  Web page creation  *(Information Technology)* | | DATA & INFORMATION  Spreadsheets  *(Information Technology)* | PROGRAMMING  Selection in physical computing  *(Computer Science)* | | PROGRAMMING  Sensing  *(Computer Science)* | |
| Significant person |  | |  | Mark Zuckerberg Facebook Creator | |  |  |  | | |
| Local Heritage |  | |  | Talk by web designer from ‘mmediadesign’ | | Talk by Prince Regent Street Data Analyst | Talk by Robotic Engineer |  | | |
| Y5 | Identify how to use a search engine.  Describe how search engines select results.  Explain how search results are ranked. | | Use a computer to create and manipulate three-dimensional (3D) digital objects.  Compare working digitally with 2D and 3D graphics.  Construct a digital 3D model of a physical object. | Review an existing website and consider its structure.  Plan the features of a web page.  Consider the ownership and use of images (copyright). | | Identify questions which can be answered using data.  Explain that objects can be described using data.  Explain that formula can be used to produce calculated data. | Control a simple circuit connected to a computer.  Write a program that includes count-controlled loops.  Explain that a loop can stop when a condition is met, eg number of times. | Create a program to run on a controllable device.  Explain that selection can control the flow of a program.  Update a variable with a user input. | | |
| Y6 | Recognise why the order of results is important, and to whom.  Recognise how we communicate using technology.  Evaluate different methods of online communication. | | Identify that physical objects can be broken down into a collection of 3D shapes.  Design a digital model by combining 3D objects.  Develop and improve a digital 3D model. | Recognise the need to preview pages.  Outline the need for a navigation path.  Recognise the implications of linking to content owned by other people. | | Apply formulas to data, including duplicating.  Create a spreadsheet to plan an event.  Choose suitable ways to present data. | Conclude that a loop can be used to repeatedly check whether a condition has been met.  Design a physical project that includes selection.  Create a controllable system that includes selection. | Use an conditional statement to compare a variable to a value.  Design a project that uses inputs and outputs on a controllable device.  Develop a program to use inputs and outputs on a controllable device. | | |