**Uplands Junior L.E.A.D Academy Subject Overview (LTP)**

**Computing**

**Intent:** We want all our children to become digitally literate so that they can be active participants in the digital world. Through our computer science lessons, children learn the principles of information and computation, how digital systems work and how to put this knowledge to use through programming. Pupils then apply this knowledge to use information technology to create programs and systems.

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|  | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Skills** – In Computing the children will learn a range of skills across each of the topics. | | | | |
| Autumn 1 (Information Technology)  **Computing systems and networks** | **Unit:** **Connecting computers** Identifying that digital devices have inputs, processes, and outputs, and how devices can be connected to make networks.  **Key Vocabulary:**  Input, process, output, network, network components, server, Wireless Access Point, network switch  **Knowledge:**  -To explain how digital devices function  - To identify input and output devices  - To recognise how digital devices can change the way that we work  - To explain how a computer network can be used to share information  - To explore how digital devices can be connected  - To recognise the physical components of a network  **Prior Knowledge:**  Knowledge and understanding of technology by focusing on digital and non-digital devices | **Unit: The internet**  Recognising the internet as a network of networks including the WWW, and why we should evaluate online content.  **Key Vocabulary:**  Router, World Wide Web, online content  **Knowledge:**  - To describe how networks physically connect to other networks  - To recognise how networked devices make up the internet  - To outline how websites can be shared via the World Wide Web (WWW)  - To describe how content can be added and accessed on the World Wide Web (WWW)  - To recognise how the content of the WWW is created by people  -To evaluate the consequences of unreliable content  **Prior Knowledge:**  Knowledge and understanding of networks in Year 3 | **Unit: Systems and searching**  Recognising IT systems around us and how they allow us to search the internet  **Key Vocabulary:**  digital system, physical connection, electronic connection  computer system, search engine rank, web search, web crawler, search engine index, content creator  **Knowledge:**  **-** To explain that computers can be connected together to form systems  **-** To recognise the role of computer systems in our lives  **-** To identify how to use a search engine  **-** To describe how search engines select results  **-** To explain how search results are ranked  **-** To recognise why the order of results is important, and to whom  **Prior Knowledge:**  knowledge and understanding of computing systems | **Unit: Communication and collaboration**  Identifying and exploring how data is transferred and information is shared online.  **Key Vocabulary:**  Web address, IP address, Domain Name Server (DNS), data packet, header, data payload, copyright  Internet communication, internet collaboration, security, privacy  **Knowledge:**  **-** To explain the importance of internet addresses  **-** To recognise how data is transferred across the internet  **-** To explain how sharing information online can help people to work together  **-** To evaluate different ways of working together online  **-** To recognise how we communicate using technology  **-** To evaluate different methods of online communication  **Prior Knowledge:**  Knowledge and understanding of computing systems and online collaborative working. |
| Autumn 2 (Computer Science)  **Programming** | **Unit: Sequencing sounds**  Creating sequences in a block-based programming language to make music.  **Key Vocabulary:**  Scratch, backdrop, code, motion block, event block, motion, stage  **Knowledge:**  - To explore a new programming environment  - To identify that commands have an outcome  - To explain that a program has a start  - To recognise that a sequence of commands can have an order  - To change the appearance of my project  - To create a project from a task description  **Prior Knowledge:**  Learners will have some prior experience of programming | **Unit: Repetition in games**  Using a block-based programming language to explore count-controlled and infinite loops when creating a game  **Key Vocabulary:**  Count-controlled loop, loop, snippet of code, infinite loop, event block, code blocks  **Knowledge:**  **-** To identify that accuracy in programming is important  **-** To create a program in a text-based language  **-** To explain what ‘repeat’ means  **-** To modify a count-controlled loop to produce a given outcome  **-** To decompose a task into small steps  **-** To create a program that uses count-controlled loops to produce a given outcome  **Prior Knowledge:**  sequence of commands in a program to using count-controlled loops | **Unit: Selection in quizzes**  Exploring selection in programming to design and code an interactive quiz.  **Key Vocabulary:**  Conditions, ‘if...then...else’ structure, program flow, branching structure, setup code  **Knowledge:**  **-** To explain how selection is used in computer programs  **-** To relate that a conditional statement connects a condition to an outcome  **-** To explain how selection directs the flow of a program  **-** To design a program that uses selection  **-** To create a program that uses selection  **-** To evaluate my program  **Prior Knowledge:**  Experience of programming using block-based construction (e.g. Scratch), understand the concepts of ‘sequence’ and ‘repetition’, and have some experience of using ‘selection’. | **Unit: Variables in games**  Exploring variables when designing and coding a game.  **Key Vocabulary:**  Variable, program variable, value  **Knowledge:**  **-** To define a ‘variable’ as something that is changeable  **-** To explain why a variable is used in a program  **-** To choose how to improve a game by using variables  **-** To design a project that builds on a given example  **-** To use my design to create a project  **-** To evaluate my project  **Prior Knowledge:**  Experience of programming in Scratch. Specifically, familiar with the programming constructs of sequence, repetition, and selection. |
| Spring 1  Creating media | **Unit: Desktop publishing**  Creating documents by modifying text, images, and page layouts for a specified purpose.  **Key Vocabulary:**  Publisher, text, image, desktop publishing, return, shift, template, page orientation, place holder, layout  **Knowledge:**  - To recognise how text and images convey information  - To recognise that text and layout can be edited  - To choose appropriate page settings  - To add content to a desktop publishing publication  - To consider how different layouts can suit different purposes  - To consider the benefits of desktop publishing  **Prior Knowledge:**  Knowledge and understanding of using digital devices to combine text and images | **Unit: Stop-frame animation**  Capturing and editing digital still images to produce a stop-frame animation that tells a story  **Key Vocabulary:**  Animation, frame, stop-frame animation, story board, sequence of frames, onion skinning  **Knowledge:**  **-** To explain that animation is a sequence of drawings or photographs  **-** To relate animated movement with a sequence of images  **-** To plan an animation  - To identify the need to work consistently and carefully  **-** To review and improve an animation  **-** To evaluate the impact of adding other media to an animation  **Prior Knowledge:**  knowledge and understanding of using digital devices to create media | **Unit: Vector drawing**  Creating images in a drawing program by using layers and groups of objects.  **Key Vocabulary:**  Vector, vector drawing, alignment grid, resize handle, zoom tool, layers, duplicate (images), group and ungroup (images)  **Knowledge:**  **-** To identify that drawing tools can be used to produce different outcomes  **-** To create a vector drawing by combining shapes  **-** To use tools to achieve a desired effect  **-** To recognise that vector drawings consist of layers  **-** To group objects to make them easier to work with  **-** To apply what I have learned about vector drawings  **Prior Knowledge:**  Knowledge and understanding of digital painting and has some links to the Year 3 ‘Creating media – Desktop publishing’ unit, in which learners used digital images | **Unit: Video production**  Planning, capturing, and editing video to produce a short film.  **Key Vocabulary:**  Video, audio, recording, storyboard, script, soundtrack, dialogue, capture, zoom, storage, digital, tape, AV (audiovisual), videographer, video techniques, zoom, pan, tilt, angle, content, camera, colour, export, trim/clip, titles, end credits, timeline, transitions, soundtrack, retake/reshoot, special effects  **Knowledge:**  -To explain what makes a video effective  **-** To use a digital device to record video  **-** To capture video using a range of techniques  **-** To create a storyboard  **-** To identify that video can be improved through reshooting and editing  To consider the impact of the choices made when making and sharing a video  **Prior Knowledge:**  Knowledge and understanding of creating media by systematically through the process involved in creating a video. The unit builds on the Year 4 unit ‘Photo editing’ where composition is introduced and the Year 3 unit ‘Stop-frame animation’ where learners explored some of the features of video production |
| Spring 2 (Information Technology)  Data and information | **Unit: Branching databases**  Building and using branching databases to group objects using yes/no questions  **Key Vocabulary:**  Attribute, value, questions, table, objects, branching databases, objects, equal, even, separate, order, organise, j2data, selecting, pictogram, information, decision tree, questions  **Knowledge:**  - To create questions with yes/no answers  -To identify the attributes needed to collect data about an object  - To create a branching database  - To explain why it is helpful for a database to be well structured  - To plan the structure of a branching database  - To independently create an identification tool  **Prior Knowledge:**  Knowledge and understanding of the categories of data handling, with a particular focus on implementation |  | **Unit: Flat-file databases**  **& Spreadsheet**  Using a database to order data and create charts to answer questions.  **Key Vocabulary:**  Database, data, information, record, field, sort, order, group, search, criteria, value, graph, chart, axis, compare, filter, presentation  **Knowledge:**  **-** To use a form to record information  **-** To compare paper and computer-based databases  **-** To outline how you can answer questions by grouping and then sorting data  **-** To explain that tools can be used to select specific data  **-** To explain that computer programs can be used to compare data visually  -To use a real-world database to answer questions  **Prior Knowledge:**  Understanding how data is stored | **Online Safety - Project Evolve**  **Unit: Managing online information**  **Knowledge**  -explain how search engines work and how results are selected and ranked.  -explain how to use search technologies effectively.  -describe how some online information can be opinion and can offer examples.  -explain how and why some people may present ‘opinions’ as ‘facts’; why the popularity of an opinion or the personalities of those promoting it does not necessarily make it true, fair or perhaps even legal.  -define the terms ‘influence’, ‘manipulation’ and ‘persuasion’ and explain how someone might encounter these online  -understand the concept of persuasive design and how it can be used to influences peoples’ choices.  -demonstrate how to analyse and evaluate the validity of ‘facts’ and information and I can explain why using these strategies are important.  -explain how companies and news providers target people with online news stories they are more likely to engage with and how to recognise this.  -describe the difference between online misinformation and disinformation  -explain why information that is on a large number of sites may still be inaccurate or untrue.  -identify, flag and report inappropriate content. |
| Summer 1  Creating Media | **Online Safety - Project Evolve**  **Unit: Managing online information**  **Knowledge**  **-**demonstrate how to use key phrases in search engines to gather accurate information online.  **-**explain what autocomplete is and how to choose the best suggestion.  **-**explain how the internet can be used to sell and buy things  **-**explain the difference between a ‘belief’, an ‘opinion’ and a ‘fact.  **-e**xplain that not all opinions shared may be accepted as true or fair by others  **-**describe and demonstrate how we can get help from a trusted adult | **Unit: Photo editing**  Manipulating digital images, and reflecting on the impact of changes and whether the required purpose is fulfilled  **Key Vocabulary:**  Rotate, crop, filter, colour effect, cloning, photo retouch, duplicate, combined image  **Knowledge:**  **-** To explain that the composition of digital images can be changed  **-** To explain that colours can be changed in digital images  **-** To explain how cloning can be used in photo editing  **-** To explain that images can be combined  **-** To combine images for a purpose  **-** To evaluate how changes can improve an image  **Prior Knowledge:**  knowledge and understanding of digital photography and using digital devices to create media | **Online Safety - Project Evolve**  **Unit: Managing online information**  **Knowledge**  -explain the benefits and limitations of using different types of search technologies  -explain what is meant by ‘being sceptical’  -evaluate digital content and can explain how to make choices about what is trustworthy  -explain key concepts including: information, reviews, fact, opinion, belief, validity, reliability and evidence.  -identify ways the internet can draw us to information for different agendas  -describe ways of identifying when online content has been commercially sponsored or boosted  -explain what is meant by the term ‘stereotype’, how ‘stereotypes’ are amplified and reinforced online, and why accepting ‘stereotypes’ may influence how people think about others.  -describe how fake news may affect someone’s emotions and behaviour, and explain why this may be harmful.  -explain what is meant by a ‘hoax’. I can explain why someone would need to think carefully before they share | **Unit: 3D Modelling**  Planning, developing, and evaluating 3D computer models of physical objects.  **Key Vocabulary:**  3D model, three dimensions, lift, lower, work plane, recolour, placeholders  **Knowledge:**  **-** To recognise that you can work in three dimensions on a computer  **-** To identify that digital 3D objects can be modified  **-** To recognise that objects can be combined in a 3D model  **-** To create a 3D model for a given purpose  **-** To plan my own 3D model  **-** To create my own digital 3D model  **Prior Knowledge:**  Prior to undertaking this unit, learners should have worked with 2D graphics applications |
| Summer 2 (Computer Science)  Programming | **Unit: Events and actions in programs**  Writing algorithms and programs that use a range of events to trigger sequences of actions  **Key Vocabulary:**  Event, action, code, programming extension, pen extension, pen down block, bugs, debugging, outcome, pen trail, set up block  **Knowledge:**  -To explain how a sprite moves in an existing project  **-** To create a program to move a sprite in four directions  **-** To adapt a program to a new context  **-** To develop my program by adding features  **-** To identify and fix bugs in a program  **-** To design and create a maze-based challenge  **Prior Knowledge:**  Programming A unit introduces the Scratch programming environment and the concept of sequences. | **Online Safety - Project Evolve**  **Unit: Managing online information**  **Knowledge:**  -analyse information to make a judgement about probable accuracy  -describe how to search for information within a wide group of technologies  -describe some of the methods used to encourage people to buy things online  -explain why lots of people sharing the same opinions or beliefs online do not make those opinions or beliefs true.  -explain that technology can be designed to act like or impersonate living things (e.g. bots) and describe what the benefits and the risks might be.  -explain what is meant by fake news |  | **Unit: Selection in physical computing** (CRUMBLE)  Exploring conditions and selection using a programmable microcontroller  **Key Vocabulary:**  Microcontroller, crumble controller, components, LED, Sparkle, crocodile clips, connect, battery box, program, repetition, infinite loop, count-controlled loop, condition, true, false, input, action, selection, motor, switch, algorithm, debug, evaluate  **Knowledge:**  **-** To control a simple circuit connected to a computer  **-** To write a program that includes count-controlled loops  **-** To explain that a loop can stop when a condition is met  **-** To explain that a loop can be used to repeatedly check whether a condition has been met  **-** To design a physical project that includes selection  **-** To create a program that controls a physical computing project  **Prior Knowledge:**  Experience of programming using a block-based language (eg Scratch) and understand the concepts of sequence and repetition |

Based on the TEACH COMPUTING scheme