Subject overview Computing

Thurlaston CE (Aided) Prima
Teaching and Living the Christian
Building Our Lives on Jesus

Unit Key Skills and Knowledge

Class	Unit	Key Skills and Knowledge	Key Vocabulary
Class 1	**Technology around us and online safety.**	Recognise a range of digital devices. Select a digital device to fulfil a specific task e.g. to take a photo. Name a range of digital devices, e.g. laptop, phone, games console. Log on to the school computer/unlock the school tablet with support. Identify the basic parts of a computer e.g. mouse, keyboard, screen. Use suitable access device (mouse, keyboard, touchscreen, switch) to access and control an activity on a computer. Open key applications independently. Save and open files with support. Add an image to a document from a given folder/source with support.	Technology, computer, mouse, trackpad, keyboard, screen, click, drag, input, device, shift, spacebar, capital letter, full stop, safely, responsibly.
	Digital painting.	Create digital content, e.g. digital art. Choose media from a selection (e.e. images, video, sound) to present information on a topic. Recognise that you can find out information from a website. Select basic tools/operations to change the appearance of digital content, e.g. filter on an image/font/size of paintbrush. Combine media with support to present information, e.g. text and images.	Paint program, tool, paintbrush, erase, fill, undo, Piet Mondrian, primary colours, shape tool, line tool, fill tool, undo tool, Henri Matisse, Wassily Kandinsky, feelings, colour, brush style, George Seurat, Pointillism, prefer, dislike, like.
	Digital writing Online safety		Word processor, keyboard, keys, letters, Microsoft Word, letters, numbers, space, backspace, text cursor, toolbar, bold, italics, underling, undo, font, toolbar
	Moving a robot	Recognise that computers don't have a brain. Explain that we control computers by giving them instructions. Explain that we control computers by giving instructions. Create a simple program, e.g. to control a floor robot – create a simple algorithm. Predict the outcome of a simple algorithm or program.	Forwards, backwards, turn, clear, go, commands, instructions, directions, left, right, plan, algorithm, route, program.
	Introduction to animation.		ScratchJr, Bee-Bot, command, sprite, compare, programming, programming area, block, joining, start, program, background, delete,

		Explain what an algorithm is – a sequence of instructions to make something happen. Recognise that the order of instructions in an algorithm is important. Debug an error in a simple algorithm or program, e.g. for a floor robot.	reset, algorithm, predict, change, value, block, instructions appropriate, design.
	Grouping data **Online safety**	Recognise different forms of digital content, e.g. text, image, video and audio. Collect simple data (e.g. likes/dislikes) on a topic. Present simple data using images e.g. number of animals/favourite colour. Recognise tally charts and pictograms and why we use them.	Object, label, group, search, image, colour, shape, property, value, data set, less, most, fewest, the same.
Class 2	**Information technology around us** **Online safety**	Recognise what a computer is (input > process > output). Recognise that a range of digital devices contain computers (phones, games console, smart speaker). Explain what the basic parts of a computer are used for. Identify and use input devices, e.g. mouse, keyboard; and output devices, e.g. speakers, screen. Open key applications independently. Have and open files to/from a given folder. Add an image to a document from a given folder/source. Resize an image in a document. Highlight text and use arrow keys. Capture media independently (e.g. take photos, record audio).	Information technology (IT), computer, barcode, scanner/scan
	Digital photography	Create simple digital content for a purpose, e.g. digital art, poster. Recognise that we can use technology to record playback audio or take and view photographs. Apply edits to digital content to achieve a particular effect, e.g. emphasise part of a text. Present ideas and information by combining media, e.g. text and images. Explain that you can search for information on the internet.	Device, camera, photograph, capture, image, digital, landscape, portrait, horizontal, vertical, field of view, narrow, wide, format, framing, focal point, subject, matter, flash, focus, background, foreground, editing, filter, Pixel, changed, real.
	Making music **Online safety**	Plan out digital content, e.g. a simple sketch or storyboard. Identify the common features of digital content, e.g. title, images. Recognise that we can use different types of media to convey Information, e.g. text, image, audio, video.	Music, planets, Mars, Venus, war, peace, quiet, loud, feelings, emotions, pattern, rhythm, pulse, Neptune, pitch, tempo, notes, instrument, create open, edit.

	Robot algorithms	Explain that computers have no intelligence and we have to program them to do things. Create a program with multiple steps, e.g. to control a floor robot.	Instructions, sequence, clear unambiguous, algorithm, program, order, commands, prediction, artwork, design, route, mat, debugging.
	Introduction to quizzes	Predict the outcome of an algorithm or program with multiple steps. Recognise that the instructions in an algorithm need to be clear and unambiguous. Identify and correct errors in each algorithm and program and recognise the term debugging. Explain what an algorithm is, and that when inputted on a computer it is called a program. Plan out a program by creating an algorithm and evaluate its success.	Sequence, command, program, run, start, predict, blocks, actions, sprite, modify, match, debug, features, evaluate.
	Pictograms **Online safety**	Recognise tally charts, charts, pictograms and branching databases and why we use them. Explain all information shown in a simple chart or pictogram. Identify key features of a chart of pictogram. Collect data on a topic (eye colour, pets etc) and present in a pictogram or a chart. Modify simple charts/pictograms, e.g. add title, item or labels.	More than, less than, most, least, organise, data, object, tally chart, votes, total, pictogram, enter, data, compare, count, explain, attribute, group, same, different, most popular, least popular.
Class 3	**Connecting computers**	Describe what a computer is (input > process > output) Explain the difference between input and output devices on a computer. Recognise that you can organise files using a folder. Delete and move files. Save files with appropriate names. Explain what a good file name would look like. Use a keyboard effectively to type in text. Use left/right and double click on a mouse. Add an image to a document from the internet. Resize and move an image in a document. Know how to copy and paste text or images in a document. Crop an image and apply simple filters. Use a search engine to find simple information. Use a search engine to find specific information.	Digital devices, input, output, process, program, connection, network, network switch, server, wireless access point (WAP)
	The internet		Internet, network, router, network security, network switch, wireless access point (WAP), router, website, web page, web address, router, routing, route tracing, browser, World Wide Web, content, links, files, use, download, sharing, ownership, permission, accurate, honest, adverts.

	Stop frame animation **Online safety**	Present ideas and information by combining media independently, e.g. text and images. Collect, organise and present information using a range of media. Identify the features of a good piece of digital content and apply these in own designs. Design and create digital content for specific purpose, e.g. poster, animation. Edit digital content to improve it according to feedback. Recognise why we use different types of media to convey information, e.g. text, image, audio, video. Explain the benefits of using technology to present information. Know where to find copyright-free content, e.g. creative commons images. Collaborate with peers using online tools, e.g. blogs, Google Drive, Office 365 etc. a specific purpose, e.g. poster, animation.	Animation, flip book, stop frame, sequence, image, photograph, setting, character, events, onion skinning, consistency, delete, frame, media, import, transition.
	Audio editing **Online safety**		Audio, record, playback, microphone, speaker, headphones, input, output, start, stop, podcast, save, file, selection, edit, mixing, time shift, export, MP3, evaluate, feedback.
	Desktop publishing **Online safety**		Text, images, advantages, disadvantages, communicate, font, style, template, desktop, publishing, copy, paste, layout, purpose, benefits.
	Photo editing **Online safety**		Image, edit, arrange, select, digital, crop, undo, save, search, copyright, composition, save, pixels, rotate, flip, adjustments, effects, colours, hue/saturation, sepia, version, illustrator, clone, recolour, magic wand, sharpen, brighten, fake, real, composite, background, foreground, retouch, paste, alter, publication, elements, original, font style, border, layer.
	Sequence in music	Predict the outcome of a block or text- based program (Scratch/discovery coding). Modify an existing program, e.g. change background, number of times things happen. Identify repeated steps in a program or algorithm. Create examples of algorithms containing count controlled loops. Create a program using a range of events/inputs to control what happens. Recognise that we can decompose a problem into smaller parts to help solve it. Use a count- controlled loop to make a program more efficient. Explain when to use forever loops and count-controlled loops, and use them in programs.	Scratch, programming, blocks, commands, code, sprite, costume, stage, backdrop, motion, turn, point in direction, go to, glide, event, task, design, code, run the code, order, note, chord, algorithm, bug, debug.
	Events and actions		Motion, event, sprite, algorithm, logic, move, resize, extension block, pen up, set up, design, action, debugging, errors, setup, test
	Repetition in shapes		Program, turtle, commands, code, snippet, algorithm, design, debug, logo commands, pattern, repeat, repetition, count-controlled loop, value,

		Recognise selection in a program or algorithm. Use selection in algorithms in programs to alter what happens when a condition changes, e.g. if…then… Recognise that we can create an algorithm to help plan out a program. Recognise that different inputs can be used to control a program. Design a program for a purpose. Recognise common mistakes in programs and how to correct them. Identify errors in a block or text-based program and correct them.	decompose, procedure.
	Repetition in games		Scratch, programming, sprite, blocks, code, loop, repeat, value, forever, infinite loop, count-controlled loop, animate, costume, even block, duplicate, modify, debug, refine, evaluate, algorithm.
	Branching databases	Recognise charts. Pictograms and databases and why we use them. Compare databases and branching data to a pictogram. Present information using a suitable chart. Choose appropriate formats to present data to convey information. Present the same data in a graph and in a chart. Explore a record card database to find out information. Use filters in a database to find out specific information. Use a computer program to sort data by attributes. Name they key parts of a database, e.g. record, field, search. Design a questionnaire and collect a range of data on a theme. Recognise that data can be collected on digital devices and sensors automatically. Answer questions about information in a database. Create questions using yes or no. Draw conclusions from information story in a database, chart or table. Name some benefits of using a computer to create charts and databases. Recognise that search engines store information in databases. Know that you use a web browser to access information stored on the internet.	Attribute, value, questions, table, objects, branching, databases, objects, equal, even, separate, order, organise, j2data, selecting, pictogram, information, decision tree, questions.
	Data logging		Data, table (layout), input, device, sensor, data logger, logging, data point, interval, analyse, import, export, logged, collection, review, conclusion.
Class 4	**Sharing information** **Online safety**	Type efficiently using both hands. Use a range of keyboard shortcuts. Recognise that different devices may have different operating systems.	System, connection, digital, input, process, output, protocol, address, packet, chat, explore, slide click, reuse, remix, collaboration.

	Communication Online safety	Explain what makes a strong password. Organise files effectively using folders and file names. Know how to mute and unmute audio on a computer or tablet. Recognise that there is more than one search engine, and that they may produce different results. Use the advanced search tools when using a search engine to find specific information and images. Know how to search for an application on a computer/tablet. Explain the basic function of an operating system. Recognise common file types and extensions e.g. jpeg, png, doc, wav. Recognise a range of Internet services e.g. email, VOIP (e.g. Skype, FaceTime), World Wide Web, and what they do.	Search, search engine, Google, Bing, Yahoo, Swisscows, DuckDuckGo, refine, index, crawler, bot, optimisation, links, web crawlers, content creator, ranking, communication, internet, public, private, one-way, two-way, one-to-one, one-to-many, SMS, email, WhatsApp, blog, YouTube, Twitter, BBC Newsround.
	Video editing Online safety	Identify and use appropriate hardware and software to fulfil a specific task . Remix and edit a range of existing, and their own, media to create content. Consider the audience when designing and creating digital content. Consider all steps of the design process when creating content (e.g. identify problems, plan, create, evaluate, share). Recognise the benefits of using technology to collaborate with others. Identify the most effective tools to present information for a specific purpose. Identify success criteria for creating digital content for a given purpose and audience. Evaluate existing digital content in terms of effectiveness and design. Evaluate their own content against success criteria and make improvements accordingly.	Video audio, recording, storyboard, script, soundtrack, dialogue, tape, AV (audio vision), videographer, video techniques, zoon, pan, tilt, angle, YouTuber, content, camera, colour, export, trip/clip, titles, end credits, timeline, transitions, soundtrack, retake/reshoot, special effects, constructive feedback.
	Web page creation Online safety		Website, web page, browser, media, Hypertext Markup Language (HTML), layout, header, media, purpose, copyright, fair use, evaluate, preview, device, breadcrumb, trail, navigation, hyperlink, subpage, implication, external link, embed.
	Vector drawing Online safety		Vector, drawing tools, shapes, object, icons, toolbar, move, resize, colour, rotate, duplicate/copy, zoom, select, alignment grid, handles, consistency, modify, layers, front, back, copy, paste, group, ungroup, reuse, improvement, evaluate, alternatives.
	3D modelling Online safety		2D, 3D, 3D object, 3D space, view, resize, colour, lift, rotate, position, select, duplicate, dimensions, placeholder, hole, group, ungroup, modify.

	Selection in physical computing	Name a range of sensors in physical systems. Design and program a physical computing system that uses sensors. Recognise that different solutions may exist for the same problem. Predict what will happen in a program algorithm when the input changes (e.g. sensor, data or event).	Microcontroller, crumble controller, components, LED, Sparkle, crocodile clips, connect, battery box, program, repetition, infinite loop, condition, true, false, input, action, selection, motor, switch, algorithm, debug, evaluate.
	Selection in quizzes.	Use two-way selection in a program and what they do. Combine a variable with relational operators (< = >) to determine when a program changes, e.g. if score >5 say 'well done'. Create an algorithm for a physical system containing a sensor. Create problems including 'repeat until' loops. Create and use simple variables, e.g. to keep score.	Selection, condition, true, false, count- controlled loop, outcomes, conditional statement – the linking together of a condition and outcome, algorithm, program, debug, implement, question, answer, task, input, outcomes, test, run, setup, share, evaluate, constructive.
	Variables in games	Recognise and use producers (sub- routines) in programs. Plan out a program in detail, including task, algorithm, code and execution level.	Variable, change, name, value, set, design, algorithm, code, task, artwork, program, project, code, test, debug, improve, evaluate, share.
	Sensing	Use nested selection statements in a program or algorithm effectively. Explain common errors in programs and how to fix them. Evaluate a program and make improvements to the code or design accordingly. Recognise key concepts (sequence, selection, repetition and variable) in a range of languages and contexts.	Micro-bit, Make Code, input, process, output, flashing, USB, selection, condition, if…then…else, variable, random, navigation, design, task, step counter, plan, create, code, test, debug.
	Flat-file databases	Explain the differences between data and information. Appreciate that different programs work with different types of data, e.g. text, number, video, paper database.	Database, data, information, record, field, sort, order, group, search, criteria, value, graph, chart, axis, compare, filter, presentation.
	Spreadsheets	Explain the different between the Internet and the World Wide Web. Know the difference between a search engine and a web browser. Explain the basics of how search engines work. Perform searches for information using advanced settings in search engines. Recognise the benefits and risks of sharing data online. Use, create and compare visual databases. Recognise what a spreadsheet is and what it is used for. Explain the difference between physical, mobile and wireless networks. Use simple formulae in a spreadsheet to find out information from a set of data.	Spreadsheet, data, data handling, data set, cells, columns and rows, data item, format, common attribute, formula, calculation, cell reference, sigma, graph, evaluate, results, comparisons, questions, software, tools, data, purpose.

		Collect data for a purpose and plan out a spreadsheet to present it effectively, using relevant formulae. Produce graphs from data in a spreadsheet to answer a question. Analyse and evaluate data and information in a spreadsheet, chart or database. Recognise that poor quality data leads to unreliable results.	

Computing systems and networks	Creating media	Programming	Data and information