Airedale Infant and Junior School

Threshold Concepts Attainment Map in Computing

EYFS	**Nursery** • Increasing follow rules, understanding why they are important • Match their developing physical skills to task and activities in the setting • Explore how things work (equipment **Reception** • Show resilience and perseverance in the face of a challenge • Develop their small motor skills so that they can use a range of tools competently, safely and confidently • Know and talk about the different factors that support their overall health and wellbeing—sensible amounts of screen time • Explore, use and refine a variety of artistic effect to express their ideas and feelings (computer program) **ELG** • Be confident, try new activities, show independence, resilience and perseverance in the face of a challenge • Explain the reasons for rules, know right from wrong and try to behave accordingly • Safety use and explore a variety of materials, tools, techniques, experimenting with colour, design, texture, form and function
National Curricu-lum	**Key Stage 1** **Pupils should be taught to:** • Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions • Create and debug simple programs • Use logical reasoning to predict the behaviour of simple programs • Use technology purposefully to create, organise, store, manipulate and retrieve digital content • Recognise common uses of information technology beyond school • 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 technology **Key Stage 2** **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 • Understand computer networks inc. the internet, how they can prof=vide 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 • 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 • Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour, identify and range of ways to report concerns about content and contact
As a digital citizen, I will explore the key concepts of...	COMPUTERS & NETWORKS—as a digital citizen I will understand how computer equipment and networks can provide services and the opportunity for communication & collaboration PRESENTING & PUBLISHING INFORMATION—as a digital citizen, I will use technology to present, save, retrieve and publish information DIGITAL COMMUNICATION—as a digital citizen, I will learn how to digitally communicate with others in a variety of ways MULTIMEDIA CREATION—as a digital citizen, I will learn how to use technology creatively and collaboratively to accomplish given goals DATA HANDLING—as a digital citizen I will, learn how to use technology to sort, analyse, evaluate and present data in different ways (DATA LOGGING—links to science & DT) PROGRAMMING & CODING—as a digital citizen I will, learn to write, design, debug and programme a variety of physical and simulated systems, ONLINE SAFETY—as a digital citizen I will learn to use technology safely and responsibly whilst identifying ways to report concerns

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COMPUTERS & NETWORKS	**Learning Name for Equipment** I can name parts of a computer I can name parts of a tablet device	**Early Computing Skills** I can use a mouse I can use a touch screen to select options	**Computing Skills** I can use a touchpad on a laptop I can use swipe and pinch on a touch screen I can logon to a device using a simple login & password	**Further Computing skills & use of internet** I can save work to my own folder I can retrieve work from my own folder I can search for the internet using one word I can search on the internet to find results suitable for children I can follow links to another webpage	**Online Searchers & Surfers?** I can understand what the internet is and how it works I understand how packets of data move along routes and connect with each other I can use a search engine to find information and can improve my results I can cross reference using tabs I can look for a reliable link using the padlock in the address bar I can bookmark a favourite page I can copy and paste from a search engine into a blank document *I can scan a QR code with a suitable device	**Strategic Searches** I can find information on the internet using search engines I can use a search engine effectively by refining the search term I can identify what makes a website reliable and trust-worthy I can understand how search engines work I can understand and explain page ranking I can use SEO to improve a webpage *I can create a QR code	**Knowing Your Network** I can understand what a computing network is I can understand the ad-vantages and disadvantages of a computing network I can understand what LAN, MAN & WAN networks are To understand how networks send and receive information I understand the differences between the internet and the world wide web I understand what 'cloud' computing is I understand what malware is and how it can affect a net-work *I can create a hyperlink	
Threshold Concept	**I can name the parts of digital devices**	**I can use a mouse/touch screen to select options**	**I can login to a device using a user name and password**	**I can perform simple searches on the internet**	**I can create searches from the internet and check for reliability**	**I can refine searches & understand how engines rank content**	**I can discuss advantages and disadvantages of a computing network**	

* Extra objective to cover not included in Twinkl Planning

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Threshold Concepts Attainment Map in Computing

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	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
PRESENTING & PUBLISHING INFORMATION			**Early Word Processing Skills Alphabet Zoo & Arrow Keys** I can find/recognise the letters on a keyboard I can understand that the uppercase letters on the keyboard corresponds to a lowercase one I can use the arrow keys to manoeuvre around the screen	**Word Processing— Purple Mash** I can find and open Purple Mash I can navigate to a specific program/icon I can use the mouse/ trackpad to select I can add words and phrases using a keyboard I can save my work I can use capital and lowercase letters I can use a full stop	**Touch Typing** I can begin to type using more than one finger (BBC dance mat) I can begin to type using more than one finger I can locate the home keys f & j using the bumps on the keyboard I can place my 8 fingers correctly on the home keys I can use my thumbs for the space bar I can extend my fingers to reach the top and bottom rows **Word Processing** To produce a text based document To use .?,!"&" (inc shift key) with support To alter font and size To alter text colour To format text (B U I) To save documents to my folder	**Publisher** To use word art (inc shape, colour, font, size) To use images from WWW (using online pictures icon) To independently resize and move items on page To use bullets and numbering tool To independently use .?,!"&" (inc shift key) To re-open/retrieve saved documents To use copy and paste (inc icons	**PowerPoint** To create a slide show with multiple slides showing consideration of an audience To use pictures from a variety of sources To use animations to make words/pics appear, flash... To use transitions to create effects between slides Add sounds to complement animations and transitions To add hyperlinks to link to other websites (with support) To use keyboard shortcuts for, (ctrl c) copy) & (ctrl v) paste	**Website Deisgn** To plan a website design which considers both audience/purpose To evaluate other websites for content and design To save/retrieve pictures and sounds from a variety of sources To create own website with sounds, pictures, headings, To create hyperlinks to other sites To create links to other parts of my website To publish online with appropriate regard to safety considerations and an understanding of what is appropriate to include
Threshold Concept			**I can find/recognise the most common keys on a keyboard (letters in my name)**	**I can use a keyboard to add words, phrases and simple punctuation to a document**	**I can type & format text in my document**	**I can add images and word-art to my document**	**I can add animations and transitions to help me to present my document**	**I can use my presenting and publishing skills to create online content**

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	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
DIGITAL COMMUNICATION	**Uses of digital equipment** I can talk about what digital equipment is used for	**Making Digital Equipment Work** I can discuss the need to charge digital equipment to make it work	**Chatterpix** I can communicate effectively using my voice to animate pictures I can take a photo using a tablet device	**Balloon Stickies+** I can link words and pictures to communicate my ideas I can type simple words and phrases on a touch screen I can locate keys on a keyboard I can export my work	**Emails** I can open and read emails I can open, save, delete, reply & send emails I can add an attachment I have created To can using 'contacts' to send emails to friends I can explain some of the safety risks e.g. phishing emails	**Blogging** I can open and create a blog and post it online I can add pictures and images to a blog I can publish a blog online (staff to consider online safety elements) I can restrict access to a blog ensuring it is safe (support) I can post positive comments and responses on other blogs	**Podcasting** I can evaluate other podcasts for content and interest I can open, plan and create a podcast I can plan a format which will consider audience/ purpose I can add sounds & images from a variety of sources I can publish online considering safety risks	**Sketch –A-Song** **I can edit and improve a prewritten composition** **I can select different instruments** **I can edit tempo** **I can chose different pitches** **I can compose my own piece in a style** **I can record/save my music**
Threshold Concept	**I can talk about what digital equipment is used for**	**I can discuss the need to charge digital equipment to make it work**	**I can communicate effectively using my voice and pictures**	**I can communicate effectively using typing and pictures**	**I can effectively communicate through the use of email**	**I can effectively create a blog to communicate with others**	**I can effectively create a podcast to communicate with others**	**I can effectively create musical content to share with others**
MULTIMEADI CREATIONS	**Early Multimedia skills** I can take a photo on a digital device I can record a video on a digital device		**Navigating An App—PUPPET PALS** I can select a suitable backdrop I can scroll through and select options I can link my ideas to tell a tale			**Augmented Reality—Halo AR** I can select a suitable image for use in own AR I can record and save an audio clip I can link audio and visual images to create an augmented reality document	**Green Screen—Do Ink** I can and create a film using dual layers I can film/perform in a video presentation I can alter Chroma to enhance my green screen technology I can edit/trim timings to fit my content I can edit my multimedia presentation to enhance viewer enjoyment	**CAD—SKETCH UP** I can use tools to make 2D into 3D shapes I can plan, design and create a 3D model of my own design **STOP MOTION** To link images to create a gif To take a series of pho-tos which link to make an animation To source, select and add music to a film
Threshold Concept	**I can record my surroundings on a digital device**		**I can create simple multimedia content using words and pictures**			**I can voice record & select images to enhance multimedia content**	**I can use video and green screen technology to create multimedia content**	**I can use 2D media to create 3D images** **I can use multimedia to create animations**

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	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
PROGRAMMING & CODING		**Coding Critters** I can use simple programmable toys by giving single instructions at a time	**Beebot Toy** I can give simple instructions to program a sequence for a physical BeeBot I can use commands forwards, backwards, left, right I can make my Beebot move to a specified location	**Beebot Online & Alex** I can give a set of instructions (algorithm) to move onscreen characters I can take account of moving parts when controlling ALEX To plan an algorithm which factors in the moving variables To check/debug simple algorithms	**Scratch Jr** I can program a character to change size I can change speed and distance that my character moves I can use repetition to make a sequence run more than once	**Scratch & Microbits** I can use turns with a variety of different ° I can draw regular shapes using repetition I can use sequencing to create a short quiz I can use selection with various forms of input and output I can debug my algorithms I can program my micro bit to create an emoji badge I can use selection (button A/B) I can create a scrolling sequence I can use repetition	**Crumbles** I can create a simple circuit and connect it to a microcontroller I can program a microcontroller to make one or more LEDs switch on/off I can explain/use an infinite loop I can connect more than one output component to a microcontroller I can use repetition (controlled loops) I can design my own sequences/algorithms I can program a microcontroller to respond to an input I can use selection to produce an intended outcome I can test and debug	**Kodu** I can understand input/output To create own algorithms which have repetitions & sequences to control on onscreen character I can use variables in my algorithms I can independently debug and refine a series of instructions To check, amend and alter a game to make improvements
Threshold Concept		**I can give single instructions to programmable toys**	**I can program a simple sequence using physical robot/ toys (step by step)**	**I can prepare then program a complete algorithm (sequence) using online screen robots**	**I can program an algorithm and use repetition**	**I can program an algorithm using sequencing**	**I can use selection to produce an intended outcome**	**I can use algorithms with repetitions, sequences and variables**

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	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
DATA HANDLING			**Pictograms (Seesaw)** I can collect data using a touch screen device	**Venn Diagrams (Seesaw)** I can sort and organise data using a touch screen device I can record verbal comments to explain how I have sorted my data	**Branching Databases** I can use a simple branching database I can select suitably linked images to sort I can type YES/No questions to build the branches To organise images and questions to create a branching database To debug a branching database that I have made		**Databases** I can perform searches on an existing database I can amend an existing database I can add/remove records/ fields I can interrogate data using 2 or more criteria	**Spreadsheets** I can correctly format rows/columns I can use simple formulas I can extract and explain information from a spreadsheet I can evaluate/amend variables (Half as much/ twice as many)
Threshold Concept			**I can collect data using a digital device**	**I can sort and organise data using digital equipment**	**I can sort and organ-ise data using YES/ NO questions on digital devices**		**I can sort, organise and interrogate data I have collated digitally**	**I can create formulae to organise my digital data**
DATA LOGGING (LINKS FOR Science)					**Sensors—Link to science (LIGHT)** With support, I can use ICT to measure light using sensors as part of a science topic	**Sensors—Link to sci-ence (SOUND)** I can use ICT to measure sound using sensors as part of a science topic	**Sensors—Link to science (TEMP/MATERIALS)** To use ICT to measure temperature/using sensors I can read/explain recorded data	**Sensors—Link to sci-ence (LIGHT)** I can use ICT to measure sound/temperature/light using sensors and inter-pret data I can interpret recorded data and suggest rea-sons for unexpected variations/results
Threshold Concept					**I use digtal equipment to record amounts of light**	**I can use digital equip-ment to record different amounts of sound and create a graph of my results**	**I can explain data record-ed digitally**	**I can interpret digitally recorded data and suggest reasons for results**

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	Nursery	Reception	Year 1	Year 2
Key Vocabulary - Computer Networks	Mouse Track pad Keyboard Keys Screen Power Cable/Charger Camera Home button (iPad)	Cursor Touch screen Press Icons	Swipe Pinch Login Password Logon	Save Retrieve Folder Search Webpage Google Bing Yahoo Browser Results
	Nursery	**Reception**	**Year 1**	**Year 2**
Key Vocabulary—Presenting & Publishing			Tap Click Arrow Keys Upper Case Lower Case	Open Navigate Icon Keyboard

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	Year 3	Year 4	Year 5	Year 6
Key Vocabulary - Computer Networks	Search Engine Website WWW (World Wide Web) URL (Uniform Resource Locator) ISP (internet Service Provider) IP Address (Internet Protocol)	Ranked Effective searching Refine Search Term SEO (Search Engine Optimisation) Web crawler SERP (Search Engine Results Page)	Clients Encrypted Protocol Router Server Streaming Switch Topology LAN (local Area Network) MAN (Metropolitan Area Network) WAN (Wide Area Network) Malware	
	Year 3	**Year 4**	**Year 5**	**Year 6**
Key Vocabulary—Presenting & Publishing	Home Keys Space Bar Return Backspace Delete Font Format B U I Save	Retrieve Word Art Online Pictures Resize Move Bullets/Numbering Shift Key Copy Paste	Slide Animations Transitions Complementary Hyperlinks Keyboard Shortcut (ctrl c) Copy (Ctrl v) Paste	Audience/Purpose Evaluate Website Header Links Consider online safety

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	Nursery	Reception	Year 1	Year 2
Key Vocabulary - Digital Communication	Text Phone Take photographs/pictures Facetime/Video Call Message	Charger Cable/Lead Batteries Power Power Source	Communicate Voice note Tablet Photo Pictures icon Tap	Words/voice recording Picture Communicate Explain Font Speech Bubble Crop Export
	Nursery	**Reception**	**Year 1**	**Year 2**
Key Vocabulary—Multimedia Creations	Digital Photograph Video Film Record		Navigate Drag Drop Animate Save	

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Threshold Concepts Attainment Map in Computing

	Year 3	Year 4	Year 5	Year 6
Key Vocabulary - Digital Communication	Email (electronic mail @ (at) Open/read Save Delete Reply Send Attach Contacts Phishing	Blog Post Images Publish Restrict Positive comments Responses Online Safety	Podcast Interest Open/Plan/Create Format Evaluate	Compose Select Pitch Tempo Increase/decrease Select Amend/edit Record/save

	Year 3	Year 4	Year 5	Year 6	
Key Vocabulary—Multimedia Creations		Augmented Reality (AR) Record Audio Link Image Overlay Upload Trigger Enhance Scan	Dual Layers Background Foreground Middle Ground Film/Presentation Chroma Edit Trim Enhance	2D/3D Design Model Pan Zoom Orbit Offset Arc Mid Point	Pivot Animate GIF (Graphics Inter-change Format) Sequence Drag Series Source

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	Nursery	Reception	Year 1	Year 2
Key Vocabulary - Programming & Coding		Press Move Turn Go Stop	Commands Left Right Forwards Back Go Sequence	Algorithms Control Plan Moving Variables Debug
	Nursery	**Reception**	**Year 1**	**Year 2**
Key Vocabulary—Data Handling			Collect data Drag Drop	Sort Organise Data (Record Comments) Audio

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	Year 3	Year 4	Year 5	Year 6
Key Vocabulary - Programming & Coding	Program Character/Sprite Choose Alter Repetition Algorithm	**Scratch** Turns Degrees Regular repetition Sequencing Input Output Debug Algorithm **Micro: bits** Selection (A/B) Sequence Repetition LEDs	Circuit Micro controller LED Infinite Loop Multiple outputs Repetition (controlled loops) Algorithms Respond Debug	Input Output Do/When Repetitions Sequences Variables Refine Debug Amend
	Year 3	**Year 4**	**Year 5**	Year 6
Key Vocabulary—Data Handling	Branching Database Sort Select YES/NO Questions Organise Build Evaluate/ Debug		Database Search Amend Record Fields Interrogate Multiple criteria	Columns Rows Cells Formulas Extract Format Edit/Amend Variables