Knowledge Progression

Year 4 Computing

	Computational Thinking TERM:	Computers & Hardware TERM:	Digital Literacy & eSafety TERM:
Key Vocabulary	Code, Code block, Conditional statement, Decompose, Direction, Feature, Icon, Orientation, Position, Program, Project, Scratch, Sprite, Stage, Tinker, Variable, Algorithm, HTML, Hex code, Script, Abstraction, Algorithm design, Computational thinking, Pattern recognition, Problem, Sequence, Packets, Logical reasoning, Hacking, Script, Co-ordinates, Logo, Images, Heading, Text boxes, Start tag, End tag, negative numbers.	Automated machine, Device, Sensor	Calculate, Climate, Forecast, Log data, Predict, Record, Source, Spreadsheet, Temperature, Weather, Collaboration, Design, Content, Edit, Embed, Feature, Header, Hyperlink, Insert, Online, Plan, Tab, Web page, Website, WWW, Copyright, CSS, Hacker, Internet browser, Permission, URL, e-Document, Icon, Link, Presentation software, Reviewing comments, Transition, Freeze, Conditional, Formatting, Animations, Edited, Replied to, Green screen, Home page, Subpage, Embed video, Navigation, chroma key,
Previous knowledge/ Learning	In Year 3, our pupils learnt to: *C1* - Incorporate loops to make code more efficient and 'remix' existing code. *C2* - Use logical reasoning to explain how simple algorithms work. *C3* - Explain the purpose of an algorithm and form algorithms independently. *C4* - Use decomposition to explore the code behind an animation. *C5* - Use a systematic approach to debugging code, justifying what is wrong and how it can be corrected.	In Year 3, our pupils learnt to: *C6* - Understand that computers respond to inputs and outputs. *C7* - Understand what the different components of a computer do, using decomposition to describe the parts of a laptop computer and a tablet. *C8* - Understand what a server does and what a network is, and their purpose. *C9* - Identify the components within a network including whether they are wired or wireless. *C10* - Recognise links between networks and the internet and learn how data is transferred in small 'packets' of information.	In Year 3, our pupils learnt to: *C11* - Understand how to use CC and BCC and attach files to an email. *C12* - Understand the vocabulary associated with databases: field, record, data, knowing the differences between paper and digital databases *C13* - Sort and filter databases to retrieve information as well as creating and interpreting graphs and charts using data. *C14* - Take photographs and record video to tell a story and use voiceovers, text, music, sound effects to edit and enhance videos and photographs. *C15* - Log in and out of an email account and write and reply to an email including a subject, 'to' and 'from'. They are responsible digital citizens and treat each other respectfully, recognising when digital behaviour is unkind understanding what cyberbullying is and recognise that some online and digital content is fake.
N.C. Objectives	➢ *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 including the internet; how they can provide 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 a range of ways to report concerns about content and contact.*
Resources / Websites	Scratch Dice String Laptops/desktops Whiteboards and pens Computers connected to the internet	Cameras Tablets Computers Laptops or desktop computers A5 paper London Tube Map	Computers ThinkUKnow Altas maps to explore the submarine cable map Pens or pencils Whiteboards and pens

Cycle 1:	**Autumn 1**	**Autumn 2**	**Spring 1**	**Spring 2**	**Summer 1**	**Summer 2**
Kapow:	Further Coding: Scratch	Investigating Weather	Website Design	HTML	Collaborative Learning	Computational Thinking

Powerful Knowledge

Year 4 Computing

Key Knowledge – what do we want our children to know before they leave our phase? How will we get them there? How is that personalised to Tranmere?

Computational Thinking

POWERFUL KNOWLEDGE

Our children will:

C1 - Know that HTML stands for Hypertext mark-up language and that style.CSS controls master styles for a website.
C2 - Know that we measure units in pixels.
C3 - Edit text and images using HTML, understanding the role of words, letters, spaces, symbols (<p> = paragraph, <h1> = heading, <img> etc.), capital letters and punctuation marks.
C4 - Solve unplugged problems by decomposing them into smaller parts and identify patterns. They also incorporate variables (ask blocks, join blocks, conditional statements) to make code more efficient.
C5 - Use decomposition to understand the purpose of a script of code and understand that websites can be altered by exploring the code underneath (HTML).
C6 - Use abstraction to identify key elements when completing both plugged and unplugged activities.
C7 - Create algorithms for a specific purpose and use a systematic approach to debugging by understanding position and orientation, applying their understanding of co-ordinates to locate objects and sprites in Scratch.

HOW DOES THIS LOOK AT TRANMERE?

1. Children identify the purpose of a code by writing the script for a times table quiz. They include variables based on the answers to make the quiz responsive to either correct or incorrect answers.
2. Children learn that HTML (completing a HTML treasure hunt to discover tags) is a mark-up language which defines how a website is displayed. They learn how to edit HTML to create their own posters and learn how HTML is used to define the layout of a website (and edit it themselves), creating their own storyboards.
3. Children learn about the four pillars of computational thinking: abstraction, algorithm design, decomposition and pattern recognition through a variety of unplugged and plugged activities. Pupils create their own game in Scratch to test their understanding of computational thinking. They will create a timestables, a bug hunt and pattern recognition game.

Computers & Hardware

POWERFUL KNOWLEDGE

Our children will:

C8 - Consolidate their knowledge of the key components within a network.
C9 - Understand what a sensor is and how to record sensor data
C10 - Use videos and photographs for a range of purposes. They will use green screens (editing, lighting, chroma key, filming angles) to create weather forecasts.
C11 - Understand that devices are created to detect dangerous weather and provide early warnings.

HOW DOES THIS LOOK AT TRANMERE?

1. Children design a weather station which gathers and records sensor data.
2. Children set up and present their own video weather forecast, effectively using green screen technology, editing, filming angles and lighting to improve the finished report.

Digital Literacy & eSafety

POWERFUL KNOWLEDGE

Our children will:

C12 - Use Google online software for documents, presentations and forms, and understand that software can be used to work collaboratively online and understand conditional formatting.
C13 - Build a web page and create content, adding hyperlinks, pages and embedding videos and images.
C14 - Recognise what appropriate behaviour is when working collaboratively with others online and recognise that some information on the internet is false and that some sources are more trustworthy than others.
C15 - Use spreadsheets to record weather data.

HOW DOES THIS LOOK AT TRANMERE?

1. Children edit their latest piece of writing on a Google doc to allow collaborative feedback.
2. Children create a survey using Google forms and then analyse the results using conditional formatting on Google sheets.
3. Children create a set of class rules for working collaboratively to share documents using Google Forms, Docs and Slides.
4. Children are introduced to Google Sites and are challenged to 'tinker' with it to create a simple web page. Children then create a book review web page and, building on the skills developed through the activity, progress to create their own web page with their own content.
5. Children learn to:
   - adapt a live website
   - understand the issue of 'fake news'
   - understand the reliability of the internet
   - create their own 'fake news' stories by hacking the code of a website.
6. Children learn how weather forecasts are made and use search engines to find data, recording and sharing the information in Google Spreadsheets.