Computing Curriculum

We care, we learn, we belong

Statement of Intent

- At MTVS we have designed our curriculum with the development of the **whole child** at the **centre.** Our aim is to provide our children with an **engaging, exciting** and **empowering** curriculum offering them opportunities to **grow** as **individuals** as well as **learners** and prepare them for life today and tomorrow.
- The intention of our curriculum is to ensure that children access a **broad** range of **enriching experiences**, so they **acquire valuable knowledge, skills, understanding** and **attitudes** to enable them to become **highly motivated** and **resilient** learners who feel they have a **voice**. Opportunities are planned to make use of our locality and the context of our school while maintaining coverage of the National Curriculum.

Computing Intent

- Computers are an integral part of everyday life. Teaching our children to be creative with technology supports the skills needed for lifelong learning and prepares them for a world that is changing at a rapid pace.
- At the core of the computing curriculum is computer science, whereby pupils are taught the principles of information and computation, how digital systems work, and how to put this knowledge to use through programming. Building on this knowledge and understanding, pupils are equipped to use information technology to create programs, systems and a range of content.
- Computing also ensures that pupils become digitally literate – able to use technology to express themselves and develop their ideas through, information and communication technology – at a level suitable for the future workplace and as active participants in a digital world.
- To ensure that all staff are confident in teaching our computing curriculum with CPD opportunities offered

Steve Job, Founder of Apple "The people who are crazy enough to think they can change the world are the ones who do. "

Computing Implementation

- Subject leads have current subject knowledge training from National Online Safety (NOS) – E-Safety lead has ensured all teachers, governors, safeguarding leads, Associate teachers and SENDco have access to the latest training materials via the NOS website.
- The Teach Computing scheme of work allows for less confident teachers to have well-structured lesson plans and easy to use resources to help support them with delivering valuable lessons to our children.
- Subject leader has sourced physical computing kits as well as attending training in using the equipment to support staff members.
- Subject leader offering CPD for teaching staff who feel less confident in teaching computing
- Curriculum trackers are highlighted and children are identified as exceeding expectations, meeting expectations are not meeting expectations.
- Computing is taught in an environment that allows the learner to focus on learning. School provides the necessary resources and materials to teach computing well.

Computing Impact

- Children develop detailed knowledge and skills across Computing and as a result, achieve well. This is reflected in our non-core subject results. In Year 6 (2022), 26/28 children achieved expected levels in computing of which 6 children were working at greater depth.
- By the time each child reaches Year 6, they will have experienced high quality, in-depth teaching of the Computing curriculum to equip them for the ever-changing world of technology.
- '…able to use, and express themselves and develop their ideas through, information and communication technology – at a level suitable for the future workplace and as active participants in a digital world.' National Curriculum 2015

Progression

- Our curriculum ensure that we have clear coverage of key skills throughout each year year and across the year groups too. We have carefully prepared a broad and balanced computing curriculum covering all aspects of Information Technology, Computer Science and Digital Literacy. It has been structured so that each year group across the school is being taught the same topic at the same time but building on their previous knowledge.
- In the Autumn term, we all focus on Computing System and Networks and the first Creating Media block. In Spring, we all focus on the first Programming block and Data Information. In Summer, we all focus on the second Creating Media block and the second Programming block.
- Key skills, concepts and vocabulary are reinforced and consolidated as they are encountered repeatedly in meaningful contexts.
- Vocabulary in the computing curriculum provides pupils with the opportunity to develop a deeper understanding of words crucial to developing their knowledge through the breadth of topics taught.

Aims

The National Curriculum for Computing aims to ensure that all pupils:

- can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation.
- can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems.
- can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems ▫ are responsible, competent, confident and creative users of information and communication technology.

Ensuring SMSC is developed

- Spiritual Development in Computing

Our Computing curriculum encourages the children to enquire and communicate their ideas, meanings and feelings. Through Digital Literacy children understand the issues online and how it can make us feel and where to go for help. We encourage independent thinking that will enable children to develop their ideas and talk about them for development and reflection.

- Moral Development in Computing

Throughout the curriculum children are encouraged to look at work that will often pose a moral question. The children's ideas are discussed in a sensible manner, respecting the views of others. Children are encouraged to discuss the inaccuracies of certain webpages and the use of material from webpages, understanding that the work on the internet can belong to people.

- Social Development in Computing

Children's work is celebrated throughout the school and is to be displayed in many areas. Children work independently and collaboratively to develop public and community work that express relationships between the children and local community. Children plan and develop digital resources for specific audiences and share these in many ways. Children discuss and research many webpages, encouraging and developing communication skills.

Children are educated about many social media apps.

- Cultural Development in Computing

Students will be exposed to a wide variety of cultures, beliefs and religions. Through their investigations they will research and explore the religious and non-religious beliefs adopted by a variety of cultures from around the world. Children will be able to communicate with others from around the world.

Pupil Voice- October 2022

- All 12 children interviewed at MTVS said ‘yes’ when asked if they enjoy using digital devices/computing lessons. (2 children per year group)
- In KS1, from the children questioned, they said they had access to iPads, Amazon Kindles and video consoles such as a Nintendo Switch with their families also owning computers, laptops and mobile phones. They are using these items to play games, watch videos and read books.
- In KS2, children said they enjoyed computing because:
  - ‘You get to make things’
  - ‘You get to know how things work that you can’t see and how quick things take’ (referring to routers and and understanding a network)
  - ‘We get to go on computers’
  - ‘We can relax- I don’t have to think too much because I enjoy it’
  - ‘We get some freedom to do what we want’
  - ‘We get to research things for ourselves’
  - ‘Computing lessons are more special because we get to use technology instead of books’
- KS2 children said that we could make out Computing lessons better by:
  - ‘Having time to explore things on our own before the lesson’
  - ‘I would like lessons more often’
  - ‘I would like to create my own PowerPoint and present it to the class
- All children asked said they felt safe using technology in school

What does Computing look like in EYFS?

- At MTVS, we understand the importance of Computing. Even though Computing is not part of the EYFS Early Learning Goals, we still feel it is important for the children to experience different forms of technology within school.
- Technology will be incorporated into the children's daily activities such as using BeeBots to develop directional language.
- Interactive whiteboard
- Sequencing events ready for programming
- Traffic lights- environment
- Take pictures on iPads
- iPads for phonics apps
- Talking tins
- Audio books

What does Computing look like in Year 1-6?

Key Stage 1

Year 1

IT	Digital Literacy	Computer Science
Autumn 1 Technology around us • Can I identify technology? • Can I identify a computer and its main parts? • Can I use a mouse in different ways? • Can I use a keyboard to type on a computer? • Can I use the keyboard to edit text? • Can I create rules for using technology responsibly	Autumn 2 Digital Painting • Can I identify technology? • Can I identify a computer and its main parts? • Can I use a mouse in different ways? • Can I use a keyboard to type on a computer? • Can I use the keyboard to edit text? • Can I create rules for using technology responsibly?	Spring 1 Moving a robot • Can I explain what a given command will do? • Can I act out a given word? • Can I combine forwards and backwards commands to make a sequence? • Can I combine four direction commands to make sequences? • Can I plan a simple program? • Can I find more than one solution to a problem?
Spring 2 Grouping data • Can I label objects? • Can I identify that objects can be counted? • Can I describe objects in different ways? • Can I count objects with the same properties? • Can I compare groups of objects? • Can I answer questions about groups of objects?	Summer 1 Digital writing • Can I use a computer to write? • Can I add and remove text on a computer? • Can I identify that the look of text can be changed on a computer? • Can I make careful choices when changing text? • Can I explain why I used the tools that I chose? • Can I compare typing on a computer to writing on paper?	Summer 2 Programming animations • Can I choose a command for a given purpose? • Can I show that a series of commands can be joined together? • Can I identify the effect of changing a value? • Can I explain that each sprite has its own instructions? • Can I design the parts of a project? • Can I use my algorithm to create a program?

Year 2

IT	Digital Literacy	Computer Science
Autumn 1 IT around us • Can I recognise the uses and features of information technology? • Can I identify the uses of information technology in the school? • Can I identify information technology beyond school? • Can I explain how information technology helps us? • Can I explain how to use information technology safely? • Can I recognise that choices are made when using information technology?	Autumn 2 Digital Photography • Can I use a digital device to take a photograph? • Can I make choices when taking a photograph? • Can I describe what makes a good photograph? • Can I decide how photographs can be improved? • Can I use tools to change an image? • Can I recognise that photos can be changed?	Spring 1 Robot Algorithms • Can I describe a series of instructions as a sequence? • Can I explain what happens when we change the order of instructions? • Can I use logical reasoning to predict the outcome of a program? • Can I explain that programming projects can have code and artwork? • Can I design an algorithm? • Can I create and debug a program that I have written?
Spring 2 Pictograms • Can I recognise that we can count and compare objects using tally charts? • Can I recognise that objects can be represented as pictures? • Can I create a pictogram? • Can I select objects by attribute and make comparisons? • Can I recognise that people can be described by attributes? • Can I explain that we can present information using a computer?	Summer 1 Digital Music • Can I say how music can make us feel? • Can I identify that there are patterns in music? • Can I experiment with sound using a computer? • Can I use a computer to create a musical pattern? • Can I create music for a purpose? • Can I review and refine our computer work?	Summer 2 Programming Quizzes • Can I explain that a sequence of commands has a start? • Can I explain that a sequence of commands has an outcome? • Can I create a program using a given design? • Can I change a given design? • Can I create a program using my own design? • Can I decide how my project can be improved?

Key Stage 2

Year 3

IT	Digital Literacy	Computer Science
Autumn 1 Connecting Computers • Can I explain how digital devices function? • Can I identify input and output devices?Can I recognise how digital devices can change the way we work? • Can I explain how a computer network can be used to share information? • Can I explore how digital devices can be connected? • Can I recognise the physical components of a network?	Autumn 2 Stop-frame animation • Can I explain that animation is a sequence of drawings or photographs? • Can I relate animated movement with a sequence of images? • Can I plan an animation? • Can I identify the need to work consistently and carefully? • Can I review and improve an animation? • Can I evaluate the impact of adding other media to an animation?	Spring 1 Sequencing sounds • Can I explore a new programming environment? • Can I identify that commands have an outcome? • Can I explain that a program has a start? • Can I recognise that a sequence of commands can have an order? • Can I change the appearance of my project? • Can I create a project from a task description?
Spring 2 Branching databases • Can I create questions with yes/no answers? • Can I identify the attributes needed to collect data about an object? • Can I create a branching database? • Can I explain why it is helpful for a database to be well structured? • Can I plan the structure of a branching database? • Can I independently create an identification tool?	Summer 1 Desktop publishing • Can I recognise how text and images convey information? • Can I recognise that text and layout can be edited? • Can I choose appropriate page settings? • Can I add content to a desktop publishing publication? • Can I consider how different layouts can suit different purposes? • Can I consider the benefits of desktop publishing?	Summer 2 Events and actions in programs • Can I explain how a sprite moves in an existing project? • Can I create a program to move a sprite in four directions? • Can I adapt a program to a new context? • Can I develop my program by adding features? • Can I identify and fix bugs in a program? • Can I design and create a maze-based challenge?

Year 4

IT	Digital Literacy	Computer Science
<u>Autumn 1</u> <u>The Internet</u> • Can I describe how networks physically connect to other networks? • Can I recognise how networked devices make up the internet? • Can I outline how websites can be shared via the World Wide Web (WWW)? • Can I describe how content can be added and accessed on the World Wide Web (WWW)? • Can I recognise how the content of the WWW is created by people? • Can I evaluate the consequences of unreliable content?	<u>Autumn 2</u> <u>Audio Production</u> • Can I identify that sound can be recorded? • Can I explain that audio recordings can be edited? • Can I recognise the different parts of creating a podcast project? • Can I apply audio editing skills independently? • Can I combine audio to enhance my podcast project? • Can I evaluate the effective use of audio?	<u>Spring 1</u> <u>Repetition in shapes</u> • Can I identify that accuracy in programming is important? • Can I create a program in a text-based language? • Can I explain what 'repeat' means? • Can I modify a count-controlled loop to produce a given outcome? • Can I decompose a task into small steps? • Can I create a program that uses count-controlled loops to produce a given outcome?
<u>Spring 2</u> <u>Data Logging</u> • Can I explain that data gathered over time can be used to answer questions? • Can I use a digital device to collect data automatically? • Can I explain that a data logger collects 'data points' from sensors over time? • Can I recognise how a computer can help us analyse data? • Can I identify the data needed to answer questions? • Can I use data from sensors to answer questions?	<u>Summer 1</u> <u>Photo Editing</u> • Can I explain that the composition of digital images can be changed? • Can I explain that colours can be changed in digital images? • Can I explain how cloning can be used in photo editing? • Can I explain that images can be combined? • Can I combine images for a purpose? • Can I evaluate how changes can improve an image?	<u>Summer 2</u> <u>Repetition in Games</u> • Can I develop the use of count-controlled loops in a different programming environment? • Can I explain that in programming there are infinite loops and count controlled loops? • Can I develop a design that includes two or more loops which run at the same time? • Can I modify an infinite loop in a given program? • Can I design a project that includes repetition? • Can I create a project that includes repetition?

Year 5

IT	Digital Literacy	Computer Science
<u>Autumn 1</u> <u>Systems and searching</u> • Can I explain that computers can be connected together to form systems? • Can I recognise the role of computer systems in our lives? • Can I experiment with search engines? • Can I describe how search engines select results? • Can I explain how search results are ranked? • Can I recognise why the order of results is important, and to whom?	<u>Autumn 2</u> <u>Video production</u> • Can I explain what makes a video effective? • Can I identify digital devices that can record video? • Can I capture video using a range of techniques? • Can I create a storyboard? • Can I identify that video can be improved through reshooting and editing? • Can I consider the impact of the choices made when making and sharing a video?	<u>Spring 1</u> <u>Selection in physical computing</u> • Can I control a simple circuit connected to a computer? • Can I write a program that includes count-controlled loops? • Can I explain that a loop can stop when a condition is met? • Can I explain that a loop can be used to repeatedly check whether a condition has been met? • Can I design a physical project that includes selection? • Can I create a program that controls a physical computing project?
<u>Spring 2</u> <u>Flat-file databases</u> • Can I use a form to record information? • Can I compare paper and computer-based databases? • Can I outline how you can answer questions by grouping and then sorting data? • Can I explain that tools can be used to select specific data? • Can I explain that computer programs can be used to compare data visually? • Can I use a real-world database to answer questions?	<u>Summer 1</u> <u>Introduction to vector graphics</u> • Can I identify that drawing tools can be used to produce different outcomes? • Can I create a vector drawing by combining shapes? • Can I use tools to achieve a desired effect? • Can I recognise that vector drawings consist of layers? • Can I group objects to make them easier to work with? • Can I apply what I have learned about vector drawings?	<u>Summer 2</u> <u>Selection in quizzes</u> • Can I explain how selection is used in computer programs? • Can I relate that a conditional statement connects a condition to an outcome? • Can I explain how selection directs the flow of a program? • Can I design a program which uses selection? • Can I create a program which uses selection? • Can I evaluate my program?

Year 6

IT	Digital Literacy	Computer Science
Autumn 1 Communication and collaboration • Can I explain the importance of internet addresses? • Can I recognise how data is transferred across the internet? • Can I explain how sharing information online can help people to work together? • Can I evaluate different ways of working together online? • Can I recognise how we communicate using technology? • Can I evaluate different methods of online communication?	Autumn 2 Web page creation • Can I review an existing website and consider its structure? • Can I plan the features of a web page? • Can I consider the ownership and use of images (copyright)? • Can I recognise the need to preview pages? • Can I outline the need for a navigation path? • Can I recognise the implications of linking to content owned by other people?	Spring 1 Variables in games • Can I define a 'variable' as something that is changeable? • Can I explain why a variable is used in a program? • Can I choose how to improve a game by using variables? • Can I design a project that builds on a given example? • Can I use my design to create a project? • Can I evaluate my project?
Spring 2 Spreadsheets • Can I create a data set in a spreadsheet? • Can I build a data set in a spreadsheet? • Can I explain that formulas can be used to produce calculated data? • Can I apply formulas to data? • Can I create a spreadsheet to plan an event? • Can I choose suitable ways to present data?	Summer 1 3D modelling • Can I recognise that you can work in three dimensions on a computer? • Can I identify that digital 3D objects can be modified? • Can I recognise that objects can be combined in a 3D model? • Can I create a 3D model for a given purpose? • Can I plan my own 3D model? • Can I create my own digital 3D model?	Summer 2 Sensing movement • Can I create a program to run on a controllable device? • Can I explain that selection can control the flow of a program? • Can I update a variable with a user input? • Can I use a conditional statement to compare a variable to a value? • Can I design a project that uses inputs and outputs on a controllable device? • Can I develop a program to use inputs and outputs on a controllable device?