Computing

Curriculum Overview
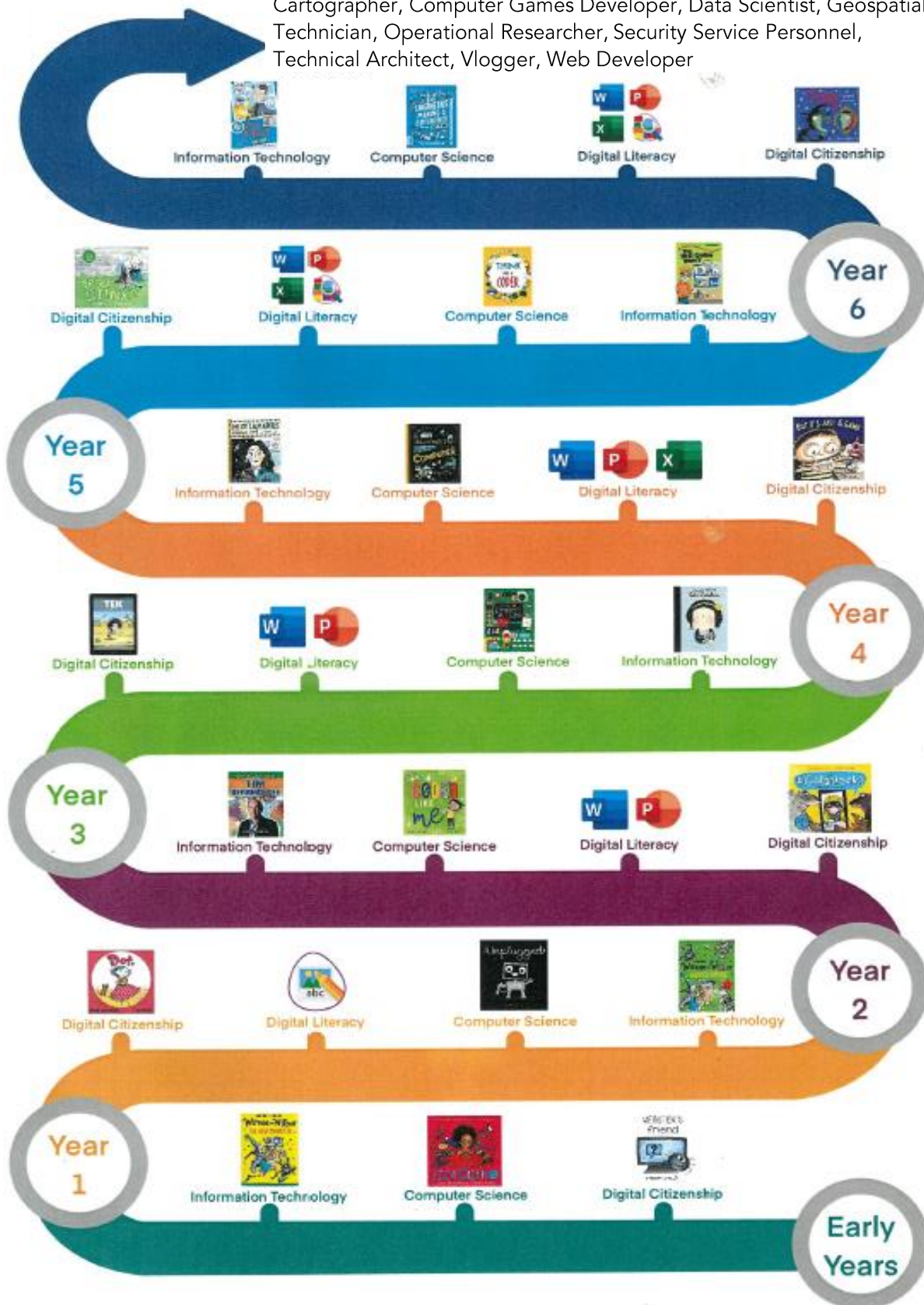
Masefield Primary School

Computing

Information Technology — Computer Science — Digital Literacy — Digital Citizenship

Year 6
Digital Citizenship — Digital Literacy — Computer Science — Information Technology

Year 5
Information Technology — Computer Science — Digital Literacy — Digital Citizenship

Year 4
Digital Citizenship — Digital Literacy — Computer Science — Information Technology

Year 3
Information Technology — Computer Science — Digital Literacy — Digital Citizenship

Year 2
Digital Citizenship — Digital Literacy — Computer Science — Information Technology

Year 1
Information Technology — Computer Science — Digital Citizenship

Early Years

"The computer was born to solve problems that did not exist before,"
– Bill Gates

Computing National Curriculum in England

A high-quality computing education equips pupils to use computational thinking and creativity to understand and change the world. Computing has deep links with mathematics, science, and design and technology, and provides insights into both natural and artificial systems. The core of computing is computer science, in which 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, 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.

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.

Attainment targets

By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.

Subject content

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 technologies.

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 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.

Statement of Intent for Computing

At Masefield, we reflect the National Curriculum's belief that high-quality Computing education provides the foundations for understanding the world through the specific disciplines of Computer Science, Information Technology and Digital Literacy. Technology has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena and the world.

The school's long term plan for Computing sets out the content of teaching within in each year group. This is supported by the school's Computing progression document which demonstrates learning outcomes within each strand of development within a Computing unit. The Computing Procedures document outlines how Computing specifically relates to our Teaching and Learning Delivery Model here at Masefield. Short term planning details how this content is developed over a series of lessons within the unit of work.

At Masefield computing is an integral part of our school and our aim is that:

- Children will enjoy computing and will tackle applications with confidence and a sense of achievement;
- Children will develop independence and use computing skills in a purposeful way;
- It will be valued through adequate provision of resources, a long term vision set out in the School Improvement and Development Plan, along with appropriate Continuing Professional Development for all staff;
- Computing will take a cross-curricular approach;
- Children will develop practical skills and the ability to solve problems using computational thinking;
- Subject co-ordinators will familiarise themselves with relevant software and provide computing resources for their subject.

Knowing More and Remembering More in Computing

At Masefield, we recognise the importance of retrieval practice in making learning more efficient. Retrieval practice allows our teachers to identify and address gaps in knowledge and check for misunderstandings, whilst simultaneously allowing children to make and strengthen connections between their knowledge and providing firmer foundations for future learning. In Computing, all teachers follow these agreed procedures to support the consolidation of prior learning and the incremental development of new learning:

The beginning of every unit

In order to assess prior knowledge, the teacher will present the children with the previous years' LbQ question set for that topic where applicable.

This low stakes quiz allows children the opportunity to recall and strengthen relevant prior knowledge which then can be built upon over the upcoming lessons. This also allows teachers the opportunity to identify and address any gaps in prior knowledge or misconceptions so that they can accurately adapt their teaching to ensure that children build a strong knowledge of the required content.

The beginning of every lesson

At the beginning of every lesson, the teacher will refer back to the previous lessons within the sequence of learning. This provides children the opportunity to recall prior knowledge and make connections between this and the new learning in the current lesson.

The end of each unit

At the end of each unit, the teacher will present the children with the LbQ question set for that unit. This is a low stakes quiz which will assess the children's knowledge of the required content in each unit.

This allows children yet another opportunity to recall and strengthen their learning from this unit. It also provides teachers with a clear picture of children's understanding, which will inform their summative assessments for the unit. This allows the teacher another opportunity to address gaps in knowledge or misconceptions.

Friday Flashbacks

Through Friday Flashbacks, the teacher will present the children with the LbQ question sets for all the units taught so far that year. These are low stakes quizzes will assess the children's knowledge of the required content in each unit.

This allows children multiple further opportunities to recall and strengthen their learning from previous units. It also provides teachers with a clear picture of children's understanding and how their knowledge and skills are developing incrementally. It allows them multiple further opportunities to address gaps in knowledge or misconceptions.

Teaching and Learning Delivery Model: Building Knowledge through Challenge
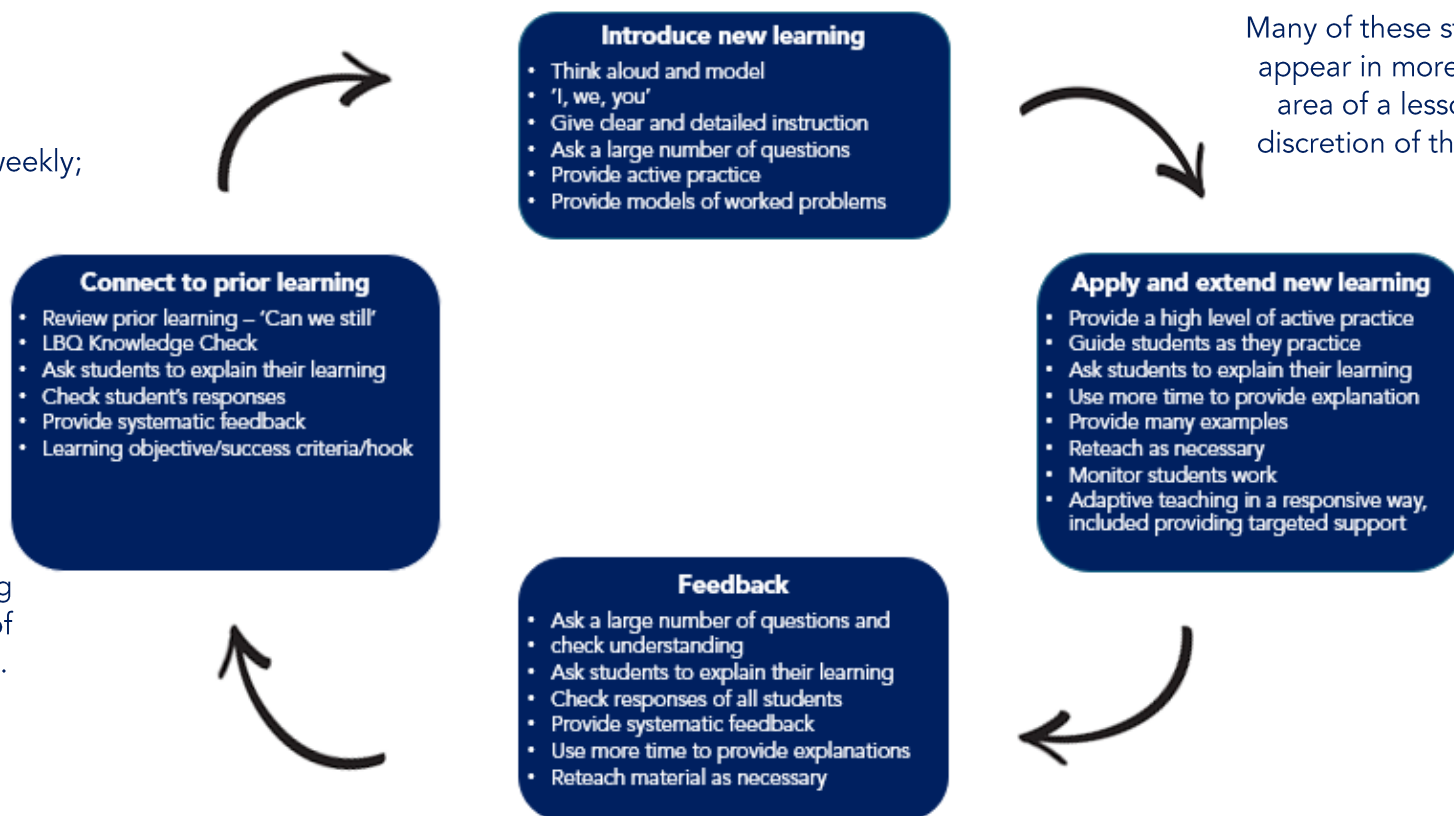
Teachers

- ✓ Have high expectations for all groups of children
- ✓ Have strong subject knowledge
- ✓ Promote independence
- ✓ Promote confidence
- ✓ Offer praise and encouragement
- ✓ Are enthusiastic and positive about learning
- ✓ Model good learning
- ✓ Offer high quality conversation and talk

Lessons

- ✓ Have a distinct knowledge base
- ✓ Are purposeful
- ✓ Are memorable
- ✓ Are active
- ✓ Are engaging
- ✓ Are focussed
- ✓ See children and teachers working as a learning team

Learning Opportunities

- ✓ Increase knowledge
- ✓ Develop basic skills
- ✓ Meet children's individual learning needs
- ✓ Broaden and extend experiences
- ✓ Offer an opportunity to try new things
- ✓ Are cross curricular if appropriate
- ✓ Offer first hand experiences through trips or visitors

There shall be no bad books!
- Vocabulary lesson;
- Regular foundation lessons – weekly;
- New page for each lesson;
- Marking grid for Seesaw work.

Many of these steps would appear in more than one area of a lesson at the discretion of the teacher.

Each lesson may not be a complete cycle of the learning sequence but over a period of time all areas will be covered.

Introduce new learning
- Think aloud and model
- 'I, we, you'
- Give clear and detailed instruction
- Ask a large number of questions
- Provide active practice
- Provide models of worked problems

Connect to prior learning
- Review prior learning – 'Can we still'
- LBQ Knowledge Check
- Ask students to explain their learning
- Check student's responses
- Provide systematic feedback
- Learning objective/success criteria/hook

Apply and extend new learning
- Provide a high level of active practice
- Guide students as they practice
- Ask students to explain their learning
- Use more time to provide explanation
- Provide many examples
- Reteach as necessary
- Monitor students work
- Adaptive teaching in a responsive way, included providing targeted support

Feedback
- Ask a large number of questions and
- check understanding
- Ask students to explain their learning
- Check responses of all students
- Provide systematic feedback
- Use more time to provide explanations
- Reteach material as necessary

Adaptive Teaching

"We are what we repeatedly do. Excellence, then, is not an act, but a habit."

What is Adaptive Teaching and why do we do it?

With adaptive teaching, all pupils are given one explicit instructional goal. They all access the same ambitious curriculum. The teacher teaches to the top and scaffolds pupils who need support to reach that level. When not needed, the teacher removes scaffolds or fades them out.

This approach promotes high achievement for all and doesn't cap opportunities or aspirations.

I do → **We do** → **You do**
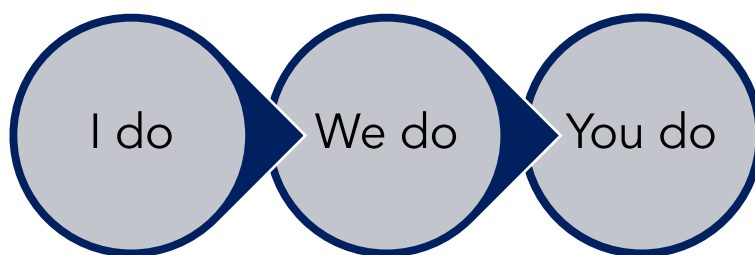
Explicit Instruction	Shared Instruction	Independent Practice
Adaptive practice: Pre-teach or TA support during modelling.	Check: Use this section to check pupils' understanding. Can they do it with the structure in place?	Reflect and Respond: Allow students who have successfully completed the 'We Do' to move on independently. Group together those who are still struggling and complete work with adult support.

Before the lesson…

Lower ability pupils	Pupils with a low reading age	SEND pupils	EAL pupils
Do they need a pre-teach? Can they complete this when they arrive?	Do they need a keyword and definition list? Are they having 1:1 reading – could this be reading they will do as part of a foundation subject lesson or reading lesson?	What resources will they need to support them in successfully completing the task (task sheet, checklists, mind maps etc.)? Communicate with TA beforehand to co-ordinate effective support.	Do they need translated resources? Laptops?

During the lesson…

CHECK REFLECT RESPOND	ENOUGH CORRECT	Practise, consolidate, move on
	NOT ENOUGH CORRECT	Re-explain, more questioning, further chunking, modelling, further scaffolding, check your question then re-check for understanding.

Further support…	Refer to Adaptive Teaching booklet, mini-whiteboards, LBQ, targeted support, additional practice, modelling (I do, we do, you do), breakdown content (chunking).

- Adjust the level of challenge – e.g provide sentence stems and question prompts to support thinking, allow children to present their work in different ways (mind maps, collaborative work).
- Clarify/simplify a task or provide numbered steps with visual representations (objects, pictures, signs, photos).
- Use bold essential content from curriculum document.
- Re-explain a concept or explain it in a different way.
- Give additional (or revisit) examples.
- Use peer tutoring/collaborative learning (everyone must participate – give them roles).
- Provide additional scaffolds - e.g – pre-teach vocabulary, 'I do, we do, you', chunk learning into smaller chunks and break learning down into key knowledge, provide worked examples, provide sentence starters for writing, use media (photographs, film) and hands on resources, where possible.
- Set clear targets/expectations.
- Provide prompts/sentence stems – e.g provide/develop with children steps to success for children to work from, question prompts to support with thinking and reduce cognitive overload.
- Improve accessibility (e.g. proximity to speaker, visibility of whiteboard, read a text to the pupil) – e.g – child-friendly texts/media, where possible. When researching, use child appropriate websites.
- Consider pace - (extra time for responses to questions, contributing to class discussions and to complete activities).
- Provide vocabulary with visual images – e.g - explicitly teach vocabulary at the beginning of a unit alongside a picture of the key word, use photographs to represent the word when using it during the unit.
- Check understanding and reinforcing as needed through repetition, rephrasing, explaining and demonstration – e.g use of mini-plenaries to check understanding (quick quizzes).
- Have alternative ways to record learning, e.g. oral, photographic, video, highlighting text, mind maps, etc. – e.g give children a variety of ways to record their work (recording themselves, use of technology, mind maps), allow children to be creative in the ways that they present their work – they do not all have to be the same.
- Pre-teach vocabulary, key content etc.

- Identify and account for prior knowledge – a child who has extensive prior knowledge could be asked to present some of the knowledge they have to the class; explain something they understand easily to a child who doesn't 'get it' so quickly – e.g – peer modelling, a more able child could present interesting facts that they already know to the children, more able children given more challenging enquiry based questions to extend their learning.
- Build on interests to extend - read widely around a subject outside of lesson time by providing them with information about suitable material, e.g. give them suitable higher-level texts to read – e.g – Use of History Pupil Leaders to develop love of History, questions to research for home learning, projects to complete for home learning.
- Depth of content - consider what you can add to create depth, e.g. digging into an area more deeply, going laterally with a concept, or asking pupils to use more complex terminology to describe abstract ideas.
- Use questioning techniques to boost thinking – ask open-ended questions which require higher-order thinking - e.g – How……..Why……..What does this source tell us?
- Consider learner roles – ensure they are appropriately challenged through the role they are given so they can make an effective contribution; argue in favour of a viewpoint that is different to their own, e.g. argue the opposite position to that which they actually hold, during a class debate, take on a more supportive 'tutor' role during group work.
- Mastery - more intensive teaching, tutoring, peer-assisted learning, small group discussions, or additional homework. e.g - analyse and interpret sources (questions – what's this? What can we say for certain? What can we infer? Does this new source strengthen, amend or completely change our thinking? What doesn't the source tell us?
- Adapted success criteria/choice of task – offer a choice of tasks with a different level of challenge.
- Feedback – framing feedback so pupils must take responsibility for improving their own learning – e.g extend more able learners through open-ended questions when providing feedback.

Learning by Questions – Using EdTech to support Teaching and Learning

What is Learning by Questions?

Pupils' use iPads and progress at their own pace and level through high quality Question Sets and receive immediate automatic feedback as they answer. Teachers receive live analysis and results are saved to support assessment and planning. Data is stored automatically to support lesson planning.

Why do we use it?

Learning by Questions (LbQ) is fully embedded into Masefield's curriculum journey. This evidence based and award winning teaching & learning tool has been fundamental in the significantly above average results at Masefield over the last few years. All teachers and pupils have accounts that allow access to all resources.

What support do I get?

- Tracked classes set up in the first week of the academic year.
- Every member of staff (teachers and TAs) will receive regular CPD on LbQ, including meeting updates, 1:1 CPD, in class coaching and observations.
- Question Sets are ready made for all subjects, including every foundation subject unit from Year 1 to Year 6.

Using LbQ in Maths

- 3 tasks completed daily as morning maths - LBQ tasks that start with 'practise'. Basic skills and previous learning only.
- Used as a teaching and learning tool – not assessment.
- Intervention screen should be used regularly to assess pupils understanding and address misconceptions immediately.
- Green button (play) should be used regularly to involve and engage all learners in the lesson.
- Pupils should not get an incorrect answer more than 3 times. The teacher or TA should intervene before this or the pupil must ask for support.
- LbQ to be used as part of the deeper learning within lessons.
- An application of the learning within the lesson must be shown in maths book (usually reasoning and problem solving).

Using LbQ in Reading

- Used for intervention sessions.
- Used as part of reading in foundation subjects.

Using LbQ in Science

- Vocabulary question set to be completed before Science Unit.
- Previous topic (if appropriate) to be completed before Science Unit (e.g Year 4 Light question set to be completed before teaching of Year 6 Light topic).
- Investigation question set available to support teaching of fair testing.
- Knowledge Review question set to be used at end of topic – or once teaching sequence completed.

Using LbQ in Foundation Subjects

- Question Sets to be completed at the end of learning and during knowledge days.
- Refer to Knowledge Day Overview document for Question Set Record.

Long-term Overview for Computing

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
EYFS: Reception	Digital Citizenship		Computer Science		Information Technology	
	Digital Literacy (provision based)					
Year One	Digital Citizenship	Digital Literacy	Computer Science (Consolidation)	Computer Science (New learning)	Information Technology	Digital Literacy
Year Two	Digital Citizenship	Digital Literacy	Computer Science (Consolidation)	Computer Science (New learning)	Information Technology	Digital Literacy
Year Three	Digital Citizenship	Digital Literacy	Computer Science (Consolidation)	Computer Science (New learning)	Information Technology	Digital Literacy
Year Four	Digital Citizenship	Digital Literacy	Computer Science (Consolidation)	Computer Science (New learning)	Information Technology	Digital Literacy
Year Five	Digital Citizenship	Digital Literacy	Computer Science (Consolidation)	Computer Science (New learning)	Information Technology	Digital Literacy
Year Six	Digital Citizenship	Digital Literacy	Computer Science (Consolidation)	Computer Science (New learning)	Information Technology	Digital Literacy

Strands within our Computing Curriculum

Digital Citizenship

Children need to examine the consequences of their online activity–both good and bad. When teaching Digital Citizenship it is vital that we thoroughly embed the principles of staying safe online and then move onto web content and how they interact with it. It is important to use real world examples with our children to ensure that their learning is relevant to their life experiences.

There are five key aspects of online education, adopted and incorporated from the Education for a Connected World framework, focalised within the teaching of Digital Citizenship at Masefield. These are:

- Self-image and Identity
- Online relationships
- Online reputation
- Online bullying
- Health, wellbeing and lifestyle

Digital Literacy

Digital Literacy is essentially how to use a whole host of different software. Having high levels of Digital Literacy enables us to decide which software we need to complete any given task, how to transfer skills and ultimately, be confident when using software. The essential component of digital literacy when it comes to the field of pedagogy is deep learning; of which there are six core skills:

- Collaboration
- Creativity
- Critical thinking
- Citizenship
- Character
- Communication

Computer Science

Computer Science has been deemed as important to the school curriculum because of its potential to teach children Computational Thinking or how to think. Computational Thinking can teach students how to be successful with design, logical reasoning, problem solving and resilience - all valuable well beyond the computer science classroom. The ability to create and adapt new technologies distinguishes computer science from computer literacy.
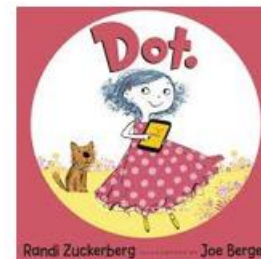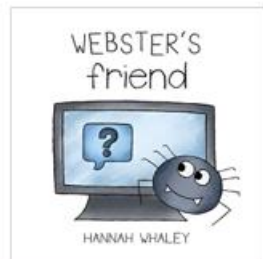
Information Technology

This is how we interact with technology using existing hardware. We need to teach children how to navigate around a variety of devices, type, save work, find and move files. In addition, they need to understand the internet and the web, use search engines, understand networks and generally be efficient and independent users of a range of technologies.

There are three key aspects of online education, adopted and incorporated from the Education for a Connected World framework, focalised within the teaching of Information Technology at Masefield. These are:

- Managing online information
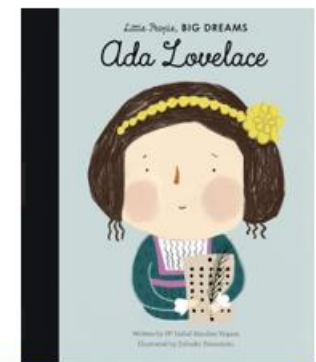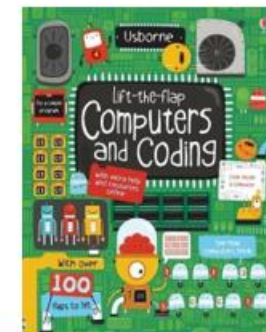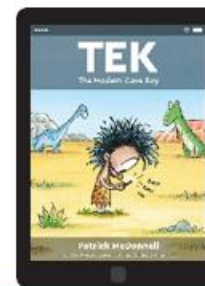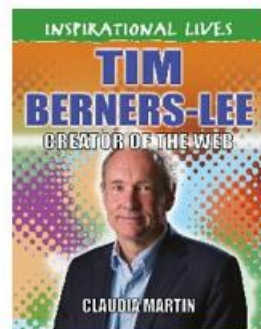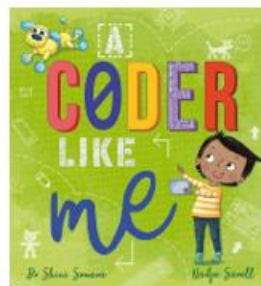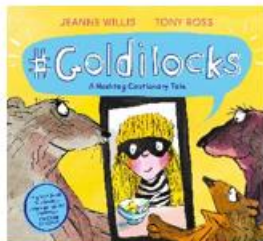- Privacy and security
- Copyright and ownership

Computing Literature Spine

To support the teaching of Computing here at Masefield, we have developed a collection of books that all children in our school are to experience and enjoy. We aim to immerse our children in a range of texts, specifically chosen by our staff to ensure that children hear the best stories read aloud to them by their teachers for pleasure, to excite and inspire our children and support the development of knowledge and skills in Computing.
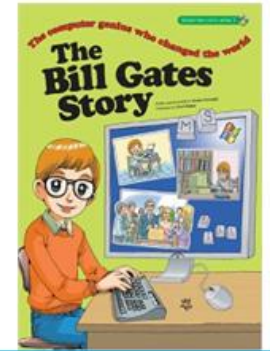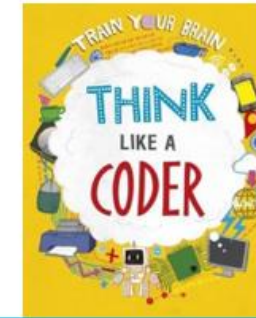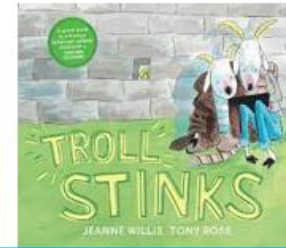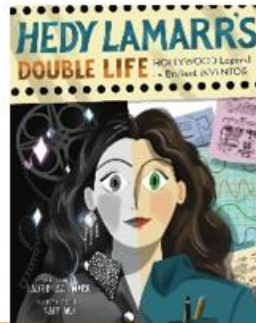
Early Years Foundation Stage

- WEBSTER'S friend — HANNAH WHALEY
- Izzy Gizmo and the Invention Convention — Pip Jones, Sara Ogilvie
- Winnie and Wilbur THE NEW COMPUTER — VALERIE THOMAS AND KORKY PAUL

Year One

- Dot. — Randi Zuckerberg, Joe Berger
- Unplugged — Steve Antony
- Winnie and Wilbur GADGETS GALORE — VALERIE THOMAS AND KORKY PAUL

Year Two

- #Goldilocks — JEANNE WILLIS, TONY ROSS
- CODER LIKE me — Dr Shini Somara, Nadja Sarell
- INSPIRATIONAL LIVES TIM BERNERS-LEE CREATOR OF THE WEB — CLAUDIA MARTIN

Year Three

- TEK The Modern Cave Boy — Patrick McDonnell
- Lift-the-flap Computers and Coding — Usborne
- Little People, BIG DREAMS Ada Lovelace

Year Four

But It's Just a Game

The History of the Computer

Hedy Lamarr's Double Life

Year Five

Troll Stinks — Jeanne Willis · Tony Ross

Think Like a Coder

The Bill Gates Story

Year Six

Pretty — Canizales

Engineers Making a Difference — Dr Shini Somara

Elon Musk — Tracey Turner

Autumn Term - Reception

Digital Citizenship

Context for study:
This unit is an introduction to Digital Citizenship. For the first time, children will begin to explore their digital footprint. They will consider how they can express their feelings about a situation, online or offline, and how their actions can make other people feel. They will also consider simple rules to help keep themselves safe and healthy when using technology.

This is a precursor to the Year 1 Digital Citizenship unit where children will explore when and how to get help with issues they face online, explain the need to be considerate of other's feelings when interacting online and explain rules to keep themselves safe and happy in more detail.

Link to Masefield's Literature Spine:

Webster's Friend
Hannah Whaley

Components (Sequence of Learning):
- DC.EYFS.1 I can talk about my digital footprint.

Self-image and identity
- DC.EYFS.2 I can recognise, online or offline, that anyone can say 'no' / 'please stop' / 'I'll tell' / 'I'll ask' to somebody who makes them feel sad, uncomfortable, embarrassed or upset.

Online Relationships
- DC.EYFS.3 I can recognise some ways in which the internet can be used to communicate.
- DC.EYFS.4 I can give examples of how I (might) use technology to communicate with people I know.

Online Reputation
- DC.EYFS.5 I can identify ways that I can put information on the internet.

Online Bullying
- DC.EYFS.6 I can describe ways that some people can be unkind online.
- DC.EYFS.7 I can offer examples of how this can make others feel.

Health, wellbeing and lifestyle
- DC.EYFS.8 I can identify rules that help keep us safe and healthy in and beyond the home when using technology.
- DC.EYFS.9 I can give some simple examples of these rules.

New vocabulary for this unit:
Digital citizen, world wide web, health and wellbeing, digital footprint.

Key resources for this unit:
Project Evolve for Early Years Foundation Stage.

Digital Literacy

Context for study:

In Reception, children will have had the opportunity to explore some software packages and simple paint programs such as PurpleMash 2Paint. They should now be able to identify simple keys on the keyboard and use the mouse/mousepad to move the cursor around the screen.

This unit is a precursor to the Year 2 Digital Literacy unit where pupils will explore further options to format their documents and begin to apply their skills to other software packages.

Cross curricular links in Digital Literacy:

Of all four curriculum strands, Digital Literacy is where cross curricular links are most likely to be seen. Although Computing is taught as a discrete subject, naturally, links are made to other areas of the curriculum but this does not dilute the quality and entitlement of high quality Computing instruction.

In Year 1, this may involve typing up a piece of written work completed in another subject. This is beneficial for children in reducing cognitive overload as it shifts the focus from thinking about what to type to practising the typing skills taught in this unit of work.

Components (Sequence of Learning):

- DL1.1 I can input text and images using a simple publishing program.
- DL1.2 I can type a simple sentence on the screen, making use of a word bank.
- DL1.3 I can format my typing in a number of ways (size, colour, font).
- DL1.4 I know the main keys for typing e.g. shift, space bar, full stop.
- DL1.5 I can type simple sentences using the correct format (Capital letters, space and full stop).
- DL1.6 I know how to make text bold, use italics and text alignment.
- DL1.7 I can use simple keyboard shortcuts (Ctrl + B, I, U to edit my text style).
- DL1.8 I can move to different places in the text using the arrow keys or mouse.
- DL1.9 I can use the 'undo' icon to fix a mistake.

Previously taught vocabulary for this unit:

Keyboard, keys, space bar, enter, cursor, mouse, app.

New vocabulary for this unit:

Digital literacy, caps lock, shift, document, insert.

Key resources for this unit:

Microsoft Word;
PurpleMash 2Publish.

Computer Science (Consolidation)

Context for study:

This unit provides children the opportunity to revisit and consolidate Computer Science learning from the previous academic year. Children will begin to give and follow simple instructions one at a time. They will plan, create and debug algorithms when programming a BeeBot or similar remote control toy.

This is a precursor to the Year 2 Computer Science unit where children will differentiate between algorithms and programs, as well as make use of events to start their program running.

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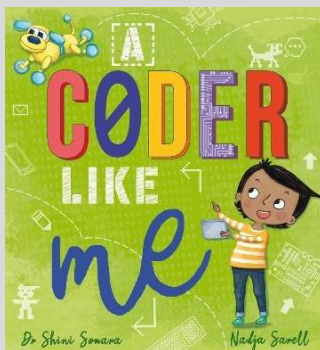
A Coder Like Me
Dr Shini Somara

Focus Element

The focus element in Computer Science for this unit is algorithms.

Components (Sequence of Learning):

- CS1.1 I can tell you what an algorithm is.
- CS1.2 I can plan a simple algorithm.
- CS1.3 I can give and follow commands, which include straight / turning commands – one at a time.
- CS1.4 I can debug a simple algorithm that is causing an unexpected outcome.
- CS1.5 I can break an algorithm down into smaller parts (decomposing/ chunking).
- CS1.6 I can predict if a simple algorithm will work.

Previously taught vocabulary for this unit:

Algorithm, debugging, computer science, computational thinking.

Key resources for this unit:

BeeBots and mats;
Remote control toys;
Unplugged activities.

Computer Science (New learning)

Context for study:

Previously, children will have explored the difference between an algorithm and a program, understood that programs require an event to run, created programs that contain several commands for a device or software programme and independently debug a program.

This is a precursor to the Year 4 Computer Science Unit where children will begin to explore repeats and loops in a program, understanding what a repeat is used for, using these independently and explaining why it is important to use the repeat function in a particular place in their sequence.

Link to Masefield's Literature Spine:
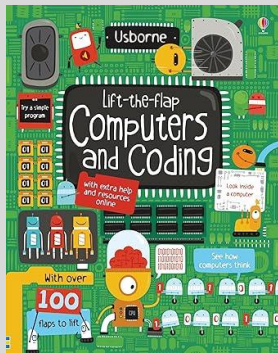
Computers and Coding
Rosie Dickins

Focus Element

The focus elements in Computer Science for this unit is sequencing.

Components (Sequence of Learning):

- **CS3.1** I know that a sequence is a list of instructions in a particular order
- **CS3.2** I know that if I change the sequence I may change the outcome of the program
- **CS3.3** I can solve problems by decomposing them into smaller parts
- **CS3.4** I can detect and debug errors in my sequence
- **CS3.5** I can use and edit a pre-written program to achieve a specific outcome
- **CS3.6** I can use logical reasoning to explain what will happen next
- **CS3.7** I can predict how a change in a sequence may impact on the outcome of a program

Previously taught vocabulary for this unit:

Algorithm, debugging, computer science, computational thinking, decompose, program, event blocks.

New vocabulary for this unit:

Sequence, input, output.

Key Resources for this unit:

CSFirst.

Information Technology

Context for study:

Previously, children will have begun to describe simple strategies for creating and keeping passwords private, and begun to explain why copying someone else's work from the internet without permission isn't fair.

This is a precursor to the Year 5 Information Technology Unit where children explain what is meant by being sceptical and give examples of when and why it is important to be sceptical. They will be able to explain what a strong password is and demonstrate how to create one and explain what app permissions are, giving some examples of these.

Link to Masefield's Literature Spine:
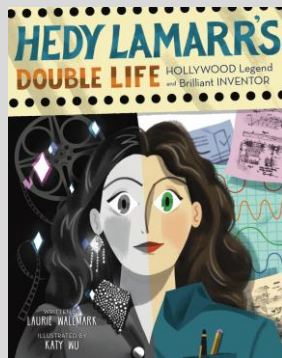
Hedy Lamarr's Double Life
Laurie Wallwork

Focus Element

- The focus element in Information Technology for this unit is online communications.

Computing Pioneer

- The Computing Pioneer that pupils will study is Hedy Lamarr.

Components (Sequence of Learning):

Managing online information

- IT4.1 I can analyse information to make a judgement about probable accuracy and I understand why it is important to make my own decisions regarding content and that my decisions are respected by others
- IT4.2 I can describe how to search for information within a wide group of technologies and make a judgement about the probable accuracy (e.g. social media, image sites, video sites)
- IT4.3 I can explain what is meant by fake news e.g. why some people will create stories or alter photographs and put them online to pretend something is true when it isn't

Privacy and security

- IT4.4 I can describe strategies for keeping personal information private, depending on context
- IT4.5 I know what the digital age of consent is and the impact this has on online services asking for consent

Copyright and ownership

- IT4.6 When searching on the internet for content to use, I can explain why I need to consider who owns it and whether I have the right to reuse it.
- IT4.7 I can give some simple examples of content which I must not use without permission from the owner, e.g. videos, music, images.

Previously taught vocabulary for this unit:

Personal information, internet, world wide web, information technology, ownership, communication, privacy, copyright, security, collaboration.

New vocabulary for this unit:

Networks.

Key Resources for this unit:

Project Evolve for Year Four.

Digital Literacy

Context for study:

This unit provides opportunity for children to revise and consolidate their previous learning in Digital Literacy.

This unit is a precursor to the Year 5 Digital Literacy unit where children will begin to explore the use of databases and how to create them. Pupils will explore how to search for and sort information in databases.

Consolidation Project:

The consolidation project allows children the opportunity to revise and build upon their previous learning in Digital Literacy in Autumn 2 and previous academic years. This will take a cross curricular approach and allows children to showcase their learning from other subjects, whilst providing further active practice of their skills in Digital Literacy.

Components (Sequence of Learning):

- DL4.1 I can transfer my word processing skills into other multimedia packages e.g. PowerPoint
- DL4.2 I can include imported images, hyperlinks and the use of sounds recorded
- DL4.3 I can enter a basic mathematical formula into Excel
- DL4.4 I can add basic mathematical formulas
- DL4.5 I can use SUM to calculate the total of a set of numbers in a range of cells
- DL4.6 I can change the look of a spreadsheet by using different formats e.g. text styles, colour, number format inc, currency and date, row and column heights
- DL4.7 I can insert and delete columns and rows in a spreadsheet
- DL4.8 I can use spreadsheets to create a graph
- DL4.9 I can decide on the most appropriate form of graph for a data set and give reasons for my choice
- DL4.10 I can interpret graphs of data collected from sensors.

Previously taught vocabulary for this unit:
Keyboard, keys, space bar, enter, cursor, mouse, app, digital literacy, caps lock, shift, document, insert, exclamation mark, question mark, table, row, column, border, layout, audience, background, shortcut, formatting, Spreadsheet, formula, SUM, AutoSum, sort, filter.

Key Resources for this unit:

PurpleMash Unit 4.3;
Microsoft PowerPoint;
Microsoft Excel.

Digital Literacy

Context for study:

This unit provides opportunity for children to revise and consolidate their previous learning in Digital Literacy.

This a precursor to the Year 6 Digital Literacy Unit where children will use skills they have learnt across multiple application programs and can choose, select and use a combination of software to present their work.

Consolidation Project:

The consolidation project allows children the opportunity to revise and build upon their previous learning in Digital Literacy in Autumn 2 and previous academic years. This will take a cross curricular approach and allows children to showcase their learning from other subjects, whilst providing further active practice of their skills in Digital Literacy.

Components (Sequence of Learning):

- DL5.1 I can select appropriate tools to add emphasis and effect to my work
- DL5.2 I can explain why I have chosen my layout and formatting
- DL5.3 I can review and edit my work and talk about the changes I made
- DL5.4 I can explain why my work is suitable for the audience
- DL5.5 I can create a database structure of my own and enter the data
- DL5.6 I can prepare a data collection form and collect quality information
- DL5.7 I can use databases to create a graph
- DL5.8 I can select the most appropriate form of graph for a data set giving reasons for my choice
- DL5.9 I can interpret graphs of data collected from a variety of sources

Previously taught vocabulary for this unit:
Keyboard, keys, space bar, enter, cursor, mouse, app, digital literacy, caps lock, shift, document, insert, exclamation mark, question mark, table, row, column, border, layout, audience, background, shortcut, formatting, Spreadsheet, formula, SUM, AutoSum, sort, filter, database, record, field, abstraction.

Key Resources for this unit:

PurpleMash Units 5.3 and 5.4; Microsoft Excel.

Digital Citizenship

Context for study:

Previously, children will have demonstrated responsible choices about their online identity, described ways that information about anyone online can be used by others to make judgments about an individual and why these may be incorrect, and described ways technology can affect health and wellbeing both positively and negatively.

Link to Masefield's Literature Spine:
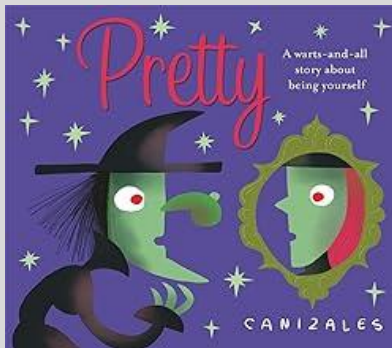
Pretty
Canizales

Components (Sequence of Learning):

- DC6.1 I can talk about my digital footprint

Self-image and identity
- DC6.2 I can talk about the importance of asking until I get the help needed
- DC6.3 I can describe issues online that could make anyone feel sad, worried, uncomfortable or frightened and explain how to get help if this happens.
- DC6.4 I can identify and critically evaluate online content relating to gender, race, religion, disability, culture and other groups, and explain why it is important to challenge and reject inappropriate representations online.

Online relationships
- DC6.5 I can explain how sharing something online may have an impact either positively or negatively
- DC6.6 I can describe how to be kind and show respect for others online including the importance of respecting boundaries regarding what is shared about them online and how to support them if others do not

Online reputation
- DC6.7 I can explain strategies anyone can use to protect their 'digital personality' and online reputation, including degrees of anonymity

Online bullying
- DC6.8 I can describe how to capture bullying content as evidence (e.g. screen-grab, URL, profile) to share with others who can help me

Health, wellbeing and lifestyle
- DC6.9 I can describe common systems that regulate age-related content (e.g. PEGI, BBFC, parental warnings) and describe their purpose
- DC6.10 I can assess and action different strategies to limit the impact of technology on health (e.g. night-shift mode, regular breaks, correct posture, sleep, diet and exercise)

Previously taught vocabulary for this unit:

Digital citizen, world wide web, health and wellbeing, digital footprint, identity, online bullying, online reputation, self-image.

Key Resources for this unit:

Project Evolve for Year Six.