# Computing

## Long-term plan

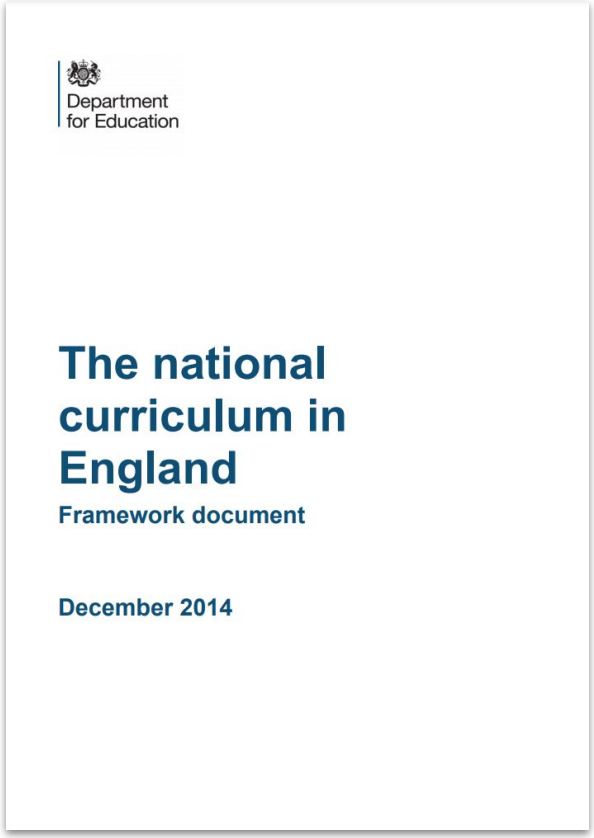
Our full 36-week EYFS, KS1 and KS2 long-term plan for **Computing** is designed for schools that deliver the subject each week.

# Contents:

# How does Kapow Primary help our school to meet the statutory guidance for Computing?

Our scheme of work fulfils the statutory requirements for computing outlined in the **National Curriculum (2014)** and, when used in conjunction with our RSE & PSHE scheme, also covers the government's **Education for a Connected World -2020 edition** framework (see our [Education for a Connected World framework mapping]).



# How does Kapow Primary's scheme of work align with the National Curriculum?

Our scheme of work fulfils the statutory requirements outlined in the **National Curriculum (2014)**. The National Curriculum Programme of Study for Computing aims to ensure that all pupils:

We have identified these three strands which run throughout our scheme of work:

- ★ 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.

→ Computer Science

- ★ Can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems.

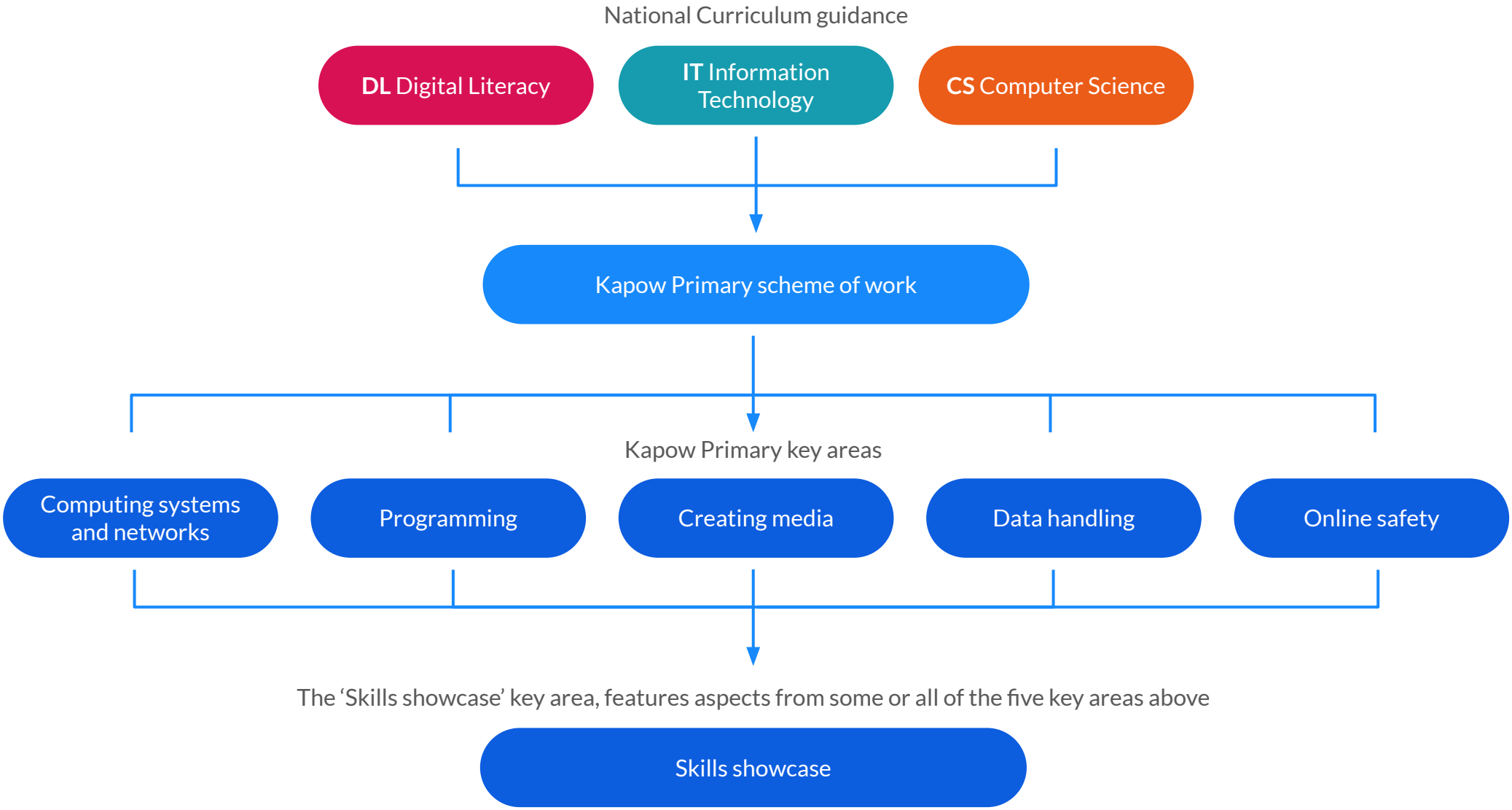
→ Information Technology

- ★ Are responsible, competent, confident and creative users of information and communication technology.

→ Digital Literacy

Our Curriculum overview document shows which of our units cover each of the National Curriculum attainment targets as well as each of the three strands. Each lesson plan references the relevant National Curriculum objectives, along with cross-curricular links to any other subjects.

# How is the Computing scheme of work organised?



# Key areas

We have categorised our lessons into the five key areas below, which we return to in each year group making it clear to see prior and future learning for your pupils and how what you are teaching fits into their wider learning journey.

| Computing systems and networks | Programming | Creating media | Data handling | Online safety |
|---|---|---|---|---|
| Identifying hardware and using software, while exploring how computers communicate and connect to one another. | Understanding that a computer operates on algorithms, and learning how to write, adapt and debug code to instruct a computer to perform set tasks. | Learning how to use various devices — record, capture and edit content such as videos, music, pictures and photographs. | Ensuring that information is collected, recorded, stored, presented and analysed in a manner that is useful and can help to solve problems. | Understanding the benefits and risks of being online — how to remain safe, keep personal information secure and recognising when to seek help in difficult situations. |

# Skills showcase units

There are four units entitled Skills showcase. These units give children the chance to combine and apply skills and knowledge gained, from a range of the five key areas above, to produce a specific outcome.

### Y1 - Rocket to the moon

### Y4 - HTML

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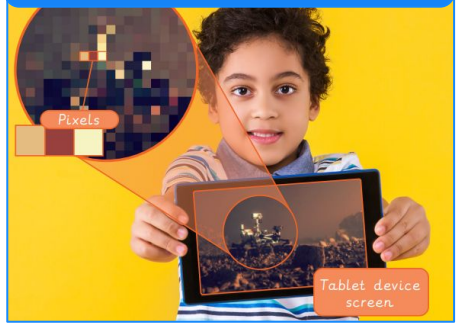
### Y5 - Mars Rover 2




### Y6 - Inventing a product

# A spiral curriculum

Kapow Primary's Computing scheme of work has been designed as a spiral curriculum with the following key principles in mind:

- ✓ **Cyclical**: Pupils revisit the five key areas throughout KS1 and KS2.
- ✓ **Increasing depth**: Each time a key area is revisited, it is covered with greater complexity.
- ✓ **Prior knowledge**: Upon returning to each key area, prior knowledge is utilised so pupils can build on previous foundations, rather than starting again.

# Is there any flexibility in the Kapow Primary Computing scheme?

Our Computing scheme of work is organised into units.

Within each unit, lessons must be taught in order as they build upon one another.

Across a single year group, units themselves do not need to be taught in the suggested order, with the exception of the numbered units which should be taught in the correct order (e.g. **Programming 1** before **Programming 2**). We would also suggest that the **Autumn 1** unit is taught first each year where possible.

The flexibility in the order the units can be taught, allows schools to adapt the planning to suit their school and to make use of cross-curricular links available.

# What about online safety?

Recognising the increasing importance of this key area, we have created an Online safety unit for each year group.

You may wish to teach this unit in the same way as the other units, on a dedicated Online Safety Day (for example, on Safer Internet Day in February each year) or spread throughout the year. See Guidance: How to fit in our Online safety units when considering the best option for your school.

# Computing in EYFS

Our EYFS lessons are a natural precursor to our Year 1 Computing plans. They are designed especially for the Reception classroom and are play-based, hands-on and fun!

Please read the teacher guidance for:

✓ Supporting a child-led project using technology

and

✓ Computing through continuous provision

Whilst the technology strand is no longer a specific area in the new EYFS framework (2021), having the opportunity to develop computing skills at an early age can foster interest and confidence in technology and give pupils an advantage going into KS1.

Our EYFS units focus on the same key areas and link to Primary and Specific Areas of the ***EYFS framework 2021*** and ***Development Matters Guidance*** as detailed on individual lesson plans and on our Curriculum overview.

# Guidance: How to fit in our Online safety units

| | Organisation | Considerations |
|---|---|---|
| **Option 1** | Teach each of our units as shown on the suggested long-term plan.<br><br>Hold an online safety day at some point during the year, where children are 'off-timetable' and cover the whole of the Online safety unit on this day.<br><br>Many schools may choose to do this on Safer Internet Day which falls in February each year. | • Timetabling of computing equipment on the online safety day.<br>• What will happen if a child is away on this day?<br>• Will pupils retain the online safety learning in their long-term memory? |
| **Option 2** | Teach each of our units as shown in the suggested Long term plan.<br><br>As each half term is usually longer than the five weeks of lessons we have provided, you should have some 'spare' Computing lessons. Some or all of these could be used to teach one lesson from the Online safety unit. | • Depending on how the holidays fall, you may still have some 'spare' lessons within a half-term and some half-terms with too few lessons.<br>• You may need to briefly recap learning from the previous online safety lesson (although this is referred to in our planning) |

| | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
|---|---|---|---|---|---|---|
| **Year 1**<br>**Option 2 example:** | Improving mouse skills<br><br>+Online safety<br>Lesson 1 | Algorithms unplugged<br><br>+Online safety<br>Lesson 2 | Rocket to the moon<br><br>+ Online safety<br>Lesson 3 | Programming Bee-bots<br>Option 1: Bee-bots<br>Option 2: Virtual Bee-bots<br>+ Online safety<br>Lesson 4 | Digital imagery | Introduction to data |

| | Organisation | Considerations |
|---|---|---|
| **Option 3** | Teach the units in the order they are shown in our suggested long-term plan.<br><br>When you have finished a unit move straight onto the next unit, rather than starting a new unit after each school holiday.<br><br>The example below assumes six Computing lessons per term. | • Will children/ teachers be too tired to start a new unit at the end of a long half-term?<br>• Will this have implications for termly overviews sent home to parents?<br>• How will this affect assessment data?<br>• Will this make it more difficult for the subject leader to monitor Computing? |

| | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
|---|---|---|---|---|---|---|
| **Year 1**<br>**Option 3 example:** | Improving mouse skills<br>(5 lessons)<br>Algorithms unplugged<br>(1 lesson) | Algorithms unplugged<br>(4 lessons)<br>Rocket to the moon<br>(2 lessons) | Rocket to the moon<br>(3 lessons)<br>Programming Bee-Bots<br>(3 lessons) | Programming Bee-Bots<br>(2 lessons)<br>Digital imagery<br>(4 lessons) | Digital imagery<br>(1 lesson)<br>Introduction to data<br>(5 lessons) | Online safety Y1<br>(4 lessons) |

# Short of curriculum time?

At Kapow Primary, we understand that curriculum time is always tight in primary schools.

We have created a Condensed curriculum version of our Long term plan to help those schools who want to ensure coverage of the National Curriculum, without dedicating an hour a week to Computing.

Our Condensed curriculum long term plan abstracts units which cover key skills and knowledge in only 20 lessons.

The selected lessons ensure that there is balanced coverage of our five key areas of Computing, as well as one Skills showcase unit, to give pupils an opportunity to combine and apply skills from different units.

This version of our Long term plan could be used if you are teaching Computing in a two-week, half termly cycle or are block teaching foundation subjects. It could also be used to relieve pressure on teachers and pupils in terms of the amount of curriculum content.

# Other useful documentation:

There are a number of key documents that can support you in planning and delivery of the Kapow Primary **Computing** scheme. Visit the **Essential subject materials page** for more.

✓ **Curriculum overview document:**

- Shows which of the National Curriculum Attainment targets are covered by each unit.

✓ **Progression of skills document:**

- Shows how understanding and application of key concepts and skills builds year on year.

✓ **Knowledge organisers - one per unit:**

- One page overview of the key knowledge and vocabulary from a unit to support pupils' learning.

✓ **Required hardware and software:**

- Explains which software each of the commonly used devices require.

✓ **Intent, Implementation, Impact statement (coming Summer 2021)**

# Suggested long-term plan: Computing - Overview (EYFS and KS1)

Years 1-6 include an Online Safety unit each. See the: Guidance: How to fit in our Online safety units for information about how to include these in your curriculum time.
All units have five lessons unless otherwise stated.

| | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 | Online Safety |
|---|---|---|---|---|---|---|---|
| **EYFS** | **Set up continuous provision in your classroom:** Computing through continuous provision | Computing systems and networks<br>Using a computer<br>Learning about the main parts of a computer and how to use the keyboard and mouse. Learning how to log in and out. | Programming 1<br>All about instructions<br>The children learn to receive and give instructions and understand the importance of precise instructions. | Computing systems and networks<br>Exploring hardware<br>Tinkering and exploring with different computer hardware and learning to operate a camera. | Programming 2<br>Programming Bee-Bots<br>Children learn about directions, experiment with programming a Bee-bot/Blue-bot and tinker with hardware. | Data handling<br>Introduction to data<br>Children sort and categorise data and are introduced to branching databases and pictograms. | |
| **Year 1** | Computing systems and networks<br>Improving mouse skills | Programming 1<br>Algorithms unplugged | Skills showcase<br>Rocket to the moon | Programming 2<br>**Programming Bee-bots**<br>Option 1: Bee-Bots<br>Option 2: Virtual Bee-bots | Creating media<br>Digital imagery | Data handling<br>Introduction to data | Online safety<br>Online safety Y1 (4 lessons) |
| **Year 2** | Computing systems and networks 1<br>What is a computer? | Programming 1<br>Algorithms and debugging | Computing systems and networks 2<br>Word processing | Programming 2<br>Programming: ScratchJr | Creating media<br>**Stop Motion**<br>Option 1: Using tablet devices<br>Option 2: Using cameras<br>Option 3: Devices without cameras | Data handling<br>International Space Station | Online safety<br>Online safety Y2 |

# Suggested long-term plan: Computing - Overview (Lower and upper KS2)

Years 1-6 include an Online Safety unit each. See the: Guidance: How to fit in our Online safety units for information about how to include these in your curriculum time.
All units have five lessons unless otherwise stated.

| | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 | Online Safety |
|---|---|---|---|---|---|---|---|
| Year 3 | Computing systems and networks 1 | Programming | Computing systems and networks 2 | Computing systems and networks 3 | Creating media | Data handling | Online safety |
| | Networks and the internet | Programming: Scratch | Emailing | Journey inside a computer | **Video trailers** Option 1: Using devices other than iPads , Option 2: Using iPads | Comparison cards databases | Online safety Y3 **(4 lessons)** |
| Year 4 | Computing systems and networks | Programming 1 | Creating media | Skills showcase | Programming 2 | Data handling | Online safety |
| | Collaborative learning | Further coding with Scratch | Website design | HTML | Computational thinking | Investigating weather | Online safety Y4 **(6 lessons)** |
| Year 5 | Computing systems and networks | Programming 1 | Data handling | Programming 2 | Creating media | Skills showcase | Online safety |
| | Search engines | **Programming music** Option 1: Sonic Pi , Option 2: Scratch | Mars Rover 1 | Micro:bit | **Stop motion animation** Option 1: Stop motion studio Option 2: Using cameras | Mars Rover 2 | Online safety Y5 |
| Year 6 | Computing systems and networks | Programming | Data handling | Creating media | Data handling | Skills showcase | Online safety |
| | Bletchley Park | Intro to Python | Big data 1 | History of computers | Big data 2 | Inventing a product | Online safety Y6 **(6 lessons)** |

# Suggested long-term plan: Computing - Outline (KS1)

| | Year 1 | Year 2 |
|---|---|---|
| **Autumn 1** | Computing systems and networks | Computing systems and networks |
| | Improving mouse skills **(5 lessons)**<br>Learning how to login and navigate around a computer; developing mouse skills; learning how to drag, drop, click and control a cursor to create works of art | What is a computer? **(5 lessons)**<br>Exploring what a computer is by identifying how inputs and outputs work and how computers are used in the wider world to design their own computerised invention. |
| **Autumn 2** | Programming 1 | Programming 1 |
| | Algorithms unplugged **(5 lessons)**<br>Algorithms, decomposition and debugging are made relatable to familiar contexts, following directions, learning why instructions need to be specific. | Algorithms and debugging **(5 lessons)**<br>Developing an understanding of; what algorithms are, how to program them and how they can be developed to be more efficient, introduction of loops. |
| **Spring 1** | Skills showcase | Computing systems and networks |
| | Rocket to the moon **(5 lessons)**<br>Developing keyboard and mouse skills through designing, building and testing. Creating a digital list of materials, using drawing software and recording data. | Word processing **(5 lessons)**<br>Learning about word processing and developing touch typing skills. Introducing keyboard shortcuts and simple editing tools. |
| **Spring 2** | Programming 2 | Programming 2 |
| | **Programming Bee-Bots (5 lessons)**<br>(Option 1: Bee-Bot) (Option 2: Virtual Bee-Bot)<br>Introducing programming through the use of a Bee-Bot and exploring its functions. | ScratchJr **(5 lessons)**<br>Exploring what 'blocks' do' by carrying out an informative cycle of predict > test > review. Programming a familiar story and make a musical instrument. |
| **Summer 1** | Creating media | Creating media |
| | Digital imagery **(5 lessons)**<br>Planning a miniature story and capturing it using photography. Editing photos, searching for and adding images to a project. | **Stop Motion (5 lessons)** (Option 1: Using tablet devices), (Option 2: Devices with cameras) **or** (Option 3: Devices without cameras)<br>Learning how to create simple animations from storyboarding creative ideas. |
| **Summer 2** | Data handling | Data handling |
| | Introduction to data **(5 lessons)**<br>Learning what data is and the different ways it can be represented. Learning why data is useful and the ways it can be gathered and recorded. | International Space Station **(5 lessons)**<br>Learning how data is collected, used and displayed and the scientific learning of the conditions needed for plants and humans, to survive. |
| **Online safety** | Online safety | Online safety |
| | Online safety Y1 **(4 lessons)**<br>Learning how to stay safe online and how to manage feelings and emotions when someone or something has upset us. | Online safety Y2 **(5 lessons)**<br>Learning: how to keep information safe and private online; who we should ask before sharing things online and how to give, or deny permission online. |

# Suggested long-term plan: Computing - Outline (Lower KS2)

| | Year 3 | Year 4 |
|---|---|---|
| **Autumn 1** | Computing systems and networks | Computing systems and networks |
| | Networks and the internet **(5 lessons)**<br>Learning what a network is, how devices communicate, how information is shared and identifying components. | Collaborative learning **(5 lessons)**<br>Learning how to work collaboratively and exploring a range of collaborative tools including Google Docs, Slides, Forms and Sheets. |
| **Autumn 2** | Programming | Programming 1 |
| | Scratch **(5 lessons)**<br>Exploring the programme Scratch, following the predict > test > review cycle. Learning about 'loops' and programming an animation, story and game. | Further coding with Scratch **(5 lessons)**<br>Exploring Scratch further by revisiting its key features and introducing the concept and execution of using 'variables' in code scripts. |
| **Spring 1** | Computing systems and networks | Creating media |
| | Emailing **(5 lessons)**<br>Sending emails with attachments and learning how to be a responsible digital citizen. Understanding what cyberbullying is. | Website design **(5 lessons)**<br>Developing research, word processing and collaborative working skills whilst learning how web pages and sites are created. Learning to embed media and links. |
| **Spring 2** | Computing systems and networks | Skills showcase |
| | Journey inside a computer **(5 lessons)**<br>Assuming the role of computer parts and creating paper versions of computers to consolidate understanding of how a computer works. | HTML **(5 lessons)**<br>Learning about the markup language behind a webpage; becoming familiar with HTML tags, changing HTML and CSS code to alter images and 'remix' a live website. |
| **Summer 1** | Creating media | Programming 2 |
| | **Video trailers (5 lessons)**<br>(Option 1: Using devices other than iPads) (Option 2: Using iPads)<br>Developing digital video skills to create trailers, with special effects and transitions. | Computational thinking **(5 lessons)**<br>Solving problems effectively using the four areas of abstraction, algorithm design, decomposition and pattern recognition. |
| **Summer 2** | Data handling | Data handling |
| | Comparison cards databases **(5 lessons)**<br>Learning what a database is and their key components, such as records, fields and data. Further developing the ability to sort and filter data. | Investigating weather **(5 lessons)**<br>Researching and storing data using spreadsheets; designing a weather station that gathers and records data; learning how weather forecasts are made. |
| **Online safety** | Online safety | Online safety |
| | Online safety Y3 **(4 lessons)**<br>Learning: the difference between fact, opinion and belief; and how to deal with upsetting online content. Knowing how to protect personal information online. | Online safety Y4 **(6 lessons)**<br>Searching for information and making a judgement about the probable accuracy; recognising adverts and pop-ups; understanding that technology can be distracting. |

# Suggested long-term plan: Computing - Outline (Upper KS2)

| | Year 5 | Year 6 |
|---|---|---|
| **Autumn 1** | Computing systems and networks<br><br>Search engines **(5 lessons)**<br>Learning: to search using keywords and phrases, to identify inaccurate information, how pagerank works and how to credit their sources. | Computing systems and networks<br><br>Bletchley Park **(5 lessons)**<br>Discovering the history of Bletchley and learning about code breaking and password hacking. Demonstrating digital literacy skills by creating presentations. |
| **Autumn 2** | Programming 1<br><br>**Programming music (5 lessons)** (Option 1: Sonic Pi) (Option 2: Scratch)<br>Building-on programming and music skills to create different sounds, beats and melodies which are put to the test with a Battle of the Bands performance! | Programming<br><br>Intro to Python **(5 lessons)**<br>Using the programming language 'Python' to create designs and art. Learning how to create loops and nested loops to make their code more efficient. |
| **Spring 1** | Data handling<br><br>Mars Rover 1 **(5 lessons)**<br>Learning about the Mars Rover, exploring how and why it transfers data including instructions, and how messages can be sent using binary code. | Data handling<br><br>Big data 1 **(5 lessons)**<br>Identifying how barcodes and QR codes work. Learning how infrared waves are used for the transmission of data while recognising the uses of RFID. |
| **Spring 2** | Programming 2<br><br>Micro:bit **(5 lessons)**<br>Creating algorithms and programs that are used in the real world. Using the 'predict, test and evaluate' cycle to create and debug programs with specific aims. | Creating media<br><br>History of computers **(5 lessons)** Writing, recording and editing radio plays set during WWII, learning about how computers have evolved from being larger than a room to fitting into the palm of our hand. |
| **Summer 1** | Creating media<br><br>**Stop motion animation (5 lessons)** (Option 1: Stop Motion Studio) (Option 2: with cameras) Creating animations, storyboard ideas and decomposing a story into small parts before putting together to create the illusion of a moving image. | Data handling<br><br>Big data 2 **(5 lessons)**<br>Further developing understanding of how networks and the Internet are able to share information. Learning how big data can be used to design smart buildings. |
| **Summer 2** | Skills showcase<br><br>Mars Rover 2 **(5 lessons)**<br>Exploring how the Mars rover: moves, follows instructions, collects and sends data; understanding how computers work, what data is and how it is transferred. | Skills showcase<br><br>Inventing a product **(5 lessons)**<br>Designing a product, pupils: evaluate, adapt and debug code to make it suitable for their needs and designing products in CAD and creating a website and video. |
| **Online safety** | Online safety<br><br>Online safety Y5 **(5 lessons)** Learning about app permissions; the positive and negative aspects of online communication; that online information is not always factual; how to deal with online bullying and managing our health and wellbeing. | Online safety<br><br>Online safety Y6 **(6 lessons)** Learning to deal with issues online; about the impact and consequences of sharing information online; how to develop a positive online reputation; combating and dealing with online bullying and protective passwords. |