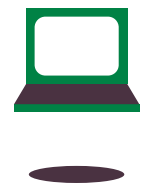


Computing Key Stage 3

Curriculum map





1. Philosophy

Six underlying attributes at the heart of Oak's curriculum and lessons.

Lessons and units are **knowledge and vocabulary rich** so that pupils build on what they already know to develop powerful knowledge.

Knowledge is **sequenced** and mapped in a **coherent** format so that pupils make meaningful connections.

Our **flexible** curriculum enables schools to tailor Oak's content to their curriculum and context.

Our curriculum is **evidence informed** through rigorous application of best practice and the science of learning.

We prioritise creating a **diverse** curriculum by committing to diversity in teaching and teachers, and the language, texts and media we use, so all pupils feel positively represented.

Creating an **accessible** curriculum that addresses the needs of all pupils is achieved to accessibility guidelines and requirements.



2. Units



KS3 Computing is formed of 18 units and this is the recommended sequence:

Unit Title	Recommended year group	Number of lessons
1 Impact of Technology - Collaborating Online Respectfully	Year 7	6
2 Gaining support for a cause	Year 7	6
3 Networks: from semaphores to the Internet	Year 7	6
4 Spreadsheets	Year 7	6
5 Programming essentials in Scratch: part I	Year 7	6
6 Programming essentials in Scratch: part II	Year 7	6
7 Design Vector Graphics	Year 8	5
8 Computing systems	Year 8	6
9 Networks 2	Year 8	6



10 Representations: from clay to silicon	Year 8	6
11 Mobile app development	Year 8	6
12 Intro to Python programming	Year 8	6
13 Animations	Year 9	6
14 Data Science	Year 9	6
15 Cybersecurity	Year 9	6
16 Representations: going audiovisual	Year 9	6
17 Python programming with sequences of data	Year 9	6
18 Physical Computing Programming	Year 9	5



3. Lessons

Unit 1 Impact of Technology - Collaborating Online Respectfully

6 Lessons

Lesson number	Lesson question	About the lesson
1.	Account security	<p data-bbox="1041 558 1265 590">Pupils will learn</p> <ul data-bbox="1075 622 1971 845" style="list-style-type: none"><li data-bbox="1075 622 1971 845">• In this lesson, we will learn how to keep our accounts secure by using a sensible password. We will also learn how to keep our online data secure when playing games online. Lastly, we will learn about the consequences of writing inappropriate comments online. <p data-bbox="1041 869 1310 901">Guidance warnings</p> <ul data-bbox="1075 933 1881 1021" style="list-style-type: none"><li data-bbox="1075 933 1881 1021">• Contains subject matter which individuals may find upsetting.

2. Respectful communication

Pupils will learn

- In this lesson, we will learn how to be respectful when communicating online. We will also learn about our digital footprint.

Guidance warnings

- Contains subject matter which individuals may find upsetting.



3. Cyberbullying

Pupils will learn

- In this lesson, we will learn about cyberbullying and what to do if you or a friend are affected by cyberbullying.

Guidance warnings

- Contains subject matter which individuals may find upsetting.

4. Recognise and report

Pupils will learn

- In this lesson, we will decide which scenarios constitute inappropriate content or contact. We will also find out how to report any concerns that we have about what we experience online.

Guidance warnings

- Contains subject matter which individuals may find upsetting.
-

5. Use presentation tools

Pupils will learn

- In this lesson, we will learn how to find copyright free images to use in our own digital products. We will also learn how to use presentation software before designing our own presentation.

Guidance warnings

- Contains external content.
-

6. Create a presentation

Pupils will learn

- In this lesson, we will have time to create our presentations before we perform them. For this lesson we will need the design work that we completed in the previous lesson.
-





Lesson
number

Lesson question

Pupils will learn

-
- | | | |
|-----------|-------------------------------------|--|
| 1. | Features of a word processor | <ul style="list-style-type: none">• In this lesson, we will think about what software should be used for what particular purposes. We will identify the key features of a word processor. We will practice our skills by looking at a pre-made document that is poorly formatted and use tools to format the document. |
| 2. | Licensing appropriate images | <ul style="list-style-type: none">• In this lesson, we will learn how to pick images that are suitable for the intended purpose, understand copyright issues when choosing images, and utilise features of a word processor to be able to format the images to fit within the work that we started in the previous lesson. |
| 3. | Credibility of sources | <ul style="list-style-type: none">• In this lesson, we will learn to critically evaluate information online and we will become equipped with techniques to help identify unreliable sources of information. |
-

4. Researching

- In this lesson, we will conduct and document research on the causes that we have chosen to support. We will learn how to document and credit our sources to avoid plagiarism.



5. Promoting your cause

- In this lesson, we will start to construct a blog and put into practice all of the skills that we have learnt so far in this unit

6. Project completion

- In this lesson, we will finalise our blogs and get them ready for launch.
-



Lesson
number

Lesson question

Pupils will learn

1. Computer networks and protocols

- In this lesson, we will contemplate the number of internet connected devices on the planet and define a computer network. We will learn about the rules of communication (protocol) in simple terms and think about how data is transmitted across the internet.
-

2. Networking hardware

- In this lesson, we will explore the functionality of key hardware components found in a network such as cables, hubs, servers and routers. We will then use our knowledge of each component to build a series of increasingly complicated network diagrams.
-

3. Wired and wireless networks

- In this lesson, we will explore the different wireless technologies, and how bandwidth varies between them. We will discuss the mobile technologies of 3G, 4G, and 5G and will develop an understanding of the term 'bandwidth'.
-

4. The internet

- In this lesson, we will explore the internet and its uses. We will gain an appreciation of the vastness of the internet and learn how messages can be successfully sent from one device to another across the planet in under a second using packets and IP addresses.



5. Internet services

- In this lesson, we will explore the internet and its services as well as the difference between the internet and the World Wide Web. We will explore the 'Internet of Things' and think about the advantages as well as disadvantages, focussing on privacy and security.

6. The World Wide Web

- In this lesson, we will introduce the key components of the World Wide Web. We will understand the difference between HTTP and HTTPS protocols.
-



Lesson
number

Lesson question

Pupils will learn

1. Getting to know a spreadsheet

- In this lesson, we will introduce the concept of spreadsheets and why spreadsheets are useful. We will learn how to navigate a spreadsheet via its rows and columns, and become familiar with the cell referencing system.

2. Quick calculations

- In this lesson, we will practise entering text into cells of a spreadsheet and then learn how to perform calculations on the data using basic formulas and cell references. We will learn how to use the autofill tool to duplicate cells and continue a linear pattern.

3. Collecting data

- In this lesson, we will begin with a recap of the previous lessons content and some further practise of using formulas. We will discover the difference between data and information, and between primary and secondary sources of data.
-



4. Become a data master!

- In this lesson, we will discover how to use functions to analyse data in a spreadsheet. As well as learning how to automatically create charts from data. We will be introduced to four functions: SUM, MAX, MIN, and COUNTA.
-

5. Level up your data skills!

- In this lesson, we will introduce three more functions "COUNTIF, AVERAGE, and IF" and to how they can sort and filter a spreadsheet. We will work on a larger data set to get a feel for analysing real-world data using spreadsheets.
-

6. Conditional formatting

- In this lesson, we will discover how to use conditional formatting, whereby the appearance of a cell changes automatically depending on the data it contains, according to rules you set. We then complete an end-of-unit summative assessment.
-



Lesson number	Lesson question	Pupils will learn
1.	Sequencing	<ul style="list-style-type: none">In this lesson, we will take our first footsteps into understanding computer programming. We will look at how computers need precise instructions to execute and we will work on sequencing our first program using subroutines.
2.	Variables	<ul style="list-style-type: none">In this lesson, we will be introduced to variables as well as getting more confident with sequences through investigating and modifying our Big Ed chat bot.
3.	Selection	<ul style="list-style-type: none">In this lesson, we will learn about expressions that evaluate to 'true' or 'false'. We will also learn about IF statements by developing your Big Ed chat program from the previous lesson.
4.	Operators	<ul style="list-style-type: none">In this lesson, we will introduce logical and comparison operators. We will get practise in this by being given different expressions to decode to see if they evaluate to 'true' or 'false' before being tasked with modifying a 'Big Quiz' Scratch program.

5. Count controlled iteration

- In this lesson, we will develop a Scratch version of the nursery rhyme Ten Green Bottles, using count-controlled iteration. We will be introduced to the concept of debugging and will be given a program to debug by tracing the value of the variables.



6. Problem solving

- In this lesson, we will play a game of beat the teacher. The following exercise requires us to put together all of the skills that we have developed throughout this unit to develop a dance game called "Move with Jim".
-



Lesson number	Lesson question	Pupils will learn
1.	You've got the moves!	<ul style="list-style-type: none">• In this lesson we will learn about subroutines. Subroutines were also discussed in Scratch programs Part I. We will create a dance battle game by decomposing dance moves and creating subroutines for each move.
2.	Fly cat, Fly!	<ul style="list-style-type: none">• In this lesson, we will introduce condition-controlled loops. We will predict, run, investigate, and modify code for a Scratch the cat flying game.
3.	Loop the loop	<ul style="list-style-type: none">• In this lesson, we will take a look at all of the types of loops that you can use in Scratch. We will learn how to evaluate which loop to choose for each problem that we want to solve.
4.	Treasure those lists!	<ul style="list-style-type: none">• In this lesson, we will discover the world of lists in Scratch. We will explore a treasure hunt game to learn how to create and manipulate lists.

5. Translate this! (Part 1)

- In this lesson, we will start creating a translation quiz in Scratch using the skills that have been covered so far in this unit.



6. Translate this! Part 2

- In this lesson, we will complete the translation quiz in Scratch. We will also have the opportunity to extend our quizzes further.
-



Lesson
number

Lesson question

About the lesson

1.

Get into shapes

Pupils will learn

- In this lesson, we will be acquainted with the basics of using inkscape to draw geometrical shapes and manipulate them.

Guidance warnings

- Contains external content.

2.

Paths united

Pupils will learn

- In this lesson, we will use path operations such as union, difference, and intersection to combine simple shapes into more complex ones.

Guidance warnings

- Contains external content.

3. Icon challenges

Pupils will learn

- In this lesson, we will be presented with a set of monochrome icons and be challenged to create some of them from scratch. The icons are carefully selected to range from simple ones that are straightforward to produce to more complex ones that require some creative thinking.

Guidance warnings

- Contains external content.
-

4. What will you make?

Pupils will learn

- In this lesson, we will create a short open ended image using the tools that we have learnt so far in this unit.

Guidance warnings

- Contains external content.
-

5. Under the hood

Pupils will learn

- In this lesson, we will explore the technical aspects of vector graphics.

Guidance warnings

- Contains external content.
-





Lesson
number

Lesson question

About the lesson

1.

Get in gear

Pupils will learn

- In this lesson, we will focus on what sets computing systems apart from other purpose-built machinery: it is their ability to execute programs that allows them to modify their operation and perform different tasks, and thus become our most versatile 'tool for thought'.

2.

Under the hood

Pupils will learn

- In this lesson, we will investigate how all computing systems make use of the same components: a processor, memory, storage, input and output devices, and communication components.

3.

Orchestra Conductor

Pupils will learn

- In this lesson, we will introduce the operating system, which is responsible for managing the complexity of modern computing devices. Here, operating systems will serve as an additional bridge between theory and practice.



4. It's only logical

Pupils will learn

- In this lesson, we will bridge the gap between logic and circuits, and make the direct link between them explicit. We will investigate the hierarchy of a computing system and the fundamental components that comprise this hardware.

5. Thinking machines

Pupils will learn

- In this lesson, we will define the term 'artificial intelligence', and explore the kinds of problems that it has traditionally dealt with. We will also focus on machine learning.

Guidance warnings

- Contains external content.

6. Sharing

Pupils will learn

- In this lesson, we will explore some common Scratch practices that we are already familiar with (sharing, 'seeing inside' projects, and 'remixing'), and will reflect upon the implications of these practices.
-



Lesson
number

Lesson question

Pupils will learn

1. Website building blocks

- In this lesson, we will look behind the curtain to help learners start to understand how web pages are constructed using HTML tags, and how they can be modified to display content as they wish.

2. Words are not enough

- In this lesson, we will explore the structure and operation of the "img" tag and understand how they can be used to 'add' images to web pages.

3. Taking shortcuts

- In this lesson, we will start to experiment with using CSS to format tags in a HTML document. We will format schemes to work and extend our knowledge by researching the numerous attributes that can be controlled by CSS.

4. Searching the web

- In this lesson, we will consider how people get to web pages and think about search engines. We will learn about the advantages and disadvantages of using key words for searching the web.
-

5. Tightening the web

- In this lesson, we will learn how to carefully control what we search for, so that we are more likely to find what we want, instead of navigating too many results.



6. The spread of the web

- In this lesson, we will explore the exponential growth of the Internet, and issues associated with that growth.
-



Lesson
number

Lesson question

Pupils will learn

1. **Across time and space**

- In this lesson, we will investigate the use of symbols to represent information (just like computers do) and relate this to human practice for centuries. We will prepare for exploring binary representations in the context of computing.

2. **Lights and drums**

- In this lesson, we will learn how to encode, transmit, and decode short messages using a variety of coding schemes and communication medium (signals, light, sounds, holes in paper, etc.). We will understand that text representation uses sequences of symbols.

3. **Binary Digits**

- In this lesson, we will grasp what binary digits are by associating them with familiar sets of symbols such as letters and decimal digits. We will solve simple problems that reinforce the connection between (alphanumeric) information and its binary representation.
-

4. Numbers in Binary

- In this lesson, we will build upon using a decimal numbering system, in order to draw analogies with how numbers can be represented using binary. We will convert between binary and decimal.



5. Large Quantities

- In this lesson, we will explore the prefixes used for measuring size, such as 'kilo-', 'mega-', 'giga-', and 'tera-'. We will revisit digital computing devices using binary digits to represent all information (including programs).

6. Turing's mug

- In this lesson, we will complete a set of tasks followed by a puzzle activity that utilises conversion between binary and decimal.
-



Lesson number	Lesson question	Pupils will learn
1.	App for that	<ul style="list-style-type: none">In this lesson, we will be introduced to the purpose of the unit: to create a mobile app. Over the next two lessons we will develop our first app together "Tappy Tap App" and start by decomposing the problem, using success criteria to help us do this.
2.	Tappy tap app	<ul style="list-style-type: none">In this lesson, we will be introduced to the concept of event-driven programming and applying this paradigm to the app that we started to develop in the previous lesson.
3.	School lab studios	<ul style="list-style-type: none">In this lesson, we will complete our Tappy Tap App by making the score screen. After this, we will then be given a choice of projects to work on to start building our own apps.
4.	User input	<ul style="list-style-type: none">In this lesson, we will explore how user input is captured. We will then start to develop our own apps by decomposing the task into more manageable steps.

5. App development

- In this lesson, we will spend time developing our apps further. We will use our decomposed steps and success criteria to help continue with this project.



6. Project completion

- In this lesson, we will complete and evaluate our app development project. Once our apps are complete, we will evaluate their success, both against our own criteria and by answering a short set of questions.
-



Lesson number	Lesson question	About the lesson
1.	First steps	<p>Pupils will learn</p> <ul style="list-style-type: none">• In this lesson, we will write and execute our first programs in Python. We will go through the basics of displaying messages, assigning values to variables, and receiving input from the keyboard. <p>Guidance warnings</p> <ul style="list-style-type: none">• Contains external content.
2.	Crunching numbers	<p>Pupils will learn</p> <ul style="list-style-type: none">• In this lesson, we will gain a deeper understanding of assignment. We will also explore arithmetic expressions.
3.	At a crossroads	<p>Pupils will learn</p> <ul style="list-style-type: none">• In this lesson, we will learn about randomness and using selection in our Python programs.
4.	More branches	<p>Pupils will learn</p> <ul style="list-style-type: none">• In this lesson, we will learn about multi-branch selection and while loops.

5. Round and round

Pupils will learn

- In this lesson, we will learn how to use a variable as a counter within a loop.



6. Putting it all together

Pupils will learn

- In this lesson, we will extend and improve a guess the number game. This will consolidate the learning that has taken place in this unit of work.
-



Lesson
number

Lesson question

About the lesson

1.

Move, rotate, scale, colour

Pupils will learn

- In this lesson, we will learn about the world of animation. We will also discover how to move, rotate, scale and colour objects in Blender. In this lesson we will create a party monkey and a snowman.

Guidance warnings

- Contains external content.

2.

Animation, names, parenting

Pupils will learn

- In this lesson, we will learn how to create animations in Blender. We will do this by creating a wintery snow scene.

Guidance warnings

- Contains external content.

3. Complex models and colours

Pupils will learn

- In this lesson, we will learn how to make more complex models in Blender. We will adapt a rocket and create our own chairs.

Guidance warnings

- Contains external content.
-

4. Organic modelling

Pupils will learn

- In this lesson, we will learn how to make our models more realistic by using different rendering techniques.

Guidance warnings

- Contains external content.
-

5. Lights, camera, render

Pupils will learn

- In this lesson, we will learn more about rendering and how to add different lighting effects to our animations.

Guidance warnings

- Contains external content.
-



6.

Project

Pupils will learn

- In this lesson, we will use all of the skills that we have developed in this unit to make our own short animations.

Guidance warnings

- Contains external content.
-





Lesson number	Lesson question	Pupils will learn
1.	Delving into data science	<ul style="list-style-type: none">In this lesson we will be introduced to data science, and in particular, how visualising data can help us to provide insights that may not be as obvious when looking at raw data.
2.	Global data	<ul style="list-style-type: none">In this lesson, we will explore how ever-improving advances in technology have made it more feasible to collect, store, and analyse much larger datasets than previously. We will then look at global data sets.
3.	Statistical state of mind	<ul style="list-style-type: none">In this lesson, we will learn about the investigative cycle PPDAC (problem, plan, data, analyse, conclusion) and apply part of this cycle to a data set about roller coasters.
4.	Data for action	<ul style="list-style-type: none">In this lesson, we will investigate a problem that we can solve by ourselves. We will take our first steps towards this by working through the earlier stages of the PPDAC investigative cycle.

5. Clean it up

- In this lesson, we will continue to develop our understanding of the investigative cycle by working through the data and analysis steps of the PPDAC cycle. We will upload and cleanse our data before uploading it into the CODAP platform to start our analyses.



6. Make a change

- In this lesson, we will complete work through the final steps of the PPDAC cycle (analysis and conclusions) and by the end of the lesson we will have used data to make a case for positive change where we live.
-



Lesson
number

Lesson question

Pupils will learn

1.

You and your data

- In this lesson, we will explore why our data is valuable to others and why it is important to keep it safe. We will look at what data companies, such as social media platforms, collect about us and what they use it for. We will also look at how the law tries to keep our data safe.

2.

Social engineering

- In this lesson, we will become aware of how humans can be a weak point in the system. We will look at the social engineering tactics deployed by cybercriminals to dupe users into giving away data that could lead to further crime.

3.

Script kiddies

- In this lesson, we will explore the concept of hacking and the techniques used by hackers to exploit computer systems. We will also look at the consequences of hacking and what laws are in place to act as a deterrent.

4. Rise of the bots

- In this lesson, we will learn about malware and the different categories of malware, as well as understanding how they work and the damage they can do.



5. There's no place like 127.0.0.1

- In this lesson, we will look at the risks that cyberthreats pose to a network, followed by an exploration of some common methods of defending the network against attacks, such as firewalls and anti-malware.

6. Under attack

- In this lesson, we will apply the knowledge that we have gained in this unit by playing a game called Under Attack where we will have to defend a network from incoming threats. We will also research the available career choices in cyber defence.
-



Lesson
number

Lesson question

About the lesson

1.

Binary Mosaic

Pupils will learn

- In this lesson, we will create digital mosaics pixel by pixel, and experience how an image composed of individual coloured elements can correspond to a sequence of binary digits.

2.

A splash of colour

Pupils will learn

- In this lesson, we will explore the most common representation of colour as a mixture of red, green, and blue: the level of each of these colours in the mixture is represented using an 8-bit sequence.

3.

Collage

Pupils will learn

- In this lesson, we will use appropriate software to perform a range of image manipulation functions and complete specific tasks and challenges.

Guidance warnings

- Contains external content.

4. Good vibrations

Pupils will learn

- In this lesson, we will familiarise ourselves with the basic concepts necessary for understanding any analogue to digital conversion; samples, sampling rate, and sample size.

Guidance warnings

- Contains external content.



5. Sonic playground

Pupils will learn

- In this lesson, we will revisit the digitisation process, in order to understand how the sampling rate and the sample size affect the size and quality of the representation. We will also use a sound editing program.

Guidance warnings

- Contains external content.

6. Always another way

Pupils will learn

- In this lesson, we will be introduced to alternative (symbolic) representations for images and sound, such as vector graphics and MIDI music. We will also be introduced to what compression is and why it is necessary.

Guidance warnings

- Contains external content.
-



Lesson
number

Lesson question

About the lesson

1.

Warm up

Pupils will learn

- In this lesson we will revisit Python. We will make sure that we can read and create simple programs that use selection, and we will introduce lists.

Guidance warnings

- Contains external content.

2.

Playlist

Pupils will learn

- In this lesson, we will identify the operations that are commonly performed on lists: adding, removing, or modifying items; locating or counting occurrences of particular items, etc.

3.

In a while, crocodile

Pupils will learn

- In this lesson, we will investigate iteration using while loops, offering a chance to retrieve and apply relevant knowledge. In the first activities, we will practise using list operations in iterative contexts.

4. The famous for

Pupils will learn

- In this lesson, we will use a for-loop to iterate over list items. We will study a range of examples before moving on to apply what we have learnt to similar tasks.



5. Make a thing

Pupils will learn

- In this lesson, we will complete a mini-project in Python where we will create a planetary quiz. It will allow us to increase our independence in Python programming.

6. Wrap up

Pupils will learn

- In this lesson, we will finish our planetary quiz project. It will allow us to further develop our independence in Python programming.
-



Lesson number	Lesson question	About the lesson
1.	Hello physical world	<p>Pupils will learn</p> <ul style="list-style-type: none">• In this lesson, we will learn about the micro:bit. We will also write and execute our first Python programs on the micro:bit using simple coding patterns.
2.	Bare bones	<p>Pupils will learn</p> <ul style="list-style-type: none">• In this lesson, we will explore micro:bit hardware components. We will also write and execute our first Python programs on the micro:bit.
3.	Making connections (Part 1)	<p>Pupils will learn</p> <ul style="list-style-type: none">• In this lesson, we will experiment with examples of using the micro:bit's General-Purpose Input Output (GPIO) pins to connect it to external hardware components, such as LEDs and speakers.

4. Making connections (Part 2)

Pupils will learn

- In this lesson, we will experiment with examples of using the micro:bit's General-Purpose Input Output (GPIO) pins to connect it to more external hardware components.



5. Mixing it up!

Pupils will learn

- In this lesson, we will develop a guess the number game that can be played on the micro:bit. The game will utilise gestures for input, and it will utilise sound and light for output.

Guidance warnings

- Contains external content.
-

4. Learn More



Contents

1. Coherence and flexibility
2. Knowledge organisation
3. Inclusive and ambitious
4. Application through software
5. Motivation through learning
6. Secondary computing curriculum themes
7. Secondary computing unit summaries

1. Coherence and flexibility

The computing curriculum is structured in units. For the units to be coherent, the lessons within them must be taught in order. However, the curriculum is flexible in terms of the order in which you teach units within a year group, except for programming, where concepts and skills rely on prior knowledge and experiences.

2. Knowledge organisation



The curriculum applies to the National Centre for Computing Education's computing taxonomy. This has been developed through a review of the KS1-4 computing programme of study, and the GCSE and A Level computer science specifications, across all awarding bodies. All learning outcomes can be described through a top-level taxonomy of ten topics, ordered alphabetically as follows:

- Algorithms
- Computer Networks
- Computer Systems
- Creating Media
- Data & Information
- Design & Development
- Effective use of tools
- Impact of technology
- Programming
- Safety & Security

The taxonomy categorises and organises content into strands which encapsulate the discipline. Whilst all strands are present at all phases, they are not always taught explicitly.

3. Inclusive and ambitious

We want Oak to be able to support all children. Our units will be pitched so that pupils with different starting points can access them. Our lessons will be sequenced so that each builds on prior learning. Our activities will be scaffolded so all children can succeed. We use unplugged or real world activities to unpack difficult concepts in computing as part of a semantic wave of learning. We also use a range of scaffolding approaches when teaching programming, ranging from copying code, exploring some commands or functions, fixing code with bugs to solving specific problems with code.

4. Application through software

We need pupils to be thinking during their lessons - both to engage with the subject and to strengthen memory of what is being learnt. Some of our lessons require practical application of concepts and skills on a computer using appropriate software. We supplement our lessons with guidance on how to use such software to reinforce the learning from the lesson.



5. Motivation through learning

We believe that computing is inherently interesting, and seek to motivate pupils through the subject matter. Where possible, we draw on real world experiences to provide an engaging viewpoint on computing concepts. Every pupil should have the opportunity to implement their skills and knowledge and ultimately feel a sense of achievement. We provide opportunities for pupils to be creative and solve problems by building their own programmes and applications for example.

6. Secondary computing curriculum themes

Here you can find all of the key stage 3 computing units organised by their curriculum theme.

Algorithms

- Programming essentials in Scratch: part I (year 7)
- Programming essentials in Scratch: part II (year 7)
- Intro to Python programming (year 8)
- Mobile app development (year 8)
- Python programming with sequences of data (year 9)
- Representations: going audiovisual (year 9)

Programming

- Spreadsheets (year 7)
- Programming essentials in Scratch: part I (year 7)
- Programming essentials in Scratch: part II (year 7)
- Computing systems (year 8)



- Intro to Python programming (year 8)
- Mobile app development (year 8)
- Cybersecurity (year 8)
- Python programming with sequences of data (year 8)
- Physical Computing Programming (year 9)
- 3D graphics, animation, video editing (year 9)

Data and Information

- Spreadsheets (year 7)
- Design Vector Graphics (year 8)
- Computing systems (year 8)
- Representations: from clay to silicon (year 8)
- Cybersecurity (year 9)
- Representations: going audiovisual (year 9)
- Data Science (year 9)
- Physical Computing Programming (year 9)

Computing Systems

- Networks: from semaphores to the Internet
- Computing systems
- Networks 2
- Intro to Python programming
- Representations: from clay to silicon

- Cybersecurity
- Representations: going audiovisual
- Physical Computing Programming



Network

- Networks: from semaphores to the Internet
- Networks 2
- Cybersecurity

Creating Media

- Impact of Technology - Collaborating Online Respectfully
- Gaining support for a cause
- Design Vector Graphics
- Representations: going audiovisual
- Data Science
- 3D graphics, animation, video editing

Design and Development

- Programming essentials in Scratch: part I
- Programming essentials in Scratch: part II
- Impact of Technology - Collaborating Online Respectfully
- Gaining support for a cause
- Design Vector Graphics
- Mobile app development

- Cybersecurity
- Python programming with sequences of data



Effective use of tools

- Spreadsheets
- Impact of Technology - Collaborating Online Respectfully
- Gaining support for a cause
- Design Vector Graphics
- Mobile app development
- Cybersecurity
- Representations: going audiovisual
- 3D graphics, animation, video editing

Impact of Technology

- Networks: from semaphores to the Internet
- Impact of Technology - Collaborating Online Respectfully
- Gaining support for a cause
- Computing systems
- Mobile app development
- Cybersecurity
- Representations: going audiovisual
- Data Science

Safety and Security

- Networks: from semaphores to the Internet
- Impact of Technology - Collaborating Online Respectfully
- Cybersecurity
- Data Science



7. Key stage 3 computing unit summaries

Here you can find short summaries of all the units in the key stage 3 computing course.

Unit title	Year group	Unit summary
Collaborating Online Respectfully	Year 7	<ul style="list-style-type: none"> • Lab introduction • Responsible Use • Cyberbullying • Security • Presentations
Media Unit: Gain support for a cause	Year 7	<ul style="list-style-type: none"> • Word Processing • Licensing • Plagiarism • Source Credibility • Blog Creation
Networks 1	Year 7	<ul style="list-style-type: none"> • Networks • Internet



		<ul style="list-style-type: none">• Web• Cybersecurity• Safety
Spreadsheets	Year 7	<ul style="list-style-type: none">• Basic Formulas• Basic Functions• Formtating (incl. conditional)
Programming 1	Year 7	<ul style="list-style-type: none">• Scratch• PRIMM• Form• Assessment• Misconceptions• Reinforce Concepts
Programming 2	Year 7	<ul style="list-style-type: none">• Scratch• Lists• Subroutines• Deeper dive
Media Unit	Year 8	<ul style="list-style-type: none">• E.g. vector graphics (inkscape)
Computing Systems	Year 8	<ul style="list-style-type: none">• Programs• Hardware components



		<ul style="list-style-type: none">• Logic• Gentrle overview of AI and ML
Networks 2	Year 8	<ul style="list-style-type: none">• Web• HTML, CSS• Search
Representations 1	Year 8	<ul style="list-style-type: none">• Representations• Binary• Numbers• Text• Units
Programming 3	Year 8	<ul style="list-style-type: none">• AppLab• Pair• Programming• Product Design• GUI Design
Programming 4	Year 8	Intro to Python
Media Unit	Year 9	<ul style="list-style-type: none">• E.g. animations (blender)• E.g. video editing

Data Science	Year 9	<ul style="list-style-type: none">• Global and local data sets• Interrogating, interpreting and visualising data following the investigative cycle
Cyber Security	Year 9	<ul style="list-style-type: none">• GDPR• Social Engineering• Network security• Malware and hacking• Brute Force, DDOS
Representations 2	Year 9	<ul style="list-style-type: none">• Images• Sounds• Manipulation
Programming 5	Year 9	<ul style="list-style-type: none">• Lists and strings in Python
Programming 6	Year 9	<ul style="list-style-type: none">• Physical computing• Python on the micro:bit• Project design

