Implementing the Teach Computing Curriculum

Session 1: Design and Structure of the Teach Computing Curriculum

National Centre for Computing Education

Introductions

Introduce yourself to the other participants on your table:

How long have you been using the TCC?

How long have you been leading computing?

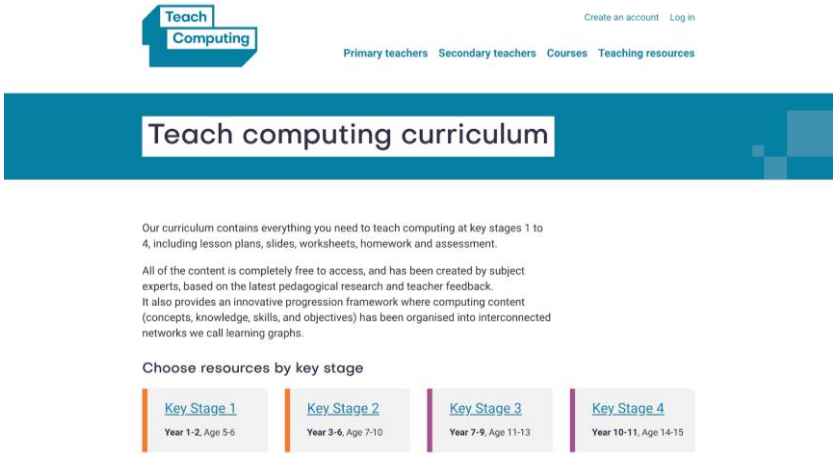
What do you hope to gain from this course?

Session 1: Design and Structure

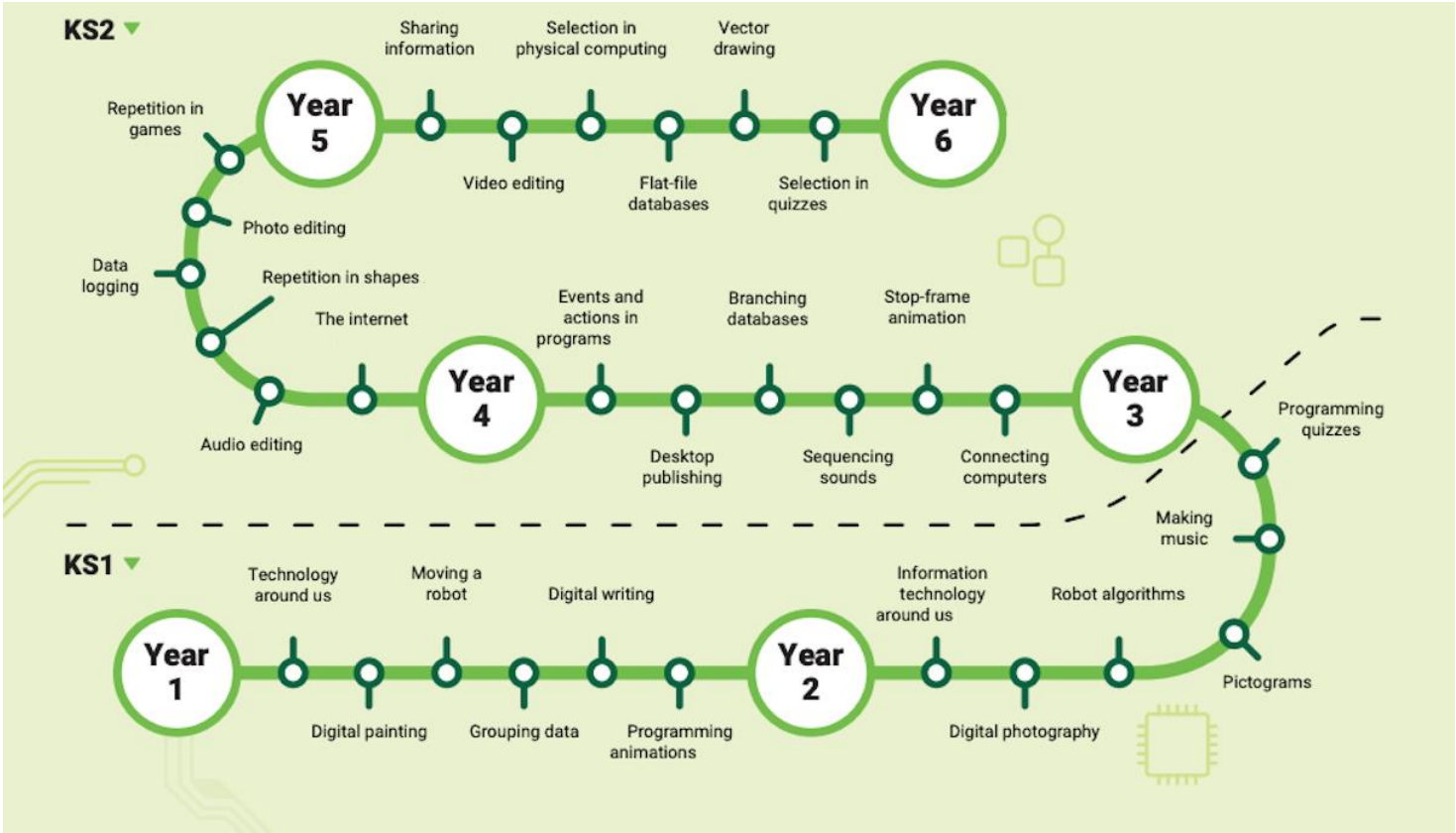
- understand the structure of Teach Computing Curriculum
- know how the Teach Computing Curriculum meets the National Curriculum objectives
- be aware of the full offer of the Teach Computing Curriculum and the documents that support the leadership of this scheme of work

Teach Computing Curriculum

- enhances provision and reduce workloads for teachers.
- everything you need to teach computing at primary
- mapped to the national computing curriculum
- created by subject experts



www.teachcomputing.org/curriculum



[Curriculum Journey Poster]

Unpicking the curriculum

The Teach Computing Curriculum consists of 6 units per year, which fall into the following four categories. Can you work out which area each unit come under?

Computing Systems and Networks	Creating Media	Data and Information	Programming

Computing Systems and Networks

Did you identify all of the units in this area?

- technology around us
- connecting computers
- sharing Information
- the Internet
- information technology around us
- communication

Take a moment to try and order these from Year 1 to Year 6, thinking about the progression of content!

Technology Around Us
Information Technology Around Us
Connecting Computers
The Internet
Sharing Information
Communication

How do units link progressively?

Computing Systems and Networks
Strand Overview

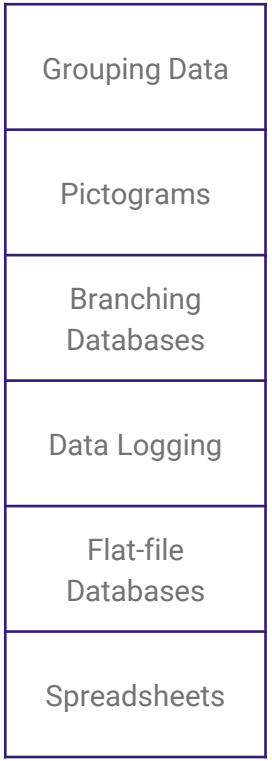
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Technology Around Us 6 hrs Recognising technology all around us and beginning to use keyboard and mouse.	**Information Technology Around Us** 6 hrs Recognising that there are peripherals that work with devices.	**Connecting Computers** 6 hrs Understand the input processing output model. Recognise computers are connected within a network	**What is the Internet?** 6 hrs Recognising the internet as a network of networks Internet fundamentals	**Sharing Information** 6 hrs How computing systems share information How the internet shares information Collaboration	**Communication** 6 hrs Search Engines Websites Online Communication

Data and Information

Did you identify all of the units in this area?

- pictograms
- spreadsheets
- data logging
- grouping data
- branching databases
- flat-file databases

Take a moment to try and order these from Year 1 to Year 6, thinking about the progression of content!



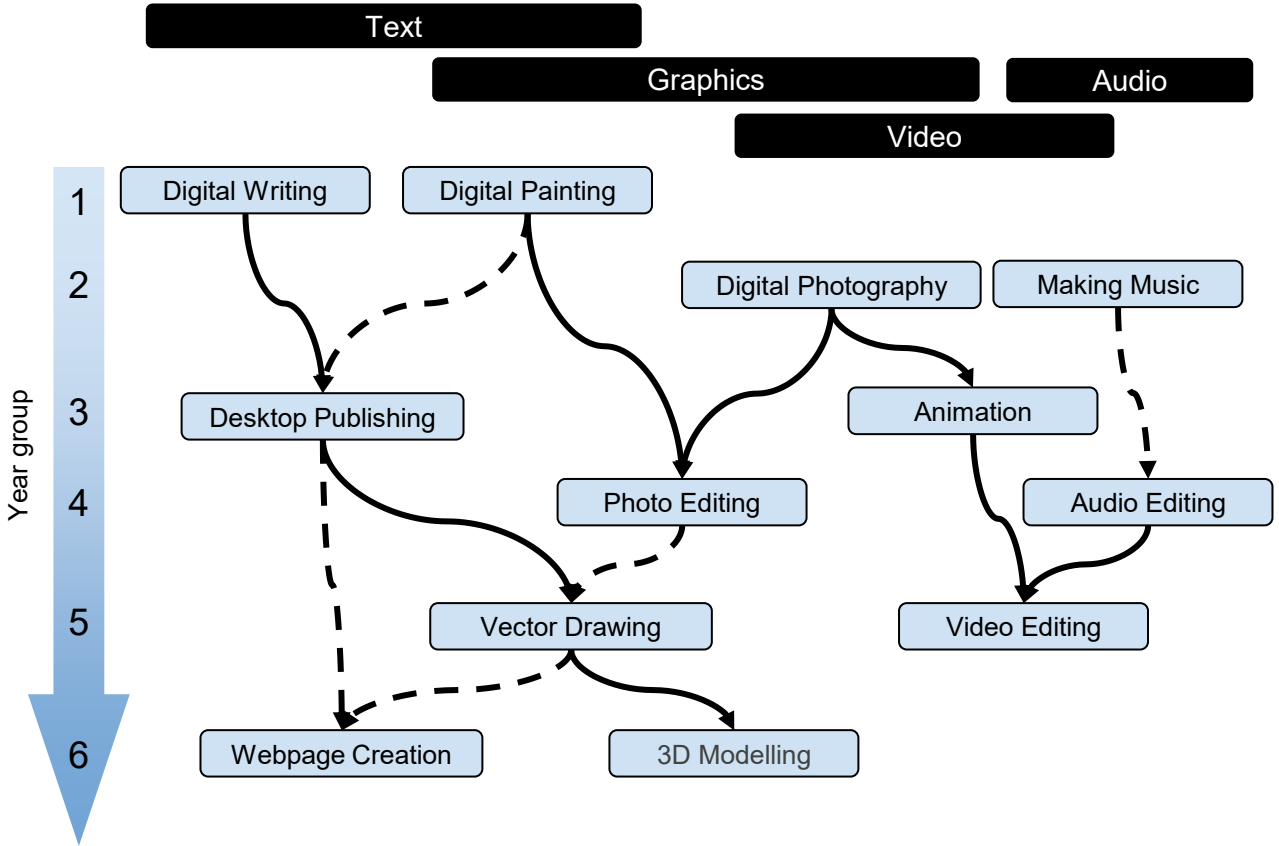
Creating Media

Can you order these units progressively?

- digital writing
- making music
- stop frame animation
- photo editing
- video editing
- web page design
- digital painting
- digital photographs
- desktop publishing
- audio editing
- vector drawing
- 3D modelling

Year 1	Digital Painting	Digital Writing
Year 2	Digital Photographs	Making Music
Year 3	Desktop Publishing	Stop Frame Animation
Year 4	Audio Editing	Photo Editing
Year 5	Vector Drawing	Video Editing
Year 6	3D Modelling	Web Page Design

Creating Media Progression



Programming

This is where it gets a little trickier so we will look at it together.

Year 1	Moving a Robot	Introduction to animation
Year 2	Robot algorithms	Quizzes
Year 3	Sequence in music	Events and actions
Year 4	Repetition in shapes	Repetition in games
Year 5	Selection in physical computing	Selection in quizzes
Year 6	Variables in games	Sensing

Programming in KS1

Programming A:
Beebots

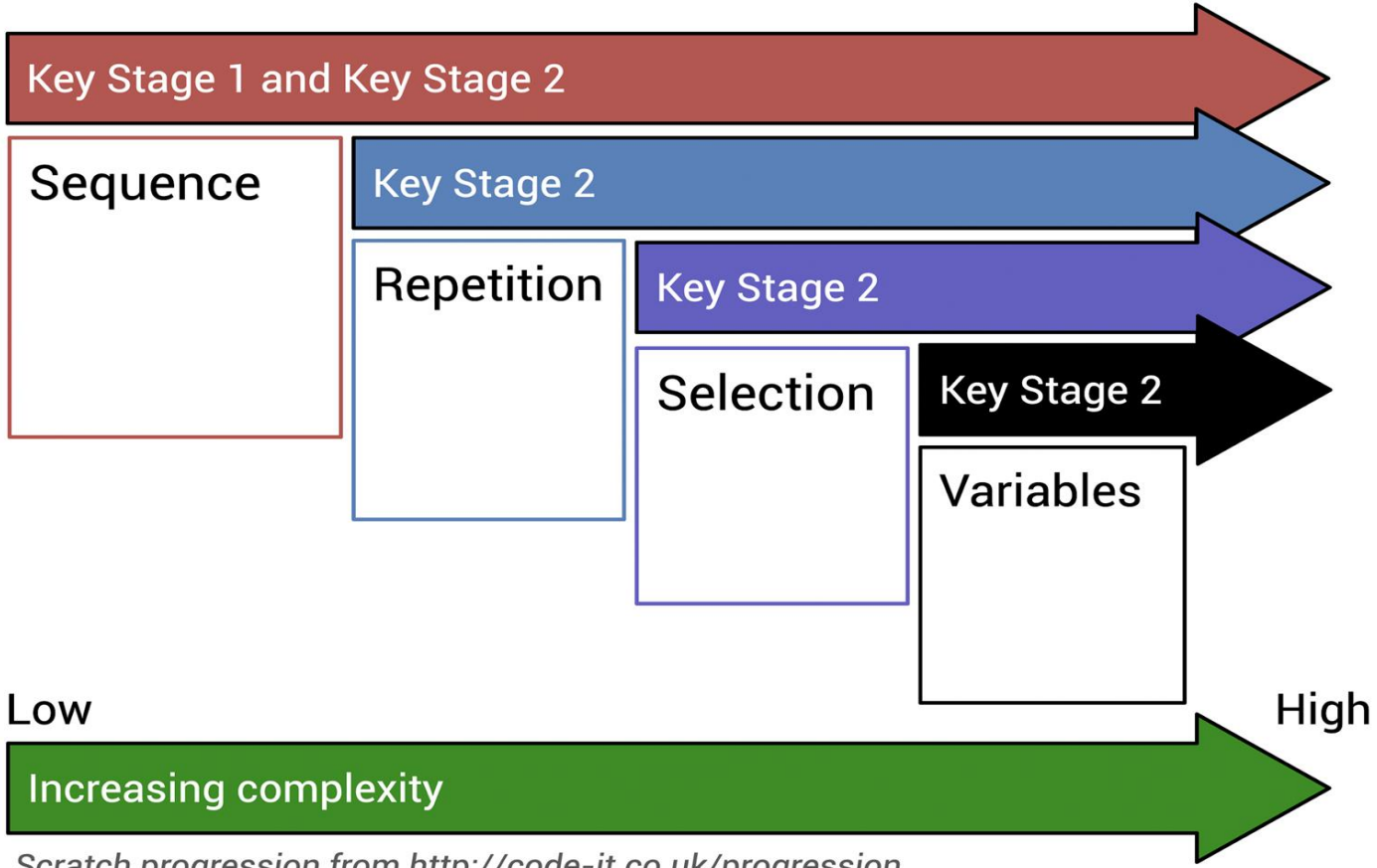
Programming B:
Scratch jr

Programming in KS2

Key Stage 2 National Curriculum Objective:

*Use **sequence**, **selection**, and **repetition** in programs; work with **variables** and various forms of **input** and **output***

Progression across Key Stage 2



Scratch progression from http://code-it.co.uk/progression

Progression across Key Stage 2

Year 3

- Programming A – Sequence in music
- Programming B – Events and actions

Year 4

- Programming A – Repetition in shapes
- Programming B – Repetition in games

Year 5

- Programming A – Selection in physical computing
- Programming B – Selection in quizzes

Year 6

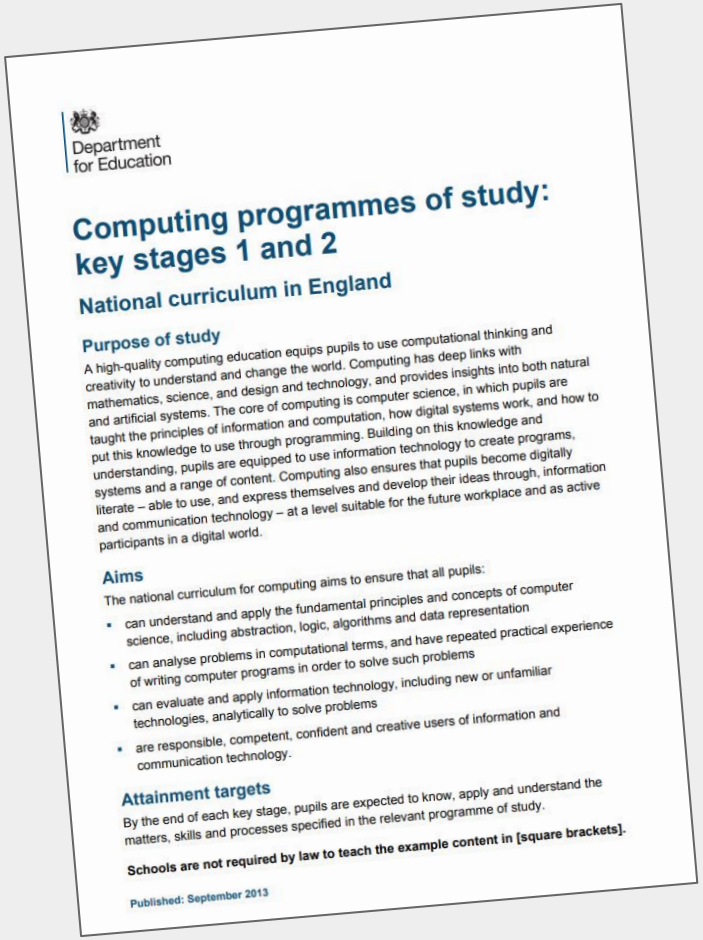
- Programming A – Variables in games
- Programming B – Sensing

	Computing Systems and Networks	Data and Information	Programming A	Programming B	Creating Media	Creating Media
Year 1	Technology Around Us	Grouping Data	Moving a Robot	Introduction to animation	Digital Painting	Digital Writing
Year 2	Information Technology Around Us	Pictograms	Robot algorithms	Quizzes	Digital Photographs	Making Music
Year 3	Connecting Computers	Branching Databases	Sequence in music	Events and actions	Desktop Publishing	Stop Frame Animation
Year 4	The Internet	Data Logging	Repetition in shapes	Repetition in games	Audio Editing	Photo Editing
Year 5	Sharing Information	Flat-file Databases	Selection in physical computing	Selection in quizzes	Vector Drawing	Video Editing
Year 6	Communication	Spreadsheets	Variables in games	Sensing	3D Modelling	Web Page Design

Computing Curriculum 2014

Do we understand the expectations and statements of the National Curriculum?

How do we know we have full coverage of the National Curriculum?



Department for Education

Computing programmes of study: key stages 1 and 2

National curriculum in England

Purpose of study

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.

Schools are not required by law to teach the example content in [square brackets].

Published: September 2013

Understanding the National Curriculum

The Computing Curriculum can be split into three key strands.

Computer Science	Information Technology	Digital Literacy
How computers and computer systems work & how they are designed and programmed	Looking at technology in our lives and the purposeful use of existing programs to develop products and solutions	The skills, knowledge and understanding needed in order to participate fully and safely in an increasingly digital world
Foundations	Applications	Implications

Can you map the Key Stage Objectives to the 3 Strands?

Where do the TCC units fit now?

What it covers?

Computing Systems and Networks

recognise common uses of information technology beyond school

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

Creating Media

use technology purposefully to create, organise, store, manipulate and retrieve 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

Creating Media

use technology purposefully to create, manipulate and retrieve 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

Data and Information

use technology purposefully to organise and store digital content

select, use and combine a variety of software (including internet services) on a range of digital devices to accomplish given goals, including collecting, analysing, evaluating and presenting data and information

Programming

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

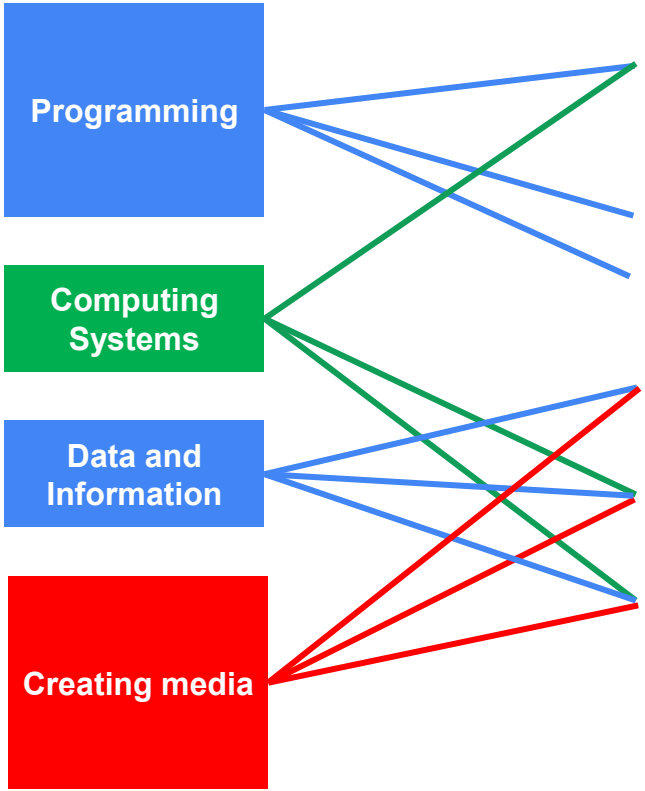
Programming

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

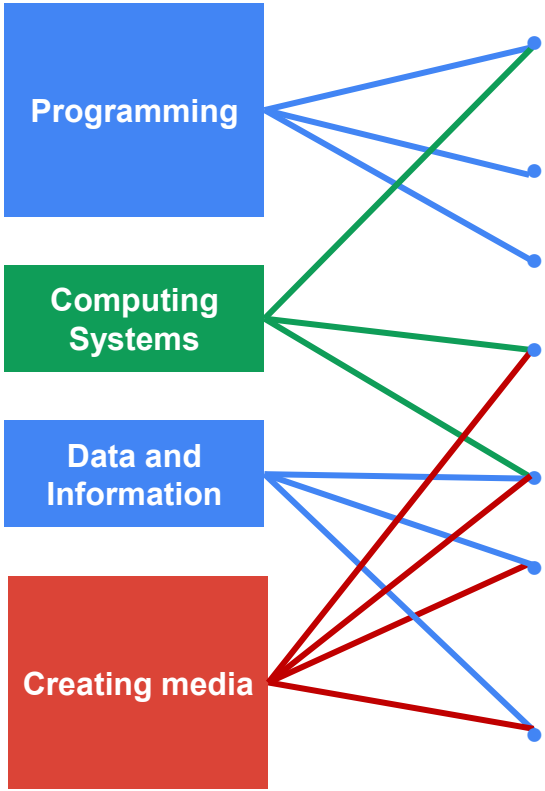
Online Safety
&
Effective Use of Tools

National Curriculum KS1



- 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

National Curriculum KS2



- 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

National Curriculum Coverage — Years 3 and 4	3.1 Connecting computers	3.2 Stop-frame animation	3.3 Sequencing sounds	3.4 Branching databases	3.5 Desktop publishing	3.6 Events and actions in programs	4.1 The Internet	4.2 Audio editing	4.3 Repetition in shapes	4.4 Data logging	4.5 Photo editing	4.6 Repetition in games
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												

Teacher guide

What about Online Safety?

Computing Systems and Networks

recognise common uses of information technology beyond school

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

Creating Media

use technology purposefully to create, organise, store, manipulate and retrieve digital content

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Online Safety
&
Effective Use of Tools

Whose responsibility is it to teach online safety?

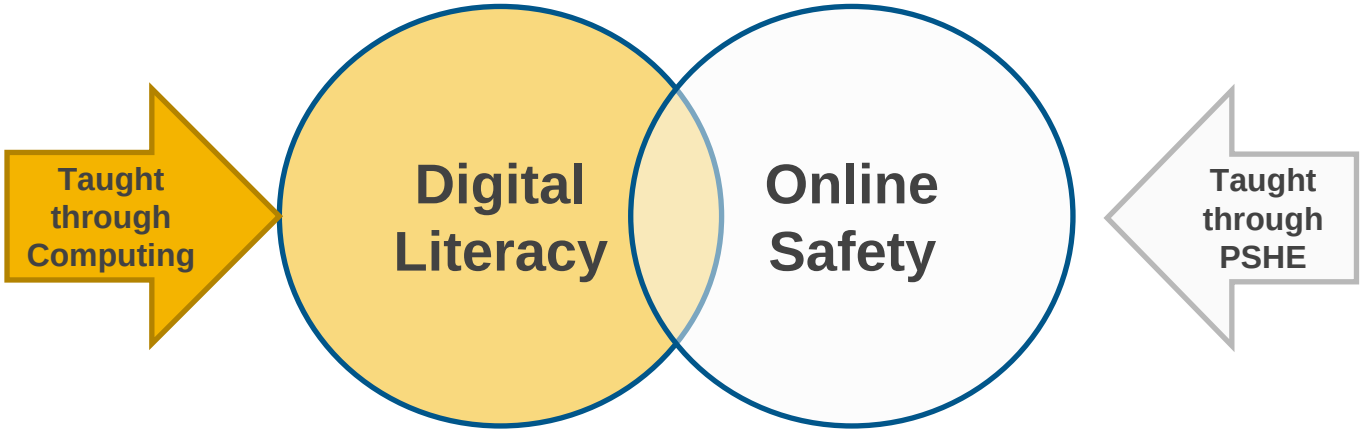
Where does it lie in the primary curriculum?

Digital Literacy

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.

National Curriculum Computing Purpose of Study (2014)

Digital Literacy & Online Safety

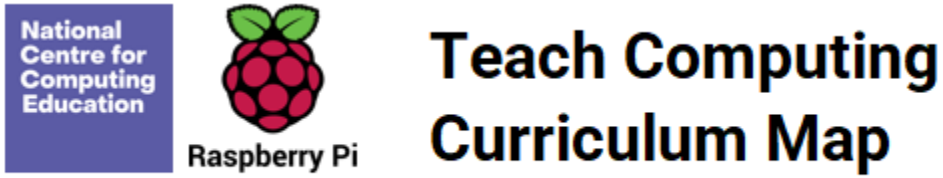


Online Safety is a whole school issue*

*Education for a Connected World, UKCCIS (2018)

Teach Computing Curriculum Maps

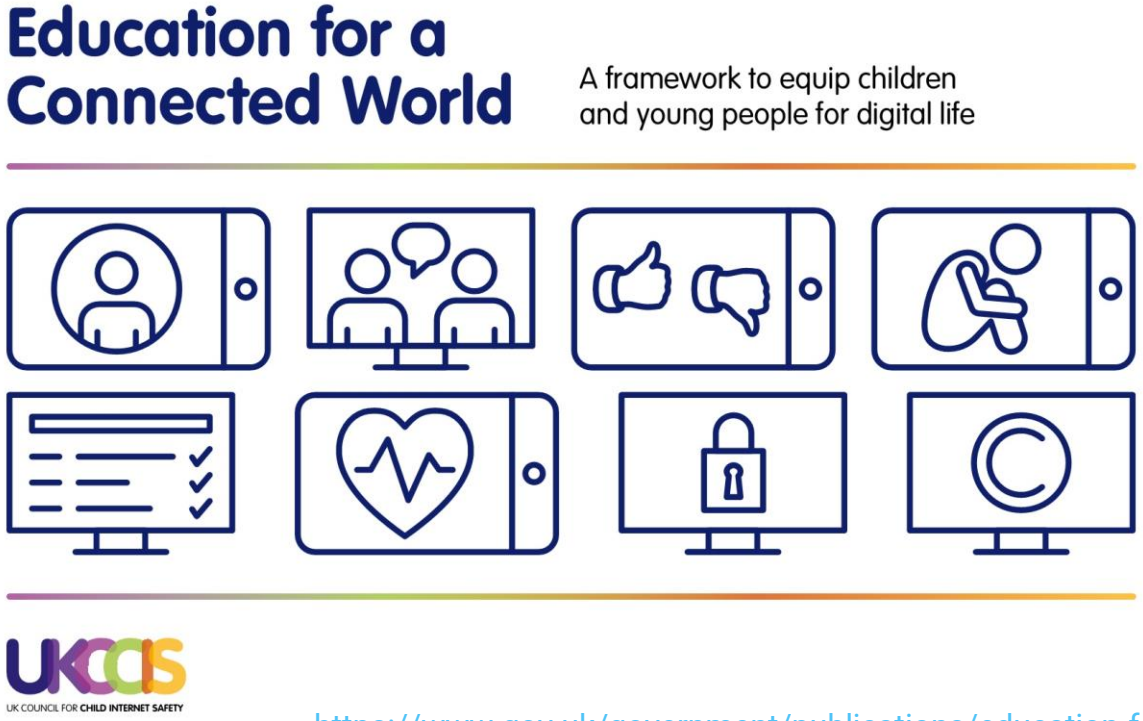
These documents provide an overview of the curriculum for each Key Stage.



Key Stage 1: https://teachcomputing.org/curriculum/key-stage-1

Key Stage 2: https://teachcomputing.org/curriculum/key-stage-2

Education for a Connected World



https://www.gov.uk/government/publications/education-for-a-connected-world

Education for a Connected World

Unit Overviews:

Curriculum links

National curriculum links

- Recognise common uses of information technology beyond school
- Use technology purposefully to create, organise, store, manipulate, and retrieve digital content
- 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.

Education for a Connected World links

Health, well-being and lifestyle

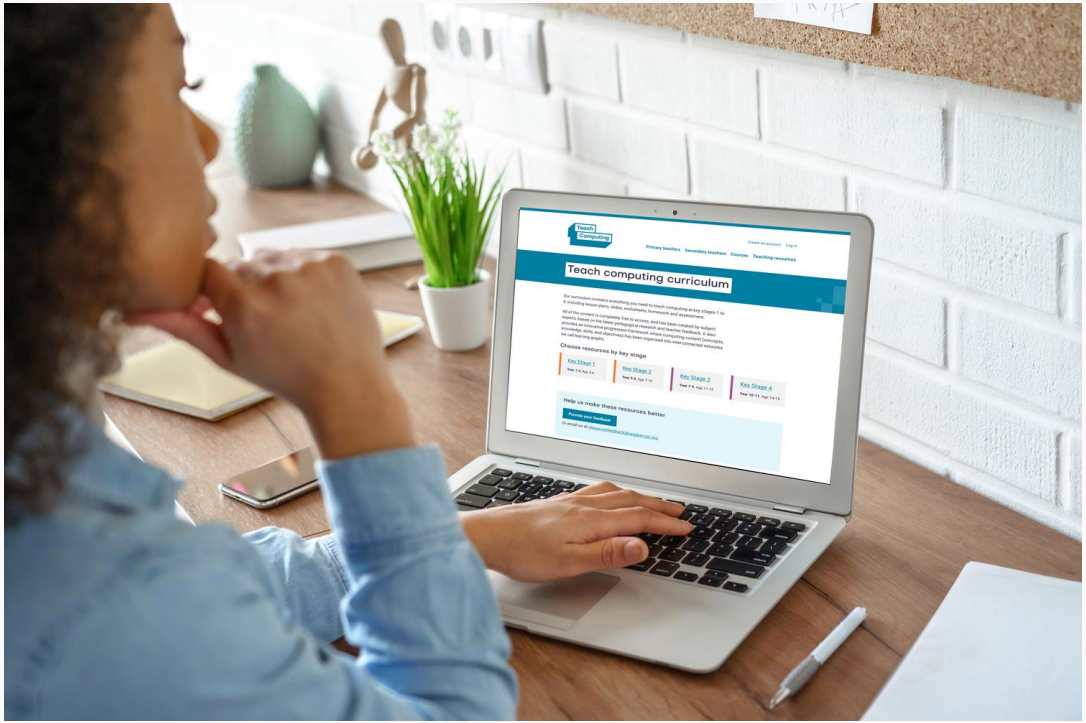
- I can identify rules that help keep us safe and healthy in and beyond the home when using technology
- I can give some simple examples

Copyright and ownership

- I know that the work I create belongs to me
- I can name my work so that others know it belongs to me

Curriculum Maps:

What else is included..?



Each unit includes:

Lesson Plans

Slides

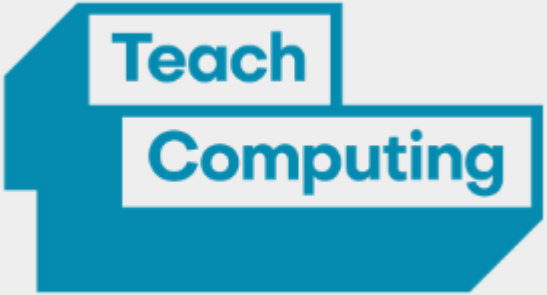
Activity Sheets

Progression mapping

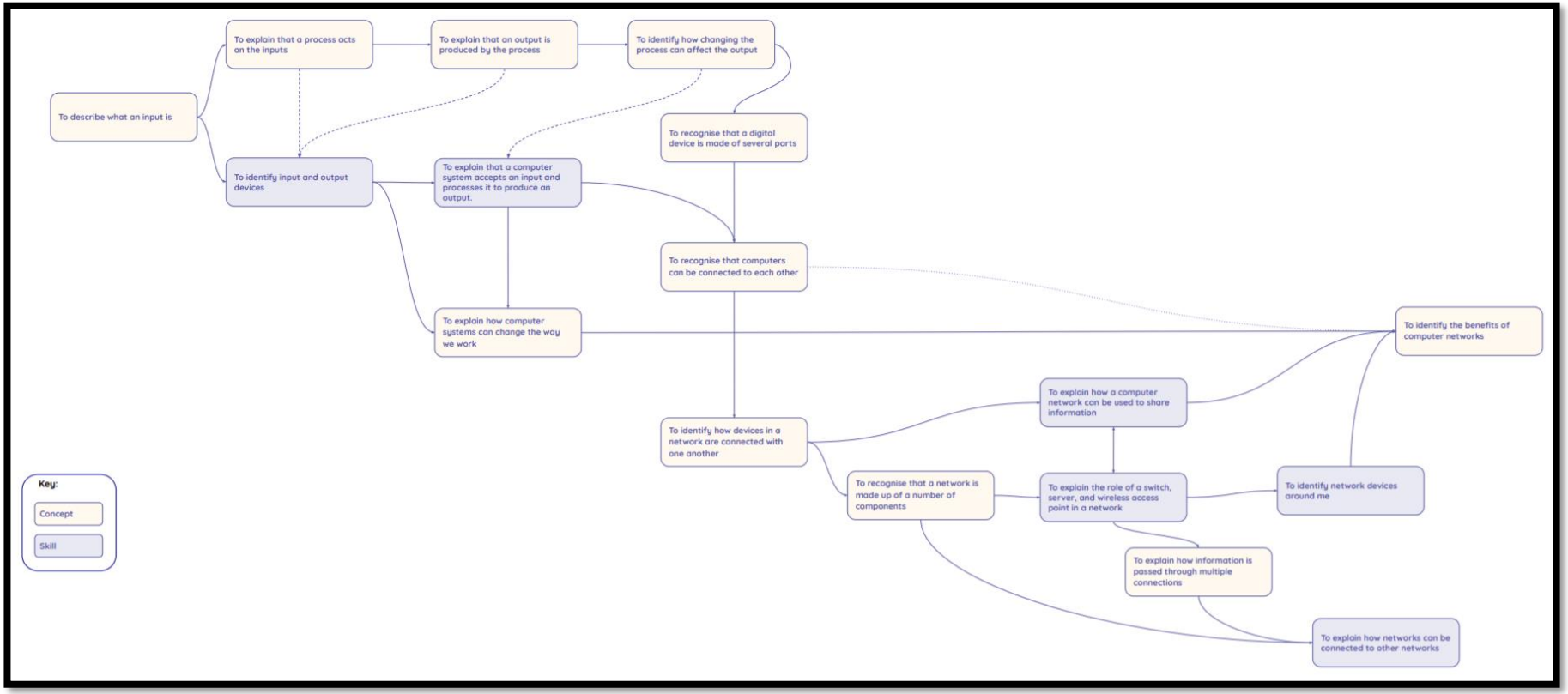
Pedagogy

Homework (KS2)

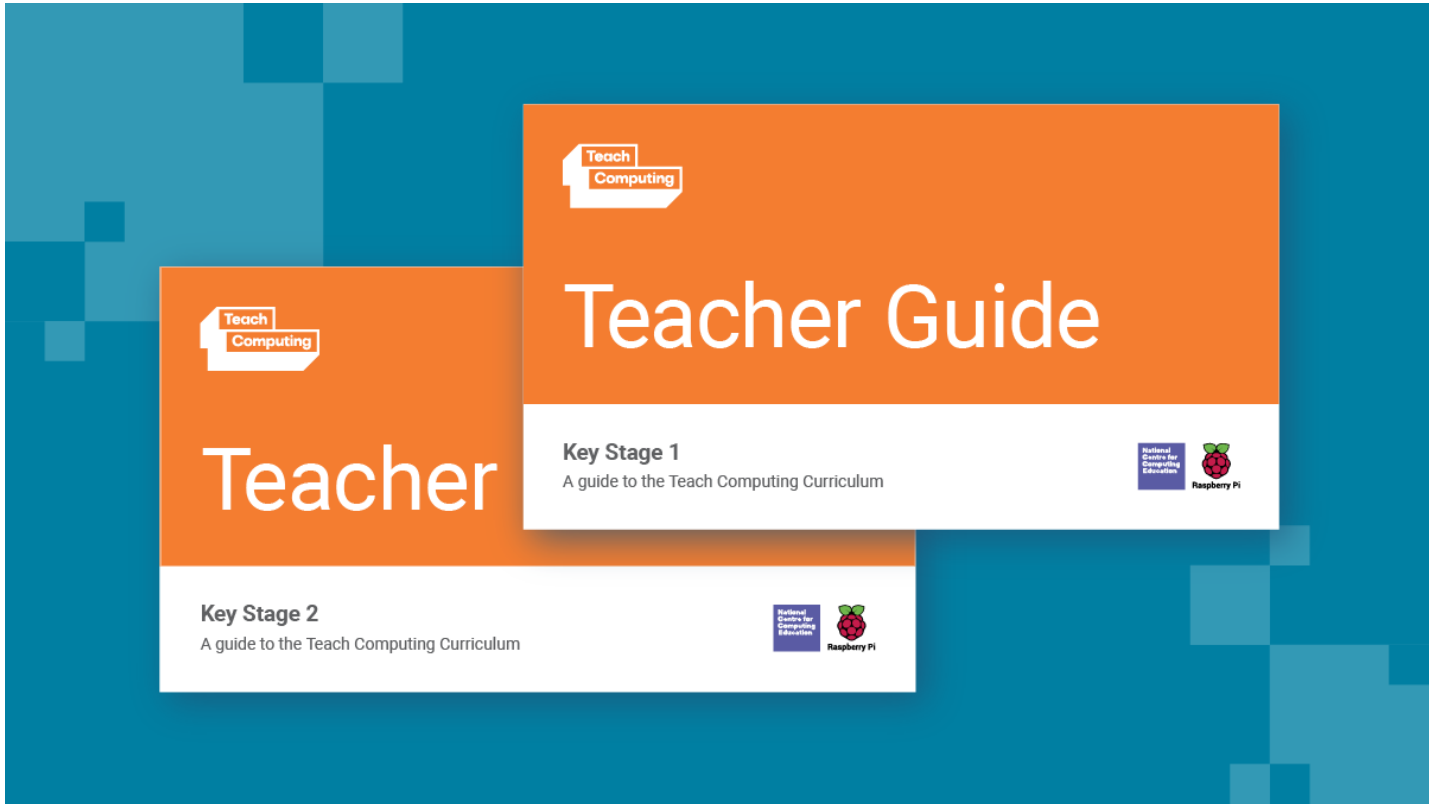
Assessment (KS2)



Learning Graphs



Teacher Guides



Cross Curricular Links

Unit Overviews:

Curriculum links

National curriculum links

KS1 Computing

- Use technology purposefully to create, organise, store, manipulate, and retrieve digital content

KS1 Art and Design

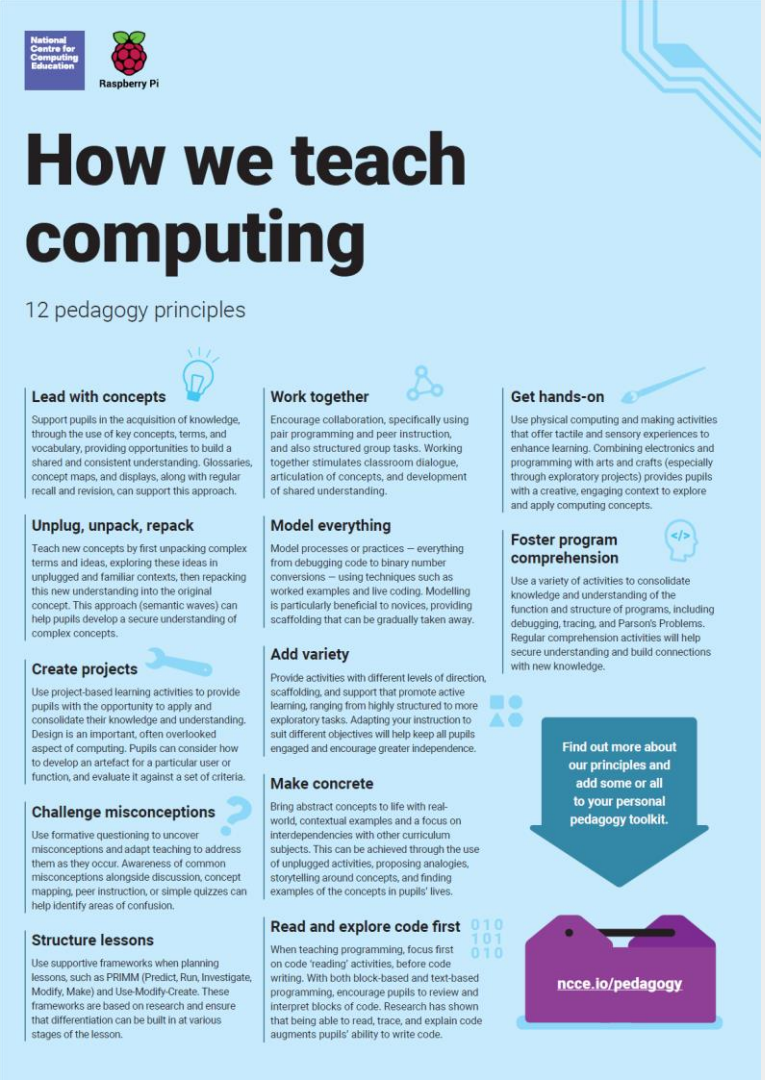
Pupils should be taught:

- To develop a wide range of art and design techniques in using colour, pattern, texture, line, shape, form, and space
- About the work of a range of artists, craft makers, and designers, describing the differences and similarities between different practices and disciplines and making links to their own work

Curriculum Maps:

Underpinned by pedagogy

https://teachcomputing.org/pedagogy



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Any Questions?