Computing Curriculum Program of Study

Key stage 1

- **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.**

Note!
The new Computing curriculum still contain ideas from the old ICT curriculum. Everything highlighted in blue are the changes introduced with the New Computing Curriculum.
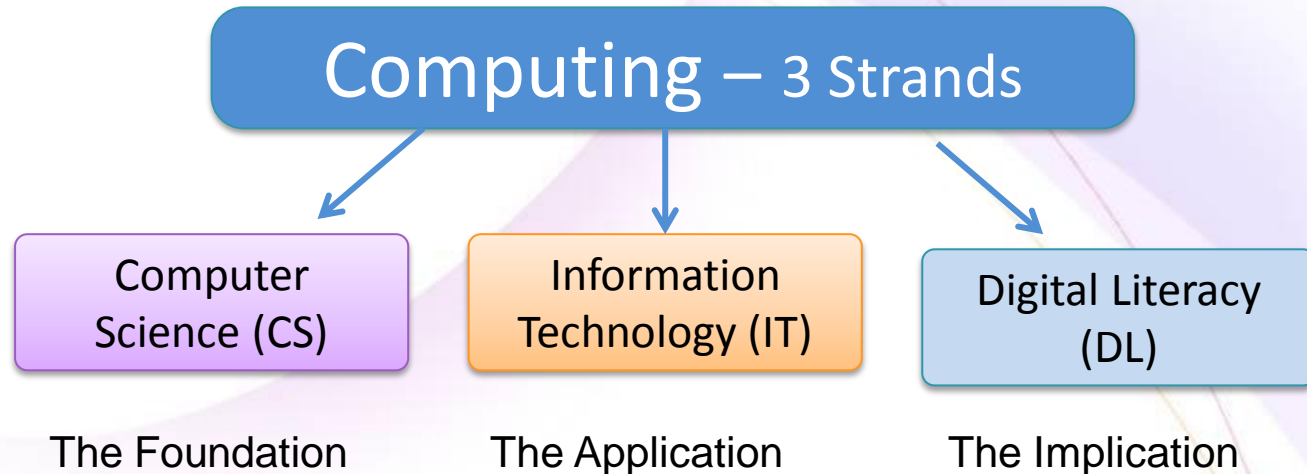
Key Stage 2

- 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 effectivel**y, 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.**

Computing Program of Study by Strand

	KS1	KS2
CS	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	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 Appreciate how [search] results are selected and ranked
IT	Use technology purposefully to create, organise, store, manipulate and retrieve digital content	Use search technologies effectively 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
DL	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	Understand the opportunities [networks] offer for communication and collaboration Be discerning in evaluating digital content Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact

Computing Strands?

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                    │   Computing – 3 Strands      │
                    └─────────────────────────────┘
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Computer Science (CS)	Information Technology (IT)	Digital Literacy (DL)
The Foundation	The Application	The Implication

- 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.

DfE Statutory Guidance – Computing programmes of Study Key Stages 1 and 2

Computing Strands continued.....

Programming

Code

Download and Install

Designing

Solve Problems

Computer Science

Cloud

Internet

Network

Systems

Solve problems

I.T.

Software running

Hardware

Digital Literacy

Applying knowledge, skills, understanding

Communication, Collaboration

Text, Images, Video, Audio

Find things out, Solve problems

e-safety

Safe and responsible use

Legal and ethical *surfing!*

Behaviours

Assessment

- No NC levels

- PoS sets out what all children should be taught by the end of each Key Stage

- Schools able to introduce own formats for assessment

- See CAS guide for assessment and progression ideas

Assessment Framework by Band

	CS	IT	DL
KS1 - 1	Understand what algorithms are Create simple programs	Use technology purposefully to create digital content Use technology purposefully to store digital content Use technology purposefully to retrieve digital content	Use technology safely Keep personal information private Recognise common uses of information technology beyond school
KS1 - 2	Understand that algorithms are implemented as programs on digital devices Understand that programs execute by following precise and unambiguous instructions Debug simple programs Use logical reasoning to predict the behaviour of simple programs	Use technology purposefully to organise digital content Use technology purposefully to manipulate digital content	Use technology respectfully Identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies
KS2 -3	Write programs that accomplish specific goals Use sequence in programs Work with various forms of input Work with various forms of output	Use search technologies effectively Use a variety of software to accomplish given goals Collect information Design and create content Present information	Use technology responsibly Identify a range of ways to report concerns about contact

Assessment Framework by Band Contd

|			
KS2 - 4	Design programs that accomplish specific goals Design and create program Debug programs that accomplish specific goals Use repetition in programs Control or simulate physical systems Use logical reasoning to detect and correct errors in programs Understand how computer networks can provide multiple services, such as the world wide web Appreciate how search results are selected	Select a variety of software to accomplish given goals Select, use and combine internet services Analyse information Evaluate information Collect data Present data	Understand the opportunities computer networks offer for communication Identify a range of ways to report concerns about content Recognize acceptable / unacceptable behaviour
KS2 -5	Solve problems by decomposing them into smaller parts Use selection in programs Work with variables Use logical reasoning to explain how some simple algorithms work Use logical reasoning to detect and correct errors in algorithms Understand computer networks including the internet Appreciate how search results are ranked	Combine a variety of software to accomplish given goals Select use and combine software on a range of digital devices Analyse data Evaluate data Design and create systems	Understand the opportunities computer networks offer for collaboration Be discerning in evaluating digital content

Apps & Resources to Support KS1 Computing

Beebot app

Beebots

A.L.E.X app

My car project - by Harry

2Simple Video Toolkit
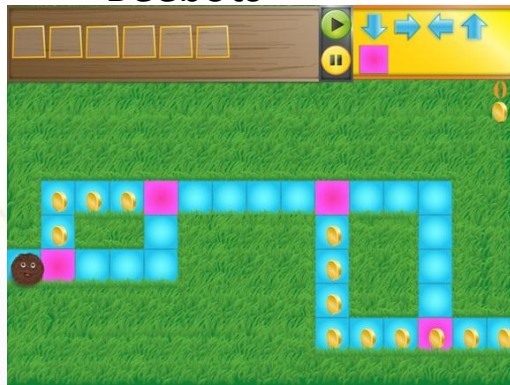
Kodable
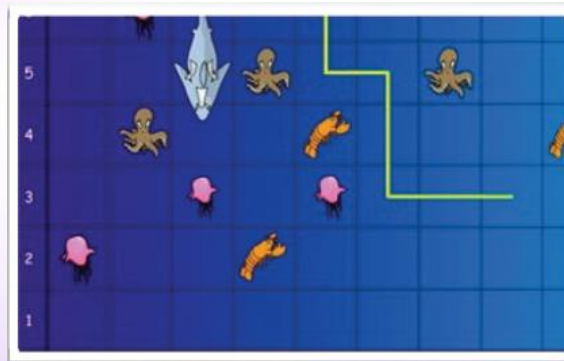
iBoard

Scratch Jnr

Daisy the Dinosaur

Book Creator

Apps & Resources to Support KS2 Computing

Code Org

EducationCity

Logo

BBC Schools Computing
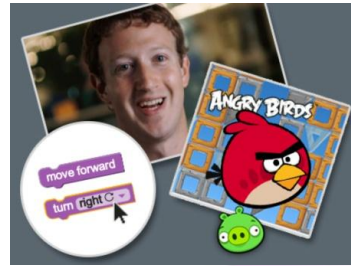
Excel

J2code - LGFL

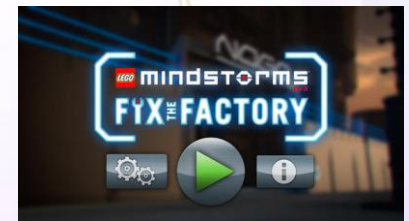iMovie

Hopscotch app

espresso coding
Computing made simple
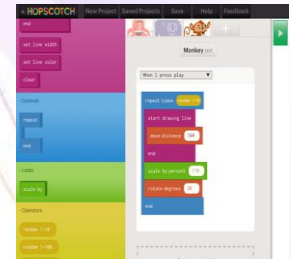
Book Creator

Light Bot

Lego Mindstorms

Garageband

Computational Thinking

Computational thinking
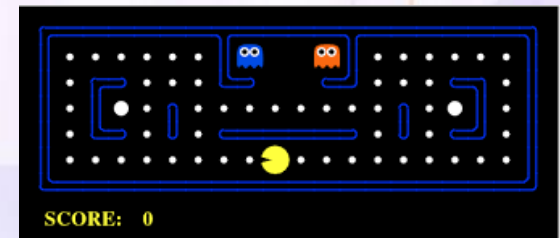
Decomposition · Abstraction · Pattern recognition · Algorithms
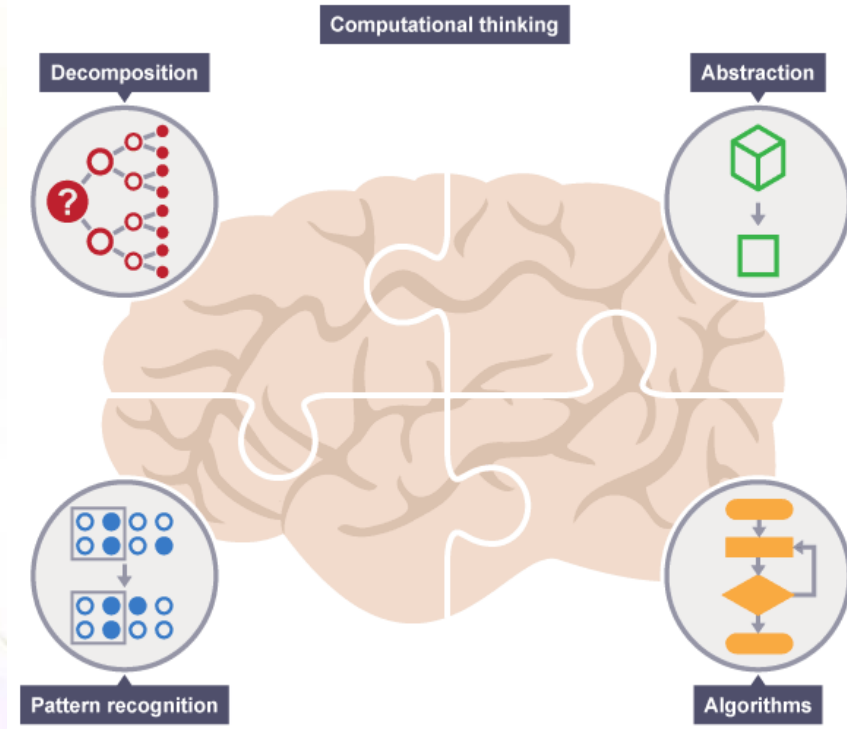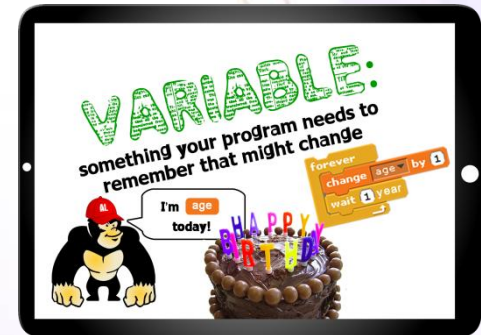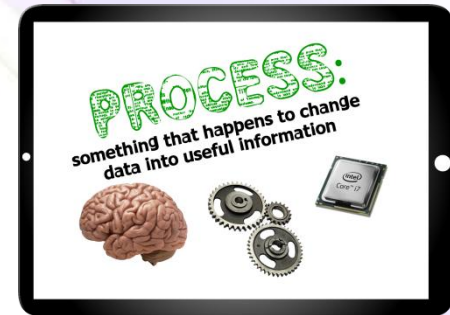
A complex problem is one that, at first glance, we don't know how to solve easily.

Computational thinking involves taking that complex problem and breaking it down into a series of small, more manageable problems (**decomposition**). Each of these smaller problems can then be looked at individually, considering how similar problems have been solved previously (**pattern recognition**) and focusing only on the important details, while ignoring irrelevant information (**abstraction**). Next, simple steps or rules to solve each of the smaller problems can be designed (**algorithms**). Finally, these simple steps or rules are used to program a computer to help solve the complex problem in the best way.

❖ Thinking computationally is not programming.
❖ It is not thinking like a computer, as computers do not, and cannot, think.
❖ Computers can be used to help us solve problems. however, before a problem can be tackled, the problem itself and the ways in which it could be solved need to be understood.

Information taken from BBC Schools Computing

Programming Principles

python

JavaScript

MIT App Inventor

forever / imagine / program / share

SCRATCH

ALGORITHM:
step by step instructions to solve a problem

DEBUG:
find and fix mistakes in a computer program

PROCESS:
something that happens to change data into useful information

REPETITION:
doing the same instruction more than once

repeat until number of bananas = 0
think Feed me!

SELECTION:
when your program has to make a choice

if colour = Yellow
say Yum Yum!
else
think Maybe not...

VARIABLE:
something your program needs to remember that might change

I'm age today!

change age by 1
wait 1 year

HAPPY BIRTHDAY

ANGRY BIRDS

SCORE: 0

What Computer Science actually is....

"Computer Science is no more about computers than Astronomy is about telescopes".

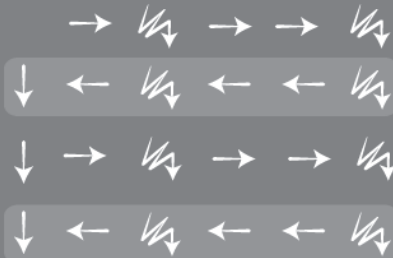**Edsger Dijkstra**, a famous award-winning computer scientist once said.

Computer Science is about the principles behind building the software packages, about the algorithms used in computer games, about the technology behind the internet and about the architecture of computing devices.
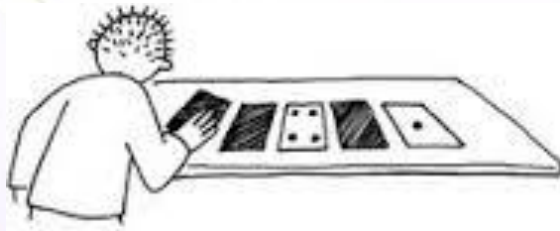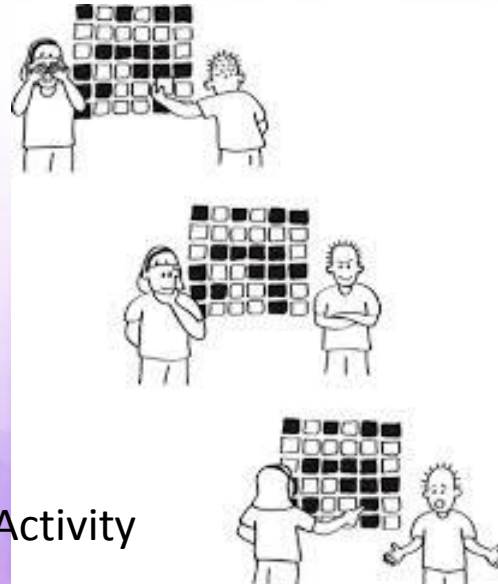
Graph Paper Programming
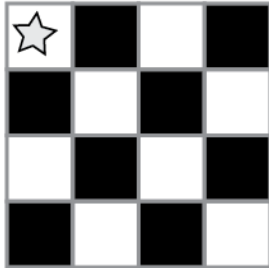
Parallel Sorting Activity

Binary Numbers Activity
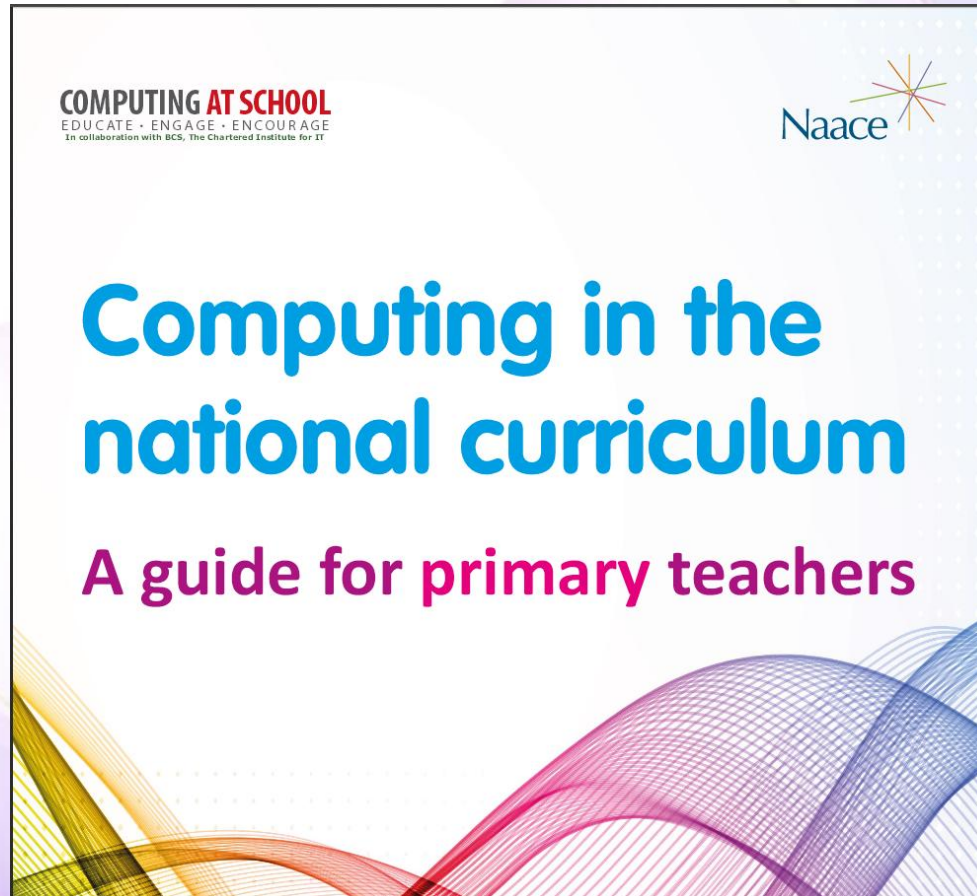

Error Detection Activity

How the Internet works – Data packets activity

Computing Primary Guide NAACE

Computing Resources

- Education City – All Programs/Core Programs
- [BBC Schools Computing](#):
- Google: Code Org Course 2