# Computing Objectives Explained

**Understanding the statements, key words and technical vocabulary in the Computing National Curriculum.**

**KS1 references** / **KS2 references** quoted from the Computing National Curriculum Objectives

## Algorithms

| | |
|---|---|
| KS1 | understand what algorithms are; how they are implemented as programs on digital devices |
| KS2 | use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs |

An algorithm is a precise list of instructions on how to perform an action. In computing terms, it is instructions for what the computer will be programmed to do. Algorithms might even be written in plain English, before translating them into code that the computer will understand.

## Collect, Analyse, Evaluate and Present Data

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|---|---|
| KS2 | select, use and combine a variety of software ... to design and create a range of programs, ... that accomplish given goals, including collecting, analysing, evaluating and presenting data and information |

Data is just information. Presenting it could be in the form of tables, charts or graphs; it may be figures in a spreadsheet or records in a database; or it may be in the form of text, images, video or audio. We collect data by gathering from different sources. To analyse and evaluate is to study or examine it and draw our own conclusions. You may collect data from one source and insert it into another (e.g. creating a graph in a spreadsheet and copying it into a presentation).

## Computer Networks

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|---|---|
| KS2 | 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 |

A computer network is a number of computers connected together, enabling them to communicate with each other. This allows information, software or hardware (such as printers) to be accessed by any computer on the network. They may be connected with wires or wirelessly. We have computer networks in our homes, schools and workplaces. The Internet or World Wide Web is like one great big network, connecting millions of computers everywhere in the world.

## Controlling or Simulating Physical Systems

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|---|---|
| KS2 | design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems |

A physical system involves actual hardware or devices, including those that could be attached to a computer. Examples could include data logging devices to measure temperature or light, traffic lights, motion sensors, buzzers or switches. A program (a piece of code) is needed to tell the system what to do. Sometimes computer software is used to mimic or recreate on screen how a real physical system would work. This is called simulating the system.

## Debug

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|---|---|
| KS1 | create and debug simple programs |
| KS2 | design, write and debug programs that accomplish specific goals |

Errors in programs, or anything that stops them from working properly, are known as bugs. To debug means to fix or get rid of the bugs and solve problems within a program in order to make it work how it is intended. Mistakes are a normal, common part of programming and every computer programmer should get used to the fun of debugging!

## Decomposing Problems

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| KS2 | solve problems by decomposing them into smaller parts |

Decomposing means breaking down into chunks. If there are several parts required in a program to make it work, splitting into smaller sections makes it easier to solve each part separately.

## Digital Content

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|---|---|
| KS1 | use technology purposefully to create, organise, store, manipulate and retrieve digital content |
| KS2 | use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content |

Digital content means any information that is stored or presented on computers or the Internet. Everything you create on the computer becomes digital content. This includes files on your computer, network or on the World Wide Web. Children need to start taking certain factors into consideration, such as where the digital content has come from and who has made it.

## Digital Devices

| | |
|---|---|
| KS1 | understand what algorithms are; how they are implemented as programs on digital devices |
| KS2 | select, use and combine a variety of software (including internet services) on a range of digital devices |

Digital devices are any types of computers that you use, including laptops, tablets and smart phones. This also includes hardware which may connect to a computer.

## Logical Reasoning

| | |
|---|---|
| KS1 | use logical reasoning to predict the behaviour of simple programs |
| KS2 | use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs |

Logical reasoning means thinking logically or systematically to solve problems. The best way to understand what a program does or solve errors in a program is to think through sensibly what is supposed to happen.

## Sequence, Selection and Repetition

**KS2** use sequence, selection, and repetition in programs

Sequence means to put things into a particular order where it is important that one action needs to be performed before another. Selection means making a choice, specifically where a program can do one of two or more things. Repetition is to perform or repeat the same process multiple times. In a loop, a process can be repeated for a set number of times or until a variable changes. Sequence, selection and repetition are the three main ways to structure a piece of computer code or algorithm.

## Software

**KS2** select, use and combine a variety of software (including internet services) on a range of digital devices

Different types of software are more suitable for different tasks. Choosing the best software is important for completing a task properly and combining software means using more than one type together, for example creating a graph or chart in a spreadsheet then copying this to a word processor or desk top publisher as part of a report.

## Variables

**KS2** work with variables and various forms of input and output

Variables are anything that can be changed or given a value in a program. A variable may be the input from a particular device or become the output, based on some code or calculation; it may be a number or text.

# Appendix:

Curriculum Objectives in full

## Key stage 1

Pupils should be taught to:

- understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions
- create and debug simple programs
- use logical reasoning to predict the behaviour of simple programs
- use technology purposefully to create, organise, store, manipulate and retrieve digital content
- recognise common uses of information technology beyond school
- use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies

## Key stage 2

Pupils should be taught to:

- design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
- use sequence, selection, and repetition in programs; work with variables and various forms of input and output
- use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs
- understand computer networks including the internet; how they can provide multiple services, such as the World Wide Web; and the opportunities they offer for communication and collaboration
- use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
- select, use and combine a variety of software (including Internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information