

Computing ≠ coding and programming

‘Coding is the new Latin’ has become a bit of a catchphrase and there is so much talk of coding and programming in the media that you might be forgiven for thinking that the main new element in the 2014 National Curriculum Computing Programmes of Study is programming.

Absolutely not! Programming plays the same role in computing that investigations do in maths or science. Programming animates the subject and brings computing to life; it is creative, and engaging. It illustrates otherwise abstract concepts in completely concrete terms. It is also an incredibly useful skill. Nevertheless computing is more than programming, just as chemistry is more than Bunsen burners and test tubes.

The first two aims of the 2014 National Curriculum Computing Programmes of Study say 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

Notice the emphasis on ‘fundamental principles’ and on ‘computational thinking’, both informed and illuminated repeatedly by programming. Essentially, programming bridges the gap between computational thinking and computers.

What exactly is ‘programming’ and is it the same as ‘coding’?

Here is an excerpt from a knitting pattern for a jumper:

A knitting pattern is very like a program:

- All the creativity is in the pattern. No creativity is required from the person or machine doing the knitting. They just knit, or execute, the pattern.
- The pattern is precise. The person or machine just has to follow the instructions and they will end up with a jumper.
- The pattern looks like gibberish to anyone who does not know how to knit. The pattern has its own ‘formal’ language, a language with a fixed grammar and vocabulary.
- Sophisticated patterns can be made by combining more than one instruction together and repeating combinations, even though the individual instructions are very simple.

Cast off 2 sts beg next 2 rows. 67 (73-79-83-97-107-117-123) sts.

1st row: (K1. P1) twice. S11. K1. pssso. Knit to last 6 sts. K2tog. (P1. K1) twice.

2nd row: (P1. K1) twice. P2tog. Purl to last 6 sts. P2togtbl. (K1. P1) twice.

3rd row: As 1st row.

4th row: (P1. K1) twice. Purl to last 4 sts. (K1. P1) twice. Rep last 4 rows 0 (0-1-1-0-3-6-6) time(s) more. 61 (67-67-71-91-83-75-81) sts.

A ‘computer program’ is just a set of instructions that the computer executes in order to achieve a particular objective; and ‘programming’ is the craft of analysing problems, and designing, writing, testing and maintaining programs in order to solve them.

So what is the difference between ‘coding’ and ‘programming’? There is no settled consensus on what the difference is, or indeed whether there is one at all; different programmers might give you different answers. So it is safe, indeed advisable, to treat the two as synonymous, at least initially. It leaves much more time and brain space for more important questions. If and when you feel ready to engage with the discussion, there are posts on the Computing At School’s community pages (community.computingschool.org.uk/door) that may interest you.