What is computational thinking and why is it important for your children to learn?

Although it can seem a little 'technical', computational thinking is actually about learning to solve problems, with or without a computer. Developing children's computational thinking is central to the computing curriculum at primary school and beyond, but it can also be applied across everyday life and indeed, all their other subjects, including maths, science, literacy and even PE. Our home learning activities can help introduce these concepts in a fun and easy way.

There are six separate computational thinking concepts: Algorithms, Decomposition, Abstraction, Pattern, Evaluation and Logic. If that all feels a bit daunting, read on as we explain each concept using examples all of us can relate to.

Algorithms
making steps and rules

An algorithm is an exact sequence of instructions, or set of rules, for performing a task.

E.g. a recipe, instructions on how to play a game or a dance routine.

Decomposition
breaking down into parts

Decomposition is breaking a problem or system down into its different parts. When we're faced with a complex task we often break this down into smaller more manageable chunks.

E.g. organising a trip: where are we staying? How are we travelling? What do we need to pack?

Abstraction
removing unnecessary detail

Abstraction is identifying what is important and leaving out information we do not need.

E.g. the London tube map is a great example here as it provides you with the information you need to make your journey (the line you need to take, accessibility, connections) without providing you unnecessary detail.

Pattern
spotting and using similarities

By noticing patterns we can make predictions about what will happen next, create rules and solve other problems.

E.g. children learn to identify patterns in reactions to their behaviour i.e. last time I drew on the wall Mum seemed upset! Will the same be true this time?

Evaluation
making judgements

We use evaluation when we make judgements based on different factors, such as what we need something to do or what outcome we are trying to achieve.

E.g. if you were buying a TV you may compare different models using screen size, cost or quality of sound depending on what is most important to you.

Logic
predicting and analysing

Logic helps us to establish and check facts, and make predictions.

E.g. completing logic puzzles such as Sudoku for example requires us to reason about which number to place in each square.

Computational thinking activities give children opportunities to develop the following approaches to learning:

Tinkering –changing things to see what happens

Creating – designing and making

Persevering – keeping going

Collaborating – working together

Debugging – finding and fixing errors

These behaviours are important life skills and help in all aspects of learning. Our home learning activities encourage one or more of these behaviours as the children carry out the tasks.