SUBJECT: Computing
UNIT: Algorithms

SANDHILL VIEW
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Algorithms have a long history. In the ninth century, the Persian scientist, astronomer and mathematician Abdullah Muhammad bin Musa al-Khwarizmi, often cited as the 'father of algebra', was indirectly responsible for the creation of the term 'algorithm'; the word is derived from his name, al-Khwarizmi.

Informally, the term '**algorithm**' has come to refer to any set of rules that precisely define a sequence of operations, such as making a cup of tea or cleaning your teeth. In the world of computing, an algorithm is a set of instructions that can be implemented as code to program a computer.

Computational thinking is a logical, strategic approach to problem solving involving four cornerstones: decomposition, abstraction, pattern recognition and algorithm design to formulate an efficient and effective algorithm.

Command	Example	Result produced
cs	cs	Clears the canvas and moves the turtle to the starting position
fd	fd 100	Moves the turtle forward in the direction it was facing when the command was issued, in the example it moves 100 steps
rt	rt 90	Turns the turtle to the right to face in a new direction, in the example by 90 degrees
lt	lt 90	Turns the turtle to the left to face in a new direction, in the example by 90 degrees
setpencolor	setpencolor 0	Sets the colour of the pen that the turtle draws with, in the example 0 is black
setwidth	setwidth 10	Sets the width of the pen that the turtle draws with, in the example 10
ht **st**	ht st	The command ht hides the turtle – useful for when the turtle has finished a drawing. The command st shows the turtle
repeat n [ ]	repeat 4 [fd 100 rt 100]	This repeats the code in brackets the number of times indicated, in the example forward 100 steps then right 90 degrees. It will draw a square

Abstraction: Abstraction is one of the four cornerstones of Computer Science. It involves filtering out – essentially, ignoring - the characteristics that we don't need in order to concentrate on those that we do.
Decomposition: Decomposition is one of the four cornerstones of Computer Science. It involves breaking down a complex problem or system into smaller parts that are more manageable and easier to understand. The smaller parts can then be examined and solved, or designed individually, as they are simpler to work with.