

# Year 7 - Half-Term 3 & 4 – Computational Thinking – Knowledge Organiser

## Lesson 1: Computational Thinking

Computational thinking is the ability to think like a computer, in a logical, time effective and efficient way, in order to solve a problem. There are four key techniques to computational thinking:

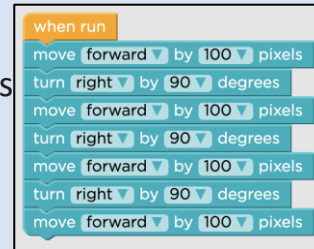
- **Decomposition** - breaking down a complex problem or system into smaller, more manageable parts.
- **Pattern recognition** – looking for similarities among and within problems.
- **Abstraction** – focusing on the important information only, ignoring irrelevant detail.
- **Algorithms** - developing a step-by-step solution to the problem, or the rules to follow to solve the problem.

## Lesson 2: Algorithms

An algorithm is a plan, a set of step-by-step instructions to resolve a problem. In an algorithm, each instruction is identified and the order in which they should be carried out is planned

## Lesson 3: Sequence

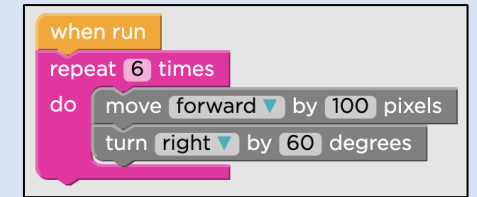
A sequence is a set of instructions and statements, performed by a computer, one after another.



```
when run
move forward by 100 pixels
turn right by 90 degrees
move forward by 100 pixels
turn right by 90 degrees
move forward by 100 pixels
turn right by 90 degrees
move forward by 100 pixels
```

## Lesson 4: Iteration

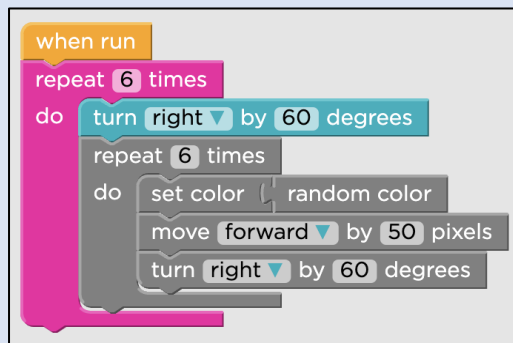
There are times when a program needs to repeat certain steps until told otherwise, or until a condition has been met. This process is known as iteration. Iteration is also often referred to as looping, since the program ‘loops’ back to an earlier line of code. Iteration enables programmers to greatly simplify a program



```
when run
repeat 6 times
do
move forward by 100 pixels
turn right by 60 degrees
```

## Lesson 5: Nested Iteration

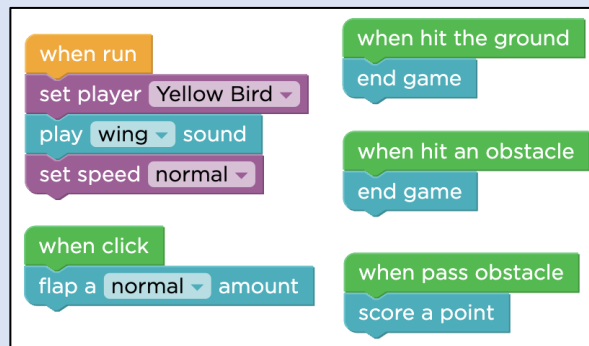
Nested iteration for example, allows for powerful, yet simple programming by putting a loop, or repeat block, within another loop or repeat block



```
when run
repeat 6 times
do
turn right by 60 degrees
repeat 6 times
do
set color to random color
move forward by 50 pixels
turn right by 60 degrees
```

## Lesson 6: Selection

Selection refers to a decision or question. Selection allows us to include more than one path through an algorithm.



```
when run
set player to Yellow Bird
play wing sound
set speed to normal

when hit the ground
end game

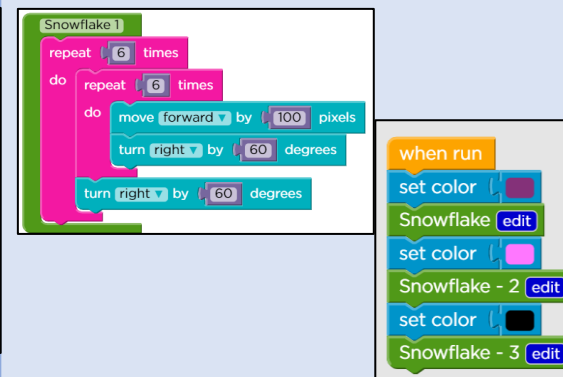
when hit an obstacle
end game

when click
flap a normal amount

when pass obstacle
score a point
```

## Lesson 7: Functions

A function is defined as a block of organised, reusable code that is used to perform a single, related action



```
Snowflake 1
repeat 6 times
do
repeat 6 times
do
move forward by 100 pixels
turn right by 60 degrees
turn right by 60 degrees

when run
set color to Snowflake
Snowflake edit
set color to Snowflake - 2
Snowflake - 2 edit
set color to Snowflake - 3
Snowflake - 3 edit
```

## Lesson 8: Inappropriate Content

Inappropriate content includes information or images that they may find upsetting, material that’s directed at adults, inaccurate information or information that might lead or tempt a young person into unlawful or dangerous behaviour

## Lesson 9: Blocking & Reporting

Blocking and reporting a user can mean different things on different social media sites, but it generally stops them being able to interact with you on that platform