



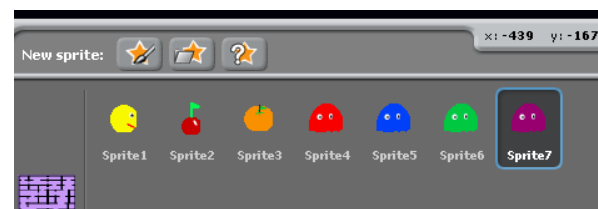
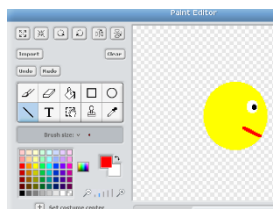
Computing Department Knowledge Organiser: Year 7 Scratch Programming

Scratch Programming

What is scratch?



Scratch is a free graphical **programming language** that allows you to create interactive stories, games, animation, music, art and presentations. You will be designing and programming a PAC-MAN game in school.



Learn how to use Scratch online

<https://scratch.mit.edu>

There are tutorials and projects you can access online. Scan the QR code with a camera to go to the tutorials webpage:
<https://scratch.mit.edu/projects/editor/?tutorial=all>



What is an algorithm?



An **Algorithm** is the step by step instructions to complete a task. A set of rules to be followed in order.

You can write your own algorithms in Scratch. Scratch has pre-programmed blocks of code that can be placed together to create your algorithm to create the instructions for your sprite(s) and the background. The first algorithm will be basic movement of your sprite.

What is a variable?



A **variable** is something that changes during the running of the program.

Variables can be used to create scoring in a game e.g. keys collected or lives.



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Sequencing

Sequencing is the specific order in which instructions are executed.

```
when green flag clicked
  go to x: 0 y: 0
  point in direction 90
when up arrow key pressed
  change y by 10
  move 10 steps
```

Selection

Selection is where a program may need to ask a question because it has reached a step where one or more options are available.

Depending on the answer given, the program will follow a certain step and ignore the others.

```
if touching edge?
  go to x: -200 y: pick random -160 to 160
if touching shark?
  hide
  change score by 1
  wait 1 secs
  go to x: -200 y: pick random -160 to 160
  show
```

Iteration (known as a Loop)

Iteration means repeating steps, or repeating instructions, over and over again. This is often called a 'loop'.

```
forever
  move 1 steps
  if touching edge?
    go to x: -200 y: pick random -160 to 160
  if touching shark?
    hide
    change score by 1
    wait 1 secs
    go to x: -200 y: pick random -160 to 160
    show
```

Tasks

- **Task 1** - What is Scratch?
- **Task 2** - What is a sprite?
- **Task 3** - What is an algorithm?
- **Task 4** - What is a variable?
- **Task 5** - Describe sequencing?
- **Task 6** - Describe selection?
- **Task 7** - Describe iteration?









Scratch - Key terms and definitions

Boolean expression

A Boolean expression is an expression that is either **true** or **false**. In Scratch, any diamond-shaped block is a Boolean expression.

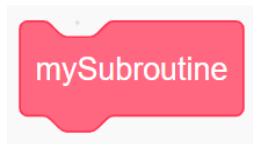
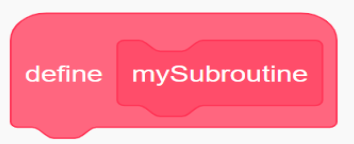
Comparison operator

Used to compare two expressions.

Operator	Meaning	Example
	greater than	 Is price greater than 2,000?
	less than	 Is price less than 2,000?
	equal to	 Is price equal to 2,000?

Decomposition

Breaking down a problem into smaller, more manageable parts in order to make the problem easier to solve.



Subroutine

A block of code within a program that is given a unique, identifiable name. Supports code reuse and good programming technique.

Scratch - Key terms, definitions and tasks

Computer bug

Code that causes your computer to behave in an unexpected way.

Problem Solving

Problem solving is about using logic and imagination to make sense of a situation and to come up with an intelligent solution.

Resilience

The capacity to recover quickly from difficulties.

Tasks

Task 1 - Describe what Boolean expression means?

Task 2 - What is a comparison operator?

Task 3 - Describe what a computer bug is?

Task 4 - Describe what resilience is?

Task 5 - What is a subroutine?

Task 6 - Describe decomposition?

Task 7 - Describe what problem-solving means?