★ There are two main ways to represent an algorithm: Pseudocode and flowchart.

WHAT IS PSEUDOCODE?

Pseudocode is an informal high-level description of a computer program or algorithm. It is written in symbolic code which must be translated into a programming language before it can be executed.

1 Mathematical operations

Assignment: ← or :=
 Example: c ← 3, c := 2
Comparison: =, ≠, <, >, ≤, ≥
Arithmetic: +, −, ×, /, mod
Logical: and, or

2 Keywords

START, BEGIN: This is the start of your pseudocode.
INPUT: This is data retrieved from the user through the input device.
READ, GET: This is used when reading data from a data file.
PRINT, DISPLAY, SHOW, OUTPUT: This will show your output to a screen.
COMPUTE, CALCULATE: To calculate the result of the expression.
SET, INIT: To initialize values
INCREMENT, BUMP: To increase the value of a variable
DECREMENT: To reduce the value of a variable
END: This is the end of your pseudocode

3 Conditionals

```
IF you are happy
  THEN smile
ENDIF
```

```
IF you are happy
  THEN smile
ELSE IF you are sad
  THEN frown
ELSE
  keep face plain
ENDIF
```

4 CASE

```
INPUT color
CASE color of
  red: PRINT "red"
  green: PRINT "green"
  blue: PRINT "blue"
OTHERS
  PRINT "Please enter a value color"
ENDCASE
```

5 Iteration

1 FOR structure

```
FOR every month in a year
  Compute number of days
ENDFOR
```

2 WHILE structure

```
PRECONDITION: variable X is equal to 1
WHILE Population < Limit
  Compute Population as Population + Births — Deaths
ENDWHILE
```

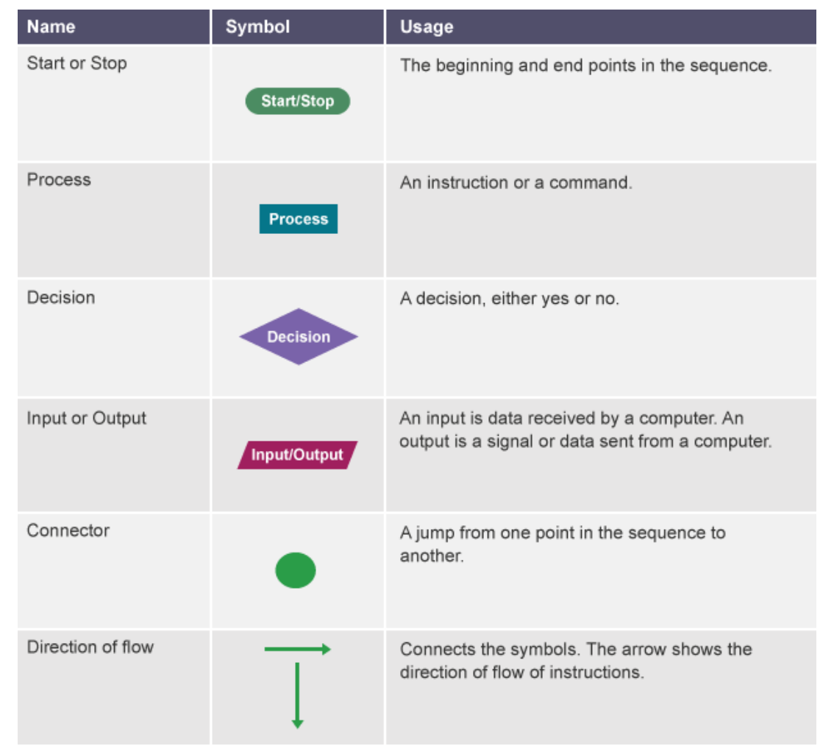
6 Exception Handling

```
BEGIN
  statements
EXCEPTION
  WHEN exception type
    statements to handle exception
  WHEN another exception type
    statements to handle exception
END
```

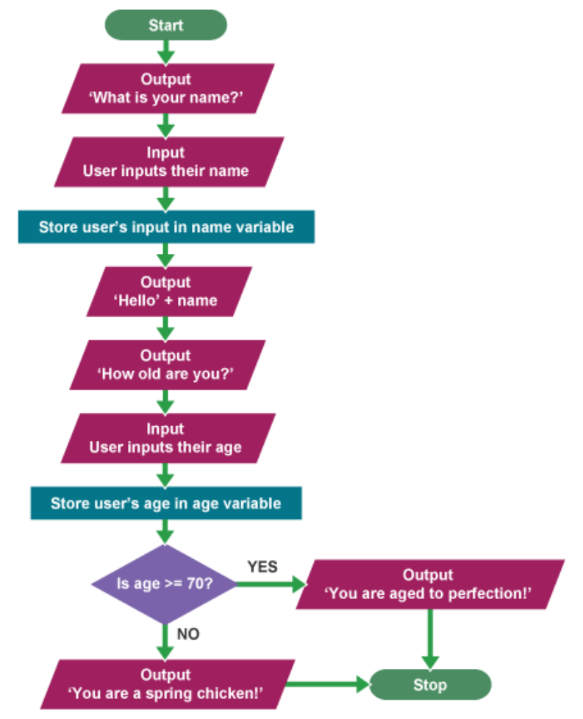
FLOWCHART

A flowchart is a diagram that represents a set of instructions

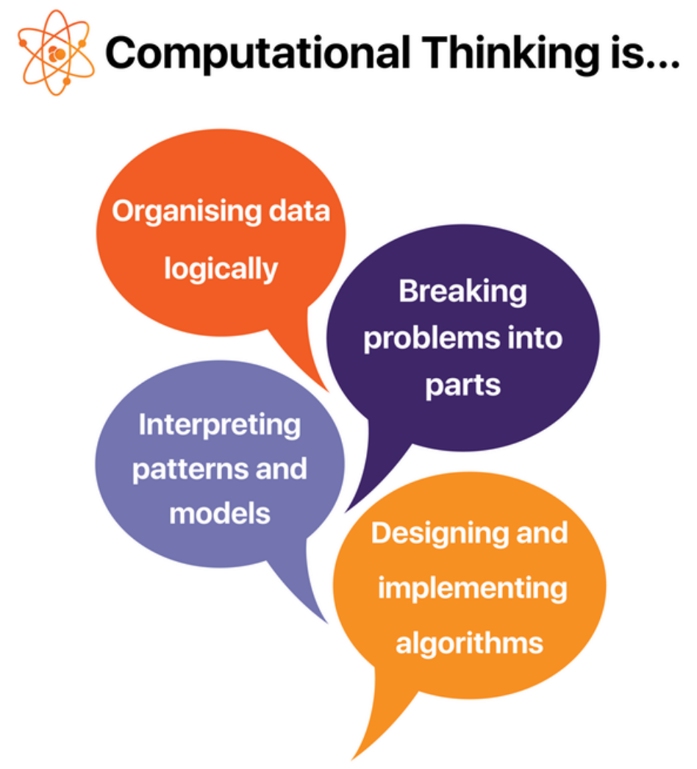
Flowchart symbols

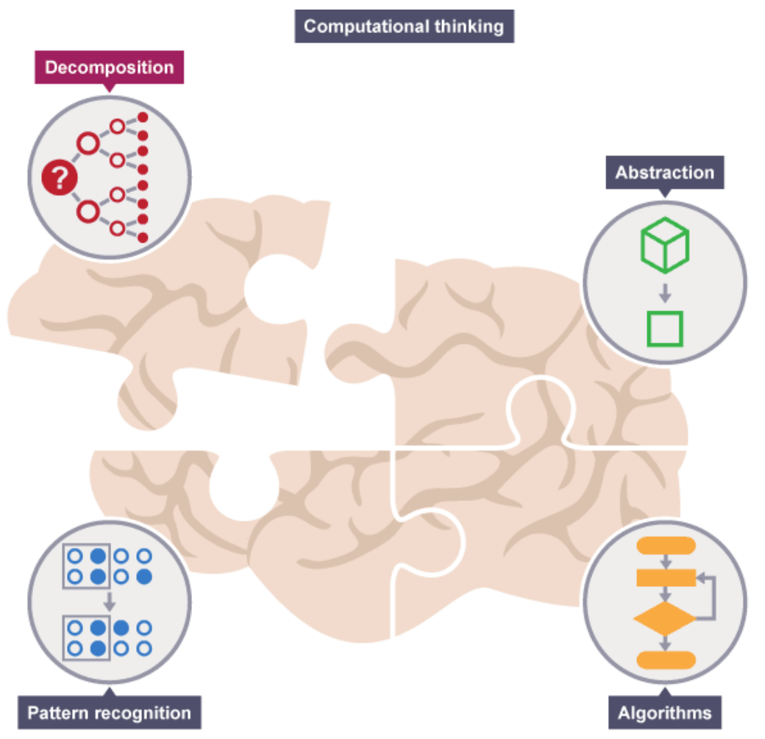


Name	Symbol	Usage
Start or Stop	Start/Stop	The beginning and end points in the sequence.
Process	Process	An instruction or a command.
Decision	Decision	A decision, either yes or no.
Input or Output	Input/Output	An input is data received by a computer. An output is a signal or data sent from a computer.
Connector	●	A jump from one point in the sequence to another.
Direction of flow	→ ↓	Connects the symbols. The arrow shows the direction of flow of instructions.

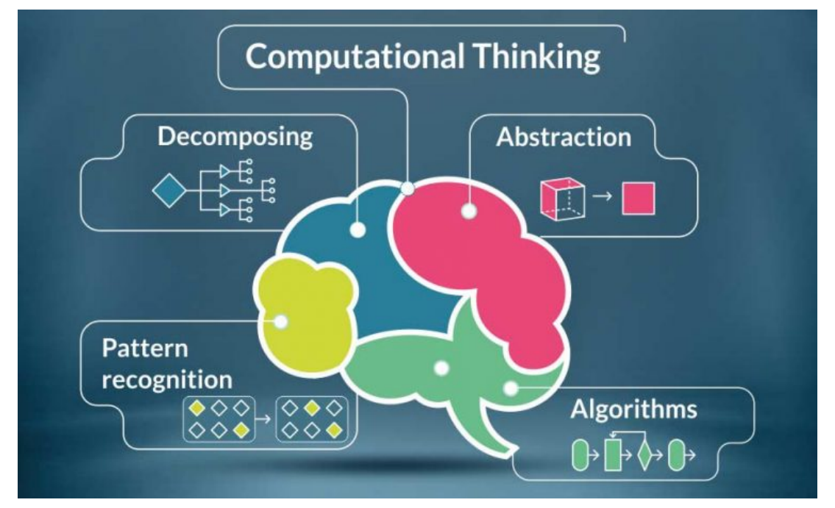


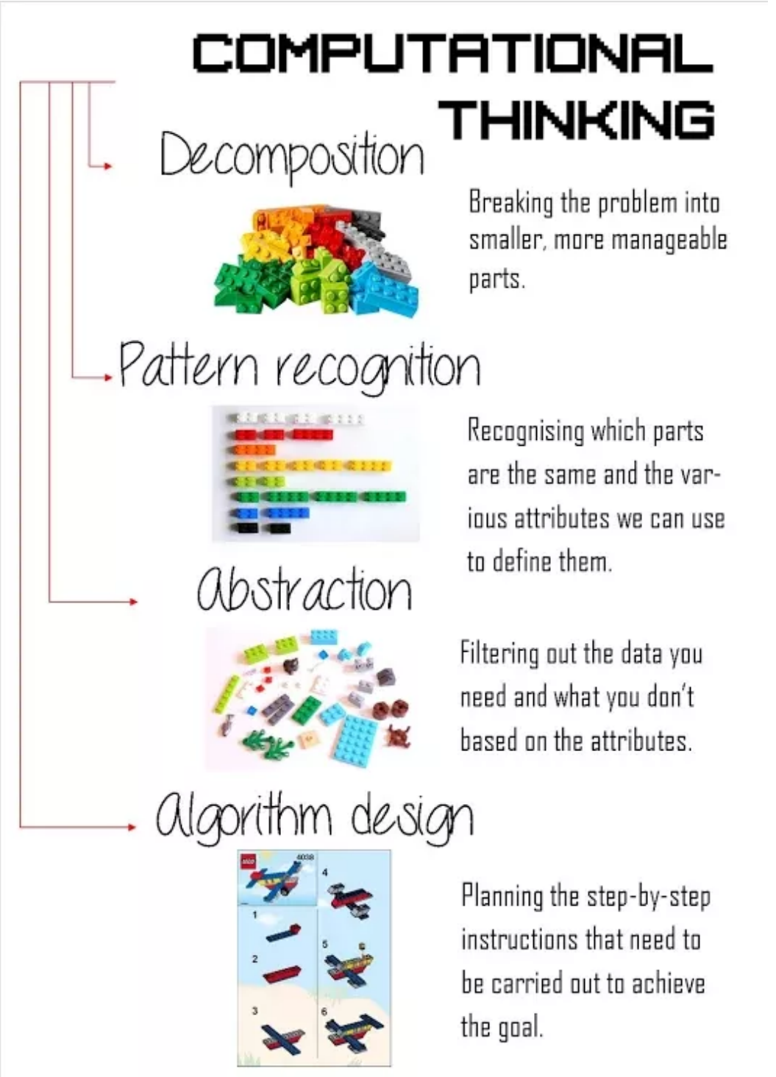
COMPUTATIONAL THINKING





WHAT IS CT?





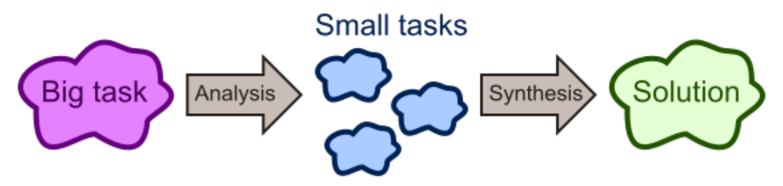
COMPUTATIONAL THINKING

Decomposition
Breaking the problem into smaller, more manageable parts.

Pattern recognition
Recognising which parts are the same and the various attributes we can use to define them.

Abstraction
Filtering out the data you need and what you don't based on the attributes.

Algorithm design
Planning the step-by-step instructions that need to be carried out to achieve the goal.



Decomposition

Breaking down data, processes, or problems into smaller, manageable parts

Pattern Recognition

Observing patterns, trends, and regularities in data

Abstraction

Focusing on important parts only, ignoring irrelevant details

Algorithm Design

Developing the step by step instructions for solving this and similar problems