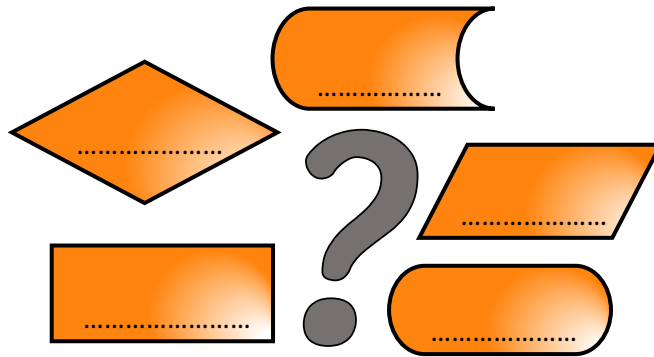
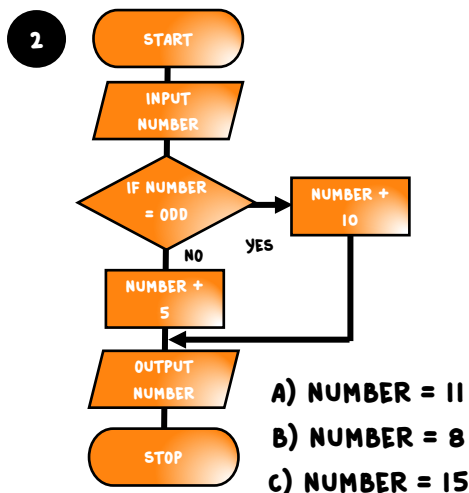


Follow the algorithms!

EXPLAIN WHAT EACH IS DOING AND WORK OUT WHAT IS OUTPUT WITH THE DIFFERENT INPUTS!

```

1 number = _____
  FOR count = 0 to 10 DO
    number = number *
    number
  IF number < 50 THEN
    OUTPUT "True"
  ELSE
    OUTPUT "False"
  NEXT count
a) total = 5 b) total = 8 c) total = 10
  
```



EXPAND — STATE THE PURPOSE OF EACH SYMBOL



ThinkIT ALGORITHM

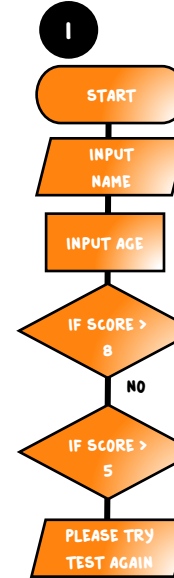
Algorithm Design!

PSEUDOCODE?
ABSTRACTION?
DECOMPOSITION?
FLOW DIAGRAM?



Error!

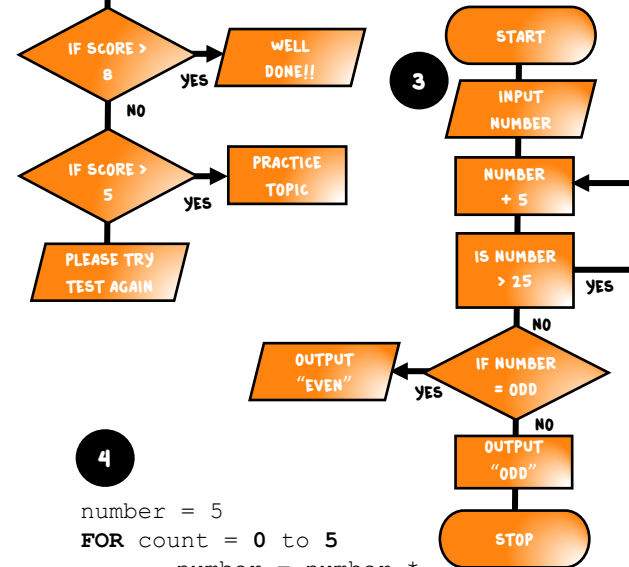
(CORRECT THE MISTAKES)



2

```

INPUT number
IF number > 50 then
OUTPUT "Bigger than 50!"
ELSE number > 25 THEN
"Bigger than 25!"
END
  
```



4

```

number = 5
FOR count = 0 to 5
  number = number *
  3
  number = number -
  6
OUTPUT number
count
IF number > 20
print "Target met!"
  
```

Computational Thinking

What is **computational thinking**?

Analysing a problem and identifying the solution in a way that a computer can carry it out.

What is **decomposition**?

Breaking down a problem into number of sub problems. Each subproblem should be a different task. Decomposition helps us solve complex problems.

What is **abstraction**?

Filtering out ideas and details that are not needed to concentrate on those that are. E.g. your timetable is an abstraction of what happens in a school day.

What is **algorithmic thinking**?

Identifying the exact steps required to solve a particular problem – usually by creating an **algorithm**. E.g. Identifying the exact steps required to create an automated quiz etc. Algorithms are usually displayed as **flow diagrams** or **pseudocode**.

Algorithms

What is an **algorithm**?

An **algorithm** is a sequence of steps that can be followed to complete a task or solve a problem. In computer science algorithms can either be expressed as **standard English**, a **flow diagram** or **pseudocode**.

What is a **searching algorithm**?

A step-by-step procedure used to locate specific data among a collection of data. It is considered a fundamental procedure in computing. E.g. locating a number within a larger list of numbers.

What is a **sorting algorithm**?

A step-by-step procedure that puts elements of a list into a certain order. This could be numerical or alphabetical order.

Creating Algorithms

Two main methods are used to design algorithms: flow diagrams and pseudocode.

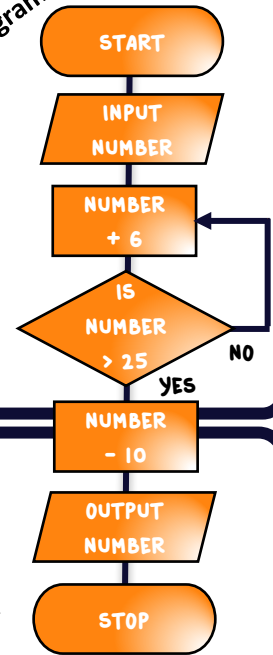
Flow Diagrams – Different symbols are used to start and end the diagram, whether information has been input or output, where a decision needs to be made (usually an IF statement or loop) and where a process is triggered e.g. add number 1 and number 2.

Pseudocode – Programs are written using a programming language which has specific rules and a specific syntax. The program will not run if the correct syntax is not used. Pseudocode looks similar to a programming language but it does not have a specific syntax which needs to be followed.

Pseudocode is not a programming language, it is a simple way of describing a set of instructions that does not have to use specific syntax.



Flow Diagram



Pseudocode

Sequence

```
INPUT number1
INPUT number2
total = number1 x number2
OUTPUT total
```

IF Statement

```
INPUT password
IF password == "Password1" THEN
    OUTPUT "Welcome!"
ELSE
    OUTPUT "Please try again!"
ENDIF
```

For Loop (Definite Loop)

```
number = 6
FOR count = 0 to 15 DO
    number = number * 2
    OUTPUT number
NEXT count
```

While Loop (Indefinite Loop)

```
total = 8
WHILE total < 100 DO
    OUTPUT total
    total = total * 2
ENDWHILE
```

Nested IF Statement

```
INPUT age
INPUT height
IF age < 12 THEN
    OUTPUT "Age criteria not met"
ELSE
    IF height <= 1.2 THEN
        OUTPUT "Height criteria not met"
    ELSE
        OUTPUT "Join the queue!"
    ENDIF
ENDIF
```