INTRODUCTION TO ALGORITHMS

WHAT IS AN ALGORITHM?

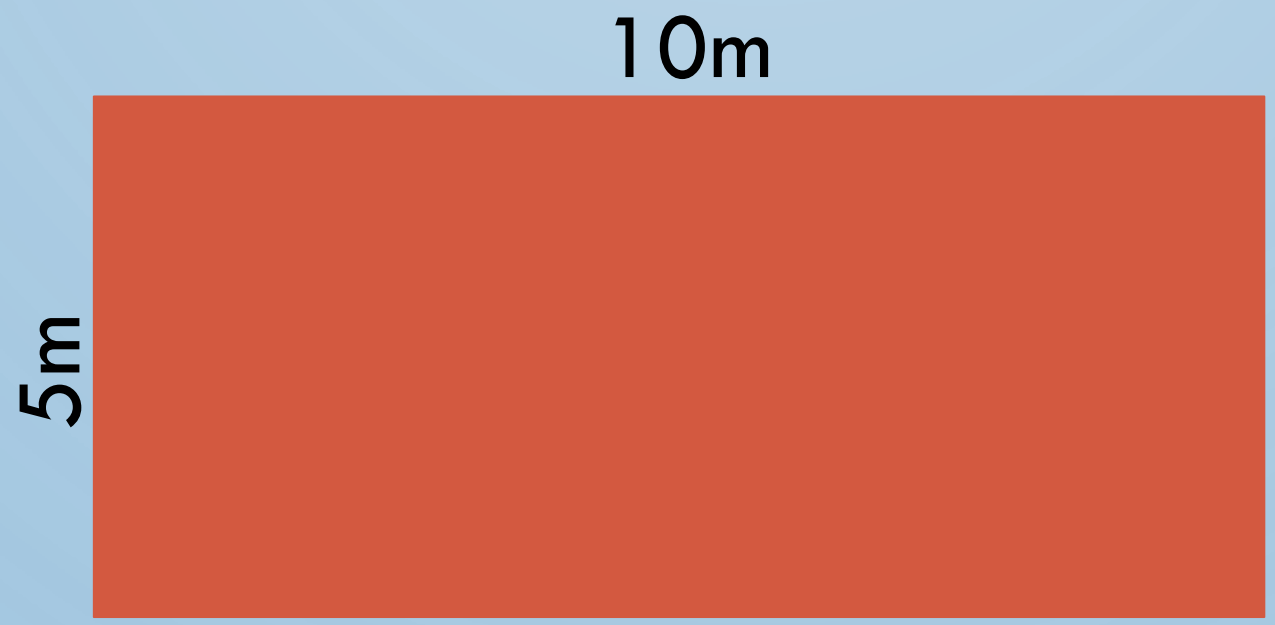
- A set of steps/instructions sequenced in logical order that when followed exactly solves a problem.

ALGORITHMS

- Algorithmic instructions should be easy to interpret and follow. They usually contain:
  - Input instructions
  - Processing instructions
  - Output instructions

EXAMPLE PROBLEM

- Create an algorithm to find the area of the shape below:



WAYS OF REPRESENTING ALGORITHMS

- A numbered list:

1) Let length = 10 and let width = 5

2) Use formula to calculate area: length x width

3) Put result of calculation as the area

WAYS OF REPRESENTING ALGORITHMS

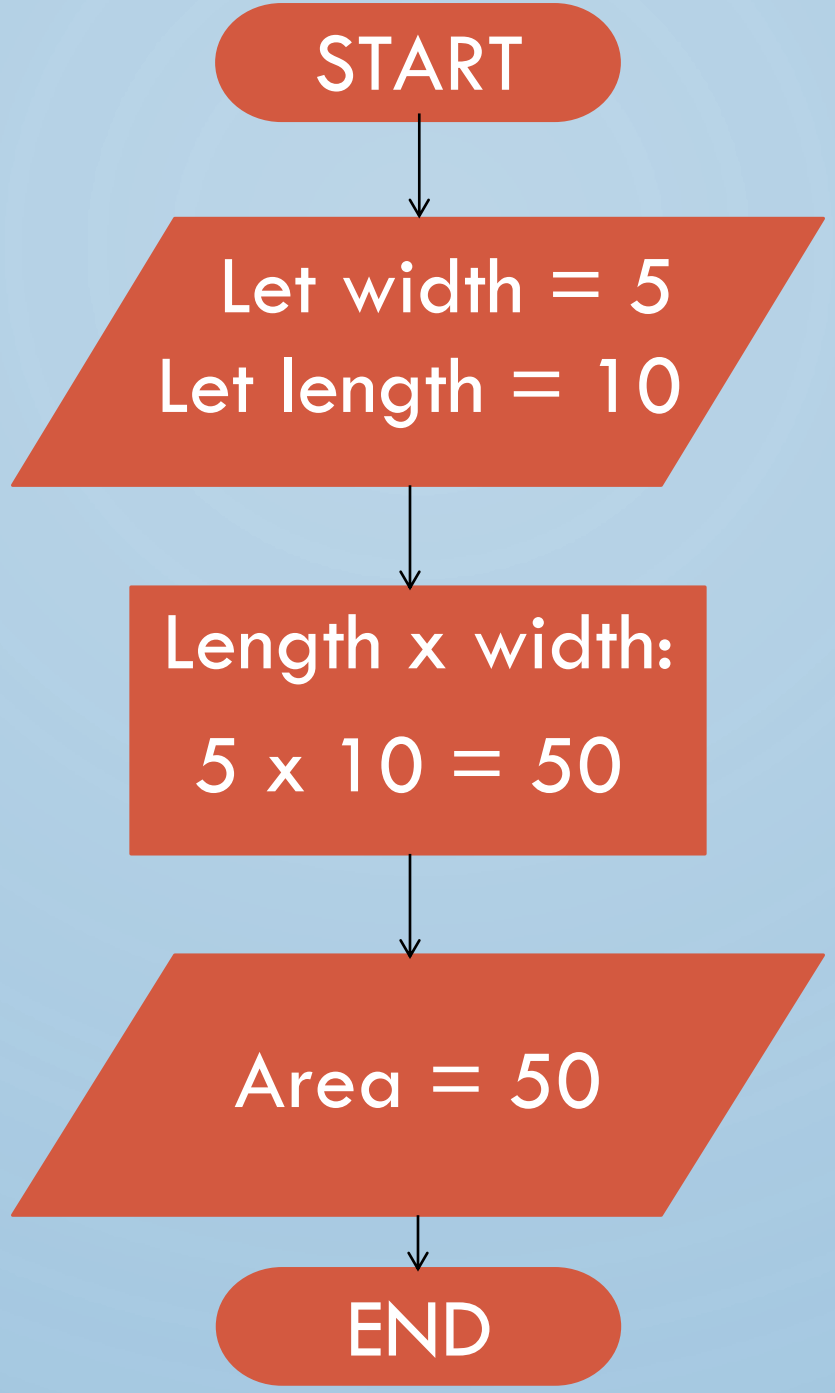
- Input, Process Output:
  - INPUT:
    - Let length be 10
    - Let width be 5
  - PROCCESS:
    - Multiply length by width
  - OUTPUT:
    - Area is the result of the calculation

WAYS OF REPRESENTING ALGORITHMS

- Flow charts

(Picture taken from: https://www.smartdraw.com/flowchart/flowchart-symbols.htm, “Flow Chart Symbols”)

Symbol	Name	Function
	Start/end	An oval represents a start or end point
	Arrows	A line is a connector that shows relationships between the representative shapes
	Input/Output	A parallelogram represents input or output
	Process	A rectangle represents a process
	Decision	A diamond indicates a decision


START
Let width = 5
Let length = 10
Length x width:
5 x 10 = 50
Area = 50
END

CHALLENGES – PART ONE

- Create algorithms for the following:
  - How many square tiles (length defined by user) will cover the floor of a square room of a certain dimension (Easy)
  - Finding the Prime Numbers between 1 and 100 using only basic arithmetic (Medium)
  - Direct a person to walk in a polygon with the number and length of sides defined by the user (Challenging)

CLASS ACTIVITY – DRAW A SQUARE

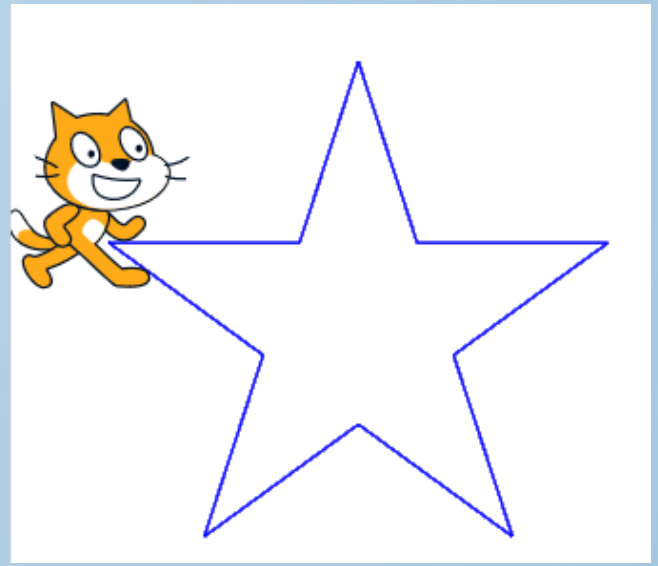
DRAW A SQUARE

- Draw a square of length 100 using the Programming language Scratch

CHALLENGES

CHALLENGES – PART TWO

- Create algorithms for the following and implement them using Scratch:
  - Draw a nonagon (Easy)
  - Draw a star (use length 100) (Medium)



  - Draw three stars that touch end to end (Challenging)
  - Draw a box around the star that touches opposite edges of the star (Challenging)