

Definition of Becimal Numbers

- The word becimal comes from a combination of the words binary and decimal.
- This entails that we are dealing with numbers in base two (2) called binary numbers and decimal numbers.
- A becimal is the base two analog of a decimal, it has a becimal point and becimal places.

Examples of bimonials

- Note : The places in a becimal can either be terminating or repeating.

1001.011

0.1101

10101

1111.001

- Reminder on converting from base 10 (denary) to base 2 (binary)

2	17
2	8 r 1
2	4 r 0
2	2 r 0
2	1 r 0
2	0 r 1

when converting 17ten to base two

17ten in base two is **10001two**

Converting from binary and denary

Reminder on Converting from binary (base two) and denary (base ten)

Convert 10101two (binary) to base ten (Denary)

2^4	2^3	2^2	2^1	2^0
1	0	1	0	1

$$1 \times 2^0 = 1$$

$$0 \times 2^1 = 0$$

$$1 \times 2^2 = 4$$

$$0 \times 2^3 = 0$$

$$1 \times 2^4 = 16$$

21ten

Converting decimal numbers in base 10 to bicimal

Example

30.375_{ten} to base two (2)

2	30
2	15 r 0
2	7 r 1
2	3 r 1
2	1 r 1
2	0 r 1

then $0.375 \times 2 = 0.75$

$0.75 \times 2 = 1.5$

$0.5 \times 2 = 1.0$

therefore: 0. 011two

Then 30.375_{ten} is **11110.011**_{two}

Converting numbers in Becimal to base 10

Example

Convert 0.1101two to base 10

$$\frac{-1}{2} \quad \frac{-2}{2} \quad \frac{-3}{2} \quad \frac{-4}{2}$$

- $\frac{1}{2} \frac{1}{4} \frac{1}{8} \frac{1}{16}$

$$1 \quad 1 \quad 0 \quad 1$$

- $\left(\frac{1}{2} \times 1\right) + \left(\frac{1}{4} \times 1\right) + \left(\frac{1}{8} \times 0\right) + \left(\frac{1}{16} \times 1\right)$

$$\frac{1}{2} + \frac{1}{4} + 0 + \frac{1}{16}$$

$$\frac{8+4+0+1}{16}$$

$$\frac{13}{16} \text{ or } \mathbf{0.8125_{ten}}$$

ACTIVITY

CONVERT THE FOLLOWING TO BICIMAL NUMBERS

- A. 19.125
B. 22.375
C. 8.125

CONVERT THE FOLLOWING BICIMALS TO BASE TEN

- A. 111.01
B. 0.11101

C. 10101.110

GRADE 8 & 9 SYLLABI ON THE TOPIC

COMPUTERS

What is a computer?

A computer is an Electronic device that can:

- Accept data, as input
- Process the data
- Store data and information
- Produce information, as output.

BASIC ELEMENTS OF A COMPUTER



FLOW CHARTS

- A computer carries out all its tasks in a logical way.
- A set of logical steps that need to be followed in order to solve a problem are also referred to as FLOW CHART.

How does one construct a flow chart?

- To construct a flow chart one needs to firstly master the symbols used and their meaning.

BASIC FLOWCHART SYMBOLS

SYMBOL	MEANING
	BEGIN/END OR START/ STOP
	INPUT/OUTPUT OR ENTRY/DISPLAY
	PROCESS

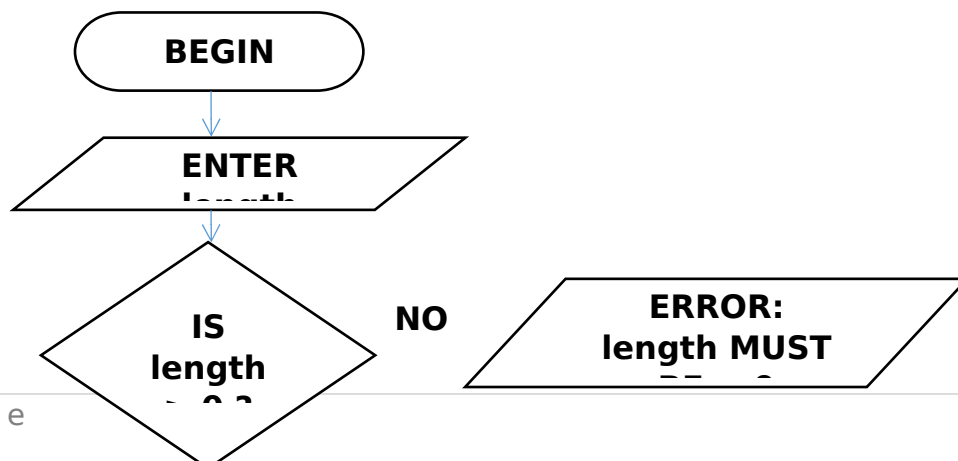
	DECISION
	PROGRAM FLOW

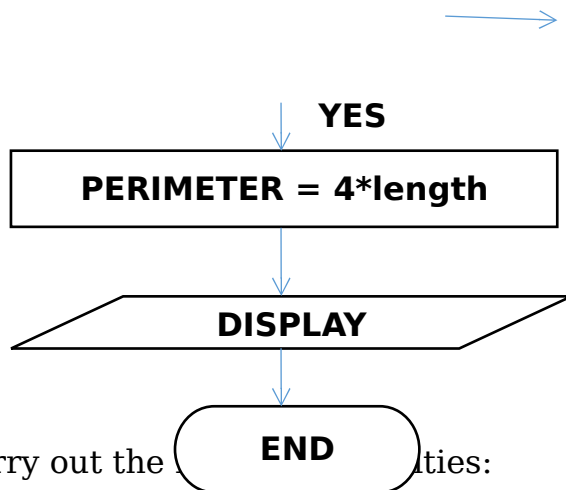
BASIC FOUR OPERATORS

SYMBOL	MEANING
+	ADDITIONAL
-	SUBTRACTION
*	MULTIPLICATION
/	DIVISION

EXAMPLE:

- Construct a **flow chart** program to calculate the **perimeter** of a square, given its **length**.
- Since the formula is:
Perimeter = 4l
- Data needed for input is the **length**





Carry out the following activities:

1. Construct a flow chart program on how to find Mr. Mwansa's age given his year of birth as y.
2. Prepare two questions using the well-known formulae or mathematical concepts on which a flow chart can be used to arrive at its solutions.

Topic Study –Mathematics Computer & Calculator

FUNCTIONS ON A CALCULATOR

- A relevant component of the syllabus but with most challenges when it comes to teaching arising from the fact that :
 1. there is no standard or specific type of a calculator to be used in our schools.
 2. the subtopic is perceived as obvious by both the learners and teachers.
 3. the supposition that the subtopic is taken care of by the manual the calculators come with.
- Hence, this subtopic goes unattended to in most cases.
- Thus far it is advised that we try to find resolutions to these
 - Challenges and start teaching this subtopic.

BASIC COMPONENTS OF A COMPUTER

A computer is an Electronic device that can:

- Accept data, as input
- Process the data

- Store data and information
 - Produce information, as output.
- Parts or devices that serve in each of the processes below:



- Input parts/devices
Examples include Keyboard, mouse etc.
- Process part/device
For example CPU or Systems Unit.
- Output parts/ devices
Examples include Monitor, Printer etc.
- Storage parts/devices
For example Flash disk, Memory card etc.

ALGORITHMS.

- A flow chart as understood from the previous presentation can also be considered as an example of an Algorithm

Definition

- An algorithm is generally a set of logical steps that need to be followed in order to solve a problem.
- For example the solving of a malaria problem using any anti-malaria drug.

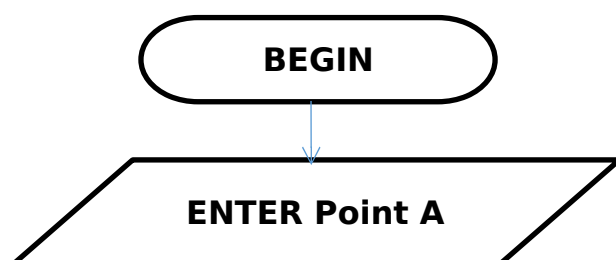
METHODS OF IMPLEMENTING AN ALGORITHM.

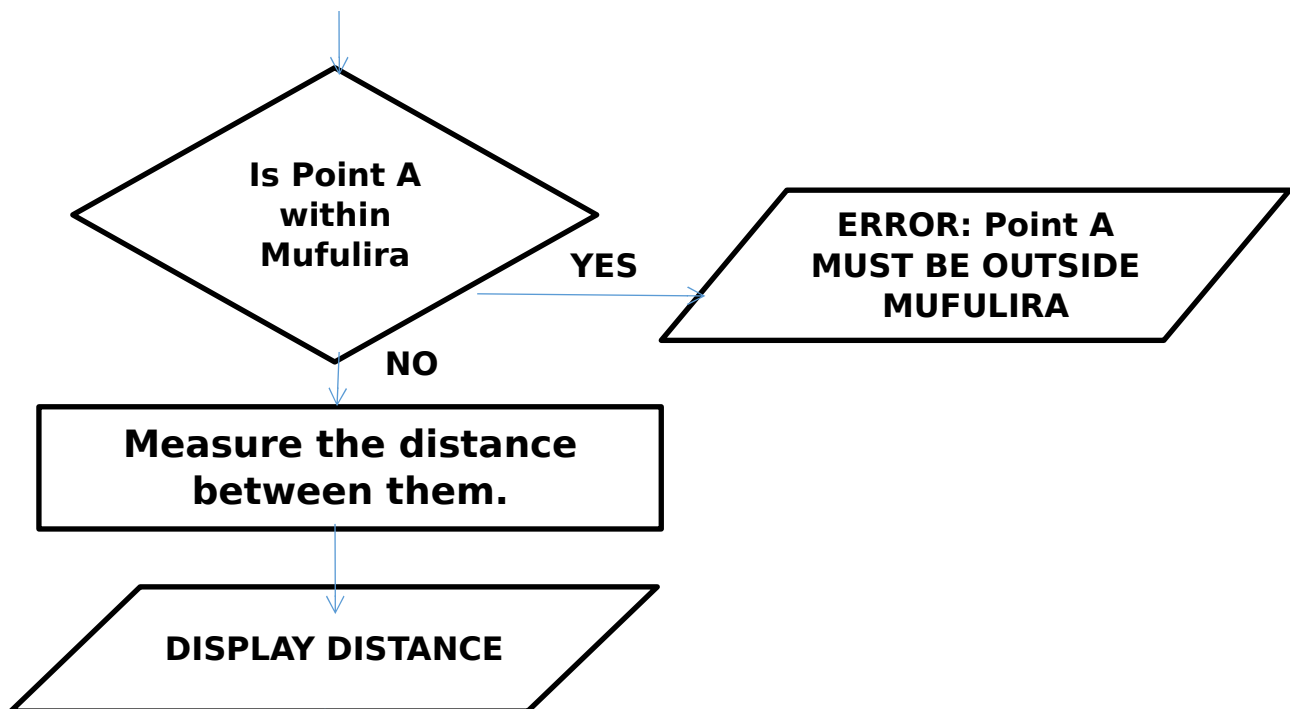
- There are two basic methods of implementing an algorithm and these are:

- (i) FLOW CHARTS
- (ii) PSEUDO CODE

- FLOW CHARTS

- The underlying factors of any flow chart are the use of the correct symbols for each step and the correct operation symbols.
- For example; calculate how far point A is from Mufulira, given point A.





- This is a derivative of a flow chart and its underlying factors are the correct extraction of statements inside a flow chart symbol, listing them vertically and preservation of the logical steps also known as indentation.
- For example; An equivalent Pseudo code to the flow chart above is:

EQUIVALENT PSEUDO CODE

BEGIN

ENTER Point A,

IF Point A is within Mufulira THEN

DISPLAY Error message,

ENTER Point A,

ELSE

Measure Distance between them,

ENDIF

DISPLAY Distance,

END.

GROUP ACTIVITIES

Working in pairs

- (i) Identify a problem whose solution is dependant on one parameter.
- (ii) Demonstrate how you would get to this solution by using both methods of implementing an algorithm.
- (iii) Each one of the members in a group to present each of the methods.

CONCLUSION

This topic on computer and calculator in mathematics does not replace the need for one to be computer literate via the learning of computer studies but among others:

- Provide for the knowledge on stages of problem solving (define a problem, analysis method of solution) and knowledge on how to write a computer program.