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Category - Little Champs

**Class : III**

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# Algorithm & Flowcharts

## Std. III

### Chapter 1. Algorithm

Algorithm is a step by step procedure to perform any task.

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For Example to make a coffee we have some procedure like



1. Take coffee in a cup.
2. Fill kettle with water.
3. Boil the water in the kettle.
4. Pour some boiled water into the cup.
5. Add milk.
6. Add sugar.
7. Stir it well.
8. Drink the coffee.

**Example1.** Above is the day to day example for making coffee here we are following some steps to get a coffee for drinking, So we can say that a logical step-by-step method to solve the problem is called algorithm, in other words, an algorithm is a procedure for solving problems.

In order to solve a mathematical or computer problems, this is the first step of the procedure. An algorithm includes calculations, reasoning and data processing. Algorithms can be presented by natural languages, pseudo code and flowcharts, etc.

## Characteristics of good algorithm

1. **Finiteness** - An algorithm must be finite that it must terminated after a finite (countable) number of steps. Each step of an algorithm must be precisely and easily defined.
2. **Input** - Input is what we can provide to process that is raw data or material like what we have in our coffee algorithm is materials like coffee, sugar, water and milk. An algorithm has zero or more inputs, i.e the values or quantities which are given to it initially before the algorithm begins.
3. **Output** - Output is the final product or the result of any program we get after procedure. Like we will get coffee for drinking after the procedure is complete.
4. An algorithm has one or more outputs i.e. quantities which have a specified relation to the inputs.
5. An algorithm should be effective. This means that all of the operations to be performed in the algorithm must be basic and should finish in a finite length of time.

## Examples of an algorithm

Addition of any two numbers

1. Start
2. Accept first number
3. Accept second number
4. Add both the numbers
5. Print the result
6. End

### Algorithm to find the given number is odd or even

1. Start
2. Accept any number
3. Check whether the number is greater than or equal to one
4. If it smaller than one give message 'enter the number greater than or equal to one'
5. Else check whether the number is divisible by 2 or not
6. If yes then the number is even
7. Else the number is odd

### Do It Your Self



## Assignments

*(a) Write an algorithm to find the smallest number between two numbers*

*(b) An algorithm to calculate even numbers between 20 and 40*

# Algorithm & Flowcharts

## Chapter 2. Flow charts






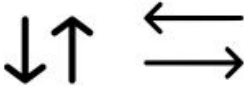
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An **Algorithm** is a step-by-step analysis of the process, while a flowchart explains the steps of a program in a graphical way.

**Algorithms and Flowcharts** are two different tools used for creating new programs, especially in computer programming.. The flowchart is a diagram which visually presents the flow of data through processing systems. This means by seeing a flow chart one can know the operations performed and the sequence of these operations in a system.

Algorithms are nothing but sequence of steps for solving problems. So a flow chart can be used for representing an algorithm. A flowchart, will describe the operations (and in what sequence) are required to solve a given problem.

To solve any problem it is good practice to write algorithm and flowchart. *Symbols used in Flow chart.*

<i>Symbols</i>	<i>Name</i>	<i>Functions</i>
	<i>Process</i>	<i>Indicates any type of operations.</i>
	<i>Input/ Output</i>	<i>Input /output operations. (I/O)Operation.</i>
	<i>Decisions</i>	<i>To find question that can be answered in Yes/No, True/False format.</i>
	<i>Connector</i>	<i>Flowchart to be drawn without intersecting lines or without a reverse flow.</i>
	<i>Terminals</i>	<i>Indicates the starting or ending of the program, process, or interrupt program.</i>
	<i>Flow Lines</i>	<i>Shows direction of flow.</i>

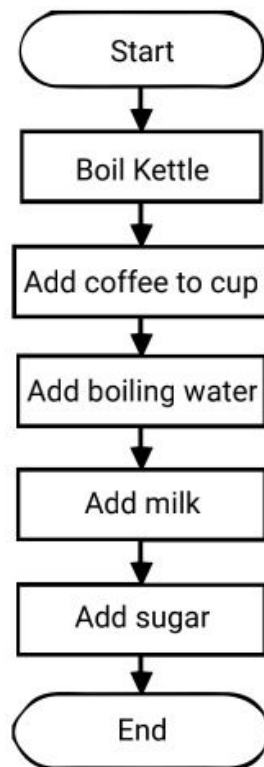
### General Rules for flowcharting

1. All symbols of the flowchart must connect with Arrows. (Not lines)
2. An entry point of the flowchart is at top with no other entry points. The exit point for all flowcharts is at the bottom except for the Decision symbol.
3. While using decision symbol we have two exit points; these can be on the sides or the bottom and one side.
4. Generally a flowchart will flow from top to bottom. However, sometimes an upward flow can be shown.
5. Connectors are used to connect breaks in the flowchart. Examples are:
  - a) From one page to another page.
  - b) From the bottom of the page to the top of the same page.
  - c) An upward flow of more than 3 symbols.
6. Flow chart is the standardized format provides a common method for people to visualize **ALGORITHM**.



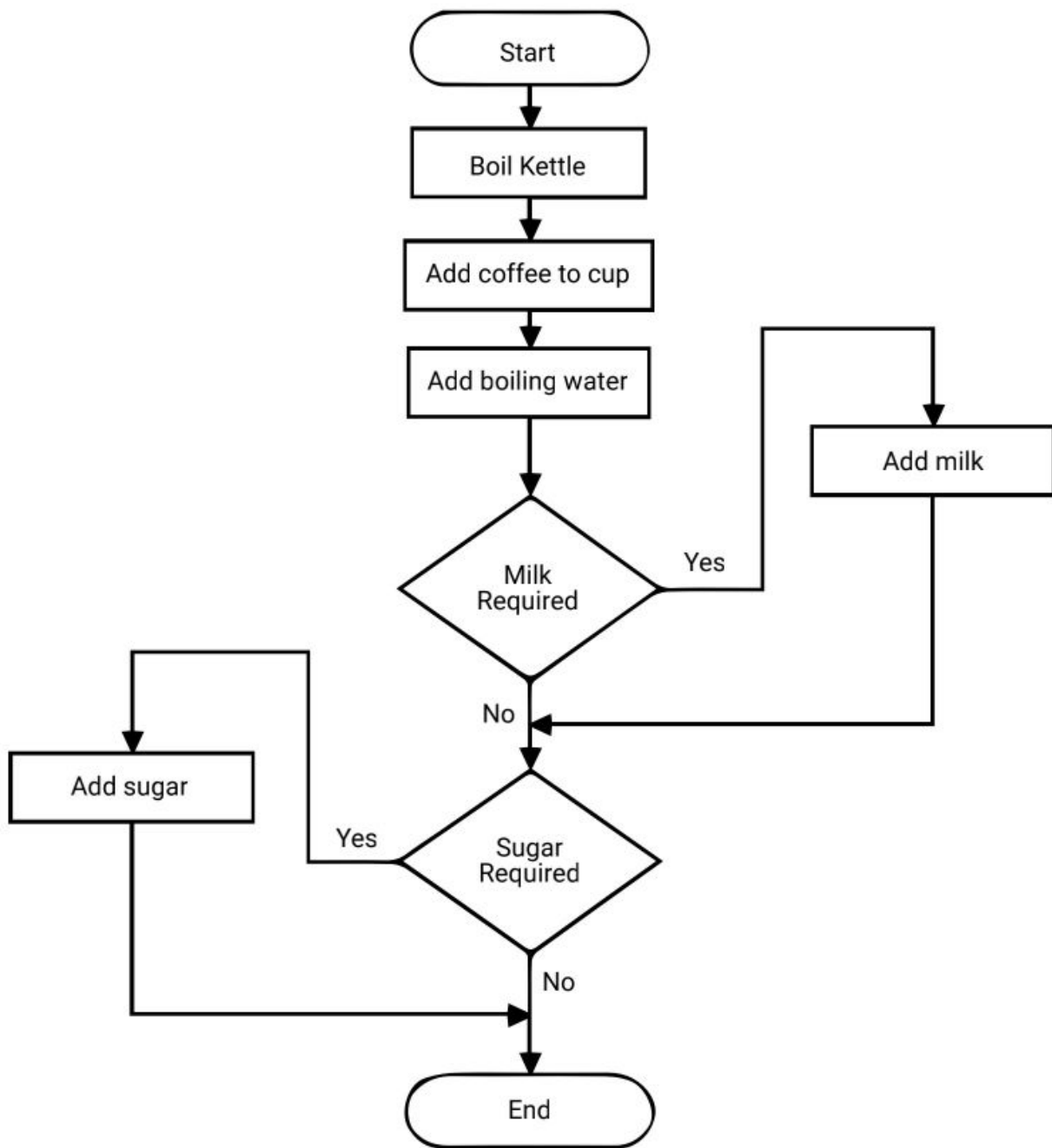
### Examples of flow chart.

Below is a flowchart that describes the process of making a cup of coffee.

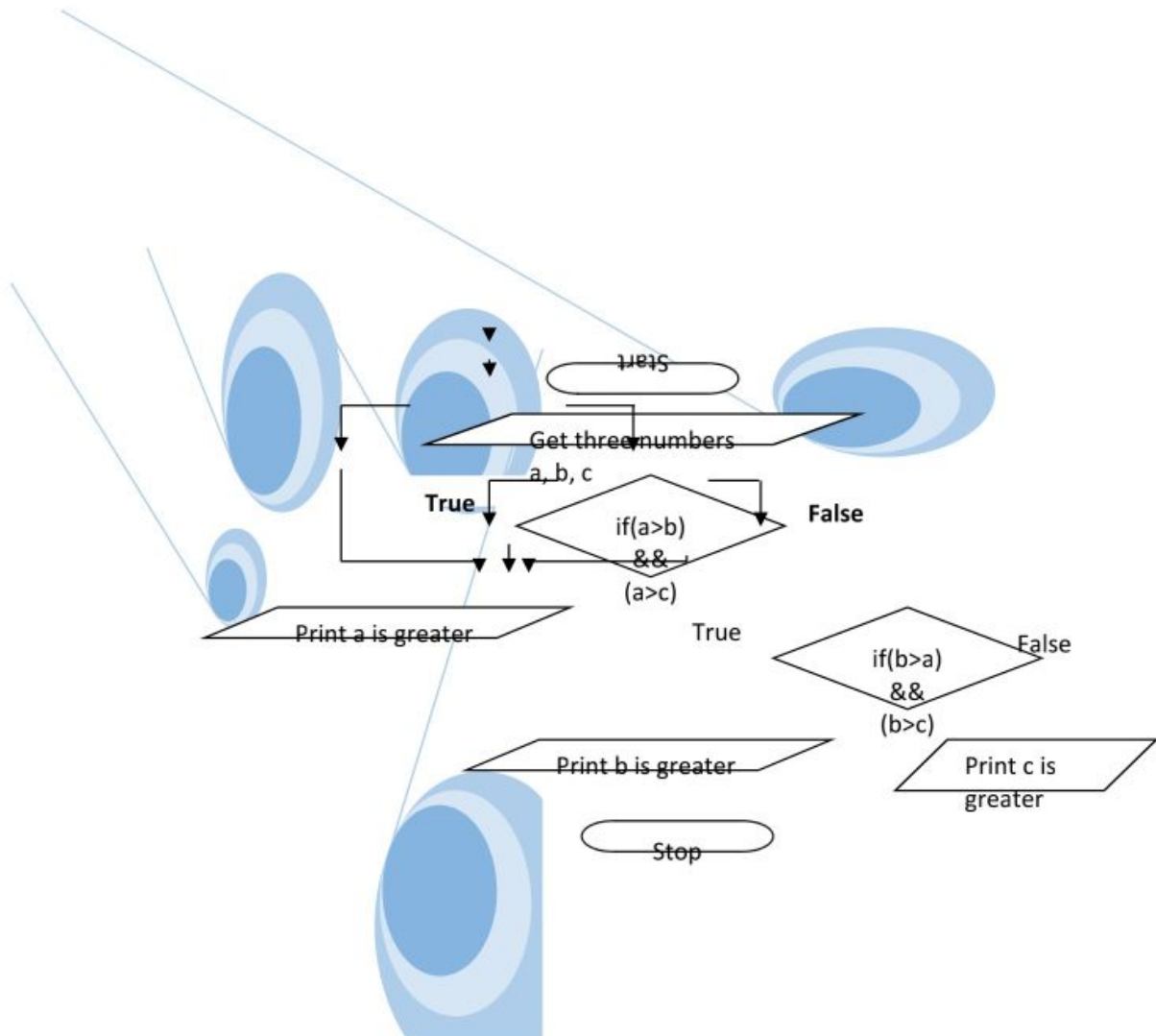


### Coffee, Milk & Sugar Optional

Not everyone takes milk and sugar in their coffee. Our first flowchart makes that assumption. This flowchart addresses that problem.



## Comparison of any three number



### Q.1 Fill in the blanks

1. Algorithm is a -----(random/step by step) procedure to perform any task.
2. Algorithms and flowcharts are mostly used to solve -----  
(computer programs /home assignments).
3. (Terminal/Flow lines)-----Indicates the starting or ending of the program, process, or interrupt program.
4. An algorithm must be finite that it must ----- (terminate/start) after a finite (countable) number of steps.

### Do it Your self

Draw a flowchart for the following.

- 1) To make a triangular fold of a paper.
- 2) Multiplication of any two numbers.

.....**End**.....



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