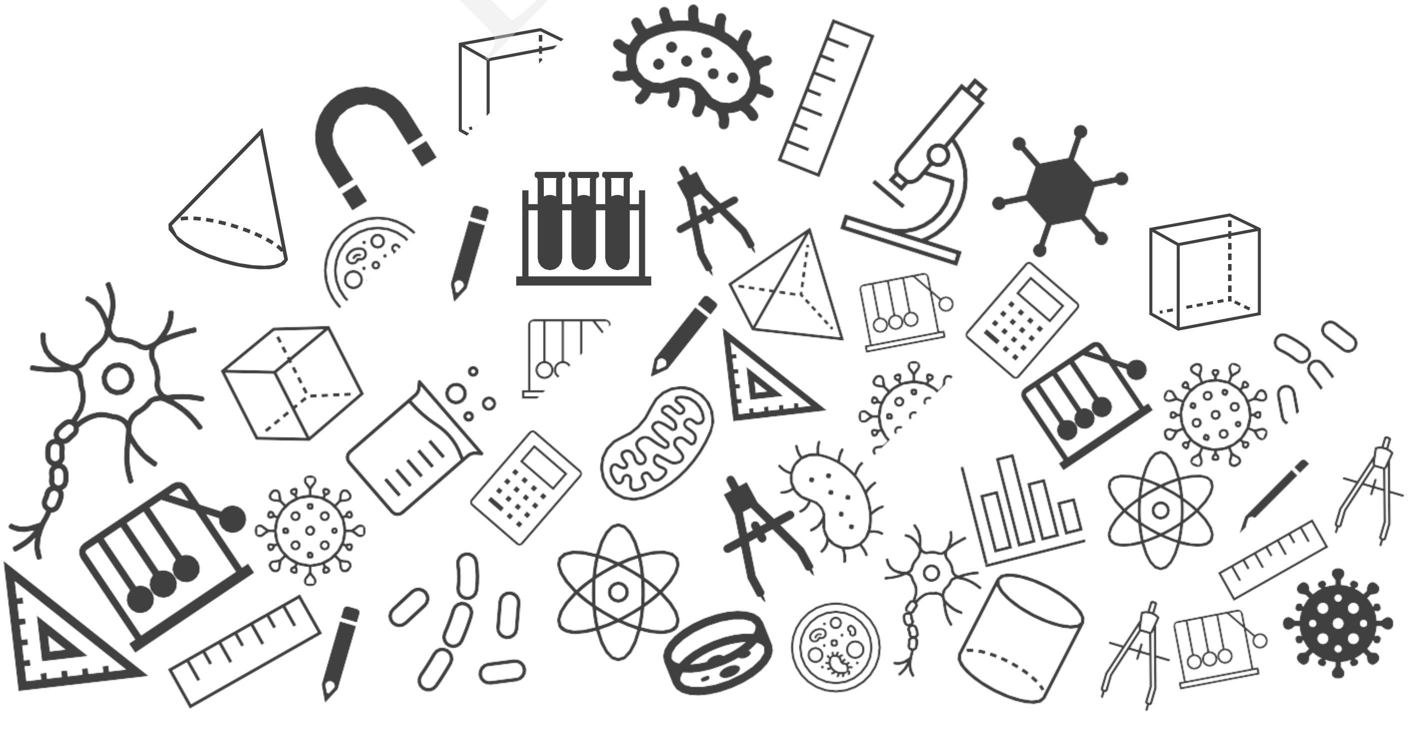
BYJU'S

Grade 08
Maths Chapter Notes



BYJU'S Classes

Chapter Notes

Data Handling

Grade 08

Topics to be Covered

1. Data

- 1.1. Raw and Organised Data
- 1.2. Frequency
- 1.3. Grouped Data

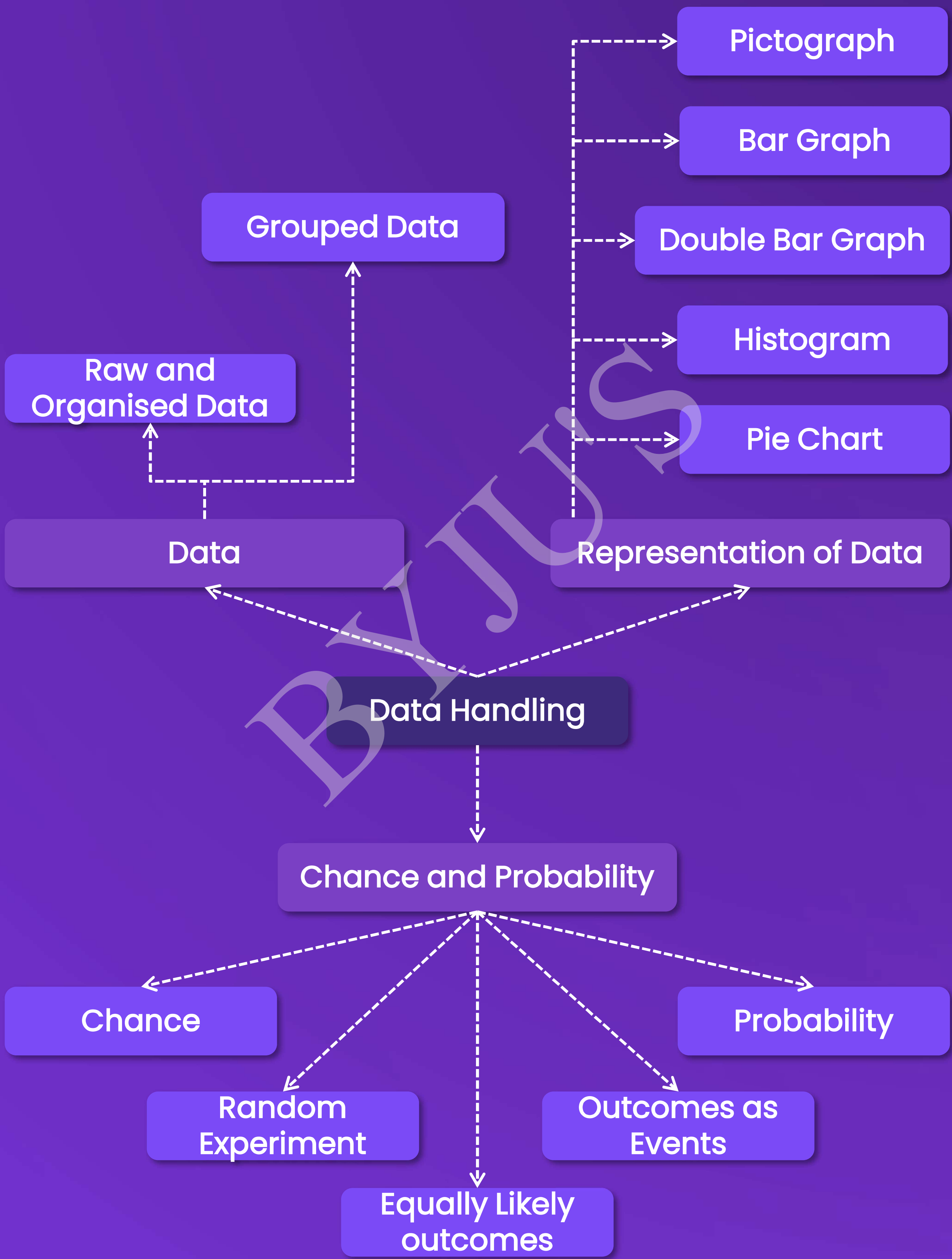
2. Representation of Data

- 2.1. Pictograph
- 2.2. Bar Graph
- 2.3. Double Bar Graph
- 2.4. Histogram
- 2.5. Pie Chart

3. Chance and Probability

- 3.1. Chance
- 3.2. Random Experiment
- 3.3. Equally likely Outcomes
- 3.4. Outcomes as Events
- 3.5. Probability

Mind Map


Pictograph
Bar Graph
Grouped Data
Double Bar Graph
Raw and Organised Data
Histogram
Pie Chart
Data
Representation of Data
Data Handling
Chance and Probability
Chance
Probability
Random Experiment
Outcomes as Events
Equally Likely outcomes

1. Data

1.1. Raw and Organised Data

Data available to us in an **unorganised form** called **raw data**.

Data organization is the process of organising raw data, by classifying them into different categories.

Example:
Raw data: 5, 4, 7, 10, 10, 10, 7, 10, 5, 10
Organised data after arranging it in ascending order: 4, 5, 5, 7, 7, 10, 10, 10, 10, 10

1.2. Frequency

Frequency gives the **number of times** that a particular entry occurs in a given data set.

Consider the following data set:
5, 4, 7, 10, 10, 10, 7, 10, 5, 10

The frequency of each data entry is represented in the following table:

Entry	Tally marks	Frequency
4	I	1
5	II	2
7	II	2
10	~~IIII~~	5

The above table is known as **frequency distribution table.**

1. Data

1.3. Grouped Data

Grouped data is the data formed by adding individual observations into groups.

Let's consider a set of data for an example:
21, 10, 30, 22, 33, 5, 37, 12, 25, 42, 15, 39, 26, 32, 18, 27, 28, 19, 29, 35, 31, 24, 36, 18, 20, 38, 22, 44, 16, 24, 10, 27, 39, 28, 49, 29, 32, 23, 31, 21, 34, 22, 23, 36, 24, 36, 33, 47, 48, 50, 39, 20, 7, 16, 36, 45, 47, 30, 22, 17

Grouped data for this data set is as follows:

Groups	Tally Marks	Frequency
0 - 10	II	2
10 - 20	~~IIII~~ ~~IIII~~	10
20 - 30	~~IIII~~ ~~IIII~~ ~~IIII~~ ~~IIII~~ I	21
30 - 40	~~IIII~~ ~~IIII~~ ~~IIII~~ IIII	19
40 - 50	~~IIII~~ II	7
50 - 60	I	1

Each of these groups 0–10, 10–20, 20–30, and so on is called a **class interval**.

The lower class limit of a class interval is the smallest data value that it can accommodate. The upper class limit of a class interval is the largest data value that it can accommodate.

This **difference** between the **upper class limit and lower class limit** is called the **width or size of the class interval.**

In the class interval, 10–20, 10 is called the lower class limit and 20 is called the upper class limit. Hence, the class size = 20 − 10 = 10

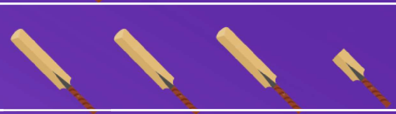
2. Representation of Data

2.1. Pictograph

A pictograph is a pictorial representation of data using symbols.

- The pictograph shows the quantity of ingredients in pictorial form.
- In the pictograph, we use a key, which denotes the value of the symbol.
- A part of an icon can be used to denote data less than minimum value.

Given below is a pictograph representing runs scored by a cricket player in 4 matches:

Runs	Pictorial Representation
500	
100	
350	
50	

Key: 1 represents 100 runs

- 500 runs is represented by 5 bats ( ).
- 50 runs is represented by half a bat ( ).

2. Representation of Data

2.2. Bargraph

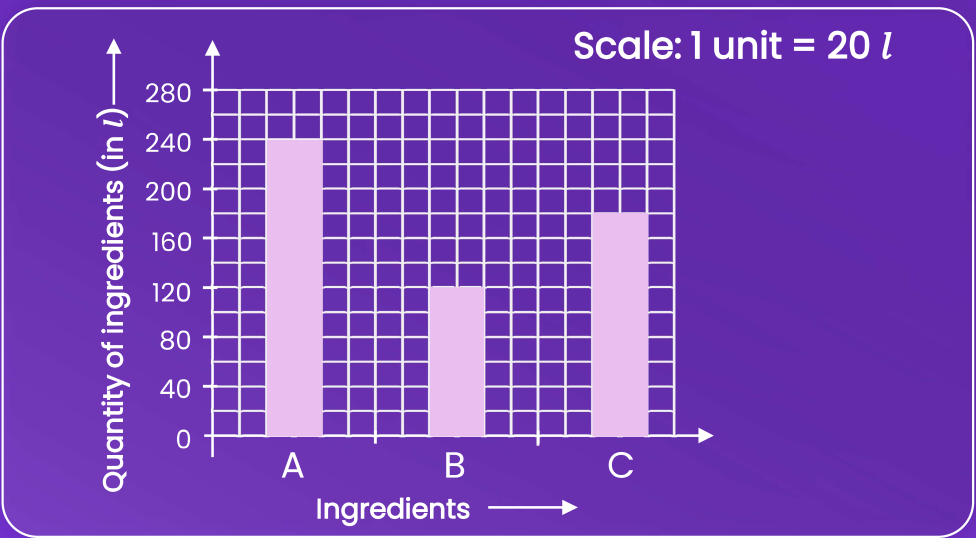
A display of information using bars of uniform width, their heights being proportional to the respective values.

- Heights of bars are proportional to the values that they represent.
- Bar graphs have two axes:
  x(horizontal) axis
  y(vertical) axis
- The scale of a bar graph helps us to represent large numbers within the page size.

A bar graph representing quantity of ingredients A, B, and C in litres is shown.

- The scale of the graph is taken as: **1 unit = 20 l**
- Along x axis ingredients are shown.
- Along y axis the quantity in litres are shown.

- The quantity of ingredient A is 200 l.
- Similarly the quantity of ingredient B and C are 120 l and 170 l, respectively.



2. Representation of Data

2.3. Double Bargraph

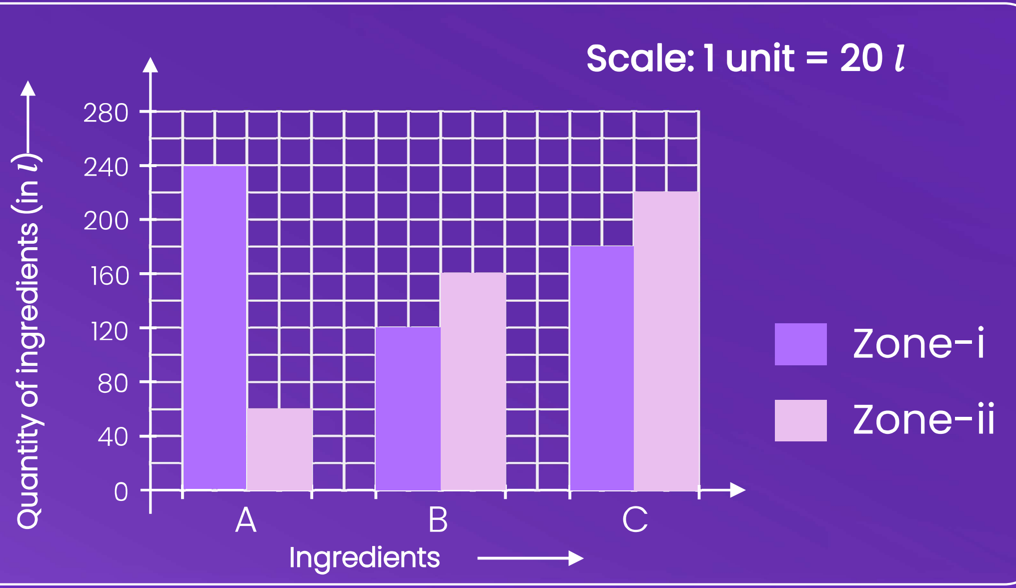
A bar graph showing two sets of data simultaneously. It is useful for the comparison of the data.

Conditions for drawing a joint bar graph:

- **Number of samples** must be **same**.
- **Scale** also must be **same**.
- **Data type** must be **same**.

A double bar graph representing the quantity of ingredients A, B and C in zone-i and zone-ii is shown.

- The scale of the graph is taken as: 1 unit = 20 l
- The quantity of ingredient A in zone-i is 240 l and in zone-ii is 60 l.
- The quantity of ingredient B in zone-i is 120 l and in zone-ii is 160 l.
- The quantity of ingredient C in zone-i is 180 l and in zone-ii is 220 l.



2. Representation of Data

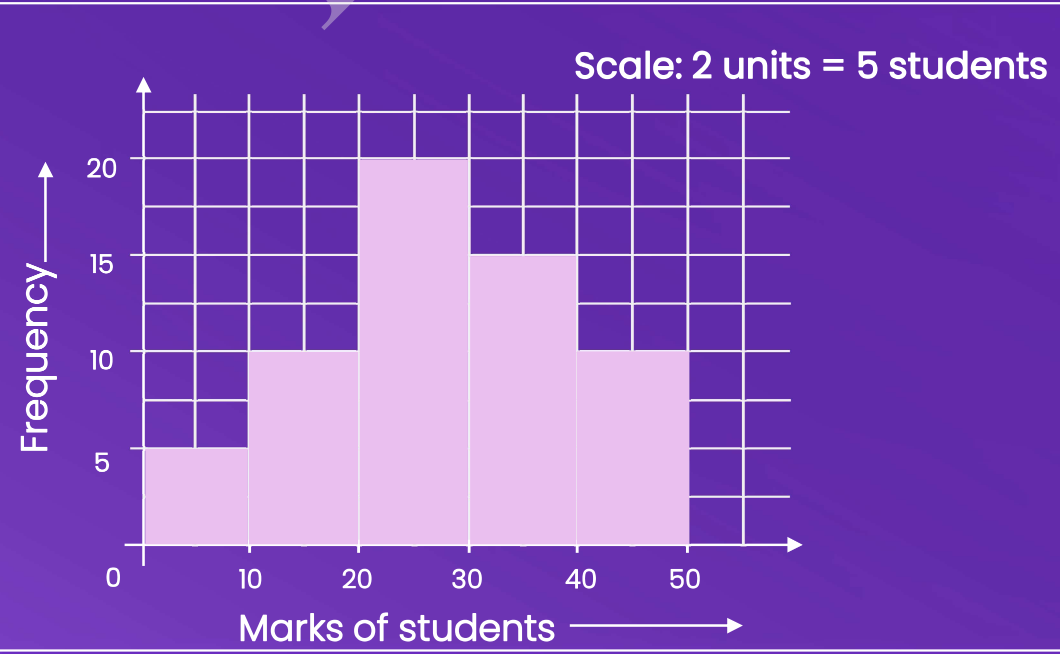
2.4. Histogram

A histogram is a graphical representation of a grouped frequency data with continuous classes.

- **Height of a bar** represents the **frequency** of the class interval.
- **Width of the bar** represents the **class size** of the class interval.
- There is **no gap** between the two bars in a histogram.

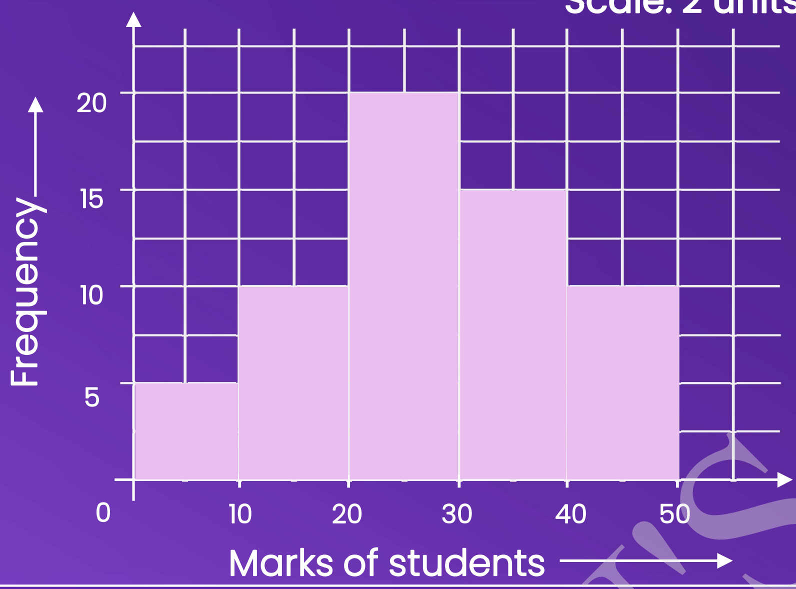
A histogram representing the marks obtained by some students is shown.

- The scale is of the histogram is taken as:
  2 units = 5 students
- The class size is 10.
- Along X axis marks obtained by the student is shown.
- Along y axis the number of students is shown.



2. Representation of Data

2.4. Histogram



The grouped frequency data for this given histogram is as follows:

Marks of students	Tally Marks	Number of students (Frequency)
0 - 10	𝍸	5
10 - 20	𝍸 𝍸	10
20 - 30	𝍸 𝍸 𝍸 𝍸	20
30 - 40	𝍸 𝍸 𝍸	15
40 - 50	𝍸 𝍸	10

2. Representation of Data

2.5. Pie chart

A pie chart is a type of graph that represents the data in the circular graph. The slices of the pie show the relative size of the data.

- The whole circle is divided into sectors.
- Circle graph shows the relationship between a whole and its parts.
- The size of each sector is proportional to the activity or information it represents.

Drawing Pie charts

- For drawing a pie chart, we need to find the central angle of the sectors.
- The total angle at the centre of a circle is 360°.

Let's consider an example:
The favourite flavours of ice-creams for students of a school is given in percentages as follows:

Flavours	% students preferring the ice-cream flavours
Chocolate	50
Vanilla	25
Other flavours	25

2. Representation of Data

Drawing Pie charts

Central angle of the sectors for the following data can be calculated as:

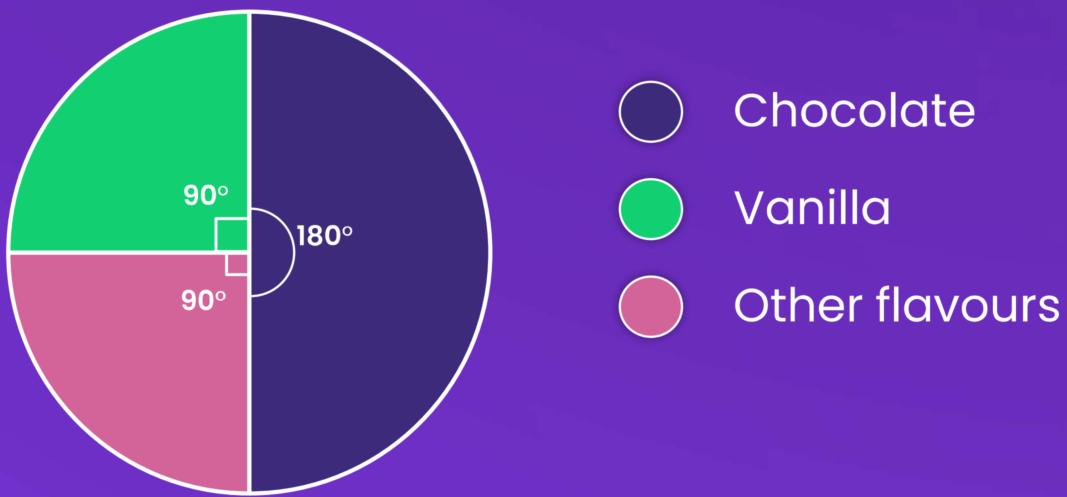
Flavours	% students preferring the ice-cream flavours	Central angle
Chocolate	50	$\frac{50}{100} \times 360° = 180°$
Vanilla	25	$\frac{25}{100} \times 360° = 90°$
Other flavours	25	$\frac{25}{100} \times 360° = 90°$
Total	100	360°

Now, that we have the central angles, we follow some steps to draw the pie chart.

1. Draw a circle with any convenient radius.

2. Use the protractor to draw the central angles of various sectors and mark them.

Finally, the pie chart obtained for the given data is as follows:



3. Chance and Probability

3.1. Chance

A chance is the occurrence of events in the absence of any obvious intention or cause. It is the possibility of something happening.

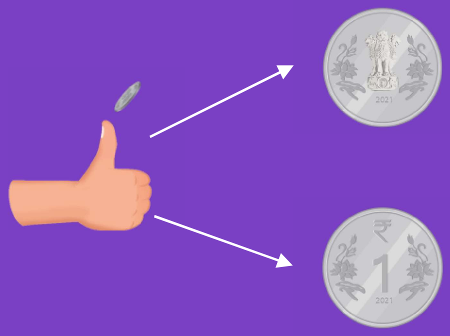
- Sometimes we usually say that there is a **high chance** of raining by looking at sky.

- Sometimes looking at the sun we can say that there is **low chance** of raining.

3. Chance and Probability

3.2. Random Experiment

An experiment whose result is uncertain is termed as a random experiment.



- For example, in tossing a coin there can be two possible outcomes: getting a head or a tail

3.3. Equally Likely Outcomes

Outcomes of an experiment are equally likely if each has the same chance of occurring.

3.4. Outcomes as Events

Each outcome of an experiment or a collection of outcomes make an event.

For example: In the experiment of tossing a coin, getting a Head is an event and getting a Tail is also an event.

3. Chance and Probability

3.5. What is Probability?

Probability denotes the possibility of the outcome of any random event. The **value of probability** is expressed from **zero to one**, where **0 means an event to be an impossible one** and **1 indicates a certain event.**

$$\text{Probability of an event} = \frac{\text{Number of favourable outcomes}}{\text{Total number of possible outcomes}}$$

Let's consider an example of rolling a dice.

The outcomes are: 1, 2, 3, 4, 5 and 6
Hence, the total number of possible outcomes is 6.

Now the probability of getting any of the numbers is $\frac{1}{6}$.