ODM EDUCATIONAL GROUP
Changing your Tomorrow

STATISTICS

INTRODUCTION

SUBJECT : MATHEMATICS
CHAPTER NUMBER: 14
CHAPTER NAME : STATISTICS

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LEARNING OUTCOME

1. Students will be able to know the concept of mean , median and mode .
2.Students will be able to use the concept of mean , median and mode in daily life situations.

MEAN (AVERAGE): Mean [Ungrouped Data] – Mean of n observations, x_1, x_2, x_3 … x_n, is

$$\bar{X} = \frac{x_1 + x_2 + x_3 + \ldots + x_n}{n} = \frac{1}{n}\sum x \qquad \therefore \qquad \bar{X} = \frac{\sum x}{n}$$

MEAN [Grouped Data]: The mean for grouped data can be found by the following three methods:

(i) Direct Mean Method

(ii) Assumed Mean Method

(iii) Step Deviation Method

Frequency of a class is centred at its mid-point called class mark.

What is mean:

https://youtu.be/6DYtC7lrVuY {6.52}

A survey was conducted by a group of students as a part of their environment awareness programme, in which they collected the following data regarding the number of plants in 20 houses in a locality. Find the mean number of plants per house.

No. of plants	No. of houses
0 – 2	1
2 – 4	2
4 – 6	1
6 – 8	5
8 – 10	6
10 – 12	2
12 – 14	3

Number of plants	Class mark (x_i)	Number of houses (f_i)	$f_i x_i$
0 – 2	1	1	01
2 – 4	3	2	06
4 – 6	5	1	05
6 – 8	7	5	35
8 – 10	9	6	54
10 – 12	11	2	22
12 – 14	13	3	39
Total		$\Sigma f_i = 20$	$\Sigma f_i x_i = 162$

We have, Mean $(\bar{x}) = \dfrac{\Sigma f_i x_i}{\Sigma f_i} = \dfrac{162}{20} = 8.1$ plants. The mean of the data is 8.1.

Since the values of x_i and f_i are small, so we have used direct method to find the mean.

Consider the following distribution of daily wages of 50 workers of a factory.

Daily wages (in ₹)	No. of workers
100 – 120	12
120 – 140	14
140 – 160	8
160 – 180	6
180 – 200	10

Find the mean daily wages of the workers of the factory by using an appropriate method.

Thirty women were examined in a hospital by a doctor and the number of heart beats per minute were recorded and summarised as follows. Find the mean heart beats per minute for these women, choosing a suitable method

Number of heart beats per minute	No. of women
65 – 68	2
68 – 71	4
71 – 74	3
74 – 77	8
77 – 80	7
80 – 83	4
83 – 86	2

Let us find the mean of the data by direct method.

Class interval	Frequency (f_i)	Class marks (x_i)	$f_i x_i$
65 – 68	2	66.5	133
68 – 71	4	69.5	278
71 – 74	3	72.5	217.5
74 – 77	8	75.5	604
77 – 80	7	78.5	549.5
80 – 83	4	81.5	326
83 – 86	2	84.5	169
	$\Sigma f_i = 30$		$\Sigma f_i x_i = 2277$

$$\therefore \text{Mean of data} = \frac{\Sigma f_i x_i}{\Sigma f_i} = \frac{2277}{30} = \mathbf{75.9}.$$

A class teacher has the following absentee record of 40 students of a class for the whole term. Find the mean number of days a student was absent.

No. of days	No. of students
0 – 6	11
6 – 10	10
10 – 14	7
14 – 20	4
20 – 28	4
28 – 38	3
38 – 40	1

Class interval	Frequency (f_i)	Class marks (x_i)	$f_i x_i$
0 – 6	11	3	33
6 – 10	10	8	80
10 – 14	7	12	84
14 – 20	4	17	68
20 – 28	4	24	96
28 – 38	3	33	99
38 – 40	1	39	39
	$\Sigma f_i = 40$		$\Sigma f_i x_i = 499$

$$\therefore \text{Mean number of days} = \frac{\Sigma f_i x_i}{\Sigma f_i} = \frac{499}{40}$$

$$= \mathbf{12.48\ days.}$$

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HOME ASSIGNMENT Ex. 14.1 Q. 1 to Q 5

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THANKING YOU

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