Uniform and Non-Uniform Motion: An object is said to be in uniform motion when it moves along a straight path, and covers equal distance in equal intervals of time. Now suppose the same car is travelling on another straight narrow road with lots of traffic, on it. It continues to travel along a straight path but its speed.

Distance and Time Graphs: The distance travelled by the object at equal intervals of time (like every second of every minute), we will get a clearer picture of its speed at different points of time. The data of the distance travelled and the time taken can be presented in many ways. One method would be to make a table. The information given in table can also be represented in a graph. This kind of a chart is called a line chart or line graph. It is created by plotting s series of data points and connecting them to form a line.

Table 12.2 Tabular representation of distance travelled and time taken

Time (in min)	Distance (in km)
2	2
4	4
6	6
8	7
10	8
12	9
14	9
16	9
18	9

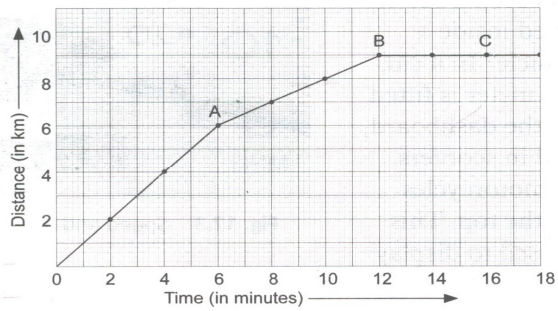
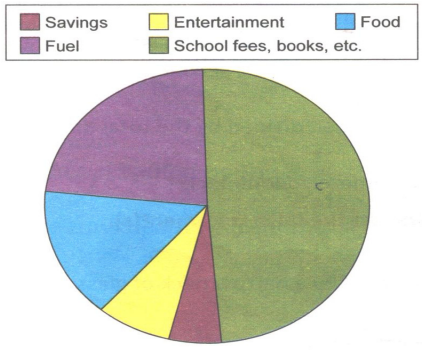
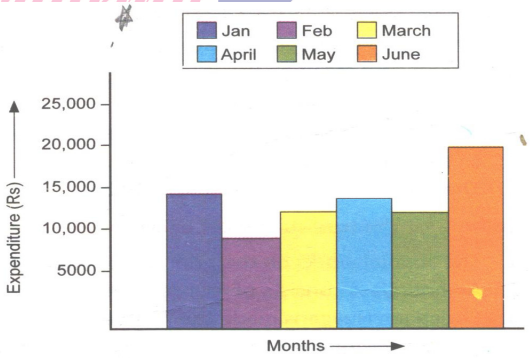


Fig. 12.4 Distance and time graph

Other commonly used charts are bar graphs and pie charts. They are generally used for representing statistical data as shown below. Figure A represents household expenditures in a month through a pie chart. Figure B represents household expenditures over a period of six months through a bar graph.



(a) Pie chart



(b) Bar graph

We can get the following points by examining the distance- time graph.

1. The steepness of the slope of the graph gives the speed. If the slope is greater (i.e, if the slope is steeper as in line OA of fig 12.4, the speed is greater than the speed shown by line AB because its slope is flatter).
2. The speed is zero if the graph is flat (i.e, parallel to the 'time' axis) as in BC.

If we assume that the vehicle moves at constant speed, i.e, it covers the same distance in equal intervals of time.

Table 12.3 Tabular representation of distance travelled and time taken

Time (in min)	Distance (in km)
2	2
4	4
6	6
8	7
10	10
12	12
14	14
16	16
18	18

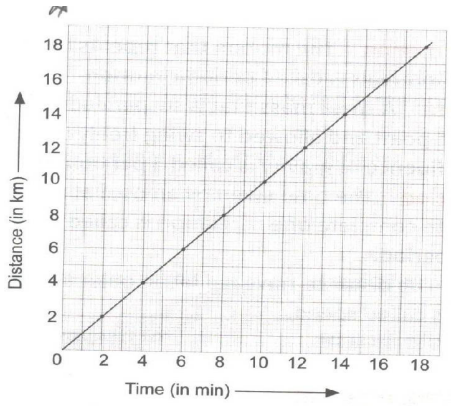


Fig. 12.6 Distance and time graph

Some Simple Calculations Once we know the speed of an object we can find out the distance covered in a given time, we have

Distance covered = speed x time

Q: The Shatabdi express takes 6 hours to travel from New Delhi to Lucknow at an average speed of 80 km/h. find the distance from New Delhi to Lucknow.

Q: The distance from Delhi to Chandigarh is 250 km. a bus travels at an average speed 50 km/h. how much time would it take to travel form Delhi to Chandigarh?

Using Motion-Time Graph

On such a linear graph, we generally choose the x- as-axis as the 'time axis' (independent variable) and the y-axis as 'distance- axis' (dependent variable)

We plot the distance- time graph be following the steps given below:

1. We choose appropriate scales to represent values of distance and time on the graph. The scale should not be too large or too small.
2. Mark the value for the distance and time on their respective axis, according to the chosen scale.
3. Next mark the points on the graph according to the given set of their values.
4. Join all the points on the graph.

For an object having a uniform motion, the distance – time graph would be a straight line, inclined to the time axis. However, if the speed of the object is changing (non- uniform motion), the graph can have any shape whatsoever.