Chapter 5

THE CIRCLE

In your previous class, you have read about the circle. You also know the shape of the circle. For example: bangles. The wheels of the bullock cart etc.

Below are given a few figures, observe whether they are circular or not and fill in the given blanks

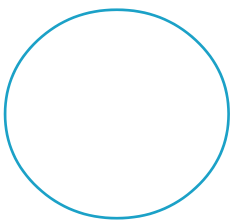

Fig 1

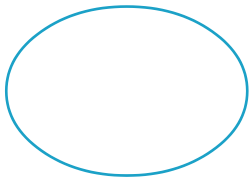

Fig 2

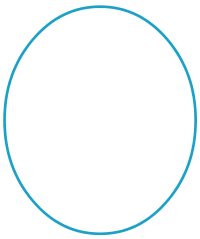

Fig 3

There are many such objects around you with the help of which you can make circles in your notebooks.

Can you identify some such objects? Make a list of such objects and make circles using three of them.

The objects that you have used to make circles might not always be a complete circle; it might have uneven edges also. Therefore, to make a perfect (accurate) circle, we use a compass.

ACTIVITY 1

Drawing a Circle with the Help of a Compass

Take the compass from your geometry box. Fix a small pencil in the space meant for holding the pencil in the compass (fig. 4). Now spread the arms of the compass a little, so that you can rotate the arm with the pencil around the pointed arm of the compass which you have kept fixed in the centre of your notebook.

You must be careful not to displace the pointed end from the centre of your notebook. The figure like this is known as a circle.

Fig 4

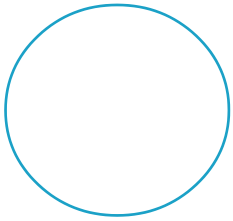

Fig 5

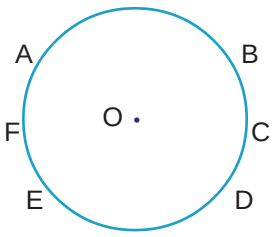

Fig 6

Put a dot at the point at which you had fixed the pointed end of the compass and name it as O. Now on the circle mark many points like A, B, C, D, E, F and measure their distances from point O.

1. OA = 2. OD = 3. OB =
4. OE = 5. OC = 6. OF =

Are all the measures equal?

Will any point on the circle give the same measure?

Similarly, make two more circles with the help of compass and verify the above results.

So, now you have learnt how to make a circle. We shall now do some activity to know the parts of a circle.

ACTIVITY 2

Make circle on piece of paper and cut out the shape of the circle from the paper with a pair of scissors. Now fold the circle in such a way that one half overlaps the other. Now, fold this semicircle into two equal parts again (again, one part will completely overlap the other.) Next open the paper and draw lines over the folds with the pencil.

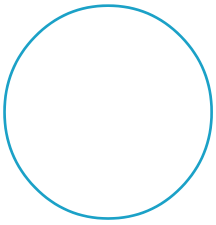

Fig 7

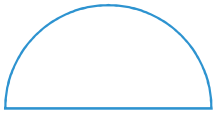

Fig 8

Fig 9

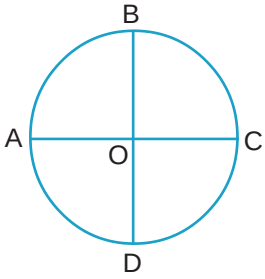

Fig 10

- Measure the lengths of AC and BD. Are they equal?
- Measure the distances from the point of intersection O for O to A, O to C, O to B and O to D and see whether their lengths are equals.

We observe that the distances of A, B, C and D from O are equal. This is known as the radius of the circle.

ACTIVITY 3

Make a circle in your copy with the help of the compass. Identify the centre of the circle. Now, take any point A on the circle. Now, join the different point of the circle to point A, in such a way that at least one line segment passes through the centre. Now measure the different line segments that you have drawn and note the measures in your notebook.

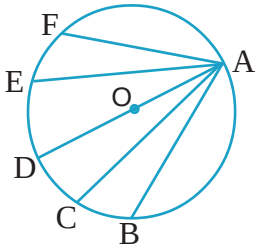

Fig 11

Now, find out the solutions to the questions given below:

1. Which is the longest line segment?
2. Does the longest line segment pass through the centre?
3. In one circle, how many such line can be drawn?

While doing this activity, you must have drawn several line segments connecting two points on a circle. These line segments are called chords. The longest chord passes through the centre of the circle and is called the diameter e.g. line segment (chord AD).

Since any line segment that passes through the centre is the longest chord and you also know that infinite number of lines can pass through a point; therefore in a circle, you can draw infinite number of diameters.

ACTIVITY 4

Draw three circles of different measures in your notebook and complete the following table.

S. no.	Length of the diameter	Length of the radius	Diameter ÷ Radius
1.			
2.			
3.			

In the above activity, you find that the diameter of any circle is double the length of the radius which means a radius is half of the length of the diameter.

Now, measure the complete area covered by the circle. This is the circumference of the circle and we shall try to understand the relationship between the circumference and the radius.

You know that in any close figure, the perimeter of the figure is the length of the circumference. To find out the perimeter of a circle cut out a circle from a piece of cardboard, mark a point on its edge. Now draw a straight line on your notebook and mark a point A on this line at one of its ends. Make the cardboard circle stand on the straight line in a way that point A on the cardboard coincides with point A on the straight line.

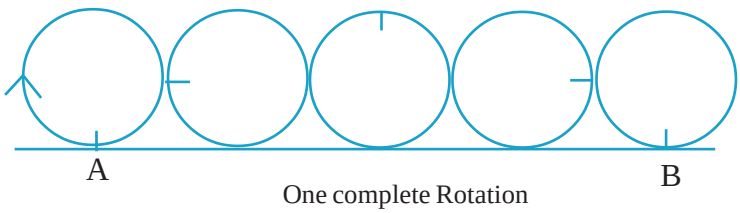

Fig 12

Now roll the cardboard circle over and till the mark A on the circle comes in the contact of the straight line again. Mark this point on the straight line as B.

Next, measure the distance between the point A and B.

S.No.	Measure of the radius	Perimeter/ circumferenc of the circle	Diameter of the circle	Circumference ÷ diameter
1.	3·5 cm			
2.	7 cm			
3.	10·5 cm			

In the above table, the circumference ÷ diameter is nearly same for all the places, which means the ratio of circumference and diameter for any circle is always the same. This constant is indicated by the Greek letter π (pie) and its value is $\frac{22}{7}$ or 3.14 approximately.

EXERICSE 5

1. **Draw circles of the given measures -**

   (i) radius = 2 cm (ii) radius = 3.5 cm

   (iii) radius = 4.2 cm (iv) radius = 5 cm

2. **Draw circles of the given measurements -**

   (i) diameter = 3 cm (ii) diameter = 6 cm

   (iii) diameter = 6.8 cm (iv) diameter = 7.4 cm

3. **In a circle of radius 3.2 cm, draw a chord of 6.4 cms.**

4. **Draw a circle whose longest chord is 8 cm in length.**

5. **If the radius of a circle is 7 cm, what would be its circumference or perimeter?**

6. **Fill in the blanks -**

   (i) diameter = 2 × _____

   (ii) The largest chord in a circle is known as a _____.

   (iii) The diameter of a circle passes through its _____.

   (iv) The radii of a circle are _____.

   (v) Two diameters in a circle intersect each other at the _____.

   (vi) The line segment joining any point on the circumference of a circle from the centers known as its _____.

   (vii) The line segment joining in any two points on the circumference of its_____.

What Have We Learnt ?

1. The line segment joining the centre of the circle to a point on the circumference of the circle is the radius of the circle.
2. All the radii of a circle are equal.
3. The line segment joining two points on the circumference of a circle is known as its chord.
4. The longest chord of the circle is its diameter which passes through the centre of the circle.
5. The diameter of the circle is twice its radius.
6. The ratio between the (perimeter) circumference of a circle and its diameter is always constant. This is known as π (pie) and its value is $\frac{22}{7}$ or 3.14 approxima-tely.