# Circles

By studying this lesson, you will be able to,

- identify items which have the circular shape and
- create circular designs using items which have the circular shape.

#### 1.1 Identifying items which have the circular shape

A figure of a purple circular shaped card is given here.

Pictures of several more items, in which the circular shape can be observed are given below.





- (1) From the following items, select and write down the ones in which the circular shape can be observed.
  - (i) The mathematics text book (ii) Drum
  - (iii) Cricket bat
  - (v) Winnowing fan
  - (vii) Steering wheel of a car
  - (ix) Pot

- (iv) Sieve
  - (vi) Wheel of a vehicle
- (viii) Tea spoon

### **1.2 Drawing circles using items**

The following figures illustrate how the circular shape is drawn using various items that have the circular shape. Carefully observe the figures and then engage in the following activity.





- Step 1 Take a two rupees coin, a cup and a saucer.
- Step 2 Draw the circular shape each using each of these items.
- **Step 3** Find several other items which have the circular shape, and draw the circular shape using each one of them.

The figure drawn in the above activity using the two rupees coin is shown here. The complete curved line of such a figure is known as a **circle**.

Observe that the circles drawn in the above manner are different from each other in size.



- Step 1 Using a cup, draw the circular shape on a piece of paper.
- Step 2 Separate the circular part, cutting along the curved line of the circular shape. Then we obtain a circular lamina.
- **Step 3-**Fold this circular lamina as shown in the figure, so that it is divided into two equal parts.
- Step 4 With the aid of a ruler, mark the fold line using a pencil.
- **Step 5**-Fold the circular lamina again as before, into two equal parts along a different fold line.
- Step 6 Mark this second fold line too with a pencil as done previously. Mark several other such fold lines, in the same manner as above.
- Step 7 Observe that all these fold lines pass through the same point. See whether the distance from this point to several points on the curved edge are equal to each other using a ruler.



Do the above activity using a saucer and a coin too.

Through this activity, the fact that the distance from the point where the fold lines which divide the circular lamina into two equal parts intersect, to any point on the curved edge of the lamina is the same is established.





Compare the figure you obtained by doing the above activity, with the figure given here.



In this manner, you will be able to identify the positions inside the circle, on the circle and outside the circle.



(1) From the following collection of items given below, select the ones that can be used to draw circles and write down the corresponding numbers.



(2) From the figures shown below, select those which are circles and write down the corresponding numbers.



- (3) Select various items which have the circular shape, and using them draw several circles which are different in size to each other.
- (4) In this figure,
  - (i) which letters indicate positions inside the circle?
  - (ii) which letters indicate positions on the circle?
  - (iii) which letters indicate positions outside the circle?



(5) In a competition of throwing darts onto a circular board by standing at a location in front of it, 10 points are awarded if the dart hits the circle and 5 points are awarded if the dart hits the inside of the circle. But, no points are awarded if the dart hits the outside of the circle.

A group of students participated in the above competition. The figure indicates where the darts thrown by each of the students hit the board.



- (ii) Who are the students who were awarded 5 points?
- (iii) Who are the students who did not receive any points?
- (iv) If each of these student is given two Rajitha more opportunities to throw darts, what is the maximum number of points that Mohan could receive in total?



### **1.3 Creating circular designs**

Three circular designs created using circles are shown below. Such designs can frequently be seen on clothing materials, festival decorations and in religious places.



**Step 4 -** Move the coin a short distance along the line once more and draw another circle.



Create various designs as in the above activity, by moving the coin along different curved lines as well and drawing circles.

One such design is shown here.



- Step 1 Take coloured pencils, pieces of paper and several items which can be used to draw circles.
- Step 2 Using various colours,
  - (i) create circular designs using only one of the items.
  - (ii) create circular designs using two or more items of different sizes.
- **Step 3 -** By drawing circular designs, create a decoration to be displayed in your room to make the room attractive.

## Summary

- There are many items of different sizes in our environment that have a circular shape.
- Various designs can be created using circles.