# **CHAPTER-19**

# Area

Arrange books on the table in your class such that no book covers the other and all the books are of the same size.

How many books did you need to cover the whole table?

Hence the surface area of table = surface of ..... books.

Now do a similar activity using copies. If you don't find copies of the same size, use only one and measure how many times you needed to cover the whole table.

You can take the help of your teacher in doing this.

You can do this using a slate too.

#### Now complete the given table-

Sometimes while keeping books on the surface of the table is does not cover the table completely. Some portion of the table, is left uncoverd.

If it happens, can we say that the surface area of the table is equal to the number of books kept on the table? Discuss with your teacher.

The measure of the surface of figure is the area of that figure.

Arrange bangles on the surface of the table in such a way that they touch each other

• How many bangles did you arrange?



- Is there space between the bangles?
- Was there space between the books you had arranged?
- Can you find the area of a surface using bangles?

• To measure the area of the surface, is it necessary to cover the whole surface with same units.

Cut surface of the following figures from a cardboard.



Are the figure completely covered?

Now use the pieces of measurement of 1 cm x 1 cm and cover the surfaces.

Have the figures been covered completely now?

You saw that it was only with the pieces of  $1 \text{ cm} \times 1 \text{ cm}$  that the given figures were completely covered.

We use unit square to measure the area.

We use  $1 \text{ cm} \times 1 \text{ cm}$  square to measure the area of small figures.

And to measure the area of bigger figures we can use  $1 \text{ m} \times 1 \text{ m}$  square or more than this if required.

Area of figure = the number of unit squares which fit in this figure

#### Now let us find out the area of a rectangle-



We want to find the area of this rectangle The length of the rectangle = 3 cmBreadth of the rectangle = 2 cm

Put marks on the sides at a distance of from 1-1 cm



Join the marks made by using a scale. The unit squares thus made are 6 Hence area of square = 6 square units

If we multiply the length with the breadth we get  $3 \times 2 = 6$ 

Can we say that the number of unit squares made in any rectangle is always equal to the product of the breadth and the length?

#### Let us find out-

You are given a rectangle whose length is 5 cm and breadth is 4 cm. Find the area of this rectangle.

How many unit squares can you make inside this rectangle? .....



Inside any rectangle you can make unit squares equal to the product of the length and the breadth.

Area of rectangle = length x breadth

#### Area of a square-

You know that square is a special type of rectangle.

 $\therefore$  Area of a square = length x breadth

But the sides of a square are equal in length

 $\therefore$  Area of square = length of side x length of side

- **Example 1 :** The length of a book is 25 cm and its breadth is 20 cm. What is the area of the book?
- Solution: Book is rectangular in shapeWe know that area of rectangle= length x breadthWe are given the length of book= 25 cmand the breadth of book= 20 cmSo the area of the book= 25 cm x 20 cm= 500 sq. cm

**Example 2 :** A square room has a side of 8 m., So what is the area of the floor?

Solution : Room is square in shape You know that area of square = length x length We are given that length of side = 8 metre So area of the floor of the room = 8 x 8 sq. m = 64 sq. m.

Find the area of the following-

- 1. Find area of a rectangle whose length is 8 cm and breadth is 4 cm.
- 2. The length of a rectangle is 25 cm and its breadth is 15 cm. Find its area.

- 3. If a rectangle is 15 metre long and 6 metre wide, what is its area?
- 4. The side of a square is 9 metre; find the area of this square.
- 5. Find the area of a square whose side is 16 cm. long.
- 6. The Kabbadi field is 14 metre long and 8 metre broad. What will its area be?
- 7. \_\_\_\_ metre long and 4 metre broad room. Find its area. (You can choose your own length.)
- 8. A carrom board has a side of 75 cm. Find its area.
- 9. What will be the area of a square garden whose side is of 55 m.
- 10. The length of a playground is twice its breadth. If the breadth is 9 metre. Find the area of the field.

#### It also happens-

It may happen that we know the area of a rectangle and we also know either the length or breadth, then can we find the other?

Let us try. The rectangle given below has been divided into 12 unit squares, hence its area is 12 square unit.

There are 4 squares in the length and 3 squares in its breadth.

If we divide 12 by 4 we get the result as 3; which is the breadth.

	Area	÷	breadth	=	length
Also	Area	÷	length	=	breadth

Let us solve this-

- **Example 3 :** The area of a rectangular courtyard is 48 square meters and its breadth is 6metres. What is the length?
- **Solution** : The area of a courtyard = 48 sq. m.

Breadth of the courtyard = 6 m.

We want to find the length of the courtyard

We know that area / breadth = length

 $48 \div 6 = \text{length}$ 

The length is 8 m.

#### Now you solve these-

- 1. The area of the floor of a room is 18 square metre. If the breadth of the room is 3 metre, find the length of the room.
- 2. A rectangular field is 35metre long. If the area of the field is 700 square metre, find the breadth of the field.
- 3. A 40 cm broad table has an area of 2800 square cm. What is the length of the table?
- 4. The area of a theater floor is 81 square meter. Find the breadth, if the length of the floor is 9 metre.

Can you say what is the shape of theater?

#### Project work -

- 1. Find the area of the floor of all the rooms is your school. Which room has the bigger area?
- 2. Find the area of the floor of any one room in your house.

What did you do in order to find this? Tell your teacher.

#### Another method of finding area -

We have divided a rectangle and square into unit squares and found their area. Let us see whether we can do the same for a triangle.



You can see that some unit squares are completely inside the given triangle but some unit squares which are half or less than half are also inside the given triangle.

Fill those squares with green colour which has less than half part inside the triangle.

Now colour the remaining squares which are inside the triangle with blue.

Since maximum number of squares are blue, we can say that the area of the triangle is equal to approximately the number of blue squares. Area of triangle = ..... unit square (approximately)

Or the Area of this triangle = ..... unit square (approximately)

Now similarly try to estimate the area of the following figures:



Can you find the area of your palm by this method? Try it.

