PATTERNS

3.1 Patterns in Geometry

Able to make border strip and tilling

Tiles: A *tiling* of the plane is a collection of subsets of the plane, i.e. *tiles*, which cover the plane without gaps or overlaps.
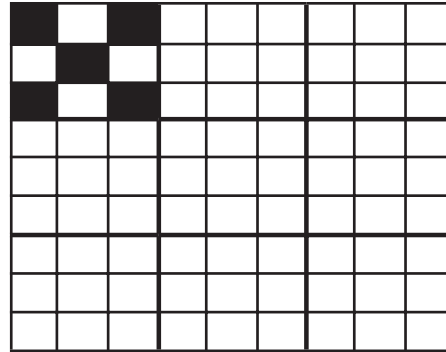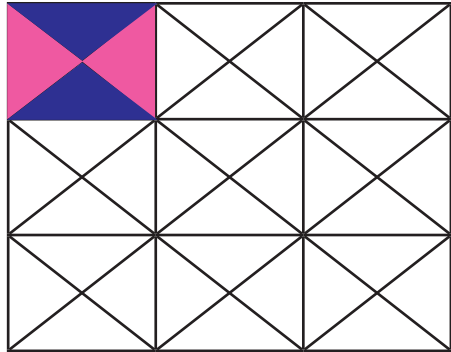
Example

Note:
A design can be made of more than one kind of shapes .
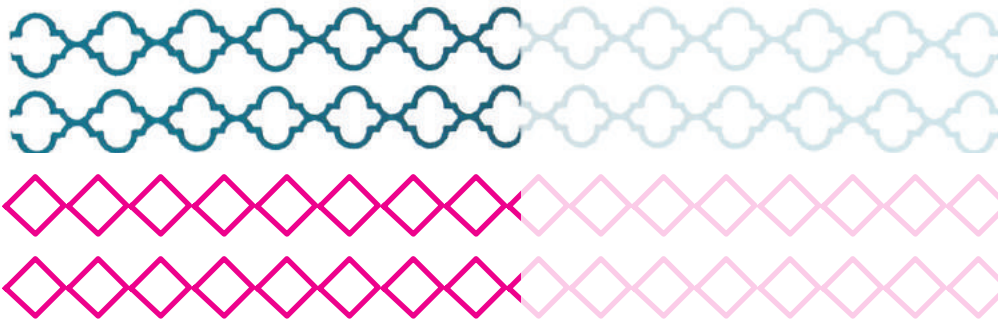
Activity 1

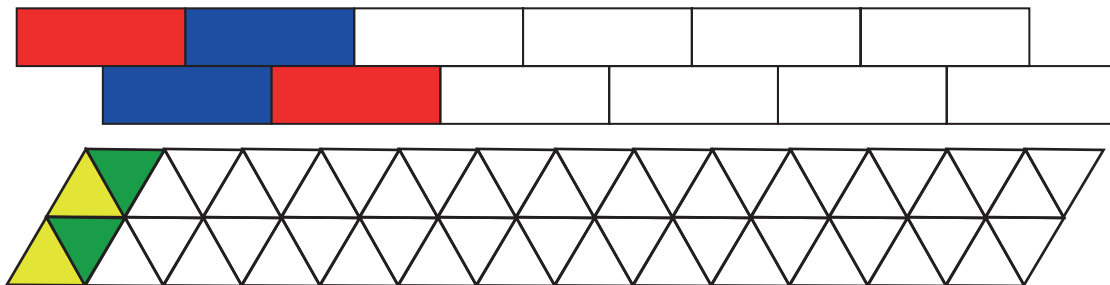Continue the pattern as done in first to complete the tile.

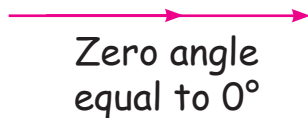## Activity 2

Continue the border stripe.
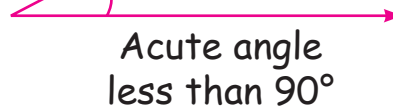
Activity 3

Colour the shapes to complete the pattern.

3.2 To make patterns of shapes using different number of angles / types of angles
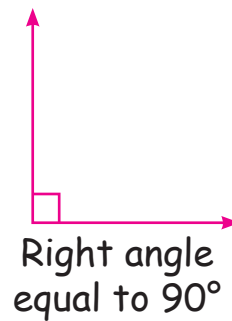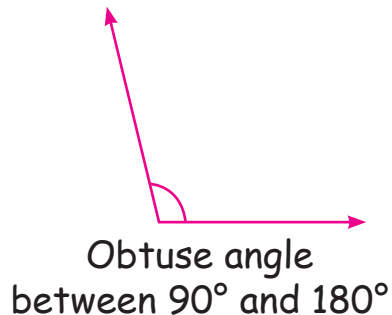
Let us recall the types of angles.

i)

Zero angle
equal to 0°

ii)

Acute angle
less than 90°

iii)

Right angle
equal to 90°

iv)

Obtuse angle
between 90° and 180°

v)

Straight angle
equal to 180°
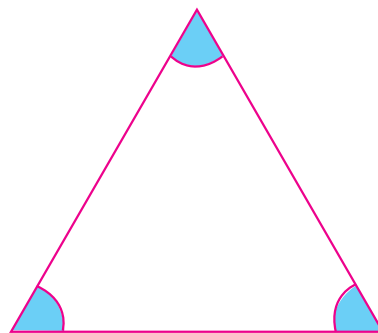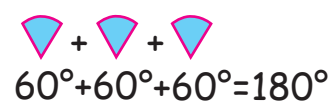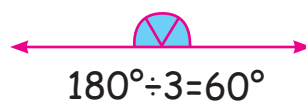

Observe the angles formed at the vertex of the following shapes.

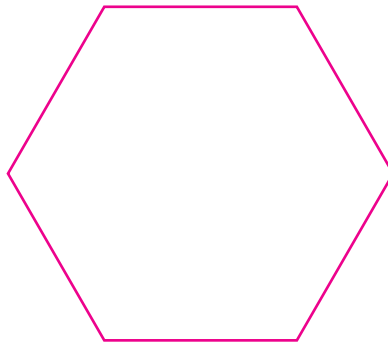This is an equilateral triangle.

It has 3 angles formed at 3 vertices.

The 3 angles are equal in measure and they are equal to 60°.

It can be demonstrated as follows.

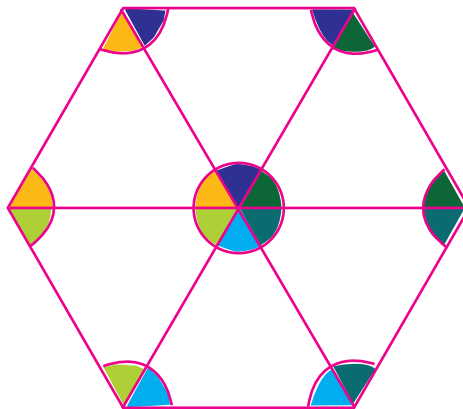Straight angle   180°÷3=60°   60°+60°+60°=180°

**Finding the angle of a regular hexagon using the equilateral triangle.**

We shall find the angles of a regular hexagon using the equilateral triangle. Place the equilateral triangles in a regular hexagon as shown in the figure.

 + + + + +

60° + 60° + 60° + 60° + 60° + 60° = 360°

Angle at the centre of a regular hexagon is 360°.
This is also the angle of a circle.

Angle at each vertex of a regular hexagon is 120°
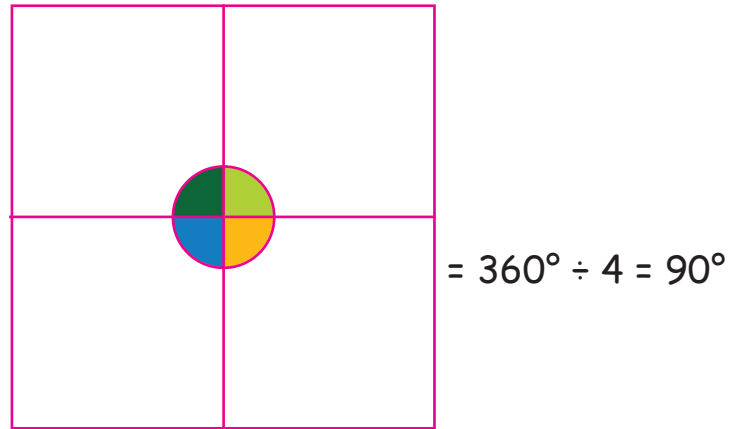
        +
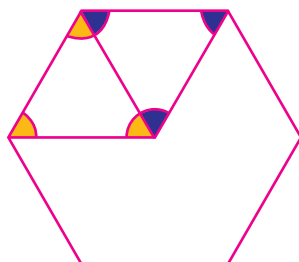
60° + 60° = 120°

Finding the angle of a square.

Angle of a circle is 360° ◯.

Let us find the angle of square using a circle.

= 360° ÷ 4 = 90°
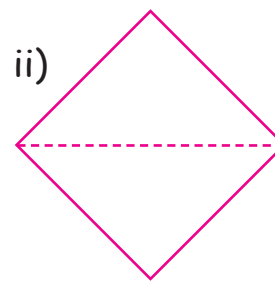
Place 4 squares as shown in the above figure.

The shape formed at the centre is a circle. The angle of circle is 360°.

Now the angle of a square is 360° ÷ 4 = 90°.

Exercise 3.1

1 **Find the angle of the given shapes using the equilateral triangle.**
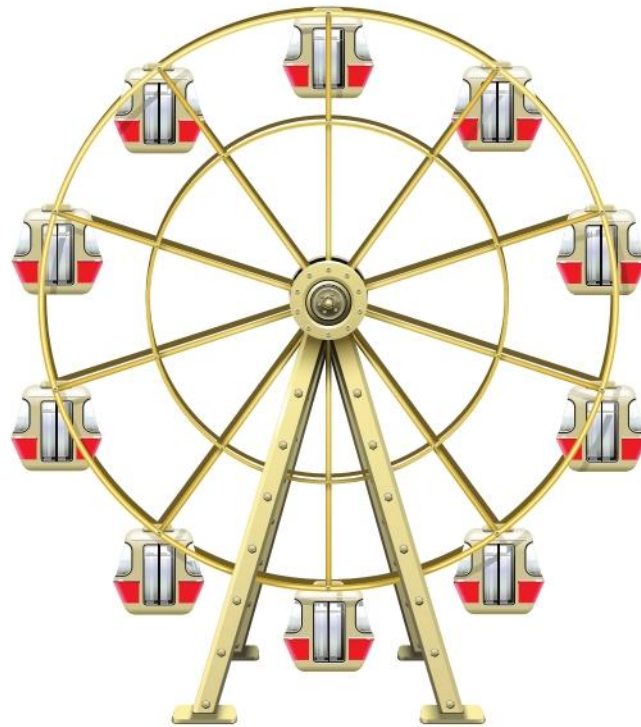
i)   ii)

2 **Find the angles of a rectangle using a circle.**

3.3 Rotating angles

Giant wheel

Look at the rotation of the giant wheel.Every compartment moves to a position and comes back to the original position.

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A clock shows time by the rotation of minute hand and hour hand.

The minute hand and hour hand of a clock form an angle.

Observe the various angle formed by the rotation of the hands of the clock.

Right angle

Straight angle
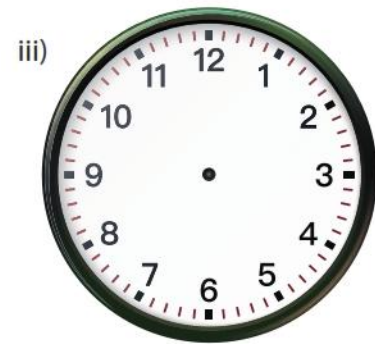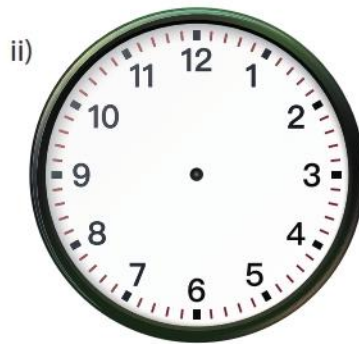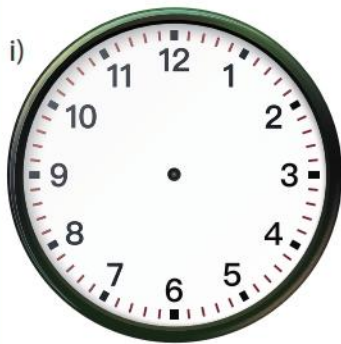

Right angle
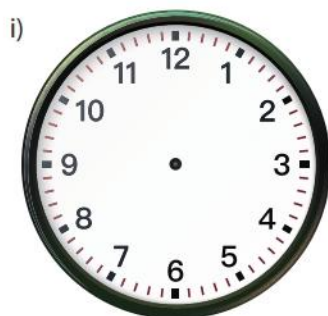

Acute angle

Zero angle

Obtuse angle

You can note that from 12.00 midnight to 12 noon the hour hand of the clock has completed one rotation. That is, it has completed 360° once. While the minute hand has completed 12 rotations. That is, it has completed 360° twelve times.

Exercise 3.2

1 Mention the time in the clock when the angle is i)180°, ii) 90°, iii)60°.
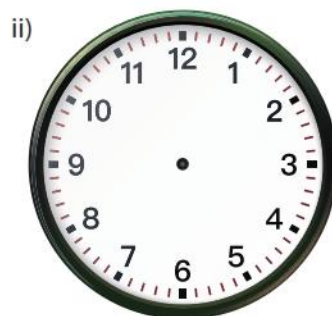
i)

ii)

iii)

2 Find the angle made by the hands of the clock at the given time.

i)

11'o Clock

_____

ii)
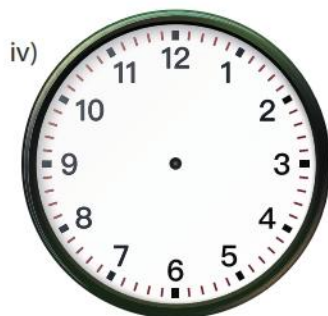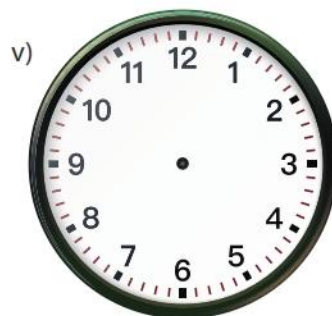
9'o Clock

_____

iii)

6'o Clock

_____

iv)

06:10

_____

v)

06:45

_____

vi)
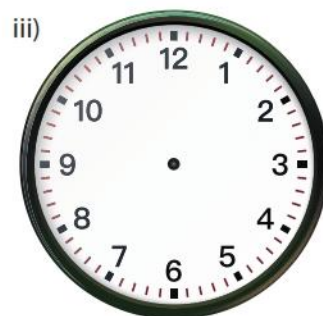
06:30

_____

3.4 Able to find patterns in a collections of words.

Example

Observe the words given below.

few, cop, cut, new, hop, hut, knew, shop, put

The last two letters of the words follow the pattern *ew, op, ut*.

Activity 4

Arrange the given words to form a pattern.

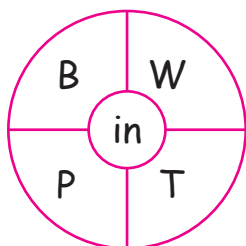Depth, called, walked, mice, played, pulled, breadth, rice, length, width, price, voice

_____, _____, _____, _____

_____, _____, _____, _____

_____, _____, _____, _____

Example

Form the words ending with 'in' and 'ail' to make a pattern.

B   W
in
P   T

_____, _____,

_____, _____

M   B
ail
S   T

_____, _____,

_____, _____
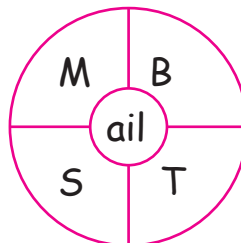
Exercise 3.3

1 Write down the collection of words by ending with "ENT" and "IGHT"

(i) WENT, SENT, B--------, R----------, T----------

(ii) NIGHT, LIGHT, R-------, S----------, M----------

2 Fill in the blanks

(i) C---AT, B---AT, G---AT

(ii) R---D, B---D, W----D

G7S6B7