SYMMETRY

Just after the morning assembly, the first pe-
riod is for mathematics. The teacher is in. He
notices Kanchan, a student, stands on the door
with a large Kochu leaf over her head as it is
raining outside. She says, 'May I come in, Sir?'
The teacher allows to come in and takes the
leaf from her hand. He folds the leaf through
its middle such a way that one part falls over
the other and becomes identical (same to
same). He shows the folded leaf to the stu-
dents and asks if both parts coincide?

The students look minutely and say in one voice – Yes.
Teacher then asks, Can you find such other leaves, which when so folded,
will the two halves concide same to same. Please go to collect some leaves
within the school campus and observe. Have you got it? Look at the pic-
tures of some leaves.
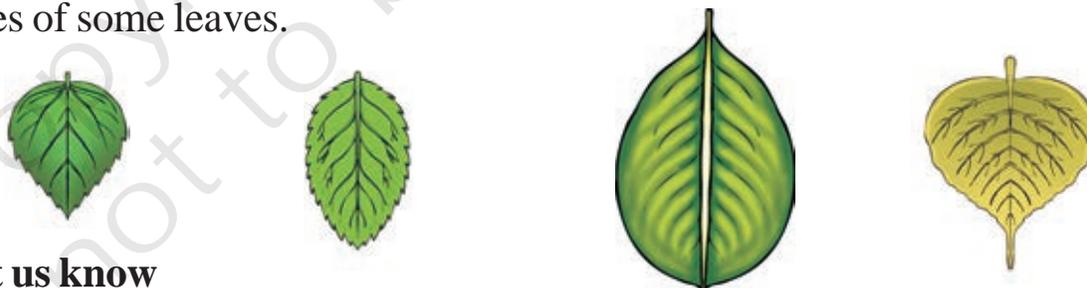
Let us know

If an object or a picture can divided into such two parts that if one part is
superimposed on the other, they become indentical. This property of an object
or picture is called symmetry and the object or picture is called symmetric.
The line which divides it into two identical parts is called its line of symmetry.

Symmetry

Activities

⇨ Take a piece of paper of square-size

⇨ Now divide the piece of paper in the middle and overlap.
⇨ See if one side concides with the other.
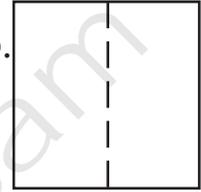
⇨ Now divide the piece of paper corner to corner (as shown in the diagram)
⇨ Have you found the same result? We say the square is symmetric in either case.
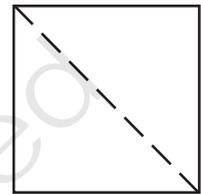
A square piece of paper may have yet another symmetry. Try it.

Let us find symmetric lines of the following diagrams.
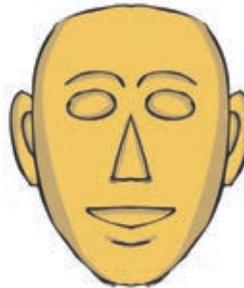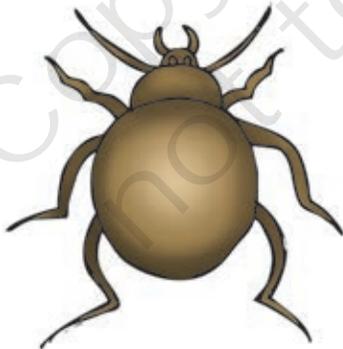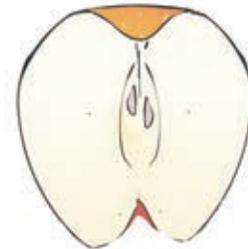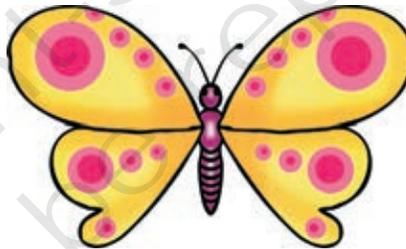
Activites : Let us draw a line of symmetry in each diagram.

Now, look at the following diagram where we can draw more than one line of symmetry. Count and tell the number of such lines you have found.
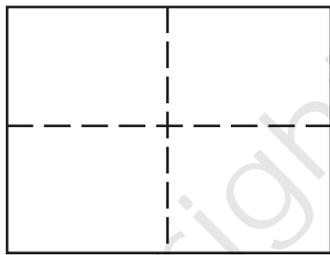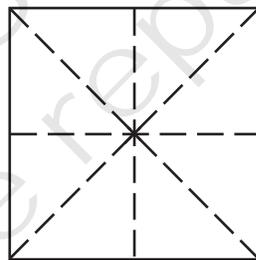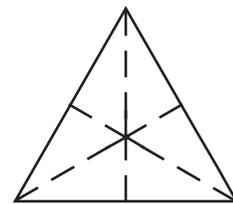

Diagram-1   Diagram-2   Diagram-3
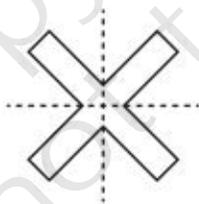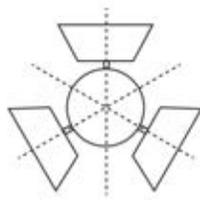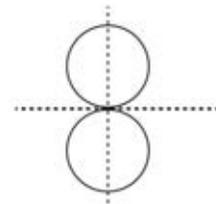

Diagram-4   Diagram-5   Diagram-6

Tips to Teachers : Inspire the students to search diagram having more than one line of symmetry.

Let us see and experience symmetry with the help of a drop of ink.

Take a piece of paper. Fold it equally. Open the fold. You get a line. Now, drop same drops of ink along the line. Fold again along the line, press and then open. Fine, you find a symmetric figure. Can you locate the line of symmetry?
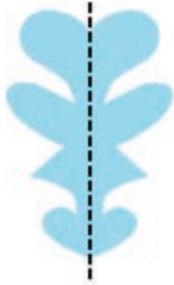
Activities : With the help of the line of symmetry in each case. We complete the figures.

(a)

(b)
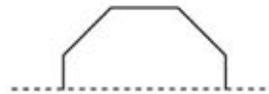
(c)

(d)

(e)

(f)

◆ Reflection and Symmetry

Read this nice story about a lion and a hare. They lived in a great jungle. The lion thinks and boasts himself as the king of the jungle. The clever hare thought of teaching the lion a lesson. One day he told the lion that the jungle has another king more powerful than him. The lion roared and wanted to see his rival. The hare politely took him to a well near by and asked him to see his rival living inside the well.

Dear students. What did the lion see in the well? Can you guess? You, let us share our views.

Reflection on a looking glass and the line of symmetry are interrelated. We associate one with the other.

In the diagrams below we show the refletions of the alphabet A.

◆ Games with a looking glass
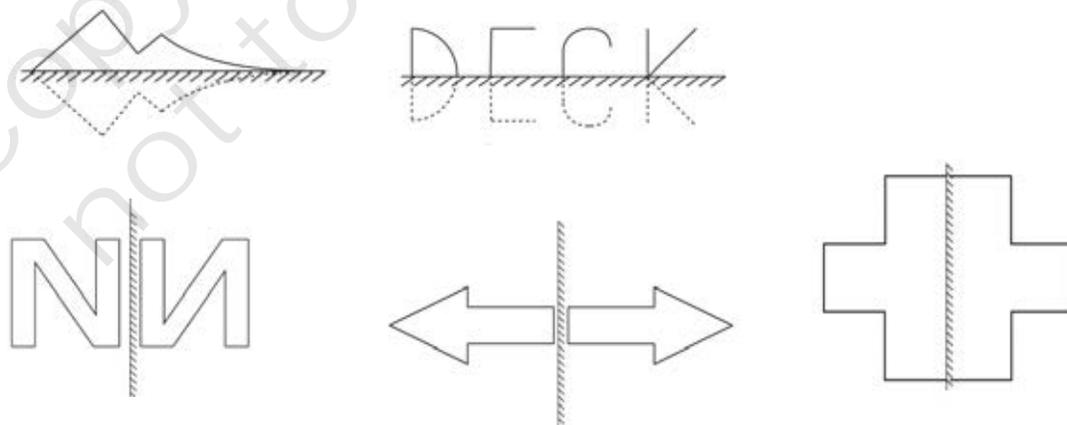
Symmetry

☞ **Activities :** Look at the diagrams, locate the Reflection symmetry and show it by a (√)tick.

(a)

1.	◯ ┊	◯
2.	◯ ┊	◯
3.	◯	◯

(b)

1.	**A** ┊	**A**
2.	**A** ┊	**A**
3.	**A** ┊	**A**
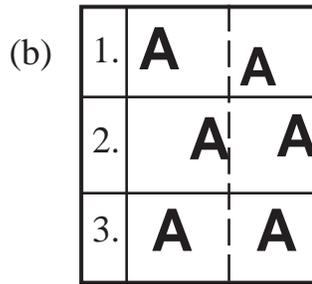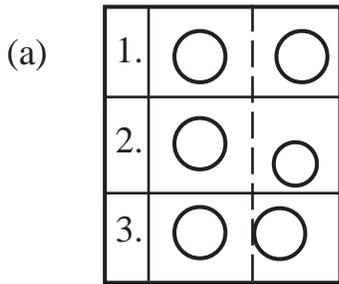
(c)

1.	**801**	**810**
2.	**801**	**801**
3.	**801**	**108**

(d) X ┊ Y

CLASS ┊ **SSAⅬƆ**   **CLASS**   **SSAⅬƆ**

(e) X ┊ Y

←─┼─◯ ───□		◯─┼─→ □───		←─┼─◯ □───		◯─┼─→ □───

(f) X ┊ Y

BED ┊ **ꓷƎꓭ**   **ꓭƎꓷ**   **ꓭꓱꓷ**

(1)   (2)   (3)

(g) X ┊ Y

ME ┊ **ꓱM**   **Mꓱꓷ**   **Mꓱ**

(1)   (2)   (3)

(h) X ┊ Y

ℚ↙		ℒ↙		6↘		ℒ↘

(1)   (2)   (3)
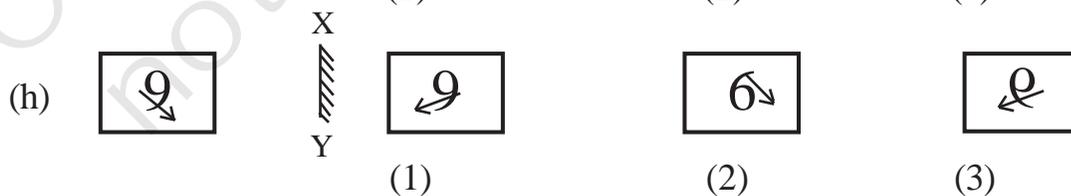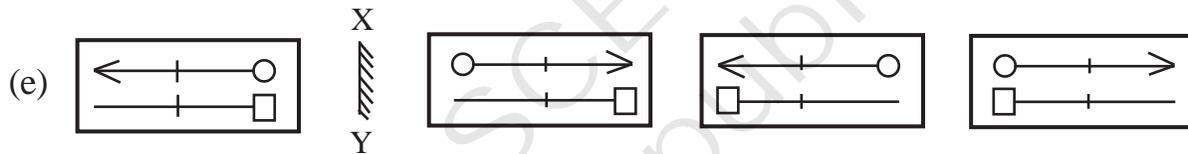
Tips to Teacher : Please use a mirror and help students to find mirror-image (i.e. Reflection Symmetry)

◆ **Rotation of a diagram**

Look at the picture of a wall-clock. It has three hands – second, minute and hour. Each hand starts from 12 and makes a complete round to reach the point at 12. This round is called a **ROTAION**.

Let the hour hand move from 12 to 3 we say

the hour hand makes $\frac{1}{4}$ of a round or quarter

round. So, from 3 to 6 or, 6 to 9 to 12 each is a quarter round.

Similarly 12 to 6 or 6 to 12 or 3 to 9, or 9 to

3, a hand makes $\frac{1}{2}$ of a round or half round.

Now look at the diagram below

It moves $\frac{1}{4}$ round along the clockwise direction.

The diagram given below move $\frac{1}{2}$ round along the clockwise direction.

[It moves $\frac{1}{2}$ round otherway round too]

Can you guess, what part of a round it makes along the clockwise direction?
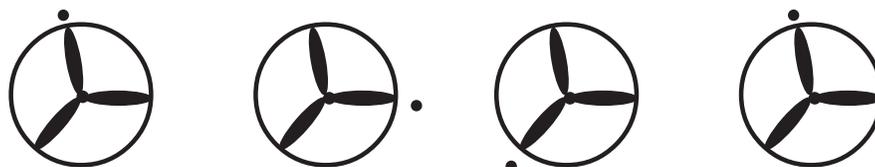
Does not the following diagram rotate round in the clockwise direction?
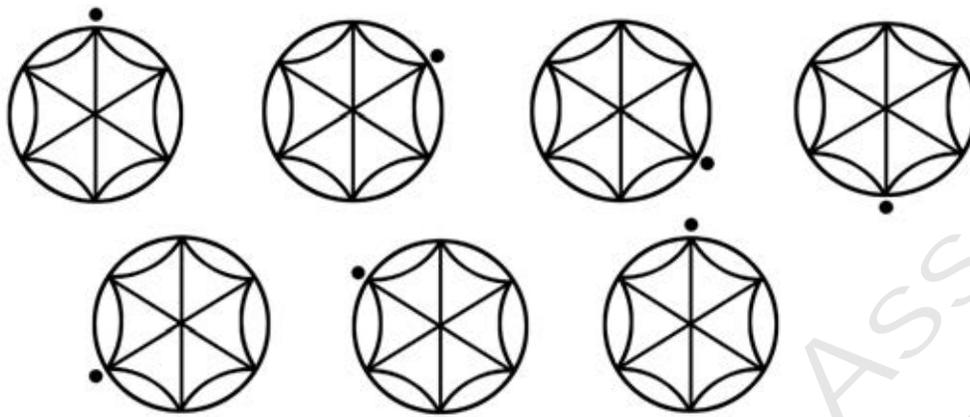
Now, tell us how much part of a round the point in the diagram rotates in each case.
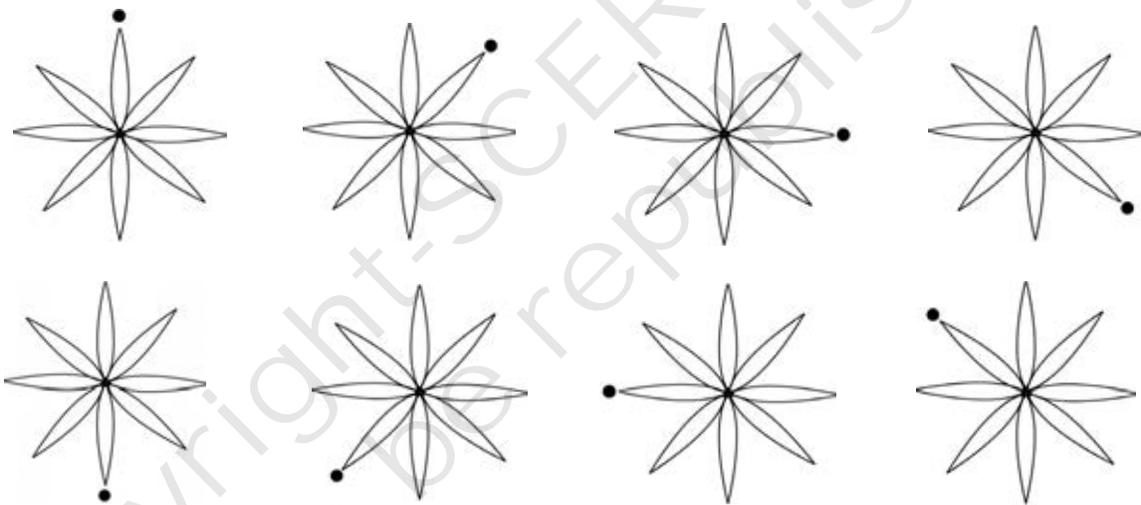

☞ **Activities :** Notice the rotation of a figure, draw the right one in the box. (first one is done example)

a)

b)

c)

d)

e)

f)

g)
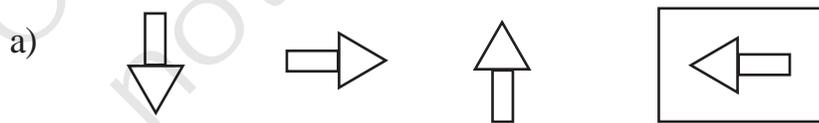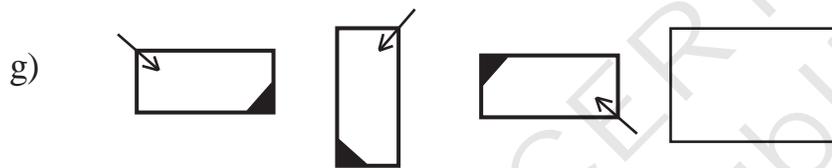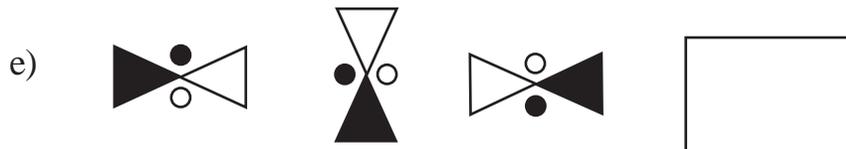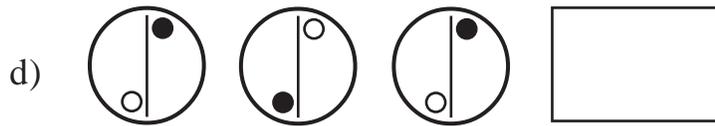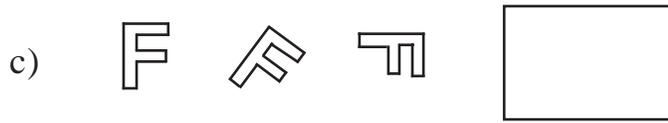
☞ **Activities :** Observe the followng pictures. What part of round will it be rotated to come its ORIGINAL position. Tick the correct one.

a) | $\frac{1}{2}$ round | $\frac{1}{4}$ round | $\frac{1}{6}$ round |

b) | $\frac{1}{2}$ round | $\frac{1}{4}$ round | $\frac{1}{2}$ round |

c) | $\frac{1}{4}$ round | $\frac{1}{6}$ round | $\frac{1}{8}$ round |

d) | $\frac{1}{2}$ round | $\frac{1}{4}$ round | $\frac{1}{8}$ round |
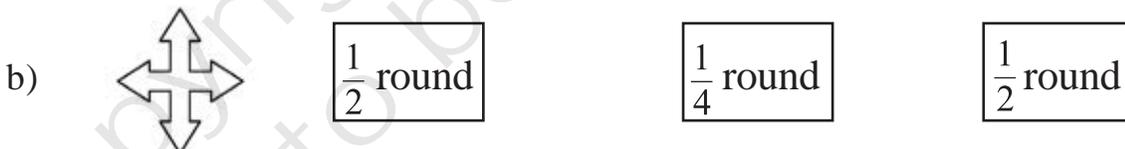
◆ **Let us look at the symmetry of reflections in each picture, below.**

(1)

(2)

(3)

* * * *