



2dimensional perspective of 3dimensional objects Z7R2E

We can identify 2D and 3D objects in our day-to-day life.



#### Recall: 2D shapes

Shapes which have two dimensions namely length and breadth are called 2D shapes.





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Cylinder Examples: **Properties:** It is a 3D shape. Two bases lie in upper and lower surfaces in a cylinder. surface Height is the distance Height ➤ Curved surface between the two bases. OA = OB = OC = OD = Radius AC = BD = heightSphere **Examples: Properties:** It is a 3D shape. It has one surface. All points on the surface are **OA-radius** 0----- A at the same distance from **O**-Centre point the centre. It has no vertices and edges. Cone Examples: **Properties:** It is a 3D Shape. It has a circle in its base. The distance from the top of the cone to the centre of the base is called as height. The distance from the apex  $\triangleright$ to any point lying on the I-slant height h circumference of base is h-height called as slant height. r-radius r Ь The height and slant height are not equal.

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5. No	Objects	shapes	Sides	Corners
1	Dice	Cube	6	8
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		$\checkmark$		
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Fix the round chart on the white paper by using a pin in centre. By rotating the chart we observe that two vertical lines on the straight and the circular centre will be placed at the same point. Look at the changes occurred, when the card is rotated.

Turn the round chart as shown in the figure (ii). The picture in figure (i) is changed as in figure (ii). This change is called as 'rotation'. 'O' is the centre. When we compare the figures (i) and (ii) the picture has taken one fourth turn. When we rotate the chart as shown in the figure (iii) the pictures has taken half turn.

#### Observe that

- When we rotate, the shapes are rotated.
- The images are rotated depending on the centre point.
- The point is called as "centre of Rotation".

#### Think

Is there any change in the position of the wings of the ventilater fan, after rotating one-fourth turn and half-turn.



Example Observe the rotation of the square. В D С Α D B 1/2 turn D С С В Α 1/4 turn Exercise 1.2 (1) Among the following shapes, find out which one would look the same after  $\frac{1}{4}$  a turn. put a ( $\checkmark$ ) mark. (IIII) (2) Among the following letters, find out which one would look same after half turn. X, H, A, N, B, O, J, I, D, S 3 Find the numbers which will look same on a half-turn. 2 3 8 Δ 5 (4) How the following numbers are changed after half turn. 88888 10101 11111 80808

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#### Project:

Prepare an album by drawing the various numbers, pictures, Rangoli, letters which will look the same after 1/3 a turn 1/6 a turn and show it to your teacher.

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Think Find the only English alphabet which will not change its shape after  $\frac{1}{4}$  a turn,  $\frac{1}{2}$  a turn,  $\frac{1}{3}$  a turn,  $\frac{1}{6}$  a turn rotations.

**1.1.3** Able to explore reflections of familiar 2D shapes intuitively.



Stand in front of a mirror and see your image.

Observe your image in the mirror when you move back. Come front to the mirror again. What do you infer?

- 1 Your image in the mirror is \_\_\_\_\_\_ (bigger, smaller, same size).
- 3 The distance between you and mirror and the distance between you and your image is \_\_\_\_\_ (equal, unequal).
- When you come forward to the mirror, your image moves \_\_\_\_\_ (forward, backward).

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#### Let's Enjoy it:

Take a rectangle shaped paper and fold it into two equal parts. Drop a thread in the ink-pot and drag it out into the folded sheet now open and see the folded sheet. What do you see?

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Are the designs on the both sides of the folded paper look alike?

Observe the changes of designs and discuss your observations with your teacher.

## **1.1.4** Able to explore symmetry in familiar 3D shapes like in alphabets intuitively.

For example, If we cut an apple into two equal halves, we observe that two parts are in symmetry.



Symmetry is an important geometrical concept commonly seen in nature and is used in every field of our life. Artists, manufactures, designers, architects and others make use of the idea of symmetry.

Symmetry refers to the exact match in shape and size between two halves of an object.

When we fold a picture in two halves and if both the halves match exactly equal then we say that the picture is symmetrical.



#### Line of symmetry:

When a line divides a given figure into two equal halves and it matches exactly then we say that the figure is symmetrical about the line. This line is called <u>the line of symmetry or axis of symmetry</u>.



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**1.1.5** Able to make the shapes of cubes, cylinders and cones using nets especially designed for this purpose.

Nets of cuboid:



Open out a match box and layout on the white paper. Draw the base sides of the match box.

Teacher: "How many sides are there in a match box?"

Student: There are 6 sides.

Teacher: You are. correct Can you assemble it again?

Student: Yes sir.

Teacher: Good.

We can describe a net as a two dimensional figure which can be folded to form a three dimensional figure.

#### Try these

Find out which of these can be made into a box by folding along the dotted lines. Put a tick mark for the correct options.







### Introduction of Angles

# **1.2.1** To get the feel of an angle through observation of objects in their environment and paper folding:

The angles are used in bridges, buildings, cell phone towers, wings of planes, bicycles, windows and doors.



#### Angle:

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An angle is a shape formed by two line segment or rays diverging from a common point (Vertex).



Ramu	:	Sir, This angle has two line segments. Those are BA and BC.
Teacher	:	Which is the common point of the two line segments?
Ramu	:	B is the common point.
Teacher	:	These two line segments make an angle. common point B is the vertex. BA&BC are arms of the angle.
Ramu	:	Then how can we call the angle in the picture?
Teacher	:	An angle is mentioned by three alphabet. The centre letter of the angle is called as vertex.
Ramu	:	Then, ABC is the name of the angle. Am I right sir?
Teacher	:	Yes, We should mention the angle as angle ABC.
Ramu	:	Sir, can we write angle CBA instead of angle ABC.
Teacher	:	Surely. Angle ABC and Angle CBA are same. We use this symbol $\angle$ for angle.

So we can write angle ABC as  $\angle$  ABC.

Picture for angle	Name of the angle	Vertex	Two arms of angle
	∠ABC or ∠CBA	В	AB and BC
D F F	?	?	\$
P R Q	\$	>	\$



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# **1.2.2** Able to learn the names of angle like acute, obtuse and right angle:

We shall classify the angles into various types based on its measurements. Let us create the various angles by combining the two wooden frames. Observe the various angles formed in the wooden frame

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SI. No.	Picture	Type of angles	Measure of the Angle
1	B C	Acute angle	Greater than 0° less than 90°
2	A B C	Obtuse angle	Greater than 90° less than 180°
3	A 90° B C	Right angle	Exactly 90°
4	A B C	Straight angle	Exactly 180°

Name the types of angles formed in the following items.





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#### **1.2.3** Able to identify right angles in the environment:

Ram is trying to cut a piece of wood in rectangular shape from a wooden board. Ram used a tool to cut the sides of the rectangle. This device is called as set square.

We can see two set square in our Geometry Box. Both the set squares have 90° measurement.

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Form angles of all the types by paper cutting or paper folding and paste them in a chart.

Write the names of the flowers or animals of birds in English capital letter and find the types of angles formed in each alphabet.



GIRAFFE



PEACOCK



SUNFLOWER



