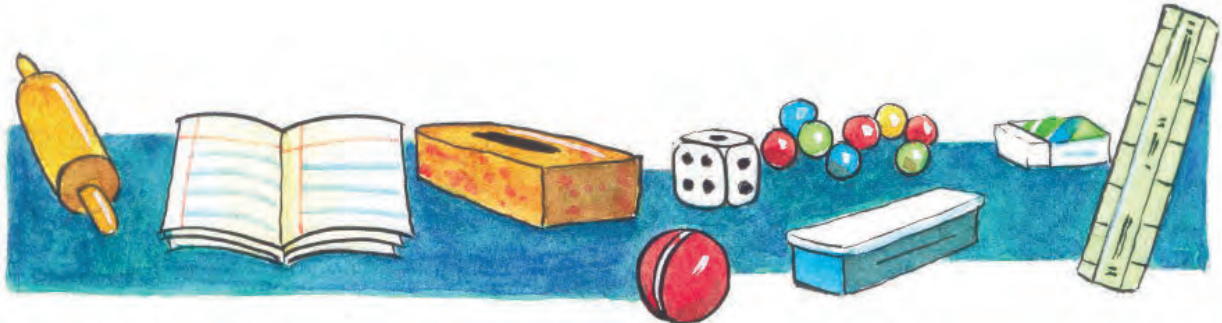


Unit 8

GEOMETRY

Surface



Collect the items given in the picture.

Roll all these items on the table one by one

Name are the items which rolled _____, _____, _____, _____, _____,

Name are the items that didn't roll _____, _____, _____, _____, _____,

Can the books be kept one above the other? Try and see.

Can the dice be kept on a book? Can a marble be kept on a ball? Try and see.

Can you place a ball on a ball? Try and see.

Can a marble be kept on a ball? Try and see.

Can you tell why this happens ?



Now feel with your hand the surface of the book, dice and ball. The surface of the book and dice is flat that's why we can keep them one on the other and we can't roll it. This type of surface is known as **plain surface**.

The surface of the ball is round. That is why we can not keep them one above the other. This can roll of. This type of surface is called spherical or **round surface**.

One glance on the glass

Take one glass. Keep it as shown in the figure.
Roll it and see...






Which are the kinds of surfaces in a glass ?

Write name of three items which have both plain surface and spherical surface.

1. 2. 3.

Some items are drawn in the table given below. What are the surfaces in these. Write the name of the surfaces.

Items	surface
	
	
	

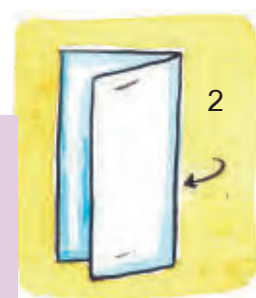
Think and tell which is the biggest surface.

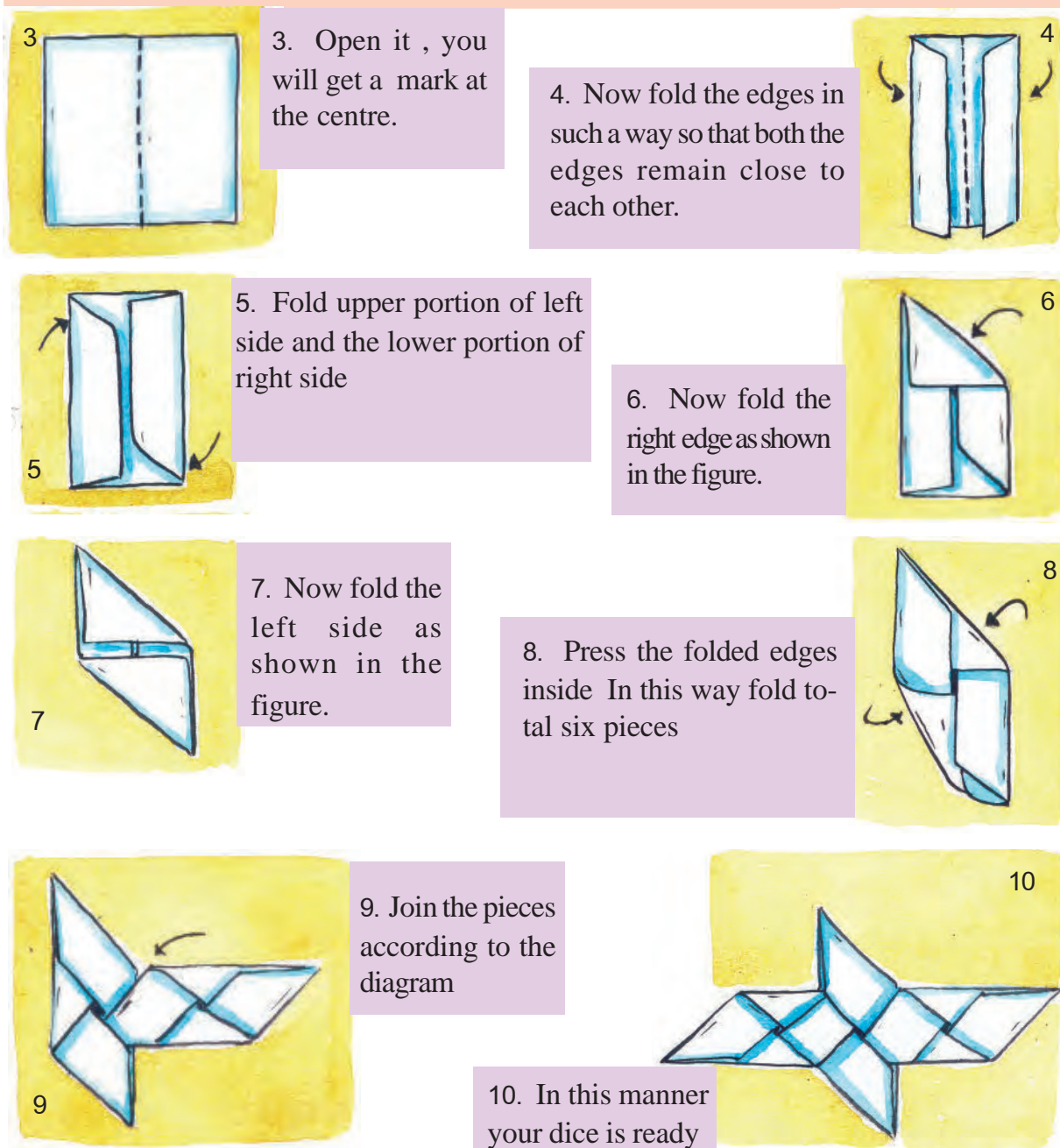
Let us make a dice.



1. Cut six square pieces from a drawing sheet

2. Take one of the pieces and fold it at the centre.





Can you tell how many surfaces are there in the dice made by you ?

Upto which number that can be written on its surface starting from 1 ?.....

Write one in any surface of the dice and write 6 just at the back of it. In the same way write 5 at the back of 2 and 4 at the back of 4.

Now the dice is ready for your game.

Now you make things made up of clay and paper in which there is only plain surface, in which there is only spherical surface and in which both spherical and plain surfaces are there.

LINE & LINE SEGMENT

Point

Take one sharp pencil, now put a mark on a page of the copy. Look at it. This mark is known as a **point**. Sharper the pencil the more accurate would be the mark (the point).



Line Segment

Draw two points in your copy with a pencil. Write their names A and B. Join them with the help of a scale.



This is a line segment. This is called line segment AB.

Measure the line segment in this way

Draw a line segment of 5 cm.

According to the figure keep the scale on the paper. Now draw a point at zero with pencil. Draw the second point at 5 cm mark on scale. Join both the points with the help of a scale.

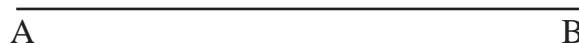
Remove the scale . This is a line segment of 5 cm.

Now Construct line segments of following lengths

1. 6 cm 2. 8 cm 3. 7 cm
4. 2 cm 5. 4 cm 6. 5 cm



If line segment is drawn on paper how will you measure that line segment ?



Lets measure this line segment AB. Place the scale and the line segment AB in such a way that zero of the scale lies at A.

Now let us find where B lies on the scale ? Read the mark of the scale against B ?

Therefore the length of line segment A B =cm



Excercise

Find the length of the line segments given below and write them:

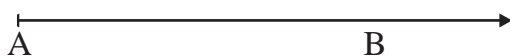
1. P ————— Q
2. X ————— Y
3. A ————— B
4. X ————— Y
5. A ————— B
6. M ————— N

Line

A Line segment is given below

A ————— B

If we extend one side of the line segment to infinity then we get the shape of a ray.



A B is a ray

Can the other end of the ray extend upto infinity?

Extension of line segment, to infinity, on both sides is called line.



A B is a line

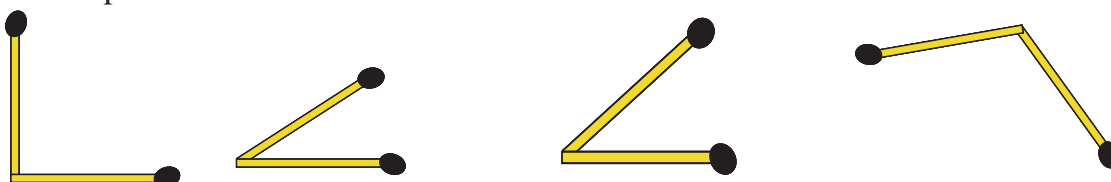
The arrow mark on both sides indicate its infinite extension.

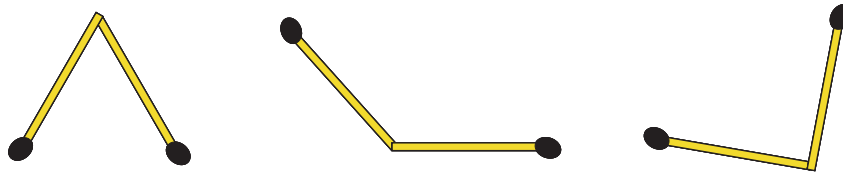


Line segment is a part of line

ANGLE

Given below are figures made out of match sticks. You can also make similar figures with the help of match sticks.





All the figures made by you depict angles.

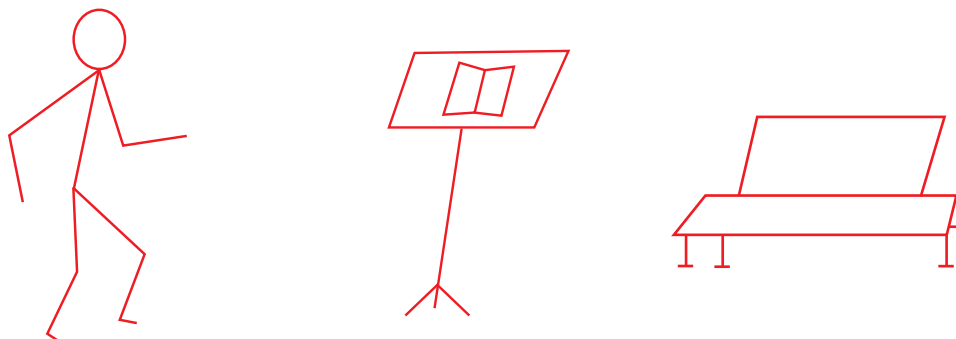
Now tell

- How many match sticks were required for one figure
- Do the match sticks meet at some point? If we imagine a match sticks as a ray we can say:

Two rays arising from one point form an angle.

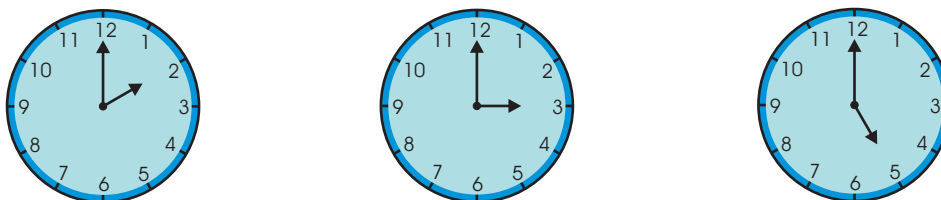
Observe the items around you and tell where you find angular objects.

The diagram below has some angles. Recognise these and mark them with a pencil.



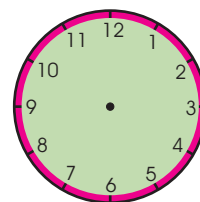
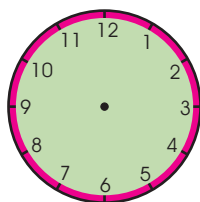
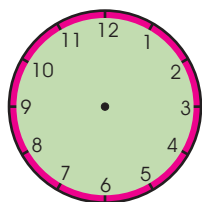
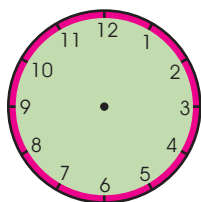
Angle in a watch

Observe the small and big hands of the watch. The hands of the clock also make an angle.



By changing the position of the hands of the watch the angles also change.

Some figures of watch are given below. Change the position of the hands and make different types of angles.




Angle with a nail

Insert a nail in the ground. Take a long thread and tie it to the nail in a manner that it has sufficient length on both the sides. Now hold both the ends of the thread and stretch it. Keep the thread stretched.



Observe minutely: does the piece of thread form an angle?

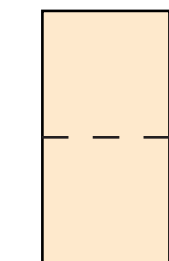
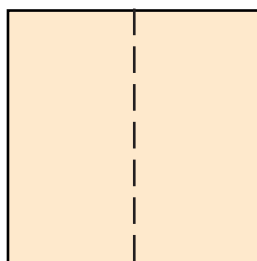
Can you make it small or big? How will you make the smallest angle? How will you make the biggest angle?

Observe the angle in objects around you such as books, black board wall etc. The figures which have  shape are called rightangle.

Sometimes the hands of the watch also form rightangle.

See the watch and tell at what time the hands of the watch form right angles.

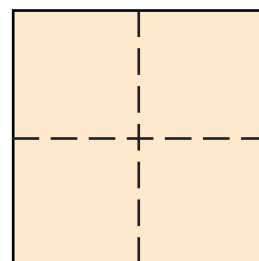
Now take a piece of paper and fold it as shown.



On folding for the first time



On folding for the second time



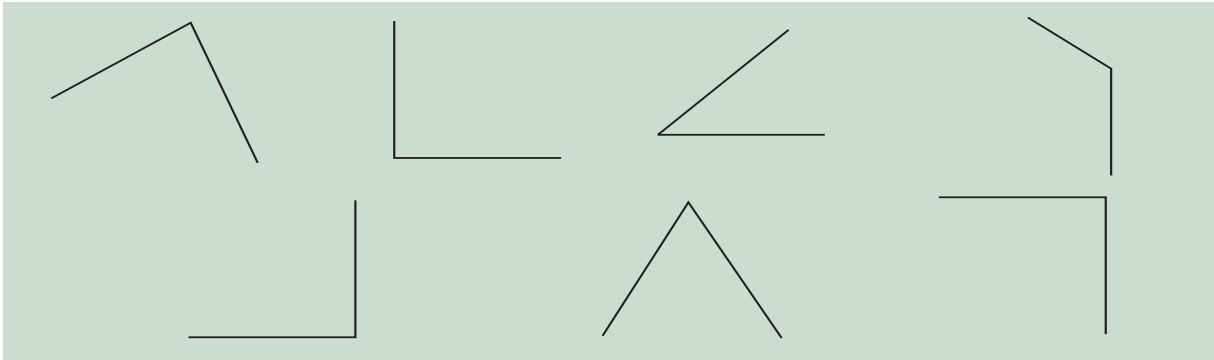
On Opening

Now open it. You will find that two lines are formed on the paper. They intersect at one point. An angle is formed at this point. There are four equal angles, on the paper. All the angles are called right angles.

See whether the same type of angles are formed on the four corners of the paper.

From the below given angles mark the angles which are right angle.

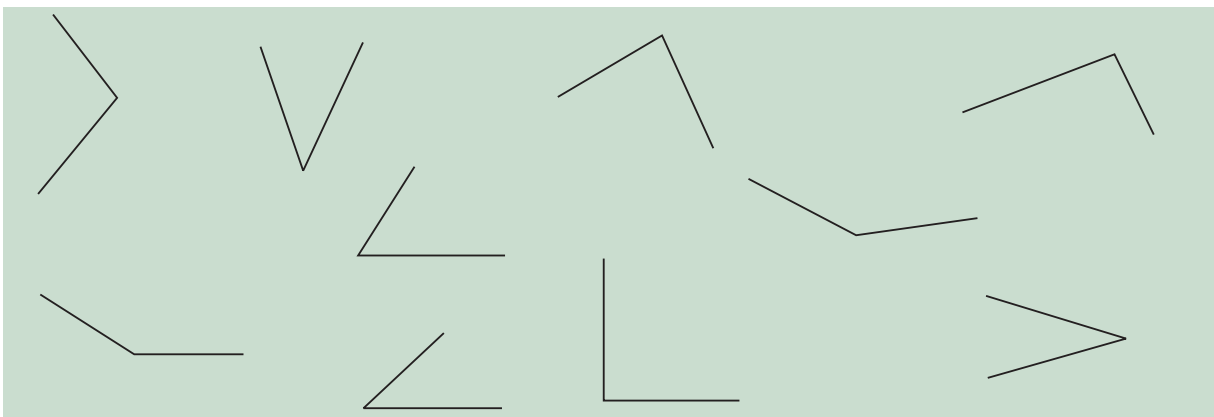
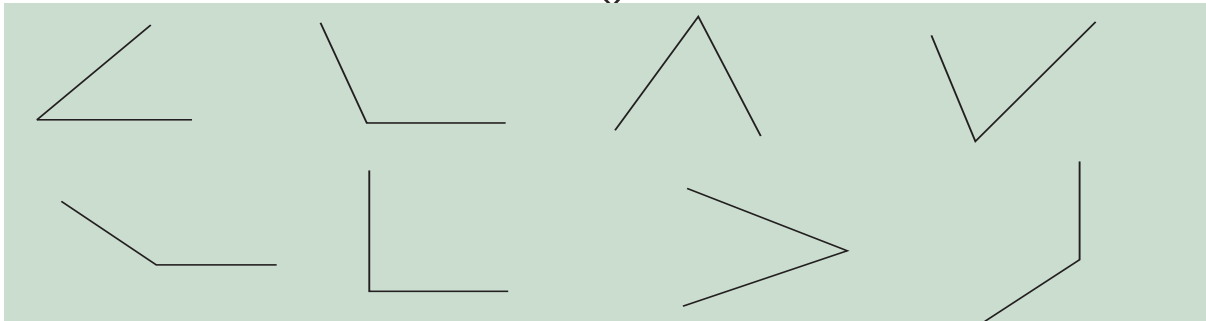
Take a square piece of paper or hard board. (Each angle of the square is a right angle) Compare with the figures given below. The angles which are smaller than corner of the piece put '×' mark over them. The angle which are bigger than corner of piece put '✓' mark over them.



The angle on which you had put × mark are acute angles. And the angles on which you have put ✓ mark they are called obtuse angle.

Angles which are greater than right angle are called Obtuse angles and the angles which are smaller than right angle are called acute angles.

Recognize the angles in the figure given below. Write their names.



Circle



Take a circular coin. Keep it on a page of your copy and draw an outline of it. Now remove the coin and see the drawn shape. Can you make this type of shape from other object ? Write their names-

Now take any two items and draw this type of shape. Let us now draw this type of figure in the field. Take a nail, a stick and a rope in the ground. then tie (fasten) the nail with one end of the rope and fasten the other end of the rope at the middle of the stick. Now draw an out line of the nail with the help of stick. Be careful while drawing the out-line make sure that the rope is stretched. What type of shape you get ?



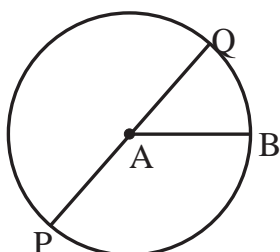
The out-line you get from the coin and the out line you get from drawing a figure by stretching a rope attached to the nail is called a circle:

In the same way you can draw circle by using compass (rounder)

Open a page of your copy keep the compass on the page as shown in the figure. Fix its pointed side at a place and move the pencil around it.



Come lets now know some facts about circle.



While drawing a circle where you placed the pointer of the compass that point is called the **centre**.

In the figure 'A' is the centre of the circle.

The line segment that join centre with any point of the circle is called **radius**. In the given figure A B is the radius of the circle.

The line segment that joins two points on the circle which passed through the centre of the circle is called diameter.

Line segment P Q is the diameter of the circle.

Give answer :

Just now you have drawn a circle by fixing a nail and rope. Where is the centre of that circle ? Draw one radius of that circle measure it. In same way draw a diameter and measure it also.

Draw Circle

Tie a chalk on both ends of the thread.

Fix a chalk on the blackboard with your left hand.

Now draw a line with your write hand.

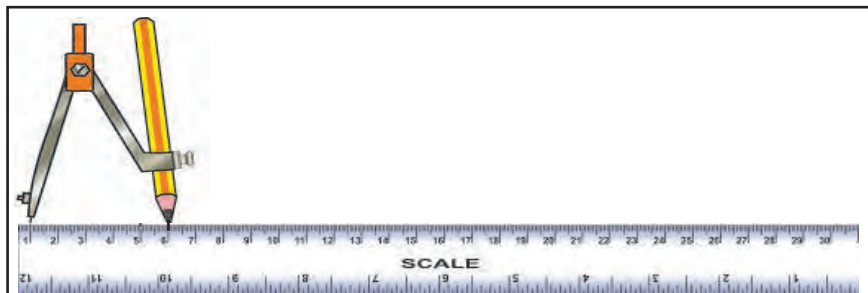
Be careful that the thread should be stretched.

What shape do you get on the black board ? Write the names of the parts.

Make circles of different radic now do this-

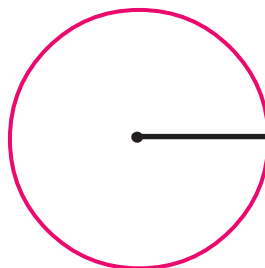
Take out scale, rounder and pencil from you compass box. Now insert the pencil in the rounder. Level the tip of the pencil and the rounder on the notebook.

Now make the distance of 5 c.m. between tip of the pencil and pointed end of the rounder using the c.m. side of the scale.



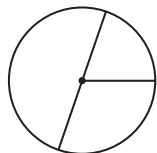
Now draw a circle on your notebook revolving the rounder.

Now measure the radii of the circle and write it.

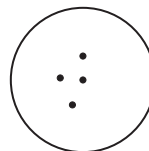
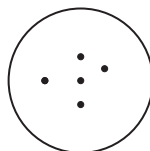
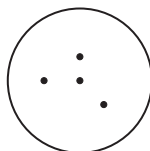


Exercise :

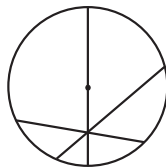
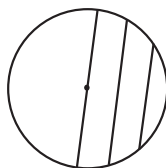
1. Write names of the parts in given figure —



2. Find out (identify) the centre of the circle in given figure.



3. Identify the diameter in the given figures.

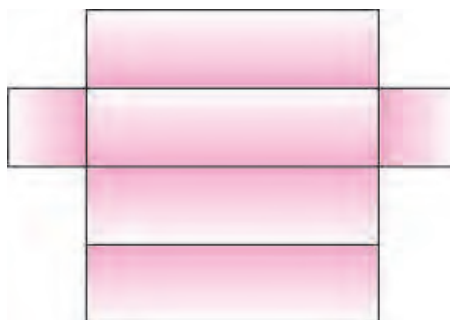


4. Draw a circle of radius 7 cm.
 5. Draw a circle of radius 3 cm.
 6. Draw a circle of radius 10 cm.

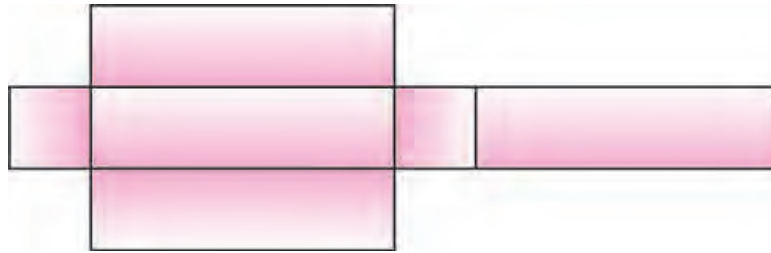
Making Cubes, cuboids -

Objects like bricks, chalk boxes, tooth paste boxes etc have cuboids shapes they have 6 rectangular faces.

Take a chalk box / tootpaste box. Cut it and open as shown in the given figure . You will get a net by opening it.

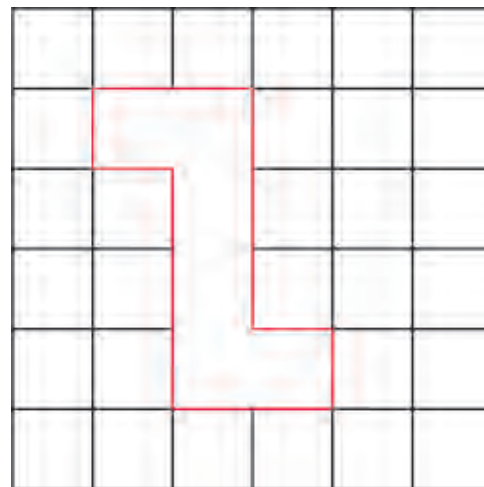


There could be other ways of cutting and opening this box. One of the ways is given here as an example -



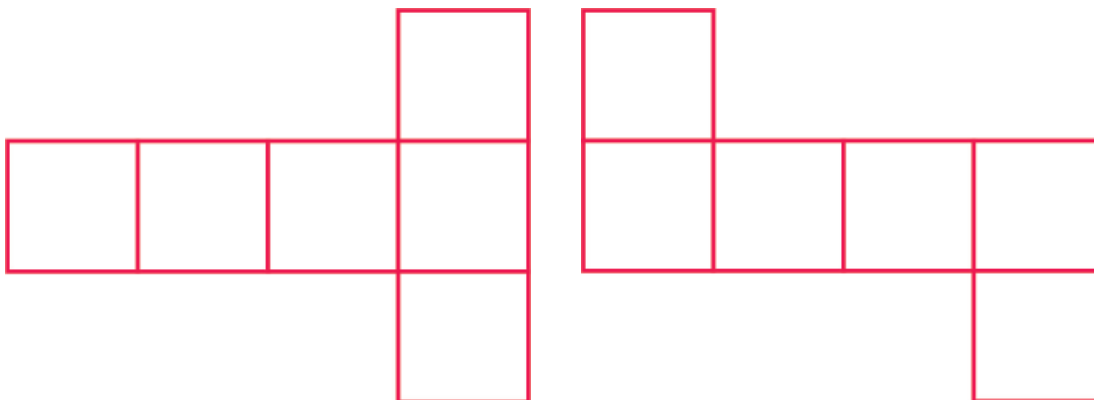
You find some other way and draw its net in your notebook.

Now take a drawing sheet and cut it according to the diagram. Now fold and make a box out of it. Are all the faces equal and square objects like this of having six square phases are cubes in shapes. For is - dice.



Make cubes from the given net -

All the boxes or the objects are not necessarily cubes or cuboids in shapes. Make cubes from the given net -



All the boxes or the objects are not necessarily cubes or cuboids in shapes.