Shapes and Angles
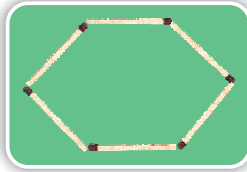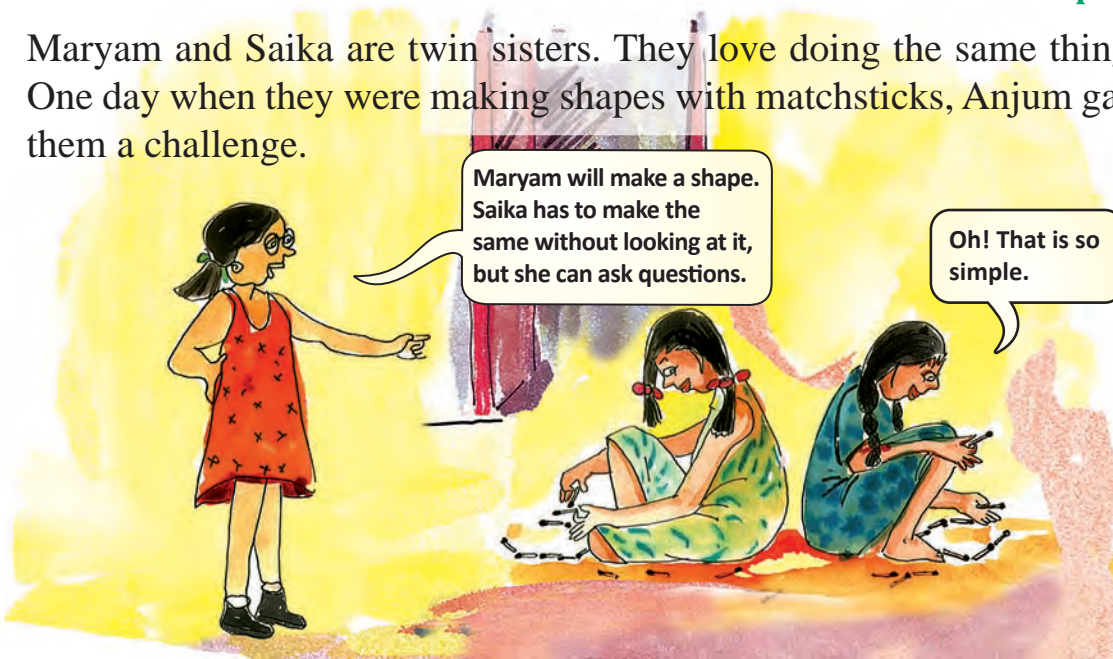
Maryam and Saika are twin sisters. They love doing the same things. One day when they were making shapes with matchsticks, Anjum gave them a challenge.
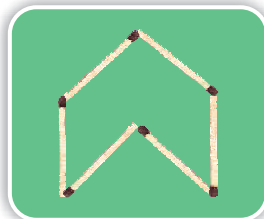

Maryam made this shape.

Saika- Is it a closed shape or an open shape?

Maryam- It is a closed shape.

Saika – How many sides are there?

Maryam – It has 6 sides.
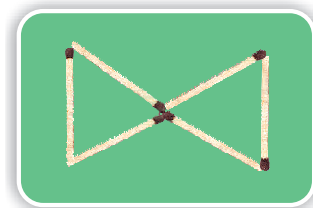
Now you give the answers.

Is it a closed shape? _____.

Does it have six sides? _____.

But it is not the same as the one made by Maryam. So Saika tried again.
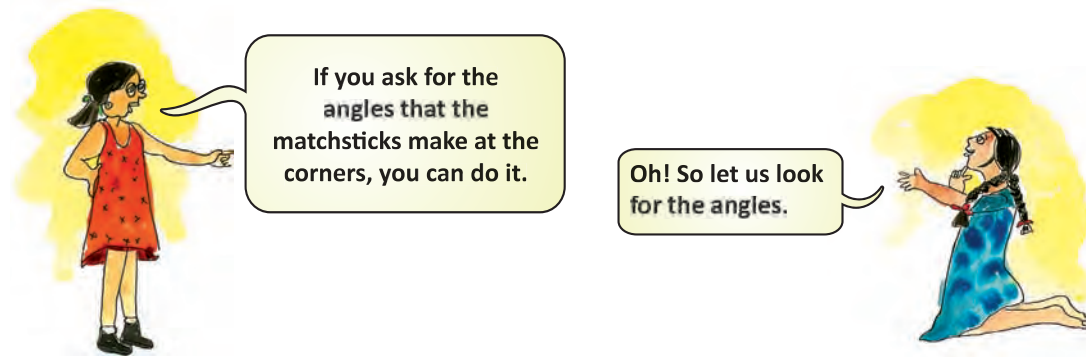
This is what she made.

Is it a closed shape with 6 sides? _____.

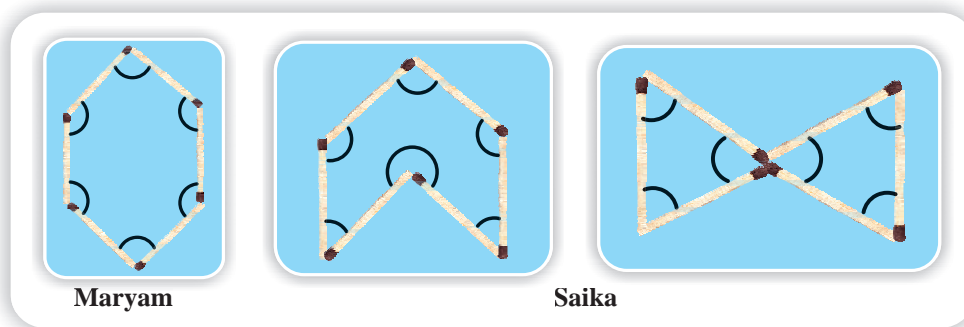Is it the same made by Maryam? _____.

Is there some way to say in what way these shapes are different?

❖ Saika is now tired of trying and asks Anjum what to do.
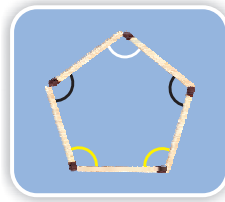

❖ Look at the angles marked in these shapes.

Can you the difference?

Maryam   Saika

Let Us Do These

1. Look at the shape and answer.

❖ The angle marked in _____ colour is the biggest angle.

2. [a]   Are the angles marked with yellow equal? _____

   [b]   Are the marked with green equal? _____

   [c]   Are the angles marked with blue equal? _____
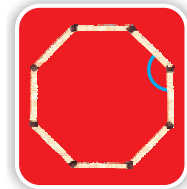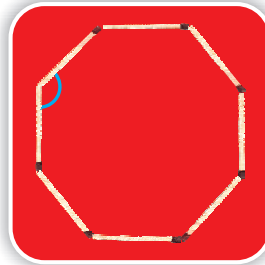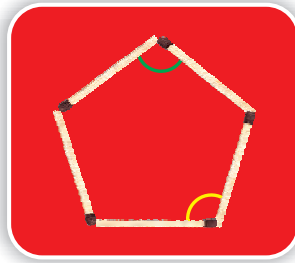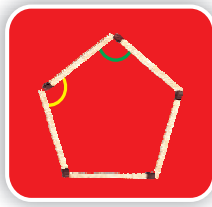
3. Four different angles are marked in four colours. Can you find other angles which are the same as the one marked in red?
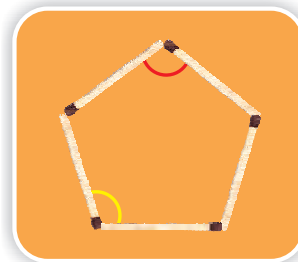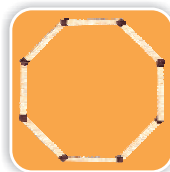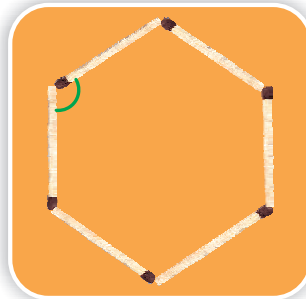
4. How many different shapes can you make by changing the angle between the matchsticks in each of these? Try.

(a)

4 matchsticks

(b)

8 matchsticks

(c)

5 matchsticks

(e)

7 matchsticks

(f)
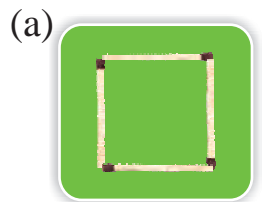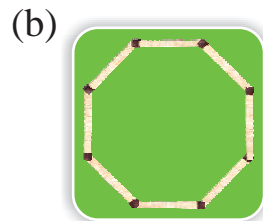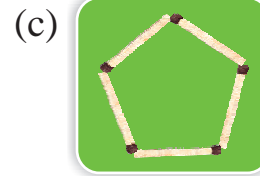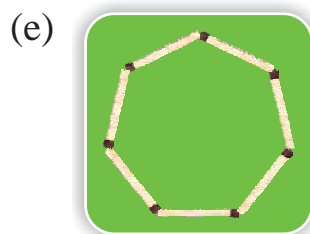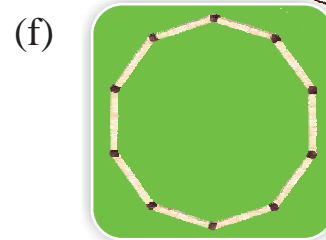
10 matchsticks
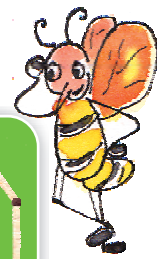
5. Two line segments with a common end point form an angle.

(a) Draw five examples of angles that you can see in your classroom

(b) An angle is formed by _____ rays.

(c) The common end point is called the _____ of an angle.

(d) The symbol used for an angle is _____.

(e) Name the given angle?

(f) BA and BC are called _____ of the angle.
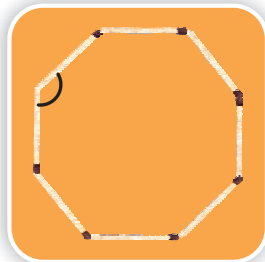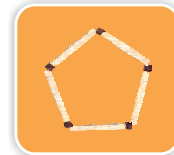
(g) Draw an angle and name it in three different ways.

Answers:

5 (a)   Corner of a Book, Duster, Floor, Table, Stool etc.

(b)   Two   (c) Vertex   (d) ∠   (e) ∠ABC

(f)   Arms   (g) ∠ABC or ∠CBA or ∠A or 1 etc.

Matchstick Puzzles

4. Make 8 triangles using 6 matchsticks. Try!

5. Take 8 matchsticks and make a fish like this. Now pick up any 3 matchsticks and put them in such a way that the fish now starts swimming in the opposite direction. Did it?

6. Using 10 matchsticks make this shape. Pick up 5 matchsticks and put them in such away that you get the shape of a house.
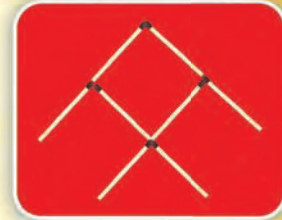
If you have not been able to solve these then look for the answers on page 14.

Angle Tester

How do we make equal angles?

Let us make an angle tester.

You also have an angle tester in your geometry box. It is called a divider.

❖ Cut two strips from a cardboard sheet.

❖ Fix them with a drawing pin or 🔘 such that both the strips can move around easily.

Ulfat and Gazala went all around with the angle tester to look for different angles in their class.

Ulfat tested the angle of the Math's book and the pencil box.

Look at the tester. It has opened like the letter L.

This is a right angle. We write it as L.

❖ Go around with your tester and draw here those things in which tester opens like the letter L. Are you sure they are all right angles.

Practice Time

1. Look at the angles in the pictures and fill the table.

Angle	Right Angle	More than a Right Angle	Less than a Right Angle
			✓

2.

(a)   Give three examples of a right angle from your classroom.

(b)   Draw a right angle, less than a right angle and greater than a right angle

> ***Answers:***
>
> (a)   Corner of a table, Black board, Duster etc.
>
> (b)
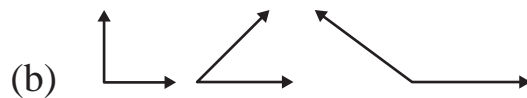
Activity

a.   Take a square sheet of paper.

b.   Fold it in half.

c.   Fold it once more and press it.

d.   Open the last fold so that the sheet is folded in half.

e.   Take one corner and fold it to meet the dotted line.

On the paper you will find lines making a right angle, an angle less than a right angle and an angle more than a right angle.

Look for each of the angles and mark them with different colours.

Angle Garden

My angle dance shows the way!
When I see flowers for making honey, I want to tell other bees. To show them the way I start dancing. My dance shows the angle between the sun and the flower.

Activity

Collect some leaves from the garden. Colour each leaf and print it. Look at the angle on the leaves. Which of them are more / less than a right angle?

Hey! Look at that bird. Its beak has an angle less than a right angle.

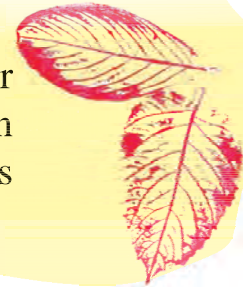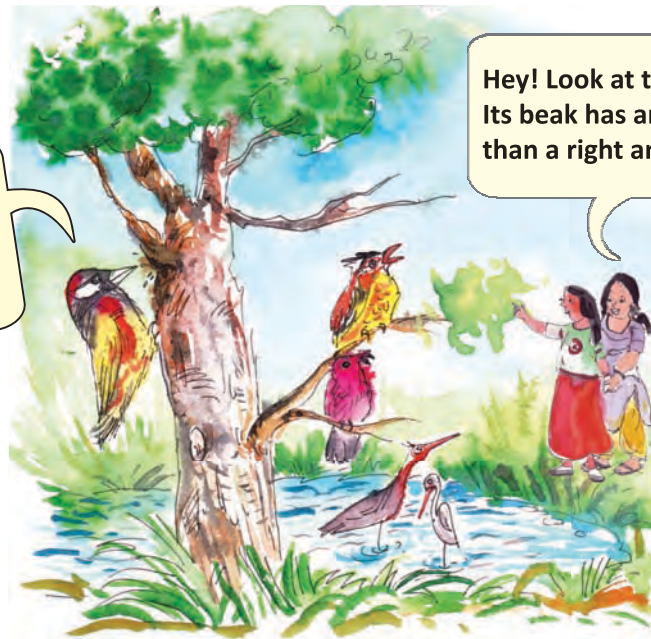I am a woodpecker. My beak is sharp because it has to cut wood

❖ Look for the birds which have beaks with small angles.

❖ In the picture mark angles between the two branches. Which two branches have the biggest angle?

❖ Write 3 names using straight lines and count the angles.

Name	Number of right angles	Number of angles more than a right angle	Number of angles less than a right angle.

Activity

a. Put 10 Merry math books on top of each other. Keep one book slanting to make a slide.

b. Now do these with six books.

❖ Roll a ball from the top. From which slide does the ball roll down faster?

❖ Which slide has the smallest angle?

These are two slides in a park.

❖ Which slide has a larger angle?

❖ Which slide do you think is safer from the little boy? Why?

Changing Shapes

❖ Things you need – used (or new) matchsticks. Piece of rubber tube used in cycle valves.

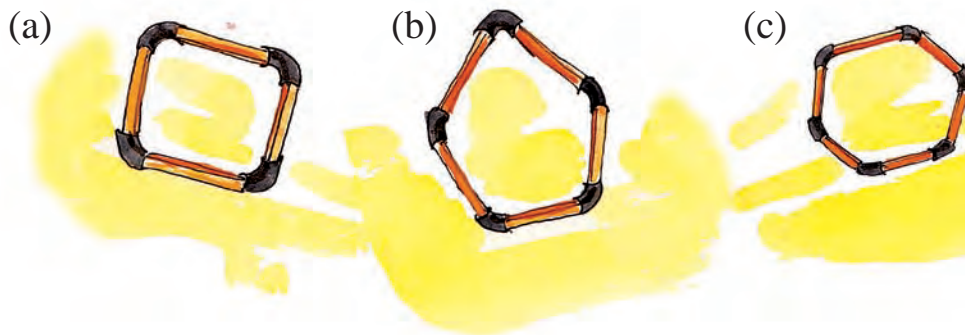i. Clean the black end of the matchsticks.

ii. Cut small pieces of the tube (about 1 cm long).

iii. Push two match sticks into each end of a tube piece.

iv. Add more matchsticks to from a triangle.

Now make these 4, 5, 6 sided shapes by using tube pieces and matchsticks.

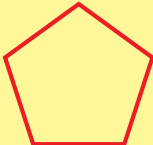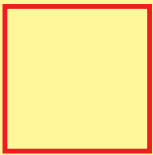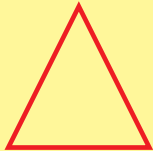(a)   (b)   (c)

❖ Find out how many angles are there in each of these shapes. Mark them.

Now push each shape downwards with the tip of your finger?

❖ Find out and write your results in the table given.

Shape	Change in angle Yes/ no

Shapes and Towers
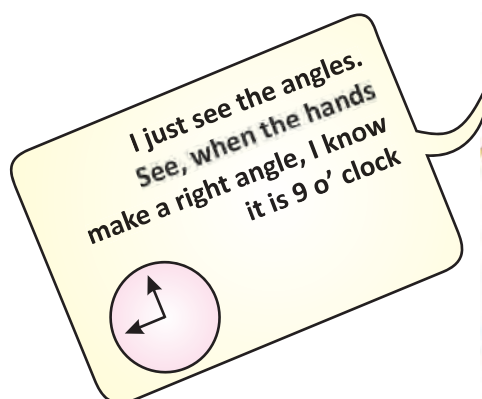
Look for triangles in the pictures below.

❖ From the activity 'Changing Shapes' can you guess why triangles are used in these towers, bridges etc?

❖ Look around and find out more places where triangles are used.

Angle and Time

Zareena, your watch does not have digits. How do you read time?

I just see the angles. See, when the hands make a right angle, I know it is 9 o' clock
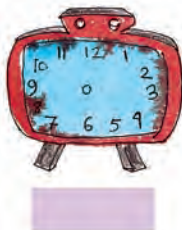
❖ There are many times in a day when the hands of a clock make a right angle. Now you draw some more.

❖ Write what kind of angle is made by the hands at these times. Also write the time.

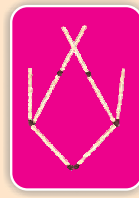❖ Draw the hands of the clock when they make an angle which is less than right angle. Also write the time.

Answers: Matchstick Puzzles (Page 5)

1.   2.   3.
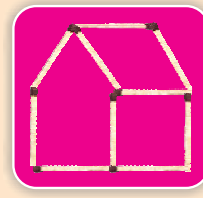
Degree Clock

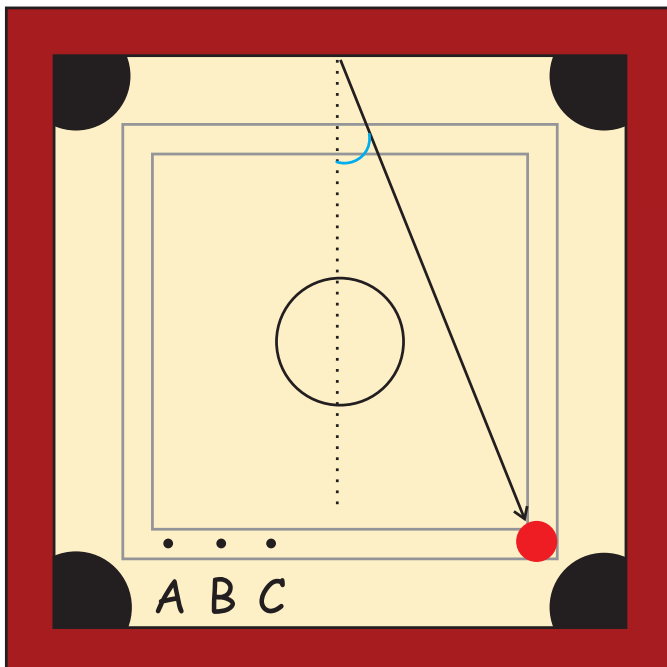Amir and Kamran are playing carom board. Amir hit the sticker.

> Hm Hm ....It comes back at the same angle.
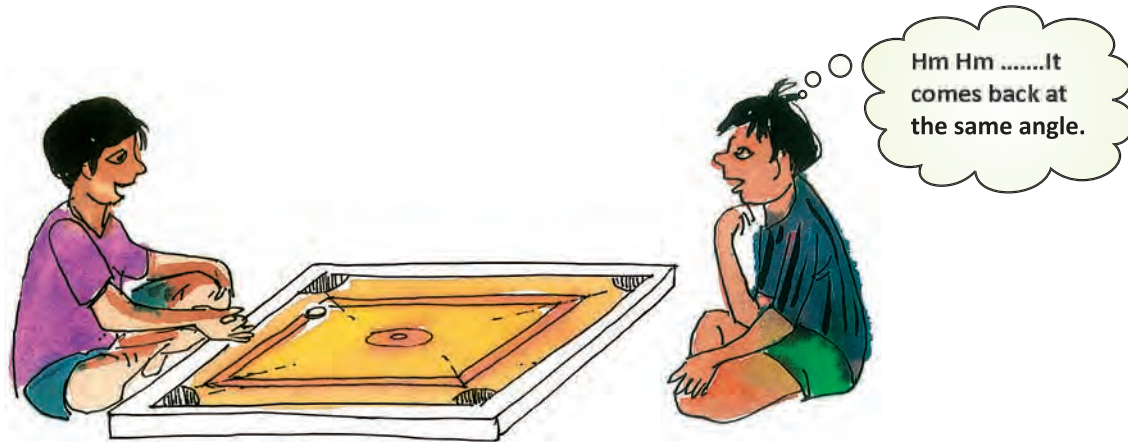
❖ In the picture three points A, B and C are shown. Draw a line to show from which point Kamran should hit to get the queen. ___

A B C

Fill in the blank spaces.

Q.NO.1. (a) An angle is measured in _____.

(b) Degree is written as _____.

(c) A _____ angle is called a right angle.

(d) $\frac{1}{2}$ of a right angle is _____.

(e) 2 times of a right angle is equal to _____.
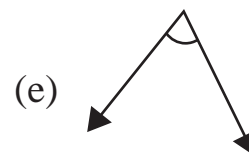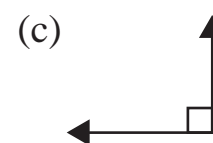
Q.NO.2. Fill in the blanks:

(a) An acute angle is more than 0˚ but less than _____

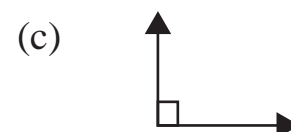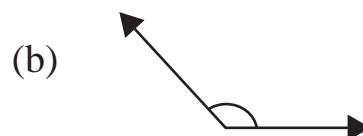(b) A _____ angle is equal to 90˚.

(c) An obtuse angle is more than 90˚ but less than _____.

(d) Two right angles are equal to a straight line then straight angles measures exactly _____.

Q.NO.3. Identify the following angles as acute, obtuse, right or straight angles.
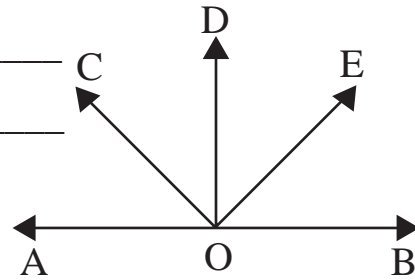
(a)   (b)   (c)

(d)   (e)
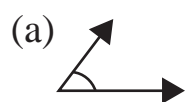
Q.NO.4. What is the measure of these angles?

(a)   (b)   (c)

Q.NO.5. Use D (Protractor) to measure the angles in the figure.

(a) AOC = _____ (b) AOE = _____

(c) COD = _____ (d) BOE = _____

(e) BOC = _____

Q. No 6 Construct the following angles with the help of your protractor.

(a) 50°   (b) 120°   (c) 90°   (d) 60°   (e) 45°   (f) 160°

Answers:

Q.NO.1:-
(a) Degree (b) 0° (c) 90° (d) 45° (e) 180°
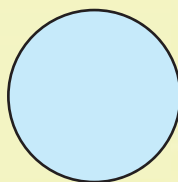
Q.NO.2:-
(a) 90° (b) Right angle (c) 180° (d) 180°

Q.NO.3:-
(a) Acute angle (b) Obtuse angle
(c) Right angle (d) Straight angle
(e) Right angle

Q.NO.4:-
(a) Less than a Right angle (b) Greater than a Right angle
(c) Right angle

Activity:

Making a Degree Clock
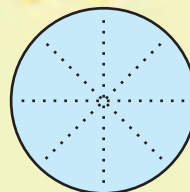
1. Cut a circle out of paper.

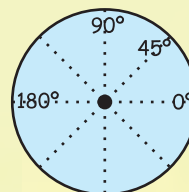2. Fold it into half.

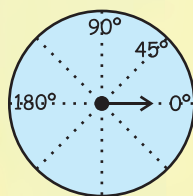3. Fold it once again in to a quarter

4. Fold in once more.

5. Open the paper. You will see lines like this.

6. Now mark 0˚, 45˚ 90˚and 180˚ as shown.

7. Paste it on an old card.

8. From the centre draw one hand.

9. Make a red hand with a thick paper and fix it to the centre with a drawing pin, so that it is free to move.
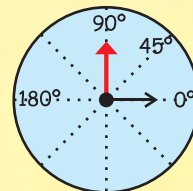
You degree clock is ready.

❖ Use your degree clock to measure the right angle of your pencil box. _____ is the measure of the right angle.

❖ Can you guess how many degrees is the angle which is ___

❖ $\frac{1}{2}$ of a right angle _____

❖ $\frac{1}{3}$ of a right angle _____

❖ 2 times of a right angle _____

❖ Measure the angle from where Junaid should hit the striker on page 15.

Angles in a Paper Aeroplane

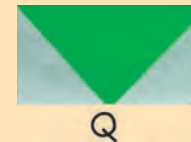1. Take a square sheet of paper.
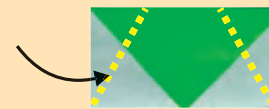
2. Fold it in half and open it.

3. Fold the corners to the centre. Your paper looks like this.

4. Fold the green triangle such that P touches Q.

5. Fold the top two corners of this rectangle along the dotted lines.

6. Your paper will look like this. There is a small triangle in the picture which has to be folded up.

7. Turn it over and fold it in half along the dotted line.

8. Now, to make a wing fold the yellow edge over the red edge.

9. Turn it and do the same on the other side as well.

Your plane is ready to fly. How well does it fly?

❖ Find the angles of 45˚and 90˚ when you open your plane.

Angles With Yoga

Umar is doing Yoga. These are the pictures of different 'Asanas' he does everyday.

❖ Measure as many angles as you can make by different parts of the body while doing 'Asanas'.

The D Game

You can play the 'D' game with your friends. You draw an angle. Your friend will guess the measure of that angle. Then you use your 'D' to measure it. The difference between the measured angle and the guess will be your friends score. The one with the lowest score will be the winner.

Come on, Play!

Draw Angle	Guess	Measure	Score
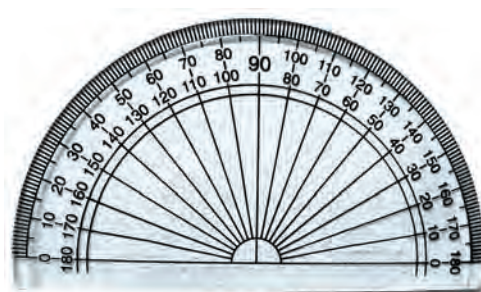
You can find this 'D' in your geometry box. Measure the angle on my head fan.