MATHEMATICS

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MATHEMATICS

What these Icons stand for!

Practice
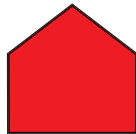
REVISION

Puzzle

PROJECT

Oral sums

Lab activity

SHAPES AND FIGURES

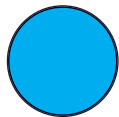**Look at the following pictures.**

Identify and write the names that are having the following shapes.

Pentagon - Front view of the house.

_____

_____

_____

_____

MATHEMATICS

Interesting facts

When people construct buildings, they use different shapes, because every shape has special characteristics that are best suited for a particular purpose.

A circle has curved line segment.
Other shapes like triangle, square, rectangle and pentagon have line segments.
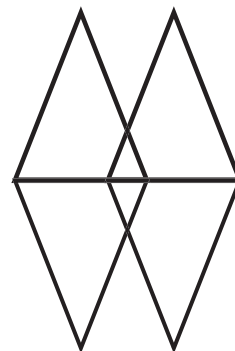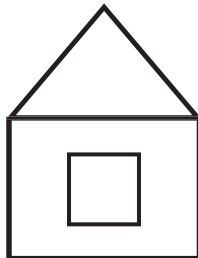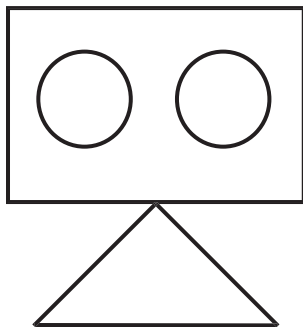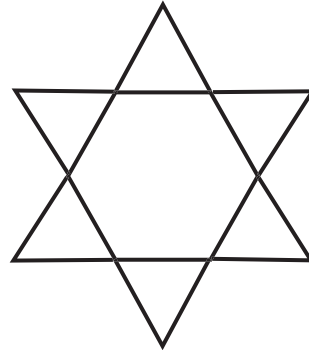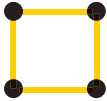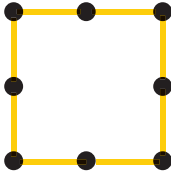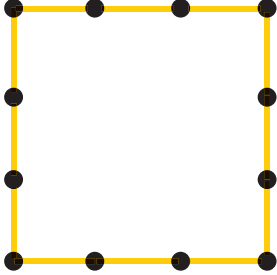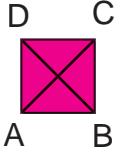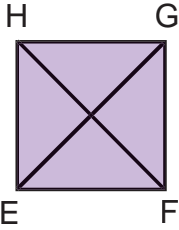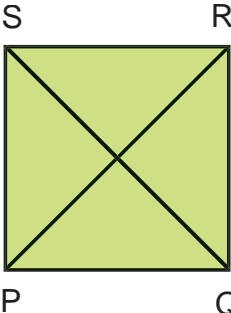
Line segment   Curved line segment

Colour the shapes

Squares

Squares using match sticks			
Squares by line segments	D C A B figure (1)	H G E F figure (2)	S R P Q figure (3)

In figure (1)
◈   A, B, C and D are corners.

◈   AB, BC, CD and DA are the sides.

◈   AC and BD are the diagonals.

◈   All sides are equal.

AB = BC = CD = DA
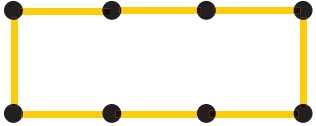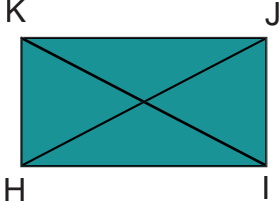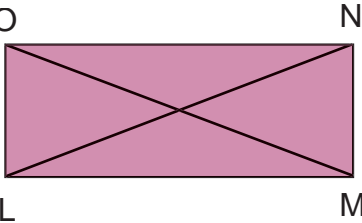
A square has four corners and four sides. All sides are equal.

Practice

Write the corners, sides and diagonals for the figure (2) and figure (3).

MATHEMATICS

Rectangle

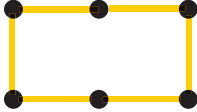|		
Rectangles using match sticks		
Rectangles by line segments	figure (1)	figure (2)

In figure (1)

◈ H, I, J and K are corners.

◈ HI, IJ, JK and KH are the sides.

◈ HJ and IK are the diagonals.

◈ Opposite sides are equal.

$$HI = JK \qquad IJ = KH$$
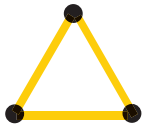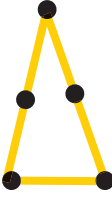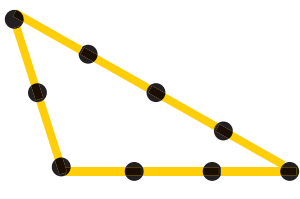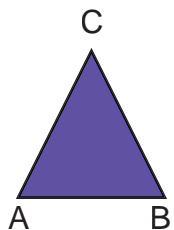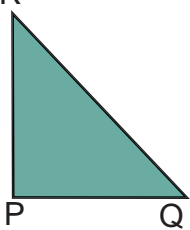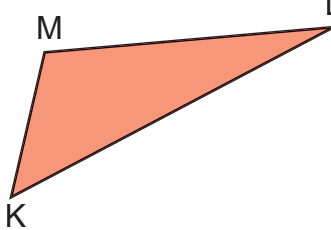
A rectangle has four corners and four sides.
Its opposite sides are equal.

Practice

Write the corners, sides and diagonals for the figure (2).

Triangle

Triangles using match sticks			
Triangles by line segments	C A B figure (1)	R P Q figure (2)	M L K figure (3)

In figure (1)

◈   A, B and C are corners.

◈   AB, BC and CA are the sides.

A triangle has three corners and three sides.

Practice
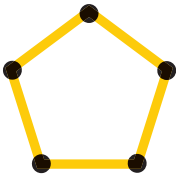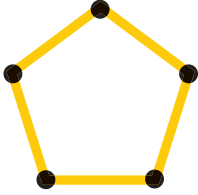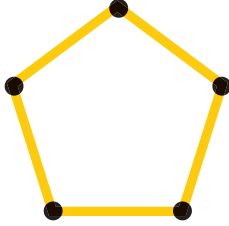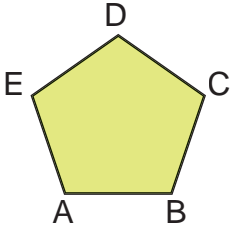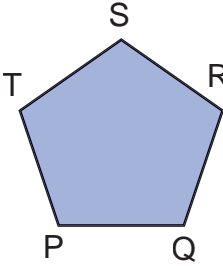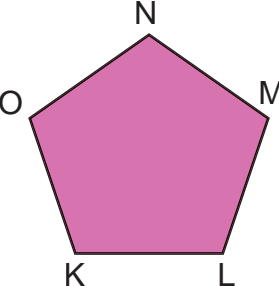
Write the corners and sides for the figure (2) and figure (3)

Lab activity

Use the following dots to draw different triangles, each triangle should be different from the others.

1)

2)

3)

4)

5)

6)

Pentagon

Pentagons using match sticks			
Pentagons by line segments	figure (1)	figure (2)	figure (3)

In figure (1)

▲ A, B, C, D and E are corners.

▲ AB, BC, CD, DE and EA are the sides.

A pentagon has five corners and five sides.

Practice

1) Write the corners and sides for the figure (2) and figure (3).

2) Shade the pentagons by different colours.
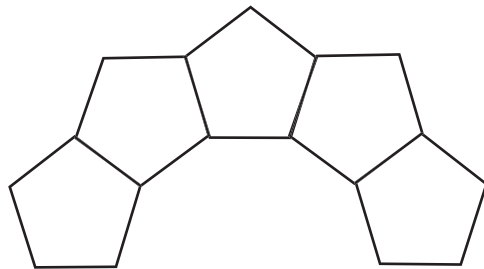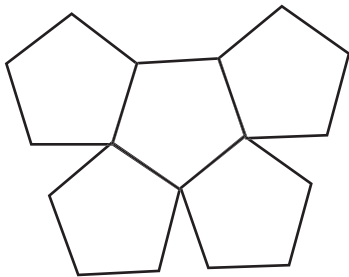
3) Draw shapes in the dots and colour it.
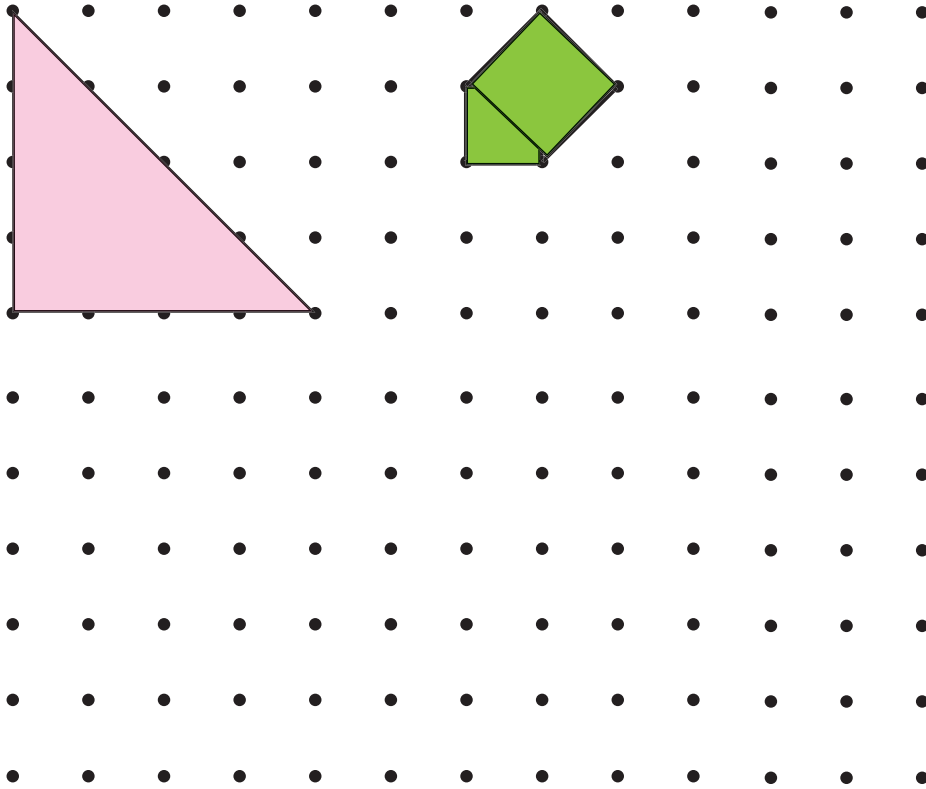
Drawing circle

Draw a circle in each of the following boxes.

Use a coin	Use a bangle	Use a bottle cap

Drawing a circle with free hand

I am going to draw a circle by using a piece of string and pencil.

O.K, how will you do?

Very simple. Let me show, look here...

- Tie one end of the string with a pencil and another end with a pin.

- Press the pin in the paper and keep a finger on its top.

- Rotate the pencil till a circle is formed.
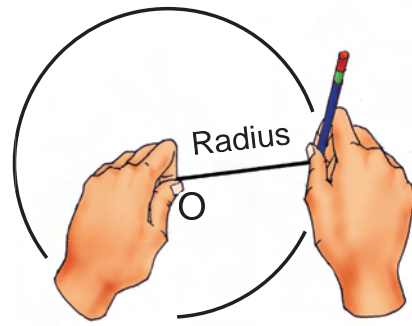
The touching point of the pin and the paper at 'O' is called the centre of the circle. The length of the string is the radius of the circle.

Practice

Using a string, without changing the centre, draw three circles with different lengths of string. You will get the diagram as given below.

Finding centre and radius using paper folding.

✦ Draw a circle in a paper.   ✦ Cut the circle.
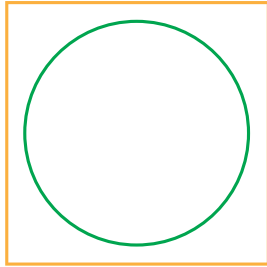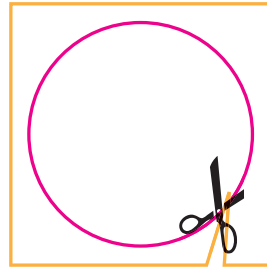
✦ Fold the circle into half.   ✦ Then fold it again like this.
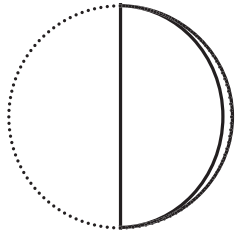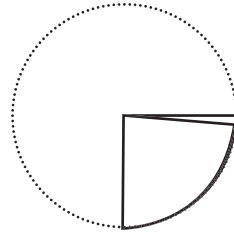
✦ Now open the foldings.

The two creased lines cross each other.

O

B   Diameter   C
O   Radius
A

OA = Radius of the circle
BC = Diameter of the circle

Two creased lines meet at a point O, is the centre of the circle.

The line segment joining any two points on the boundary of the circle, which is passing through the centre of the circle is called diameter.

MATHEMATICS

1) **With the help of your ruler measure the radius of the following circle.**
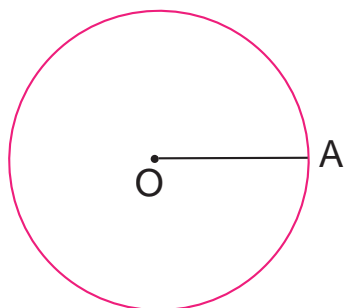
Radius = OA = _2cm_
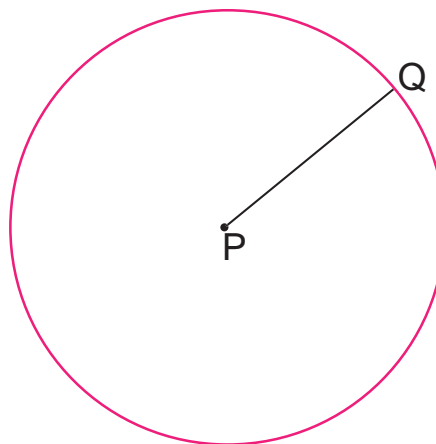
Radius = PQ = _____

2) **Draw the radius for the following circles and measure them.**

MATHEMATICS

About compass

Pivot arm

Movable arm
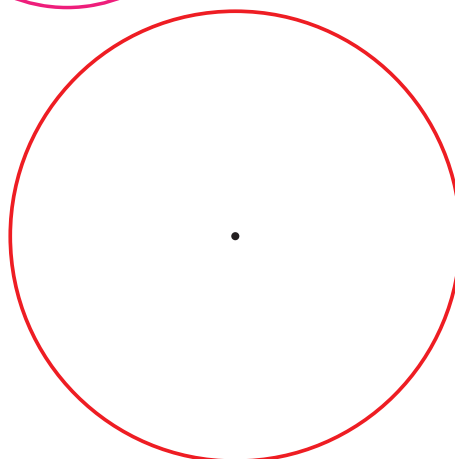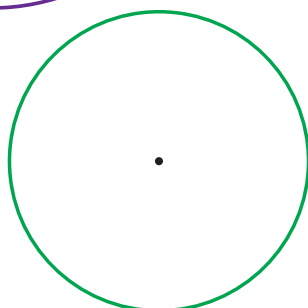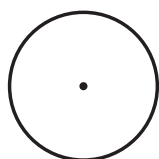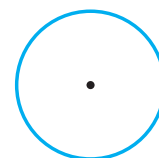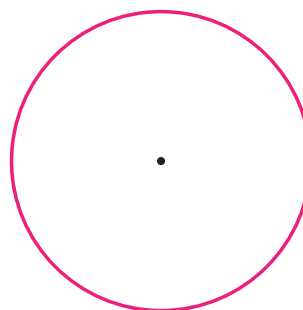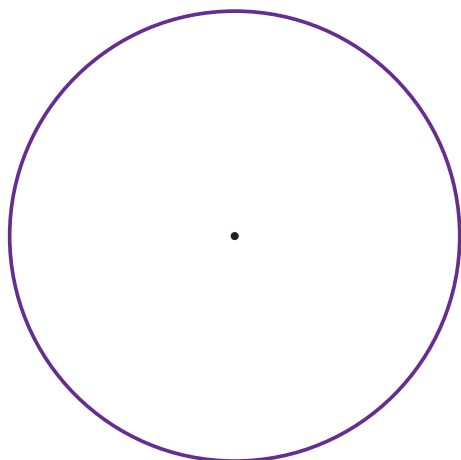
Steel end
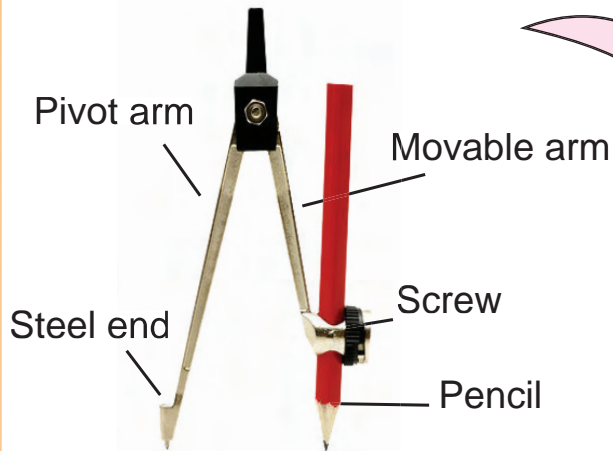
Screw

Pencil

- ◉ I am a compass.
- ◉ I have two arms.
- ◉ One arm has the steel end, called pivot arm.
- ◉ Movable arm has a screw to fix a pencil.

Drawing a circle using compass

★ Take a radius of 4cm using the ruler.
★ Fix the pivot point on the paper.
★ Rotate the pencil point till the circle is formed.
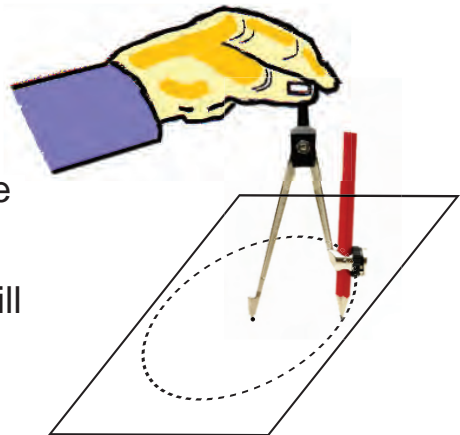
Practice

Draw circles using compass for the given radius.

1) 4 cm   2) 5 cm   3) 3 cm   4) 6 cm

Geometric shapes with tangrams

Tangram is a thousand years old chinese puzzle. It consists of seven geometrical pieces called tans, which are put together to form shapes. Using tans we can create different patterns, geometric designs, human beings, birds and animals.
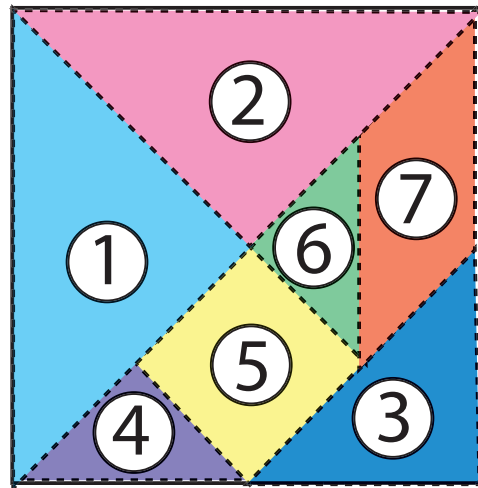
Different shapes using tangram
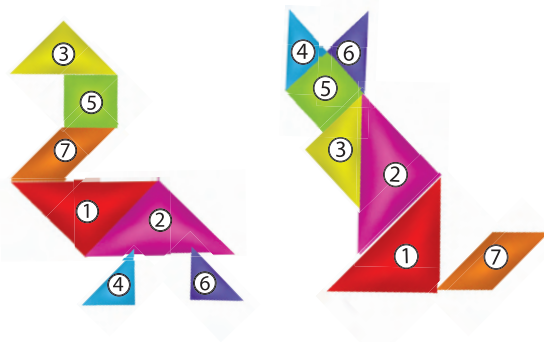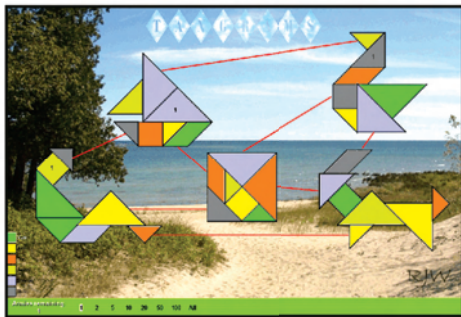
Practice

Tangram pieces are arranged into a picture of a man.
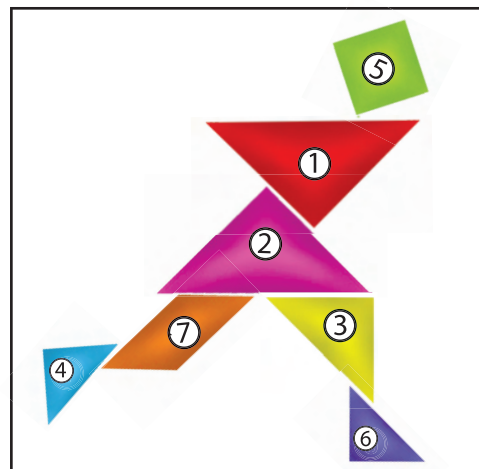
Arrange the tangram pieces

1)
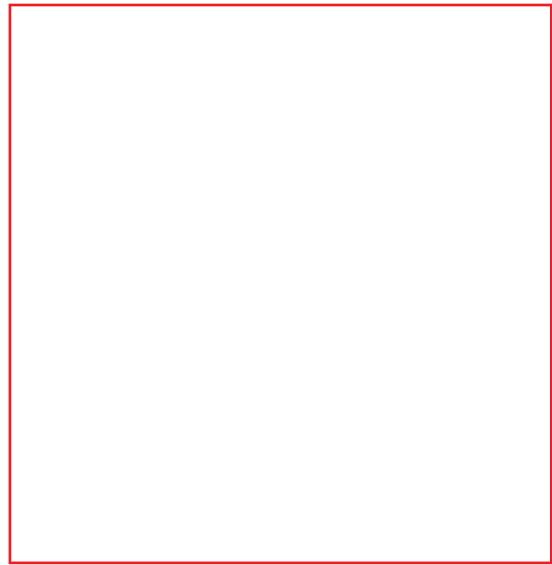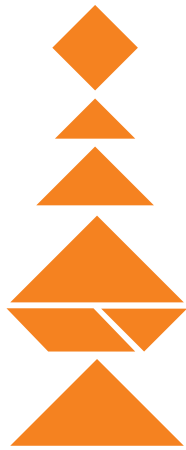
2)

3)
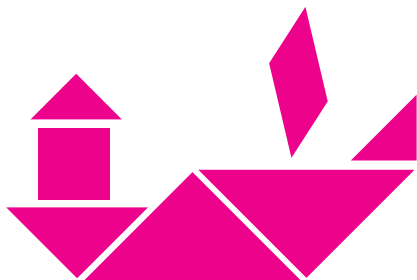
Tiling

Observe the following pictures.

Brick wall
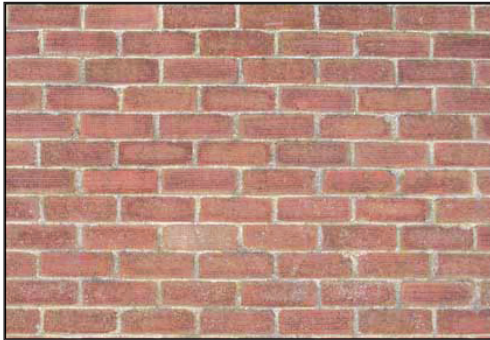
Chess board
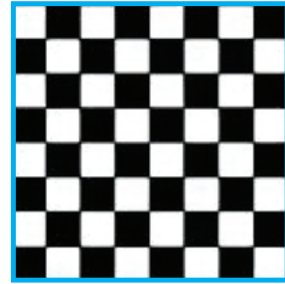
Bee hive

Floor tiles

Pictures are filled with different tiles without gaps and over laps.

Tiling the space with one or two shapes

This space is filled by triangle shapes
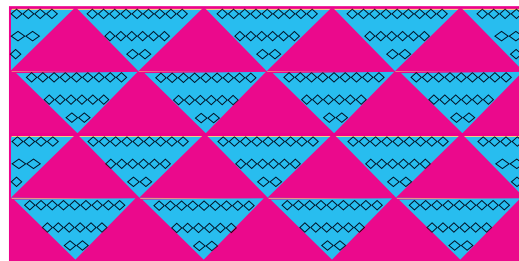
This space is filled by two shapes
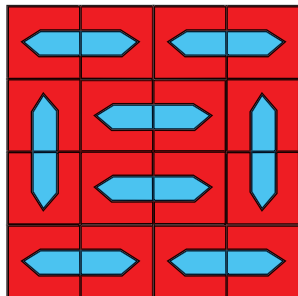
Select the two suitable shapes and tile the space given below.

1)

2)

3)

MATHEMATICS
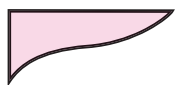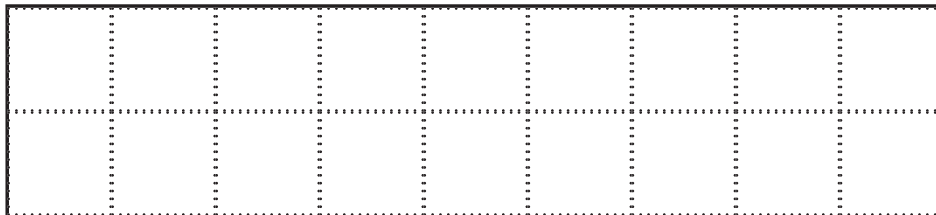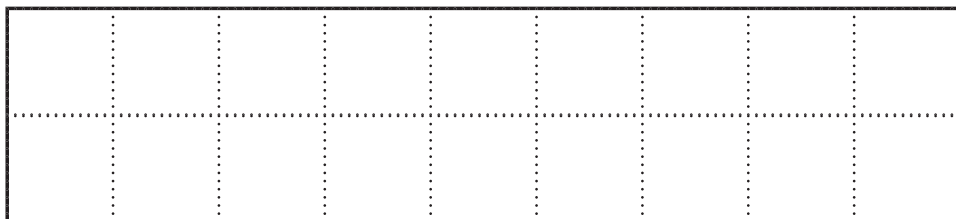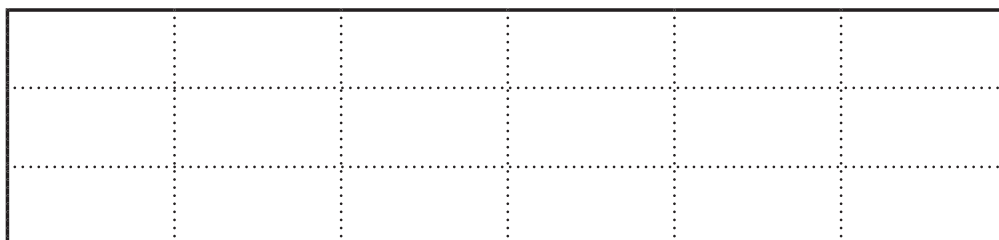
1) Count and write the number of squares and rectangles.
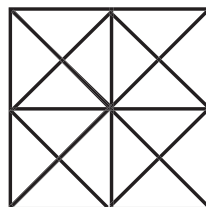
Number of squares _____   Number of rectangles _____

2) Count and write the number of rectangles and triangles.
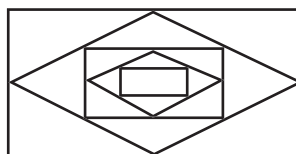
Number of triangles _____   Number of rectangles _____

3) Count the number of triangles and pentagons.
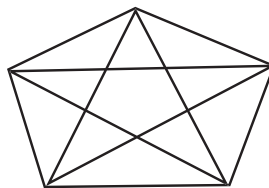
Number of triangles _____   Number of pentagons _____

4) A square and a rectangle have _____ sides and _____ corners.

5) A _____ has 5 sides and 5 corners.

6) _____ sides of a rectangle are equal.

7) The line joining centre point and any point on the boundary of the circle is called _____.

8) The line segment joining any two points on the boundary of the circle, which is passing through the centre of the circle is called _____.

9) Create two shapes using tangrams.

MATHEMATICS

Uma and Deepa are friends. One day Deepa visited Uma's house. Deepa noticed a Tamilnadu map hanging on the wall.

Deepa read the names of the rivers from the map, Uma read the length of the rivers. Deepa read "Thamirabharani".

Uma said, "130 km".
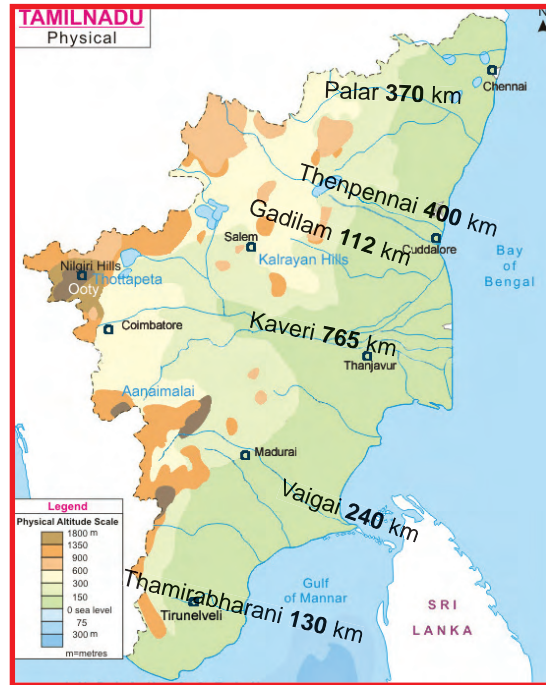
Fill up the details in the following table.

Length of the rivers	Numerals	Number name	Expanded form
Thamirabharani 130 km.	130	One hundred and thirty	100 + 30+0
Vaigai 240 km.	240		
Kaveri 765 km.			
Gadilam 112 km.			
Thenpennai 400 km.			
Palar 370 km.			

Use abacus to express the numbers

Chitra and Jothi are sisters. They are playing with the beads in an abacus. Jothi asked Chitra to put the beads for the number 999. Chitra placed successfully.
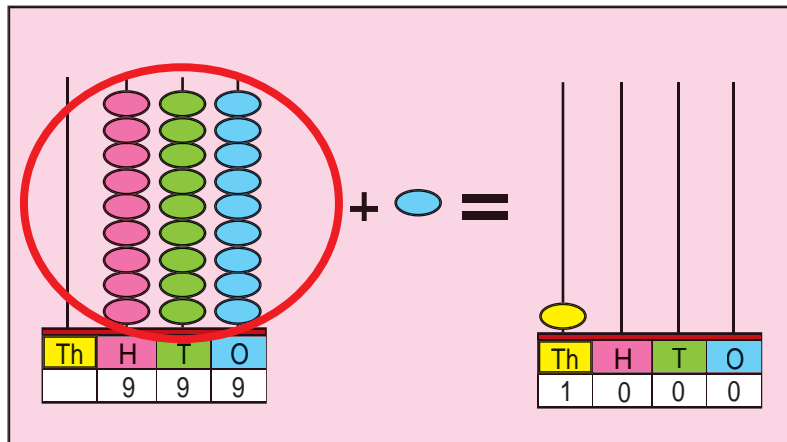
Can you put one more bead? asked Chitra. Jothi observed the abacus from 'ones' place to 'thousands' place. She removed all the beads and placed one bead in the 'thousands' place because,

| 10 ones = 1 ten | 10 tens = 1 hundred | 10 hundreds = 1 thousand |

999 + 1 = 1000.   We read it as ⬭ One thousand

Comparing the two numbers 999 and 1000

★   999 has 3 digits, 1000 has 4 digits.

★   1000 has 0 in ones, tens and hundreds places.

★   999 has 9 in ones, tens and hundreds places.

★   The greatest 3 digit number is 999.

★   The smallest 4 digit number is 1000.

1) Fill up the boxes.

9 + 1 = 10	10 + 1 = 11	10 - 1 = 9
99 + 1 = ☐	100 + 1 = ☐	100 - 1 = ☐
999 + ☐ = 1000	1000 + ☐ = 1001	1000 - ☐ = 999

2) Write the numbers shown in the following abacus.

Th	H	T	O
3	3	2	2

3322

Th	H	T	O

Th	H	T	O

Th	H	T	O

Th	H	T	

Th	H	T	O
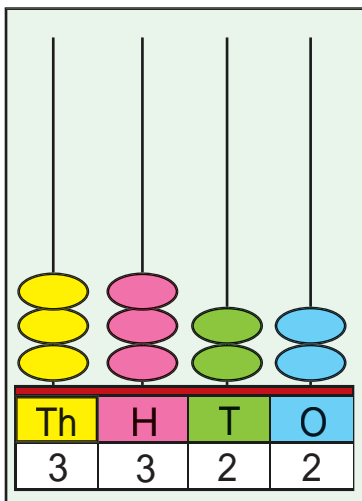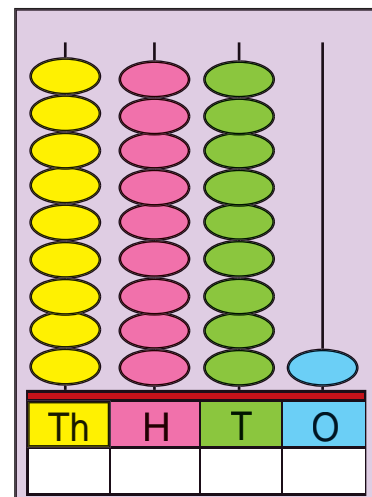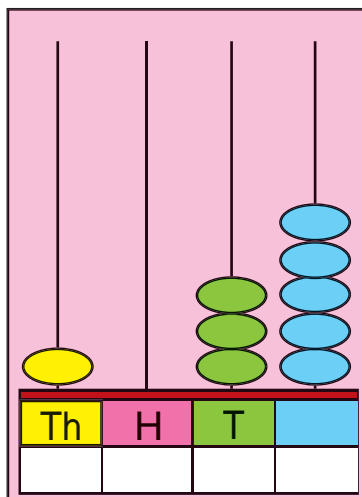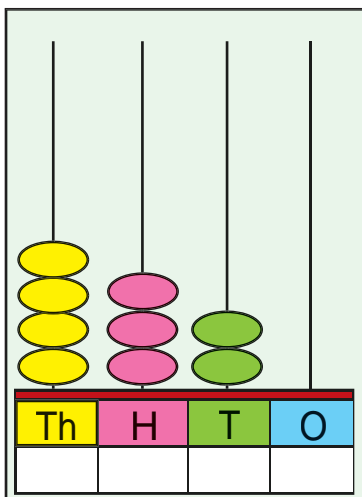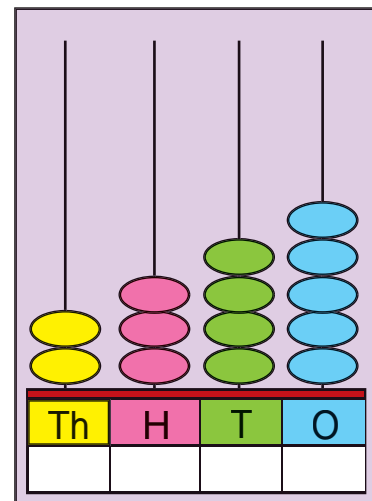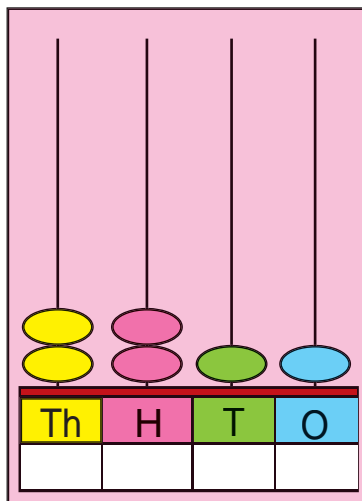
3) Draw beads for the number shown in the following abacus.

Th	H	T	O
5	2	7	3

Th	H	T	O
8	1	5	2

Th	H	T	O
6	0	7	4
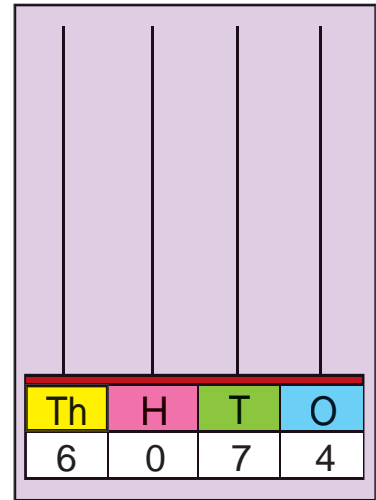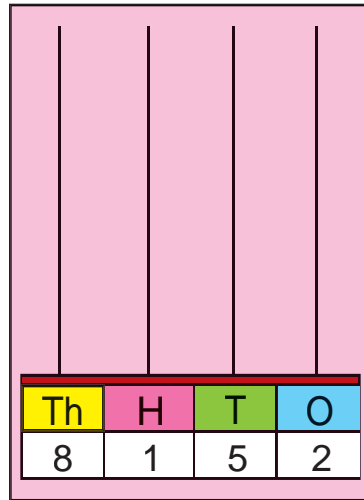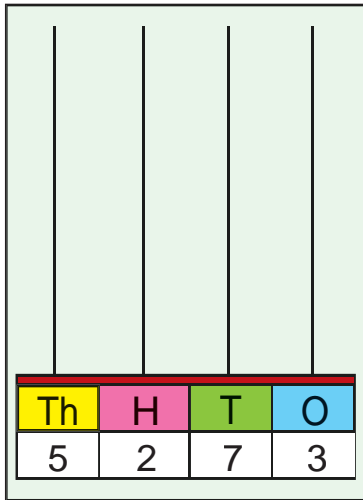
4) Write the missing numbers.

1001	1002			1005				1009	
2005	2010				2030				2050
3010	3020					3070			
4020	4040						4160		4200
5050	5100							5450	
6100	6200							6900	
7200	7400						8600		9000
5000	5500					8000			
9990	9991				9995			9998	
1000	2000			5000					10000

The greatest four digit number is 9999

Read the following sentences.

- ❖ Thirukkural has 1330 Kurals.
- ❖ The depth of Indian ocean is 7258 metres.
- ❖ Commonwealth games were held in New Delhi in 2010.

Shall we read the numbers !

1330 - One thousand three hundred and thirty

7258 - Seven thousand two hundred and fifty eight

2010 - Two thousand and ten

Place value

Th	H	T	O
1	3	3	0

1 3 3 0
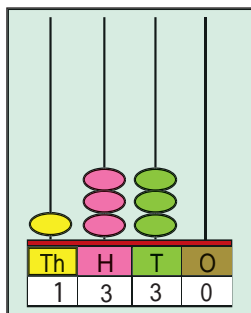
digit	place		place value
0 ×	1 =	0 =	0 ones
3 ×	10 =	30 =	3 tens
3 ×	100 =	300 =	3 hundreds
1 ×	1000 =	1000 =	1 thousand

Th	H	T	O
7	2	5	8

7 2 5 8
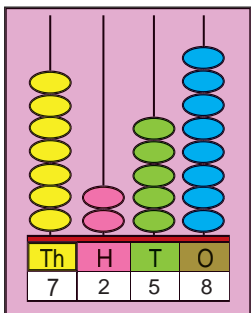
8 ×	1 =	8 =	8 ones
5 ×	10 =	50 =	5 tens
2 ×	100 =	200 =	2 hundreds
7 ×	1000 =	7000 =	7 thousands

Th	H	T	O
2	0	1	0

2 0 1 0
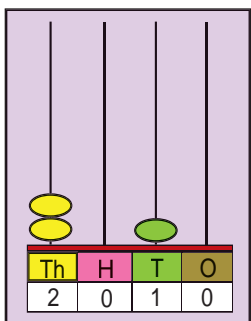
0 ×	1 =	0 =	0 ones
1 ×	10 =	10 =	1 ten
0 ×	100 =	0 =	0 hundreds
2 ×	1000 =	2000 =	2 thousands

MATHEMATICS
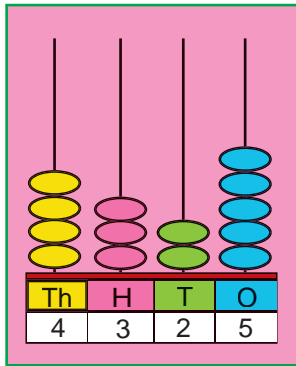
Expanded form

Number: 4325

Number name:

Four thousand three hundred and twenty five

Expanded form: 4325 = 4000 + 300 + 20 + 5

1) Write the place value of the encircled digits.

⑧ 3 4 5 - The place value of 8 is 8 thousands

② 7 5 1 - _____

3 ② 6 8 - _____

9 0 ⓪ 4 - _____

1 9 7 ④ - _____

5 4 ③ 0 - _____

2) Write number, number name and expanded form for the beads in the abacus.

Th	H	T	O

Th	H	T	O
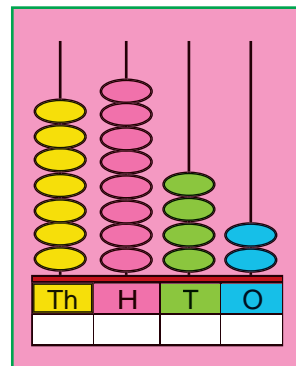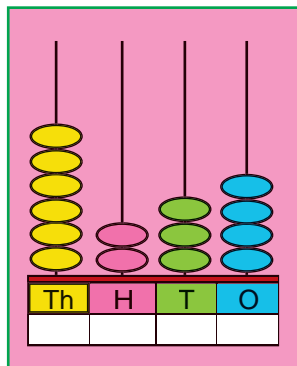
3) Form the numbers using number cards.

I shall arrange the number cards.

I shall write the numbers.
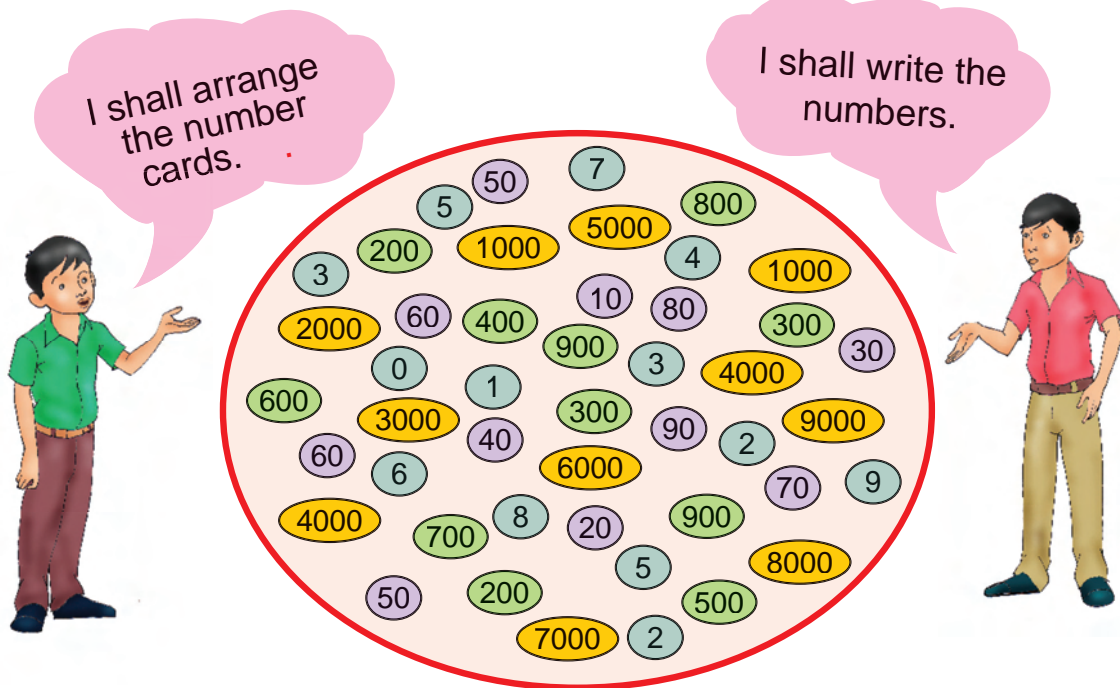
Balu arranges the number cards according to place value.

Velu writes the corresponding numbers.

Will you help them?

2000 + 200 + 30 + 5 = 2235

1000 + 300 + 10 + 8 = ⬭

8000 + ⬭ + 60 + 6 = 8066

4000 + 400 + 40 + 4 = ⬭

5000 + ⬭ + ⬭ + 3 = 5503

Balu writes the numbers.   Velu arranges the number cards.

9687 – 9000 + ⬭ + ⬭ + 7

6722 – ⬭ + 700 + 20 + 2

4359 – 4000 + ⬭ + 50 + ⬭

3970 – ⬭ + 900 + 70 + ⬭

8001 – ⬭ + ⬭ + ⬭ + 1

MATHEMATICS

101

Formation of greatest and smallest number

In which order they should stand to form the greatest 4 digit number?

In 4, 6, 9, 2   the greatest digit is 9
In 4, 6, 2   the greatest digit is 6
In 4 and 2, 4 is greater than   2
In 4, 6, 9, 2 the smallest digit is   2

They stand from the greatest digit to smallest digit.

Now the number formed is 9642

This is the greatest 4 digit number, using the given digits.

In the same way in which order they should stand to form the smallest 4 digit number?

In 4, 6, 9, 2   the smallest digit is 2
In 4, 6, 9   the smallest digit is 4
In 6 and 9, 6 is smaller than   9
In 4, 6, 9, 2 the greatest digit is   9

They stand from the smallest digit to the greatest digit.

Now the number formed is 2469

This is the smallest 4 digit number formed from the given digits.

The greatest number is **9642**

The smallest number is **2469**

Practice

1) Form the greatest and smallest 4 digit number.

Digits	Greatest Number	Smallest Number
0,4,2,8	8420	2048
3,7,4,9		
9,3,6,5		
5,0,1,7		

2) Pick out the smaller number, greater number and compare using > or <.

Numbers	Smaller Number	Greater Number	use > or <
4910, 3618	3618	4910	3618 < 4910
2897, 5110			
2375, 5732			
8000, 6070			

Ascending order and Descending order

Look at the marks scored by four students in XII Std Examination.

Velu	Jayashree	Anandan	Radhika
992	1187	1074	1126

Of these four marks 992 is the lowest mark as 992 has 3 digits.

> 992 is the smallest number.

But the other three marks are 4 digit numbers.

First compare the digits in the 'thousands' place.

1187   1074   1126

All the three numbers have 1 in the 'thousands' place.

So, compare the digits in the 'hundreds' place.

1187   1074   1126

1187, 1126 has 1 in the 'hundreds' place.

1074 has 0 in the 'hundreds' place.

So 1074 is smaller than 1187 and 1126.

Now compare the digits in the 'tens' place.

1187   1126

1187 has 8 tens, 1126 has 2 tens.

So 1126 is smaller than 1187.

increasing: 992, 1074, 1126, 1187

decreasing: 1187, 1126, 1074, 992

> 1187 is the greatest number.
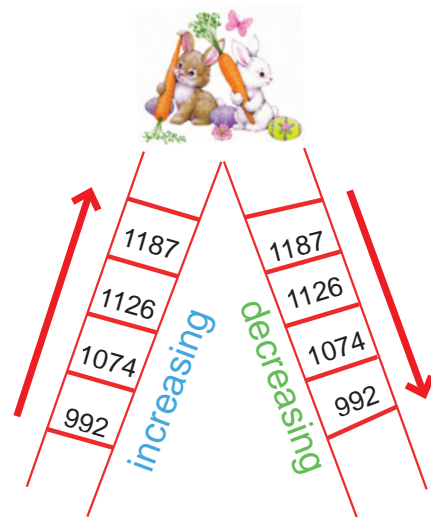
Ascending order	992, 1074, 1126, 1187
Descending order	1187, 1126, 1074, 992

Arranging the numbers from the smallest to the greatest is called ascending order and from the greatest to the smallest is called descending order.

Practice

1) Arrange the measurement of the heights in ascending order and descending order.

Height in metres	Kalvarayan Hills	Nilgiri Peak	Aanai Malai Hills	Doddabetta Peak
	914	2474	2695	2637

Ascending order	
Descending order	

2) Arrange the numbers in ascending order and descending order.

1) 8000, 4105, 7400, 3050   2) 6345, 6789, 9876, 4567

3) 4248, 1375, 5615, 1360   4) 1178, 1068, 1368, 1278

5) 7800, 5300, 8800, 6400   6) 4999, 1809, 4959, 2829

Odd numbers and Even numbers

Shade the odd numbers in blue and even numbers in red.

From the above coloured numbers write odd numbers and even numbers.

Odd numbers	_____, _____, _____, _____, _____, _____, _____, _____, _____, _____.
Even numbers	_____, _____, _____, _____, _____, _____, _____, _____, _____, _____.

The digits in the 'ones' place for odd numbers are 1, 3, 5, 7 and 9

The digits in the 'ones' place for even numbers are 0, 2, 4, 6 and 8

To identify whether the given number is odd or even,
it is enough to look at the digit in 'ones' place.

Identify the odd and even numbers. Fill them in flowers given below.

2765	4862	5047	4751	6404	3006
8354	7298	9433	8450	1239	5237
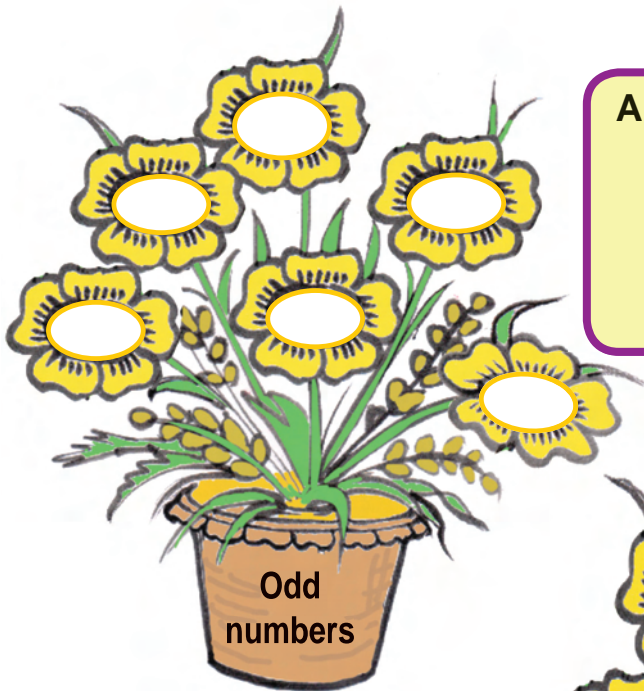
Odd numbers

Arrange the odd numbers in ascending order.
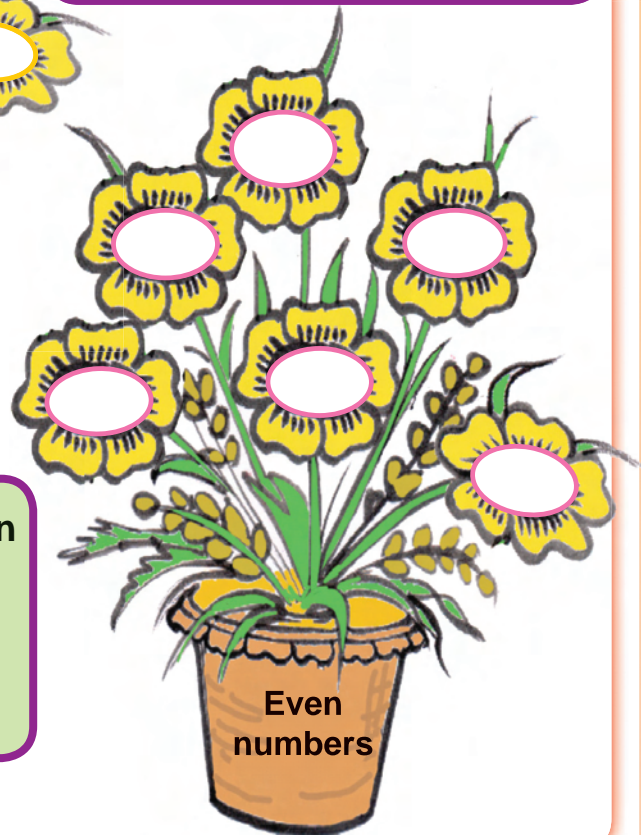
Arrange the even numbers in descending order.

Even numbers

Complete the table.

Family members	Name	Year of Birth
My name		
Father		
Mother		
Grandfather		
Grandmother		

Write the numbers from the above table and answer the following questions.

★ Write the number names.

★ Write in expanded form.

★ Write the place value of each digit in the numbers.

★ Arrange the numbers in ascending and descending order.

Puzzle

I am a 4 digit number.

My 'ones' place is 3.

Digit in 'tens' place is 2 more than in 'ones' place.

Digit in 'hundreds' place is 1 less than in 'tens' place.

Digit in 'thousands' place is 3 more than in 'hundreds' place.

I am ☐

MATHEMATICS

Estimation in numbers

Look at the apples, without counting say approximately, how many apples are there ?

Approximately 30 apples.

Your answer is close to actual number. But actual number of apples kept in the basket is 28.

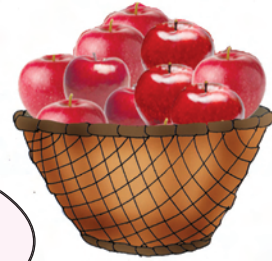What do you learn from the above conversation ?
We use estimation for counting in our daily life.

Estimation using number line

Estimation (round off) of numbers to the nearest 10

20 21 22 23 24 25 26 27 28 29 30
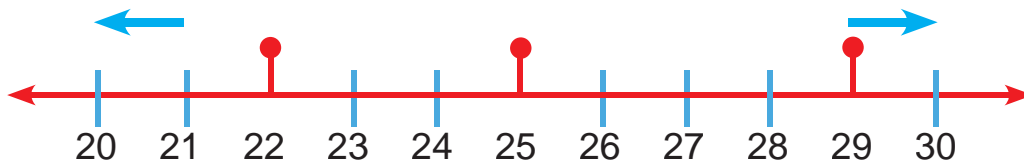
★ 22 is rounded off to 20 since it is close to 20

★ 29 is rounded off to 30 since it is close to 30

★ 25 is rounded off to 30 since it is half way between 20 and 30

We can estimate the number more easily by using number line.

Estimation (round off) of numbers from 91 to 99 to the nearest 10
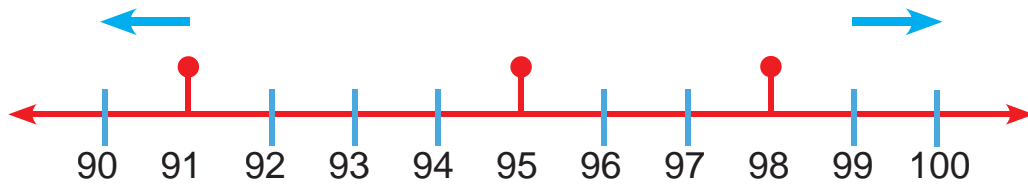
★ 95 is rounded off to 100 since it is half way between 90 and 100

★ 98 is rounded off to 100 since it is close to 100

★ 91 is rounded off to 90 since it is close to 90

Practice

Estimate to the nearest 10.

1) 23	2) 46	3) 54	4) 65
5) 14	6) 35	7) 88	8) 91
9) 76	10) 99	11) 87	12) 94

While rounding off a number check its 'ones' place,
if it is 5 or more than 5, round off the number to the next nearest 10.
If it is less than 5, round off the number to the nearest 10.

1) Write the missing numbers.

   (i) 7430, 7440, _____ , _____, _____, _____, _____ , 7500.

   (ii) 1300, 1400, _____ , _____, _____, _____, _____ , 2000.

2) Write the number names for the following numbers.

   (i) 3906 _____

   (ii) 10000 _____

3) Write the numerals for the following.

   (i) Four thousand nine hundred and eighty two

   (ii) Six thousand two hundred and five

4) Write the place value of the circled digits.

   (i) 7 ④ 5 0 _____

   (ii) 3   9 ⑧ 5 _____

5) Express the following in the expanded form.

   (i) 3 4 6 0 _____

   (ii) 9 0 1 7 _____

6) Write the short form of the following numbers.

   (i) 5000 + 400 + 30 + 9 =

   (ii) 4000 +   0 +   0 + 4 =

7) Write the ascending order and descending order.

   8275   8555   8150   8325

8) Encircle the even numbers.

   3645   9450   8564   3718   6071

9) Put '<' or '>'

   (i) 4375 _____ 3747   (ii) 10000 _____ 9999

10) Round off the following numbers to the nearest tens.

   (i) 75   (ii) 83   (iii) 94   (iv) 36