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Term - I

Volume-2

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Department of School Education

Untouchability is Inhuman and a Crime

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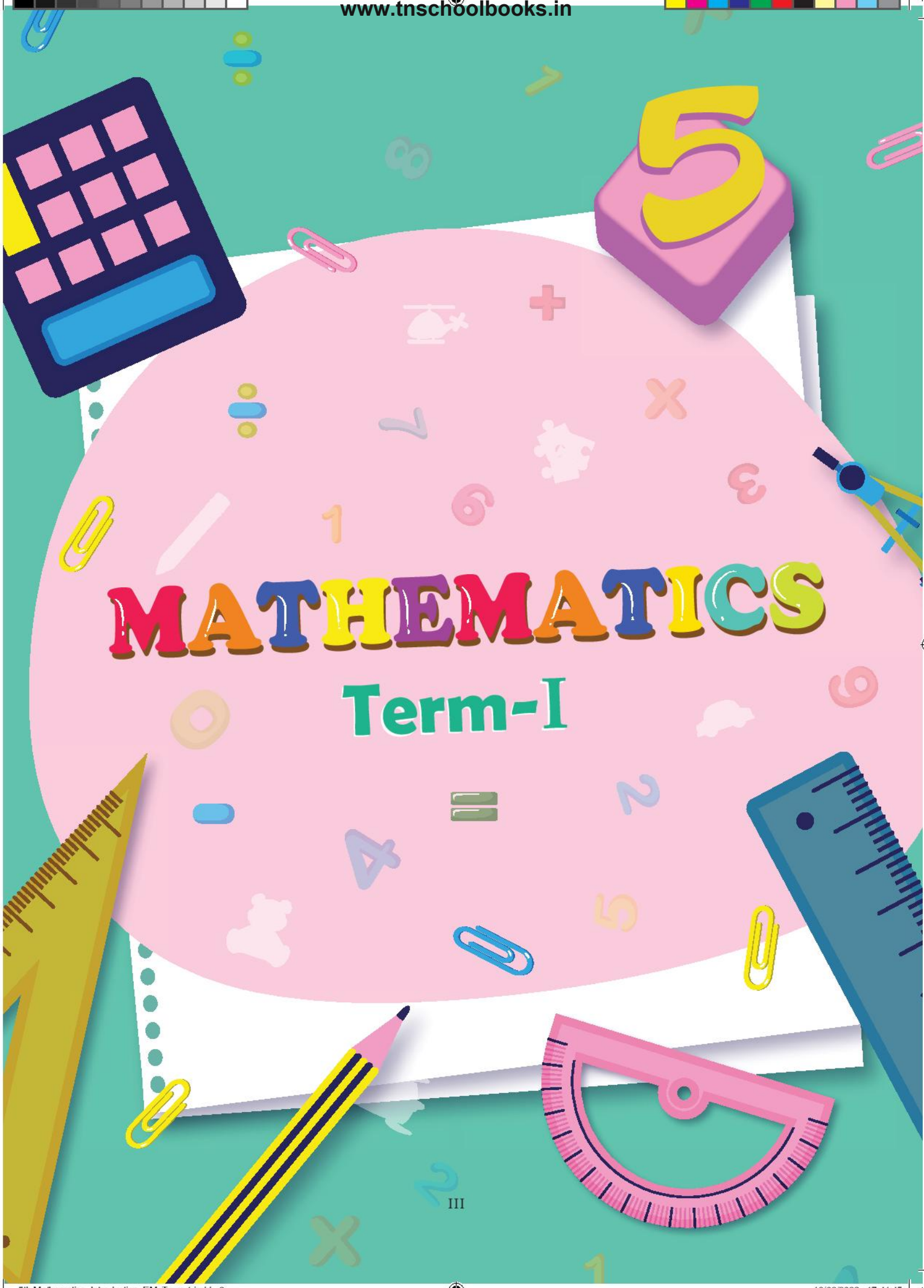
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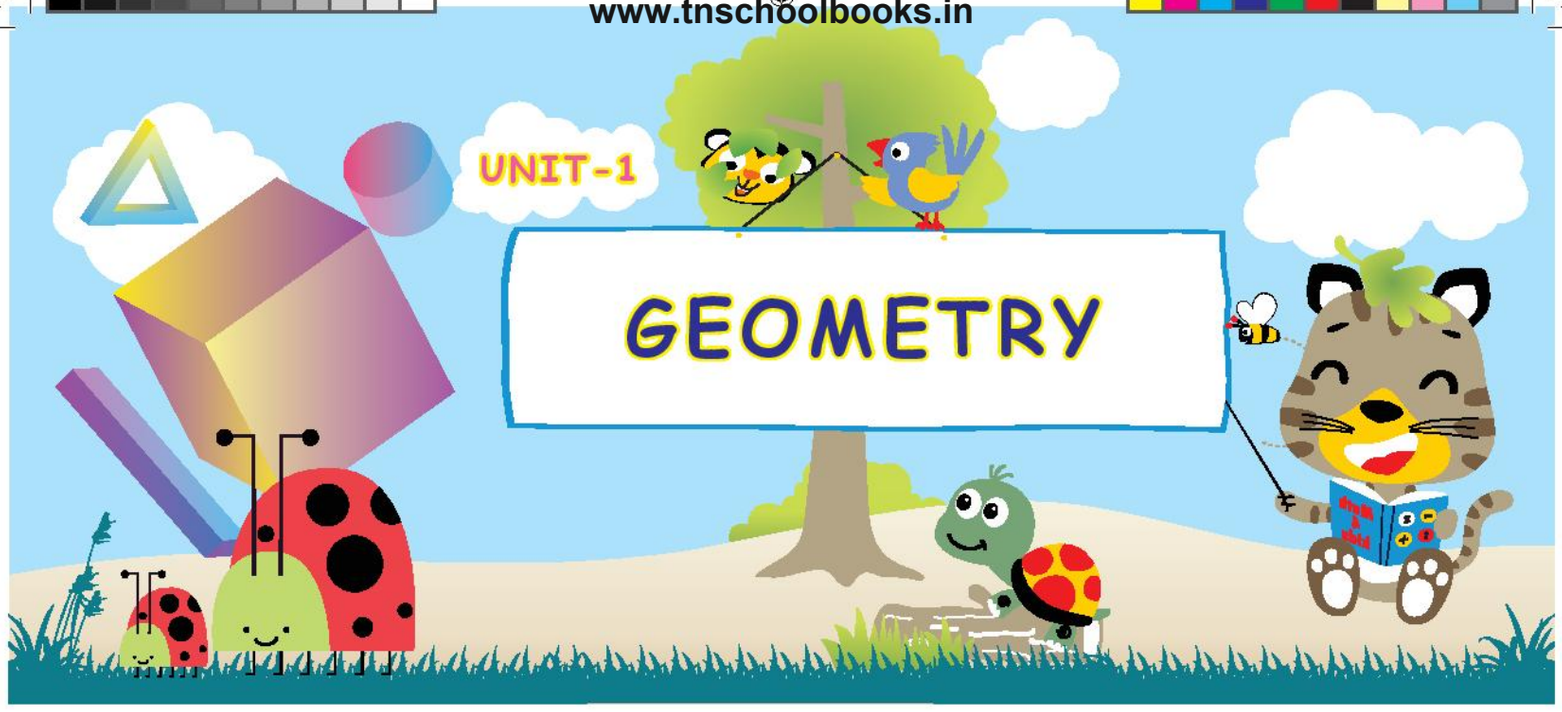
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Assessment



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UNIT-1

GEOMETRY

1.1 2 Dimensional Perspective of 3 Dimensional Objects

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.

Examples









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3-D Shapes

3D Shapes are solid objects that have three dimensions namely length, breadth and height.

Examples



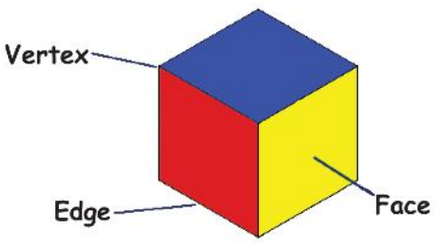


1.1.1 Properties of 3D shapes

Cube

Properties:

- It is a 3D shape.
- It has six faces.
- All sides are equal.
- It has 8 vertices and 12 edges.



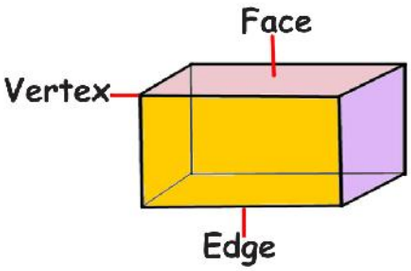
Examples




Cuboid

Properties:

- It is a 3D shape.
- It has six faces.
- It's opposite sides are equal.
- It has 8 vertices and 12 edges.



Examples

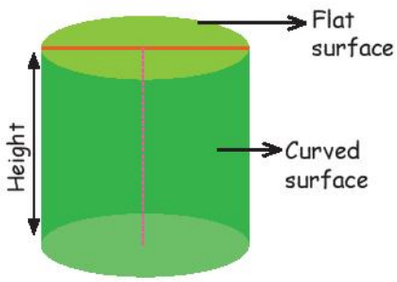



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Cylinder

Properties:

- It is a 3D shape.
- It has two flat surfaces and one curved surface.
- Distance between the two flat surfaces is its height.



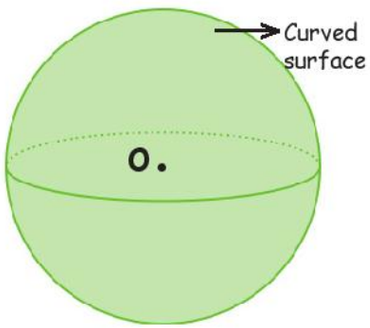
Examples



Sphere

Properties:

- It is a 3D shape.
- It has one curved surface.
- All points on the curved surface are at the same distance from the centre.
- It has no vertices and edges.



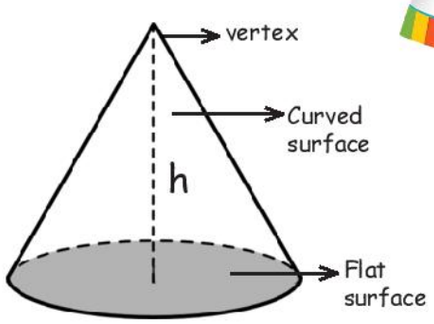
Examples



Cone

Properties:

- It is a 3D Shape.
- It has one flat surface and one curved surface.
- It has one vertex.
- The distance from the top of the cone to the centre of the base is its height.



Examples



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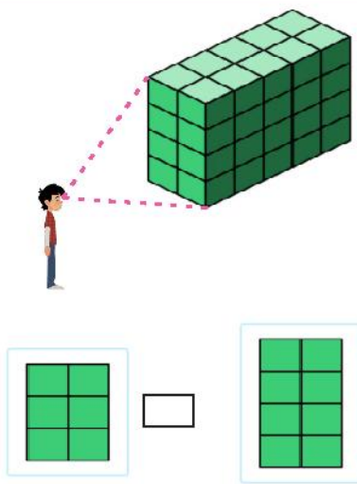
Activity

Observe the 3D objects around you and fill the table.

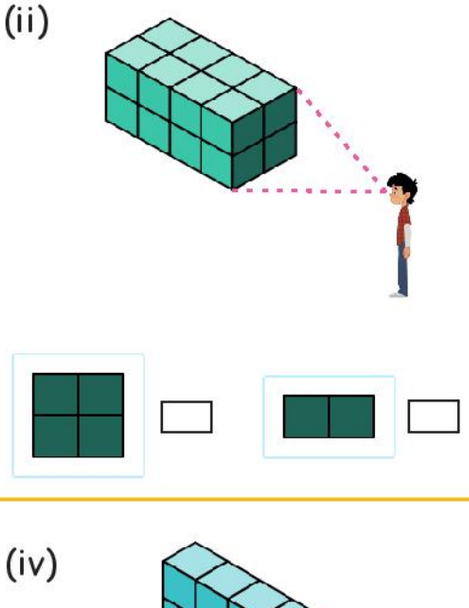
S. No.	Objects	Shapes	Sides	Corners
1	Dotted cube	Cube	6	8
2				
3				
4				
5				

Observe the 3D shapes and tick the image of the blocks that can be seen from the man's view.

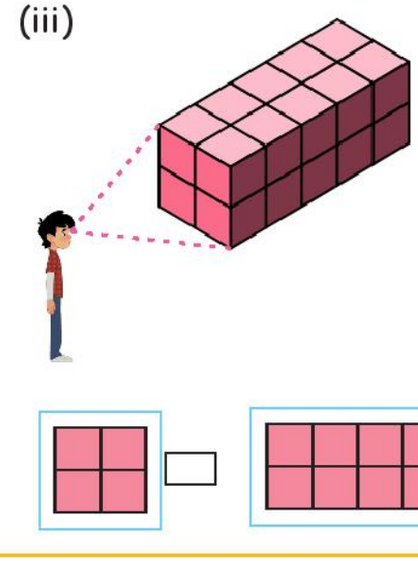
(i)



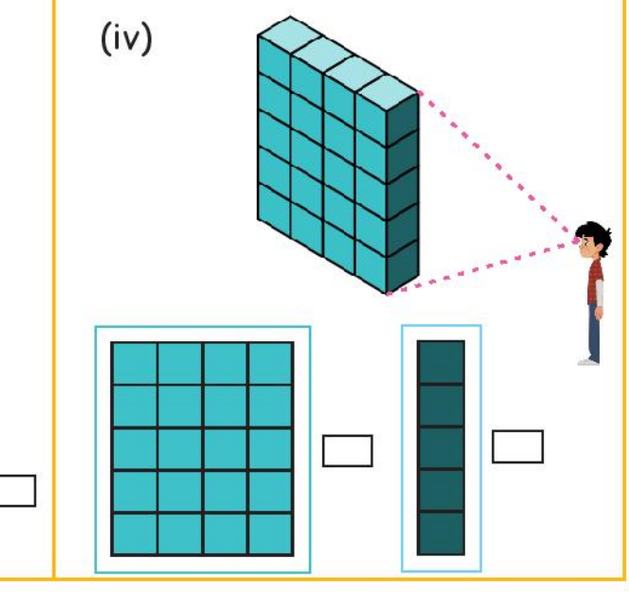
(ii)



(iii)



(iv)



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Exercise 1.1

1 Match the following

i)  — Cuboid

ii)  — Sphere

iii)  — Cone

iv)  — Cylinder

v)  — Cube

2 Find whether the given statements are true or false

i) Cube has by 6 square faces.

ii) The height and slant height of the cone are equal

iii) A Cuboid has 7 vertices.

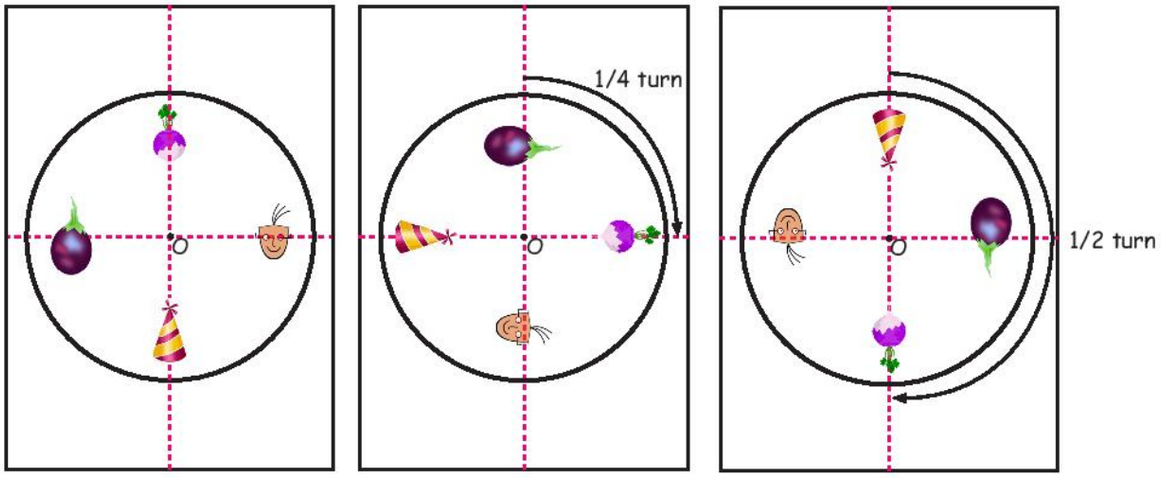
iv) A cylinder has two flat surfaces.

v) Sphere is a 3D Shape.

1.1.2 Able to explore rotations of familiar 2D Shapes intuitively.

Draw a circle in a chart. Then cut the circle from the chart. Fold it into four equal parts and spread again. Draw or paste four pictures on the circle as shown in the figure.

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Fold a paper as shown in the figure and draw lines on it. Fix a pin at the centre and keep the chart on it in such a way that the lines on the paper and circular chart matches. As the chart is rotated the pictures in each quadrant is also rotated. Now we can see the pictures are moving as the chart is rotated on the paper.

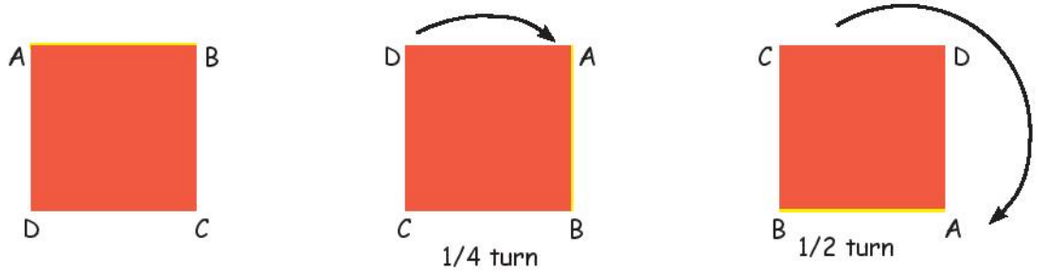
Movement about a fixed point is called rotation. The point o where the pin is fixed is called centre of rotation. We can observe the movement of pictures after every rotation. After one complete rotation, the chart comes back to the starting position.

From this we understand that,

When the round chart is rotated about the centre point the images are rotated accordingly. The point is called as "centre of Rotation".

Example

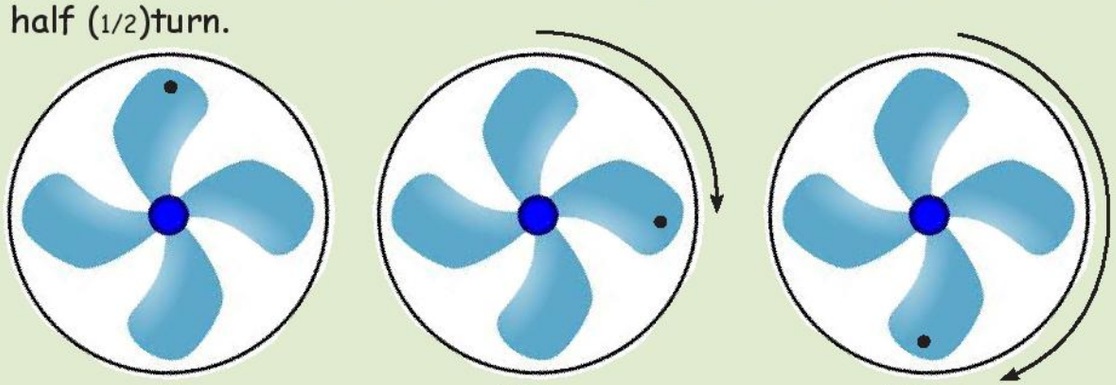
Observe the rotation of the square.



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Think

Is there any change in the position of the wings of the ventilater fan, after rotating one-fourth (1/4) turn and half (1/2)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 (✓) mark.



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.

1 2 3 4 5 0 8

4. How the following numbers are changed after half turn.

i) 8 8 8 8 8 _____

ii) 1 0 1 0 1 _____

iii) 1 1 1 1 1 _____

iv) 8 0 8 0 8 _____

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Project:

Prepare, a collection of 5 pictures after one fourth and half turns, and show it to your teacher. From the collection, tabulate the pictures that looks the same after one fourth and half rotations.

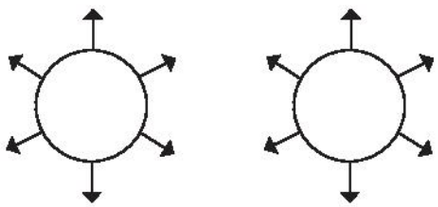
1/3 a turn:

Example: The following picture will look same on 1/3 of a turn.



1/6 a turn:

Example: The following picture will look same on 1/6 of a turn.



Practice

1. Observe at the following shapes and draw its image after 1/3 of a turn and 1/6 of a turn

S. No.	Shapes	1/3 a turn	1/6 a turn
1			
2			
3			

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Project:

Collect various numbers, pictures and letters which will look the same after 1/3 a turn 1/6 a turn and show it to your teacher.



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 Reflections of familiar 2D shapes.

Activity

- Write the letter 'D' in bigger size on a white paper now draw a line on the paper using a pencil and place a mirror on the line drawn.
- Observe the image of alphabet 'D' in the mirror.
- Now, 'Ↄ' is the "image". This event is called Reflection.



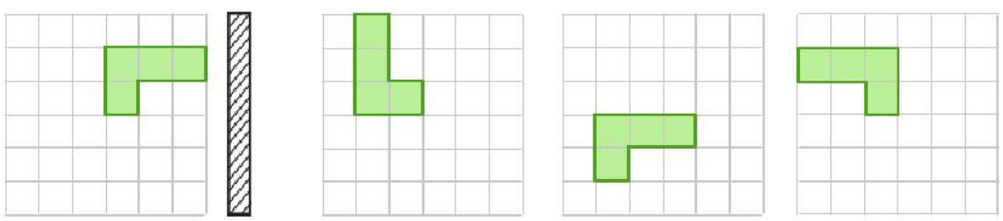
Now remove the mirror. The line drawn using pencil is called as the "reflection axis."

From this we understand that,

- The object and image in the mirror are equal in size.
- The object and image are at equal distance from the reflection axis.
- If direction of the object is left to right, then the direction of the image on the mirror will be from right to left.

Activity

Tick the image that shows the reflection of the given shape.



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Try this

Draw some of your favorite shapes and draw its reflection images on a chart and show it to your teacher.

Activity



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).
2. When you go back, your image moves _____ (backward, forward).
3. The distance between you and mirror and the distance between mirror and your image is _____ (equal, unequal).
4. When you come forward to the mirror, your image moves _____ (forward, backward).
5. When you raise your right hand, the image in the mirror looks like, _____ hand is raising. (right, left).
6. When you raise your left hand, the image in the mirror looks like, _____ hand is raising. (right, left).

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Pleasure Time

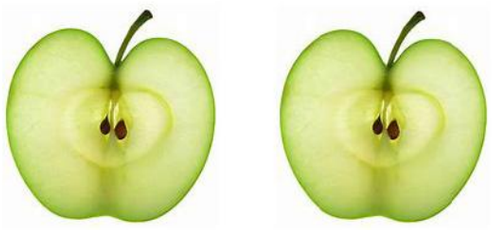
Take a rectangle shaped paper and fold it into two equal parts. Dip a thread in an ink-pot. Place it inside the folded paper and drag it out. Now open and see the folded sheet. What do you observe?

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

Discuss your observations with your teacher.

1.1.4 Symmetry

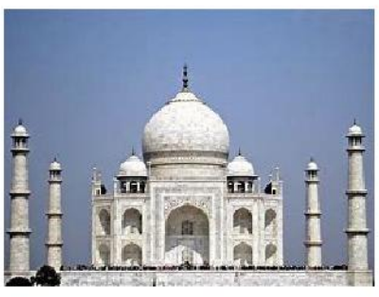
If we cut an apple into two equal halves, we observe that two parts are symmetrical.



Symmetry is an important geometrical concept commonly seen in nature and is used in every field of our life. Artists, manufacturers, 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.

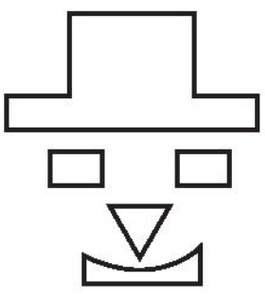
When we fold a picture in two halves and if both the halves match exactly equal then we say that the picture is symmetrical.







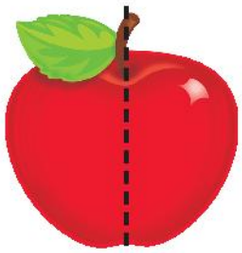


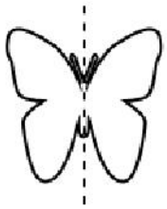


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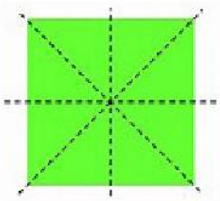
Line of symmetry:

When a line divides a given figure into two parts and both the parts match exactly then we say that the figure is symmetrical about the line. This line is called the line of symmetry or axis of symmetry.

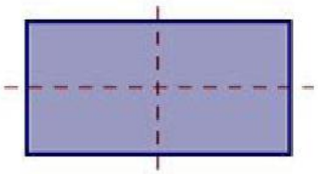




Example



4 lines of symmetry. We can divide a square in 4 ways symmetrically.

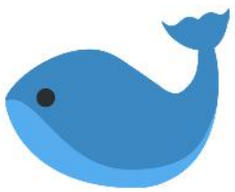


2 lines of symmetry. We can divide a rectangle in 2 ways symmetrically.

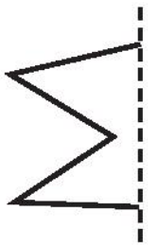
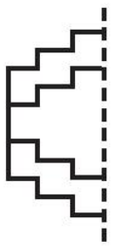
Activity

1. List out 2 symmetrical objects that you know.
2. Tick the picture which has symmetry



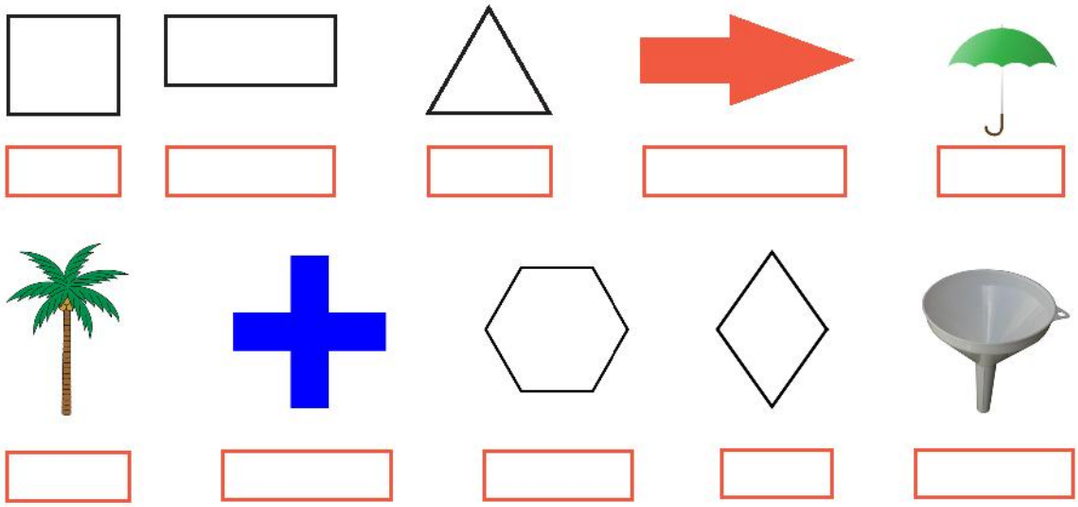



3. Complete the other half to make the given figure symmetric.

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4 Draw the lines of symmetry for the following figures and write the number of lines of symmetry.



Think

1. Can we divide an irregular solid shape symmetrically? Justify your answer.
2. Write the alphabets of English which are not symmetrical.
3. Write the alphabets of English which are symmetrical. Further find whether the symmetry is horizontal and vertical.
4. Circle has many lines of symmetry. Is it true? why?
5. Find the three numbers between 1 and 9 which are symmetrical
6. Find two numbers between 0 and 9 which has two lines of symmetry?

Do you know?

Tajmahal in Agra is a symmetrical monument.



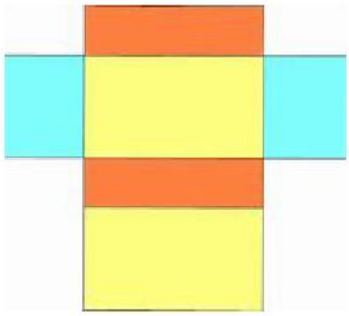
Project:

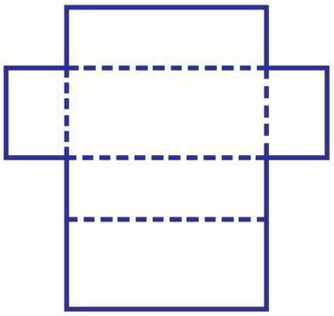
Write all the 26 letters of English in a chart. Draw the lines of symmetry for symmetrical alphabets. Circle the letters that are not symmetrical.

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1.1.5 Making 3D shapes using nets.

Nets of cuboid:





Open out a small box and layout on the white paper.

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

Student: There are 6 sides.

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

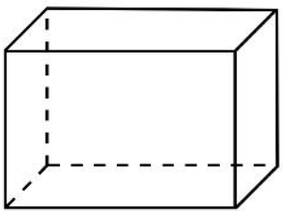
Student: Yes sir.

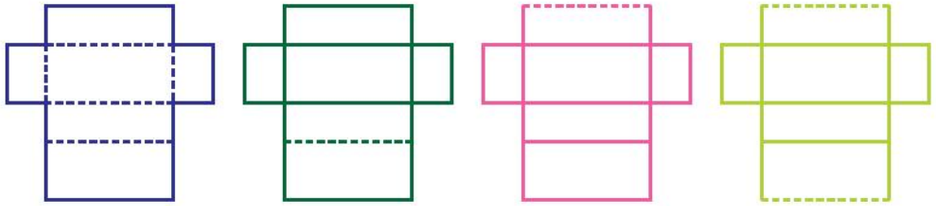
Teacher: Good.

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

Try this

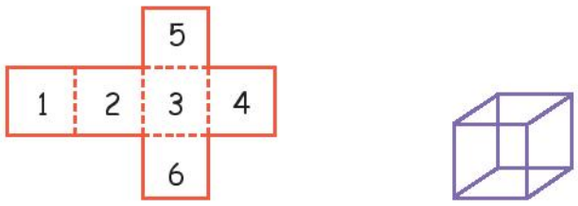
Find out which of these can be made into a box by folding along the dotted lines. Put a tick mark for the correct options.





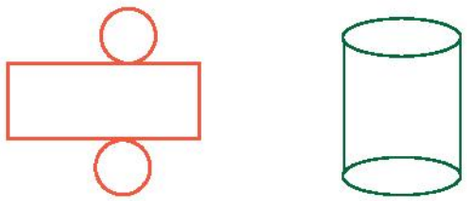
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Net of a cube:



Fold squares along the dotted lines to form a cube. Hence six equal squares form the net of a cube.

Net of a cylinder:

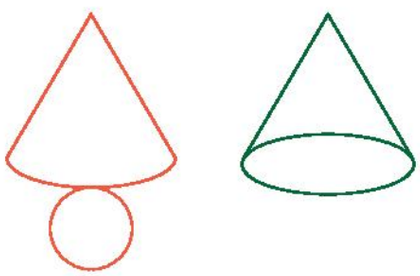


Consider a rectangle and two equal circles. This net forms a cylinder.

Join the two edges of a rectangle along the breadth in such a way that the length of the rectangle forms the boundary of one circle at the top and other circle at the bottom of this figure.

The length of the rectangle forms the boundary of the circle. Both are equal in length.

Net of a cone:



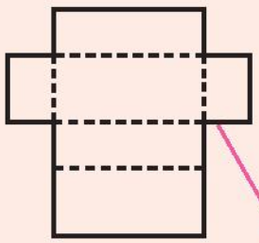
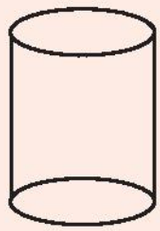
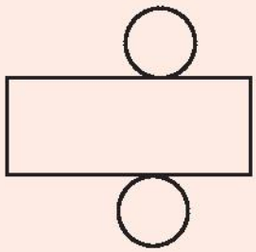
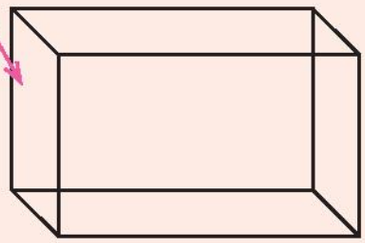
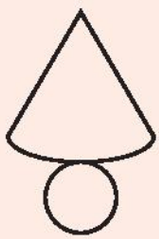
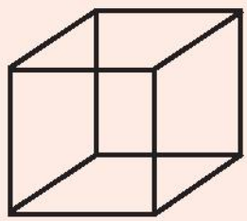
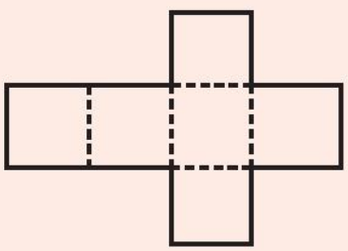
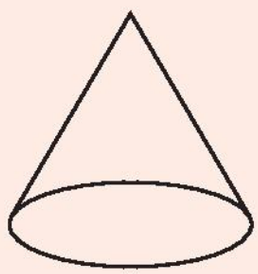
Look at the figure. Join both the sides of the portion of a circle in such way that the arc of the circle falls on the boundary of the circle attached at the bottom.

The length of the arc forms the boundary of the circle. Both are equal in length.

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Activity

Match the net with the 3D shape you will get by folding.

1		
2		
3		
4		

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1.2 Introduction of Angles

1.2.1 Angles in real life

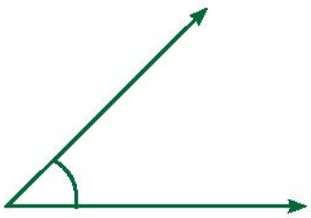
The angles are used in bridges, buildings, cell phone towers, wings of planes, bicycles, windows and doors.



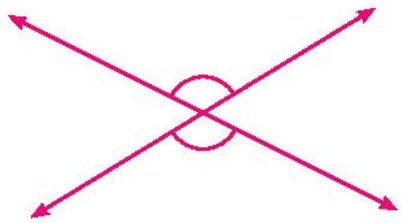



Angle:

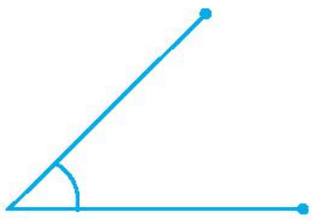
An angle is a shape formed by two line segments or rays starting from a common point (Vertex).



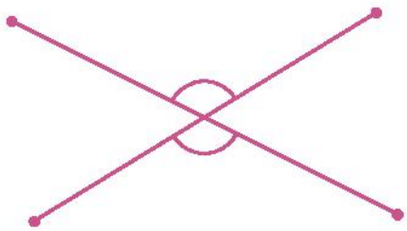
Angle formed by meeting of two rays.



Angle formed by intersection of two lines



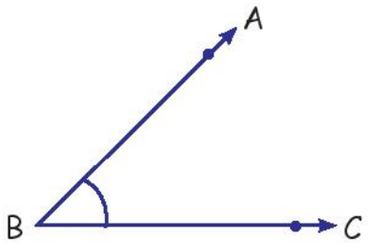
Angle formed by meeting of two line segments.



Angle formed by intersecting of two line segments.

Teacher : What does this picture convey?

Ramu : This picture shows an angle. Does angle have name sir?



Teacher : Yes. Angles have names. Can you see two line segments in this picture? Read the names of that.

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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 alphabets. The centre letter of the angle is called as vertex.

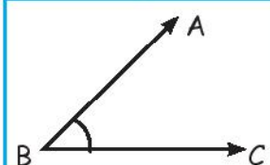
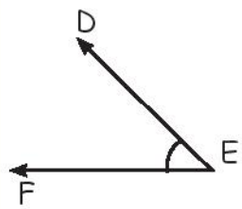
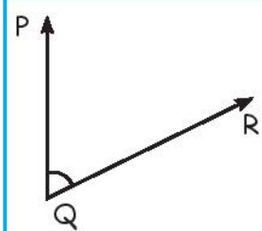
Ramu : Then, ABC is the name of the angle. Am I right sir?

Teacher : Yes, We should mention the angle as angle ABC.

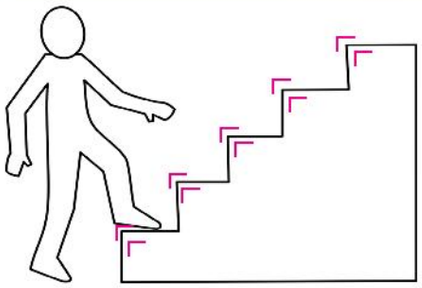
Ramu : Sir, can we write angle CBA instead of angle ABC.

Teacher : Sure. 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
	$\angle$ABC or $\angle$CBA	B	AB and BC
			
			

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Angle between ground and stair case



Angle between ladder and ground



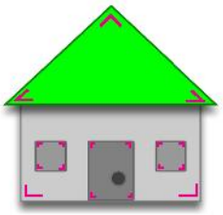
Angle between branches of a tree



Angle in an electric pole



Angle in a bicycle



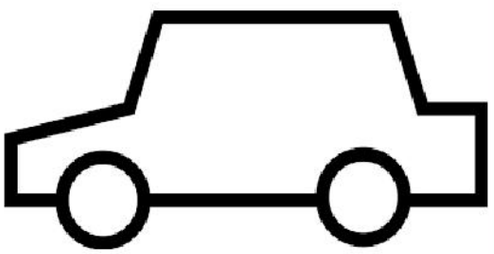
Angle in a house



Angle in a clock

Find:

Mark the angles formed inside and outside using colour pencils in the given picture.



Activity

Look at the angles formed by your elbow. Draw them as stick picture. Discuss with your teacher and friends.

Project:

Collect some pictures with angles and paste the same in a chart. Draw and mark the angles using pencil.

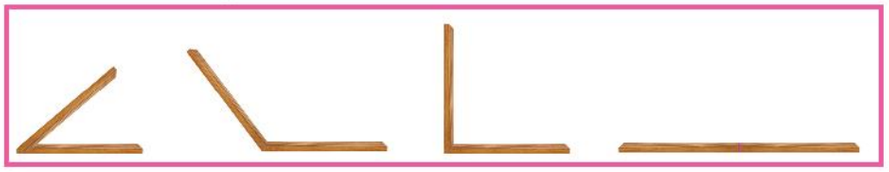
Do you know?

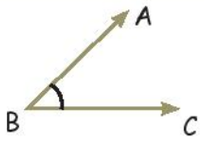
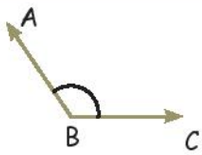
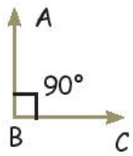
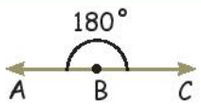
The word angle originated from the Greek word "Angilos". It means curved and not straight. Ankle is the place where knee and leg foot is joined.

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1.2.2 Types of angles:

We shall classify the angles into various types based on its measurements. Observe the various angles formed in the wooden frame.



Sl. No.	Picture	Type of angles	Measure of the Angle
1		Acute angle	Greater than 0° Less than 90° E.g. 5°, 80°, 2°, 50°
2		Obtuse angle	Greater than 90° Less than 180° E.g. 93°, 170°, 100°, 132°
3		Right angle	Exactly 90°
4		Straight angle	Exactly 180° Combination of two consecutive right angles.

Name the types of angles formed in the following items.



_____



_____



_____

Try this









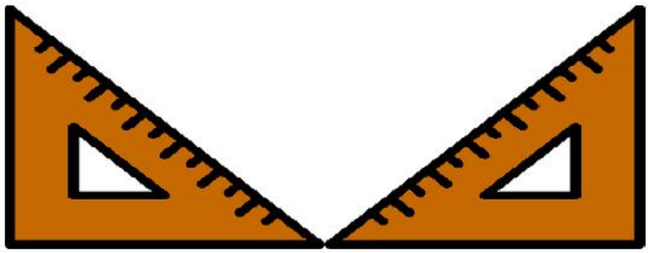
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1.2.3 Identify right angles in the environment:

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.



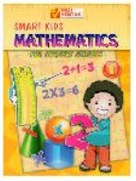


Examples:











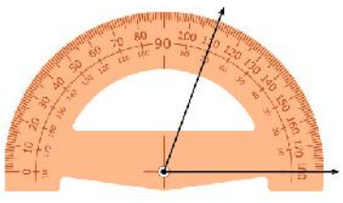


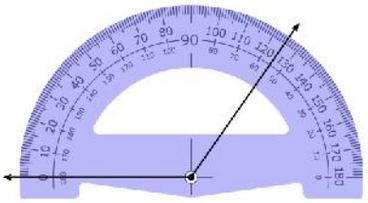
Try this

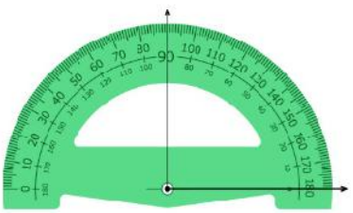
Draw 5 objects with right angle:

Activity

1. Classify and write the angles as acute, obtuse and right angle.





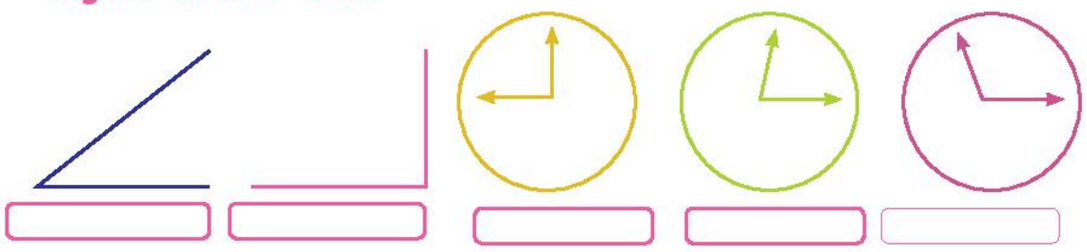


2. Classify the following angles (acute angle, obtuse angle and right angle)

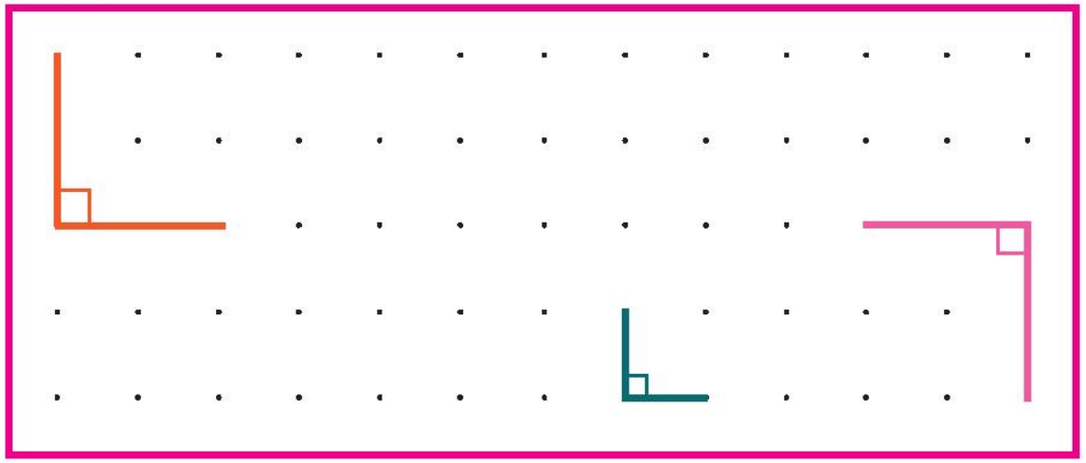
   30°, 45°, 60°, 90°, 120°, 130°, 170°, 75°

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3. Observe the following pictures and write the name of the angles in their box.



4. Join the dots and draw right angle, acute angle and obtuse angle.



Project (Art and Craft)

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

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



GIRAFFE



PEACOCK



SUNFLOWER

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Exercise 1.3

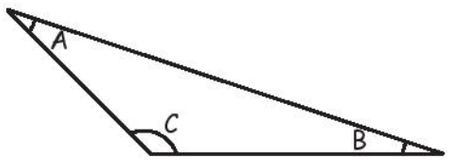
ARGI8

1. The angles below 90° and above 0° are called as _____.

2. The angles below 180° and above 90° are called as _____.

3. _____ angle is formed by combining two consecutive right angles.

4. Which of the following is obtuse angle in $\triangle ABC$?.



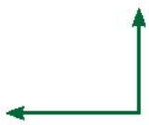
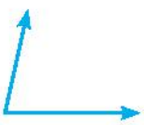
a. $\angle A$ b. $\angle B$ c. $\angle C$ d. None of these

5. Hands of a clock at 2 hours shows _____ angle.

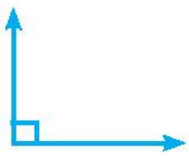
6. Which of the following alphabets has a right angle in it?

a. L b. K c. Z d. N

7. Circle the right angle.

a.  b.  c.  d. 

8. The angle shown in this picture is.



a. more than 120° b. Less than 45°

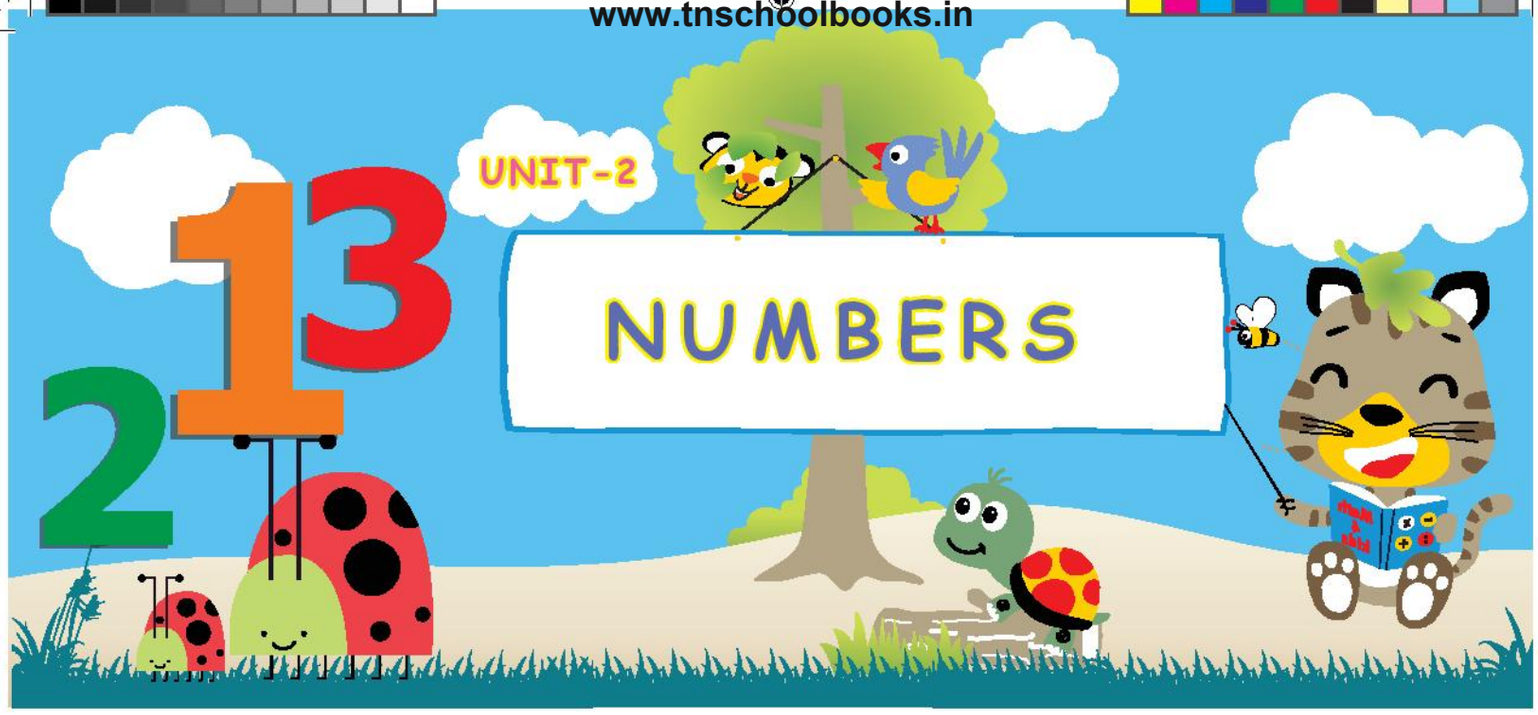
c. more than 180° d. 90°

9. The angle formed by the nail cutter is _____.

10. Name the angles formed when the vessels are lifted by tongs in kitchen is _____.

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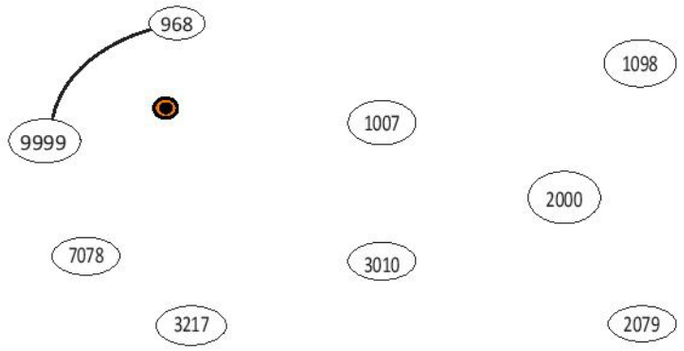


2.1 Numbers beyond 10000

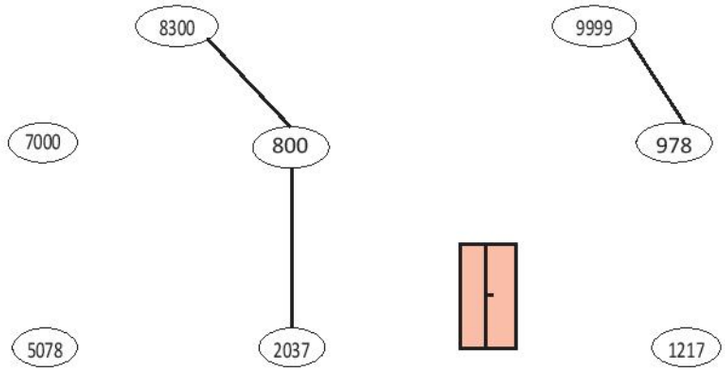
B45GK

Recall:

1. Join the numbers in descending order to complete the picture.



2. Join the numbers in ascending order to complete the picture.



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2.1.1 The uses of numbers beyond 10000 in real life situation.

Introduction

The price of a television is ₹ 18500, the price of a mobile phone is ₹ 15250, the price of LPG cylinder is ₹ 975, the price of a wooden cot is ₹ 30000, the price of a car is ₹ 450000 the price of a bicycle is ₹ 5250 and the price of a pencil is ₹ 115.

Price of various items is given in the above data. Classify the data as price more than ₹ 10000 and the price less than rupees ₹ 10000.

More than ₹ 10000	Less than ₹ 10000

We have learnt about numbers upto 10000 in fourth standard. Now let us know about numbers more than 10000.

Fill in the table from 10001 to 10100

10001	10002	10003	10004	10005	10006	10007	10008	10009	10010
10011							10018		
10021									
10031				10035					
10041						10047			
10051									
10061					10066				
10071									
10081		10083							
10091									10100

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Activity 1

Skip count in tens and complete the table.

10010	10020	10030	10040	10050	10060	10070	10080	10090	10100
10110									
10210								10290	
10310									
10410									
10510									
10610		10630							
10710						10770			
10810									
10910									

Exercise 2.1

1 **Fill in the blanks.**

a) 10101, 10102, 10103, _____, _____, _____, _____

b) 10220, 10230, _____, _____, _____, 10270

c) 10920, _____, _____, _____, 10960, _____

d) 11101, 11102, 11103, _____, _____, _____, _____

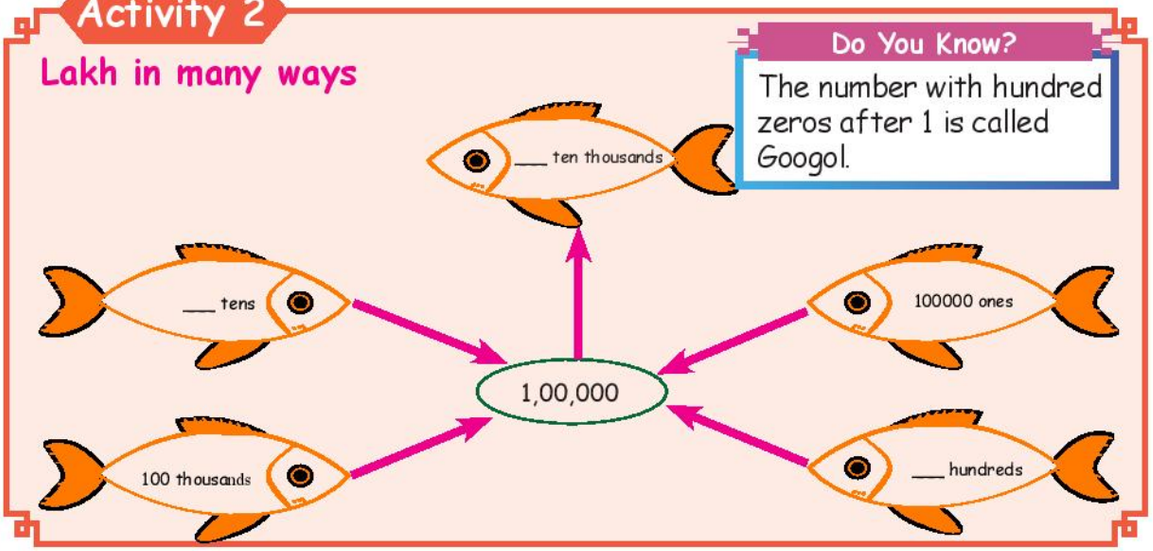
Let us Know

9999	9999+1	10000	Ten thousand
99999	99999+1	100000	Lakh
999999	999999+1	1000000	Ten lakhs
9999999	9999999+1	10000000	Crore

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Activity 2

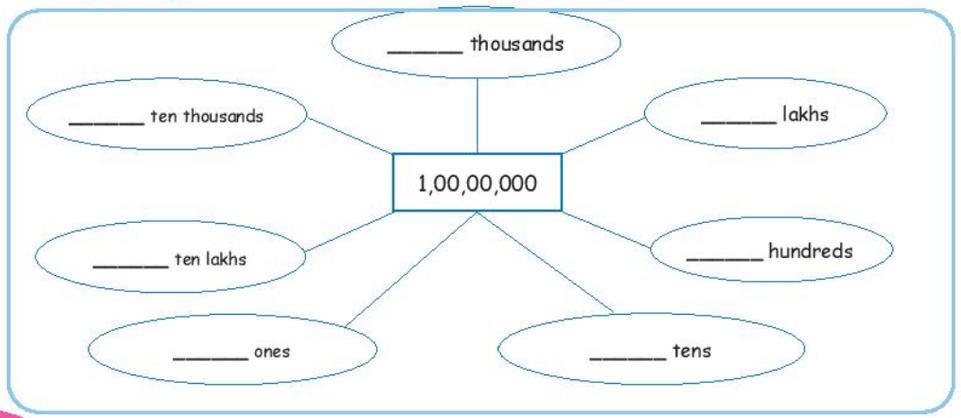
Lakh in many ways



Do You Know?

The number with hundred zeros after 1 is called Googol.

Crore in many ways



2.2 Place Value of Numbers

2.2.1 Importance of commas or periods.

Numbers having 4 or more digits can be read quickly and easily by putting them into groups using commas.

Crores		Lakhs		Thousands		Ones		
T C	C	T L	L	T.Th	Th	H	T	O

In the Indian place value system, ones, tens and hundreds form the first group under "ones" period. Thousands and ten thousands form second group under "thousands" period, lakhs and ten lakhs form the third group under "lakhs" period and crores and ten crores form the fourth group under "crores" period. Each group is seperated by a comma.

1. 99,15,797 2. 2,30,145 3. 1,34,19,922

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Exercise 2.2

1. Read the following numbers by placing the commas at appropriate periods and write their number names.

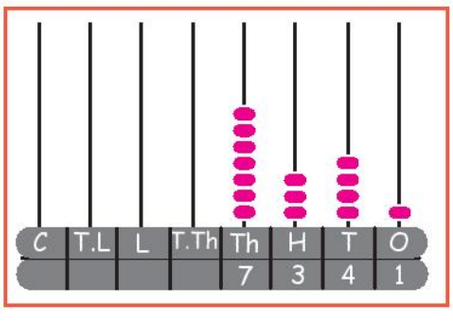
   a. 15731997 **b.** 341964 **c.** 29121972 **d.** 347810

2.2.2 Place value chart

Fill in the boxes in the following table.

	Crore	Ten Lakhs	Lakhs	Ten Thousands	Thousands	Hundreds	Tens	Ones
In one crore	1	10	100	1,000	10,000	1,00,000	10,00,000	1,00,00,000
In ten lakhs		1						
In a lakh			1					
In ten thousand				1				
In thousand					1			

Example 1



Try this

Add 4 tens 2 thousands to this number 345678.

The abacus shows the number: 7,341.

Number name: Seven thousand three hundred and forty one.

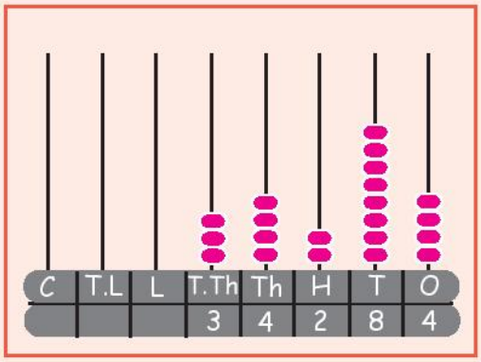
Expanded form: 7 thousands + 3 hundreds + 4 tens + 1 one

= 7000+300 +40 + 1

= 7 x 1000 + 3 x 100 + 4 x 10 + 1

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Activity 1



Try this

How many thousands are there in 34,284?

The Abacus shows the number 34,284

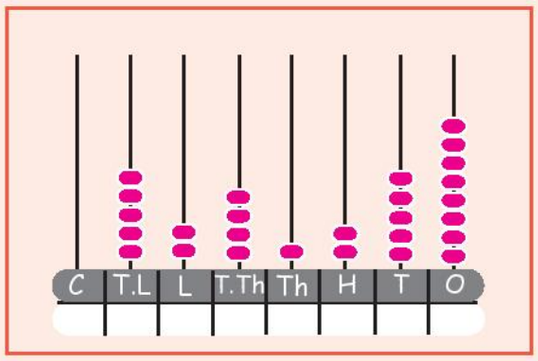
Number name: Thirty four thousand two hundred and eighty four.

Expanded form: 3 Ten thousands + 4 thousands +2 hundreds + 8 tens + 4 ones.

= 30,000 + _____ + 200 + _____ + _____

= 3 x 10000 + 4 x _____ + 2 x 100 + 8 x _____ + _____ x 1

Activity 2



Try this

How many thousands are there in 3,45,789?

Look at the Abacus and fill in the blanks.

Number:_____

Number name: _____

_____

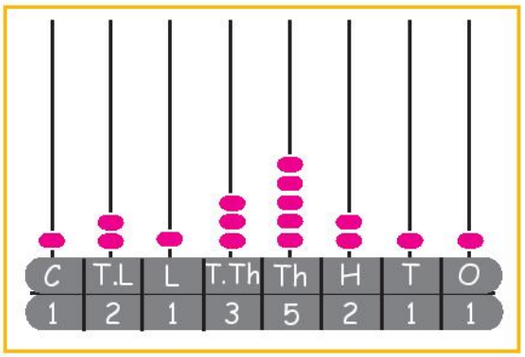
Expanded form: 5 ten lakhs + _____ lakhs + _____

ten thousands +1 _____ + 2 _____ + 5 tens + _____ ones

= 5000000 + _____ + 40000 + _____ + 200 + 50 + 8.

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Example 2



Try this

Find the sum of the place values of 2 7226382.

The Abacus shows the number 1, 21, 35, 211

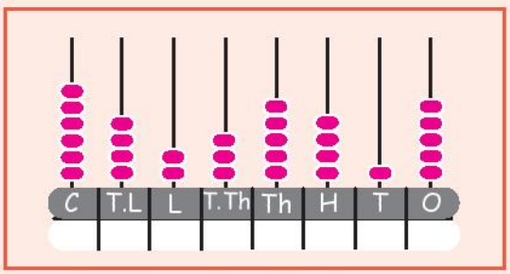
Number name One crore twenty one lakhs thirty five thousand two hundred and eleven.

Expanded form: 1 crore + 2 ten lakhs + 1 lakh + 3 ten thousands + 5 thousands + 2 hundreds +1 ten + 1 one.

= 1,00,00,000 + 20,00,000 + 1,00,000 + 30,000 +5000 +200+ 10 +1

= 1x1,00,00,000 + 2x10,00,000 + 1x100,000 +3x 10000 +5x 1000+ 2x 100+ 1x10+1

Activity 3



Look at the Abacus and fill in the blanks.

Given number: _____

Number name: _____

_____

Expanded form:

6 crores + ____Ten lakhs + ____ Lakhs +

_____Ten thousands + 5 Thousands + _____Hundreds + 1 Ten + 5 ones.

= 6,00,00,000 + 40,00,000 + _____ + _____ + 5000 + 400 + _____ + 5

= 6 x _____ + 4 x _____ + 2 x 100,000 + 3 x 10000 + 5 x _____ + _____ x 100 + 1 x 10 + _____ x 1

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Example 3

Write the place value of each digit for the given numbers.

4 34, 56 ,789

C	TL	L	TTh	Th	H	T	O
4	3	4	5	6	7	8	9

The place value of 9 is 9 x 1 = 9
The place value of 8 is 8 x 10 = 80
The place value of 7 is 7 x 100 = 700
The place value of 6 is 6 x 1000 = 6000
The place value of 5 is 5 x 10000 = 50000
The place value of 4 is 4 x 100000 = 400000
The place value of 3 is 3 x 1000000 = 3000000
The place value of 4 is 4 x 10000000 = 40000000

Do you Know?

100 lakhs make 1 crore

Activity 4

Write the place value of 7 and 1 for the given numbers.

a. 81,70,453 **b.** 3,46,710 **c.** 5,87,13,946

Exercise 2.3

1. Consider the number 15,478

   a. The place value of 7 is _____.

   b. The place value of 4 is _____.

   c. The place value of 1 is _____.

2. Fill the table with the place value for the following numbers.

Place value	crore	lakhs		thousands		ones		
Numbers	1,00,00,000	10,00,000	1,00,000	10000	1000	100	10	1
23,45,172		2	3	4	5	1	7	2
84,701								
2,01,784								
9,04,704			9	0	4	7	0	4
2,07,91,132								
10,07,000								

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3 Write the place value of 5 in the following numbers.

a. 287500 **b.** 586012 **c.** 5869732 **d.** 5467859

4 Write the following numbers in standard notation.

a. 30000 + 3000 + 300 + 30 +3

b. 200000 + 7000 +7

c. 8000000 + 70000 + 3000 +30 +5

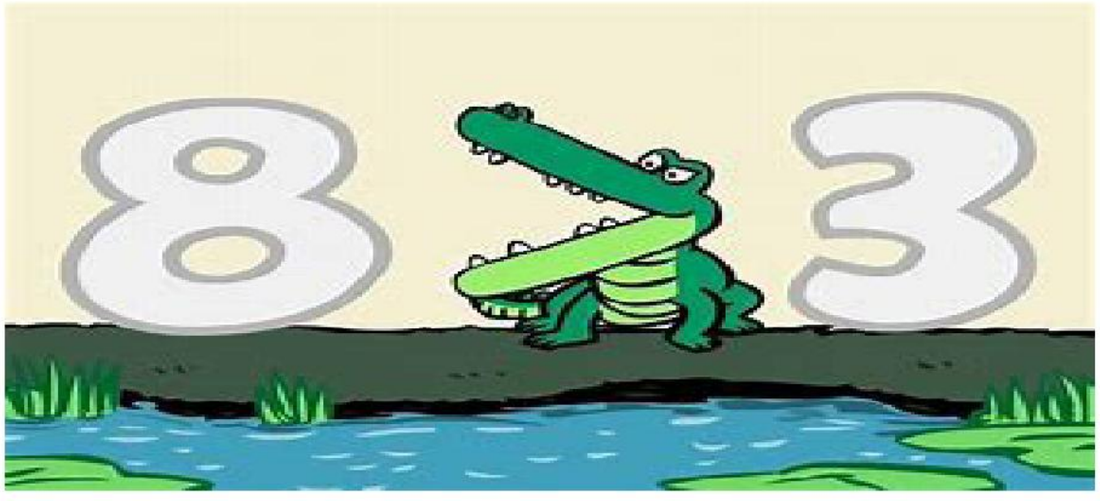
d. 4000000 + 400 + 4.

5 Write the following numbers in expanded from.

a. 63,570 **b.** 36,01,478 **c.** 1,45,70,004 **d.** 28,48,387

6 Find the difference between greatest 7 – digit number and smallest 6-digit number.

2.3 Comparison of Numbers.



We use symbols >, < and = to compare any two numbers

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Which is **smaller? 20344** or **3241**

Number with more number of digits is a **larger number.**

Number with less number of digits is a **smaller number**.

3241	**<**	**20344**
4 digits		5 digits

Which is **greater? 73652** or **56372**

Here, Both numbers have 5- digits. So the highest digit is to be compared to find the greater number.

T.Th	Th	H	T	O
7	3	6	5	2

T.Th	Th	H	T	O
5	6	3	7	2

Here 7 ten thousands is **greater** than 5 ten thousands.

Hence,

73652 > 56372

We read it as, seventy three thousand six hundred and fifty two is **Greater than** fifty six thousand three hundred and seventy two.

Which is **smaller? 54349** or **53449**

Since both are five digit numbers and the digits in the ten thousands place are equal, the numbers in the thousands place are to be compared.

T.Th	Th	H	T	O
5	4	3	4	9

T.Th	Th	H	T	O
5	3	4	4	9

When we compare the thousands place, the first number has **4** Thousands and the second number has **3** Thousands so the second number is the **smaller** number.

Hence,

53449 < 54349

We read it as fifty three thousand four hundred and forty nine is **less than** fifty four thousand three hundred and forty nine.

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For example:

a) 54,689 < 54,869

b) 75,432 > 75,412

c) 45,327 > 45,321

Activity

Compare the pairs of numbers given below using < , > and = signs.

1. 3,002 ☐ 8,002

2. 43,731 ☐ 44,371

3. 43,115 ☐ 43511

4. 13,435 ☐ 13,4753

Write the smallest and greatest five digit numbers using the given digits only once.

Example

A) 1,2,3,4,5

Smallest number : 12,345

Greatest number : 54,321

B) 7,6,9,4,8

Smallest number : 46,789

Greatest number : 98,764

Activity

1. **Write the smallest and greatest five digit numbers using the given digits only once.**

   a) 7, 1, 0, 5, 4

   b) 3, 4, 7, 0, 9

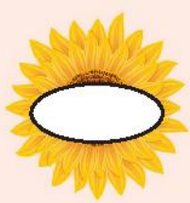
   c) 9, 7, 1, 6, 4

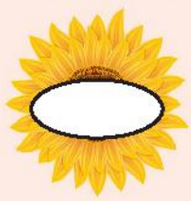
   d) 4, 5, 9, 6, 7

2. **Write the smallest number in the fruit and the greatest number in the flower.**

   a) 45678, 145, 7829

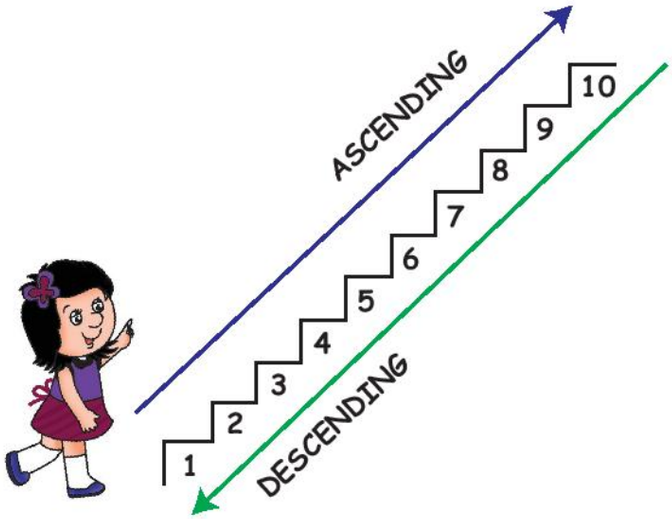
   b) 23, 8873, 88738, 883






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2.4 Ascending and Descending Order of Numbers



Ascending order of numbers is arranging the numbers from the smallest to the greatest.

Example 1

Arrange the given numbers in ascending number

413, 43, 986, 38490, 8490

Answer: Ascending order:

43, 413, 986, 8490, 38490

Descending order of numbers is arranging the numbers from the greatest to the smallest.

Example 2

Arrange the given numbers in descending order

195, 4090, 81343, 95, 9040

Answer: Descending order:

81343, 9040, 4090, 195, 95

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Activity

Arrange the following numbers in the ascending order and descending order.

i) 33,270, 1,078, 137, 27,935

ii) 44,918, 32,113, 23,112, 42,231

iii) 75,343, 30,475, 43,452, 13,055

iv) 733, 34,946, 35,945, 23,745

Exercise 2.4

1 Write the number name

a. 11000 — Eleven thousand.

b. 34000 — _____

c. 100000 — _____

d. 98,364 — Ninety eight thousand three hundred and sixty four.

e. 37,689 — _____

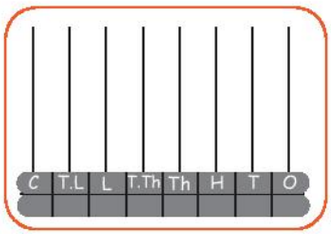
f. 46,763 — Forty six thousand seven hundred and sixty three.

g. 4,00,000 — _____

h. 12,00,000 — _____

2 Answer the following

a. Represent given values in Abacus.
3 Ten crores, 7 crores, 6 ten lakhs, 7 lakhs, 4 tens and 7 ones.



b. Find the place value of 7 and 4 of this numbers 34578910

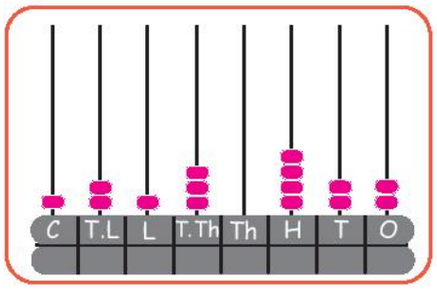
c. Write in numeral

a. One crore forty thousand and four.

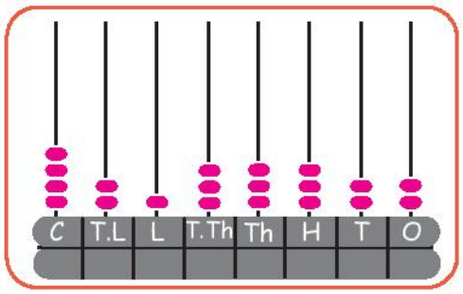
b. Sixty four lakhs and three.

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d. (i)



(ii)



(i) Write the number names of the numbers represented in the Abacus.

(ii) How many lakhs and hundreds are there in the numbers represented by the Abacus given above

e. Find the sum of greatest 4-digit number and smallest 5-digit numbers.

f. Write in ascending order and descending order.

i. 33,058, 40,978, 97,879, 81,421, 90,470, 47,224

ii. 99,999, 11,111, 22,222, 33,333, 44,444, 66,666

g. Write in standard form: 7 lakhs+ 5 thousands + 4tens +3ones

h. Add 5 thousands and 3 hundreds to this number 1, 34,510

i. Subtract smallest 6-digit numbers from greatest 7- digit numbers.

2.5 Numbers and its Operations

2.5.1 Addition

Introduction

"Ananthan come fast". Ananthan's mother called."Bus would come earlier".

Ananthan ran fast happily, "I am here mummy, I am ready" he said. The whole family was very busy because next week they have ananthan's sister marriage. They have to buy new clothes for their relations and family members.



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They finished their purchase and returned back home.

Ananthan asked his father 'how much did you spend for our dresses?

His father said, "Cost of dresses for gents is ₹ 25050, and for ladies is ₹ 47025 and for kids ₹ 7125, and also cost of bride and groom dresses are 17500, now can you tell the total amount.

Ananthan took a paper and pen, he wrote all the amounts one by one according to their place values.

For gents	-	₹ 25050
For ladies	-	₹ 47025
Kids	-	₹ 7125
Groom and bride	+ -	₹ 17500
		₹ 96700

Check whether, the above total amount is correct or not.

Yes, ananthan did correct, see the cost of kids, `7125, There is a vacant place in ten thousand's place. So Anandi wrote down the numbers one by one according to the place value. We learnt about place values of the numbers, Now we are going to add numbers. Write them one by one as shown below.

137462 + 4005 + 38 + 56734.

L	T.Th	Th	H	T	O
1	3	7	4	6	2
		4	0	0	5
				3	8
	5	6	7	3	4
1	9	8	2	3	9

Step 1: Start by adding the ones. We have 19 ones in ones place.

Step 2: We must regrouping 19 ones to 1 ten and 9 ones.

Step 3: Now we can put 1 ten with ten and write 9 in the ones place.

similarly we shall add the digits in other places

Arrange all the given numbers according to their place value.

We can do all the addition problems in this manner.

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Note:
When we write the numbers, we can avoid mistakes, by starting from right side, that is from the units place.

Exercise 2.5

1. Find the sum.

	6	8	7	5
		6	3	7
+	5	4	3	0	0
				5	4

	3	2	5	6	7
				7	8
+		4	3	2	4
			5	0	0	0

2. Add the following numbers
   a. 19732 + 24105 + 525 + 48
   b. 241605 + 34788 + 5003 + 2052
   c. 1000 + 250787 + 3574 + 43
   d. 7 + 65 + 324 + 52342.

3. Population of five villages in a town panchayat are 980; 3254; 4125;687;6786 . What is the total population.

4. Ramu bought some household things. The price list is given below. Find the total cost ?

Fan	= ₹ 3,250
Fridge	= ₹ 26,437
Television	= ₹ 18,520
Iron box	= ₹ 940
Cot	= ₹ 15,520

5. A day's sales of different vegetables in a vegetable shop is as follows: Brinjal ₹ 4500 Tomato ₹ 7800 Onion ₹ 26500 Potato ₹ 7825 and Beetroot ₹ 825. Find the total amount of sales.

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2.5.2 Subtraction

We have already learnt how to write the number numbers in their corresponding place values and add them. Now we are going to do the subtraction The process of finding the difference between two numbers or quantities is denoted by a minus sign Example

The result of subtracting one number from another number is called the **Difference**



Answer

L	TTH	TH	H	T	O
6	7	5	4	3	2
	3	2	4	5	6
6	4	2	9	7	6

Example

Mathan is working in construction company. His salary is ₹ 57385 per month. He spent ₹ 48500 for his family every month. How much does he save per month?

Answer:

			₹
Mathan's Salary	=		57,385
His expenditure	=	-	48,500
His savings			**8,885**

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Exercise 2.6

1. Subtract

a. 78,347 (-) 59,475

b. 67,056 (-) 3,748

c. 1,58,376 (-) 47,978

d. 89,700 (-) 4,538

2. Rahul has 3289 stamps. Ravi has 4021 stamps. How many more stamps does Ravi have than Rahul?

3. Create the story problem by using the pictures given below:





2.5.3 Multiplication

We have learnt about lattice multiplication in Class IV.
We shall now learn to multiply numbers with place value.



35 students are studying in class 5. The cost of uniform for one student is ₹ 350, How much is the total cost for 35 students?

Here, the number which is multiplied is called multiplicant. The number which multiplies is called multiplier. And answer of the multiplication is called product.

Step1: Multiply by the multiplicant by the digit in ones place of the multiplier.

Step2: Put a star below the one place to hold its place.

Step3: Multiply by the multiplicant by the digit in tens place of the multiplier.

Step4: Add them up

multiplicant multiplier

350 × 35

1750

1050*

12250

product

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See the following steps:

O-Ones T-Tens H-Hundreds

Step: 1

```
  O  O
350 x 35
-------
   0
```

Multiply the digits in ones place
5 x 0 =0

Step: 2

```
   2
  HT   O
350 x 35
-------
  50
```

Multiply the digits in tens place
5 x 5 = 25
carry over 2 to hundreds place.

Step: 3

```
   2
   H   O
350 x 35
--------
1750
```

Now multiply hundred place by digit in ones place.
5 x 3 = 15
15 + 2 = 17

Step: 4

```
350 x 35
--------
1750
  *
```

Put * in ones place. Then multiply the number by digit in ten place as earlier.

Step: 5

```
  O  T
350 x 35
--------
1750
 0*
```

3 x 0 = 0

Step: 6

```
   1
  HT  T
350 x 35
--------
1750
 50*
```

3 x 5 =15
carry over 1 over to the hundreds place.

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Step: 7

$$\begin{array}{r} {\scriptstyle 1} \\ \text{H}\quad\text{T} \\ 350 \times 35 \\ \hline 1750 \\ +\ 1050* \\ \hline 12250 \end{array}$$

$3 \times 3 = 9$
$9 + 1 = 0$

Add the numbers to get the product.

2.5.4 Multiply the three digit numbers by two digit numbers

Example 1

Raveena has planted 15 rows of coconut trees in her garden Each row has 112 trees. How many coconut trees were planted in total

Number of rows of coconut trees Raveena planted = 15

Number of trees in one row = 112

Total number of coconut trees planted in 15 rows = 112 x 15

= 1680

$$\begin{array}{r} 112 \times 15 \\ \hline 560 \\ +\ 112* \\ \hline \mathbf{1680} \end{array}$$

∴Total number of coconut trees in her garden is 1680.

Example 2

Badri sold 1kg of Apple for ₹165. Find the total amount of 12 Kgs of Apple?

Cost of 1Kg of Apple = ₹165.

Quantity of apple bought = 12 kgs.

Total cost of 12 Kgs of Apple = 165 x 12

= ₹1980

$$\begin{array}{r} 165 \times 12 \\ \hline 330 \\ +\ 165* \\ \hline \mathbf{1980} \end{array}$$

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Exercise 2.7

1 **Multiply:**

a. 473 x 48 **b.** 4052 x 19 **c.** 876 x 25 **d.** 854 x 21

e. 417 x 39 **f.** 870 x 28

2 **Answer the following :**

a. There are 55 mangoes in a basket. Cost of one mango is ₹ 15. What is the total cost of 55 mangoes?

b. There are 55 passengers in a bus. Each of them get tickets of ₹ 25. what is the amount collected by the conductor?

c. A classroom has 23 benches, cost of one bench is ₹ 725. What is the total cost of all the 23 benches?

d. There are 675 people living in a village. One person uses 25 L of water daily. How much of water is needed for the village for one day?

e. In a building, there are 26 rooms, cost of painting for one room is ₹ 950 What is the total cost of painting the building?

2.5.5 Division



Sabari is living in Kovalur village, he is a farmer, he has a cow, he gets the milk from it and sell the milk to 8 houses daily. His cow gives 8 litre of milk daily. So it gives 240 litres of milk for 30 days.

If so, how much of milk is bought by each house. In a month Sabari shares 240 L of milk to each 8 houses

So we have to split 240 in 8 parts.

$\frac{240}{8}$ - **Numerator** / **Denominator**

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We can find this using long division (or) standard division algorithm.

Step: 1

$$\overline{)\,2\ 4\ 0}$$

We are going to divide 240, so 240 is called as the **dividend**

Step: 2

$$8\overline{)\,2\ 4\ 0}$$

We have to split 240 into 8 equal parts, so 8 is the **divisor**

Step: 3

$$\begin{array}{r} 3 \\ 8\overline{)\,2\ 4\ 0} \\ 2\ 4 \\ \hline \end{array}$$

There are three 8's in 24.

(8 + 8 + 8 = 24)

Write 3 on the top of the line.

3 x 8 = 24

Write the number 24 below 240 as shown.

Step: 4

$$\begin{array}{r} 3\ 0 \\ 8\overline{)\,2\ 4\ 0} \\ -2\ 4\ \downarrow \\ \hline 0 \end{array}$$

Next bring down the '0' . We can't divide 0 by 8

So, write '0' on the top nearby 3.

So 30 is quotient

It means people in each house has bought 30 litres of milk per month.

Note:

Generally, when we do addition subtraction and multiplication , we start from the unit's place. But when we do division, we have to do in opposite manner. First, we choose the number in digits of highest place value. Here it is the digit in hundred place. Here 2 is smaller than 8 so take the next digit also i.e. 4 in the Ten's place. Now we shall divide 24 by 8.

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Example 1

Find Quotient and Remainder 53675 ÷ 8

```
      6 7 0 9
   ┌──────────
 8 │ 5 3 6 7 5
   - 4 8
   ─────
     5 6
   - 5 6
   ─────
       0 7 5
     - 7 2
     ─────
         3
```

Note:

Dividend = Divisor x quotient + reminder

Dividend	=	53675
Divisor	=	8
Quotient	=	6709
Remainder	=	3

Exercise 2.8

1 Find quotient and remainder:

a. 5732 ÷ 9

b. 47345 ÷ 5

c. 3032 ÷ 7

d. 43251 ÷ 10

e. 2532 ÷ 4

2 Answer the following:

a. 3057 families are living in a town. The town panchayat decided to split the town into 3 wards. How many families will be there in each panchayat?

b. A water board distributes 28,049 litres daily to a town in 7 lorries. How much of water will each lorry carry?

c. A company gives ₹ 93,300 as salary for 6 workers equally. How much salary will each worker get?

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2.5.6 Division of 4 digit numbers by 2 digit numbers

We learnt how to divide by a single digit number. Now we are going to learn to divide 4 digit number by 2 digit number.



Children of class 5 were excited on seeing their bus for their picnic. When the teacher asked them to get into the bus, all of them entered the bus with loud cheer. The bus reached Arignar Anna Botanical garden. The class teacher paid ₹ 1530 as entrance fee for all of the students. If there are 34 students, then what is the entrance fee for one student?

To find the answer, we have to divide the total amount ₹ 1530 by 34.

1530 ÷ 34

Step: 1

	Th	H	T	U
34)	1	5	3	0

When divide by 2 digit number, we have to choose first two digit from the dividend.

34) 15

Here 15 is smaller than 34,

So we choose 3 from tens place with 15

34) 153

Step: 2

				4
34)	1	5	3	0
	-1	3	6	
		1	7	

Now try to divide 153 by 34. Calculate how many 34's in 153.

4 X 34 = 136.

Step: 3

			4	5
34)	1	5	3	0
	-1	3	6 ↓	
		1	7	0
	-1	7	0	
			0	

On subtracting 136 from 153, we get 17. Now bring down the '0' in the unit place, we have 170.

Calculate how many 34's in 170

5 X 34 = 170

Quotient = 45, Remainder = 0

Therefore the entrance fee for one student is ₹ 45

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Divide and find the quotient and Remainder.

Example 1

4 9 2 5 ÷ 25

Step: 1

```
      1
25 | 4 9 2 5
   -2 5
   ------
     2 4
```

We know that when divide by 2 digit number have to choose first 2 digit from the dividend

Here divide 49 by 25

```
25 | 49
```

25 occurs one time in 49

1 x25 = 25

Step: 2

```
      1
25 | 4 9 2 5
   -2 5↓
   ------
     2 4 2
```

Subtract 25 from 49 we get 24,
Next write down 2 from the ten's place

Step: 3

```
      1 9
25 | 4 9 2 5
   -2 5↓   |
   ------  |
     2 4 2 |
   -2 2 5↓ |
   ------  |
       1 7 5
```

Divide 242 by 25
Calculate the number of 25's in 242
9 X 25 = 225
Subtract 225 from 242 we get 17.
Next bring down 5 from unit place.

Step: 4

```
      1 9 7
25 | 4 9 2 5
   -2 5↓   |
   ------  |
     2 4 2 |
   -2 2 5↓ |
   ------  |
       1 7 5
     - 1 7 5
     -------
           0
```

Now we have 175
Calculate the number of 25's in 175
7 X 25 = 175

Quotient = 197,
Remainder = 0

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Example 2

A car factory produce 3750 cars per month (30 days).
Find how many cars were produced per day.

Divide 3750 by 30 days.

3750 ÷ 30

Step: 1

```
      1
30 | 3 7 5 0
    -3 0
    -----
       7
```

Choose first 2 digit 37 from the dividend
Divide 37 by 30
Calculate the number of 30's in 37
1 X 30 = 30

Step: 2

```
      1
30 | 3 7 5 0
    -3 0 ↓
    -------
       7 5
```

Subtract 30 from 37, we get 7
Next bring down the 5 in ten's place

Step: 3

```
      1 2
30 | 3 7 5 0
    -3 0 ↓
    -------
       7 5
     - 6 0
     -----
       1 5
```

Divide 75 by 30.
Calculate the number of 30's in 75
2 X 30 = 60
Subtract 60 from 75 we get 15

Step: 4

```
      1 2 5
25 | 3 7 5 0
    -3 0 ↓ |
    -------
       7 5 |
     - 6 0 ↓
     -------
       1 5 0
     - 1 5 0
     -------
           0
```

Next bring down the '0' from unit place.
In 150, calculate how many 30's
5 X 30 = 150

Quotient = 125,
Remainder = 0

The remainder is zero in the above example. The remainder can be a non-zero number also.

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Example 3

Divide 4327 by 18 and Write quotient and remainder

Solution :

$$
\begin{array}{r|l}
 & 2\ 4\ 0 \\
\hline
18 & 4\ 3\ 2\ 7 \\
 & -3\ 6\downarrow\ \ \ \\
\hline
 & \ \ 7\ 2\ \ \ \\
 & -\ 7\ 2\downarrow \\
\hline
 & \ \ \ \ \ \ 7
\end{array}
$$

Dividend	=	4327
Divisor	=	18
Quotient	=	240
Remainder	=	7

Exercise 2.9

5PQDT

1 Answer the following questions:

a. A cement factory produces 37500 bags of cements in a month (30 days). How many cement bags were produced in one day?

b. 8075 mangoes were harvested from a mango garden. 95 mangoes are packed in each package. How many packages will be there?

c. 25 families living in a street needed 1625 liters of water per day. How much of water is needed by one family?

d. 6750 bananas have to be loaded in a tempo van. If 15 bananas are arranged in one basket, then how many baskets will be needed to arrange all the bananas?

2 Divide the following and find the quotient and remainder.

a. 4525 ÷ 15 b. 3448 ÷ 24 c. 7342 ÷ 18

d. 3626 ÷ 37 e.4872 ÷ 56

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3.1 Patterns in Shapes

PMJC7

Look at the image given below. Observe the design



Patterns are present everywhere around us.Patterns are regular and repeated arrangement of colours, shapes, designs, lines etc. on a surface

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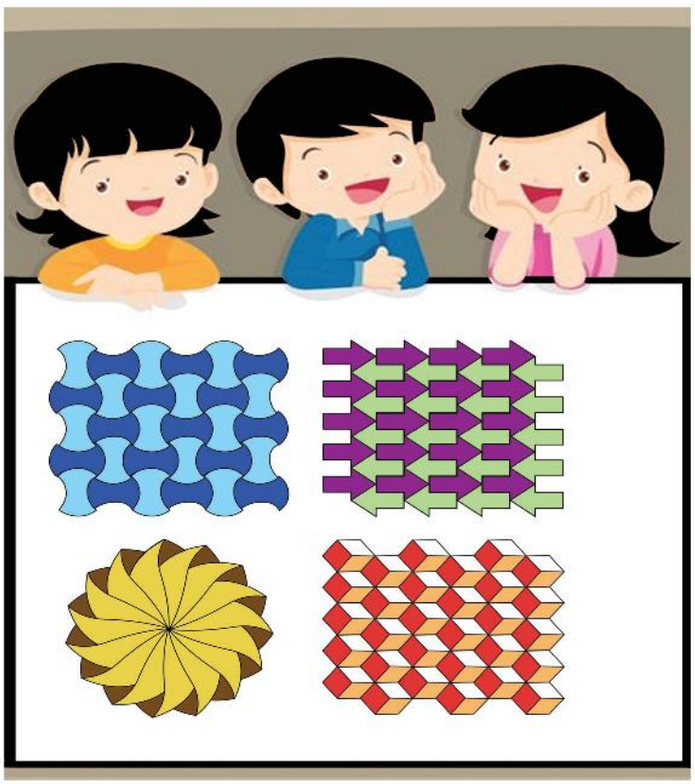
Example

Observe the patterns in shapes given below.



Example

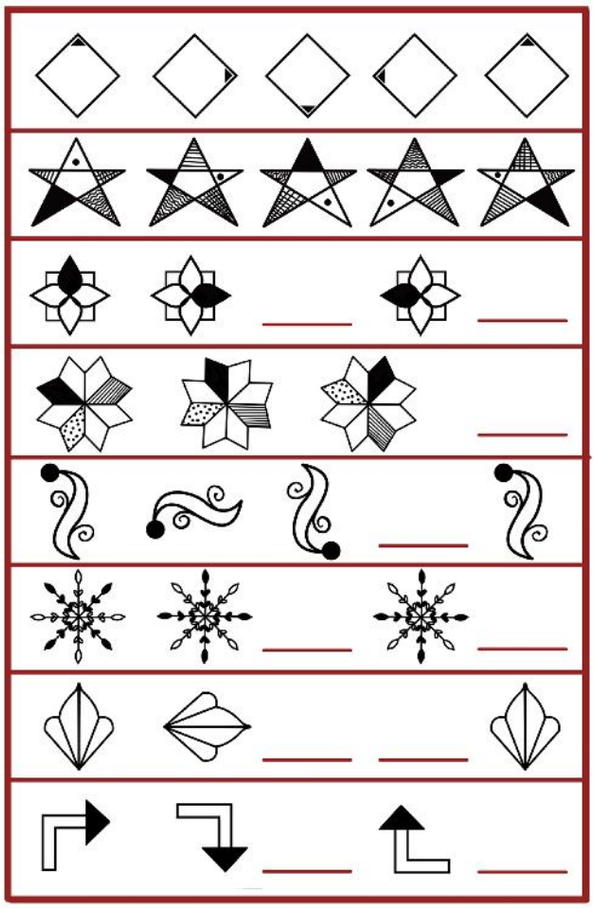
Observe the patterns of shapes given below.



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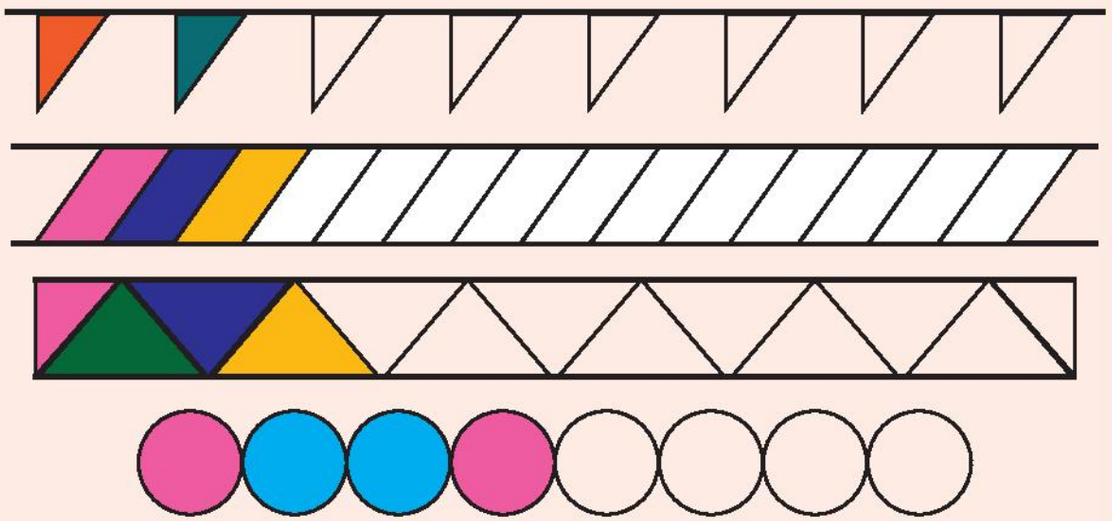
Exercise 3.1

Observe the given patterns and fill in the blanks



Activity

Observe and complete the colour pattern given below:



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3.2 Patterns in Numbers

3.2.1 To identify patterns in square numbers and triangular numbers.

Square numbers

Introduction:

In order to find the square of a number we multiply the number by itself. A square number is always positive. The numbers like 4, 9, 16, 25 ... can be expressed as the product of a number by itself.

$1 \times 1 = 1^2 = 1$

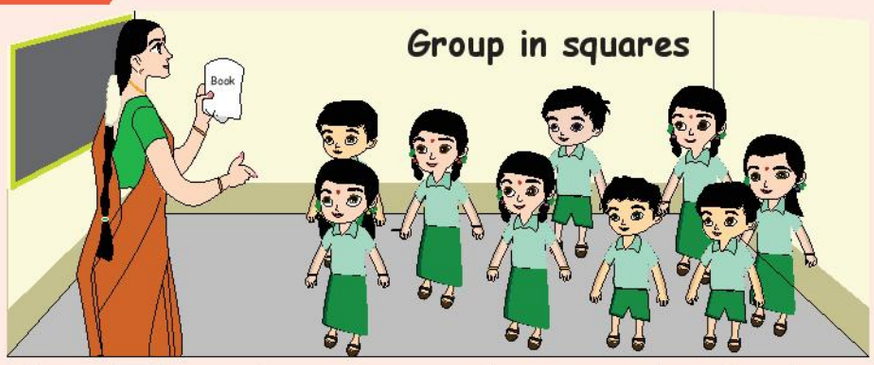
$2 \times 2 = 2^2 = 4$

$3 \times 3 = 3^2 = 9$

$4 \times 4 = 4^2 = 16$ and so on.

When we multiply a number by itself, we get the result as a square number.

Activity

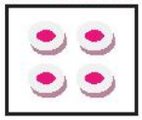
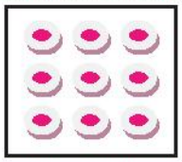
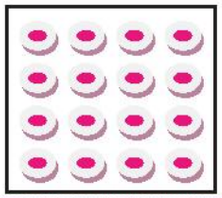


The teacher shall say the square numbers in order. Students should form groups among themselves according to the number said by the teacher. Children without group will not participate in the game further. The teacher shall continue with other numbers.

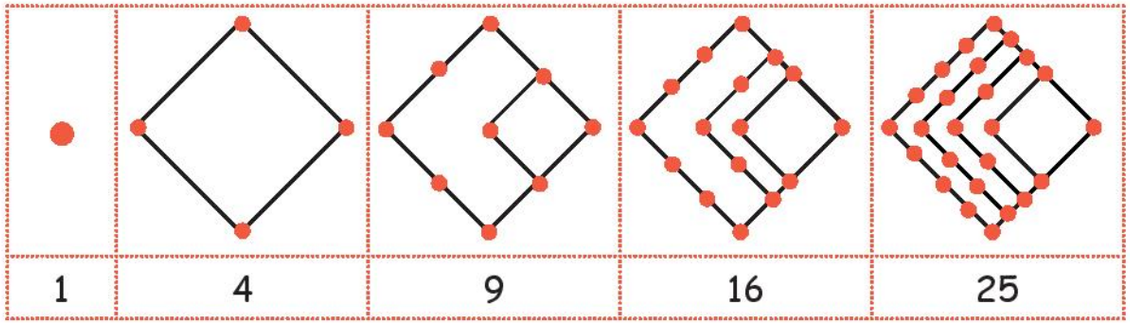
For example, if the teacher say 4, if 33 students are in a class. All the students shall create groups of 4 each in the shape of a square. One student will remain without a group.

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A number that can be shown using a pattern of dots in a square using flowers or small balls will be a square number. We can arrange the dots by counting numbers as given below, that will make a square shape.

1 x 1 = 1	
2 x 2 = 4	
3 x 3 = 9	
4 x 4 = 16	

Observe the dots in the figures given below.



1	4	9	16	25

Do you know?

Square of number	Sum of digit of square
$1^2 = 1$	1
$(11)^2 = 121$	$1 + 2 + 1 = 4 = 2^2$
$(111)^2 = 12321$	$1 + 2 + 3 + 2 + 1 = 9 = 3^2$
$(1111)^2 = 1234321$	$1 + 2 + 3 + 4 + 3 + 2 + 1 = 16 = 4^2$

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Let us know

Joshua formed a square using 12 bindis.
Is 12 a square number?



No, because there are so many gaps in the square.
So the number 12 is not a square number.

Do yourself

1. Count and write the numbers of tiles :

Figure					
Number of Tiles					

2. Circle the square numbers

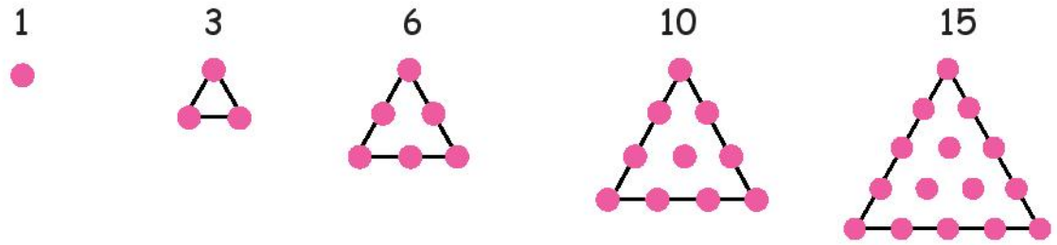
x	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	10	12	14	16	18	20
3	3	6	9	12	15	18	21	24	27	30
4	4	8	12	16	20	24	28	32	36	40
5	5	10	15	20	25	30	35	40	45	50
6	6	12	18	24	30	36	42	48	54	60
7	7	14	21	28	35	42	49	56	63	70
8	8	16	24	32	40	48	56	64	72	80
9	9	18	27	36	45	54	63	72	81	90
10	10	20	30	40	50	60	70	80	90	100

Triangular Numbers

Triangular numbers are series of numbers obtained by summation of the consecutive natural numbers.

A number that can make a triangular dot pattern.

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We can find the next number of the sequence of triangular numbers by adding another row of dots and counting all the dots placed previously.

The first triangle has just 1 dot.

The second triangle has another row with 2 extra dots, making 1+2=3

The third triangle has another row with 3 extra dots, making 1+2+3=6

so, the fourth has 1+2+3+4=10. And the series goes on,

Here 1, 3, 6, 10, 15, ... are called triangular numbers.

Note

Picture form of triangular numbers can make an equilateral triangle or a right angled triangle.

Do you know?

What is the relationship between triangular numbers and natural numbers?

$1 = 1$

$1 + 2 = 3$

$1 + 2 + 3 = 6$

$1 + 2 + 3 + 4 = 10$

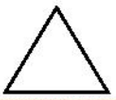
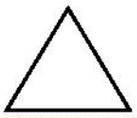
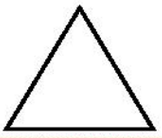
$1 + 2 + 3 + 4 + 5 = 15$ → Triangular numbers

The sum of series of consecutive natural numbers make the triangular numbers

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Do yourself

Make the triangle shapes in the form of series of the triangular numbers using seeds.

				
1	3	6	10	15

Exercise 3.2

RJS7F

a. Answer the following:

1. Square of the number 7 is _____

   a. 14 b. 49 c. 21 d. 28

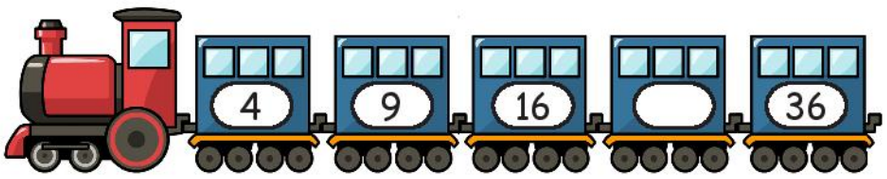
2. 64 is the square number of _____

   a. 4 b. 16 c. 8 d. 32

3. Is 24 a square number? _____

4. A number multiplied by _____ is called its square number.

5. Fill in the blank box.

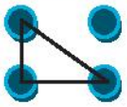
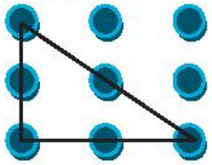
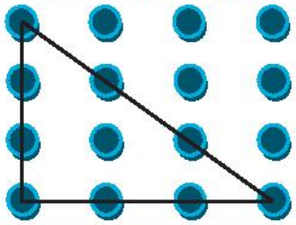


6. 1, 3, 6, _____, 15, _____, 28

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Do you know?

The result of the sum of two triangular consecutive numbers is a square number.

1 + 3 = 4	
3 + 6 = 9	
6 + 10 = 16	

3.2.2 Relationship between consecutive square numbers and odd numbers.

We have already learnt about the relationship between square numbers and triangular numbers.

Now we are going to know the relationship between consecutive square numbers and odd numbers.

When we add the consecutive odd numbers from 1, we will get the square numbers.

1	=	1
1 + 3	=	4
1 + 3 + 5	=	9
1 + 3 + 5 + 7	=	16
1 + 3 + 5 + 7 + 9	=	25

Square numbers

Note:

1 is the common number among square numbers and triangular numbers.

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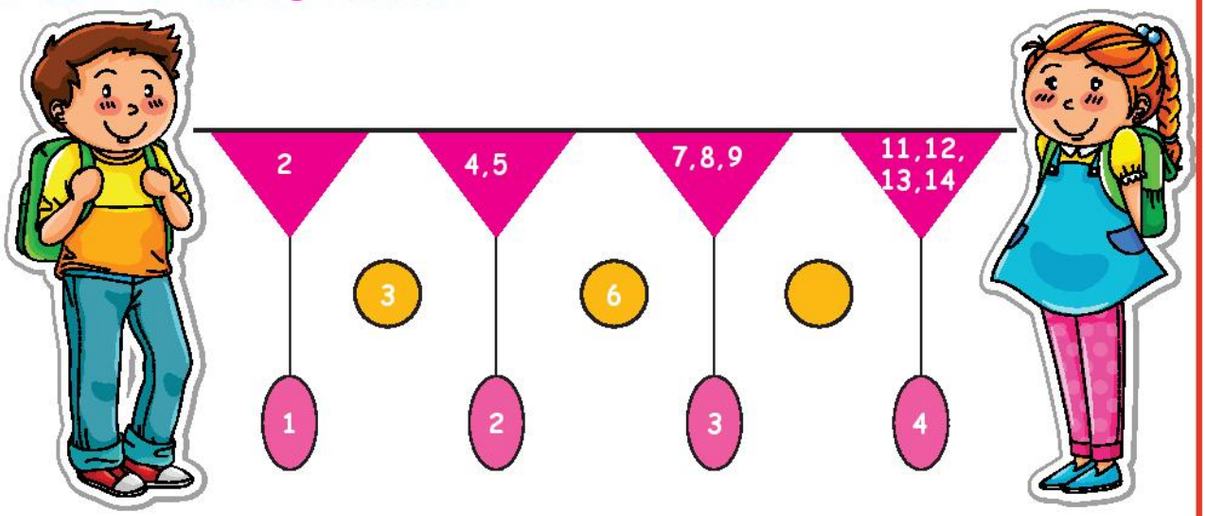
Try this

a. 1 + 3 + 5 + 7 + 9 + 11 = 36 = 6 x 6 = 6^2

b. 1 + 3 + 5 + 7 + 9 + 11 + 13= ____ = ____ = ____

c. 1 + 3 + 5 + 7 + 9 + 11 + 13 + 15 = ____ = ____ = ____

Find the missing number!



Relationship between Square number and Triangle numbers

When we add two consecutive triangular numbers we get perfect square numbers.

			
Green : 1	3	6	10
White : 0	1	3	6
Sum : 1+0=1	3+1=4	6+3=9	10+6=16

The sum of green and white triangles denotes the square number.

Do you Know?

'36' is a triangular number and also a square number.

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4.1 Length

68W4U

4.1.1 Life oriented problems based on length.

Introduction

In day to day life, we measure many small things by standard and non standard units. But how can we measure the distance.







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The metric measurements are used to measure the length and distance.

I am Banu. I would like to measure:



1. What is the length of the table?
2. How tall am I?
3. How far is my school from my home?

How do I measure it? What kind of measurements are they?

Ponni explained Banu that answers for the questions such as how long, how tall and how far set examples of length.

a. Millimetre (mm):

Small unit of length is called millimetre. A millimetre is about the thickness of a plastic id card. Or about the thickness of 10 sheets of paper on top of each other.

Millimetre is the smallest measurement!

S.No.	Name of the object	Thickness in mm
1.	Cell phone	
2.	Maths Book	
3.	Eraser	

b. Centimetre:

1 Centimetre is equal to 10 millimetres.

If you have an object of 10 millimetre length then you can say it as 1 centimeter.

1 Centimetre = 10 millimetres



We can use millimetres or centimetres to measure how tall we are, or how wide a table is.

Banu, can you please mark 5mm in the scale?

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Mark 4mm in red colour and 10mm in Green colour?



10 millimetre = 1 centimetre
10 centimetre = 1 decimetre
10 decimetre = 1 metre
10 metre = 1 deca metre
10 deca metre = 1 hecta metre
10 hecta metre = 1 killo metre

Mark 1cm and 3mm (1 cm 3 mm)?



S.No.	Length to be measured	Length in cm
1.	Composition Note	
2.	Your height	
3.	Geometry box	

c. Metre

A metre is equal to 100 centimetres

Metres are used to measure the length of a house or the length of a playground.

1 Metre = 100 centimetres

A Measuring tape has centimetre and metre units marked on it. Measuring tapes are useful for measuring lengths of cloth, large household objects like furniture and rooms.

S. No.	Length to be measured	Length in metre
1.	Length of classroom	
2.	Distance between school entrance and your classroom	

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d. Kilometre

When you need to get from one place to another, you can measure that distance using kilometres. A kilometre is equal to 1,000 metres.

The distance from one city to another or how far a plane travels is measured using kilometres.

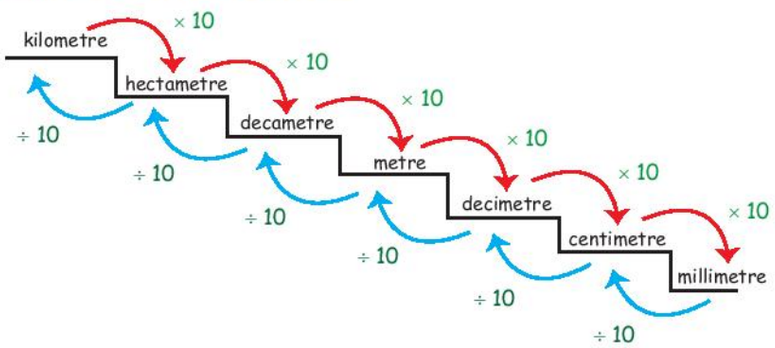
We can ride two wheeler/ Four Wheeler to go from one place to the other. The distance travelled is measured using odometre.

1 Kilometre = 1000 metres

S.No.	Distance to be calculated	Distance in Km
1.	School – your home	
2.	School – your taluk head quarters	
3.	School – your District head quarters	

Note:
Collection of above data can be done with the help of your elders.

4.2 Conversion of units



Let us know

To convert upper unit into lower unit the number should be multiplied.

To convert lower unit into upper unit the number should be divided.

100 centimetre = 1 metre

$\frac{1}{2}$ metre = 50 centimetre

$\frac{1}{4}$ metre = 25 centimetre

$\frac{3}{4}$ metre = 75centimetre

1000 metre = 1 kilometre

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Activity

Measure the things by using tape and scale.

S.No.	Name of the object	Length			
		Km	Metre	Cm	mm
1.	Your shoulder length				
2.	Your height				
3.	Thickness of the chess board				
4.	Distance between your house and your uncle's house				

Example 1

Convert into millimetre

(i) 70 cm

70 cm = 70 × 10 mm 1 cm = 10 mm

=700 mm

(ii) 65 cm 6 mm = (65 × 10) + 6 mm

= 650 + 6

= 656 mm

(iii) 7 m

7 m = (7×1000) mm 1 m = 1000 mm

= 7000 mm

Note:

1. To convert metre into millimetre multiply the given metres by 1000.
2. To convert centimetre into millimetre multiply the given centimetre by 10.

Try this

Convert into millimetres

1. 90 cm
2. 5 cm 8 mm
3. 5 m 9 mm

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Example 2

Convert into centimetres

(i) 5 m

5 m = (5 x 100) cm

= 500 cm

(ii) 7 m 40 cm

7 m 40 cm = (7 x 100) + 40 cm

= 700 + 40

= 740 cm

(iii) 110 mm

110 mm = 110 ÷ 10 cm

= 11 cm

Note:
To convert metre into centimetre multiply the given metres by 100

Try this

Convert into centimetres

1. 8 m 2. 6 m 4 cm 3. 80 mm

```
   11
10 | 110
     10
     ---
      10
      10
     ---
       0
```

Example 3

Convert into metre

(i) 7 km 50 m

1 km = 1000 m

7 km 50 m = (7 x 1000) + 50 m

= 7000 + 50

= 7050 m

(ii) 850 cm

850 cm = 850 ÷ 100 m

= 8 m 50 cm

(iii) 2005 mm

2005 mm = 2005 ÷ 1000 m

= 2 m 5 mm

Note:
1. To convert kilometre into metre multiply the given kilometre by 1000.
2. To convert millimetre into metre divide the given millimetre by 1000.

```
    8 m
100 | 850
      800
      ---
       50 cm
```

```
     2 m
1000 | 2005
       2000
       ----
          5 cm
```

Try this

Convert into metre

1. 8 km 400 m 2. 900 cm 3. 3500 mm

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Example 4

Convert into kilometre

(i) 9000 m [1000 m = 1 km]

9000 m = 9000 ÷ 1000 m

= 9 km

```
        9 km
1000 | 9000
       9000
       ----
          0 m
```

(ii) 2300 m

2300 m = 2300 ÷ 1000 m

= 2 km 300 m

```
        2 km
1000 | 2300
       2000
       ----
        300 m
```

Note:
To convert metres into kilometres divide the given metres by 1000.

Try this

Convert into kilometre

1. 5430 m
2. 7500 m
3. 8000 m

4.3 Addition in measurements

Example 1

1. Find the sum of the following.

(i) 7 m 25 cm + 15 m 50 cm

	m	cm
	7	25
+	15	50
	22	75

Sum = 22 m 75 cm

Step:1 Start from centimetre
25 cm + 50 cm = 75 cm

Step:2 Add metres
7 m + 15 m = 25 m

(ii) 5 km 700 m + 12 km 450m

	km	m
	(1)	
	5	700
+	12	450
	18	150

Sum = 18 km 150 m

Step:1
Add metres 700 + 450 = 1150

Step:2
Convert metre into kilometre
1150 ÷ 1000 = 1 km 150 m

Step3:
Add 1 km to the km column
1 km + 5 km + 12 km = 18 km
1 + 5 + 12 = 18

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Example 2

2. The length of three ropes are 1 m 20 cm, 2 m 15 cm and 1 m 25 cm. What is the total length of the three ropes?

Solution:

		m	cm
The length of the first rope	=	1	20
The length of the second rope	=	2	15
The length of the third rope	=	+ 1	25
Total length of ropes		**4**	**60**

Total length of the ropes = 4 m 60 cm

4.4 Subtraction in measurements

Example 1

Find the difference

(i) 75 km 500 m – 40 km 250 m

	km	m
	75	500
-	40	250
	35	**250**

Difference = 35 km 250 m

(ii) 55 km 75 cm – 23 m 40 cm

	m	cm
	55	75
-	23	40
	32	**35**

Difference = 32 m 35 cm

Try this

Subtract the following

1. 1075 km 400 m – 27 km 350 m
2. 250 m 25 cm – 127 m 18 cm
3. 27 km 900 m – 18 km 850 m

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Example 2

Kannan bought 90 m 80 cm of cloth .He used 43 m 75 cm of cloth to stich the uniform how much cloth is left with him?

Solution:

		m	cm
The total length of cloth	=	90	80
The length of the cloth used to stich uniform	=	43	75
The length of the cloth remaining	=	47	05

The length of the cloth remaining is 47 m 05 cm.

4.5 Multiplication in measurements

Example 1

(i) 12 km 225 m x 6

	km	m
	12	225
x		6
	73	**350**

225m x 6 = 1350m
= 1km 350m

12 km 225 m x 6 = 73 km 350 m

(ii) 75 m 15 cm x 5

	m	cm
	75	15
x		5
	375	**75**

75 m 15 cm x 5 = 375 m 75 cm

Try this

a. 7m 20cm x 6
b. 15m 75cm x 5
c. 15km 200m x 4
d. 35km 500m x 5

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Example 2

The length of a ribbon is 4 m 25 cm. Find the total length of three ribbons.

Solution:

Length of one ribbon = 4 m 25 cm

Length of three ribbons = 4 m 25 cm x 3 = 12 m 75 cm

Length of three ribbons = 12 m 75 cm

4.6 Division in measurements

Example 1

(i) 84 m 40 cm ÷ 4

	m	cm
	21	10
4	84	40
	- 8	
	4	
	- 4	
		4
	-	4
		0

84 m 40 cm ÷ 4 = **21 m 10 cm**

(ii) 360 km 540 m ÷ 9

	km	m
	40	060
9	360	540
	-36	
	0	54
	-	54
		0

Answer = **40 km 060 m**

Try this

a. 750 m 45 cm ÷ 5 b. 49 km 630 m ÷7 c. 770 km 550 m ÷ 11

Example 2

If a cloth of length 8 m 60 cm is cut into 4 equal pieces then, what is the length of one piece of cloth?

Solution:

Length of the cloth = 8 m 60 cm

Length of one piece of cloth = 8 m 60 cm ÷ 4

Length of one piece of cloth = 2 m 15 cm

Length of one piece of cloth = **2 m 15 cm**

	m	cm
	2	15
4	8	60
	-8	
		6
		-4
		20
		-20
		0

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Exercise 4.1

1 **Fill in the blanks.**

a. 7 m 5 cm= _____cm

b. 505 mm = _____cm _____mm

c. 326 m = _____cm

d. 5 km 30 m = _____m

e. 650 cm = _____m _____cm

2 **True or False**

a. 600 m is 6 mm.

b. 7000 m is 7 km.

c. 400 cm is 4 km.

d. 770 mm is 77 cm.

e. 9000 m is 90 mm.

3 **Find the sum of the following.**

a. 17 m 45 cm + 52 m 30 cm

b. 75 km 400 m + 37 km 300 m + 52 km 750 m

c. 4 cm 8 mm + 5 cm 9 mm

4 **Subtract the following.**

a. 15 km 450 m - 13 km 200 m.

b. 750 m 840 mm -370 m 480 mm.

c. 5 km 400 m - 3 km 350 m

5 **Multiply the following.**

a. 350 m 45 cm x 7

b. 25 km 300 m x 6

c. 37 m 350 mm x 8

6 **Divide the following.**

a. 950 km 800 m ÷ 5

b. 49 m 770 mm ÷ 7

c. 172 m 48 cm ÷ 4

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7 **Answer the following.**

a. Saravanan had chosen to drive his vehicle from puducherry to Chennai for a distance of 165 Km. While starting his vehicle, the odometre showed 000157 Km, Find the reading of the odometre, when he reach Chennai?

b. Karthik Raja decided to travel from A. He moves 1Km in east to reach B. Then he goes 2Km towards north and reaches C. Then he goes 1 Km towards west and reaches D. If he goes 2Km towards South, Where would he reach? Draw apt Diagram and Justify. Also find out the total distance travelled by him.

c. Sangeetha has just finished building a new house with garden area. She measured the garden area and found it to be 6m x 6m. Suppose she has to put a pole every 1m, how many poles are required? Each pole is of height 1.5m from the ground. What should be the total length of the fencing material to fence the garden?

d. One student needs 1m 25 cm cloth to stich a shirt. What is the total length of clothes need to stitch a class of 22 students?

f. The distance from village A to village B is 3 km 450 m. The distance from village B to village C is 5 km 350 m. What will be the total length of the road, if the road is laid from village A to village C?

Try this

Create the life oriented problem by using the pictures given below.






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Recall

Draw the hour Hand and write the time.

K19M6

When did you go to bed yesterday?_____



When will you get up in the morning? _____



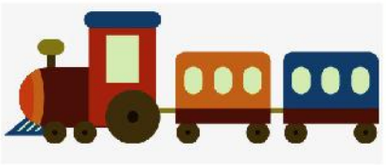
When will you go to school? _____



Look at the clock given and write the time	Draw hands in the Clocks to show time
 ( )	11:40 
 ( )	04:55 
 ( )	01:40 

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5.1 Railway time



We are using 12 hours clock generally. We use railway time in railway station, Defence department, television and internet. We cannot see or hear the a.m. or p.m. in any train time table or announcement because the railway time represents time in 24 hours.

Generally railway times are written in 4 digits. The first two digits show the hour and the last two digits show the minutes.

24-Hours Clock





We can write,

Mid night 12 hour is 00:00 hour or 24 hours 	Noon 12 O'Clock – 12:00 hours
9. a.m. – 09:00 O'clock 	1. p.m. – 13:00 hours (12+1) hours

While converting the 12 hour time to 24 hour time during p.m. we should add 12 to hours and keep the minutes same.

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5.2 Normal time and Railway time

12 hours Clock	24 hours Clock	12 hours Clock	24 hours Clock
12 Mid night	00:00 hours or 24:00 hours	12:01 p.m.	12:01 hours
0:20 a.m.	00:20 hours	12:59 p.m.	12:59 hours
0:49 a.m.	00:49 hours	1:00 p.m.	13:00 hours
1:00 a.m.	01:00 hours	4:00 p.m.	16:00 hours
4:00 a.m.	04:00 hours	5:20 p.m.	17:20 hours
5:30 a.m.	05:30 hours	9:45 p.m.	21:45 hours
11:15 a.m.	11:15 hours	11:30 p.m.	23:30 hours
12:00 Noon	12:00 hours	12 Mid night	00:00 hours or 24:00 hours

Try this

Normal time	Railway time
1. 3:30 a.m.	_____ hours
2. 4:15 p.m.	_____ hours
3. _____	12:50 hours
4. _____	20:15 hours
5. 12:25 p.m.	_____ hours
6. 01:55 p.m.	_____ hours

24 hour Clock 12 hour Clock

2:20 a.m.  02:20

Mid night 2 hours 20 minutes

2:20 p.m.  14:20

After noon 2 hours 20 minutes

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6:55 a.m.  06:55

Morning 6 hours 55 minutes

6:55 p.m.  18:55

Evening 6 hours 55 minutes

11:15 a.m.  11:15

Morning 11 hours 15 minutes

11:15 p.m.  23:15

Night 11 hours 15 minutes

12:00  12:00

Noon 12 hours

12:00  00:00

Mid night 12 hours

Try this

Write a.m. or p.m.

1. Ravi starts the school at 8:45 ___
2. Ramya eats lunch at 1:00___
3. Akila sees the moon at 8:20_____
4. Kavi goes to the bed at 9:00____
5. The sun rises at 6:10_____

5.3 Use addition and subtraction in finding time interval

Addition

Example 1

Add : 4 hours 30 minutes and 2 hours 45 minutes

	Hours	Minutes
	4	30
+	2	45
	6	75
	7	15

75 minutes = 1 hour 15 minutes

7 Hour 15 minutes

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Example 2

Krishna goes to his village. He travels 4 hours 35 minutes in bus and 1 hour 55 minutes in Two-Wheeler. **What is the total time of his travel?**

			Hours	Minutes
Travel in bus	=		4	35
Travel in Two-Wheeler	=	+	1	55
			5	90
Total time	=		6	30

90 minutes = 60+30 minutes
60 minutes = 1 hour
30 minutes = 30 minutes
∴ 5+1 = 6 hour 30 minutes

∴ Krishna has travelled for 6 hour 30 minutes

Example 3

Subtract : 3 hours 45 minutes from 5 hours 30 minutes

	Hours	Minutes
	5	30
-	3	45

	Hours	Minutes
	4	60+30 90
	~~5~~	~~30~~
-	3	45
	1	45

We can't subtract 45 minutes from 30 minutes so regroup 1hour from 5 hours as (60 + 30) 90 minutes and subtract 45 minutes from 90 minutes. We can get 45 minutes.

When we subtract 3 hours from 4 hours balance is 1 hour.

1 Hour 45 minutes

Example 4

Ram works on his computer from morning 10 O'clock to evening 3:30. How long does he work in his computer?

		Hours	Minutes
Ram works on his computer till evening	=	3	30
He starts work at morning	=	10	00

	Hours	Minutes
	15	30
-	10	00
	5	30

Subtract from a.m. to p.m., we add 12 hours.
Add 3:30 hours + 12 hours we can get 15:30

∴ Ram works 5 hours 30 minutes in his computer

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Example 5

SCHOOL TIME TABLE			
First bell	9:00 a.m.	Lunch time	12:40 p.m. to 2:00 p.m.
Morning prayer	9:15 a.m.	Afternoon school starting time	2:00 p.m.
Class starting time	9:30 a.m.	Afternoon break time	3:20 p.m. to 3:30 p.m.
Morning break time	11:00 a.m. to 11:10 a.m.	Evening school closing time	4:10 p.m.
Morning school closing time	12:40 p.m.		

1. Find out the duration between First bell time to morning break time in school.

		Hour	Minutes
Morning break time	=	11	00
First bell time	=	- 9	00
		2	00

The time interval between First bell and morning break time is **2 Hours.**

2. Find the time interval between the time of class starting and the time of morning break.

		Hour	Minutes
		10	(60 + 10)
Morning break ending time	=	~~11~~	~~10~~
Class starting time	=	- 9	30
		1	40

The time interval between class starting time and morning break ending time is 1 hour 40 minutes.

We can't subtract 30 minutes from 10 minutes so we convert to hour into minutes 1 hours to 60 minutes and add.

60+10 = 70 now we subtract 30 minutes from 40 we can get 1 hour 40 minutes.

3. Find the total time from starting of morning class to closing of Afternoon class?

	Hour	Minutes
Afternoon school ending time =	4	10
Morning class starting time =	9	30

Hours	Minute
	(60+10 = 70)
15	
~~16~~	~~10~~
9	30
6	40

Add 12 hours, 4.10 + 12.00 = 16 Hours + 10 minutes.

The total time from starting of Morning class to closing of Afternoon class is 6 hours 40 minutes.

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Try this

Find the time interval between starting of Afternoon class to closing of Evening class

		Hour	Minutes
Evening school ending time	=	4	10
Afternoon school starting time	=	- 2	00

Subtract from am to pm, we add 12 hours and then subtract the a. m time

Exercise 5.1

1 **Write down your school time table of the following:**

a. Morning school break time to morning school ending time.

b. Morning school working time.

c. Afternoon school working time.

d. Afternoon Lunch break time.

GKNDM

2 **Match the following:**

12 hours Clock	24 hours Clock
9:40 a.m.	23:40 hours
3:20 p.m.	6:25 hours
6:25 p.m.	15:20 hours
11:40 p.m.	9:40 hours
6:25 a.m.	18:25 hours

3 **Addition**

a. 4 hours 30 minutes +2 hours 50 minutes = _____

b. 4 hours 50 minutes +2 hours 30 minutes = _____

c. 3 hours 45 minutes +1 hours 35 minutes = _____

d. 1 hours 50 minutes +3 hours 45 minutes = _____

e. 2 hours 25 minutes +4 hours 50 minutes = _____

4 **Subtract**

a. 5 hours 10 minutes - 2 hours 35 minutes = _____

b. 4 hours 20 minutes - 2 hours 40 minutes = _____

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c. 4 hours 25 minutes – 1 hours 20 minutes = _____

d. 6 hours 55 minutes – 2 hours 20 minutes = _____

e. 5 hours 45 minutes – 3 hours 55 minutes = _____

5 Answer the following:

a. An office works from 10 a.m. to 6 a.m. What is the duration of working hours?

b. A school works from morning 9 O'Clock to evening 4 O' Clock. What is the duration of working hours of the school?

c. A circus starts at 12:15 p.m. and ends by 2:30 p.m. What is the duration of circus?

d. A bank works from morning 9:30 a.m. to 4:30 p.m. What is the working time of the bank?

e. A man comes to his village in Tamilnadu from Ahmedabad. He travels 2 hours 15 minutes in Aeroplane and 4 hours 40 minutes in Car. What is the total time of travel?

f. A painter paints a house for 3 hours 15 minutes in morning and 2 hours 50 minutes in evening. What is the total time he painted?

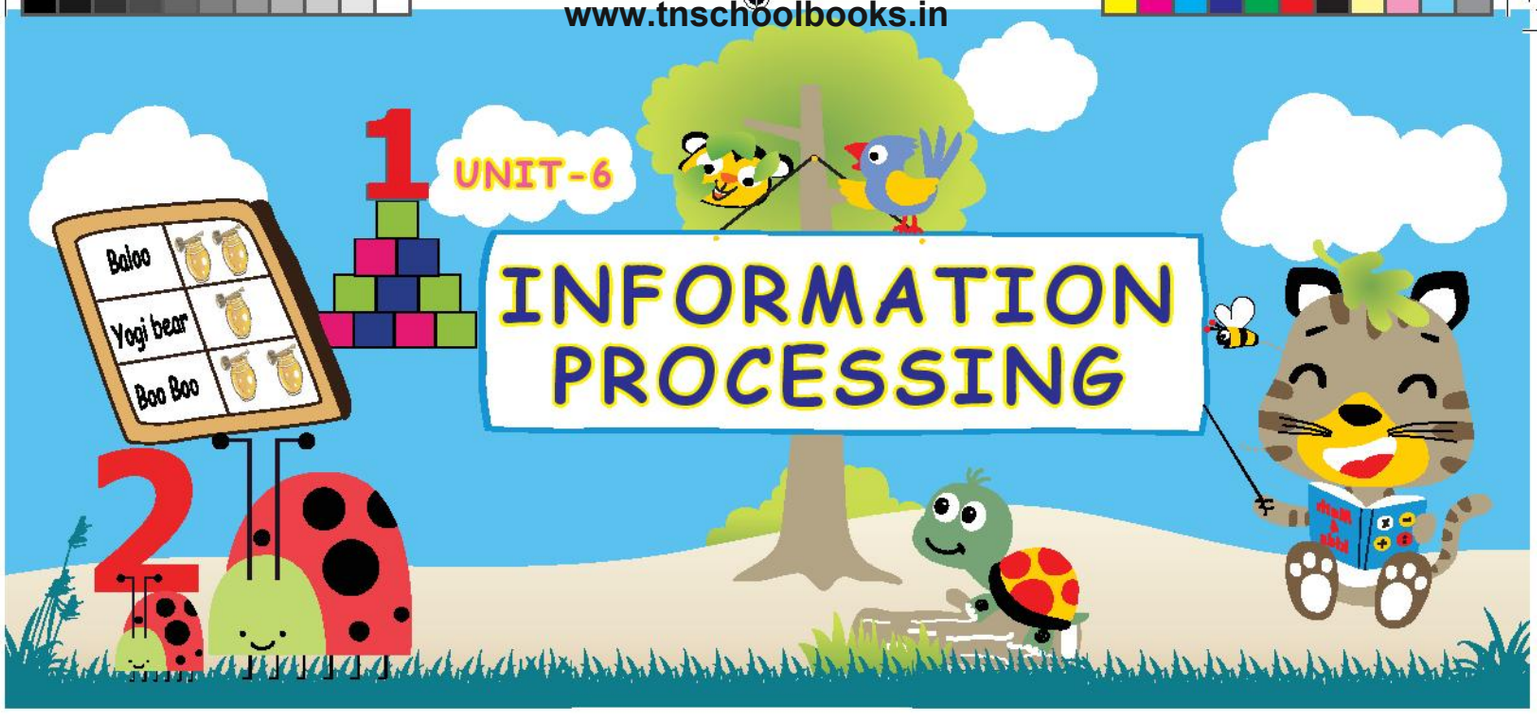
Activity

Find the travel time of the train with the time given in 24-hour clock.

Train Name	Starting time Chennai	Reaching time	Travelling time
Sarkar Express Kakkinoda	17:20	09:50	
Rameswaram Express train Rameswaram	19:15	08:35	
Ananthapuri Express Kollam	06:50	08:20	
Sozhan Express Train Trichirapalli	08:00	16:00	

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UNIT-6

INFORMATION PROCESSING

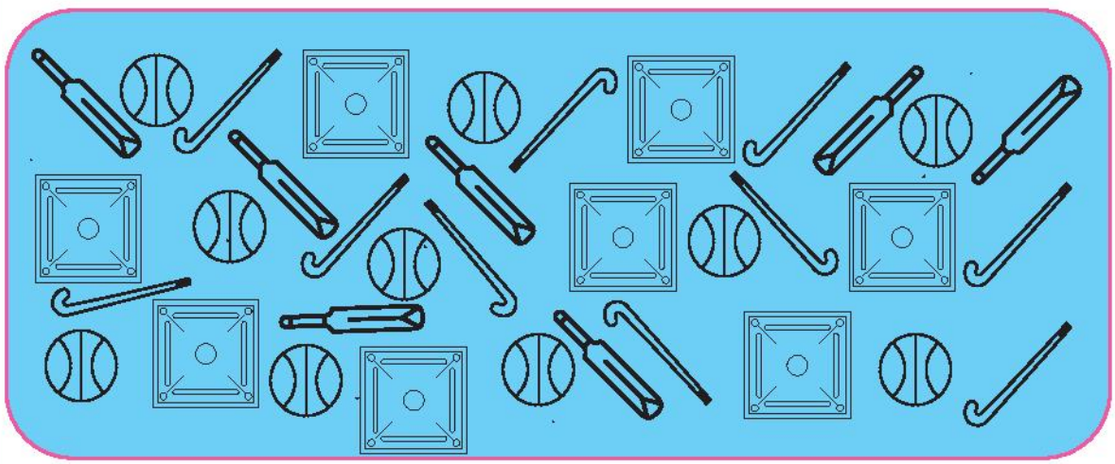
Introduction

7OTYX

The main aim of this information processing is to enable the learners to count, compare and assume information such as invitees coming to attend a birthday party, sort out the class library books, food production, the number of pupils taking food in the mid-day meal scheme and the various occupations of their parents.

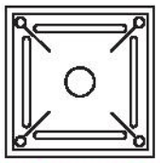
Example

A fifth standard teacher asked a student named Dinu to collect the pictures of favourite sports articles of his clasmates and Dinu collected the same and handed it over to the teacher in a short span of time. Let us see how is it possible for him to do it quickly.



The teacher asked few questions about his collection and Dinu was able to answer those questions quickly. Let us find what Dinu did to answer the questions quickly.

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Sports article				
Numbers	7	10	8	10

Dinu tabulate the data he collected as given above and answered the following questions.

1. How many students like the cricket bat? 7
2. How many students like football? 10
3. How many students like the Carrom board? 8
4. How many students like hockey stick? 10
5. Find the total number of sports articles. 35

6.1 Systematic Listing

Number puzzle is considered to be one of the unique games in mathematics. These types of games create more interest and involvement to learn mathematics in a very easy manner.

It is very happy to note that most of the number puzzles can be solved with basic knowledge of mathematics.

Here is a number puzzle with a systematic rule to solve it.

i. Choose any one number
ii. Add the next number to it.
iii. Then add 9 to the sum.
iv. Divide it by 2.
v. And then subtract the number chosen from it.
vi. Can you guess the answer?

Try with other numbers you could observe the answer is same for all the numbers.

Let us know



The above diagram (grid) shows rows and columns, horizontal squares are called **Rows** vertical square called **Columns**.

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Example 1

3×3 Sudoku

The object is to fill all empty squares so that the numbers 1 to 3 each number can only appear once in a row and column.

Step: 1

1	2	3

Step: 2

1	2	3
2	3	1

Step: 3

1	2	3
2	3	1
3	1	2

Try this

How many ways can we arrange the numbers from 1 to 3 in first Row?

[**Answer:** (1 2 3), (1 3 2),(2 1 3),(2 3 1),(3 1 2)]

Example 2

4×4 Sudoku

1	4	3	
3			
	1		3
2		4	1

Answer:

1	4	3	2
3	2	1	4
4	1	2	3
2	3	4	1

Try this

In how many ways can we arrange the numbers from 1 to 4 in first row?

Try this

5, 3, 2 = 15 10 22

9, 2, 4 = 18 36 52

8, 6, 3 = 48 24 66

5, 4, 5 = 20 25 41

therefore 7, 2, 5 = ?

Answer: 14 35 47

Note:

(i) product of 1st 2nd numbers
7 x 2 = 14

(ii) product of 1st 3rd numbers
7 x 5 = 35

(iii) Add these 2 products then subtract the middle number
= 14 + 35 = 49 - 2 = 47

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Exercise 6.1

1. Fill in the boxes 1, 2 & 3.

a.

1		3
		2
	1	

b.

1		2
3		1

c.

2		
	2	
		2

d.

3		
	3	
		3

2. Solve 3×3 magic square using the numbers from 1 to 9. So that the sum is 15 both horizontally and vertically.

			15
			15
			15
15	15	15	

3. Complete the following 4×4 Sudoku by using the numbers 1, 2, 3, 4.

1			
	4		
4			
	3		1

		1	
	4		
3			2

	1	3	
2			1

4. Can you spot the duplicate?
DEF, EFD, FDE, EFD, FED, DFE, EDF

5. Can you find the mistake? Explain.
ABC, ACB, BCA, BAA, CAB, CBA

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6.2 Graphical Representation of Data

6.2.1 Collection of data

The easy method to calculate is to tabulate the collected information and represent it in pictures.

Example 1

Sports day celebration

After the Sports day Celebration the students kept all the used sports articles in a room. The physical director asked the students Dinesh & Ganesh of Class V to arrange the sports article in a proper order. They tabulated the sports articles as below.



Note:
Rows are horizontal arrangements whereas column are vertical arrangements.

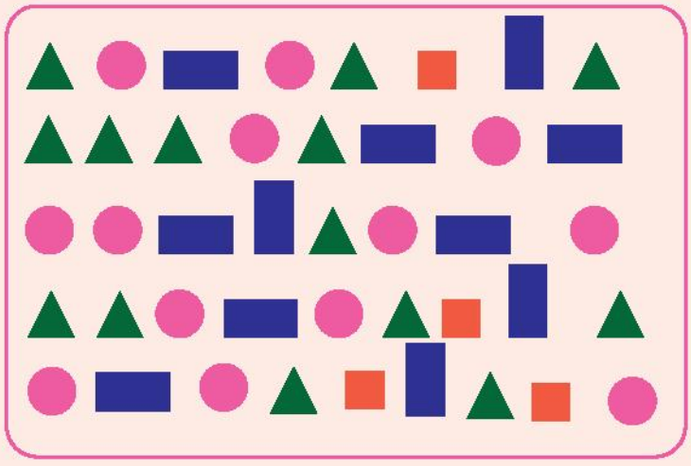
Let us see the way they arranged the articles in a proper way

Shapes										
Numbers	4	1	2	6	11	3	2	1	1	10

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Activity 1

The Fifth standard students were given a task of collecting mathematical shapes in a competition. Team named shakuntaladevi won the competition.



Let us count the shapes collected by the winning team.

Shapes	▲	▬	●	■
Numbers				

Example 2

Prabu would like to present some gifts to his friends on his birthday party. He collected the details from his friends about their favourite item.

Friends name	Favourite item	Friends name	Favourite item
Mathavi	Pen	Priya	Pencil
Arul	Eraser	Vishal	Pen
Anjali	Eraser	John	Pencil
Malar	Pen	Ravi	Pencil box
Vembu	Pencil	Albert	Water bottle
Selvi	Scale	Periasamy	Pencil box
Begam	Pencil	Senthil	Water bottle
Sangavi	Eraser		

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Items	Pencil box	Pen	Eraser	Pencil	Scale	Water bottle
Numbers	2	3	3	3	1	2

Activity 2

Total stock of household articles at the end of the month in a mart is given below.



Observe the above picture and complete the table.

Items								
Numbers								

Answer the following questions.

1. How many chairs were there in the stock list?
2. Name the articles that are lesser in count than the count of cots.
3. What is the total number of things in the stock?
4. How many tri footed stools are there?
5. Mention the article which is 3 numbers greater than tri footed stool?

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6.3 Pictograph

Information can be easily understood when it is represented in pictures.

A **pictograph** is the representation of data using pictures. Pictographs represent the frequency of data using symbols or images that are relevant to the data. This is one of the simplest ways to represent data.

Example

Information collected from 150 students about their favourite subjects are given below. Make a pictograph based on it:

Subject	Number of students
Tamil	25
English	20
Maths	55
Science	35
Social sciences	15

 = 5 students

Subject	Number of students
Tamil	
English	
Maths	
Science	
Social science	

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Activity

The following information shows the number of literates in a village of 200 people. Draw a pictograph for that data.

Education	Numbers
Up to Fifth standard	10
Up to Eigth standard	20
Up to Tenth standard	50
Up to Twelveth standard	70
Under Graduate	10
Post Graduate	10
Illiterates	30

Exercise 6.2

1. The following table shows the weight of paddy cultivated in a particular village during the years 2010 to 2015

Year	Paddy production
2010	
2011	
2012	
2013	
2014	
2015	

 = 100 kg

Observe the pictograph and answer the following questions.

a) In which year paddy production was maximum?

b) In which two years paddy production were equal?

c) Find the quantity of paddy production in 2015.

d) Find the total quantity of paddy production particularly 2013, 2014, and 2015.

2. The total number of pupil studying in 5 school in a particular are as follows

GHSS: 1000 PUPS: 200 BHSS: 400

PUMS: 400 Private nursery School: 800

Prepare a pictograph using the symbol  to represent 100 Pupil and answer the following question:

1. Which school has the maximum number of pupil?
2. Which school has the least number of pupil?

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6.4 Representation of Data by Tally Marks

Any collection of information in the form of numerical figures giving the required information is called Data.

In olden days primitive man used to count and verfy his livestock using stones. This is the first data gathering method. Nowadays we use many methods to collect information. The most efficient method is to keep a "**tally marks**".

Example 1

An information collected about the number of vehicles which crossed a school on a particular time are shown below.

Car	IIIIIIIIII
Van	IIIIII
Lorry	IIIIIIIIIII
Two wheelers	IIIIIIIIII
Bus	IIII

'1' is called a 'tally mark'. It is difficult to count if there are more number of tally marks.

Therefore to make it easier to count, we change it as follows.

II - 2	𝍸 II - 7
III - 3	𝍸 III - 8
IIII - 4	𝍸 IIII - 9
𝍸 - 5	𝍸 𝍸 - 10
𝍸 I - 6	𝍸 𝍸 I - 11

Note:
We can use tallymark to record data of a variety of things with large numbers.

Solution

Vehicles	Tally mark	No. of vehicles
Car	𝍸 𝍸 I	11
Van	𝍸 II	7
lorry	𝍸 𝍸 III	13
Two wheelers	𝍸 𝍸 II	12
Bus	IIII	4

Answer the following questions:

1. Which vehicle crossed the school maximum in numbers?
   Answer: lorry
2. Find the total number of vehicles which crossed on a particular time?
   Answer: 47

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Example 2

Information was collected by Balu from 20 students of class five regarding their favourite snacks are given.

Students	Favourite snacks	Students	Favourite snacks
1	Chocolate	11	Apple
2	Cake	12	Chocolate
3	Biscuit	13	Cake
4	Chocolate	14	Chocolate
5	Chocolate	15	Chocolate
6	Banana	16	Cake
7	Biscuit	17	Banana
8	Biscuit	18	Chocolate
9	Biscuit	19	Apple
10	Chocolate	20	Chocolate

Tabulate the above information by using Tallymark. Here, all the students have chosen any one of the snacks we can tabulate it as follows.

Name of the snack	Tallymark	No. of students
Chocolate	𝍸 IIII	9
Cake	III	3
Biscuit	IIII	4
Apple	II	2
Banana	II	2

Activity 1

The number of Two Wheeler sold in a week in a showroom is given below. Represent the data using tally marks.

Sunday-6	Wednesday-5
Monday-11	Thursday-16
Tuesday-3	Friday-16
	Saturday-4

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Activity 2

In a mathematics test, the following marks were obtained by 30 students. Arrange these marks in a table using tallymarks.

8	1	3	2	6	4	2	8	4	9
2	9	5	7	6	2	7	10	2	4
3	4	7	5	5	5	6	3	8	6

(a) Find how many students obtained marks equal to or more than 8?

(b) How many students obtained marks below 4?

Mark	Tally marks	Number of students
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Try this

Collect information about the number of students present in a particular day in all the classes of a school. Tabulate the above information using tallymark.

Do it yourself

Collect the information about the different types of houses in your village and complete the following table.

Type of the house	Tally mark	Total number of houses
Thatched house		
Tiled house		
Asbestos house		
Concrete house		

Try yourself

Choose any five cities and record their temperature from the TV (or) Newspaper.

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Try this

Collect information based on the points given below and prepare a table using tally marks

(a) Types of storybooks liked by your classmates.

Clue: [Fairy tales, Moral stories, Comics, picture stories, fictions and animal stories]

(b) Ambition of your classmates.

Clue: [Doctor, Farmer, Engineer, Pilot, Politician]

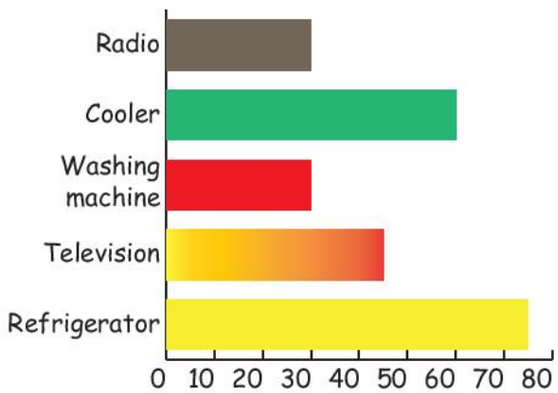
6.5 Bargraph

A Bar graph is a chart that uses bars to show comparisons between categories of data. The bars can be either horizontal or vertical.

Example 1

The number of things sold in a month of January in a particular shop is shown below. Draw a bargraph.

Home appliances	No. of things sold
Refrigerator	75
Television	45
Washing machine	30
Cooler	60
Radio	30



Activity 1

1. Take a survey among your friends and family on their favourite pet. Use the information to draw a bargraph.
2. Take a survey among your school friends on their favorite colour. (key: Purple, Green, Red, Brown, Blue)

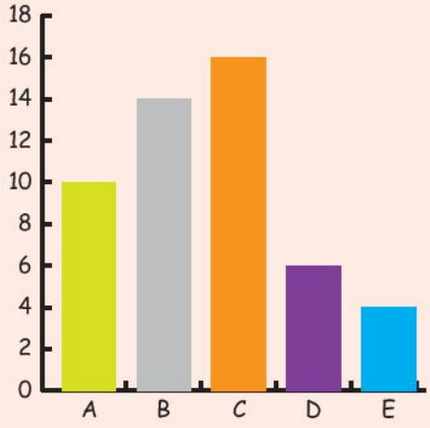
   Draw a bargraph to represent your data.

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Activity 2

The following information is collected from 50 students of class V about their grades in exams. Complete the following table from the bar graph.

Grade	Tallymark	No. of students
A	𝍸 𝍸	10
B	𝍸 𝍸 IIII	14
C		
D		
E		



Example 2

In Trichy, GHSS has five different clubs. The data shows the number of students in each club. Use the information to draw a bargraph and answer the question.

Art club	Debate club	Dance club	Drama club	Sports club
28	80	150	100	120

1) Which club has the fewest students? How many?
   Arts club 28
2) How many students are there in art club and debate club?
   28+80=108
3) How many more students are there in the sports club than the drama club?
   20
4) How many students are there in all the clubs altogether?
   478

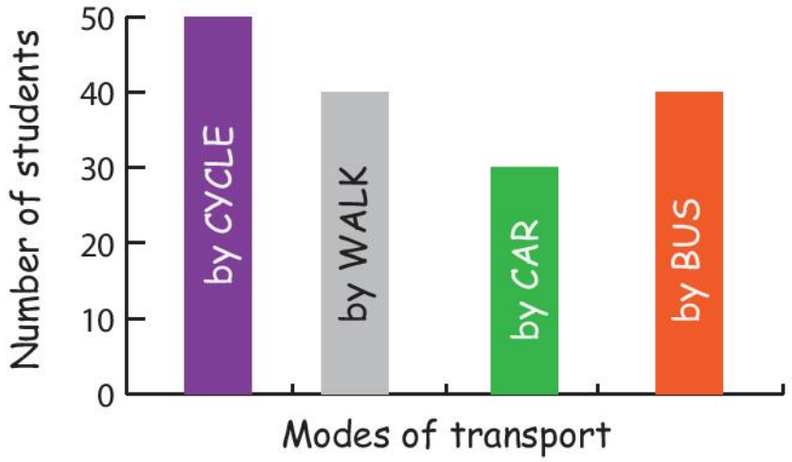
Activity 3

Take a survey among your classmates on their favourite hobby.
[Clue: Reading, Painting, Gardening, Cooking, Fishing]

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Exercise 6.3

1 **The bar chart represents the number of students using different modes of transport.**



Observe the above bar chart and answer the following questions.

a. Which mode of transport is mostly used by the students?

_____

b. How many students come to school by walk? _____

c. Which mode of transport is used the least? _____

d. How many students come to school by bus? _____

2 **The following information shows the grades of science and maths of 30 students of class 5.**

Answer the following questions.

a. How many students got equal grades in both subjects.

b. How many students got a higher grade in science than in maths?

c. Which was the most common grade in science?

Maths Grade

Science Grade	A	B	C	D	E
A	2	8			
B		1	4		
C		2	3		
D			4	2	
E		1	0	2	1

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3 **Mr. Dinesh collected the information about the rainfall of a particular city in a week from the newspaper and recorded his information in the pictograph.**

Measurement of rain (mm)

Sunday	💧💧💧
Monday	💧💧💧💧💧💧
Tuesday	💧💧💧💧💧
Wednesday	💧💧💧
Thursday	💧💧💧💧
Friday	💧💧💧💧💧💧💧💧💧💧
Saturday	💧💧💧💧💧💧

💧 = 2 millimetres of rain

Answer the following questions

a. On which day, the rain was most?

b. On which day, the rain was least?

c. How much rain was there on Sunday?

d. How much rain was there on Monday?

e. Find total rainfall of the city in that whole week?

4 **Neela, Mala, Kala and Bala were neighbours. The following data shows the number of fish in each of their fish tank. Draw pictograph to represent the data and answer the following questions.**

Neela	Mala	Kala	Bala
16	20	12	24

a. How many fishes did bala have? _____

b. Who has 16 fishes? _____

c. How many fewer fish did Kala have than Mala? _____

d. How many fish did Neela and Bala have altogether? _____

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Answers

GEOMETRY

Exercise 1.1: 2. a) true b) false c) False d) True e) True

Exercise 1.2: 2. X, A, O, I, S 3. 1,0,8 4. 88888, 10101, 11111, 80808

Exercise 1.3: 1. Acute angle 2. Obtuse angle 3. Straight angle 4. $\angle C$

5. Acute angle 6. L 7.  8 90° 9. Obtuse angle 10. Obtuse angle

NUMBERS

Exercise 2.1: 1. 10104, 10105, 10106, 10107 2. 10240, 10250, 10260, 10270

3. 10930, 10940, 10950, 10970 4. 11104, 11105, 11106, 11107

Exercise 2.2: 1. a) 1,57,31,997 – one crore fifty seven lakhs thirty one thousand nine hundred ninety seven.

b. 3,41,964 – three lakhs forty one thousand nine hundred sixty four

c. 2,91,21,972 – Two crore ninety one lakhs twenty one thousand nine hundred seventy two

d. 3,47,810 – Three lakh forty seven thousand eight hundred ten.

Exercise 2.3: 1. a) 70 - 7 tens b) 400 - 4 hundreds c) 10000 - 1 ten thousands

3. a) 500 – five hundred b) 500000 – five lakhs

c) 5869732 – 5000000 – Five ten lakhs

d) 5467859 – 5000000- five lakhs, 50- Five tens

4. a) 33333 b) 207007 c) 8073305 d) 4000404

5. a) 60000+3000+500+70 b) 3000000+600000+1000+400+70+8

c) 10000000+4000000+500000+70000+4

d) 2000000+800000+40000+8000+300+80+7

6. 9899999

Exercise 2.4: 1. b) thirty four thousand c) one lakh

e) Thirty seven thousand six hundred eighty nine

g) Four Lakhs h. Twelve lakhs

2. b) 70000 – 7 Ten thousand 4000000 – Four Ten Lakh

c) a. 10040004 b. 6400003

d) (i) 12130422 1 lakhs 4 hundreds (ii) 42133322 one lakh 3 hundreds

e) 19999

f) a. Ascending order : 33058 40978 47224 81421 90470 97879

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Descending order : 97879 90470 81421 47224 40978 33058

b. Ascending order: 11111 22222 33333 44444 66666 99999

Descending order : 99999 66666 44444 33333 22222 11111

g) 70543 h) 184810 i) 9899999

Exercise 2.5: 1. 61,866; 41,969

2. a) 44,410 b) 2,83,448 c) 2, 55, 404 d) 52,738 3. 15,832

4. ₹ 64, 667 5. ₹ 47,450

Exercise 2.6: 1. a) 18,872 b) 63,308 c) 1,10,398 d) 85,162 2. 732

Exercise 2.7: 1. a) 22,704 b) 76,988 c) 21,900 d) 17,934

e) 16,263 f) 24,360

2. a) ₹ 825 b). ₹ 1375 c) ₹ 16,675 d) ₹ 16,875 e) ₹ 24,700

Exercise 2.8: 1. a) Q = 636, R = 8 b) Q = 9469, R = 0 c) Q = 433, R = 1

d) Q = 4325, R = 1 e) Q = 633, R = 0

2. a) 1019 b) 4007 c) 15550

Exercise 2.9: 1. a) 1250 b) 85 c) 65 d) 1450

2. a) Q = 301, R = 10 b) Q = 143, R = 16 c) Q = 407, R = 16

d) Q = 98, R = 0 e) Q = 87, R = 0

PATTERNS

Exercise 3.2: 1. b) 49 2. c) 16 3. No 4. Itself 5. 25 6 10,21

MEASUREMENTS

Exercise:4.1

1. a) 705 cm b) 50 cm 5 mm c) 32600 cm d) 5300 m e) 6m 50 m
2. a) false b) true c) false d) true e) false
3. a) 69 m 750 cm b) 165 km 450 m c) 10 cm 7 mm
4. a) 2 km 250 m b) 380 m 360 mm c) 2 km 50 m
5. a) 2453 m 15 cm b) 151 km 800 m c) 298 m 800 mm
6. a) 190 km 160 m b) 7m 110 mm c) 43m 12cm
7. a) 000322 b) 6 km c) 20 poles, 30 m

d) 27 m 50 cm e) 8 km 800 m

TIME

Exercise: 5.1: 3. a) 7 h 20 min b) 7 h 20 min c) 5 h 20 min d) 5 h 35 min

e) 7 h 15 min

4. a) 2 hr 35 min b) 1 hr 40 min c) 3 hr 05 min d) 4 hr 35 min e) 1 hr 50 min
5. a) 8 hr b) 7 hr 10 min c) 4.45 hrs d) 6 hrs e) 6 hr 55 min f) 6 hr 05 min

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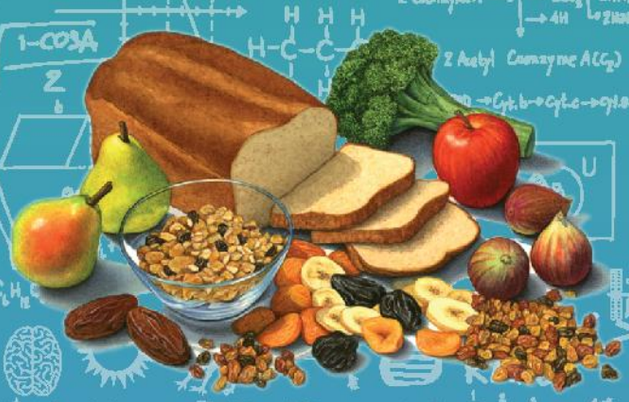


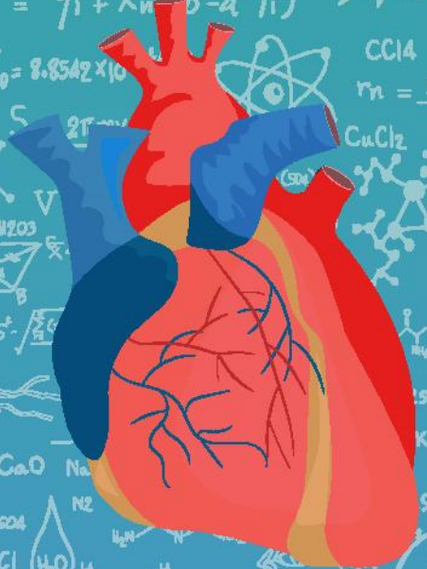
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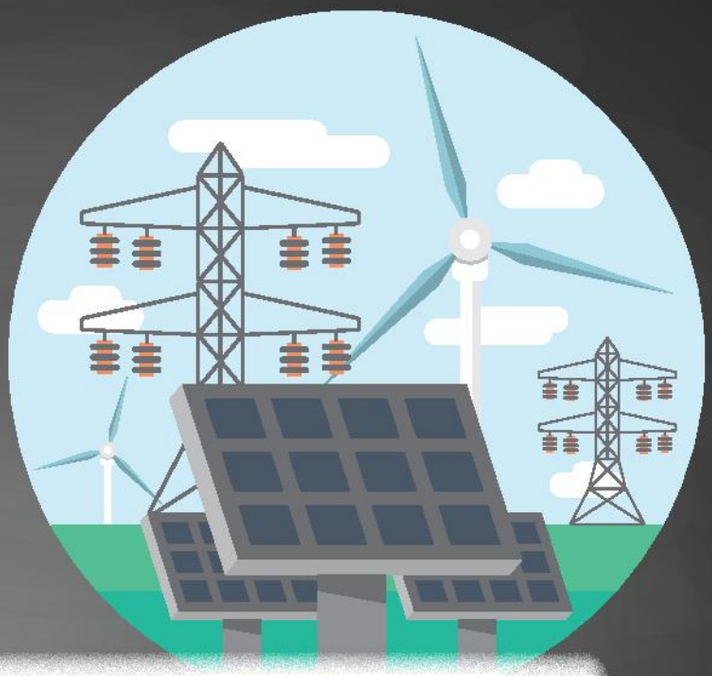
SCIENCE

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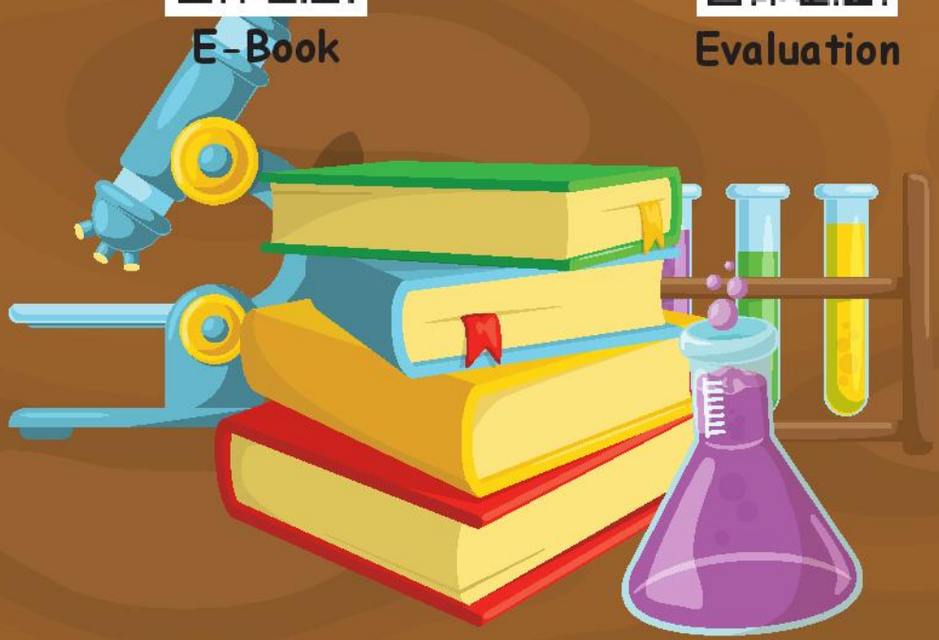
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3	Energy	121	Jul - Aug
4	Science in Everyday Life	130	Aug - Sep

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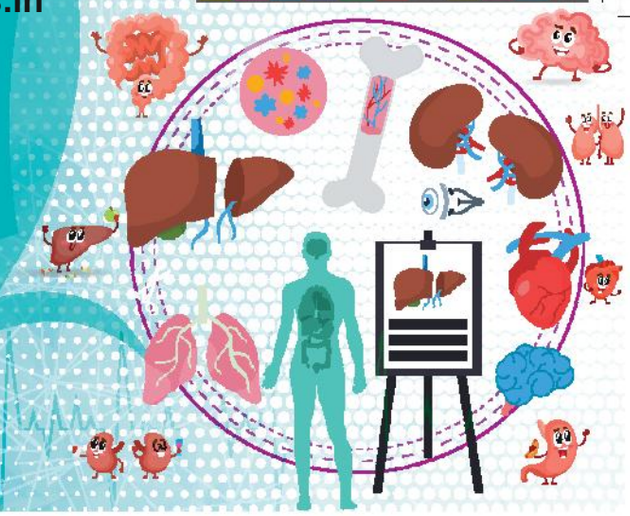
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Evaluation



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1 Organ Systems



Learning Objectives

After completing this lesson, students will be able to:

- know about different organ systems of human body.
- identify different organs.
- understand the functions of different organs.

Introduction

We get energy for our daily activities from the food we eat. How is the food broken down into simpler forms? It is through the process called digestion. After we eat the food, it is digested and the waste products are removed from the body. The process involved in removal of wastes is called excretion. We need oxygen to survive. Our body gets oxygen through the process called respiration. These processes are carried out by different organs in our body. Different organs together form an organ system. In this lesson we will study about different organ systems in our body and their functions.

I. Digestive System

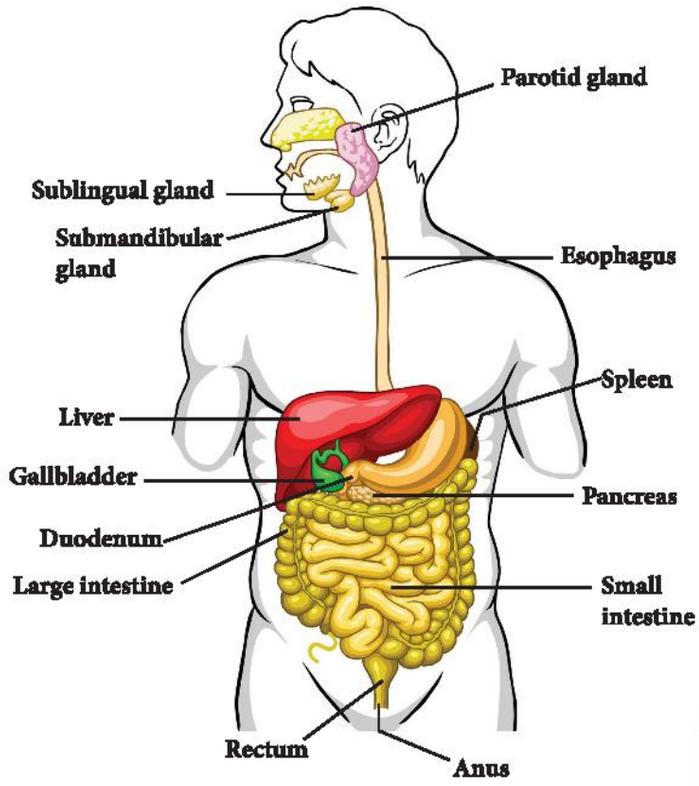
The food we eat consists of complex compounds like carbohydrates, proteins and fats. They have to be converted into simpler molecules like glucose, amino acids, and fatty acids and glycerol respectively. These simpler molecules are then assimilated either by blood or lymph in order to give us energy. The process of conversion of complex food molecules into simpler molecules is called digestion. The digestive system can be divided into two.

1. Digestive tract 2. Digestive glands

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1 Digestive Tract (Alimentary canal)

It is a coiled muscular tube extending from the mouth to the anus. It is about 6-9 metres long and consists of many specialized divisions. They are sequentially arranged as mouth, buccal cavity, pharynx, esophagus, stomach, small intestine, large intestine, rectum and anus.



Mouth
↓
Buccal cavity
↓
Pharynx
↓
Esophagus
↓
Stomach
↓
Small intestine
↓
Large intestine
↓
Rectum
↓
Anus



Do you know?

There are some organisms which live in the digestive systems of animals. For example, tape worm lives in the human intestine.

2 Digestive Glands

Three important digestive glands associated with the process of digestion are:

1. Salivary glands
2. Pancreas
3. Liver

Salivary glands secrete saliva which moistens food. Saliva contains enzymes which break down complex molecules into simple molecules. Pancreas produces pancreatic juice which contains digestive enzymes for digesting fats, proteins and carbohydrates. Liver produces bile for the digestion of fat.



Do you know?

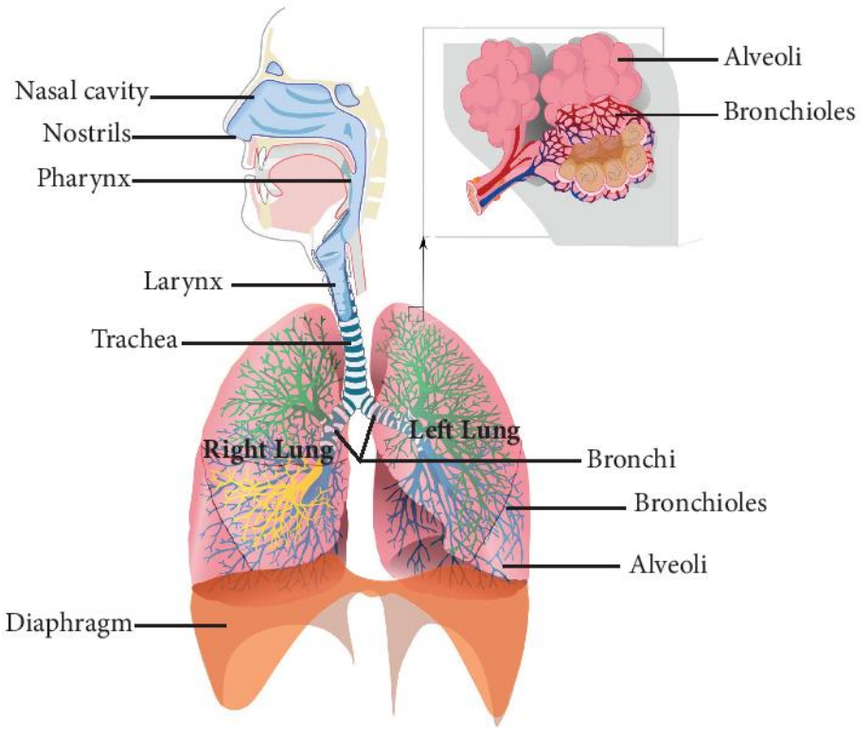
The three pairs of salivary glands parotid, sublingual and submandibular secrete approximately 1.5 litre of saliva every day.



II. Respiratory System

The respiratory system provides oxygen to the tissues of the body and removes carbon dioxide from the tissues. There are three major parts forming the respiratory system.

1. Airway 2. Lungs 3. Muscles of respiration



- Nostrils
- Nasal cavity
- Pharynx
- Larynx
- Trachea
- Bronchi
- Bronchioles
- Alveoli



Do you know?

People suffer due to smoke. Smoke contains large amount of carbon monoxide, a toxic gas. People when engulfed in smoke or fire die due to suffocation.



Activity 1

Sit quietly and count how many times you breathe per minute. On an average, we breathe 16-18 times per minute. Can you guess the number of times you breathe in a day? On an average, we breathe more than 20,000 times in a day.

1 Airway

The airway includes the nasal cavity, pharynx, larynx, trachea, bronchi and bronchioles. It carries air between the lungs and the surrounding.

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2 Lungs

The lungs are the primary organs of the respiratory system. They are paired, cone-shaped organs. They are located in the thoracic chamber (rib cage) on both sides of the heart.

3 Muscles of Respiration

Muscles of respiration include diaphragm and intercostal muscles. They help to push the air in and out of the lungs during breathing.



Do you know?

- Air pollution causes many respiratory diseases.
- Smoking can cause lung cancer.



III. Circulatory System

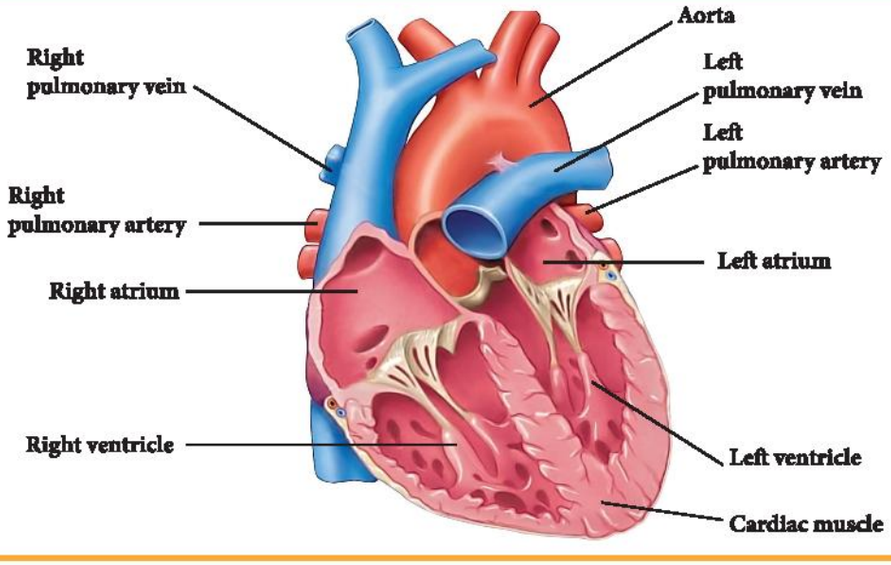
In this system blood is circulated to transport oxygen and nutrients to every part of the body. Circulatory system consists of the following.

1. Heart
2. Blood vessels
3. Blood

3NB52

1 Heart

The heart is a hollow, muscular organ. It is somewhat conical in shape. It is covered with double walled membrane called pericardium. The space between the membranes is filled with pericardial fluid. The pericardial fluid protects the heart from shock. Heart is placed inside the thoracic chamber (rib cage) in between the two lungs.



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The heart is divided into four chambers. Two upper chambers are called atria (Singular-atrium) or auricles. Two lower chambers are called ventricles. The upper and lower chambers of the heart are separated by a muscular wall or tissue known as the auriculo - ventricular septum of the heart. The right side of the heart receives deoxygenated blood from various parts of the body and pumps it to the lungs for oxygenation. The left side of the heart receives oxygenated blood from the lungs and pumps it to different parts of the body.

2 Blood Vessels

Blood vessels consist of arteries, veins and capillaries. Arteries carry oxygenated blood (except pulmonary artery which carries deoxygenated blood from the heart) and veins carry deoxygenated blood (except pulmonary vein which carries oxygenated blood to the heart).

Capillaries are thin blood vessels which connect the arteries and veins. They help in exchange of materials between circulatory system and body tissue.

3 Blood

Blood transports nutrients, oxygen, wastes and hormones. The volume of blood in human adults is 4-5 litres. It regulates water level and the body temperature. Blood is pumped throughout the body by the heart. It takes oxygen to the tissues and cells and finally reaches the lungs to take oxygen again.



Do you know?

There are some animals like lobsters and crabs that have blue blood. Cockroach has colourless or white blood.



Activity 2

Locate your pulse points either on wrist or neck. Place your right index and middle finger on the palm side of your left wrist. On the neck the pulse point is located beneath the ear and jaw bone. Count the number of beats for 15 seconds. Multiply this by four. This shows how many times the heart beats in one minute.



IV. Excretory System

Excretory system removes the waste products from the body. It also regulates water and electrolyte balance. Kidneys, lungs, liver and skin together function as excretory organs. Excretory system consists of the following.

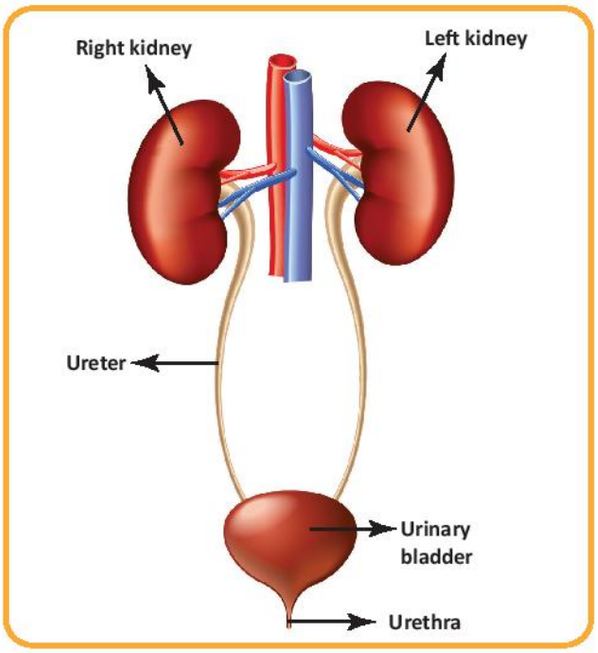
1. Kidneys
2. Ureters
3. Urinary bladder

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1 Kidneys

The kidneys filter the blood to remove waste and produce urine. The kidneys are a pair of dark red, bean shaped organs placed behind the abdomen on either side of the vertebral column. The average adult's kidney measures about 12 cm in length, 6 cm in width and 3 cm in thickness. Right kidney is slightly lower than the left kidney. Each kidney is covered by a fibrous membrane called capsule.

The kidneys are made up of millions of excretory units, called nephrons, which are the structural and functional units of the kidneys.



2 Ureters

Two ureters connect the kidneys with the urinary bladder. Urine formed from each kidney reaches urinary bladder through ureters.

3 Urinary Bladder

It is sac-like in shape and acts as a temporary storage organ of urine. Urine entering the urinary bladder from the ureters slowly fill the hollow space inside the bladder. Urine is expelled from the body through the urethra.



Do you know?

Every minute, kidneys receive approximately 1.25 litre of blood.



V. Nervous System

Nervous system is an integration of nerves and they are composed of specialised cells called neurons. The human nervous system is divided into the following.

1. Central Nervous System (CNS)
2. Peripheral Nervous System (PNS)

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1 Central Nervous System

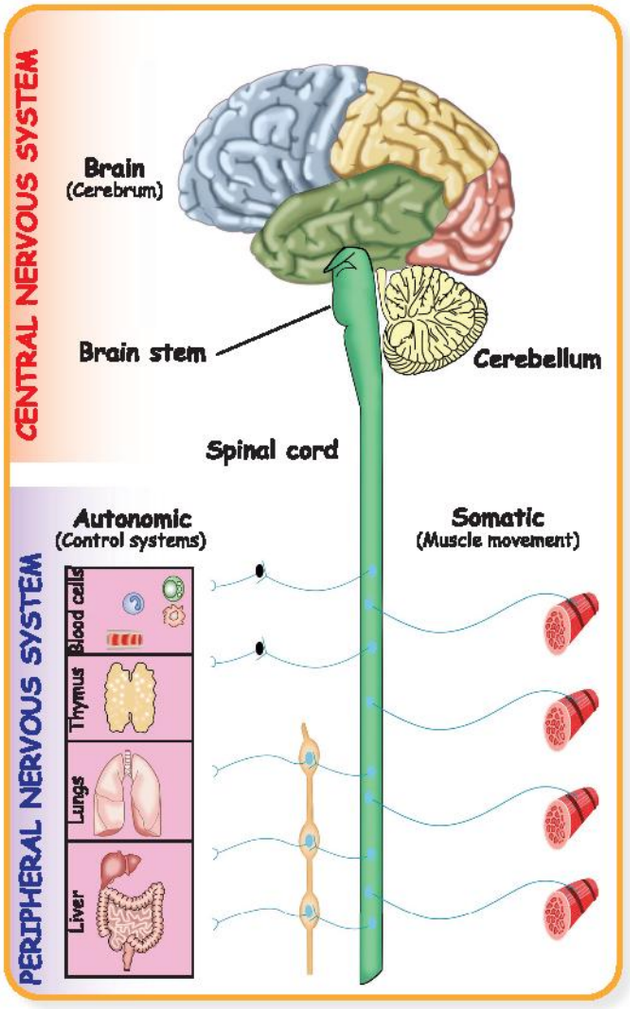
Central nervous system consists of the brain, the spinal cord and the nerves.

❖ Brain

Brain controls all our activities like thinking, reading and writing. The brain is covered by three membranes called meninges. They are dura mater, arachnoid membrane and pia mater. The meninges protect the CNS from mechanical shock. It is made up of eight immovable bones. The brain is made up of millions of functional units called neurons.

Human brain is divided into three major parts.

- Forebrain
- Midbrain
- Hindbrain



Forebrain

- The forebrain consists of cerebrum, thalamus and hypothalamus.
- It is the largest part of the brain.
- It is the centre of human memory.
- It is responsible for intelligence, imagination and reasoning.



Do you know?

The weight of human brain is approximately 1.36 kilogram.

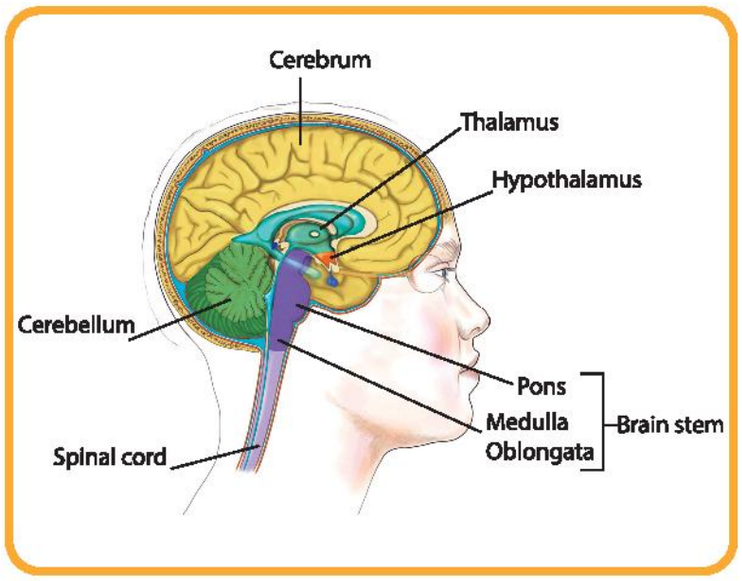
Midbrain

- It lies behind the cerebrum.
- It co-ordinates the movements of the muscles of the body.
- It regulates our vision, hearing, sleep and body temperature.

Hindbrain

- The hindbrain comprises of pons and medulla oblongata.
- It is also called the brain stem.
- It is called 'vital knot' because it controls breathing, heart beat and other involuntary muscles.
- It connects the brain to the spinal cord.

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Do you know?

- The brain needs a continuous supply of oxygen for better functioning.
- The brain loses the ability to function when it does not get oxygen for more than 4 minutes.
- Enough sleep and healthy food increase the efficiency of our brain.

❖ Spinal cord

Spinal cord is a long tube like structure which extends from the brain. It lies within the back bone of our body.

2 Peripheral Nervous System

Peripheral nervous system consists of nerves extending from the spinal cord to all parts of the body. It is made up of two parts.

- Somatic Nervous System
- Autonomic Nervous System

Somatic nervous system carries sensations from the organs to the brain and takes messages from the brain to the organs for movements. Autonomic nervous system controls the nerves of the inner organs of the body.



Evaluation

E4T17

I. Choose the correct answer.

1. What is the length of the alimentary canal?

   a) 3-5 m b) 5-6 m c) 9-11 m d) 6-9 m

2. Which organ is involved in respiration?

   a) Kidney b) Lungs c) Heart d) Brain

3. How many kidneys do we have?

   a) 2 b) 3 c) 1 d) 4

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4. Functional unit of brain is

a) neuron b) nephron c) brain stem d) nerves

5. Blood is pumped by

a) lungs b) heart c) kidneys d) bones

II. Fill in the blanks.

1. A group of organs together make up an _____ system.
2. The process by which the body removes waste is called _____
3. The number of chambers in human heart are _____
4. The functional unit of kidney is _____
5. The human nervous system is divided into _____ parts.

III. Say True or False.

1. The circulatory system is made up of the heart, blood and blood vessels.
2. Important function of the heart is to transport blood with nutrients, oxygen, waste and hormones.
3. The brain is protected by the rib cage.
4. The functional unit of kidney is neuron.

IV. Circle the odd one.

1. a) Mouth b) Buccal cavity c) Pharynx d) Lungs
2. a) Nostrils b) Nasal cavity c) Pharynx d) Stomach
3. a) Mouth b) Esophagus c) Stomach d) Kidney
4. a) Tasting b) Hearing c) Thinking d) Smelling
5. a) Cerebrum b) Cerebellum c) Medulla oblongata d) Nephron

V. Match the following.

1. Digestive system - Kidney
2. Respiratory system - Brain
3. Circulatory system - Alimentary canal
4. Excretory system - Heart
5. Nervous system - Lungs

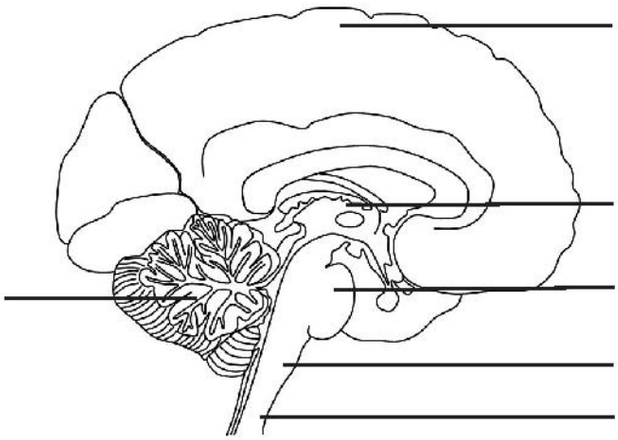
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VI. Answer briefly.

1. Name the salivary glands in our mouth.
2. What is respiration?
3. What is the function of pericardial fluid?
4. Name the chambers in human heart.
5. Arrange the excretory system in correct sequence.
   (Urinary bladder, Ureter, Kidney, Urethra).
6. What are the two parts of peripheral nervous system?
7. What are the functions of blood?

VII. Answer in detail.

1. List out the functions of the digestive system.
2. Explain the main parts of the circulatory system.
3. Explain three major parts of human brain.
4. Label the diagram given below.



VIII. Questions based on higher order thinking (HOT).

1. Why it is important to wear helmet while riding a bike?
2. Eating fast food and junk food affects our health. Justify.

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2 Matter and Materials

Learning Objectives

After completing this lesson, students will be able to:

- know about matter and materials.
- understand the process of manufacturing fabrics.
- know the varieties of grains and the food products.
- understand why do things float or sink.

5Z3AT

Introduction

Our needs have increased in the modern days and we use a number of things in our daily life. We get some of them from the nature and some of them are manufactured artificially. The things you use like pen, pencil, ink, eraser, note book, ball and the food you eat, all have different nature and characteristics. They are obtained by transforming the natural and artificial substances. In this lesson we will study about different things used in our life and how they are obtained.

I. States of Matter

Matter is anything that has mass and occupies space. Matter can exist in three physical states: solid, liquid and gas. It is made up of molecules and the molecules are made up of atoms.

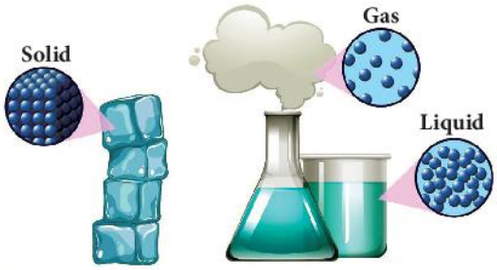
❖ Solid

In solids, molecules are very closely packed. Solids are incompressible. They have definite shape, size and volume.

❖ Liquid

In liquids, molecules are loosely packed. Hence, liquids are negligibly compressible. They have definite volume, but no definite shape and size.

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❖ Gas

In gases, molecules are very loosely packed. Hence, gases are highly compressible.



Activity 1

Look at your surrounding. Give some examples for solids, liquids and gases.

Solids	Liquids	Gases

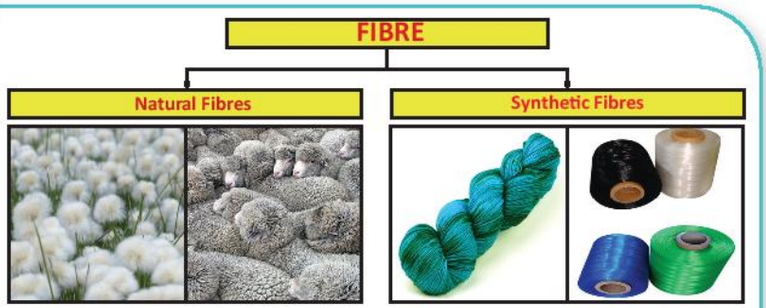


II. Materials

A material is a mixture of substances that constitute an object. They can be pure or impure, natural or man made. Materials are required to get the things needed for our daily life. We need food, dress and many other goods for our daily living. Natural and man made materials are transformed to produce these things.



III. Fibres



Fibre is a thin thread of natural or artificial substances. It is used to make cloths with the help of power looms or weaving machines. The fibres we get from plants and animals are called natural fibres. Cotton, jute, coir and flax are examples for plant fibres. Wool and silk are examples for animal fibres. Fibres made by humans by chemical synthesis are called synthetic fibres or artificial fibres. Rayon, nylon, acrylic and dacron are examples for artificial fibres. These fibres are obtained from petroleum by complex chemical processes.

1 Natural Fibres



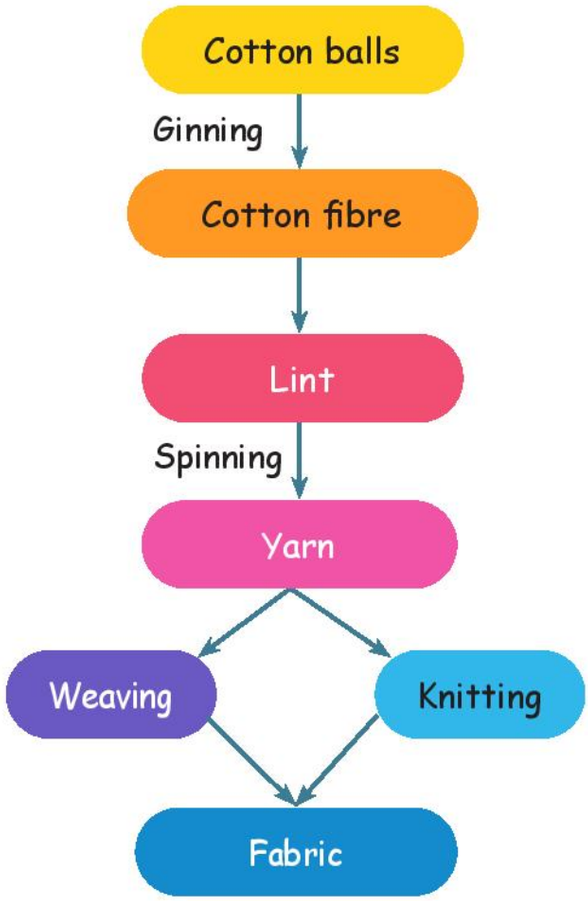
❖ Cotton

A cotton plant is a bushy plant of 5 to 6 feet high. Cotton grows well in black soil and alluvial soil. The cotton plant bears a large number of small green pods called cotton balls. These balls contain seeds covered with white fibres. When the cotton balls mature, they burst exposing the white fibre of cotton. Cotton is usually hand picked from the plants.

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Ginning

There are two processes to make cotton yarn from cotton fibre. The raw fibres are separated from the seeds by a process known as ginning. The fibrous material left after separating cotton seeds is called lint. The lint is then tied and pressed into balls. The final proportions of short fibres and other impurities are removed by the process of combing.



Spinning

The process of making yarn from lint (fibre) is called spinning. Spinning is done on a large scale with the help of spinning machines.

Yarn to fabrics

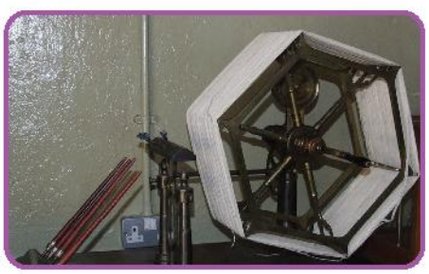
Weaving and knitting are the two most important processes used for making fabric from the yarn. The process of making two sets of yarns together to make fabric is called weaving. It is done by weavers on a machine called loom. The looms are either hand – operated (hand looms) or power - operated (power looms). During knitting a single yarn is used to make a piece of fabric. It is done by hand and also on machine.



Spinning



Weaving



Knitting

Uses of Cotton

- It is used to manufacture cotton textiles and garments.
- It is used as fillers in pillows and mattresses.
- It is used for making surgical bandages.
- It is used for making dhotis, sarees, bedsheets, table cloth and so on.

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❖ Jute

Jute fibre is obtained from the stem of the jute plant. Jute plant has long, soft and shiny fibres. It is also known as golden fibre due to its colour and cost effectiveness. Jute fibres are separated from the process of retting jute by hand and then they are dried. These are converted into yarns in the same manner as in the case of cotton.



Uses of Jute

- ➔ It is used for making bags, carpets, curtains and ropes.
- ➔ It is used for making cloths for wrapping bales of raw cotton and to make sacs for storing grains.
- ➔ It is used for making wall hangings for decoration.



❖ Coir

Coir fibre is obtained from the outer covering of coconut. It is used to make floor mats, door mats, brushes and mattresses.



2 Synthetic Fibres (or) Manmade Fibres

These fibres are made by human beings with the help of chemical process. Hence, they are called synthetic fibres or manmade fibres. These fibres are obtained from coal, petroleum and natural gas.

Synthetic fibre	Sources
Rayon	Wood pulp
Nylon	Coal
Polyester	Petroleum products
Acrylic	Natural gas



Activity 2

Classify the following fibres.
Polyester, Jute, Silk, Nylon, Cotton, Wool, Acrylic, Rayon.

Synthetic Fibres	Natural Fibres

Uses of Synthetic Fibres

- Rayon is used to make rope, cloth, cap, tyre cords and carpets.
- Nylon is used to make fishing nets, ropes, parachutes, fabrics and bristles for brushes.
- Polyester is used to make fabric for suits and shirts, hoses, conveyor belts, films, PET bottles and wires.
- Acrylic is used to make sweaters, shawls and blankets.



Do you know?

The world's most valuable fibre is obtained from a small wild animal called Vicuna. It belongs to a camel family.





IV. Grains

Grain is a small, hard, dry seed. Each grain is protected by a husk and the husk encloses the seed. Two main types of commercial grain crops are cereals and legumes. Wheat, maize, rice, beans, peas, barley and millets are some of the whole grains.

❖ Wheat

This is the most important crop in the world. Whole wheat is important because it is rich in fibre, vitamins and minerals. Wheat products are breads, cakes, pasta, wheat germ and cracked wheat.



❖ Maize

In many tropical and sub tropical countries (Mexico and America) maize is the main food that people eat. It is also known as corn. Maize oil is extracted from corn for cooking. Yellow or coloured corn may promote eye health. It is also a rich source of many vitamins and minerals. Corn syrup is used as a sweetener instead of sugar in many products. Maize products are sweet corn, breakfast cereal, tortilla chips, taco and maize oil.



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❖ Rice

Rice is a type of grass. It is cultivated worldwide after sugarcane and maize. Large parts of the world's human population especially people in Asia have this as their main food. Ninety percent of the world's rice production is in Asia. White rice contains few essential nutrients. Brown rice is a whole grain that contains the fibrous bran. Brown rice is usually considered much healthier than white rice. Rice idly, idiappam and rice aval (flattened rice) are the food items prepared from rice.



❖ Millets

Millets are a group of small seeded grasses. They are widely grown around the world as cereal crops for fodder and human food. It helps in weight loss. It is rich in fibre. Some of the millets are sorghum, foxtail millet, finger millet, pearl millet, barnyard millet, kodo millet and little millet.





V. Household Things

These are the products that we use in our houses. The things that are found in our houses permanently are called household things. House hold things are furniture, kitchenware, clothes, towels, beddings, boots and electronic goods etc.

Household things used in the olden days



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Household things used in the modern days








VI. Sinking and Floating

You could have seen that some objects float in water while others sink. Whether an object floats or sinks in water is determined by its density. When an object is immersed into a liquid, the liquid exerts an upward force on the object. It is known as upthrust. What happens if you put a coin and an empty water bottle in water? The weight of the coin is greater than the upthrust and so the coin sinks. But the weight of the empty water bottle is less than the upthrust and so it floats.



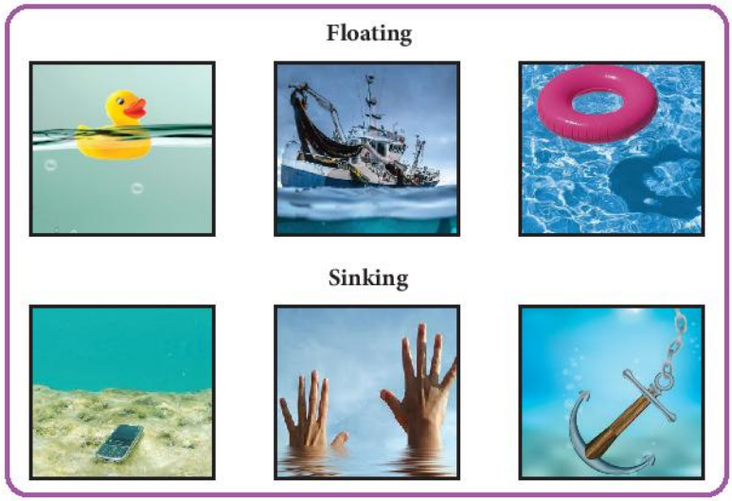
Activity 3

Take water in a bucket and drop the following items into the water.

Apple, Scissors, Silver fork, Marbles, Plastic ball.

Complete the table from your observation.

Things	Floats / Sinks
Apple	
Scissors	
Silver fork	
Marbles	
Plastic ball	





Do you know?

A fish can control the upthurst on its body. So, it can float and go beneath the surface of the water.

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VII. Solubility of Solids in Water

Some substances completely dissolve in water. We say that these substances are soluble in water. Other substances do not dissolve in water even after we stir for long time. These substances are insoluble in water.



Activity 4

Collect some samples of solid substances such as salt, sugar, chalk powder, sand and saw dust.

Take five beakers filled with water and add a small amount of sugar to the first beaker, salt to the second and similarly, add small amounts of other substances in other beakers. Stir the content with a rod. Wait for a few minutes. What happens to the substances added? Note your observation.

Substances	Disappears in water / Does not disappear
Salt	
Sugar	
Chalk powder	
Sand	
Saw dust	



Sugar in water



Chalk in water



Sand in water

VIII. Mixing

Certain liquids are denser than other liquids. When you attempt to mix liquids which have different densities they separate when you stop mixing them. The heavier liquid deposits at the bottom and the lighter liquid floats on the top.

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Activity 5

Collect samples of coconut oil, kerosene, mustard oil, lemon juice and vinegar. Take five test tubes and fill them with water up to half mark. Add a spoon full of one liquid to this and stir it well. Keep it in a test tube stand and wait for few minutes. Observe whether the liquid mixes with water. Repeat the experiment with other liquids and tabulate your observation.

Liquid	Mixes well / Does not mix
Lemon juice	
Vinegar	
Mustard oil	
Coconut oil	
Kerosene	



Vinegar in water



Coconut oil in water



Do you know?

- Substances with similar chemical properties will mix.
- Substances with different chemical properties will not mix.



Evaluation

PQB8X

I. Choose the correct answer.

1. Which of the following are the states of matter?
   a) Solid, Liquid, Water b. Solid, Liquid, Gas
   c) Solid, Liquid, Wood d. Solid, Liquid, Sugar
2. Which of the following is a solid?
   a. Kerosene b. Air c. Water d. Apple
3. Jute fibre is obtained from
   a. leaf b. stem c. flower d. root

II Fill in the blanks.

1. _____ soil is suitable for growing cotton.
2. The process of making cotton yarn from cotton fibre is _____.
3. Ginning is done to separate _____ from the seeds.
4. Synthetic fibre is also called _____ fibre.
5. Woolen clothes are manufactured from _____ (plants / animals).

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III. Match the following.

Yarn	-	Ginning
Lint	-	Spinning
Fabrics	-	Wood pulp
Rayon	-	Stem
Jute	-	Weaving

IV. Say True or False.

1. Coir is the outer covering of coconut.
2. Beans and peas are pulses.
3. Table is a household thing.
4. Sweet corn is not a product of maize.
5. Cotton balls contain jute fibre.

V. Complete the given analogy.

1. Solid : Table :: _____ : Water
2. Cotton seed : _____ :: Lint : Spinning
3. Coir fibre : _____ :: Cotton fibre : Cotton plant
4. Black pepper : Spice :: Sweet corn : _____

VI. Answer in brief.

1. What is known as ginning?
2. Give two examples for food products made from wheat.
3. What are synthetic fibres?
4. What is known as upthrust?
5. Name the list of whole grains.

VII. Answer in detail.

1. Discuss briefly about three states of matter.
2. Draw a flow chart to indicate the process of making fabrics from cotton ball.

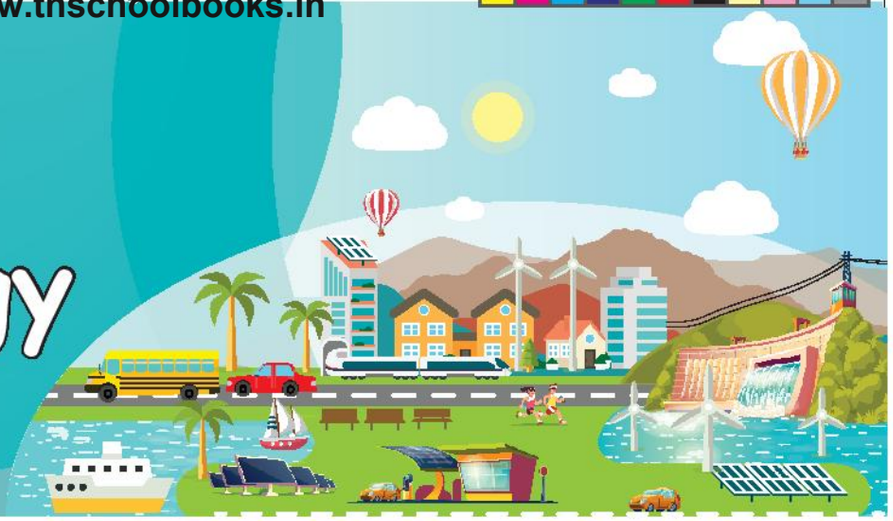
VIII. Give reason.

1. Why umbrellas are made up of synthetic cloths?
2. What determines whether an object floats or sinks in a fluid?

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3 Energy



Learning Objectives

After completing this lesson, students will be able to:

- know about different forms of energy.
- explain the energy changes in daily life.
- understand the law of conservation of energy.
- list out the uses of energy.

IQMOB

Introduction

Mala was standing in the row for her morning school assembly. Suddenly she fainted and fell down. Her class teacher rushed to her, took her to the class room and gave her water to drink. She came to know that Mala had skipped her breakfast. She was given some food and then she came back to normal. What do you understand from this?

We need energy to do our daily activities. We get this energy from the food. In science, energy is defined as the capacity to do work. Let us study about different forms of energy and their uses in this lesson.

I. Different forms of Energy

We do many works in our daily life. Many of them are done physically. Some works are done with the help of instruments and devices. But, they also need energy to work. There are different forms of energy like mechanical energy, heat energy, light energy, wind energy and so on. Let us study about them here.

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Activity 1

Find out what do we need for the following.



To drive bus | To dry cloth | To cook | To work in laptop

1 Mechanical Energy

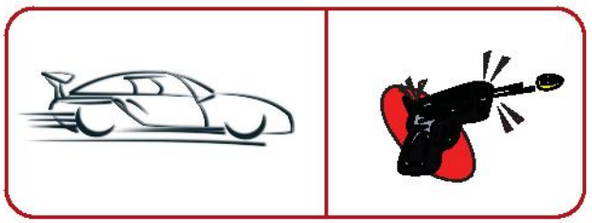
Energy possessed by an object due to its motion and position is called mechanical energy. Mechanical energy can be classified into two.

- Kinetic Energy
- Potential Energy

Kinetic Energy

Energy possessed by a moving object is known as kinetic energy. It is also known as energy of motion.

Examples: Moving car, cricket ball bowled by a player, bullet coming out of a gun.



Potential Energy

Energy possessed by an object which is at rest is known as potential energy. It is also known as stored energy of position.

Examples: Object lifted above, stone in the stretched rubber, water in the dam.



Uses of Mechanical Energy

Mechanical energy can be used to do many works. Some of them are given below.

- In hydro electric plants, kinetic energy of water is converted into electrical energy.
- Wind mills convert kinetic energy of winds into electrical energy.
- Mechanical energy of the hammer is used to apply force on the nail.
- Mechanical energy can bring a moving body to rest and make a body at rest to move.

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Activity 2

Find out the form of energy in the following.



2 Wind Energy

Energy possessed by the wind is known as wind energy.

Uses of Wind Energy

- Wind mills use wind energy to generate electricity.
- Ships sail by the power of wind.
- Sports like wind surfing, sailing, kite surfing use wind energy.
- Wind energy can be used for pumping water.



Do you know?

Tamil Nadu stands first in generating electricity from wind mills. Wind mills are located in places like Aralvaimozhi, Kayatharu and Gudimangalam.



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3 Heat Energy

When the temperature of a substance is raised, its atoms and molecules begin to vibrate and release a kind of energy. This energy is known as heat energy or thermal energy. This energy flows from a hot substance to a cold substance.



Do you know?

Heat is the total energy of the molecules in a body. Temperature is the measure of heat in a body.

If we put some ice cubes into water in a glass, water becomes cold. It is because, heat is transferred from water to ice.



Activity 3

Rub your hands together. What do you feel in your hands? Do you feel the heat generated by friction?



Activity 4

Take a small amount of lime powder in a glass. Add some water and stir well. Touch the glass outside. How do you feel?

In both the cases, you can feel the heat. Thus, heat is produced by friction and chemical reactions also. Sun is the primary source of heat energy.

Uses of Heat Energy

- Heat energy obtained from power stations is used to generate electricity.
- Heat energy obtained from petrol and diesel is used to run vehicles.
- We cook food with the help of heat. Heat energy renders the food material soft and easy to digest.
- Hard substances like iron are heated to mould them into different shapes.
- Heat is used to dry clothes and other wet substances.



4 Light Energy



Do you know?

Study of light is known as Optics.

Light is a form of energy which travels as a wave. It contains a particle called photon which are the minute packets of energy. It is the only form of energy visible to human eye. Light does not require any medium to travel. It travels at a speed of 3,00,000 km/s. Sunlight takes 8 minutes and 20 seconds to reach the earth.

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Uses of Light Energy

- We are able to see objects with the help of light energy.
- Plants use light energy to synthesis their food.
- With the help of light energy, our skin is able to synthesis Vitamin-D.
- Electricity can be produced with the help of light energy.



5 Electrical Energy

We know that all things are made up of atoms. Atoms possess particles like protons, electrons and neutrons. Movement of electron in the objects causes an energy. This energy is called electrical energy. In our daily life we use batteries to get electrical energy. Electrical energy is also generated from nuclear power plants, hydroelectric plants and wind mills. It is also generated from solar energy.

Uses of Electrical Energy

- Electrical energy is needed for the working of fan, light, television, washing machine, refrigerator etc.
- Electric iron box, electric stove and electric water heater work by electrical energy.
- It is used to run cars and trains.
- It is used in factories to produce materials.



Do you know?

'Electric eel' is a fish which generates electrical energy. It uses this energy to defend itself against its predators.



Activity 5



Mention the places in Tamil Nadu where electrical energy is generated in power plants.

Nuclear plant	Hydroelectric plant	Thermoelectric plant



6 Chemical Energy

Chemical energy is stored in substances when atoms join together to form chemical compounds. When two or more chemical substances react with each other, this energy is released.



Activity 6

Observe the stove burning in your kitchen.
Do you see the light and feel the heat?
Where do you get these from?

Uses of Chemical Energy

- The food we eat contains chemical energy.
- Chemical energy in wood provides heat energy which helps us to cook food.
- Chemical energy in coal is used to generate electricity.
- Batteries we use in our daily life contain chemical energy.
- Fuels like petrol and diesel possess chemical energy which is used to run vehicles.



II. Conservation of Energy

Energy cannot be created and it cannot be destroyed also. It is changed from one form to another form or transferred from one object to another object. We can say many examples for conservation of energy in our daily life.

1 Water Dam

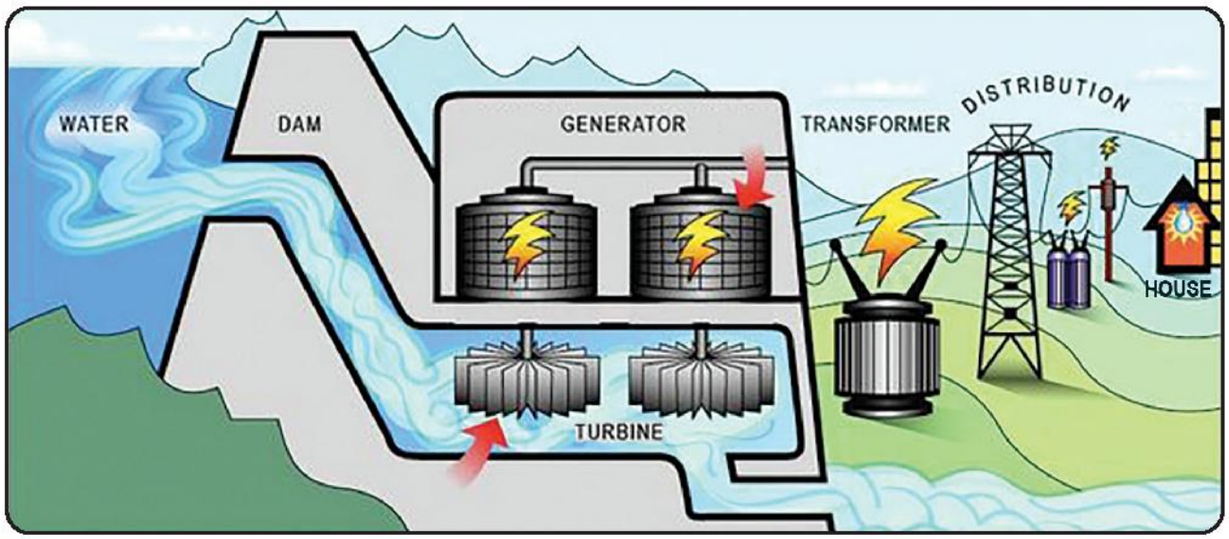
Water stored in water dams possesses potential energy. When water falls down, potential energy of water is converted into kinetic energy. Kinetic energy of water rotates the turbines and electric energy is generated.



Do you know?

Law of conservation of energy states that energy can neither be created nor be destroyed. One form of energy is converted into another form of energy. This law was given by Julius Robert Mayer.

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2 Electrical Appliances

Electrical energy is used in many domestic appliances such as electric stove, iron box and fan. As current flows into the coil of the electric devices, it heats up the coil. With the help of this heat energy, we do many useful works. Thus, electrical energy is converted into heat energy. Electrical energy is converted to mechanical energy in fan, light energy in bulb and, sound and light energy in computer.

WLEPA



3 Driving Car

We use fuel in the form of petrol or diesel or gas to run vehicles. When this fuel burns in the engine, chemical energy is converted into heat energy. Burning fuel produces hot gases which pushes the piston in the engine to move the vehicle. Thus, heat energy is converted into mechanical energy.

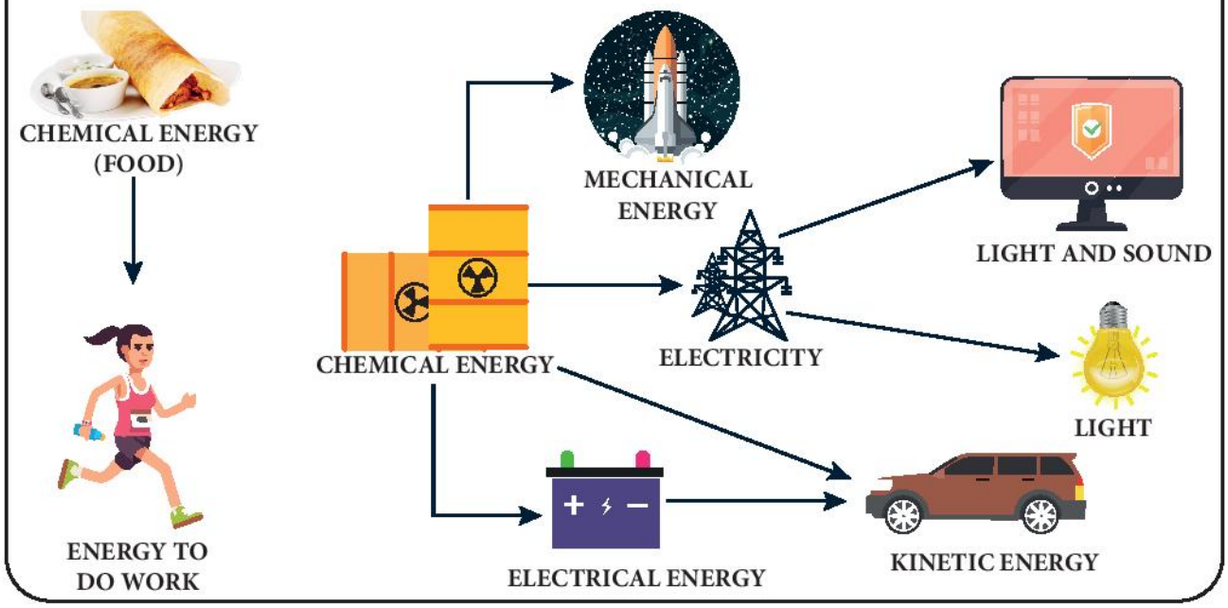


Do you know?

Photosynthesis changes solar energy into chemical energy.

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Conservation of Energy



Evaluation

C8HAF

I Choose the correct answer.

1. When diesel is burnt chemical energy is converted into _____.
   a) wind energy b) heat energy
   c) solar energy d) sound energy
2. Running water possesses _____
   a) potential energy b) chemical energy
   c) kinetic energy d) sound energy
3. Unit of energy is _____
   a) kilogram b) Newton
   c) Kelvin d) Joule
4. Which one of the following requires wind energy?
   a) Bicycle b) Photosynthesis
   c) Parachute d) Automobiles
5. Cow dung possesses _____.
   a) kinetic energy b) chemical energy
   c) solar energy d) heat energy

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II. Find out the energy conversion that takes place in the following.

1. Iron box : Chemical energy ➔ Heat energy
2. Electric iron box : _____ ➔ _____
3. Electric fan : _____ ➔ _____
4. Speaker : _____ ➔ _____
5. Generator : _____ ➔ _____

III. Find out the form of energy possessed by the following things.

1. A rock on the top of a hill
2. A rolling ball
3. Charcoal
4. Water falls
5. Battery

IV. Match the following.

1. Electric bell	-	Heat energy
2. Water in dam	-	Light energy
3. Solar heater	-	Chemical energy
4. Petrol	-	Potential energy
5. Torch light	-	Sound energy

V. Say True or False.

1. An apple falling from a tree is an example for kinetic energy.
2. Electrical energy is used to run electric trains.
3. Heat energy cannot be produced by friction.
4. Potential energy and heat energy are the two forms of mechanical energy.
5. The unit of energy is Joule.

VI. Answer in brief.

1. What is energy?
2. What are the different forms of energy?
3. What are the uses of mechanical energy?
4. State the law of conservation of energy.
5. Mention the uses of light energy.

VII. Answer in detail.

1. Explain the types of mechanical energy.
2. Explain the conservation of energy.

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4 Science in Everyday Life



Learning Objectives

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After completing this lesson, students will be able to:

- know about scientists from Tamil Nadu.
- understand the reason for the blue appearance of the sky.
- differentiate reversible and irreversible processes in daily life.
- get awareness about waste materials generated in home and school environment.

Introduction

Science has helped us to find solution to many of our problems. It has shaped our daily life also. The world we are living in is not the same as before. It is changing everyday, in fact every hour. We see a lot of changes around us. Some of them are reversible and some of them are irreversible. Irreversible changes like burning of wastes pollute our home and school environment. We need to know about waste management and proper disposable of wastes. Let us study about them in this lesson.

I. Scientists from Tamil Nadu

Tamil Nadu has a long history of science since ancient times. Scientific concepts can be seen in ancient Tamil literatures. Tamil Nadu has produced many scientists who have contributed to the world of science. The following table gives the names of some of the scientists from Tamil Nadu and their contributions.

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Name of the Scientists	Department	Contribution
Dr. M.S. Swaminathan	Genetics	Green revolution
Srinivasa Ramanujam	Mathematics	Composite numbers
Venkataraman Radhakrishnan	Biology	Structure of ribosome
Dr. A.P.J. Abdul Kalam	Aeronautical Engineering	Missile development
Sir. C.V. Raman	Physics	Scattering of light

1 Sir. C.V. Raman (1888-1970)



Chandrasekhara Venkata Raman was born at Trichirapalli, Tamil Nadu on 7th November, 1888. In 1904, he completed his Bachelor of Arts (B.A) degree at Presidency College, Chennai. He stood first and won gold medal in Physics. In 1907, he got his master degree from University of Madras.

Sir.C.V. Raman won the Nobel Prize in Physics in the year 1930 for his work on scattering of light. In 1954, he was awarded the Bharat Ratna.

Blue appearance of the sky

One day in the summer of 1921, Sir.C.V. Raman was on the deck of a ship sailing in the mediterranean sea. He was observing the blue colour of the sky and started reasoning it. He concluded that sunlight is scattered by the gases and particles present in the air. The white light we see is composed of different colours such as violet, indigo, blue, green, yellow, orange and red (VIBGYOR). Among these colours, blue is scattered more. Because of this reason, sky appears blue most of the time. During sunrise and sunset, rays have to travel long distance. As they travel, all other colours except red are scattered. So, sky appears red at sunrise and sunset.





Do you know?

National Science Day is celebrated on 28th of February in order to commemorate the invention of the Raman Effect by Sir Chandrasekhara Venkata Raman on the same day in the year 1928.

2 Dr. A.P.J. Abdul Kalam (1931-2015)



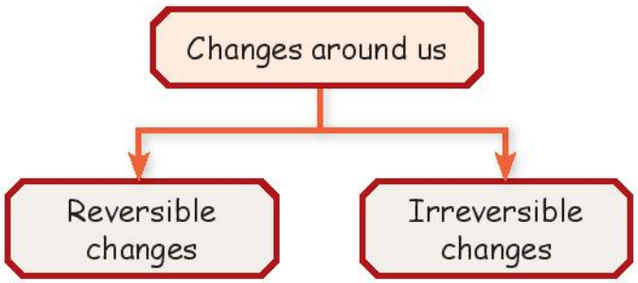
Avul Pakir Jainulabdeen Abdul Kalam was an aeronautical scientist. He was born on 15th October, 1931 in Rameshwaram, Tamil Nadu. He got his Bachelor of Science (B.Sc) degree from St.Joseph's College, Trichirappalli in 1954. In 1960, he got his degree in Aeronautical Engineering from Madras Institute of Technology.

He was involved in India's missile development programme and thus came to be known as Missile Man of India. He also served as the President of India (2002-2007) and was widely referred to as the People's President. He was awarded Padma Bhusan in 1981, Padma Vibhusan in 1990 and Bharat Ratna in 1997. He has written many books like Wings of Fire, India 2020 and Ignited minds.



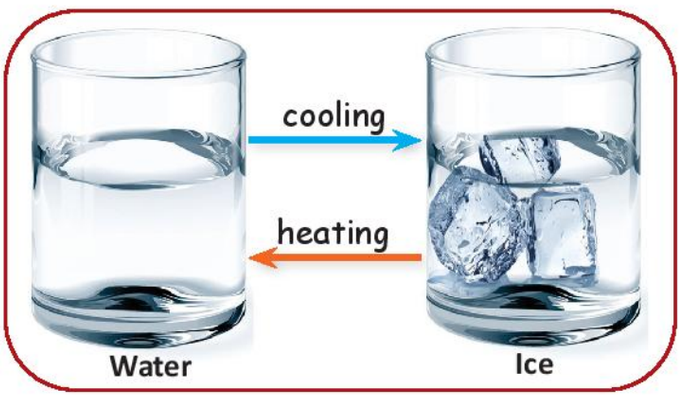
II. Changes Around Us

Change is the transition of a substance from one form to another. We see many changes around us. We see changes like day and night, summer and winter and so on. We also see changes in objects. Growth of a tree, ripening of fruits, falling of leaves are some of the changes taking place around us. You can observe changes in you also. Your height and weight increase, hair and nail grow and you have grown up as a whole compared to last year. Changes around us can be classified as reversible and irreversible changes.



1 Reversible Changes

Changes which can be reversed are called reversible changes. If you keep water in the freezer for some time, it is transformed into ice. If it is taken out, it becomes water again. This is a reversible change.



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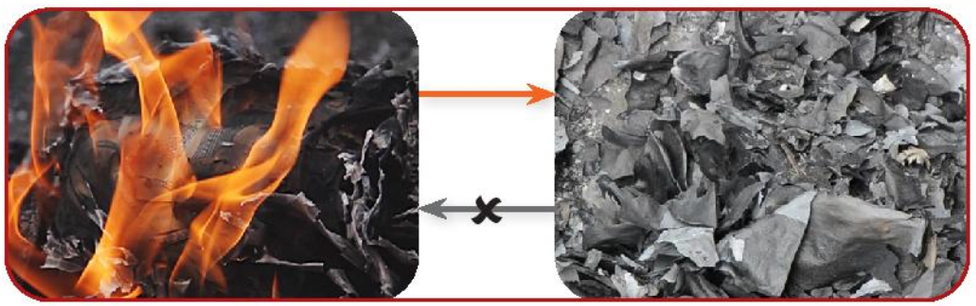
2 Irreversible Changes

Changes which cannot be reversed are called irreversible changes. If you burn a piece of paper it burns and turns into ash. It cannot become paper again. This is an irreversible change.



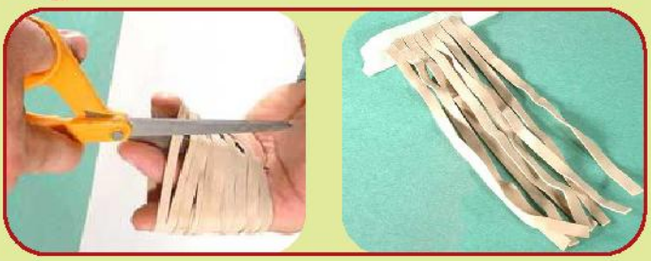
Do you know?

Irreversible changes are also known as permanent changes. Processes like burning, cooking, rusting of iron cause permanent changes.





Activity 1



Take an elastic band and stretch it to the maximum. Now release it. What do you observe?

Cut it now into pieces. Can you get the band back again?



Activity 2



Take a balloon and blow air into it. You can see that the shape and size of the balloon is changed. Now let the air escape from the balloon. What do you observe now?

Now blow it to its full size and prick it with the tip of a pin. It is burst. Can you get the balloon back?

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From such activities we can observe some differences between reversible and irreversible changes. Differences between reversible and irreversible changes are listed below.

Reversible Change	Irreversible Change
A substance can turn to its original state.	A substance cannot turn to its original state.
The chemical properties of the substance do not change.	The chemical properties of the substance change.
Most of the physical changes are reversible.	All chemical changes are irreversible.



Activity 3

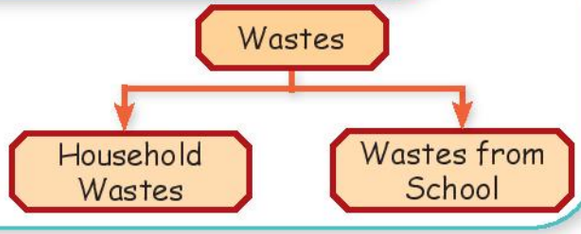
Which of these common changes, you think, can be reversed?

Change	Can it be reversed?
Raw egg to boiled egg	Yes / No
Ice cube to water	Yes / No
Batter to Idly	Yes / No
Milk to Curd	Yes / No
Grain to Flour	Yes / No
Bud to Flower	Yes / No
Cow dung to Biogas	Yes / No



III. Wastes Generated in Our Environment

Waste is any substance which is discarded after primary use. It is worthless, defective and of no use. They are unwanted and undesirable materials.



1 Household Wastes

Wastes from home is known as household waste. Solid wastes disposed from home and apartments comprise of garbage and rubbish (bottles, cans, clothings, composts, disposable items, food packings, news papers, magazines and trimmings). We can classify the household wastes as below.

Organic wastes: Kitchen wastes, vegetables, flowers, leaves, fruits.

Toxic wastes: Old medicines, paints, chemicals, bulbs, spray cans, fertilizers, pesticide containers, batteries, shoe polish.



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Recyclable wastes: Paper, glass, metals, plastics.

Soiled wastes: Cloths soiled with blood and other body fluids.

e-wastes: Computer parts, electronic materials, cell phone parts, CFL bulbs.



Do you know?

- 40 million tons of electronic waste is generated every year worldwide.
- E-waste comprises 70% of our overall toxic waste.
- E-waste contains hundreds of substances, of which many are toxic.



Activity 4

Collect the wastes from your house before it is thrown into dustbin. Separate them into two groups.

Group 1: Garbage from the kitchen like fruit and vegetable peel, egg shells, waste food, tea leaves, news papers, dry leaves and paper bags.

Group 2: Pieces of cloth, polythene bags, broken glass, aluminum wrappers, nails, old shoes and broken toys.

Find out how you can dispose them properly.

2 Wastes from School



Do you know?

Each one in our state capital (Chennai) contributes 700 gram of waste everyday. It is the highest in our country.

You leave many waste materials inside your class rooms and throw away many things in the school campus. If they are not collected and disposed properly, your environment will be polluted. Papers, pen and its parts, blades, chocolate covers and plastic items are found in the school environment. The single most common material generated in schools is food waste. Food is not only wasted but it is also thrown away everywhere, making your surrounding unclean.

In a survey conducted, it is found that food waste accounts for 23.9% of the total wastes generated in the school and recyclable paper like card board, white paper and mixed papers account for 23.5% of the total waste. To keep our surrounding clean, we need to have a proper waste disposal system.



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3 Need for Proper Disposal of Wastes

With so much of wastes lying everywhere, what do you think that we should do? We need a proper waste management system. Waste management is needed for the following reasons.

To control pollution

- Various pollutions like water pollution, air pollution and soil pollution can be avoided.

To conserve natural resources

- Waste disposal is important for the conservation of our environmental resources like forest, minerals and water.

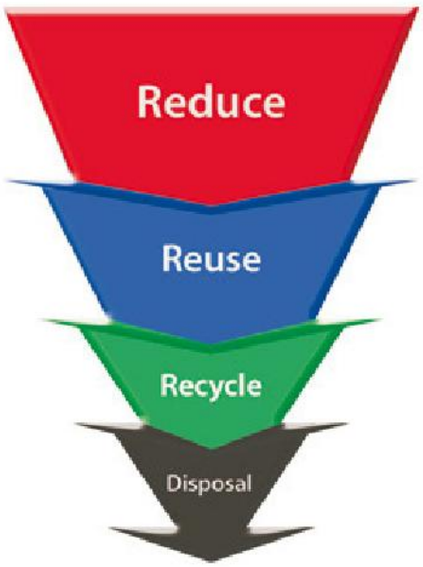
To control spread of diseases

- Spread of infectious diseases can be controlled.

Recycle for further use

- Wastes can be recycled to get products for further use.

4 Ways to Reduce Waste



The best place to start difference is our home. We need to learn how to reduce, reuse and recycle wastes. The following practices will be helpful to reduce wastes in our home and school environment.

- Use reusable and recyclable bags and containers.
- Avoid one time use items and use items which can be used permanently.
- Segregate wastes into bio-degradable and non-biodegradable items and hand over them to the municipal and corporation people who collect them.
- Do not throw away your wastes everywhere. Put them in dustbins and dispose them properly.
- Don't waste food. Waste food in schools can be collected and used to feed cattle.
- Organic wastes can be converted into manures.



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Evaluation

I. Choose the correct answer.

1. Blue appearance of the sky is due to_____ of light.
   a. reflection b. refraction c. interference d. scattering
2. Who is known as Missile Man of India?
   a. Sir. C.V. Raman b. Dr. A.P.J. Abdul Kalam
   c. Dr. M.S. Swaminathan d. Srinivasa Ramanujam
3. An example for reversible change is
   a. melting of ice b. burst of balloon
   c. burning paper d. change of milk into curd
4. Chemical reactions are example for
   a. reversible change b. irreversible change
   c. both of them d. none of them
5. Which of the following is not an organic waste?
   a. Flowers b. Vegetables
   c. Fruits d. Battery

II. Fill in the blanks.

1. The book 'Wings of Fire' was written by _____
2. A stretched rubber band comes back to normal shape. It is an example for _____.
3. Most of the physical changes are _____ changes.
4. News paper is a _____ waste.
5. Wastes from house and apartments are called _____ waste.

III. Match the following.

1. Bud to flower	-	Dr. A.P.J. Abdul Kalam
2. Reversible change	-	Recyclable waste
3. India 2020	-	Organic waste
4. Paper	-	Melting of ice
5. Vegetables	-	Irreversible change

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IV. Circle the odd one.

1. a) Melting	b) Freezing	c) Boiling	d) Cooking
2. a) Boiling	b) Burning	c) Cooking	d) Rusting of iron
3. a) Vegetables	b) Flowers	c) Fruits	d) Chemicals
4. a) Paper	b) Glass	c) Metals	d) Paints

V. Answer briefly.

1. Sky appears blue in colour. Why?
2. What is reversible change?
3. Differentiate reversible and irreversible changes.
4. What are the different types of wastes?
5 Write a note on e-waste.
6 Name the scientists from Tamil Nadu.

VI. Answer in detail.

1. Write about different household wastes.
2. Explain the need for waste disposal.
3. How can you reduce waste in your school environment?

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5

SOCIAL SCIENCE

TERM - 1



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98AWS

E-Book

VQAEI

Assessment

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UNIT
1

Our Earth

Learning Objectives



Students can:

- ❖ know about the Universe.
- ❖ understand the Solar System.
- ❖ understand our Earth.

A2VLQ

Imayan is waiting for his **father** after returning from school in the evening. His **father** is an employee in a reputed bank.

Imayan : Come Daddy! (Imayan ran and hugged his father)

Father : Imaya.... Had your snacks?

Imayan : Yes, I had! My social teacher is going to teach about Earth tomorrow. Please tell me about the Earth.

Father : Ok. I will tell you.

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Imayan : How did the Earth form?

Father : Approximately 4.54 billion years ago, Solar System was a cloud of dust and gas known as **Solar Nebula.** Due to an explosion, these particles collapsed and began to spin having the sun at centre. The bigger particles which revolve around the sun are called **planets.** Thus, the planet Earth formed.

Solar Nebula



Imayan : Will you explain about Universe, Daddy?

Galaxy



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Father : The **Universe** is a vast expansion of space. The Universe consists of billions of **galaxies, stars, planets, dwarf planets, comets, asteroids, meteoroids** and **satellites.** The exact size of the Universe is still unknown. Scientists believe that the Universe is still expanding outward.

Imayan : What is a Galaxy, Daddy?

Father : A **Galaxy** is a huge cluster of stars. Our galaxy **Milky Way** is one among the countless of galaxies in the Universe.

Milky Way Galaxy



Imayan : Ok Daddy. What is **Solar System?**

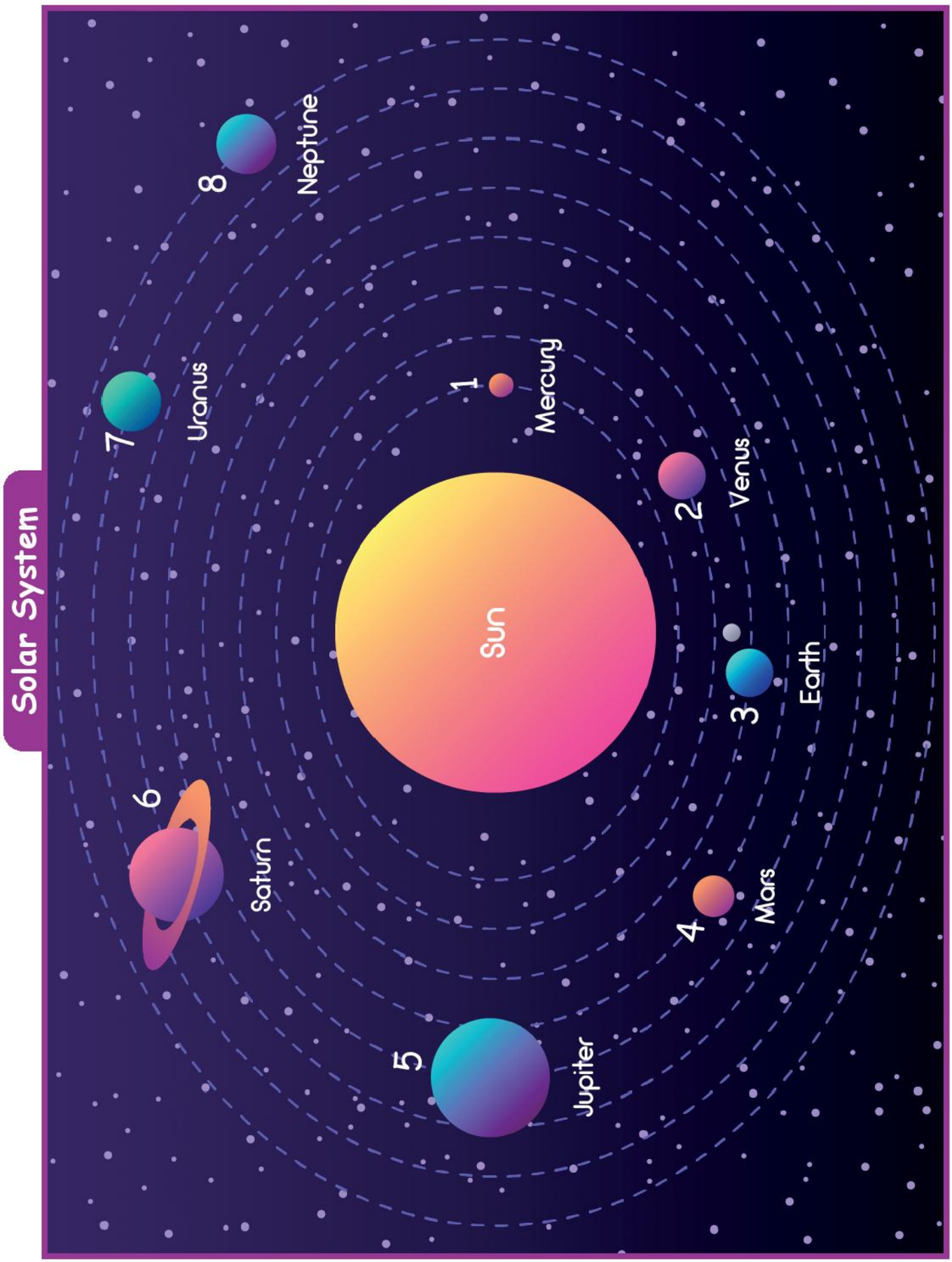
Father : **Solar System** consists of the sun, the eight planets, their moons, dwarf planets, asteroids and comets. These objects are gravitationally bound.

Imayan : Very interesting Dad. Tell me about our **Solar System.**

Father : There are 8 planets in our Solar System.They are:

1. Mercury
2. Venus
3. Earth
4. Mars
5. Jupiter
6. Saturn
7. Uranus
8. Neptune

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Solar System
Sun
1
Mercury
2
Venus
3
Earth
4
Mars
5
Jupiter
6
Saturn
7
Uranus
8
Neptune



The rocky-inner planets are Mercury, Venus, Earth and Mars. They are called terrestrial planets. The outer planets are gaseous planets. They are Jupiter, Saturn, Uranus and Neptune. The frozen planets are Uranus and Neptune.

Imayan : Dad..... Where is our **Earth** in the **Solar System?**

Father : The Earth is the **third planet** from the sun and the **fifth largest** in Solar System.

Imayan : It is said that the Earth is rotating itself and at the same time revolving around the sun. Is it true?

Father : Yes, Earth has **two movements**. They are:

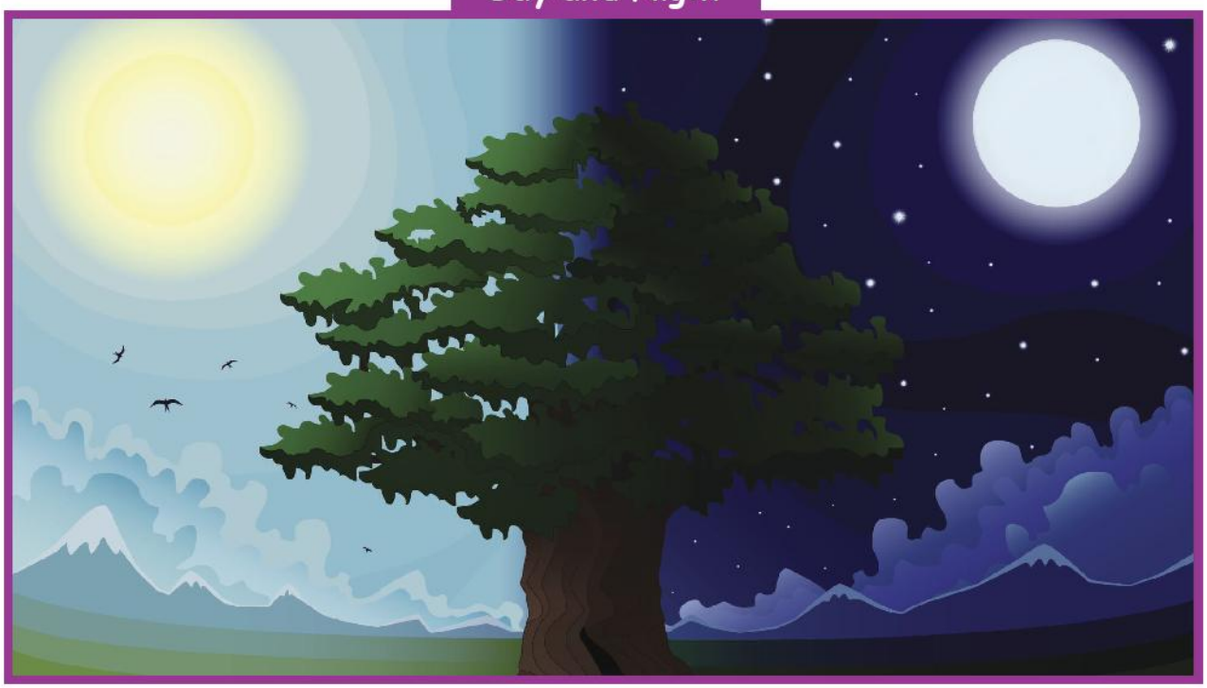
1. **Rotation**
2. **Revolution**



Rotation

The movement of the Earth on its axis is called **rotation** of the Earth. **Day and night** are caused due to the Earth's rotation.

Day and Night



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Revolution

The movement of the Earth around the Sun on it's axis which is tilted about $23\frac{1}{2}^{\circ}$ is called **revolution** of the Earth. **Seasons** are caused by Earth's revolution.



Summer
(March to May)



South West Monsoon
(June to September)



North East Monsoon
(October and November)



Winter
(December to February)

ACTIVITY
Let us do

Make the model of a Globe.



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Father : Life is possible only on the Earth because of the presence of **land**, **air** and **water**.

Imayan : Oh! I see. What is the distance between the sun and the Earth?

Father : The distance between the sun and the Earth is nearly 150 million kilometres.

Imayan : Say some more interesting facts about Planets Dad....

Father : Mercury and Venus lie near to the sun. Next to Earth is Mars, Jupiter, Saturn, Uranus and Neptune. The planets nearer to the sun are very hot. The planets away from the sun are very cold. **Mercury** is the **smallest** planet. **Jupiter** is the **largest** planet.



Venus and **Earth** are called **twin planets**. **Mars** is described as the **Red planet**. **Earth** is called the **Blue planet**. **Saturn** is the **Ringed planet**.

Imayan : Wow! Amazing! Where do we live on the Earth?

Father : We live on the surface of the Earth. It is made up of 7 continents and 5 oceans.

Imayan : 7 continents! What are they?

Father : Listen. They are:

Asia, **Africa**, **North America**, **South America**, **Antarctica**, **Europe** and **Australia**.

Imayan : Which is the biggest continent?

Father : The **Asia continent**, where we live is the **biggest** of all. **Australia** is the **smallest** one. Antarctica is a snow covered landmass.



A4 NoSE

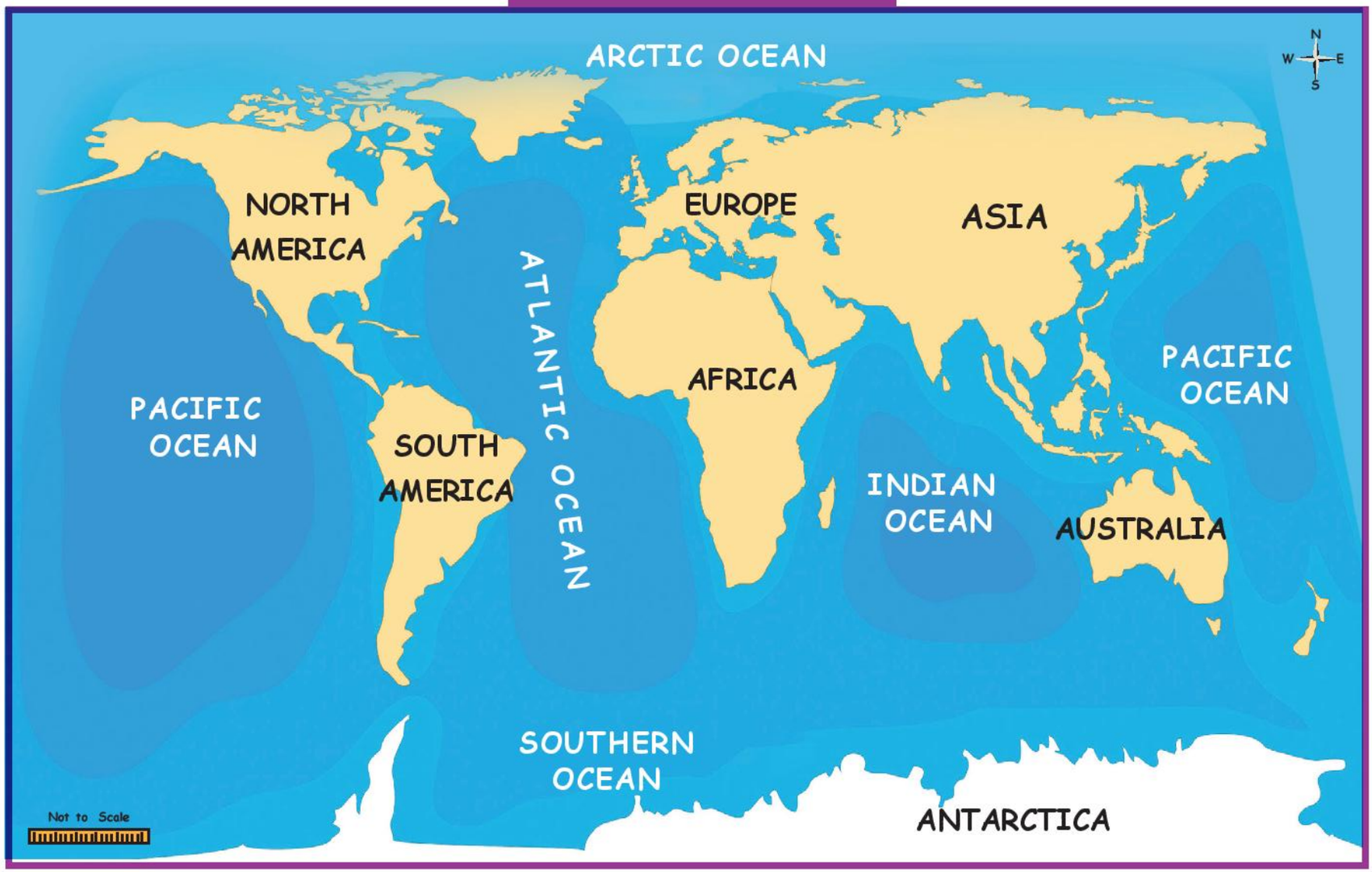
(A1) Asia, (A2) Africa, (A3) Antarctica, (A4) Australia, (No) North America, (S) South America, (E) Europe.

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Continents and Oceans





The surface of the Earth is classifed into different landforms such as **mountains, plateaus, plains, coastal plains, valleys, deserts** and **islands.** The **highest peak** on the Earth is **Mount Everest** (8848m) in the **Himalayas.**

Imayan : What are the **five oceans** Daddy?

Father : **Pacific Ocean, Atlantic Ocean, Indian Ocean, Southern Ocean** and **Arctic Ocean.** 71% of the Earth is covered by water and 29% is covered by landmass. About 96.5% of water is saline, 2.5% of water is fresh and 1% of water is easily accessible.



The average depth of the oceans is 3800m. The deepest point on the Ocean is **Mariana Trench** which is located in the **Pacific Ocean.**

Imayan : Thank you, Daddy. Today I have learnt a lot about the Earth from you. Now I am going to study and do my home work.

Father : Ok, Imaya. Go and study.



Glossary

Particles : Very small pieces
Saline water : Salty water
Trench : A long ditch



Recap

- The Universe consists of billions of galaxies, stars, planets, dwarf planets, comets, asteroids, meteoroids and satellites.
- The Earth is the third planet from the sun and the fifth largest in the Solar System.

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EVALUATION



9E5DQ

I. Fill in the blanks.

1. The distance between the Earth and the Sun is _____.
2. _____ are caused due to the revolution of the Earth.
3. The continent _____ is covered by ice.
4. The biggest continent is _____.
5. _____ is described as Red Planet.
6. _____ percentage of our Earth is covered by salt water.

II. Match the following.

1	Smallest continent	Earth's revolution
2	Blue planet	Australia
3	Neptune	Earth
4	Seasons	Earth's rotation
5	Day and night	Farthest planet

III. Answer the following.

1. What do you know about Universe?
2. Define Solar System.
3. How did the Earth form?

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4. Distinguish between rotation and revolution.
5. How many oceans are there on the Earth?

V. Answer in detail.

1. Write about the Solar System.
2. Write about the Planet Earth in detail.
3. Explain about the continents.











Fun With
ACTIVITY

Project

Collect and stick the images of the planets.

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UNIT 2

Towards History

Learning Objectives



Students can:

- know about the Stone Age.
- understand the Nature of Human Evolution.
- understand the Human Nomadic life.

DYOP7

Stone Age

In the beginning humans were not aware of metals. They took several years to discover metals. Our lives today are their gifts. During this period humans were not aware of scripts. The **Stone Age** is the period in which **stones** were used as **weapons**.

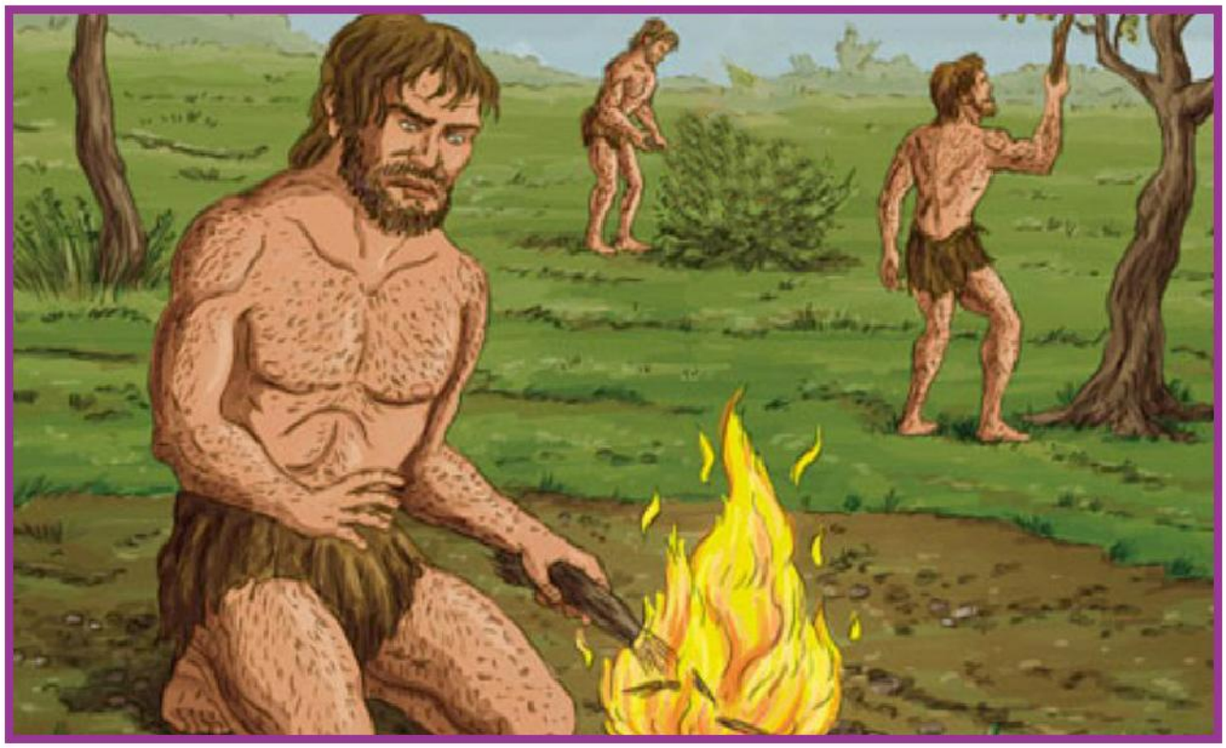


Stone weapons

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Nature of Human Evolution

Early humans lived in jungles along with animals. They used stone tools to protect themselves, drive away animals, dig out roots, shoots etc. The most important thing is that they ate everything raw including flesh. They did not know the use of fire in the beginning. At first, dog was their good companion. Wild animals ran away when dogs barked. **Dog** was the first pet animal.They took it wherever they went.



Later humans started rearing cattle and they were very useful to them. They observed some **grains** growing along the river side. They ate and found them very tasty. They observed that the scattered grains were eaten up by birds. They found that the grains grow with the help of **sunshine** and **rainfall**. Thus, they learnt the art of **cultivation**.

Humans noticed **forest fire**. At first they were afraid of fire. They found some animals died due to fire. They ate the flesh of the burnt animals. It tasted good. They also observed that the **spark** came out by scratching two stones together. Since then, they ate cooked food.

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- Early man used **Quartzite,** a type of stone for making **tools** and **weapons.**
- A type of stone called **Flint stone** was used to produce **fire.**

Nomadic Life

Early humans did not know to grow crops. They wandered in all the landscapes in search of food. They ate whatever they got and drank water from natural sources. This kind of life was called **nomadic life.** They wore **skins of animals, leaves** and **barks of trees** to cover their body. They lived in **caves** and **holes of big trees.**



Stones were sharpened as tools by them. They made it with the help of other stones too. These sharp tools were used to hunt animals and tear their flesh.

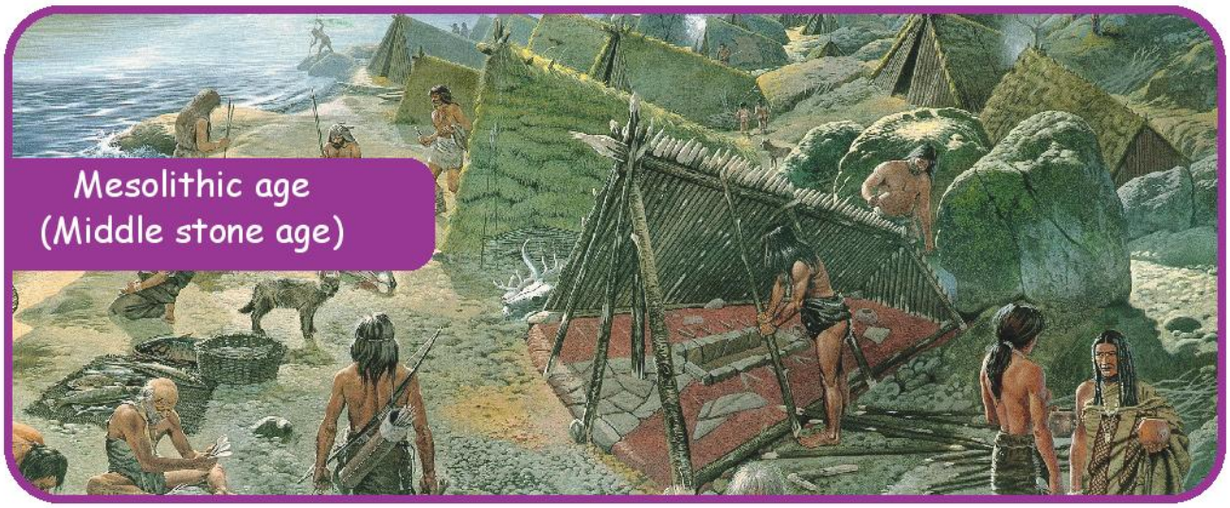


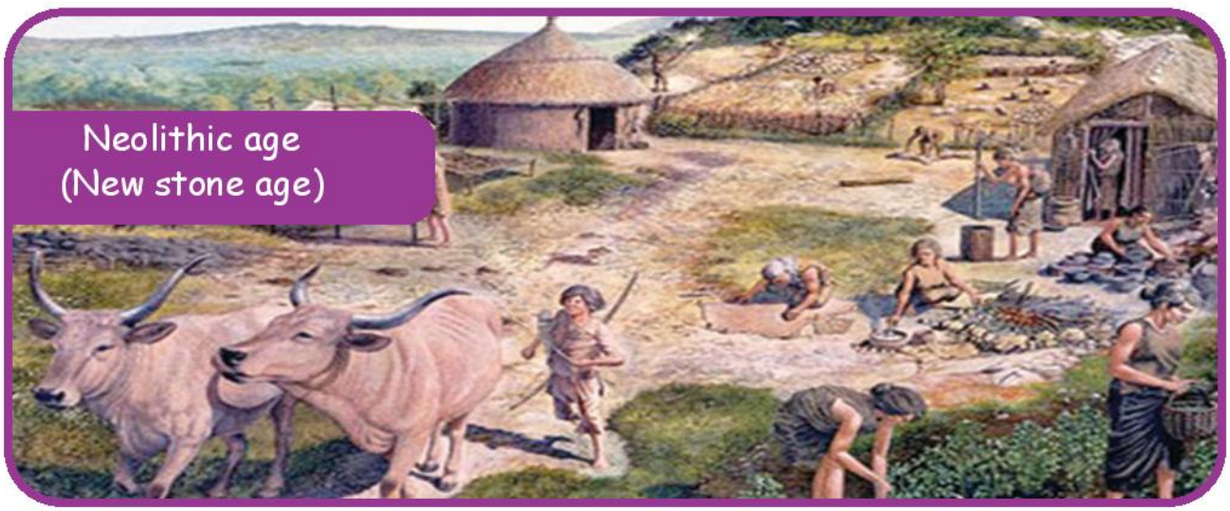


They used **bones, horns, stones, skin, branches of trees** and **sticks** as their tools and weapons. This stage of development in history was called **New stone age** or **Neolithic age.**

Stone Age







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ACTIVITY

Let us write

1. What were the food eaten by early humans?

_____

2. Why did early humans live in caves?

_____

3. Why did they eat raw flesh?

_____

- Early humans used **weapons** to protect themselves from animals.
- They used **torches** to find the path at night.
- They **drew paintings** of what they saw around them on the walls of the caves where they lived.

Stone wheels

When the stones rolled from the mountains they acquired a round shape. Humans observed them and thus wheel was invented. In the beginning it was made of stone and later by wood. **Wheel** is the first scientific invention of man.



LET US KNOW

The period which has written documents is called **Historical Period.** These documents help us to know about the life styles of the people, events, food habits, culture, art, architecture, literature and so on.

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Pottery

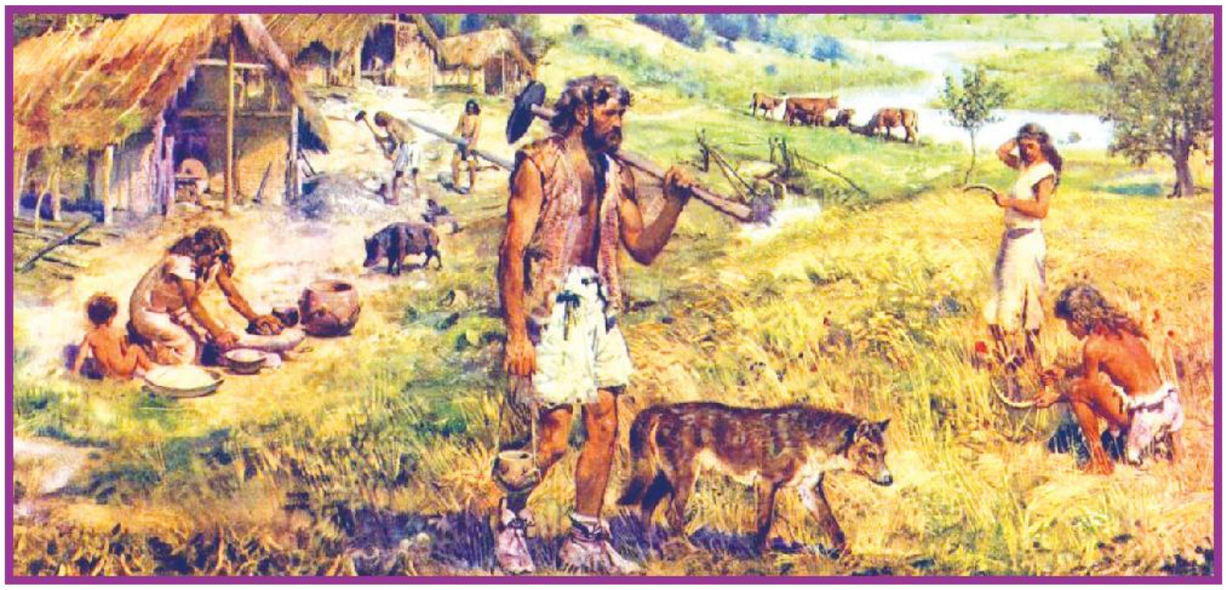


Pottery was also one of the greatest inventions by humans. The baked pot was strong and looked beautiful. Stone age people made all the household articles by themselves.

Stone houses were built. The roofs of these houses were thatched with sticks and husks. After several inventions, humans started to live in a settled life.

Agriculture

Agriculture was an important activity in the history of humans. They started cultivating crops. They sowed seeds and harvested crops. They found it convenient to live along the river as the crops grew well.





Museum is a place where archaeological objects which were used by our ancestors are preserved. These give information about the lives of ancient people. Therefore it is important to preserve the remains of the past.

KL9W6

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Progress in man's life

Man ⟶ family ⟶ society ⟶ community ⟶ administration





There were burial pots called urns in which the dead bodies were placed and buried under the ground.

Chalcolithic Age

At the end of new stone age **copper** was invented. In this age both stone and copper were used. This period was called **Chalcolithic age.** Bronze was produced when copper, zinc and tin were mixed together. The period when people made tools from bronze was called **Bronze age.**

Iron Age

After this, humans discovered iron and started using iron tools and weapons. This age was called **Iron age.** In this age household articles and agricultural tools were made up of iron.






ACTIVITY

Let us write

Write the names of some iron tools in your home.

Sickle, Spade, _____

_____

5th Social Science EM Term-1 Unit-2.indd 158 21/02/2023 17:32:35

Archaeological excavations

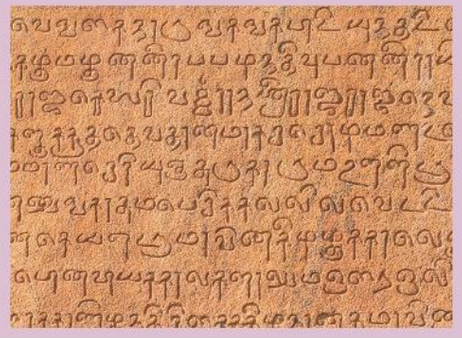
Coins, potsherds, metal objects and so on are dug out from **Archaeological sites**. Such objects are preserved in the **museum**. In Tamilnadu, **Athichanallur, Arikkamedu** and **Keeladi** are such sites where the objects used by the people of the past are excavated. Still research is going on in these sites.



If you come across any old, traditional objects of historical value try to **collect and preserve** them.



Scripts inscribed about a king's rule, people or society on rocks and walls are called inscriptions. Usually they are found on temple walls.







Glossary

Artefacts : Articles made by early humans

Excavate : Dig out

Potsherds : Broken pottery fragments



Recap

- The Stone age is the period in which stones were used as weapons.
- Stone age is classfied as Palaeolithic age, Mesolithic age and Neolithic age

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EVALUATION



I. Choose the best answer.

1. Palaeolithic humans,

   a) wore cotton clothes b) wore woolen clothes.

   C) wore leaves and skin of animals

2. _____ was the first pet animal of man.

   a) Cow b) Horse c) Dog

3. What was the first metal discovered by early human?

   a) Iron b) Copper c) Gold

II. Fill in the blanks.

1. Early man lived in _____.
2. The Stone age is the period in which stones were used as _____.
3. _____ was used to produce fire.
4. _____ is the first scientific invention of man.
5. At the end of New stone age, _____ was invented.

III. Answer the following.

1. What is Stone age?
2. Write a short note on Nomadic Life.
3. Define Neolithic age.
4. Write a short note on pottery.
5. Name some archaeological sites in Tamil Nadu.

IV. Answer in detail.

1. How can we classify the Stone age?
2. Write about Chalcolithic age and Iron age.

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UNIT 3

Good Citizen

Learning Objectives

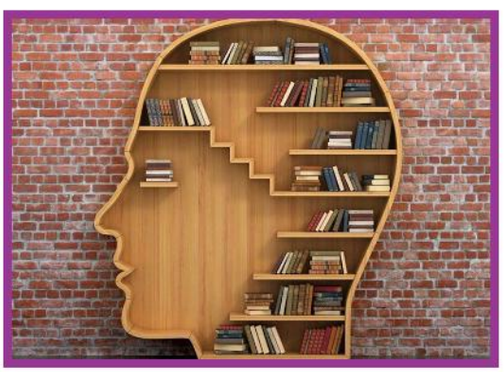


Students can:

- know the differences between animals and human beings.
- understand the Good Values.
- know about the factors that enrich Good Values.

9YNCF

Man is a social animal



Human beings are bestowed with senses. Human beings think and act using their senses. They are born free but bound in the social web. They cannot live alone. They need social and emotional support. To live in the society they need to develop some good values.

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We are born with few values and rights. These values are further polished in educational institutions. The **aim of education** is to change a person into a **valuable human being**.



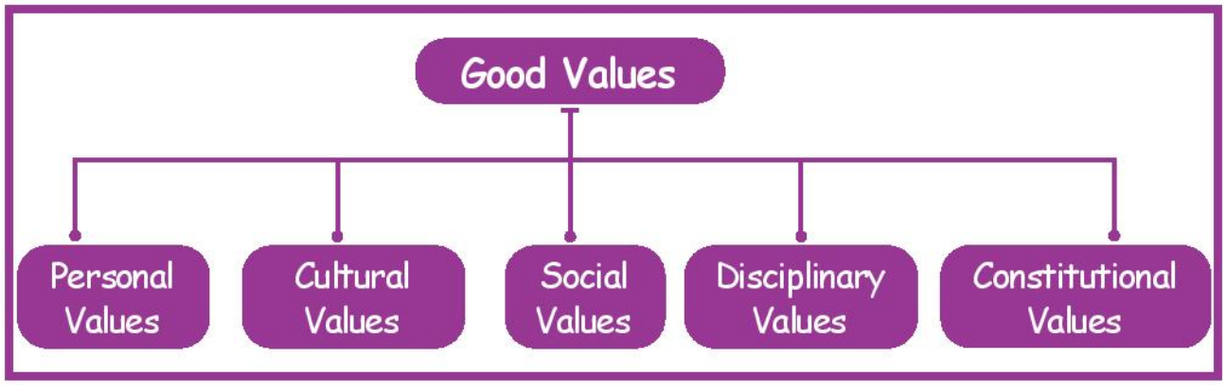
What do the above pictures say?

Good values

Good values are the qualities of a person that keep the society running. These qualities can be developed by all. The term **civic** relates to **people** or **civilian** or **citizen of a country**. People should live together in **unity**. Despite all the disparities, living together in harmony is a significant value. Helping others is also an important value.

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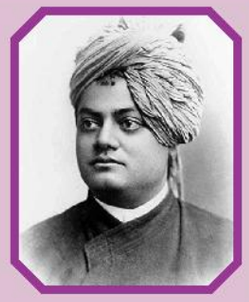
There should be no disparity among people and all are one. Today's children are tomorrow's citizens of the nation. **Moral and good values** have to be inculcated in children. So that they may become valuable citizens.





World survives on morality.
Selfishness is immoral and
Selflessness is moral.

-Swami Vivekananda













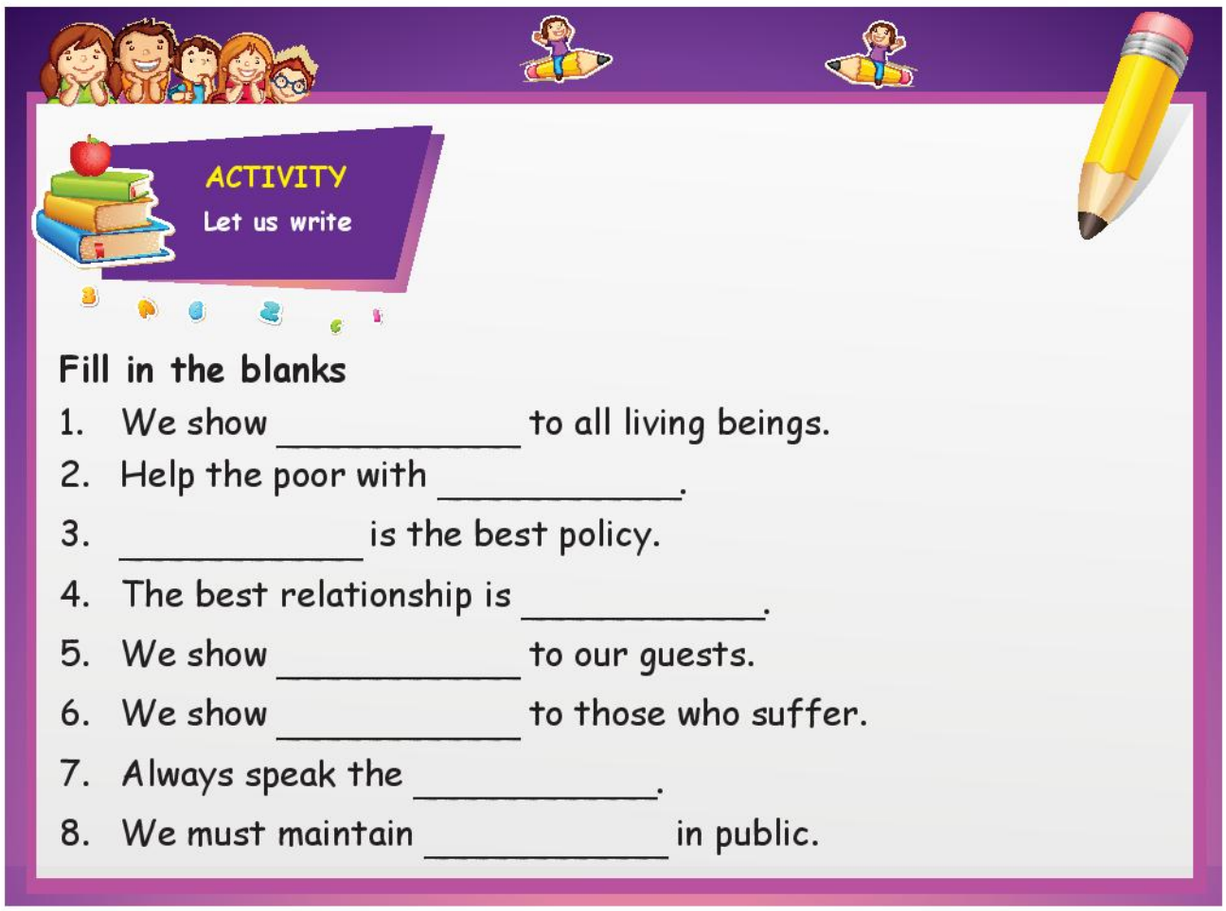
ACTIVITY
Let us write

1. What is your mother tongue? _____
2. _____ is the best policy.
3. Main food of North India is _____.
4. _____ is the main food of South India.
5. How many languages do you know? _____

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Personal values

Personal value is the basic value for an individual. Some personal values are **love, mercy, generosity, honesty, truth, friendship, hospitality, peace, tolerance, faith** and so on.

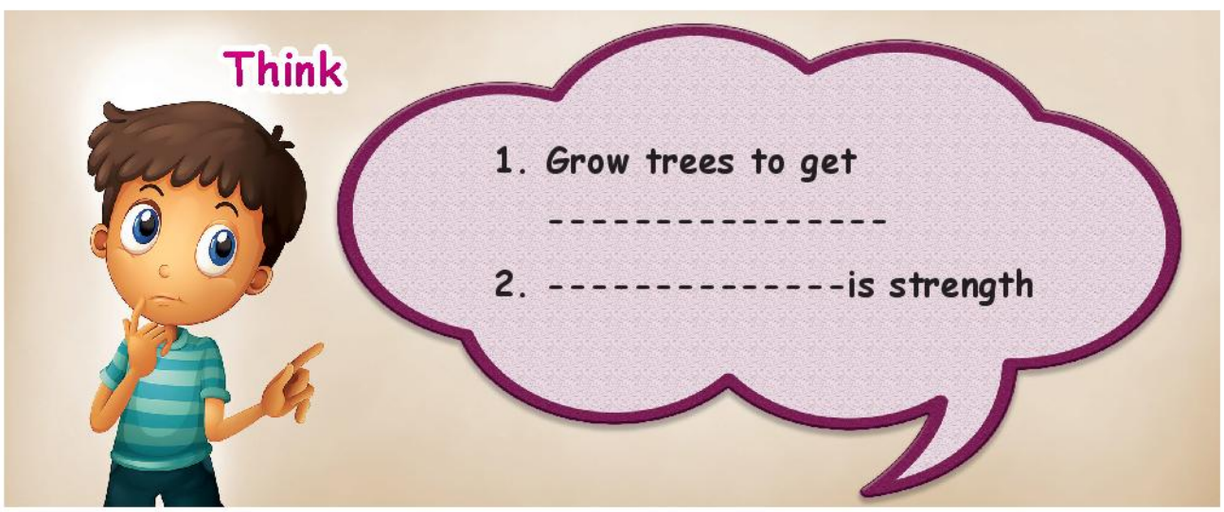


ACTIVITY

Let us write

Fill in the blanks

1. We show _____ to all living beings.
2. Help the poor with _____.
3. _____ is the best policy.
4. The best relationship is _____.
5. We show _____ to our guests.
6. We show _____ to those who suffer.
7. Always speak the _____.
8. We must maintain _____ in public.



Think

1. Grow trees to get

   ----

2. ----------is strength

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Cultural values

Becoming well mannered and cultured is an essence of the society. Irrespective of language and religion people live together in harmony. This help to maintain cultural values. We are all humans. We must live together as brothers and sisters.



Social values

How should you behave in public places?

We should maintain the following good values in public places.

- Maintain good relation with people
- Respect elders
- Protect nature
- Be tolerant
- Maintain friendship



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Disciplinary values

Disciplinary values are **punctuality, involvement, treating every one as equal, doing work ontime, holding morals, discharging duties without fail** and so on.











ACTIVITY

Let us do

Circle the **good values** given above.

P	L	E	Q	A	L	I	T	Y	A	B
U	O	G	X	C	O	N	D	U	C	T
N	Y	E	T	F	V	V	O	L	E	D
C	T	N	M	A	E	O	R	H	R	S
T	U	E	O	E	M	I	S	I	S	E
U	V	R	U	D	T	V	T	G	R	R
A	A	O	P	E	S	E	R	V	I	V
L	B	C	L	F	X	M	K	M	G	I
I	D	I	N	I	Z	E	R	L	H	C
T	E	T	K	L	G	N	F	N	T	E
Y	Y	Y	G	M	O	T	I	O	I	K

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*A **Citizen** is a person who is a member of a particular country and enjoys various rights and executes his duties. A sovereign state provides Right to live, Right to education, Right to vote, Right to work and reside anywhere in the country for its **Citizen**.*

Constitutional values:

- Safeguard public properties.
- Maintain unity and integrity of the nation.
- Develop scientific attitude.
- Protect natural resources.
- Care for the environment.
- Honour national symbols.
- Respect martyrs and their sacrifices.
- Preserve our cultural values and heritage.
- Develop patriotism.





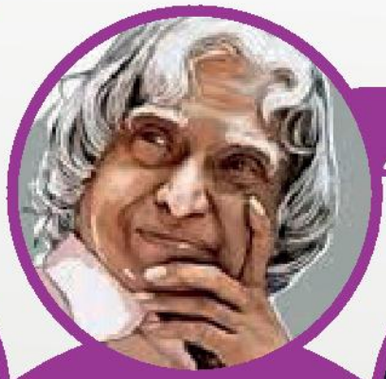
- Do not violate the rules.
- Do not spit and dump garbage in public places.
- Do not pollute land and water.
- Do not burn the old objects in streets.



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ACTIVITY
Let us do

Match the following



Dr. A.P.J. Abdul Kalam



National Flag

1) Peace
2) National symbol
3) Public property
4) Environment
5) Scientific attitude



Mother Teresa



Bus



Tree

Citizenship *is the right to live in a best way as a* ***civilian.*** *This includes a person's participation in Government activities too.*

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Factors that enrich Good values are:

- Literacy
- Awareness and interests
- Try hard till success
- Evaluate oneself
- Acceptance
- Self confidence

Hygienic is the most significant part of the good values. One must follow the routine below:

- Wake up early in the morning
- Brush your teeth
- Have a bath
- Wear clean clothes
- Wear slippers or shoes
- Trim hair and cut the nails
- Wash hands before and after meals.



Glossary

Offer : Give
Preserve : Protect
Self confidence : Belief in oneself



Recap

- Good values are developed by practicing them.
- Honesty is the best policy.
- Good values are classified into four types.

1. Personal values
2. Cultural values
3. Social values
4. Disciplinary values.

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EVALUATION



JSO5K

I. Fill in the blanks.

1. Man is a _____.
2. The word civic means _____ of a nation.
3. The aim of education is to change a person into a _____.
4. _____ is the basic value for every individual.
5. Always be _____ in discharging duty.

II. Match the following.

1	Personal value	Harmony
2	Cultural value	Affecting factor
3	Disciplinary value	Tolerance
4	Social value	Punctuality
5	Unemployment	Honesty

III. Answer the following.

1. Define the term citizen.
2. List out any five personal values.
3. Write a short note on cultural values.
4. What are the social values?
5. What are disciplinary values?

IV. Answer in detail.

1. Write about the constitutional values.
2. Write any five factors that enrich good values.

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UNIT 4

Atmosphere

Learning Objectives



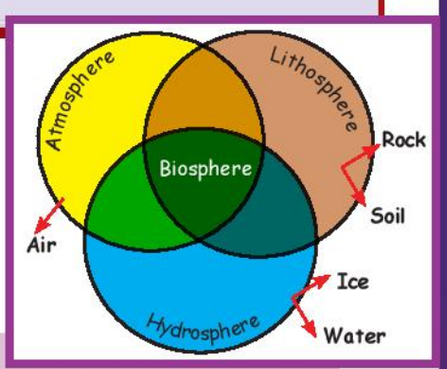
Students can:

- know about the Biosphere.
- understand the Atmosphere.
- understand the different types of wind and clouds.

UT746

Biosphere

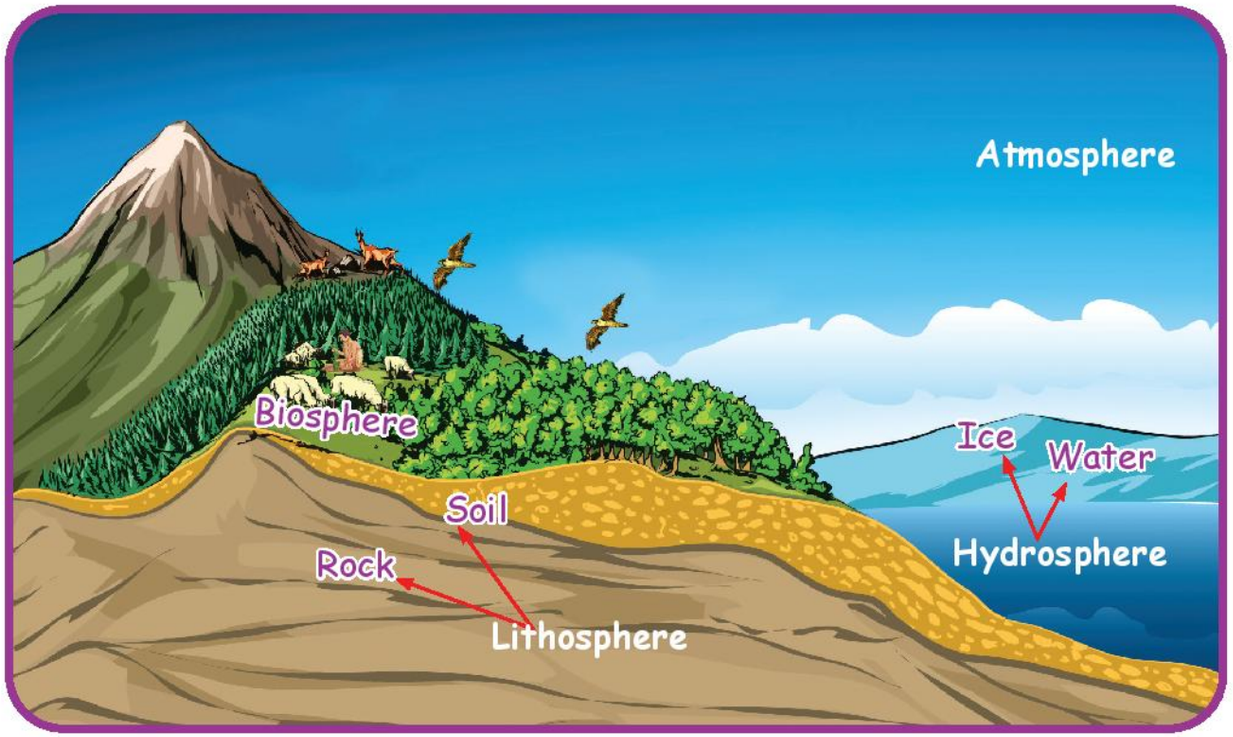
Biosphere is the combination of **Lithosphere**, **Hydrosphere** and **Atmosphere** that can support life.





- **Lithosphere** - Land on Earth
- **Hydrosphere** - Water on Earth
- **Atmosphere** - Air on Earth
- **Biosphere** - Life on Earth

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Atmosphere

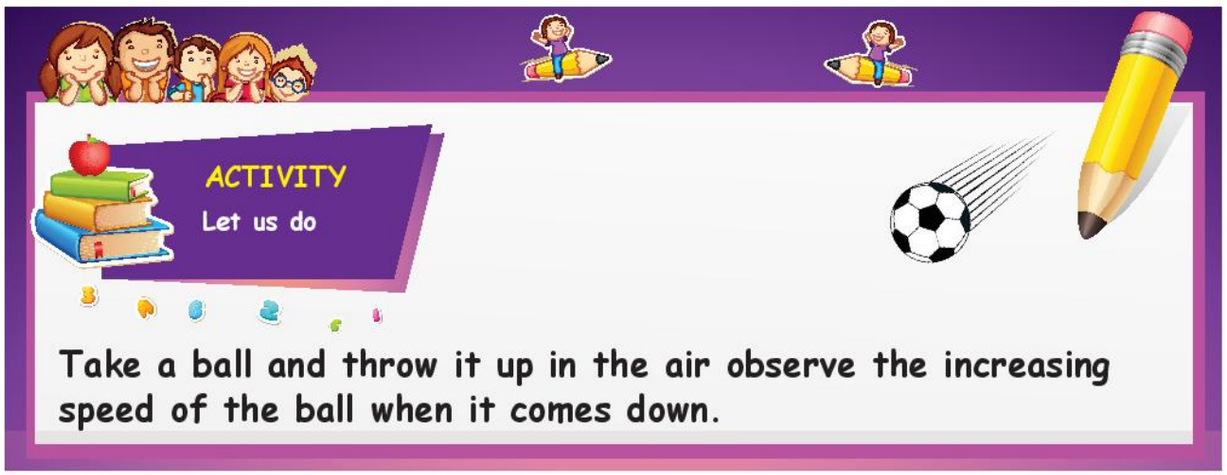
Atmosphere is the envelope of air around the Earth.

Weather

Weather is a day to day conditions of atmosphere at any place in regard to temperate, pressure, wind, humidity and rainfall.

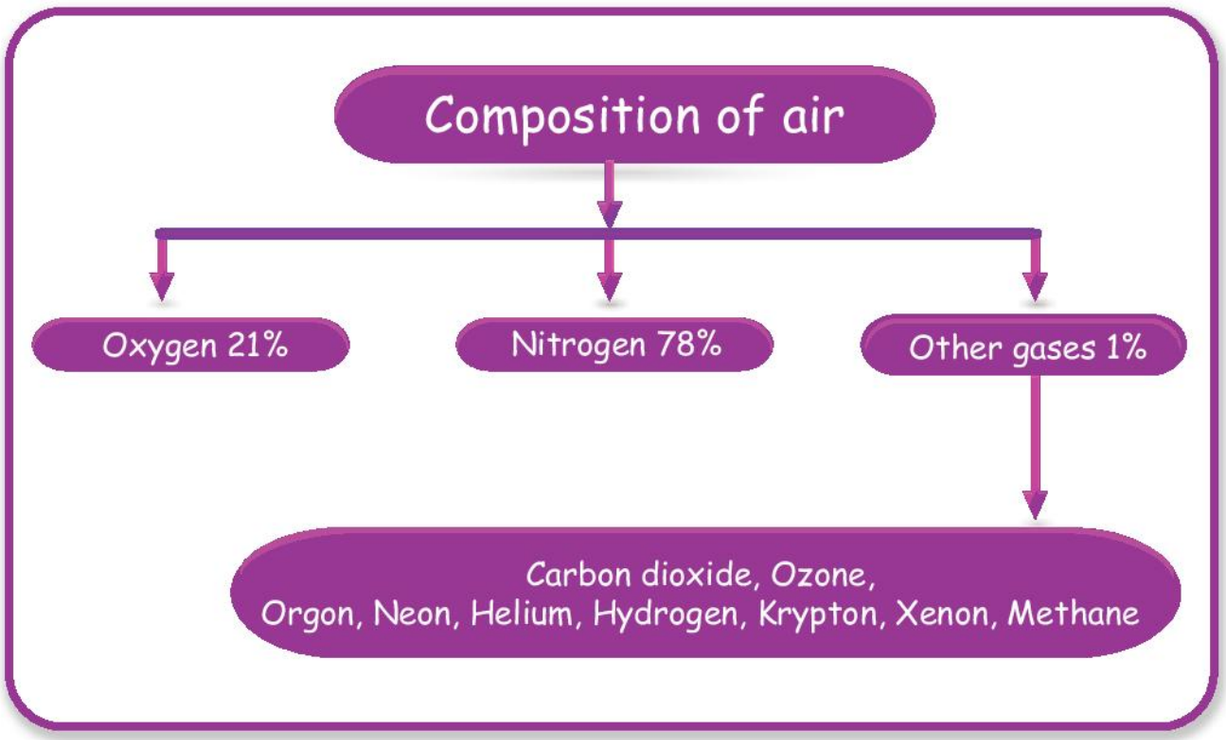
Climate

Climate is the average weather condition of a vast area over more than 30 years.



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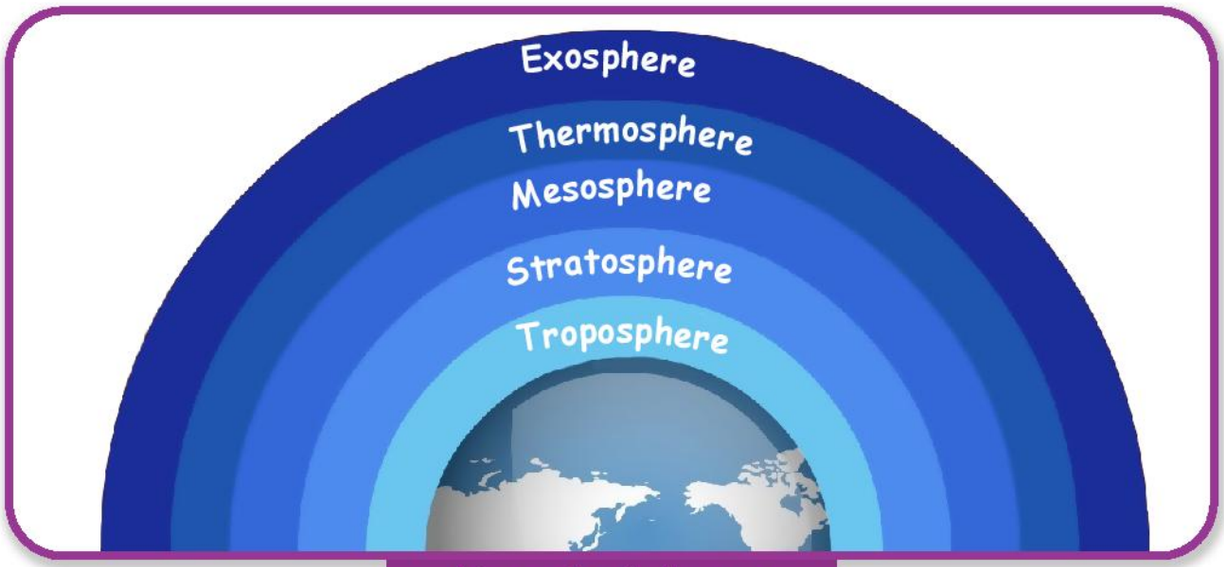
Atmospheric Layers

We know that the gravitational force increases near the Earth and decreases as we go higher. As a result the density of air also differs and can be found in five layers called **Troposphere, Stratosphere, Mesosphere, Thermosphere** and **Exosphere**. All weather changes occur in the **Troposphere**. The study of weather is called **Meteorology**.



The word **climate** is derived from the Greek word called **clima**.

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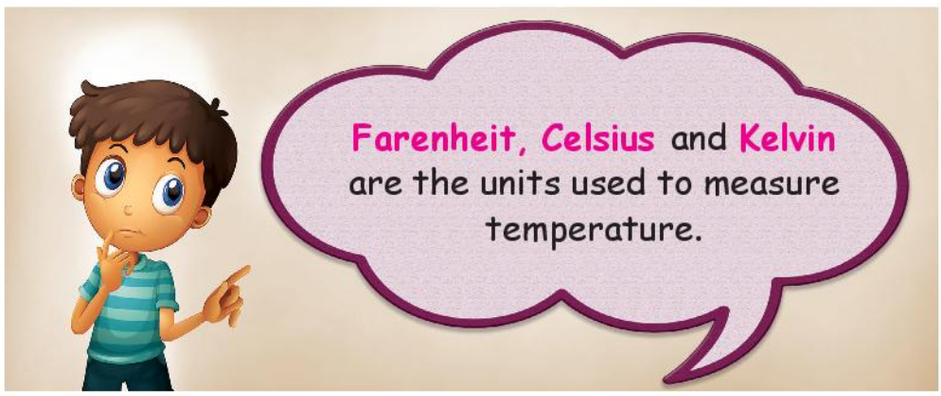


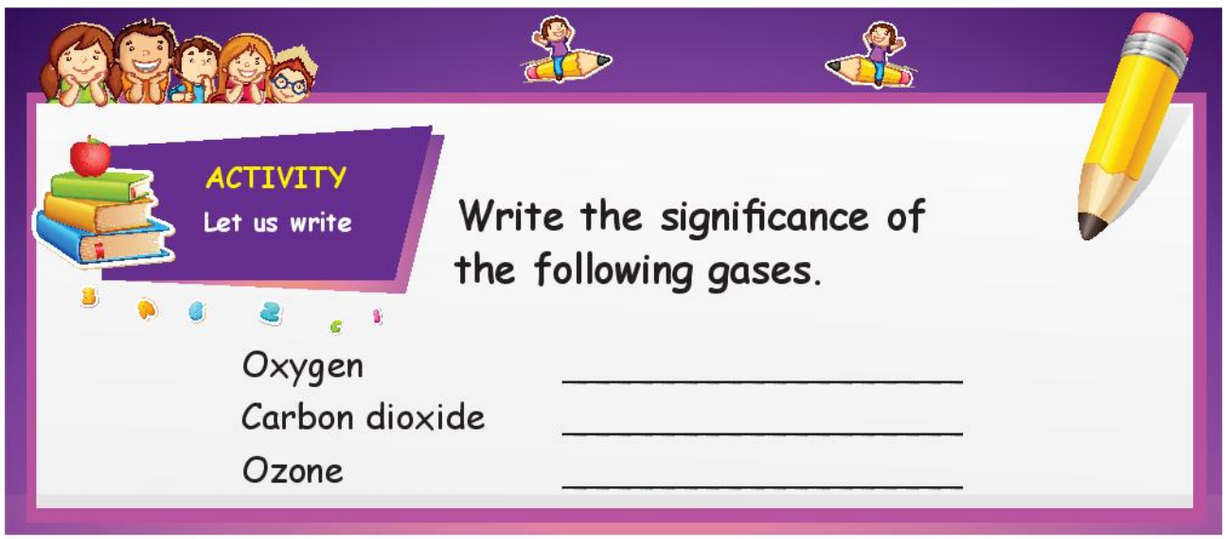
Atmospheric Layers



World Meteorological Day - March-23

World Ozone Day - September-16





ACTIVITY

Let us write

Write the significance of the following gases.

Oxygen _____

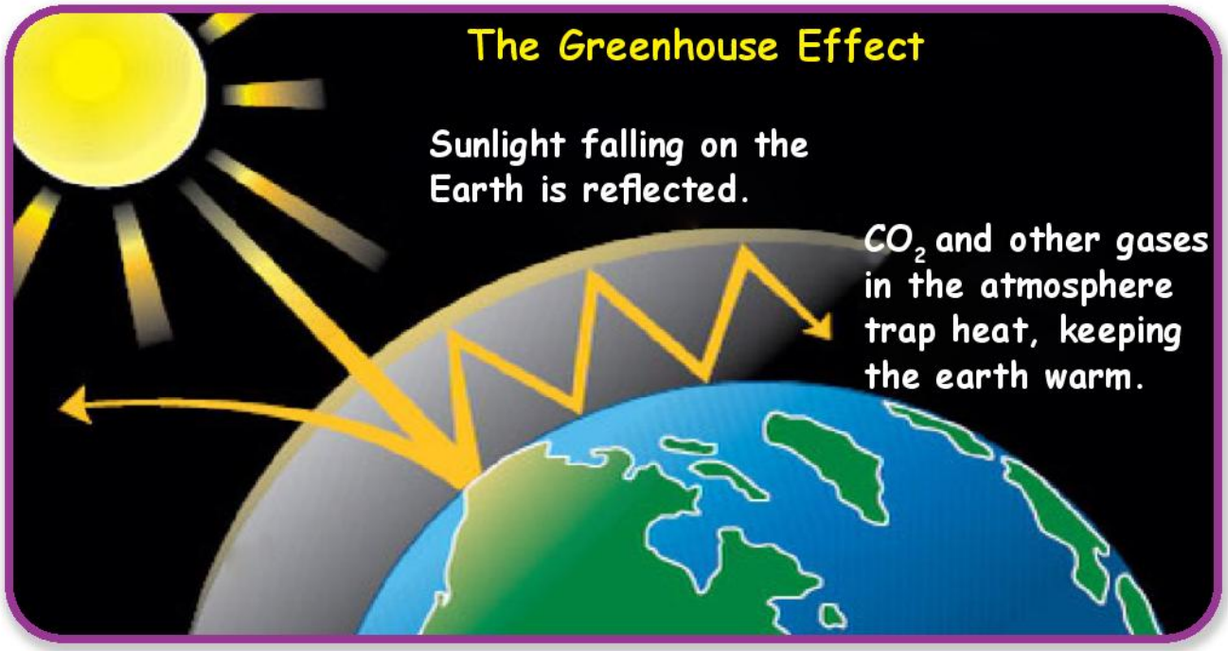
Carbon dioxide _____

Ozone _____

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Solar Radiation

The sun is the only source of light to all the planets in the solar system. The land, water and air in our planets receives heat from the sun. The Earth receives heat energy from the Sun in the form of radiation. It is called **solar radiation**.



Elements of Climate

1) Temperature **2)** Pressure **3)** Wind **4)** Clouds **5)** Rainfall

1) Temperature

- Land – Conduction
- Water – Convection
- Atmosphere - Terrestrial radiation

The earth has the capacity to reflect the sun's rays. The temperature is not same every where. **Latitude, altitude, distance from the sea, position of the mountains** are some of the factors that determine the temperature of a place.



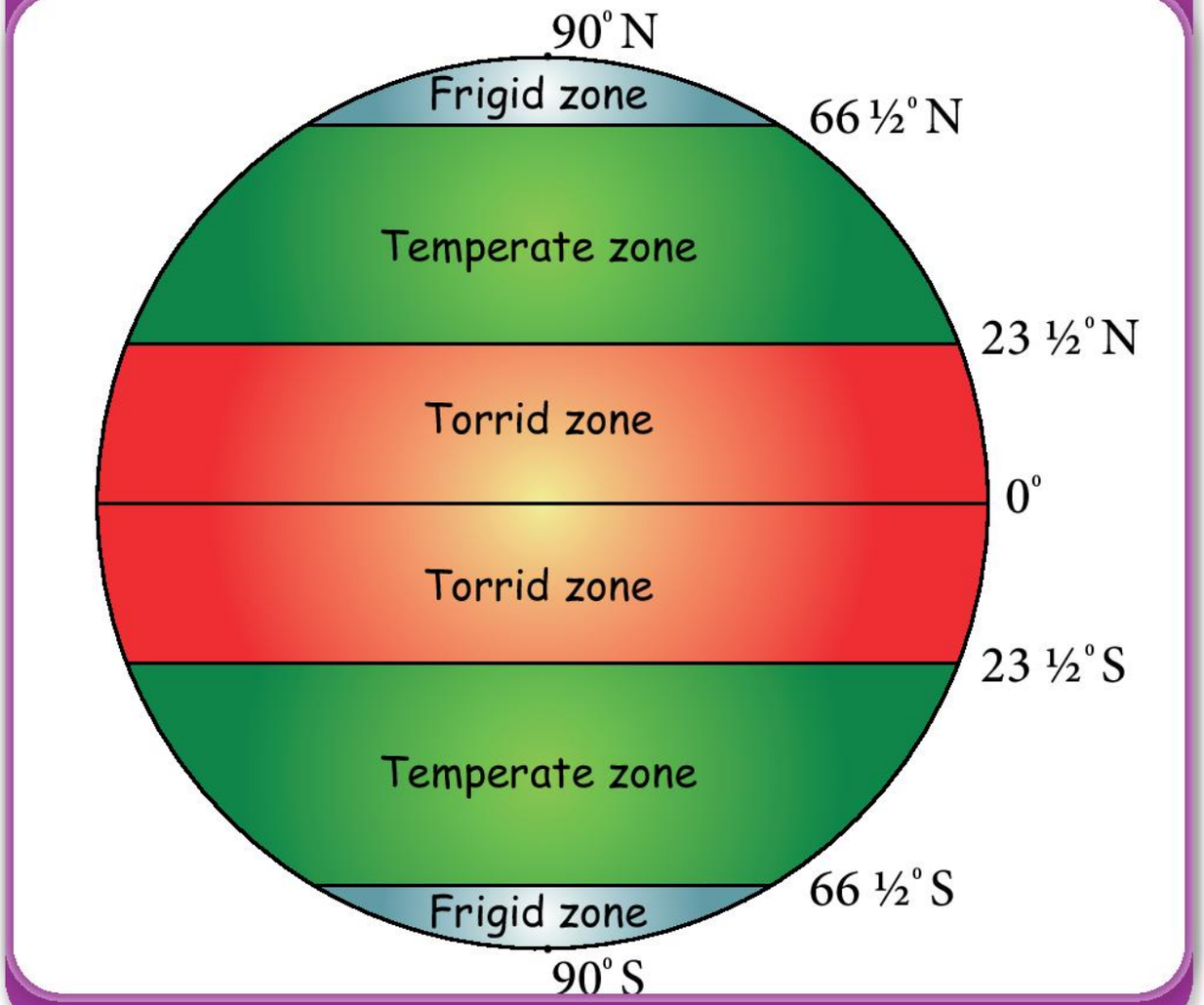
The imaginary lines drawn horizontally on the Earth surface from West to East are called **latitudes.**

The imaginary lines drawn Vertically on the Earth surface from North to South are called **longitudes.**

Latitudes and longitudes help us to locate a place correctly.

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Heat Zones of the Earth



Why does heat vary from morning to evening?

It is because of the sun's rays.

The land is divided into various heat zones according to the fall of sun's rays on the surface of the Earth.

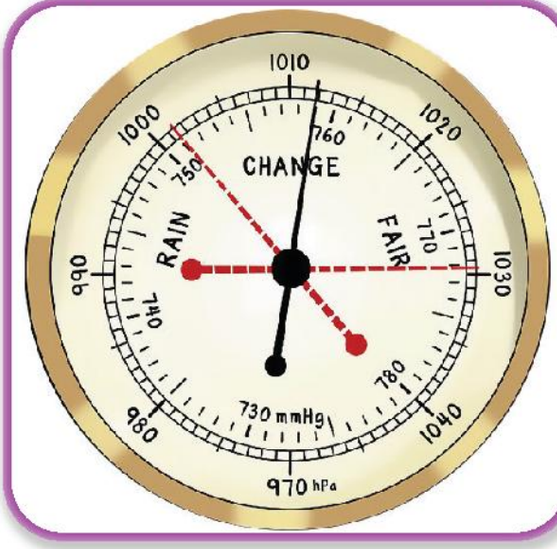
- The zone between Tropic of Cancer and Tropic of Capricorn is called **Tropical or Torrid zone,** where the sun's rays fall vertically.
- The zone between $23\frac{1}{2}°$N to $66\frac{1}{2}°$N latitude and $23\frac{1}{2}°$S to $66\frac{1}{2}°$S latitude which receives slanting rays of the sun is called **Temperate zone.**
- The zone which recives the extreme slanting rays of the sun and experiences extremely low temperature is called **Frigid zone.**

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2) Pressure

When the temperature increases, pressure decreases and when the temperature decreases, pressure increases.

Barometre





The average pressure of wind at sea level is **1013 mb.** (milli bar)

The instrument which is used to measure the pressure of the wind is **Barometre**.

Anemometre



The instrument which is used to measure the speed of the wind is **Anemometre**.

Wind Vane



The instrument which is used to measure the direction of the wind is **Wind Vane**.

3) Wind

The air which moves horizontally from high pressure area to low pressure area is called **wind.** Air never moves in one direction. It differs from place to place and time to time. This is due to the rotation of the earth.



Wind energy is a form of renewable energy. Wind turbines converts the kinetic energy into **mechanical energy.** A generator can convert mechanical energy into **electrical energy.**

Wind Mill



Loo Wind



Loo Wind

Loo is a strong, dusty, hot and dry summer wind which blows over the **North Western India** during the months of May and June.

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Different types of Wind

Planetary Wind

This wind blows in the same direction throughout the year.

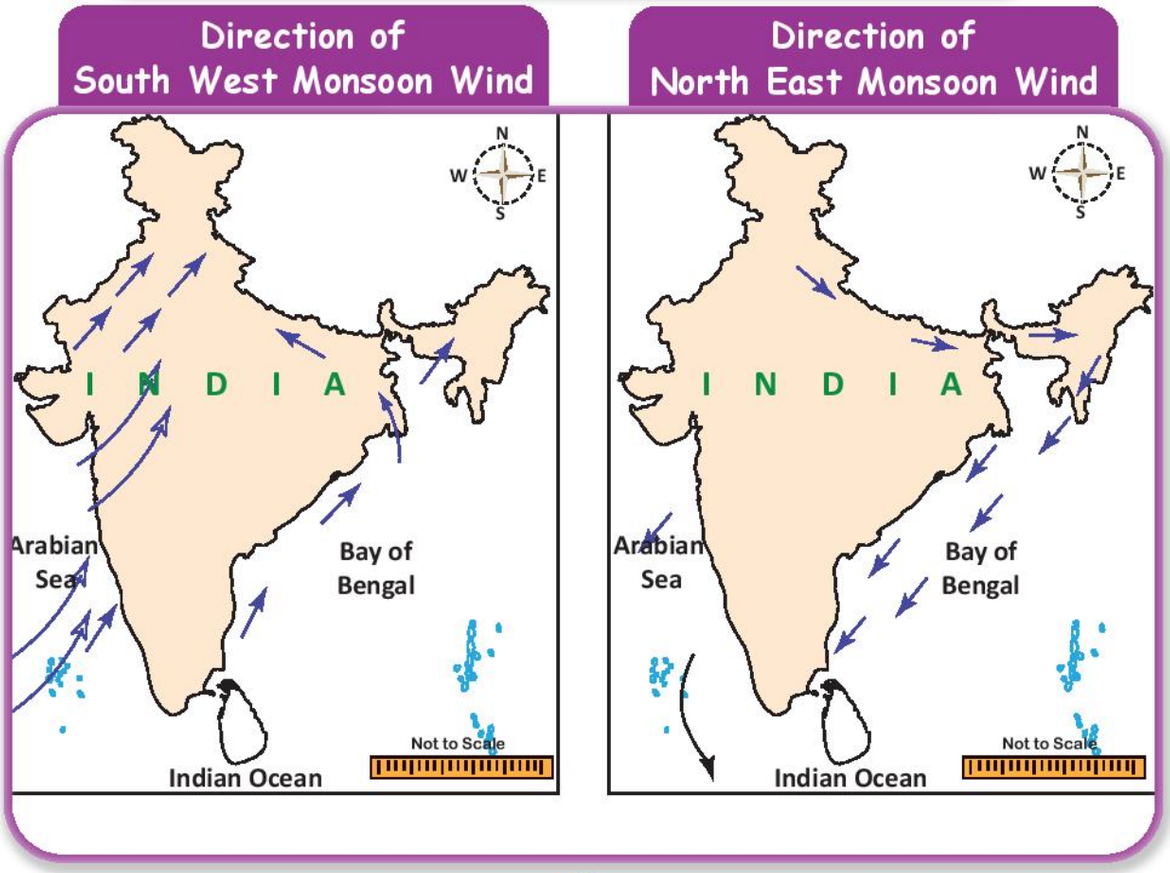
Monsoon Wind

The word monsoon is derived from the Arabic term 'mausim' which means season. Monsoon wind is the seasonal wind.

Types of Monsoon winds in India

- South West monsoon wind
- North East monsoon wind

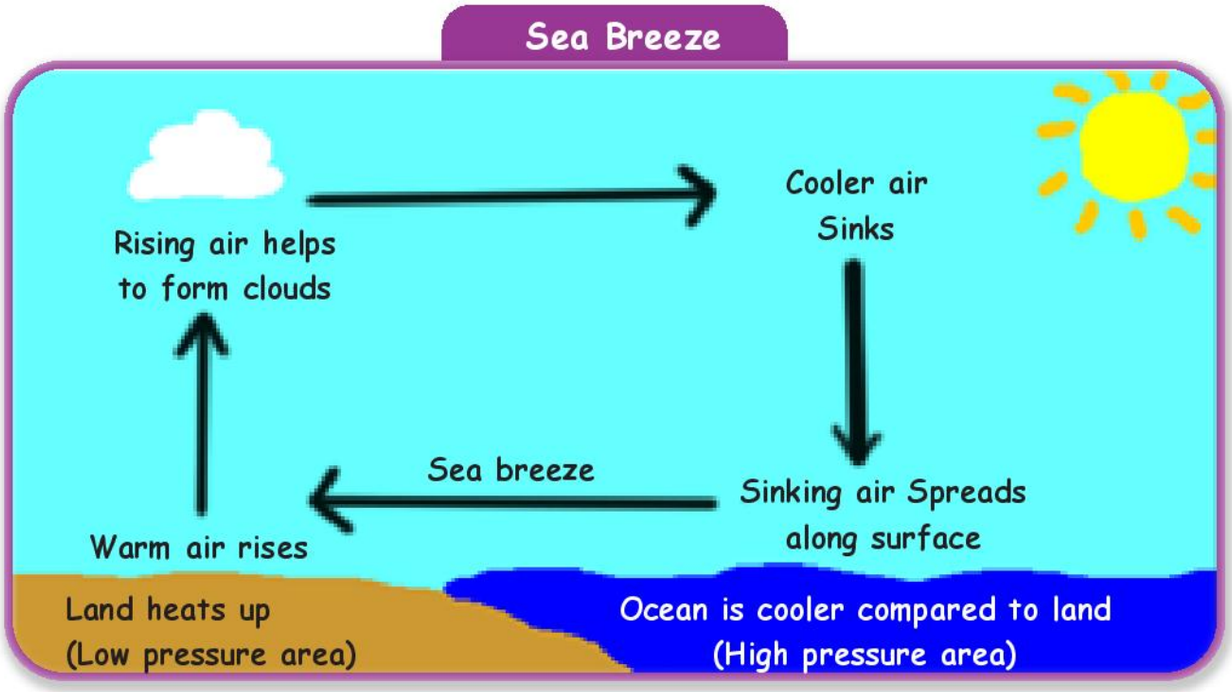




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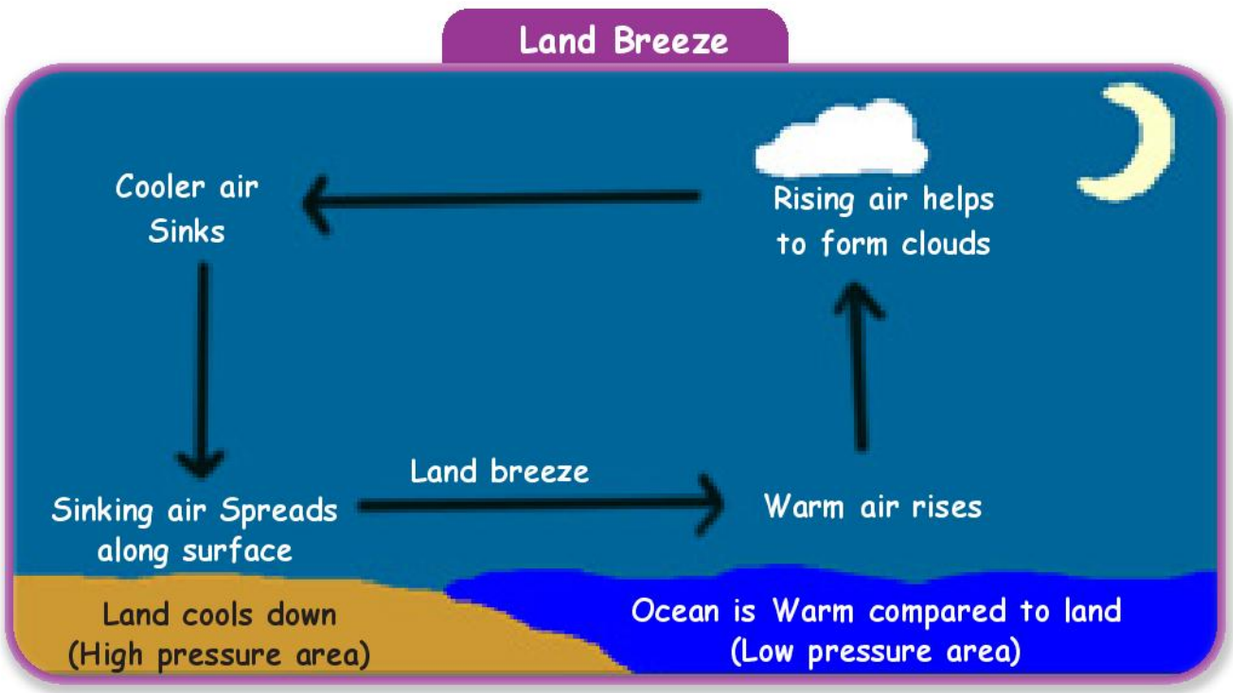
Sea Breeze

Sea breeze blows from **sea to land** in the evening.



Land Breeze

Land Breeze blows from **land to sea** in the morning.



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Local Wind

Local wind affects the weather.

- Warm local wind - North West India. E.g. Loo
- Cool local wind - North East India E.g. Norwesters.

Jet Streams

Air currents in the upper layers of atmosphere is known as **Jet streams**. It could determine the arrival and departure of monsoon winds in India.

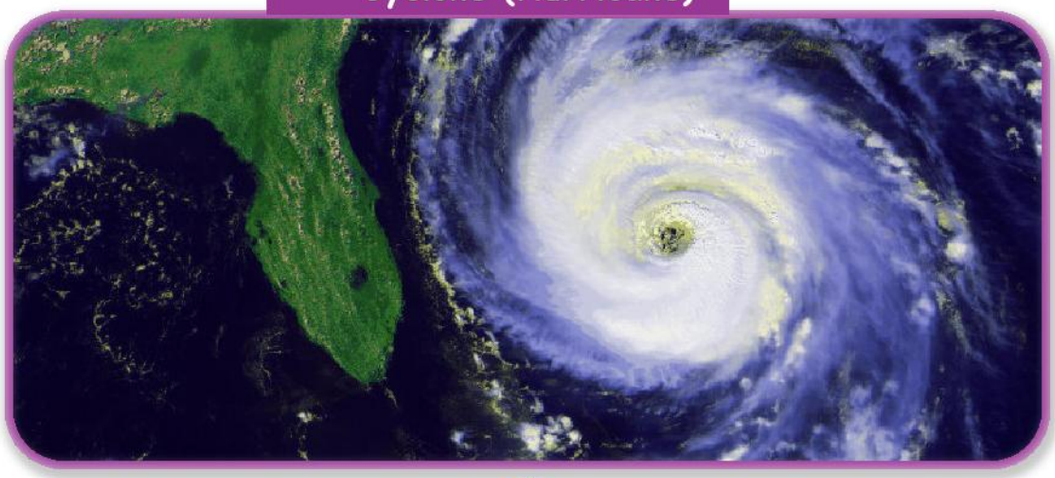
Jet Streams



Cyclone (Hurricane)

Cyclone changes its position and direction with time to time. The speed of wind also changes with time. It gives heavy rainfall.

Cyclone (Hurricane)



4) Clouds

Clouds are large collection of very tiny droplets of water . These are divided into four types on the basis of appearance and height. They are:

- Cirrus clouds
- Stratus clouds
- Cumulus clouds
- Nimbus clouds

Cirrus Cloud

Cirrus cloud appears like a silver grey fish at a very high altitude in the sky. These may not give rain.

Cirrus Cloud



Stratus Cloud



Stratus Cloud

Stratus cloud is grey in colour and are spreadout. They may give small shower.

Cumulus Cloud

Cumulus cloud looks like a puffy white cotton and gives convectional rainfall. These clouds are associated with rainfall, lightning and thunder.

Cumulus Cloud



Nimbus Cloud



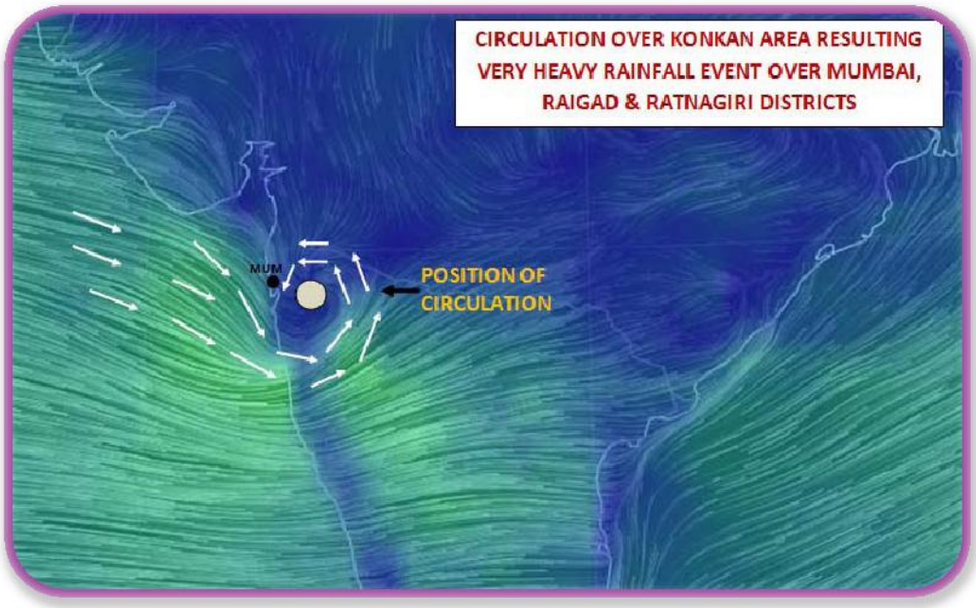
Nimbus Cloud

Nimbus cloud appears as dark or grey in colour. It gives heavy rainfall. It is called vertical or rain clouds.

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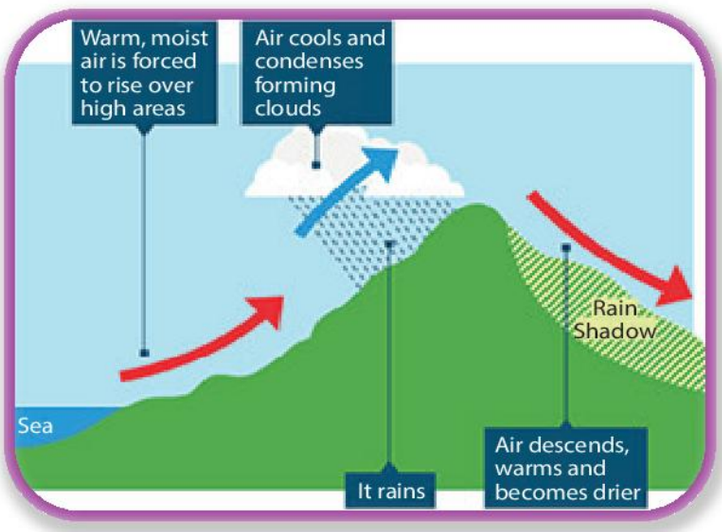
5) Rainfall

Condensation of the water vapour causes **rainfall.** Rain water must be saved and not be wasted.



Convectional Rainfall

During summer solar insolation takes place in land and water evaporates from **lakes, ponds, seas, oceans** and **vegetations.** Due to this, a heavy rainfall with lightning and thunder occurs in the evening for a short period.



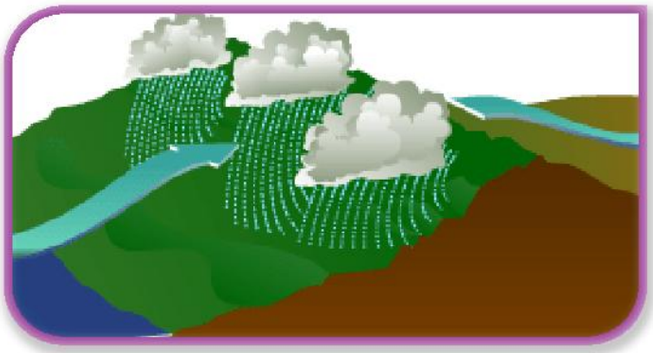


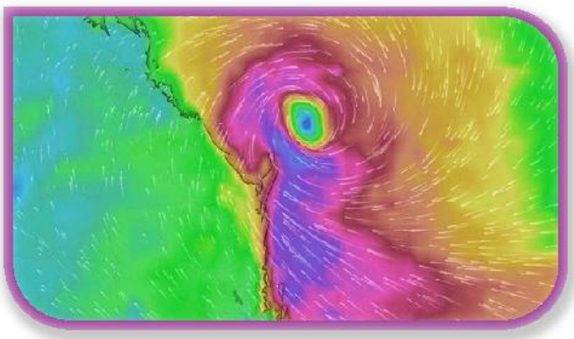
The natural materials and living things, including sunlight are called **natural environment.**

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Orographic Rainfall

When the moisture laden winds from the sea rises as it moves over a mountain range, it becomes cool and causes heavy rainfall. The opposite side of the mountain is called Leeward side. It receives very little rainfall.





Cyclonic Rainfall

The warm air from the hot area is heated and moves upwards. Hence a low pressure area is developed and it attracts air from high pressure area. Owing to Earth's rotation a circular motion of winds develop. It gets cooled and brings heavy rainfall.

Rain Water Harvesting

Rain water harvesting is a technique of collection and storage of rainwater into natural reservoirs or tanks, or the infiltration of surface water into subsurface aquifers (before it is lost as surface runoff). One method of rainwater harvesting is **Rooftop Harvesting.**





Recap

- Biosphere is the combination of lithosphere, hydrosphere and atmosphere that can support life.
- Climate is the average weather condition of a vast area over more than 30 years.



Glossary

Condensation : Process of gas changing to liquid
Reservoir : Large lake
Vegetation : Plant

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EVALUATION



I. Fill in the blanks.

1. The atmosphere is divided into _____ layers.

   a) four b) five

   c) six d) seven

2. The Earth receives heat energy from the _____

   a) Moon b) Mars

   c) Sun d) Venus



3. World Meteorological Day

   a) March-20 b) March -21

   c) March-22 d) March-23

4. The study of weather is called _____.

   a) Meteorology b) Ecology

   c) Archaeology d) Sociology

5. Zone located in between Tropic of cancer and Tropic of Capricorn is _____ zone

   a) Temperate b) Subtropical

   c) Cold d) Torrid

6. _____ is used to measure pressure in the air.

   a) Barometer b) Thermometer

   c) Anemometer d) Wind vane

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7. Monsoon is derived from the _____ word.
   a) Greek b) Arabian
   c) English d) Latin
8. Vertical cloud is called _____.
   a) Cirrus cloud b) Stratus cloud
   c) Cumulus cloud d) Nimbus cloud.
9. _____ clouds give convectional rainfall.
   a) Cirrus b) Stratus
   c) Cumulus d) Nimbus
10. Statement I - The instrument used to measure wind direction is wind vane.
    Statement II - Light travels faster than sound.
    a) Statement I is True, Statement II is False
    b) Statements I and II are True
    c) Statements I and II are False
    d) Statement I is False, Statement II is True

II. Fill in the blanks.

1. The instrument used to measure heat is _____.
2. The imaginary lines drawn parallel to the surface of the earth is _____.
3. Sea breeze blows from _____ in the evening.
4. _____ is called as rain cloud.

III. Match the following.

1	Cirrus clouds	Grey sheet
2	Stratus clouds	Storm clouds
3	Cumulus clouds	Do not give rain
4	Nimbus clouds	Looks like puffy white cotton

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IV. State True/ False.

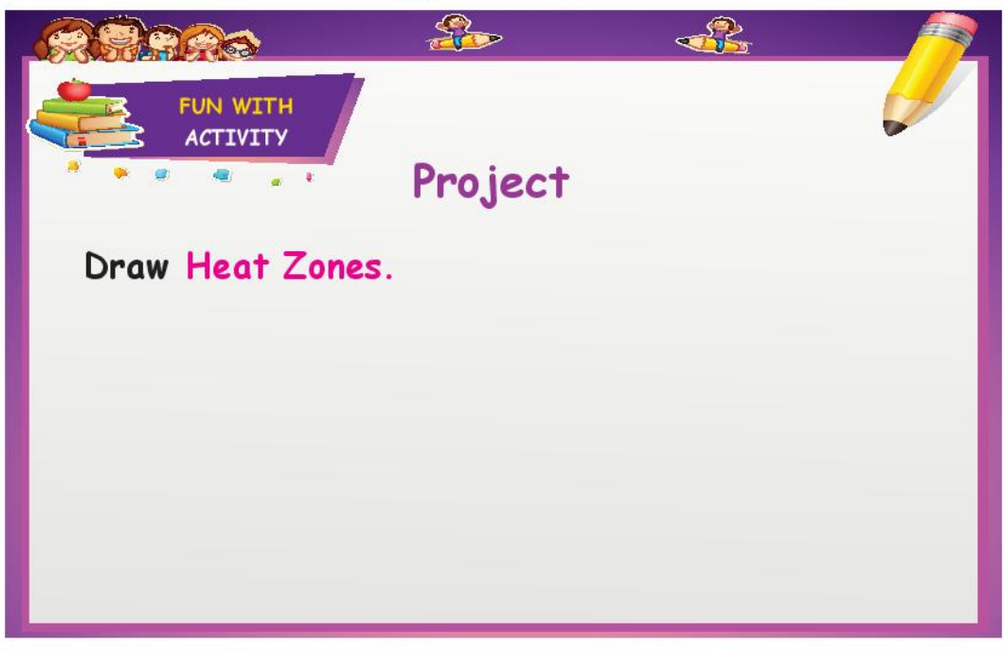
1. All weather changes occur in the Troposphere. ( )
2. Latitudes and Longitudes help us to locate a country. ( )
3. Atmosphere gets heated by conduction than solar radiation. ( )
4. The main reason for the change of wind direction is to Earth rotation. ( )
5. Cyclone moves in anti-clock-wise direction. ( )

V. Answer the following.

1. What is climate?
2. Name the atmospheric layers.
3. Write a short note on the Nimbus clouds.
4. Write a short note on the orographic rainfall.

VI. Answer in detail.

1. Write about Jet Streams.
2. Explain the types of winds.



Project

Draw **Heat Zones.**

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