

## STANDARD FIVE Term - I Volume-2

# MATHEMATICS SCIENCE SOCIAL SCIENCE

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## **Department of School Education**

**Untouchability is Inhuman and a Crime** 

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## Term - I MATHEMATICS

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1





Vrite t	he 3-D shap	es lying around	d us	
S. No	Objects	shapes	Sides	Corners
1	Dice	Cube	6	8
2				
3				
4				
5				

at this object from the front?

What will you observe, if you look What will you observe, if you look at this object from the sideways?







Fix/put the round chart on the white paper by using a pin in center.By rotating the chart we observe that two vertical lines and the center point will lie at the same point. Look at the changes occurred, when the chart is rotated.

Turn the round chart as shown in the figure (ii). The picture in figure (i) is changed, as in figure (ii) This change is called as "rotation:. "O" is the "center". When we compare the figures (i) and (ii) the pictures are changed as one-fourth turn. When we rotate the chart as shown in the figure (iii) the pictures are changed as half-turn.

#### To Observe

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

### Think it

Is there any changes to the wings of the ventilater fan, after rotating one-fourth turn and half-turn.





#### Project:

Prepare, a Gallery of 5 pictures after one fourth and half turns, and show it to your teacher. From the Gallery, prepare a table, that which looks the same after one fourth and half turn rotations.



 Look at the following shapes. Draw that how will it be changed after 1/3 and 1/6 of a turn?

S. No	Shapes	1/3 a turn	1/6 a turn
1			
2	$\mathbf{A}$		
3	O A A A A A A A A A A A A A A A A A A A		

### Project:

Prepare a Gallery by drawing the various numbers, pictures, Rangoli which will be occurred in 1/3 a turn, 1/6 a turn and show it to your teacher.



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

## **1.1c** Able to explore reflections of familiar 2D shapes intuitively.



While standing infront of a mirror, see your image.

Observe your image in the mirror when moving back and coming front to the mirror again. What do you infer?

Your image in the mirror is \_\_\_\_\_ (bigger, smaller, same size)



The distance between you and mirror and the distance between you and your image is \_\_\_\_\_ (equal, unequal)

When you come forward to the mirror, your images is moving \_\_\_\_\_ (forward, backward)



### Let's Enjoy it:

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

Are the designs on both the sides of the folded paper look alike? Observe the changes of designs and express your ideas/results to

your teacher.

## **1.1d** Able to explore symmetry in familiar 3-D shapes like in alphabets intuitively.

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



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

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

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



### Line of symmetry:

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





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**1.1e** Able to make the shapes of cubes, cylinders and cones using nets especially designed for this purpose.

Nets of cuboid:



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

Teacher: Do you see, "How many sides are there in a match box?'

Student: yes sir. There are 6 sides.

Teacher: You are right. Can you assemble/create it after dissemble?

Student: Yes sir.

Teacher: Good

The net is a two dimensional shape and it always forms three-dimensional shape.

A net is a two dimensional figure which can be folded to form a three dimensional figure.

### Try these

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



Net of a cube:



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

Net of a cylinder:



Consider a rectangle and two equal circles. This net thus formed is a cylinder.

Join the two edges of a rectangle breadth wise 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.

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

Net of a cone:



Look at the figure.

Join both 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 of them are equal in length.





### Introduction of Angles

# **1.2a** To get the feel of an angle through observation of objects and by paper folding:

Bridges, buildings, cell phone towers, wings of planes, bicycles, windows doors and things around us have angle in them.



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

Picture for angle	Name of the angle	Vertex	Two arms of angle
	∠ABC or ∠CBA	В	AB and BC
D E F	?	?	?
P R Q	\$	;	\$
	18	3	



Angle between ground and stair case



Angle between ladder and ground



Angle between branches of a tree







Angle in a house



Angle in a clock

## Angle in a electric pole

Angle in a bicycle

## Find:

In this picture, mark the angles formed inside and outside by using colour pencils.



### project:

Collect some pictures having angles, and paste the same in a chart. Draw some angles by using pencil and show it to your teacher.



Look at the angles formed by your elbow and draw them as stick picture and show it to your teacher. Please share it with your friends and check.

### Word and meaning:

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

## **1.2b** Able to learn the names of angle like acute, obtuse and right angle:

We can create the various angles by combining the two wooden frames. Let us see the picture given below, from these shape we can find the types of angles.



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

Write the angles generated in the following items. (Obtuse angle, acute angle, right angle)

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Activity 1 Draw right angle, acute angle and obtuse angle by tracing. **Project (Art and Craft)** Form the angles acute/obtuse/right angle by cutting/folding the papers and paste it in a chart. 2 🌶 Write the names of the flowers or animals (or) birds in English capital letter and mention the angles in it. GIRAFFE PEACOCK SUNFLOWER Exercise 1.2 7354S The angles below 90° are called as \_\_\_\_\_ The angles above 90° are alled as \_\_\_\_\_ By joining two right angles \_\_\_\_\_ angle is 3 formed







## 2.1 The uses of numbers beyond 10000 in real life situation. Introduction

The price of television is ₹ 18, 500, the price of cell phone is ₹ 15,250 the price of LPG cylinder is ₹ 975, the price of wooden cot is ₹ 30,000 the price of car is ₹ 4,50,000 the price of bicycle is ₹ 5,250 and the price of pen is ₹ 115.

Tabulate the above data for price more than ₹ 10,000 and the price less than ₹ 10,000.

More than ₹ 10000	Less than ₹ 10000

We have learnt upto 10000 in the fourth standard, Now let us know 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














### 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	<	<b>20344</b> 5 diaits	
4 digits		5 digits	

Which is greater 73652 or 56372 ?

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

T.Th	TH	Н	Т	0	T.TH	ΤН	Н	Т	0
7	3	6	5	2	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 should be compared.



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

Hence.,



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





<u>\_</u> 1

Try t	his
1 Ar de 33	range the following numbers in the ascending order and scending order. ,270; 1,078; 137; 27,935
44	, 918; 32,113; 23, 112; 42,231
75	,343; 30,475; 43,452; 13,055
73	3; 34,946; 35,945; 23,745.
	Exercise 2.3
I. Write	the number name:
a. 11000	) Eleven thousand
b. 3400	0
c. 1000	00
a. 98,30	four.
e. 37,68	39
f. 46,76	53 Forty six thousand seven hundred and sixty three
g. 4,00,	000
h. 12,00	),000
II. Write	the following values in abacus.
1 3 Te	ens, 7 crores, 60 lakhs, 7lakhs 4 tens
2 Find	the place value of 7 and 4 of this num-
bers	s 34578910
3 Wri	te any one number with 6 thousands with 9 tens and 3 ones.
Wri <sup>•</sup>	te in numerals
a. C	one crore forty thousand and four.
b. S	ixty four lakhs and three



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, for ladies is ₹ 47025 and for kids is ₹ 7125, and for bride and groom dresses is ₹17500, Now you can tell the total amount.

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

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

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

Yes, ananthan is correct, see the cost of kids, ₹ 7125, There is a empty place in ten thousand's place. So Ananthan wrote down the numbers according to the place value. We learnt about place values of the numbers. Now we are going to use the method of adding different values of numbers. Add the following numbers and write down one by one.

137462 + 4005 + 38 + 56734

L	T.Th	Th	Н	Т	0
1	3	7	4	6	2
		4	0	0	5
				3	8
	5	6	7	3	4
1	9	8	2	3	9

**Step1**: Start by adding the ones. We have 19 ones in ones place.s

**Step2**: We must regrouping 19 ones to 1 ten and 9 ones.

Step3: Now we can put 1 ten with ten and write 9 in the ones place.

Simillarly we have to do the hundred, thousand ... and so on.

Arrange all the given numbers according to their place value.

We can do all the addition problems in this manner.

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

Exercise 2.4a Find the sum. 1 32567 6875 78 637 4 3 2 4 54300 5000 54 2 Add the following 19732 + 24105 + 525 + α. 48 Ь. 241605 + 34788 + 5003 2052 + 1000 + 250787 + 3574 + 43 С. d. 7 + 65 + 324 + 52342. (3) In a town panchayat, population of 5 villages are 980, 3254, 4125, 687 and 6786. what is the total population? Ramu bought some home needs. The price list of which is given below. What is the total cost? -₹ 3,250 Fan -₹26,437 Fridge Television - ₹ 18,520 Iron box -₹ 940 Cot - ₹ 15,520 5 In a vegetable market, one day sales of Brinjals is ₹ 4500, Tomato is ₹ 7800, Onion is ₹ 26,500, Potato is ₹ 7825 and Beetroot is ₹ 825, What is the total amount of sales on that day?

# 2.4b Subtraction

We have already learnt how to add the numbers and to write down the numbers with their corresponding place values. In the same manner we have to do subtraction problem . The operation or process of finding the difference between two numbers or quantities, denoted by a minus sign (-).





See the followi	ing steps:
<b>Step: 1</b> 0 <u>350 x</u> 0	O 35
<b>Step: 2</b> 2 HT <u>350</u> 50	O x 35
Step: 3	
2 H 350 x 1750	O 35
Step: 4	
350 x	35
1750 0	
Step: 5	
0 350 x	T 35
1750 00	
<b>Step: 6</b> 1 HT 350 x	T 35
1750 500	

Step:	7	
1		
Н	Т	
35	) x 35	
175	)	
+ 105	C	
122	0 1750 + 105	500 = 12250
2.4d Mu nui	tiply the three digit number bers	rs by two digit
Example 1		
Raveena ha has 112 tre	planted 15 rows of coconut tree s. How many coconut trees were	s in her garden Each row planyed in total?
Using multi	ly method	
Number of	ows planted by Raveena	= 15

Number of rows planted by Raveena	= 15	
Number of trees in one row	= 112	
Total number of coconut trees in her garden	= 112X15 = 1680	<u>112x 15</u> 560
Example 2		1680
One kg of Apple is sold by Bathri for Rs 165. Find the total cost of 12 Kgs of Apple?		
Cost of 1Kg of Apple	= Rs 165.	
Total cost of 12 Kgs of Apple	= 165 × 12	
	= Rs 1980	
		165x 12 330 + 1650 <b>1980</b>

# Exercise 2.4c

### 1. Multiply:

a. 473 × 48
b. 4052 × 19
c. 876 × 25
d. 854 × 21
e. 417 × 39
f. 870 × 28

### 2. Answer the following :

In a Basket there are 55 mangoes. Cost of one mango is ₹ 15. What is the total cost of 55 mangoes?



3

In a Bus, there are 55 passengers. Each of them get tickets of ₹25. What is the amount is collected by the conductor?

A classroom has 23 benches, each bench cost is ₹ 725. What is the total cost for 23 branches?

In a village there are 675 people are living. Each person uses 25 L of water daily. How much water is need for the village everyday?

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

## 2.4e Division Algorithm

Mr. Sabari lives in kovalur village. He is a farmer and has a cow. He gets milk from it and sells the milk to 8 houses daily. His cow gives 8 L of milk daily. So it gives 240 L of milk for 30 days.

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

So we have to split 240 in 8 parts.

- 240 Numerator
  - 8 Denominator



We can find this by long division (or) standard division algorithm.				
<b>Step: 1</b>	4 0 4 0 We are going to divide 240, Here 240 is the <b>dividend</b>			
<b>Step: 2</b> 8 2	4 0 We have to split 240 into 8 equal parts, Here 8 is the <b>divisor</b>			
<b>Step: 3</b> 8 2 2	3There are three 8's in 24. (8 + 8 + 8 = 24)404040404040404040404040404040405050100110120130140150160170170170170180190190190190190190190190190190190190191919<			
Step: 4 8 2 -2	<ul> <li>3 0</li> <li>4 0</li> <li>4 0</li> <li>4 ↓</li> <li>0</li> <li>Next write down '0'. We Cant divide 0 by 8</li> <li>So, write '0' on the top near 3.</li> <li>So 30 is quotient</li> <li>It means, each house bought 30 L in a month.</li> </ul>			
Note: Genera multipli But in o First cl Here a have 24	lly, when we are doing addition subtraction and ication , we are starting from units place. division , We do in opposite manner. hoose the highest digit. 2 is smaller than 8 so take 2 from Ten's place. Now we 4.			



# 2.4f Divide 4 digits by 2 digits

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

On that day 5<sup>th</sup> std students are very excited, as the bus came to school for educational tour. The class teacher asked the students to get in the bus. Students got into the bus happily. The bus reached Arignar Anna Botanical garden. The class teacher paid ₹ 1530 as Entrance fee for all the



students. If there are 34 students, what is the entrance fee for one student?

So, we have to divide the total amount ₹ 1530 by 34.

1530 ÷ 34	When dividing by 2 digit number, we have to choose first two digit from the dividend.
Step: 1	34 15
Th H T U 34 1 5 3 0	But 15 is smaller than 34, So choose 3 from tens place with 15, we get 153 34 153
Step: 2 4 $34 \overline{) 1530}$ -136 17	Now divide 153 by 34 Calculate how many 34's are there in 153. 4 X 34 = 136.
Step: 3 4 5 34 1 5 3 0 -1 3 6 4 1 7 0	Next write down the '0' in the unit place We have 170. Calculate how many 34's are there in 170 5 X 34 = 170
$\frac{-170}{0}$ Therefore, the entrance f	Quotient = 45, Remainder = 0 ee for one student is ₹ 45

Divide and find the quotient	and Remainder.
Example 1: 4 9 2 5 ÷ 25 Step: 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 is one time in 49 1 x25 = 25
Step: 2 $25 \ 4925 \ -254 \ 242$	Subtract 25 from 49 we get 24, Next write down 2 from the ten's place
Step: 3 $25 \ 4925 \ -254 \ -242 \ -225 \ 175$	Divide 242 by 25 Calculate how many 25's in 242 9 X 25 = 225 Subtract 225 from 242 we get 175.
Step: 4 197 25 4925 -254 242 -2254 175 -175 0	Next write down 5 from unit place. Now we have 175 Calculate how many 25's in 175 7 X 25 = 175 Quotient = 197, Remainder = 0

Example 2: Divide 4327 by 18 and find quotient and remainder Solution :

	240	<b>N:</b> 11.1		4207
18	4327	Dividend	=	4327
	-36 1	Divisor	=	18
	7 2	Quotient	=	240
	- 7 2 1	Remainder	=	7
	/			

### Example 3:

A car factory produces 3750 cars per month (30 days). Find the number of cars produced per day.

Divide 3750 by 30 days. 3750 ÷ 30 Step: 1 1 30 3750 Choose first 2 digits. 37 from the dividend Divide 37 by 30  $\frac{-30}{7}$ Calculate how many 30's in 37  $1 \times 30 = 30$ Step: 2  $\begin{array}{r}
1 \\
30 \overline{\smash{\big)}3750} \\
\underline{-30} \\
75
\end{array}$ subtract30 from 37, we get 7 Next down the 5 in ten's place Step: 3 12 Divide 75 by 30. 30 3750 -30↓ 75 Calculate how many 30's in 75 2 X 30 = 60 - 6 0 Subtract 60 from 75 we get 15 15







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

# Examples

Observe the below patterns of colours and shapes.



### Examples

Observe the below patterns of shapes.









Let us know

Joshua formed a square using 12 bindis. is it 12 is a square number?



No because there are so many gapes in the square.

Though the number 12 made the square. But it is not a square number.



### Triangular Numbers

Any of the series of numbers obtained by continued summation of the natural numbers.

A number that can make a triangular dot pattern.



can you understand now? yes, the sum of consecutive natural nun make the triangular numbers.





# **3.2b** To relate sequences of odd numbers between consecutive square numbers.

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.









### Length

# **4.1a** Able to apply the four operation in solving problems involving length.

### Introduction

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



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



I am measurika. 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 her that how long things are, how tall they are, or how far apart they might be. These are all the examples of length.

Measaurika, you should know the following measurements:

 a. Millimeter (mm): Millimeters is the smaller unit of length.
 A millimeter is about the thickness of a plastic id card (or Debit/ credit card). Or about the thickness of 10 sheets of paper on top of each other.

This is a very small measurement!

S.no	Name of the object	Thickness in mm
01	Cell phone	
02	Maths Book	
03	Eraser	

### b. Centimeter: 10 millimeters is equal to 1 centimeter

1 centimeter = 10 millimeters

A fingernail is about one centimeter wide.

We can use millimeters or centimeters to measure how tall we are, or how wide a table is. But to measure the length of football field, it is better to use meters.

Measurika, could you please mark 5mm in the scale? Children could you please help measurika.





### Could you please mark 4mm in red colour and 10mm in Green colour?



### Could you mark 1cm and 3mm (1.3cm)?

10 milli meter = 1 centi meter 10 centi meter = 1 deci meter 10 deci meter = 1 meter 10 meter = 1 deca meter 10 deca meter = 1 hecta meter 10 hecta meter = 1 killo meter



S.no	Measure the length	Length in cm
01	Composition Note	
02	Your height	
03	Geometry box	

#### c. Meter

A meter is equal to 100 centimeters

The length of this guitar is about 1 meter

Meters are used to measure the length of a house, or the size of a play ground.

One meter is approximately the length from your shoulder to your fingertips. A meter is also approximately the distance of one large step or jump.

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

S. no	Measure the length	Length in meter
01	Classroom	
02	Distance between school entrance and your classroom	

### d. Kilometer

When you need to get from one place to another, you can measure the distance using kilometers. A kilometer is equal to 1,000 meters.

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

We can ride a Two wheeler/ Four wheeler to go from one place to the other. The distance travelled is measured using the speedometer.

1Km = 1000m

S.no	Calculate the distance	Distance in Km
01	Distance between school and your home	
02	School and your taluk head quarters	
03	School and your District	



### Let us know

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

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

- 100 centimeter = 1 meter
- $\frac{1}{2}$  meter = 50 centimeter
- $\frac{1}{4}$  meter = 25 centimeter
- $\frac{3}{4}$  meter = 75 centimeter
- 1000 meter = 1 kilometer



<b>6 1 1 0</b>	Name of the object	Length			
5.NO		Km	Meter	Cm	mm
1.	Your's Shoulder length				
2.	Your's height				
3.	Thickness of the chess board				
4.	Distance between your house and uncle's house				
Conver	t into millimeter		١	Note:	ert meter
(i) 70	) cm		1	into milli	imeter the given
70	$cm = 70 \times 10 mm$ 1 cm	= 10 m	m	multiply	by 1000.
=700 mm			2. To convert		
(ii) 65 cm 6 mm = (65 x 10) + 6 mm = 650 + 6			into mil	limeter , the giver	
			centimeter by 10		
	= 656 mm			Try 1	this
	'n		Cor	ivert into	millimeter
(iii) 7				1.90	cm
(iii) 7 7	m = (7×1000) mm 1 m =	: 1000	mm	2.5 c	cm 8 mm



5th\_Unit\_04\_Measurement\_Term 1.indd 66










#### F. Divide the following:

1

950 km 800 m÷5

49 m 770 mm ÷ 7

172 m 48 cm ÷ 4

## LIFE ORIENTED PROBLEMS

#### G. Answer the following:

Saravanan had chosen to drive his vehicle from puducherry to Chennai for a distance of 165 Kms. While starting his vehicle, his odometer showed 00015. What will be the reading of the odometer, When he reaches Chennai?

Karthik Raja decided to travel from A. He moves 1Km 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 a Diagram and Justify it. Also find out the total distance he travelled.

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?



5

(3)

A students needs 1m 25 cm cloth to stich a shirt. What is the total length of cloth need to stitch 22 shirts?

The distance from village A to village B is 3 km 450 m. The distance from village B to village C 5 km 350 m. How long will be the road laid from village A to village C?

## H. Create the story problem using the pictures given below:0









Railway time

We are using 12 hours time generally. To avoid confusion, we use railway time in railway station, television. airport, internet, etc. When we are going to railway station we cannot see or hear announcements in a.m. or p.m. Because railway uses 24 hours time?



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



add 12 to hours and keep the minutes same.



## Conversion

12 hours Clock	24 hours Clock	12 hours Clock	24 hours Clock
12 Mid night	0000 hours or 2400 hrs	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 hrs or 24:00 hrs









#### Example

Krishna goes to his village. He travels 4 hours 35 minutes in bus and 1 hour 55 minutes in two wheeler. What is his total time of travel?

		H	ours	Minutes	;
Travel in bus	=		4	35	
Travel in two wheeler	=	+	1	55	90 minutes = 60+30 minutes
			5	90	60 minutes = 1 hour
Total time	=		6	30	30 minutes = 30 minutes ∴ 5+1 = 6 hour 30 minutes

:. Krishna travels totally for 6 hour 30 minutes

#### Subtraction

#### Example

Subtract : 3 hours 45 minutes from 5 hours 30 minutes

	Hours	Minutes
	5	30
-	3	45

	Hours	Minutes
	4	60+30
	5	30
-	3	45
	1	45
1	lour 45 i	ninutes

We can't Subtract 45 minutes from 5 hours 30 minutes so we change the 5 hours in to (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

#### Example

Ram works on his Computer from morning 10' O Clock to Evening 3.30. How long does he work on his computer?

						Hours	Minutes	
Ram w	am work on his Computer at Evening				=	3	30	
His wo	is work at Morning				=	10	00	
		Hours	Minutes					
		15	30					
	-	10	00	Subt	ract	from a.m.	to p.m., we add	12 hours.
		5	30	Add	3.30	hours + 12	2 hours we can g	get 15:30
	∴ Ro	am works <mark>5</mark>	hours 30 mir	nutes or	n his c	computer		

	SCHOOL	TTME TARIE	·		
First bell	9.30 am	Lunch time	,		12:40 nm to
	0.15				2:00 p.m.
morning prayer	9:15 a.m.	Afternoon sc	:hool		2:00 p.m.
Class starting time	9:30 a.m.	starting time	2		1
Morning break time	11:00 a.m. to 11:10 a.m.	Afternoon br	reak ti	me	3:20 p.m. to 3:30 p.m.
Morning school closing time	12:40 p.m.	Evening school time	ol clos	ing	4:10 p.m.
1	1				ار ار
First bell time = $\frac{-9  00}{2  00}$ The time interval between First bell and morning break is 2 Hours. 2. Find the time interval between the time of class starting and the time of morning break.					
The time interval betw 2. Find the time inter morning break.	een First bell and •val between the	morning break time of class s	is 2 Ho starting	ours. g and t	he time of
The time interval betw 2. Find the time inter morning break.	een First bell and val between the Hour	morning break time of class s Breaking	is 2 Ho starting time	we car	<b>he time of</b> n't subtract 30 s from 10 min-
The time interval betw 2. Find the time inter morning break.	een First bell and val between the Hour 10	morning break time of class s Breaking (60 + 10	is 2 Ho starting 1 time 10)	We can minute utes sc	<b>The time of</b> n't subtract 30 s from 10 min- o we convert to
The time interval betw 2. Find the time inter morning break. Morning break ending t	een First bell and val between the Hour 10 rime = 11 = -9	morning break time of class s Breaking (60 + 10 30	is 2 Ho starting 1 time 10)	We can minute utes sc hour in hours t	he time of n't subtract 30 s from 10 min- o we convert to nto minutes 1 to 60 minutes and
The time interval betw 2. Find the time inter morning break. Morning break ending t Class starting time	een First bell and val between the Hour 10 -ime = 11 = - <u>9</u> 1	morning break time of class s Breaking (60 + 10 <u>30</u> 40	is 2 Ho starting 10)	We can minute utes sc hour in hours 1 add.	the time of n't subtract 30 s from 10 min- o we convert to to minutes 1 to 60 minutes and
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<ul> <li>The time interval betw</li> <li>2. Find the time intermorning break.</li> <li>Morning break ending the Class starting time</li> <li>The time interval betwee morning break ending the total time for the total time f</li></ul>	een First bell and val between the Hour 10 Time = 11 = -9 1 veen class starting time is 1 hour 40 m rom starting of mo	morning break time of class s Breaking (60 + 10 30 40 g time and minutes.	is 2 Ho starting time 10) osing of	We can minute utes sc hour in hours t add. 60+10 tract 3 40 we minute	the time of n't subtract 30 s from 10 min- to we convert to not o minutes 1 to 60 minutes and = 70 now we sub- 30 minutes from can get 1 hour 40 s. noon class.
The time interval betw 2. Find the time inter morning break. Morning break ending t Class starting time The time interval betw morning break ending t 3. Find the total time fu	een First bell and val between the Hour 10 Time = 11 = -9 1 veen class starting time is 1 hour 40 r rom starting of ma	morning break time of class s Breaking (60 + 10 30 40 g time and ninutes. minutes.	is 2 Ho starting time 10) osing of	We can minute utes sc hour in hours t add. 60+10 tract 3 40 we minute Afterr Minute	the time of n't subtract 30 s from 10 min- to we convert to not o minutes 1 to 60 minutes and = 70 now we sub- 30 minutes from can get 1 hour 40 s. noon class. s
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	4 hours 25 minutes - 1 hours 20 minutes =				
	6 hours 55 minutes - 2 hours 20 minutes =				
<b>)</b> !	5 hours 45 minutes - 3 hours 55 minutes =				
Ans	wer the following:				
	An office works from mor What is the working hour	rning 10' 0 clo s of the office	ck to afterno 2 in a day?	on 6' O clock.	
	A school works from 9 a.r the school?	n. to 4.10 p.m.	What is the	working hours	
	A circus starts at 2:15 p. the circus ends?	m. and end aft	er 2:30 hours	s. At what time	
	A bank works from morning hours of the bank?	ng 9:30 to eve	ning 4:30. Wl	nat is the work	
	A man comes to his village from abroad. He travels 2 hours 15 minutes in Aeroplane and 4 hours 40 minutes in Car. What is his total time of travel?				
	hours 50 minutes in the e	venina. What i	s his total ti	morning, and 2 ne of work?	
[24	hours 50 minutes in the e Project / Activity Hours Clock]	evening. What i	s his total ti	morning, and 2 ne of work?	
[24 Wr	hours 50 minutes in the e <b>Project / Activity</b> <b>Hours Clock]</b> rite down the time of t	travel.	s his total ti	morning, and 2 me of work?	
[24 Wr	hours 50 minutes in the e <b>Project / Activity</b> H hours Clock] rite down the time of t Train Name	travel. Starting time Chennai	Reaching time	morning, and 2 me of work? Travelling time	
[24 Wr Sai	hours 50 minutes in the e <b>Project / Activity</b> <b>Hours Clock]</b> <b>rite down the time of t</b> <b>Train Name</b> rkar Express Kakkinoda	travel. Starting time Chennai 17:20	Reaching time 09:50	morning, and 2 ne of work? Travelling time	
[24 Wr Sai Rai	hours 50 minutes in the e <b>Project / Activity</b> <b>Hours Clock]</b> <b>rite down the time of t</b> <b>Train Name</b> rkar Express Kakkinoda meswaram Express train meswaram	travel. Starting time Chennai 17:20 19:15	Reaching time 09:50 08.35	morning, and 2 ne of work? Travelling time	
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Introduction



The main aim of information processing is to enable the **N87UR6** learners to count, compare and assume information such as invitees coming to attend a birthday party, sort out the library books, food production, the number of pupils taking food in the mid-day meal scheme and the various occupations of their parents.

## Example

The teacher asked a student named Dinu to collect the pictures of his favourite sports articles and Dinu collected the same and handed it over to the teacher quickly. Let us see how is it possible for him to do it quickly.



He tabulated the same as follows, then the teacher asked questions to classify the details of sports articles.



Let us know what the teacher asked dinu?

- 1. Find the total number of pictures?
- 2. How many students like cricket bat?
- 3. How many students like football?
- 4. How many students draw Carrom board?
- 5. How many students like hockey stick?



## 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 contain the basic knowledge of mathematics.

Here is a game of number puzzle with a systematic rule and with a specific property.

- i. Choose any one number
- ii. Add the next number to this
- iii. Then add 9
- iv. Divide by 2
- v. And then subtract the assumed number
- vi. Answer 5 (common for all)









## GRAPHICAL REPRESENTATION OF DATA

## 6.2a Collection of two - dimensional quantitative Data

The easy method to calculate is to tabulate the collected 2 - dimensional 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 from Fifth Standard to arrange the sports article in order. They tabulated the sports articles as below



## Activity 1

In a Sports day celebration. The Fifth standard students were given a competition of collecting mathematical shapes. Shakuntaladevi team won the competition.



## Try this

Can you make a rectangle using the triangles taken from a square?

Let us count the shapes collected by the winning team.

Shapes		
Numbers		

## Example 2

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

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

Items	Pencil box	Pen	Eraser	Pencil	Scale	Water bottle	Colour Pencil
Numbers	2	3	3	3	1	2	1
Activit	y 2						
In a house of the mo	e hold ar <sup>.</sup> nth as gi	ticles r ven be	nart, tot low. Ansı	al stock wer the t	was calc following	ulated at questior	t the end 1.
Questions							
1. How m	any chai	rs wer	e there i	n the sto	ock list?		
2. Name	the artic	les wh	ich are l	esser th	an the n	umber of	cots.
3. What	is the to	tal nun	nber of 1	hings in	the stoc	:K?	
4. How m	iany tri f	ooted	STOOIS W	ere ther	e? ton thon	tri foot	
J. Menno	Jn The ur		which ur	e 5 greu	ren mun		24 510012
		- Do	it your	self			
		List	& tabulat	te the			
		Turni	ture in y	our scho	01.		
ቅ							6
			87				

## 6.2b Pictograph

#### Information can be easily understood when they are represented in pictures.

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

## Example This is information collected from 150 students about their favourite subjects. Make a pictograph based on it: Number of students Subject 👤 = 5 students Tamil 25 English 20 Maths 55 Science 35 Social sciences 15 Number of students Subject Tamil English Maths Science Social sciences

Activity				
	Education	Numbers		
The following information	Up to Eigth standard	20		
shows the number of	Up to Tenth standard	50		
literates in a village of	Up to Twelveth standard	70		
200 people. Draw a	Under Graduate	10		
pictograph for the data.	Post Graduate	10		
	Up to Fifth standard	10		
Ъ	Illiterates	30		
<ol> <li>The following table show particular village betwee</li> <li>Year</li> </ol>	s the weight of paddy Cultiv n 2010 and 2015 Paddy production	vated in a = 100 ka		
2010 🔰	$\mathbf{X} \mathbf{X} \mathbf{X} \mathbf{X} \mathbf{X}$	- 100 kg		
2011	$\mathbf{A}$			
2012				
2013				
2014				
		•		
<ul> <li>Observe the pictograph and answer the following questions.</li> <li>1. In which year the paddy production was maximum?</li> <li>2. In which years the paddy productions were equal?</li> <li>3. Find the paddy production in 2015,.</li> <li>4. Find the total quantity of paddy production in 2013, 2014, and 2015.</li> </ul>				
2. The total number of pupils	studying in class 5 are as foll	lows		
GHSS: 1000 PUPS: 200	BHSS: 400			
PUMS: 400 Private nur	sery School: 800			
Prepare a pictograph using and answer the following qu	the symbol 🙂 to represen lestion:	nt 100 Pupils		
<ol> <li>Which school has the ma</li> <li>Which school has the lead</li> </ol>	ximum number of pupils? ast number of pupils?			

## 6.2c Graphical Representation or Data

## 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 verify 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 stick".

#### Example 1

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

'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.

11 - 2	1111 11 - 7
111 - 3	1111 111 - 8
1111 - 4	1111 1111 - 9
1111 - 5	1111 1111 - 10

1111 1111 1 - 11

Car	11111111111
Van	1111111
Lorry	11111111111111
Two wheelers	111111111111
Bus	1111

#### Note:

We can use tallymark to record data with large numbers.

## Solution

11111-6

Vehicles	Tally mark	No. of vehicles
Car	1111 1111 1	11
Van	1111_11	7
lorry	1111 1111 111	13
Two wheelers	1111 1111 11	12
Bus	1111	4

## Answer the following questions:

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

## Example 2

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

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	1111 1111	9
Cake	111	3
Biscuit	1111	4
Apple	11	2
Banana	11	2





## Try this

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

(a) Which story book do your classmates like?

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

(b) What do your classmates want to become when they grow up?

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

## 6.2d Bar graph

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



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



## Activity 3

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







	Ans	wers	
NUMBERS			
Exercise 2.4a			
1. 61,866;	41,969		
2. a) 44,410	b) 2,83, 448	c) 2, 55, 404	d) 52, 738
3. 15,832			
4. Rs. 64, 667			
5. Rs. 47,450			
Exercise 2.4 b			
(a) 1) 18,872	2) 63,308	3) 1,10,398	4) 85,162
(b) 732			
Exercise 2.4 d			
1. a) 22,704	b) 76,988	c) 21,900	d) 17,934
e) 16,263	f) 24,360		
2. 1. Rs. 825	2. Rs.1375	3. Rs.16,675	4. Rs. 16, 875
5. Rs.24,700	)		
MEASUREMENTS			
Exercise:4			
A. 1) 705 cm	2) 50 cm 5 mm	3) 32600 cm	4) 5300 m
5) 6m 50 m			
B. a) false	b) true	c) false	d) true
e) false			

C. 1) 69 m 750 cm	2) 165 km 450 m	3) 10 cm 7 mm
D. 1) 2 km 250 m	2) 380 m 360 mm	3) 2 km 50 m
E. 1) 2453 m 15 cm	2)151 km 800 m	3) 298 m 800 mm
F. 1) 190 km 160 m	2) 7m 110 mm	3) 43m 12cm
G. 1) 000322	2) 6 km	3) 20 poles, 30 m
4) 27 m 50 cm	5) 8 km 800 m	

## TIME

## Exercise:5

С.	1) 7 h 20 mir	1	2) 7 h 20 min
	3) 5 h 20 mi	n	4) 5 h 35 min
	5) 7 h 15 mir	ı	
D.	1) 2 hr 35 m	in	2) 1 hr 40 min
	3) 3 hr 05 m	in	4) 4 hr 35 min
	5) 1 hr 50 m		
E.	1) 8 hr	2) 7 hr 10 min	3) 4.45 hrs

4) 6 hrs 5) 6 hr 55 min 6) 6 hr 05 min



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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 converted into energy? It is through the process called digestion. After we eat the food, waste products are removed from the body. The process involved in this 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 form the organ systems. 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, 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



## 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. Arranged sequentially, these are: mouth, buccal cavity, pharynx, esophagus, stomach, small intestine, large intestine, rectum and anus.



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 starch into simple cabrohydrate molecules. Pancreas produces pancreatic juice which contains digestive enzymes for digesting fats, proteins and carbohydrates. Liver produces bile for the digestion of fat.



Mouth

**Buccal** Cavity



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





The lungs are the primary organs of the respiratory system. They are paired, cone-shaped organs. They are located near the backbone on both sides of the heart.

## 3 Muscles of respiration

Muscles of respiration include diaphram and intercostal muscles. They act as pump and push the air into and out of the lungs during breathing.





consists of the following:

2. Blood

1. Heart

3. Blood vessels



## 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.




The heart is divided into four chambers. Two upper chambers are called atria or auricles (Singular-atrium). Two lower thicker 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 into different parts of the body.

## 2 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 through out the body by the heart. It takes oxygen to tissues and cells and finally reaches the lungs to take oxygen again.

## **3** Blood vessels

Blood vessels consist of arteries and veins. 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).

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 (15 \* 4 = 60). 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

## l 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.

## 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 hallow space inside the bladder. Urine is expelled from the body through the urethra.



V. Nervous System

Nervous system is an integration of nerves and specialised cells called Neurons. The human nervous system is divided into the following.

- 1. Central nervous system (CNS)
- 2. Peripheral nervous system (PNS)



#### Central nervous system

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

#### \* Brain

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We use our brain to think, read and write. The brain is covered by three membranes called meninges. They are dura mater, arachnoid membrane and pia mater. The brain is kept in a bony case called cranium or skull. 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.

Fore Brain (Cerebrum)

Mid Brain (Cerebellum)

Hind Brain (Medulla Oblongata)

#### Fore Brain (Cerebrum)

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

#### Mid Brain (Cerebellum)

- → It lies behind the cerebrum.
- → It co-ordinates the movements of the muscles of the body.
- → It helps to maintain the balance of the body.

#### Hind Brain (Medulla Oblongata)

- → The hind brain 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.









🐠 Do you know? The Brain needs a supply continuous 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 along a 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
- → Autonomous nervous system

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





d) 6-9 m

#### I Choose the correct answer.

1. What is the length of the alimentary canal?

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



- 4. Functional unit of brain is
  - a) Neuron b) Nephron c) Brain stem d) Nerves
- 5. Blood is bumped bya) Lungsb) Heartc) Kidneysd) 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 is \_\_\_\_\_
- 4. The functional unit of kidney is \_\_\_\_\_
- 5. The human nervous system is divided into \_\_\_\_\_ parts.

#### III Say True or False.

- 1. In human respiratory system, length of trachea is 8-10 cm.
- 2. The circulatory system is made up of the heart, blood and blood vessels.
- 3. Important function of the heart is to transport blood with nutrients, oxygen, waste and hormones.
- 4. The brain is protected by the rib cage.
- 5. 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) Taste	b) Hear	c) Think	d) Smell
5.	a) Cerebrum	b) Cerebellum	c) Medulla Oblongata	d) Nephron

#### V Match the following.

Digestive System	-	Kidney
Respiratory system	-	Brain
Circulatory system	-	Alimentary canal
Excretory system	-	Heart
Nervous System	-	Lungs



#### 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?
- 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.

### Introduction

Our needs have increased in the modern days and we use number of things in our daily life. We get some of them from the nature and some other things 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 arranged. Solids are incompressible. They have definite shape, size and volume.

#### \* Liquids

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



#### \* Gas

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





## Activity 1

Give some examples for solids, liquids and gases.

Liquids	Gases
	Liquids

A material is a mixture of substances that constitute an object. They can be pure or impure, natural or man made. Materials are needed 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.



Fibre is a thin thread of natural or artificial substances. It is used to make cloths with the help of powerlooms or weaving machines. The fibres we get from plants and animals



are called natural fibres. Cotton, jute, coir, flax, hemp 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 loom are either hand - operated (hand looms) or power - operated. During knitting a single yarn is used to make a piece of fabric. It is done by hand and also on machine.



Spinning



Knitting

#### Uses of cotton

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





#### Sute

Jute fibre is obtained from the stem of the jute plant. Jute plant has long, soft and shiny fibres. It is also referred to as the 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 clothes for wrapping bales of raw cotton and to make socks 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	Silk and wool
Polyester	Petroleum products
Acrylic	Wool products





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

Activity 2

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, conveyer belts, films, PET bottles and wires.
- Acrylic is used to make sweaters, shawls and blankets.

IV. Grains



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





#### Wheat

This is the most important crop cultivated 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 is also made into oil for cooking. Yellow or coloured corn may promote eye health. It is also 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.





#### \* Rice

Rice is a type of grass. It is produced 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 made 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 millet products are Sorghum, Fox tail millet, Finger millet, Pearl millet, Barnyard millet, Kodo millet and Little Millet.



## V. Household Goods

These are the products that we use in our house. The goods that are found in a house permanently are called household goods. Household goods are: Furniture, Kitchenware, Cloths, Towels, Beddings, Boots and Electronic goods.

#### Household goods used in the olden days



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#### Household goods 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 is determined by its density. When an object is immersed in 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 it is less on the empty water bottle and so it floats.



Activity 3

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

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

Fill the table with your observation.

Things	Float	Sink
Apple		
Scissors		
Silver fork		
Marbles		
Plastic ball		



## 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 glass rod. Wait for few minutes. What happens to the substances added? Note your observation.

Substances	Disappear in water/ Does not disappear/ Disappear completely in water
Salt	
Sugar	
Chalk powder	
Sand	
Saw Dust	



Sugar in water



Chalk in water



Sand in water

VIII. Mixing

Certain liquids are heavier (dense) 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.





## Activity 5

Collect samples of coconut oil, kerosene, mustard oil, lemon juice and vinegar. Take five test tubes, fill them up to half with water. 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



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



#### I. Choose the correct answer.

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

 Which of the following is a solid?

 a. Kerosene
 b. Air
 c. Water
 d. Apple

 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 \_\_\_\_\_ ( plant / animals).

#### 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 good.
- 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 :: Sweat 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 clothes?
- 2. What determines whether an object floats or sinks in a fluid?

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Learning Objectives

After completing this lesson, students will be able to:

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



### 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 capacity to do work. Let us study about different forms of energy and their uses in this lesson.



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 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 one by one.





## Mechanical Energy

Energy possessed by an object due to its 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 a force on a 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.



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





## 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.



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



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 mold them into different shapes.
- → Heat is used to dry cloths and other wet substances.



## 4 Light Energy

Light is a form of energy which travels in the form of 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 to reach earth.



#### 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.



Electrical energy

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

#### Uses of Electric energy

- Electric 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' generates electric energy. It uses this energy to defend itself against its predators.



### Activity 5

Mention few places where electric energy is generated in plants.



Nuclear plant	Hydroelectric plant	Thermoelectric plant





## 6 Chemical energy

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

#### Uses of chemical energy

The food we eat contains chemical energy. Activity 6 Observe the stove burning in your kitchen. Do you see the light and feel the heat? Where do you get these from?

- → 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 posses 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 posseses 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.



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 Mayar.

