GOVERNMENT OF TAMIL NADU

STANDARD FIVE

MATHEMATICS
SCIENCE
SOCIAL SCIENCE

Term - III

Volume-2

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Department of School Education

Untouchability is Inhuman and a Crime

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MATHEMATICS

TERM - III

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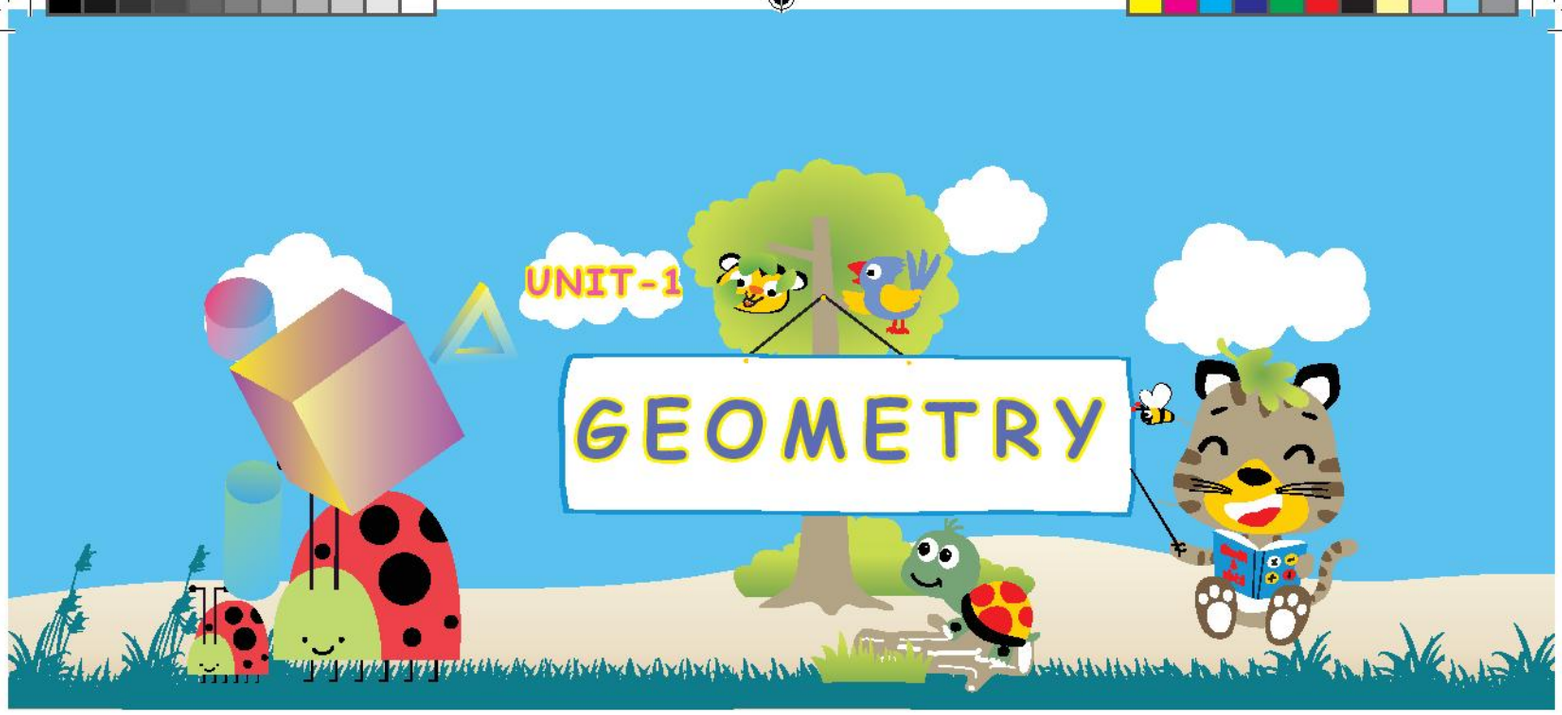
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Assessment

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OILN6

Perimeter and Area

Perimeter of the rectangle and square

Situation

Raju is a class 5 student of a Panchayat union middle school. Raju's head master wanted to fence the school as there is disturbance caused by the tresspassers. Hence the headmaster decided to fence the school.



The headmaster asked Raju and his classmates to measure the length of the boundary of the school premises, so as to buy the required fencing wire.

Raju and his friends measured the length of each side and added them to find the total length.

Length of the boundary = sum of the length of each side

Here, the length of the boundary is called as perimeter.

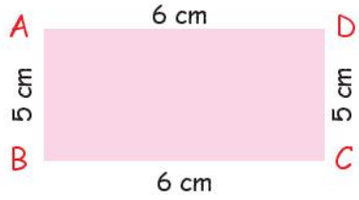
Hence, the sum of the length of all the sides of a closed area is called its perimeter.

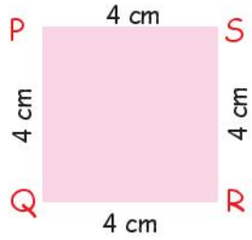
Perimeter is used in framing a photo, for fencing a vacant land, etc..,

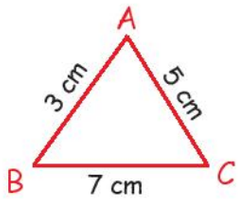
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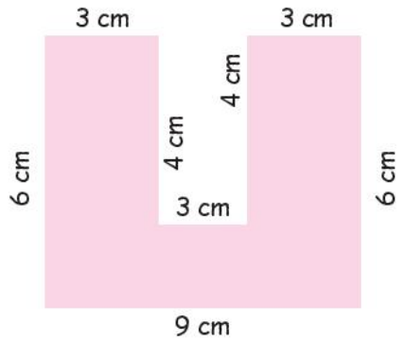
Activity 1

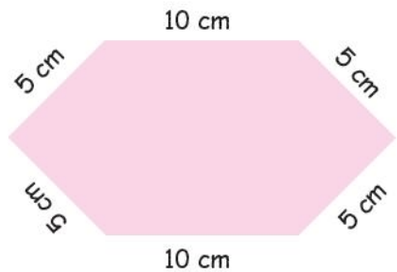
Find the perimeter of each figure:

1. 

2. 

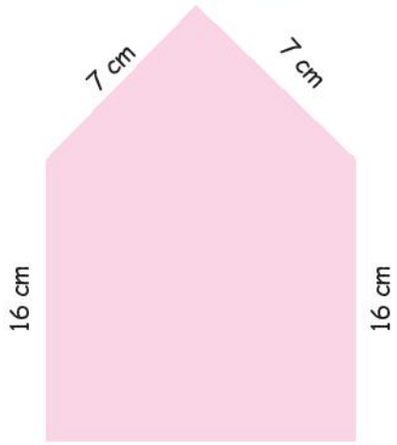
3. 

4. 

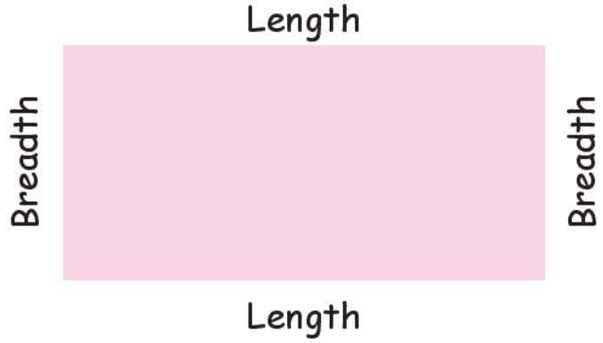
5. 

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6.



Formula for the perimeter of a rectangle:



Perimeter = length + breadth + length + breadth (opposite sides of a rectangle are equal)

So, the perimeter of a rectangle = twice the length + twice the breadth

Perimeter of a rectangle = (2 x length) + (2 x breadth)

Example 1.1

The length and the breadth of the rectangle given below is 5cm and 2cm respectively. Find its perimeter.



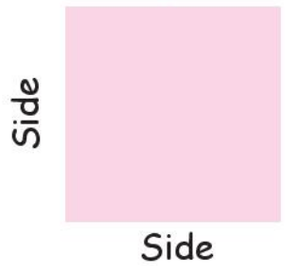
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Solution

Perimeter of rectangle PQRS = (2 x length) + (2 x breadth)
= (2 x 5) + (2 x 2)
= 10 + 4
= 14

Therefore, the perimeter of the rectangle is 14 cm.

Formula for the perimeter of a square



The length of all the sides of a square are equal.
Therefore, the perimeter of a square = four times the length of one of its sides

Perimeter of a square = 4 x (the length of one side)

Example 1.2

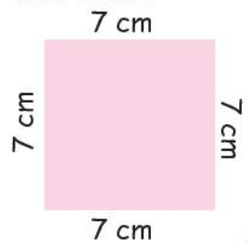
The length of one side of a square is 7cm. Find its perimeter.

Solution

The perimeter of a square is four times the length of one side.

Perimeter of a square = 4 x (length of one side)
= 4 x 7
= 28

Therefore, the perimeter of the square is 28 cm.



Example 1.3

The length of a rectangular park is 60 cm, while its width is 50 cm. What is its perimeter?

Solution

Perimeter of the rectangle = (2 x length) + (2 x breadth)

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$= (2 \times 60) + (2 \times 50)$

$= 120 + 100$

$= 220$

Therefore, the perimeter of the rectangular park is 220 cm.

Example 1.4

How much wire will be needed to put a triple fence around a square plot with side 20m? What will be the total cost of the wire at ₹ 50 per metre?

Solution

Perimeter of a square = 4 x length of one side = $4 \times 20 = 80$

The perimeter of the square plot is 80 metres. Since the fence is to be a triple fence we must triple the perimeter

$80 \times 3 = 240$ m of wire will be needed to fence the square plot.

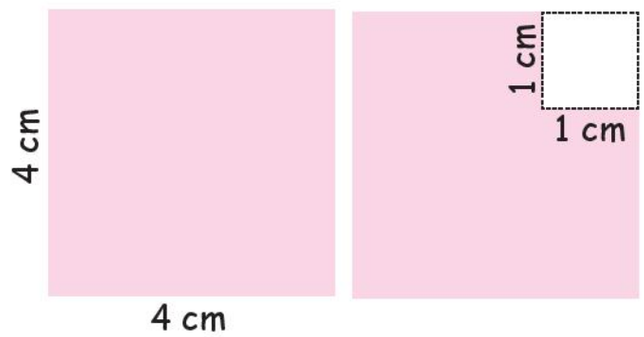
Now let us find out how much the wire will cost. One metre of wire costs ₹ 50

Therefore the cost of 240 m of wire will be $240 \times 50 = 12{,}000$

The total cost of wire for putting a triple fence around the plot will be ₹ 12,000

Try this

If a square of side 1 cm is cut out of the corner of a larger square with side 4 cm. What will be the perimeter of the remaining shape?



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Exercise 1.1

1. How much wire will be needed to make a rectangle of length 6 cm and breadth 3 cm?
2. If the length of a rectangle is 14 m and its breadth is 10 m, what is its perimeter?
3. Each side of a square is 6 m long. Find its perimeter.
4. If we take 2 rounds of a field, that is 340 m long and 160 m wide. Find the distance covered in kilometers?
5. Sanju completes 10 rounds around a square park every day. If one side of the park is 110 m, then find the distance covered by sanju in a day in terms of kilometers and metres.

Area of the rectangle and square

Situation

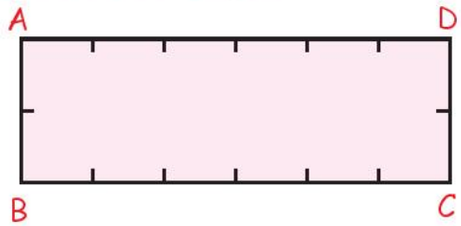
There are lot of mosquitoes in Kavitha's house. These mosquitoes enter her house through the windows. Kavitha's mother decided to cover the windows by a mesh. What kind of measurement is required by Kavitha's mother to cover the window using the mesh?

The measurement required by Kavitha's mother to cover the window is the area.

Area can be defined as the space occupied by a flat shape or the surface of an object.

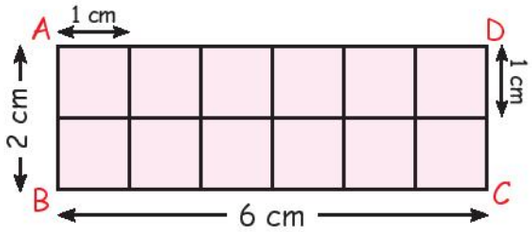
The unit denoted for the area of an object is square units. (Example: 16 sq. cm, 24 sq. m).

Formula for the area of a rectangle



In the rectangle ABCD given above, 1 cm divisions were marked on each side.

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The points on opposite sides were joined as shown in the figure above. The length of the sides of each square thus created is 1 cm.

Therefore, the area of each square is 1 sq.cm, Its a unit square.

In the rectangle ABCD we have created 2 rows of 6 squares each.

Therefore, the number of squares in the rectangle ABCD is $6 \times 2 = 12$

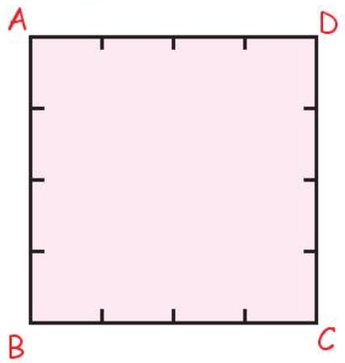
Here, the length of the rectangle ABCD is 6 cm and its breadth is 2 cm.

The number of unit squares formed are the same as the product of the length and breadth of the rectangle.

Therefore, the area of rectangle ABCD = $6 \times 2 = 12$ sq.cm

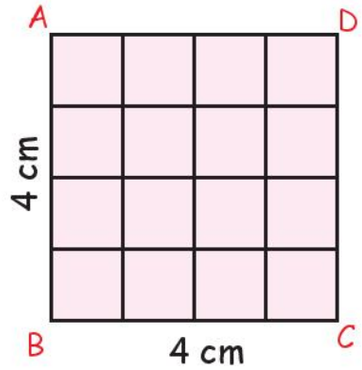
Therefore, the area of the rectangle = length x breadth

Formula for the area of a square:



In the square ABCD given above, 1 cm divisions were marked on each side.

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The points on opposite sides were joined as shown in the figure above. In the square ABCD we have created 4 rows of 4 squares each. The length of the sides of each square thus created is 1 cm.

Therefore, the area of each square is 1 sq.cm, Its a unit square.

Look at the square given above. The side of the square is 4 cm and we have 16 squares of 1cm each within this square.

The number of unit squares formed are the same as the product of two sides of the square.

Since the length of each side of the square is 4 cm the area of the square = 4 x 4 = 16 sq.cm.

Therefore, the area of a square = length of a side x length of a side

It is not necessary to divide a square or rectangle into small squares every time when you calculate their area. The advantage of a formula is that you can calculate the area simply by substituting the appropriate values.

Example 1.5

What is the area of a rectangle of length 10 cm and breadth 8 cm?

Solution

Area of a rectangle = length x breadth

= 10 x 8

= 80

Therefore, the area of the rectangle is 80 sq.cm.

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Example 1.6

A wall that is 6 m long and 2 m wide has to be painted. If the labour charges are ₹20 per sq.m, then what is the cost of labour for painting the wall?

Solution

First let us calculate the area of the wall to be painted

Area of the wall = length of the wall x breadth of the wall

= 6 x 2 = 12

Thus, the area of the wall is 12 sq.m.

Labour cost of 1 sq.m is ₹20.

So, the labour cost for 12 sq.m. = 12 x 20 = ₹240.

Therefore, the cost of labour for painting the wall is ₹240.

Example 1.7

What is the area of a square with side 12 cm?

Solution

Area of a square = length of a side x length of a side

= 12 x 12 = 144

Therefore, the area of the square is 144 sq.cm.

Example 1.8

One side of a square floor is 3 m. If the cost of labour for laying 1 sq.m of the floor is ₹25, then what is the total cost of labour?

Solution

First we must find the area of the square floor

Area of the square floor = length of a side x length of a side

= 3 x 3 = 9

Therefore, the area of the square floor is 9 sq. m.

The labour cost of laying 1 sq.m of flooring is ₹25.

Therefore, the cost of laying 9 sq.m of flooring is 25 x 9 = ₹225.

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Exercise 1.2

1. The length of the side of each square is given below. Find its area.
   (i) 10 metres (ii) 5 cm (iii) 15 metres (iv) 16 cm

2. Find the area of the following rectangles.
   (i) length = 6 cm and breadth = 3 cm
   (ii) length = 7 m and breadth = 4 m
   (iii) length = 8 cm and breadth = 5 cm
   (iv) length = 9 m and breadth = 6 m

   O7W8C

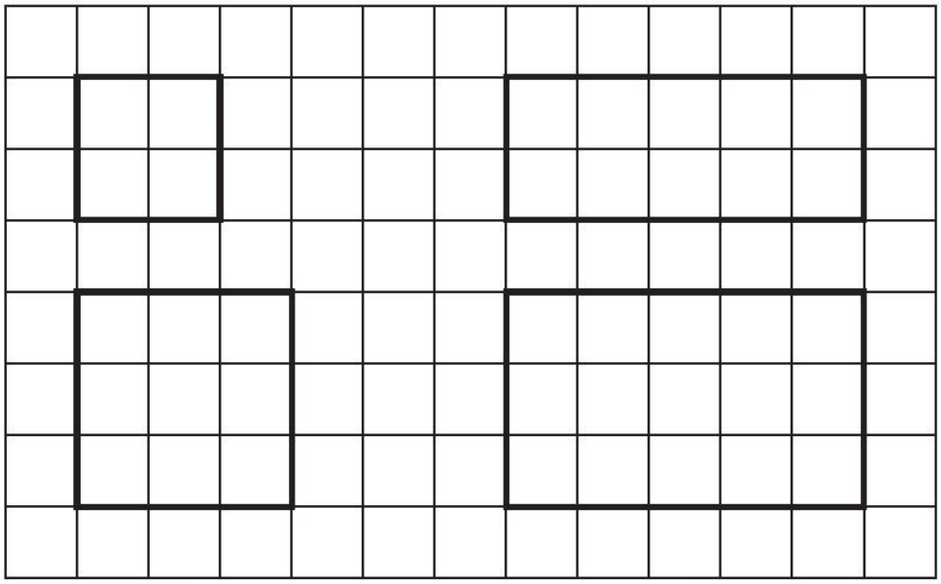
3. If the cost of 1 sq.m of a plot is ₹800, then find the total cost of the plot that is 15 m long and 10 m breadth.

4. The side of a square is 6 cm. The length of a rectangle is 10 cm and its breadth is 4 cm. Find the perimeter and area of both the square and rectangle.

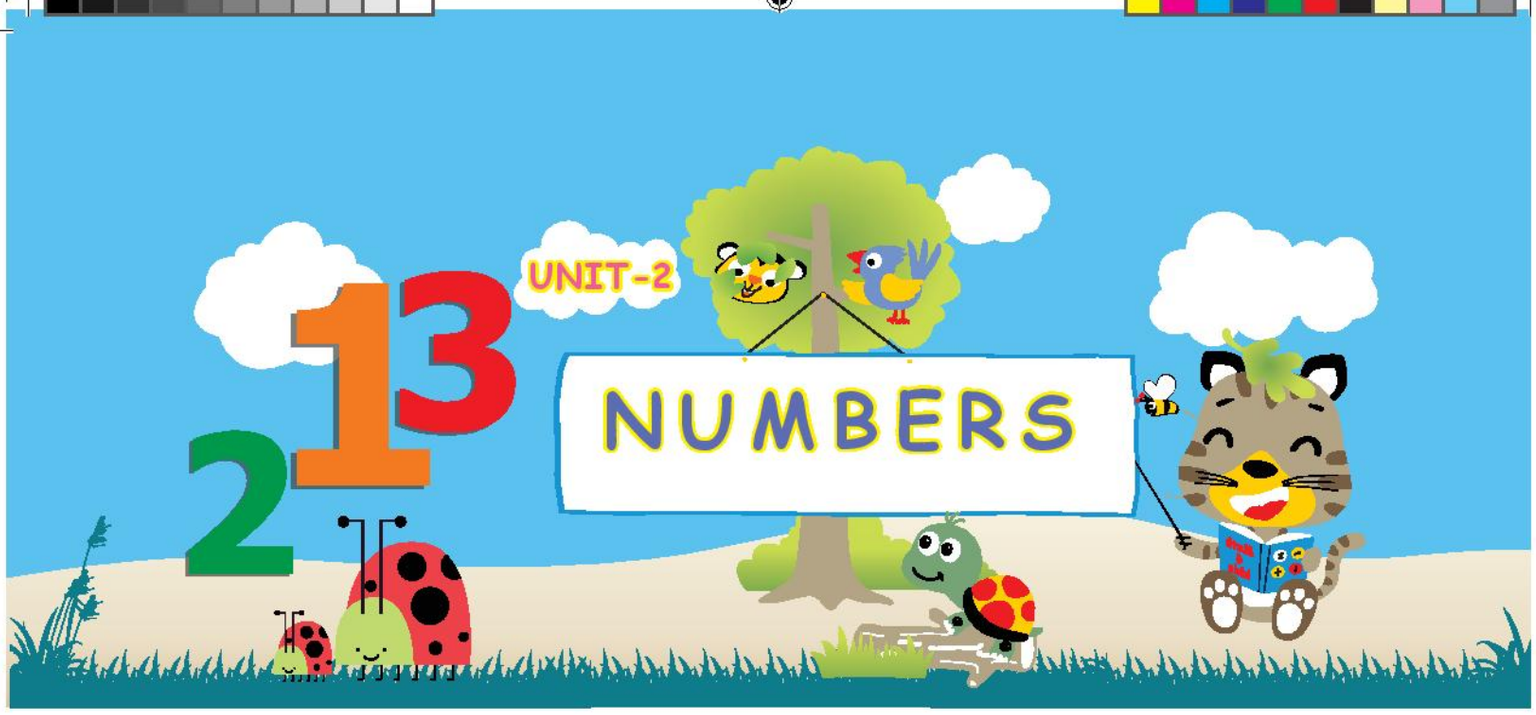
5. What will be the labour cost of laying the floor of an assembly hall which is 14 m long and 10 m breadth if the cost of laying is ₹60 per sq.m?

Activity 2

Using the grid sheet find the area and perimeter of the rectangles and squares. Each square is 1 sq. cm.



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2.1 Estimation

Situation 1

There are two bunches of grapes find the number of grapes in bunch 'A' and bunch 'B' without counting it.

A



B



Number of grapes in bunch 'A' ----------

Number of grapes in bunch 'B' ----------

Then count the exact number of grapes and note it.

Exact number of grapes in bunch 'A' ----------

Exact number of grapes in bunch 'B' ----------

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Situation 2

The estimated bus fare for a trip from trichy to Chennai is ₹ 300

The Exact bus fare is ₹ 286.





Therefore, the value which is nearest to the correct value is called its estimated value.

The symbol for estimation is ≃

Let us Know

Other words denoting estimates are 'About', 'Approximate', 'nearby', etc.,

Activity 1

Fill in the boxes

	Estimated value	Exact value
Number of bananas in a bunch		
Number of Tamarind seeds in your hand		
Number of leaves in small neem stick		
Your weight		
Your teacher's height		

Able to estimate a number upto two digit

Estimating a number to the desired digit by rounding off is called estimation.

To estimate a number to a particular digit, first underline the digit right to that digit

Case 1: If underlined digit is less than 5, then the number should be rounded off to that particular digit by making the underlined digit as 0

For example, when we estimate 64 to its nearest Tens place the number have to be rounded to 60.

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Case 2: If the underlined digit is greater than or equal to 5, then add 1 to the digit to which the number is to be estimated and make the underlined digit as 0

For example, when we estimate 65 to its nearest Tens place the number have to be rounded to 70.

Example 2.1

Estimate 48 to its nearest Tens place.

Solution

Estimating 4$\underline{8}$ to its nearest Tens place, we get 50.

Since the unit place is 8, which is greater than 5, the number have to be rounded upto 50.

Therefore, 48 $\simeq$ 50.

Example 2.2

Estimate 74 to its nearest Tens place.

Solution

Estimating 7$\underline{4}$ to its nearest Tens place, we get 70.

Since the unit place is 4, which is less than 5, the number have to be rounded down to 70.

Therefore, 74 $\simeq$ 70.

Example 2.3

Estimate 144 to its nearest Tens place.

Solution

Estimating 14$\underline{4}$ to its nearest Tens place, we get 140.

Since the unit place is 4, which is less than 5, the number have to be rounded down to 140.

Therefore, 144 $\simeq$ 140.

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Example 2.4

Estimate 155 to its nearest Tens place.

Solution

Estimating 155 to its nearest Tens place, we get 160.

Since the unit place is 5, The number have to be rounded to 160.

Therefore, 155 $\simeq$ 160.

Able to estimate sums, differences products and quotients to two digit numbers.

Example 2.5

If the cost of 1 kg apple is ₹ 95 and the cost of 1 kg Guava is ₹ 48 then estimate their cost nearest to Tens place and find their sum. Also, find the difference between the estimated sum and actual sum.

Solution

		Actual value	Estimated value
The cost of 1kg apple	=	₹ 95	₹ 100
The cost of 1kg Guava	=	₹ 48	₹ 50
Sum	=	₹ 143	₹ 150

Difference between estimated value and actual value = Estimated value - Actual value

= 150 - 143

= ₹ 7

Example 2.6

If the cost of a note book is ₹ 42 and the cost of a pen is ₹ 27, then estimate their cost nearest to Tens place and find their difference. Also, find the difference between the estimated value and actual value.

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Solution

		Actual amount	Estimated amount
The cost of a note book	=	₹ 42	₹ 40
The cost of a pan	=	₹ 27	₹ 30
Difference	=	₹ 15	₹ 10

Difference between actual value and estimated value = Actual value - Estimated value

= 15 - 10

= ₹ 5

Try this

Write down the estimated value of numbers and find their sum. Also, find the difference of their sum.

Numbers	Estimated sum	Actual sum	Difference
68, 31	70 + 30 = 100	68 + 31 = 99	1
33, 42			
46, 52			
29, 35			

Example 2.7

If the cost of 1 metre cloth is ₹ 86, then find the estimated cost of 5 metre cloth nearest to its Tens place.

Solution

		Actual cost	Estimated cost
The cost of 1 metre cloth	=	₹ 86	₹ 90
The cost of 5 metre cloth	=	86 x 5	90 x 5
	=	₹ 430	₹ 450

Therefore, the cost of 5 metre cloth is ₹ 450

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Example 2.8

If the cost of 3 kg potato is ₹ 63, then estimate its cost nearest to Tens place and find the cost of 1 kg potato.

Solution

		Actual cost	Estimated cost
The cost of 3 kg potato	=	₹ 63	₹ 60
The cost of 1 kg potato	=	63÷3	60÷3
	=	₹ 21	₹ 20

Therefore, the cost of 1 kg potato is ₹ 20

Try this

Write down the estimated value of numbers and divide. Then find the difference between estimated value and actual value.

Numbers	Estimated sum	Actual sum	Difference
42, 14	40 ÷ 10 = 4	42 ÷ 14 = 3	1
81, 9			
63, 21			
36, 9			

Exercise 2.1

1 Fill in the blanks

(i) Estimation of 27 to its nearest Tens place is ----------

(ii) Estimation of 65 to its nearest Tens place is ----------

(iii) The cost of 1kg pomegranate is ₹ 93. Then the estimated cost is ----------

(iv) Estimation of 76 bananas to its nearest Tens place is ---------

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2. There are 27 girls and 38 boys in a class. Find the sum and estimate the sum to its nearest Tens place.

3. If the cost of a geometry box is ₹ 53 and the cost of a note book is ₹ 36, then estimate their cost to its nearest Tens place and find the sum. Also, find the difference between the estimated value and the actual value.

4. If Kavitha has 93 pictures and she gave 42 pictures to her friend Neela, then estimate the picutres to its nearest Tens place and find their difference. Also, find the difference between actual value and the estimated value.

5. The cost of a pen is ₹ 32. Find the cost of 6 pens and estimate it to its nearest Tens place.

6. Arun has ₹ 47, Raja has ₹ 54. Find the sum and estimate it to its nearest Hundreds place.

7. There are 21 chocolate bars in a packet. Find the number of chocolate bars in 9 such packets and estimate it to its nearest Hundreds place.

8. 132 peanut candies are shared equally with 12 students. Find the share for one student and estimate it to its nearest Tens place.

2.2 Systematic Ordering

Logically find out something based on the condition.

BC2DQ

LOGICALLY TRY AND SOLVE THE PROBLEM

Know the sequence of numbers

Sequence of natural numbers	1, 2, 3, 4, 5…….
Sequence of odd numbers	1, 3, 5, 7, 9…….
Sequence of even numbers	2, 4, 6, 8, …….
Sequence of square numbers	1, 4, 9, 16, 25 …….

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Sequence of prime numbers	2, 3, 5, 7, 11 .....
Multiples (Multiples of 2)	2, 4, 6, 8, 10 .....
Multiples of 4	4, 8, 12,16.....
Add the same number and set a successive Numbers	1, 4, 7, 10.....
Subtract the same number and set a successive Numbers	37, 32, 27, 22.....
Multiple the same number and set a successive Numbers	1, 3, 9, 27.....
Divide the same number and set a successive Numbers	64, 32, 16.....

LET'S GIVE NUMBERS TO THE ENGLISH ALPHABLET.

A	B	C	D	E	F	G	H	I	J	K	L	M
1	2	3	4	5	6	7	8	9	10	11	12	13

N	O	P	Q	R	S	T	U	V	W	X	Y	Z
14	15	16	17	18	19	20	21	22	23	24	25	26

Example 2.9

(i) If CAT is 24 [3 + 1 +20],

Then BAT is 23 [2 + 1 +20]

(ii) If BOY is 21525 [2 15 25],

Then GIRL is 791812 [7 9 18 12]

(iii) If PEN is 35 [16 + 5 + 14]

Then PENCIL is 59 [16 + 5 + 14 + 3 + 9 + 12]

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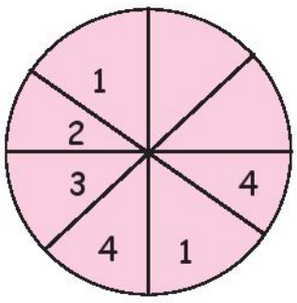
Activity 2

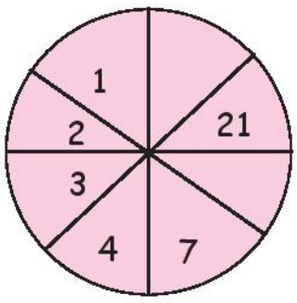
A. Colour each row of numbers using the instructions given below.

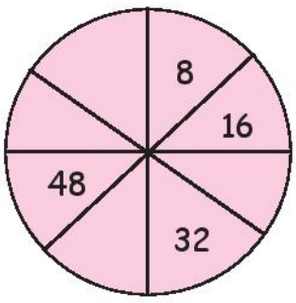
2	23	5	37	61	13	17	29	97
1	16	4	25	9	36	49	64	81
1	3	5	7	9	11	13	15	17
2	4	6	8	10	12	14	16	18
6	12	18	24	30	36	42	48	54
8	16	24	32	40	48	56	64	72

1. **Orange** colour to the prime number row.
2. Don't colour the odd number row.
3. **Blue** colour to multiples of 6 row.
4. **Orange** colour to the square number row.
5. Don't colour the even number row.
6. **Blue** colour the multiples of 8 row.

B. Let us fill the number wheel

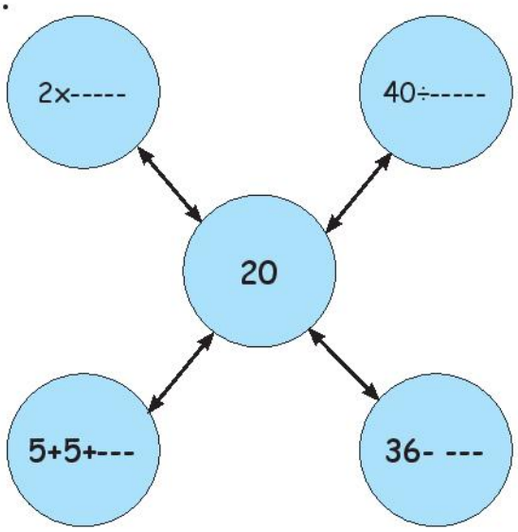






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C. Complete the circle using the given four basic operators to get the number 20.



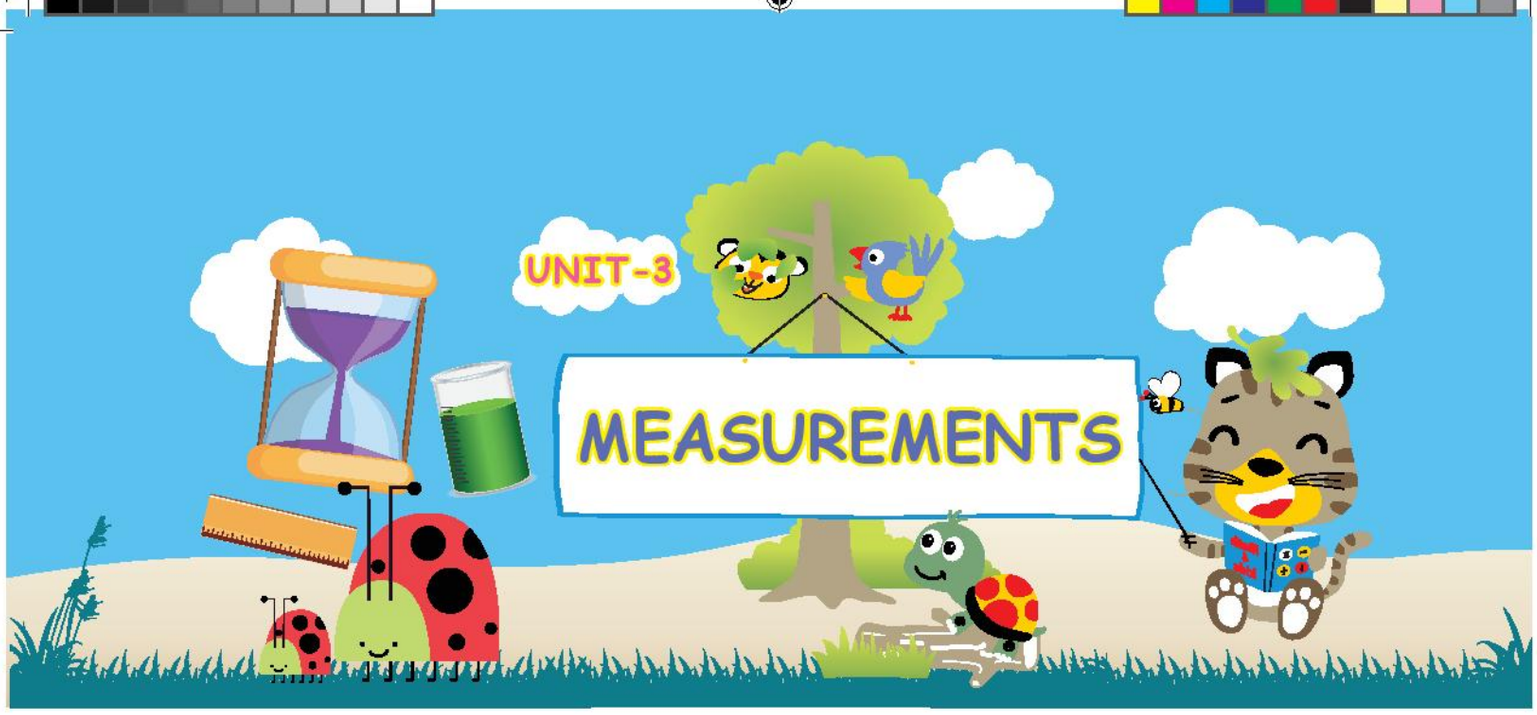
D. Fill in the blanks:

1. 5, 10, 15, ------, 25
2. 30, 24, -----, 12, 6
3. 7, 9, 11, -----, ------, 17
4. 1, 4, 9, ------, 25
5. 1, 4, 7, ------, 13, -----, 19

E. Answer the following

1. If BOOK is 43,
   Then PEN is ----------
2. If SCHOOL is 1938151512,
   Then CLASS is ----------
3. If BAG is 10,
   Then BOOK is ----------
4. If LION is 50,
   Then TIGER is ----------
5. If HEN is 8514,
   Then COCK is ----------

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To know the volume of a solid body by informal measurement

Situation 1

Venba's uncle gave her a sweet box. The sweet box contains 10 pieces of soan papdi. Now, we can tell that the capacity of the sweet box is 10 soan papdi. So, we can tell that the volume of that sweet box is the space occupied by 10 pieces of soan papdi.



V60I5

Situation 2

Kuralini arranged her books in her school bag. She kept five books in her bag. Hence, we can say that the capacity of the bag is 5 books.





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Here, 5 books occupy the space in one bag.

The volume of 5 books is one bag.

The volume of 1 book is $\frac{1}{5}^{th}$ of a school bag.

Capacity of a container is the atmost quantity of an item the container can hold.

Volume of a solid is the space occupied by the solid.

Exercise 3.1

1 Tick the object which has more volume












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2 Arrange the given objects according to their volume

(i) 

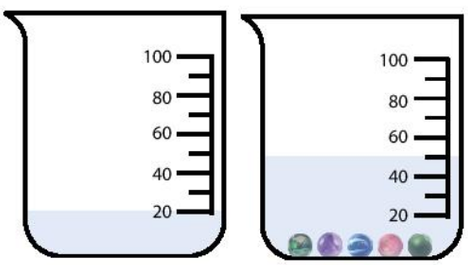
(ii) 

(iii) 

Activity 1

Measure the height of the water level by putting the object into the beaker.

Mark the measures millimeter and centimeter with a scale in a glass. Then fill the water at upto 20 mm.



Put a marble into the glass and note the height of the water level.

Similarly, put the items given in the table into the glass and note the height of the water level.

Name of the objects	Water level (mm)
Marble	45 mm
Eraser	
Coin	
Stone	
Potato	
Tomato	

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Activity 2

- Take some water in a beaker and mark its level.
- Take a solid, that is, potato and immerse it in the beaker containing water.

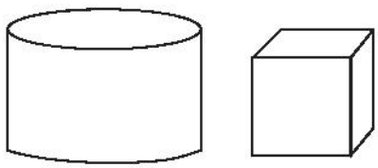
What do you observe?



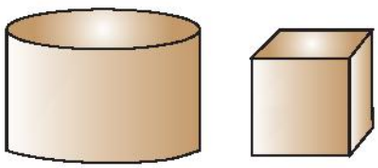


Activity 3

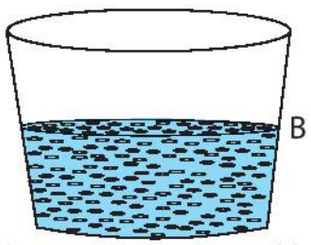
1. Take 2 sheets of same size (may be an old rough paper).
2. Using scissor and glue make a cylindrical and a cubical box.



3. Fill both with sand and cover all the ends.



4. Take a bucket. Partially, fill the bucket with water. Mark the water line.

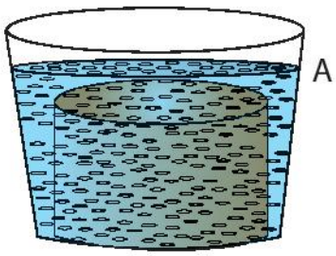


Before immersing sand box

5. Now, if we dip the sand-filled cylindrical box inside the bucket/ tub, will there be any change in the water level? If so, will it increase or decrease?

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6. Now, dip the sand-filled cylindrical box inside the bucket/tub. Mark the water level as "A" (after).



Let the children observe the rise in the water level. Ask them the following:

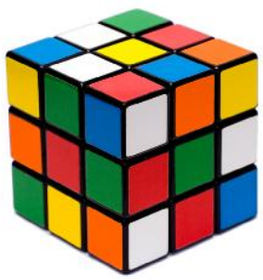
- What do you observe? Is there any changes in the water level?
- What could be the reason for change in the level?
- Could you find the space occupied by the cylindrical box?

Finding volume using unit cubes.

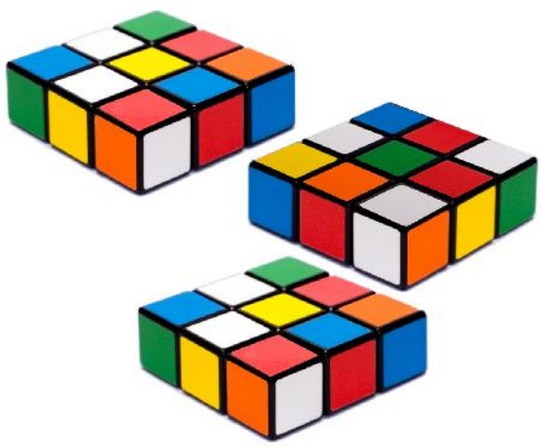
We shall measure the volume of solid objects using unit cubes. Unit cubes are cubes with dimension of length = 1 unit, breadth = 1 unit and height = 1 unit. The units may be Centimetre or Metre.

Rubik's cube:

1 Cube = 3 x 3 x 3 = 27 Units.



The cube can be filled by 3 layers of 3 rows and 3 columns of unit cube, that is, the volume of cube is 3 x 3 x 3 = 27 Units.

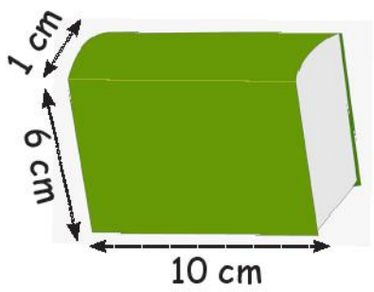


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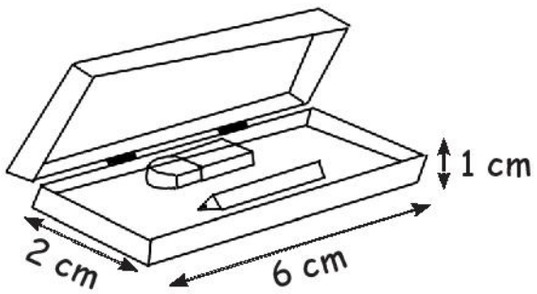
Activity 4

We shall follow the method of unit cubes to calculate or find the volume of the objects given below. The dimensions of the objects are mentioned.

Book



Pencil box



_____ _____

Exercise 3.2

1. Volume of regular solids such as cube and cuboid can be found by multiplying the dimensions. Complete the given table by finding the volume of the given objects.

S.No.	Objects	l	b	h	Volume (cubic cm)
1.	Note books	6 cm	15 cm	1 cm	
2.	Name board	20 cm	90 cm	2 cm	
3.	Show case cub board	70 cm	250 cm	70cm	
4.	Gift box	10 cm	10 cm	10 cm	
5.	Dice	1 cm	1 cm	1 cm	

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2. Complete the given table by finding the volume of the given objects.

S.No.	Objects	l	b	h	Volume (cubic units)
1.	Brick	6 cm	8 cm	10 cm	—
2.	Window pane	5 cm	—	4 cm	900 cubic cm
3.	Sunshade	70 cm	20 cm	—	4200 cubic cm
4.	Steps	80 cm	—	20 cm	32000 cubic cm
5.	Room	—	4 m	3 m	36 cubic m

3. Find the number of bricks of dimension 20 cm x 5 cm x 10cm required to construct a wall of dimension 300 cm x 200 cm x 20 cm.

4. How many sack of dimension 15 cm x 45 cm x 90 cm filled with rice can be kept in a room of dimension 3 m x 18 m x 9 m.

ZXIV5E

CAPACITY

3.1 Able to apply the four operation in solving problems involving capacity.

Recall


50ml


250ml


500ml


750ml


1000ml

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Let us recall

10 millilitre (ml) = 1 centilitre (cl)
10 centilitre = 1 decilitre
10 decilitre = 1 litre (l)
10 litre (l) = 1 decalitre
10 decalitre = 1 hectalitre
10 hectalitre = 1 kilolitre (kl)

Let us know

1 litre (l) = 1000ml
$\frac{1}{2}$ litre = 500ml
$\frac{1}{4}$ litre = 250ml
$\frac{3}{4}$ litre = 750ml

Note:
Generally, we used to write millilitre as ml and litre as l in short.

CONVERSION

Example 3.1

Convert into millilitre.

Note:
To convert litre into millilitre multiply the given litre by 1000.

(i) 2 l 500 ml

1 l = 1000 ml

2 l 500 ml = (2 x 1000) + 500 ml
= 2000 + 500
= 2500 ml

2 l 500 ml = 2500 ml

Note:
1 kilolitre (kl) = 1000 litre (l) To convert kilolitre into litre multiply the given kilolitre by 1000.

(ii) 7 Litre = (7 x 1000) ml
= 7000 ml

(iii) 6 Litre = (6 x 1000) ml
= 6000 ml

(iv) 5 l 700 ml = (5 x 1000) + 700 ml
= 5000 + 700 = 5700 ml

Try this
Convert into millilitre:
a. 5 l 500 ml
b. 9 l 200 ml
c. 2 l 300 ml

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Activity 5

Litre	Millilitre
1 l	1000 ml
2 l	2000 ml
3 l	
4 l	
5 l 300 ml	5300 ml
6 l	
7 l	
8 l 400ml	
9 l	
10 l 200ml	

Example 3.2

Conversion Millilitre into litre

(i) 7000 ml

7000 ml = 7000 ÷ 1000

=7 l

$$\begin{array}{r|l} & 7 \\ \hline 1000 & 7000 \\ & 7000 \\ \hline & 0 \end{array}$$

Millilitre	Litre
10000	10
9000	
8000	
7000	
6000	

Note:
To convert millilitre into litre divide the given millilitre by 1000

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Addition

Example 3.3

(i) Add 6 l 700 ml and 12 l 800 ml.

	l	ml
	1	
	6	700
+	12	800
	19	**500**

700 ml + 800 ml = 1500 ml

1500 ml = 1 l 500 ml

Subtraction

Example 3.4

Find the difference

(i) 15 l 500 ml - 6 l 300 ml

	l	ml
	15	500
-	6	300
	9	**200**

Difference = 9 l 200 ml

(ii) 36 l 400 ml - 12 l 550 ml

	l	ml
	5	13
	3~~6~~	4~~0~~0
-	12	550
	23	**850**

Try this

1. 4 l 300 ml + 6 l 700 ml
2. 7 l 250 ml + 2 l 300 ml
3. 5 l 500 ml - 4 l 450 ml
4. 46 l 300 ml - 12 l 550 ml

36 l 400 ml - 12 l 550 ml = 23 l 850 ml

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Example 3.5

Look at the quantity of milk bought for three days to make sweets in a bakery. Find the total quantity of milk bought for three days?

Monday	7 l	300ml
Tuesday	15 l	350ml
Wednesday	16 l	200ml

Solution:

		l	ml
Quantity of milk bought on Monday	=	7	300
Quantity of milk bought on Tuesday	=	15	350
Quantity of milk bought on Wednesday	= +	16	200
Total quantity of milk bought	=	**38**	**850**

Total quantity of milk bought on Monday, Tuesday and Wednesday } **=38 l 850 ml**

Do It Yourself

Find the total quantity of milk bought in seven days.

Example 3.6

A tin contains 10 l 500 ml of coconut oil out of this 7 l 250 ml oil was used. What is the remaining quantity of coconut oil?

Solution:

		l	ml
Total quantity of coconut oil	=	10	500
The quantity of coconut oil used	= -	7	250
Remaining coconut oil	=	**3**	**250**

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Multiplication in capacity

Example 3.7

Multiply the following:

4 l 200 ml x 3

	l	ml
	4	200
x		3
	12	600

4 l 200 ml x 3 = 12 l 600 ml

Try this
2 l 250 ml x 2

Example 3.8

Deepak fills 1 litre 500 ml petrol in a day. How much quantity of petrol will he fill in 5 days?

Solution:

		l	ml
Petrol filled by Deepak in a day	=	1	500
Petrol filled by Deepak in 5 days	=	x	5
Total quantity of petrol	=	**7**	**500**

Division in capacity

Example 3.9

(i) 2 l 320 ml ÷ 2

	l	ml
	1	160
2	2	320
	- 2	
		3
	-	2
		12
		12
		0

2 l 320 ml ÷ 2 = 1 l 160 ml

Try this
18 l 240 ml ÷ 6

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(ii) Vimal shared 500 ml cooldrink equally, to his two children. How much quantity of cooldrink would each child get?

Solution:

The quantity of cooldrink that vimal bought = 500ml

Number of children = 2

The quantity of cooldrink that each child get = $\frac{500}{2}$ = 250ml

Each child will get 250ml of cooldrink.

Exercise 3.3

0SQB3

1 Fill in the blanks

(i) _____ is the smallest metric measure of capacity.

(ii) _____ is the largest unit of volume and equals _____ litres.

(iii) 7 kl 30l = _____l.

(iv) 5 l 400 ml = _____ml.

(v) 1300 ml = _____l _____ml

2 Match the following

(i) 4500 ml - 6 l 500 ml

(ii) 3250 ml - 8 l 200 ml

(iii) 6500 ml - 7 l 50 ml

(iv) 8200 ml - 4 l 500 ml

(v) 7050 ml - 3 l 250 ml

3 Add and write in litres

(i) 400 l + 50 l + 500 ml

(ii) 3 kl + 400 l + 3 ml

(iii) 1400 ml + 5680 ml + 280 l

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4 **Subtract:**

(i) 3 kl from 15 kl 485 l

(ii) 15 kl from 20 kl

(iii) 345 ml from 5 l

5 **Multiply the following:**

(i) 3 l 200 ml x 8

(ii) 4 l 450 ml x 4

(iii) 5 l 300 ml x 5

(iv) 6 l 700 ml x 6

6 **Divide the following:**

(i) 18 l 240 ml ÷ 6

(ii) 20 l 600 ml ÷ 2

(iii) 21 l 490 ml ÷ 7

(iv) 25 l 350 ml ÷ 5

7 Kalaiyarasi bought 5 l 500 ml groundnut oil and 750 ml sesame oil. How much quantity of oil did she bought in all?

8 In a fuel station there was 70 l 500 ml of fuel. How much quantity of fuel will be left after selling 35 l 700 ml of fuel?

9 A pot contains 9 l 800 ml of water, how much quantity of water will 7 such pots contain?

10 25 l 500 ml of milk is filled in 5 milk cans, how much quantity of milk is filled in one can?

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Situation

COI13

Mala: Sir, my brother said he was studying algebra. What is algebra?

Sir: To put it simply, algebra consists of the use of numbers and letters to state and solve problems.

Arun: Does that mean addition and subtraction of letters? How do we do that?

Sir: To prepare for that, let's first learn a few things using numbers.

Equality

Whenever we add, subtract, multiply or divide two numbers, the answer we get is always another number. For example when we add 4 and 2, we get the number 6. We write this as 4 + 2 = 6. Similarly, 10 - 4 =6 , 12 ÷ 2 = 6, 6 x 1 = 6.

Now, let us think about this in another way.

Suppose that, by performing a mathematical operation on two numbers, we have obtained the number 10. Let us find pairs of such numbers.

They could be (5 + 5), (17 - 7), (5 x 2), (20 ÷ 2) etc.

When we want to say a number obtained by adding 5 and 5, it is easier to express it by using brackets like this: (5 + 5).

(17 - 7) means a number obtained by subtracting 7 from 17.

(5 x 2) means a number obtained by multiplying 5 by 2.

(20 ÷ 2) means a number obtained by dividing 20 by 2.

Arrangement of numbers like (5 + 5), (17 - 7), (5 x 2) and (20 ÷ 2) are called expressions. The value of each of these expressions is 10, which means all these expressions are equal to each other.

Hence, we can also write this as,

(5 + 5) = (17 - 7) = (5 x 2) = (20 ÷ 2)

An expression such as (5 + 5) = (17 - 7) or (5 + 5) = (20 ÷ 2) is called an 'equality'.

5 + 2 = 7, 8 x 1 = 8 are also equalities.

Exercise 4.1

1. Using brackets, write three pairs of numbers whose sum is 12. Use them to write three equalities.
2. Find four pairs of numbers, one for each of addition, subtraction, multiplication and division that make the number 16. Write the equalities for each of them.

Inequality

The value of the expressions (6 + 3) and (6 x 3) are 9 and 18 respectively. It means the above two expressions are not equal.

We can consider another example. Take two numbers 4 and 5. We know that 4 is not equal to 5. But, still we can relate those two numbers by a relationship.

If two expressions or numbers are not equal, one of them is greater or smaller than the other. To show 'greater than' and 'lesser than', we use the symbols '>' and '<' respectively.

This kind of representation is called an 'inequality'.

Let us consider another example, the value of (9 - 5) is 4 and the value of (25 ÷ 5) is 5 and we know that 4 < 5. So, the relation between the expressions (9 - 5) and (25 ÷ 5) can be shown as (9 - 5) < (25 ÷ 5).

Do you know?

Note: Have you ever seen these symbols '≥' and '≤'?

These, two symbols can be read as, greater than or equal to (≥) and lesser than or equal to (≤).

Example 4.1

Fill in the boxes between the expressions with <, = or > as required in the following.

(i) $(7 + 8) \square (20 \div 2)$

Solution

First, we have to add 7 and 8

$7+8 = 15,$

Now, we divide 20 by 2, we get

$20 \div 2 = 10$

Therefore, $(7 + 8) \square (20 \div 2)$

$15 \boxed{>} 10$

Hence, $(7 + 8) \boxed{>} (20 \div 2)$.

(ii) $(12 \times 3) \square (9 \times 4)$

Solution

First, we have to multiple 12 by 3

$12 \times 3 = 36$

Now, multiplying 9 by 4, we get,

$9 \times 4 = 36,$

Since, (12×3) and (9×4) is equal, we have,

$(12 \times 3) \boxed{=} (9 \times 4)$.

(iii) $(15-5) \square (8 \times 3)$

Solution

First, we have to subtract 5 from 15.

$15 - 5 = 10$

Now, multiplying 8 by 3, we get,

$8 \times 3 = 24$

Since, $(15 - 5 = 10)$ is less than $(8 \times 3 = 21)$, we have,

$(15 - 5) \boxed{<} (8 \times 3)$.

Example 4.2

Write a number in the box that will make this statements correct.

(i) $(6 \times 4) = (\square - 6)$

Solution

The value of the expression 6×4 is 24. So, the number in the box has to be one that gives 24 when 6 is subtracted from it. Subtracting 6 from 30 gives 24.

Therefore, $(6 \times 4) = (\boxed{30} - 6)$

(ii) $(35 \div 5) < (2 + \square)$

Solution

The value of the expression $35 \div 5$ is 7. So, the number in the box has to be such that when it is added to 2, the sum is greater than 7.

Therefore, $(35 \div 5) < (2 + \boxed{6})$

Instead of 6, the solution for this condition can be 7, 8,....

Exercise 4.2

1. Say whether true or false.

(i) $(23 + 4) = (4 + 23)$ (ii) $(9 + 4) > 12$

(iii) $(9 + 4) < 12$ (iv) $121 > 121$

(v) $142 < 142$ (vi) $112 = 112$

(vii) $(6 \times 5) = (32 - 2)$ (viii) $\frac{49}{7} > 7$

(ix) $(4 \times 3) = (3 \times 4)$ (x) $(21 + 0) = 21$

2. Fill in the blanks with the right symbol (<, > or =).

(i) $(54 \div 9) \square (8 - 3)$

(ii) $(6 + 2) \square (4 \times 2)$

(iii) $(10 \times 2) \square (15 + 20)$

3 Fill in the blanks in the expressions with the suitable number.

(i) $(1 \times 9) = (\square \times 1)$ (ii) $(6 \times 3) > (8 \times \square)$

(iii) $(36 \div 6) < (\square \times 7)$ (iv) $(0 + 2) > (7 \times \square)$

(v) $(42 \div 7) = (4 + \square)$ (vi) $(6 - \square) < (1 + 2)$

Using letters

Symbols are frequently used in mathematical writing. The use of symbols makes the writing very short. For example, using symbols, division of 63 by 9 gives us '7' can be written in short as "63 ÷ 9 = 7". It is also easier to grasp.

Letters can be used like symbols to make our writing short and simple

While adding, subtracting or carrying out other operations on numbers, you must have discovered many properties of the operations.

For example, what properties do you see in sums like (7 + 3), (3 + 7)?

The sum of any two numbers and the sum obtained by reversing the order of the two numbers is the same.

Now see how much easier and faster it is to write this property using letters.

Let us use a and b to represent any two numbers. Their sum will be 'a + b'

Changing the order of those numbers will make the addition as 'b + a'. Therefore, the rule will be, for all values of 'a' and 'b'

$$(a + b) = (b + a).$$

Let us see two more examples

- Multiplying any number by 1 gives the number itself. It the number is replaced by an alphabet 'a', then the above statement can be represented as $a \times 1 = a$.

- Given two unequal numbers, the division of the first by the second is not the same as the division of the second by the first.

In short, if a and b are two different numbers, then
$(a \div b)$ is not equal to $(b \div a)$

Take the valve of 'a' as 6 and the value 'b' as 2 and verify the above property by yourself.

Activity

Use a letter for "any number" and write the following properties in short.

(i) The sum of a number and zero is the number itself

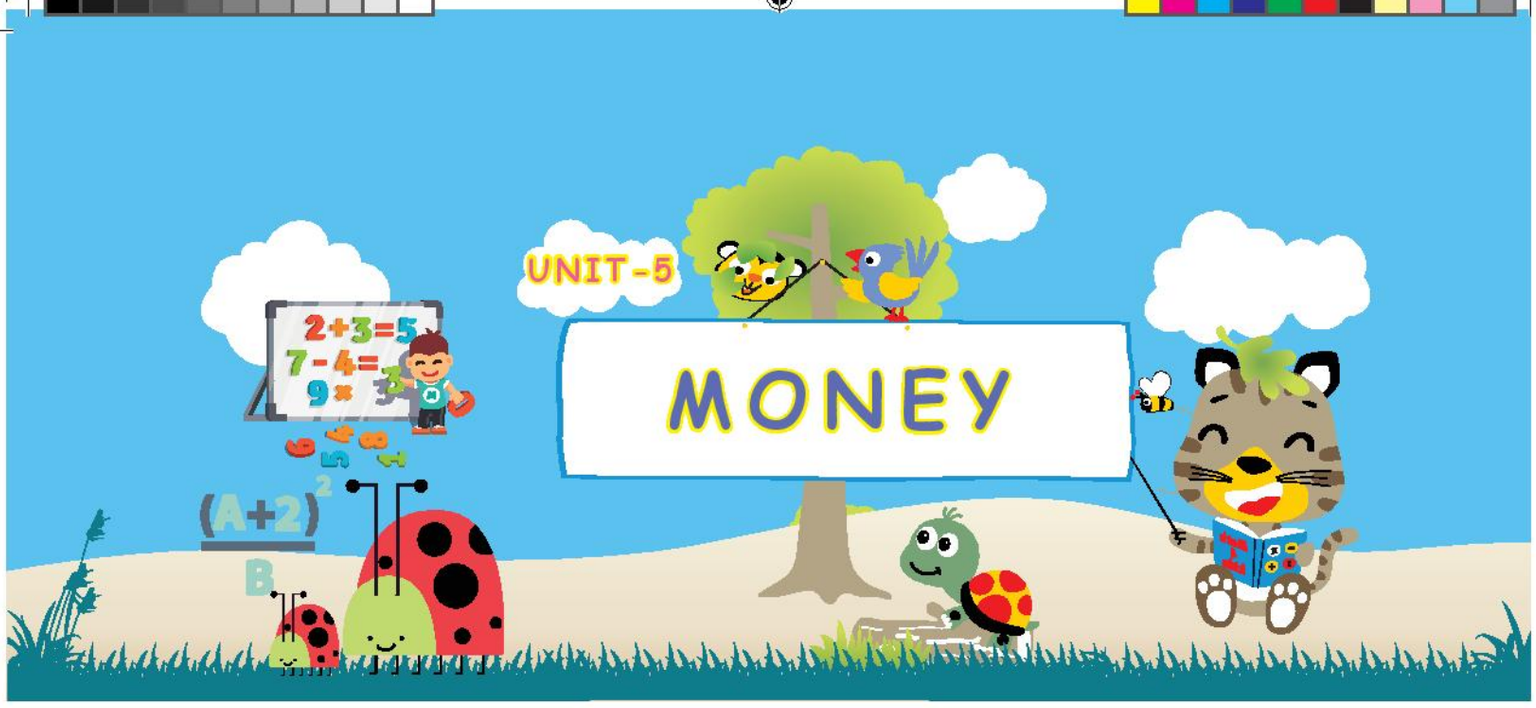
(ii) The product of any two numbers and the product obtained after changing the order of those numbers is the same.

(iii) The product of a number and zero is zero

(iv) Write the following properties in words

(i) n-0=n

(ii) m÷1=m



Recall:

We have already learnt about the conversion of money in the interconcept chapter in the previous term. Let us try to fill in the following.

Try this

₹1 = 100 Paise

₹5 = _____ Paise

775 Paise = ₹7.75

425 Paise = ₹_____

Addition and Subtraction using money



54UH1

Situation 1

Sarathi and Meenu went to a temple car festival (Thaer thiruvizha) with their parents. In the festival, Sarathi bought a watch for ₹70,

Meenu bought bangles and earrings for ₹90 and their mother bought a chain for ₹160. The shopkeeper asked them to pay money for what they bought. Meenu didn't know how much money she had to pay. So, she asked her mother. Her mother told her to add the cost of the items purchased. She added as follows.

Cost of the watch = ₹70

Cost of bangles and earrings = ₹90

Cost of the chain = ₹160

Total cost = 70 + 90 + 160 = ₹320.

So Meenu had to pay ₹320 to the shopkeeper.

Situation 2

Vasu had a stationery shop. He wanted to check the stock of pen. Vasu didn't know how to find out the remaining items. For that he asked his friend. His friend helped him to form a table. The table is given below.

S.No	Name of the item	Cost of available item	Cost of sold out item	Cost of remaining item
1.	Pen	₹ 3750	₹ 1680	₹ 2070

To get the cost of remaining item, we have to subtract the cost of sold out items from the cost of available items.

That is, cost of remaining items = cost of available item – cost of sold out items

= ₹ 3750 – ₹ 1680

= ₹ 2070

Example 5.1

Arun bought a T.V, a Washing Machine and a bike at the cost of ₹ 12,500, ₹ 14,999 and ₹ 75,000 respectively. Find the total amount spent by Arun.

Solution

Cost of a T.V	=	₹ 12,500
Cost of a Washing machine	=	₹ 14,999
Cost of a Bike	= (+)	₹ 75,000
Total amount	=	₹ 1,02,499

Example 5.2

Find the total amount by adding the amounts ₹7678.75, ₹50875.50, ₹4071.50 and ₹675.75

Solution

Rupees	Paise
7678	75
50875	50
4071	50
675	75
63301	50

Add the paise 75+50+50+75 and covert into rupees.

75 + 50 + 50 + 75 = 250 paise

100 paise = 1 rupees

250 paise = $\frac{250}{100}$ = 2.50 rupees

Therefore, the total amount = ₹7678.75 + ₹50875.50 + ₹407.50 + 675.75

= ₹63,301.50

Example 5.3

A colony of people had arranged for a tour for three days. They allotted an amount of rupees ₹18,540 for the same. They spent ₹6235 on the first day. How much money was left for the next two days?

Solution

Amount allotted for three days = ₹ 18,540

Amount spent on the first day =(+) ₹ 6,235

Remaining amount = ₹ 12,305

Therefore, remaining amount for the next two days is ₹12,305.

Example 5.4

Geetha wants to buy a table for her family. She has paid an amount of ₹4,529.50 to the Shop Keeper. He has given ₹439.75 as balance to her. What is the cost of the table?

Solution

Amount paid by Geetha	=	₹ 4,529.50
Balance amount given by the Shop Keeper	=(−)	₹ 439.75
Cost of the table	=	₹ 4,089.75

When we subtract 75 pasie from 50 paise convert ₹1 into paisa and add with 50 paise and then subtract.

₹ 1 = 100 paise

100 + 50 = 150 paise

150 − 75 = 75 paise

Activity 1

Match the big bag with small bags

Big Bag		Small Bags				
 ₹50	.....	₹575	−	₹38	−	₹20
 ₹73	.....	₹489	+	₹258	+	₹49
 ₹517	.....	₹123	−	₹33	−	₹17
 ₹796	.....	₹32	+	₹16	+	₹2

Exercise 5.1

1 **Fill in the blanks**

(i) ₹35.50 + ₹ 4.50 = _____

(ii) ₹7500 + ₹3000 = _____

(iii) ₹1000 – ₹230 = _____

(iv) ₹75.50 – ₹30.25 = _____

2 **Match the following**

(i) ₹950.50 + ₹350	-	(a) ₹399.50
(ii) ₹8000 – ₹3500	-	(b) ₹91.25
(iii) ₹50.75 + ₹40.50	-	(c) ₹1300.50
(iv) ₹750 – ₹350.50	-	(d) ₹4500

3 **Add the following**

(i) ₹8987.75 + ₹9565.50 + ₹7693.50

(ii) ₹29763.50 + ₹95675.50 + ₹4973.50

(iii) ₹9978.75 + ₹7695.50 + ₹635.00

4 **Subtract the following**

(i) ₹1985 – ₹798.25

(ii) ₹688 – ₹215

(iii) ₹49689 – ₹33462.50

5 Arun purchased gold coins in different weights in a Jewellery shop. The price of the gold coins were ₹18965.75, ₹26998.00 and ₹3589.50 respectively. Find the total price of the gold coins.

6 In a textiles shop, father, mother, son and daughter were purchasing clothes. The price of each of their clothes were ₹8950, ₹14875, ₹7895 and ₹9780 respectively. Find the total cost of their clothes.

7. A farmer wanted to buy a tractor. The price of the tractor was ₹6,72,598, but he had only ₹2,86,760. How much more amount was required to buy the tractor?

8. A man had ₹17,246 in his savings account. If he had taken ₹8,891 to pay for house rent, then how much amount was left in his savings account?

Multiplication and Division in Money

Situation 1

A book company announced a discount on dictionaries to school students. After discount, the cost of a dictionary was ₹425 and 25 students wanted to buy it. How much money in total was required for them to buy? For this, we have to multiply the number of students with the cost of a dictionary.

The cost of each dictionary = ₹425

Therefore, the total cost of 25 dictionaries = 25 X ₹425

= ₹10,625

Situation 2

8 students of a school participated in an International Competition and won a cash award of ₹5,000. They wanted to share the amount among themselves. How much share would each one get?

For this, we have to divide the total amount by the number of students.

₹5,000 ÷ 8 = ₹625

Therefore, each one's share is ₹625.

Example 5.5

The cost of a chair is ₹520. What will be the cost of 9 chairs?

Solution

Cost of one chair = ₹520

Cost of 9 chairs = ₹520 × 9

= ₹4680

Example 5.6

Rani buys a saree which costs ₹675.50. She wants to buy 12 such sarees. What will be the cost of 12 sarees?

Solution

Cost of one saree = ₹675.50

Cost of 12 sarees = ₹675.50 × 12

= ₹8106

(i) Multiply the paise

50 × 12 = 600 paise

Convert the paise into rupees 600 paise } = ₹6

(ii) Multiply the rupees

675 × 12 = 8100

Now, add (i) and (ii) to get

= 8100+6

= 8106

Example 5.7

Find the answer for ₹65,295 ÷ 9

Solution

$$
\begin{array}{r}
7255 \\
9\overline{)65295} \\
63 \\
\hline
22 \\
18 \\
\hline
49 \\
45 \\
\hline
45 \\
45 \\
\hline
0
\end{array}
$$

Therefore, ₹65295 ÷ 9 = ₹7,255

Example 5.8

The total cost of 7 pens is 105. Find the cost of one pen

Solution

Total cost of 7 pens is = ₹105

Therefore, cost of one Pen = ₹105 ÷ 7

= ₹15

Therefore, the cost of one pen is ₹15.

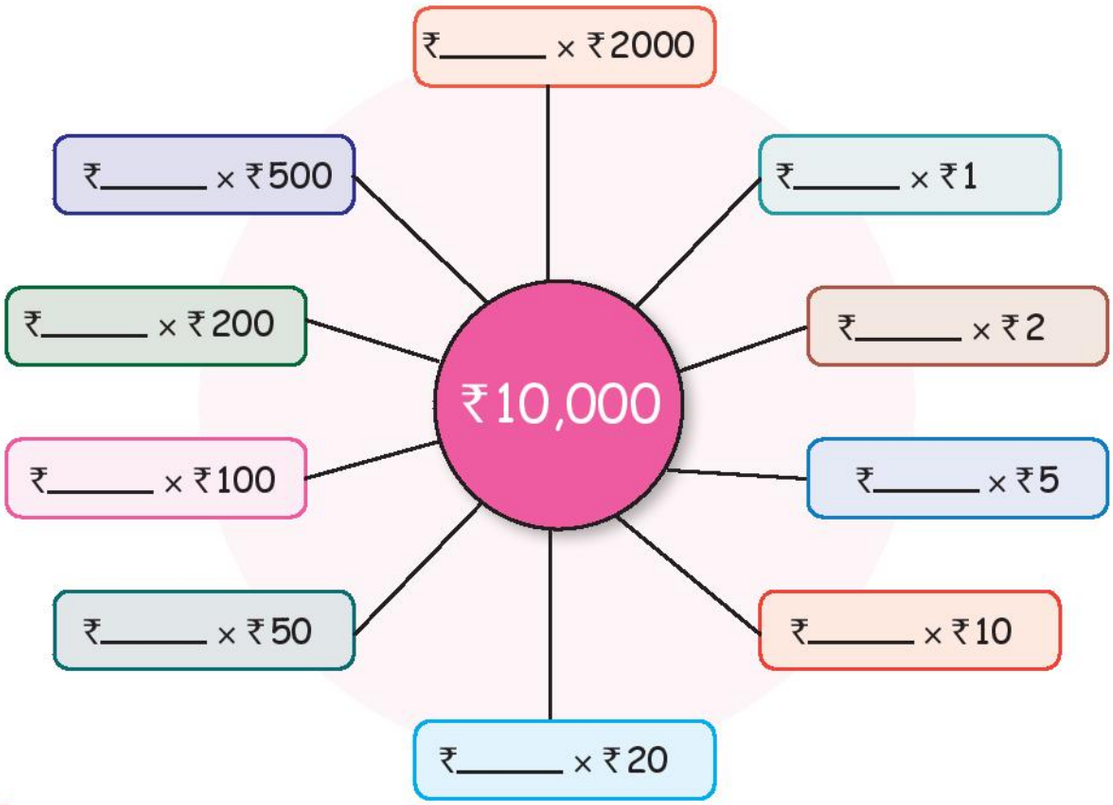
$$
\begin{array}{r}
15 \\
7\overline{)105} \\
7 \\
\hline
35 \\
35 \\
\hline
0
\end{array}
$$

Let's think

Divide 1000 paise equally for 5 students. How many rupees does each student get?

Activity 2

Find out how many denominations of ₹1, ₹2, ₹5, ₹10, ₹20, ₹50, ₹100, ₹200, ₹500 and ₹2,000 are there in ₹10,000?



Exercise 5.2

1 **Fill in the blanks**

(i) ₹75 × 5 = _____

(ii) ₹200.25 ÷ 25 = _____

(iii) ₹3500 ÷ 500 = _____

(iv) ₹15.50 × 100 = _____

2 **Answer the following**

(i) ₹98725 × 5

(ii) ₹679.68 × 7

(iii) ₹362.37 × 12

(iv) ₹324.52 ÷ 28

(v) ₹7980 ÷ 8

(vi) ₹397.10 ÷ 11

3 The cost of 1 kg of tomato is ₹15. Find the cost of 5 kg of tomatoes?

4 The cost of one egg is ₹4.50. Find the cost of 20 eggs.

5 The school management has decided to give a pen for all children participating in the Children's day celebration. The cost of a pen is ₹18 . How much money do they need to buy pens for 256 children?

6 A fruit seller buys 8 boxes of grapes for ₹2,000. What is the cost of one box?

7 In a sweet stall, the cost of 18 kg of sweets is ₹2,520. What is the cost of 1 kg of sweet?

To collect bills for items bought and compare costs of same items

Situation

Raju and Ravi got two bills of the same items from two different shops which are given below.

Shop 1 (Raju's Bill)

S. No	Name of the item	Quantity	Cost of the item (in ₹)	
			Rupees	Paise
1	Pencil	10 Nos.	37	50
2	Eraser	12 Nos.	15	00
3	Pen	11 Nos.	60	50
Total			₹113	00

Shop 2 (Ravi's Bill)

S. No	Name of the item	Quantity	Cost of the item (in ₹)	
			Rupees	Paise
1	Pencil	10 Nos.	40	00
2	Eraser	12 Nos.	12	00
3	Pen	11 Nos.	66	00
Total			₹118	00

They have shown the above bills to the teacher in the class. Teacher asks the students to sit in groups and discuss and compare the cost of items. After a few minutes, the teacher asks the following question regarding bills.

Teacher: In which shop is the cost of an eraser less? By how much?

Student: In shop 2, it is less by ₹ 3.

Teacher: What is the difference in total between shop 1 and shop 2?

Student: ₹ 5.

Teacher: Is the cost of a pencil high or less in shop 1 compared to shop 2?

Student: The cost of a pencil is less in shop 1.

Teacher: What is the cost of a pen in shop 1 and shop 2? Also find the difference between the costs?

Student: The cost of 1 pen in shop 1 is ₹ 5.50 and in shop 2, it is ₹ 6. The difference between the cost is 50 paise.

The teacher concludes that the cost vary from place to place depending on factors like travel, rent, wages for labour and electricity etc., used by the shopkeeper.

Activity 3

Observe at the vegetables shop nearby your house and find out the cost of items sold over there. Compare it with the cost of vegetables sold at the supermarket nearby to your house.

To find and reason out for being expensive and inexpensive

Situation

Rani bought 1 kg of brinjal from a vegetable vendor nearby her house. Its cost was ₹ 50. Her friend Kala bought the same quantity of brinjal in a wholesale market. Its cost was ₹ 30. What did you understand from the above situation?

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From the above situation, we come to understand that the brinjal bought by Kala is inexpensive, but for Rani, it is expensive.

Activity 4

Check the cost of items bought from the provision store nearby your house and the cost of the same item in the supermarket. Find out which is expensive and inexpensive.

Use of vocabularies such as expensive, inexpensive costly, cheap, affordable and luxurious

Situation 1

Ravi goes to a provision store to buy provisions for his family. He wants to buy boiled rice. He sees many brands of boiled rice and from that he selected a brand. In that particular brand, there are different types, with a range of costs. It is given below.

Type-1 = ₹42 per kg

Type-2 = ₹48 per kg

Type-3 = ₹52 per kg

Type-4 = ₹56 per kg

He buys Type-1 boiled rice which costs ₹42 per kg. Why does he choose to buy that type and not other types? Though it is affordable for him to buy other types also, he thinks that Type-1 is cheaper for him.

Situation 2

Three families namely A, B and C in a city wanted to buy a car. They had gone to a car showroom. There, they saw cars of minimum price and maximum price and also the imported car.

Family A selected the car of minimum price. Why did family A select the car of minimum price? Though they had money to buy the car of maximum price, they felt that the car of minimum price is inexpensive for them.

Family B selected the car of maximum price. Why did family B select the car of maximum price? Though they had money to buy other cars also, they selected the car of maximum price which is expensive.

Family C selected the imported car because they wanted a luxurious car.

Now, we can see the meaning of following words:

(i) Expensive - Costing much in price.
(ii) Inexpensive - Low cost.
(iii) Costly - High in price.
(iv) Cheap - Low in price.
(v) Affordable - Reasonable price.
(vi) Luxurious - Highly expensive.

Activity 5

Ask the students to go to the market and find out the selling price of each and every vegetable in various shops over there and make them to prepare a list of their observations. Let them discuss about this in the classroom like which is cheaper, costlier and affordable with their pair groups. The teacher has to instruct the students while discussing.

Activity 6

Fruit seller-1, uses her bike to sell her fruits for ₹150 and spends ₹170 for petrol. But fruit seller-2 sitting outside of an office sells her fruits for ₹250.

Make the students to sit in groups to discuss about this situation on which is costlier and which is cheaper?



6.1 Compare fractions

Finds a number corresponding to a part of collection in the form of fractions

Situation



Radhika bought a chocolate bar, which is divided into 8 pieces. She wants to share it with his brother Tharun. She gave him 2 parts out of 8 parts. But he denied to have that. He needed more. Then she gave him 3 out of 8 parts, which was also refused by him. So she finally decided to give him 4 out of 8 parts. Again, he was not willing to take. He wants more. But she explained him that she had given him equal share only.

Consider the above situation. How will you express 2 out of 8 parts mathematically?

$\frac{2}{8}$ Isn't it?

How will you express 3 out of 8 parts ?

$\frac{3}{8}$ Isn't it?

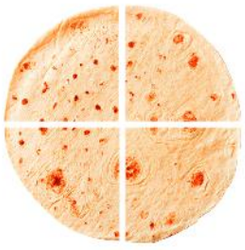
Here, $\frac{2}{8}$ and $\frac{3}{8}$ are fractions.

Fraction is a part of a whole or collection.

6.2 Equivalent fractions

If one chappathi is divided equally between two people then, each one will get half a chappathi. The fraction half, is written as $\frac{1}{2}$. Here, 1 is the numerator and 2 is the denominator.



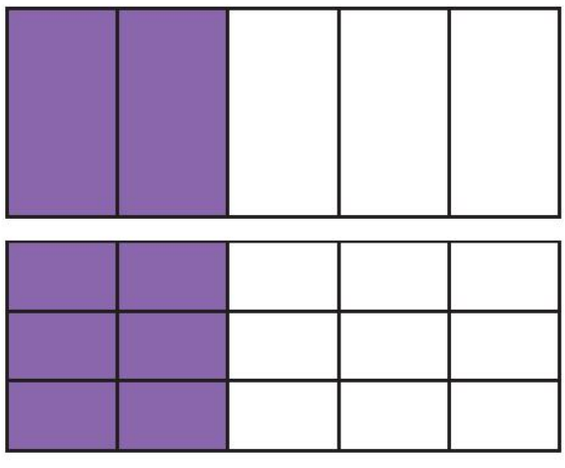


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The same chappathi is divided into four equal parts. Two parts were given to each person. This is shown as $\frac{2}{4}$. Here 2 is the numerator and 4 is the denominator.

It means that the value of two fractions is the same. That is, $\frac{1}{2} = \frac{2}{4}$. Such fractions of equal value are called equivalent fractions.

Obtaining equivalent fractions



Two of the five equal parts in the figure are coloured. The coloured part is $\frac{2}{5}$ of the whole figure.

When two lines are drawn horizontally in the same figure, the figure gets divided into 15 equal parts. So, the fraction that shows the coloured part now has changed. Now, the fraction of the coloured part is $\frac{6}{15}$ but coloured size is the same.

Two figures that have the same size are called equivalent fractions.

Therefore, we see that $\frac{2}{5} = \frac{6}{15}$

When the numerator and denominator of a fraction are multiplied by the same non-zero number, we get a fraction that is equivalent to the given fraction.

Example 6.1

Find a fraction with denominator 20 which is equivalent to $\frac{2}{5}$.

Solution

$\frac{2}{5} = \frac{\square}{20}$. We must find the right number for the box.

Here, 4 times the denominator 5 is 20. So, multiply the numerator also by 4

Therefore,

$\frac{2}{5} = \frac{2 \times 4}{5 \times 4} = \frac{8}{20}$

Hence, the fraction $\frac{8}{20}$ is equivalent to $\frac{2}{5}$.

Example 6.2

Find a fraction equivalent to $\frac{8}{20}$ with denominator 5.

Solution

$\frac{8}{20} = \frac{\square}{5}$. We must find the number for the box.

In both the fractions denominator is given, that is 20 and 5.

Here, we get 5 in one of the fractions if we divide 20 (denominator of the other fraction) by 4.

So, we can get the required number (in box), if we divide 8 by 4.

That is $8 \div 4 = 2$.

Therefore $\frac{8}{20} = \frac{8 \div 4}{20 \div 4} = \frac{\boxed{2}}{5}$

Thus, the fraction $\frac{2}{5}$ is equivalent to the fraction $\frac{8}{20}$.

Exercise 6.1

1. Write the suitable number in the box.

(i) $\frac{1}{2} = \frac{\square}{8}$ (ii) $\frac{1}{3} = \frac{7}{\square}$ (iii) $\frac{9}{11} = \frac{18}{\square}$

(iv) $\frac{5}{15} = \frac{\square}{3}$ (v) $\frac{14}{26} = \frac{\square}{13}$ (vi) $\frac{\square}{4} = \frac{8}{16}$

(vii) $\frac{1}{\square} = \frac{7}{28}$ (viii) $\frac{\square}{5} = \frac{15}{25}$

2. Find an equivalent fraction with denominator 18 for each of the following fractions.

$\frac{1}{2}, \frac{2}{3}, \frac{4}{6}, \frac{2}{9}, \frac{7}{9}, \frac{5}{3}$

3. Find an equivalent fraction with denominator 5 for each of the following fractions.

$\frac{6}{15}, \frac{10}{25}, \frac{12}{30}, \frac{6}{10}, \frac{21}{35}$

Like fractions and unlike fractions

Consider the following figures:



(i) (ii) (iii)

The fraction represented by (i) is $\frac{2}{6}$. The fraction represented by (ii) is $\frac{3}{6}$. The fraction represented by (iii) is $\frac{4}{6}$.

In $\frac{2}{6}, \frac{3}{6}$ and $\frac{4}{6}$, the denominators are the same. Such fractions are called as like fractions.

Like fractions

Fractions with same denominators are called **like fractions**.

Examples: $\frac{1}{5}, \frac{4}{5}, \frac{3}{5}$

Unlike fractions

Fractions with different denominators are called **unlike fractions**.

Examples: $\frac{1}{7}, \frac{2}{9}, \frac{9}{11}$

Converting unlike fractions into like fractions

To convert unlike fractions into like fractions, we change the denominators of the given fractions into a common denominator. This can be done by finding the common multiples of the denominator.

Example 6.3

Convert $\frac{5}{6}$ and $\frac{7}{9}$ into like fractions.

Solution

Find common multiples for the numbers 6 and 9

Multiples of 6 : 6,12,18,24,30,36,...

Multiples of 9 : 9,18,27,36,45,.....

Here, the number 18 is a multiple of both 6 and 9 and so 18 is the first common denominator of both the fractions.

$\frac{5}{6} = \frac{5 \times 3}{6 \times 3} = \frac{15}{18}$ | $\frac{7}{9} = \frac{7 \times 2}{9 \times 2} = \frac{14}{18}$

Thus, $\frac{15}{18}$ and $\frac{14}{18}$ are like fractions, respectively equivalent to $\frac{5}{6}$ and $\frac{7}{9}$.

Example 6.4

Convert $\frac{4}{8}$ and $\frac{5}{16}$ into like fractions.

Solution

As 16 is twice 8, it is easy to make 16 as the common denominator.

$\frac{4}{8} = \frac{4 \times 2}{8 \times 2} = \frac{8}{16}$

Thus $\frac{8}{16}$ and $\frac{5}{16}$ are the required like fractions.

Example 6.5

Find a common denominator for $\frac{2}{5}$ and $\frac{3}{7}$.

Solution

The number 35 is a common multiple of both 7 and 5.
So, take 35 as the common denominator.

$$\frac{2}{5} = \frac{2 \times 7}{5 \times 7} = \frac{14}{35} \qquad \frac{3}{7} = \frac{3 \times 5}{7 \times 5} = \frac{15}{35}$$

Therefore $\frac{14}{35}$ and $\frac{15}{35}$ are the required like fractions.

Exercise 6.2

1. Convert the following into like fractions.

(i) $\frac{1}{4}, \frac{3}{8}$ (ii) $\frac{2}{5}, \frac{1}{7}$ (iii) $\frac{2}{5}, \frac{3}{10}$ (iv) $\frac{2}{7}, \frac{1}{6}$

(v) $\frac{1}{3}, \frac{3}{4}$ (vi) $\frac{5}{6}, \frac{4}{5}$ (vii) $\frac{1}{8}, \frac{3}{7}$ (viii) $\frac{1}{6}, \frac{4}{9}$

Comparing like fractions

To compare like fractions, check the numerators of the given fractions.

Example 6.6

Compare the shaded and unshaded part in the following figure.



Solution

A strip is divided into 7 equal parts. It means that each part represents $\frac{1}{7}$.

The coloured part is $\frac{3}{7} = \frac{1}{7} + \frac{1}{7} + \frac{1}{7}$

The uncoloured part is $\frac{4}{7} = \frac{1}{7} + \frac{1}{7} + \frac{1}{7} + \frac{1}{7}$

The coloured part is less than the uncoloured part.

This tells us that $\frac{3}{7}$ is less than $\frac{4}{7}$

This is written as $\frac{3}{7} < \frac{4}{7}$

Example 6.7

Compare the different shaded parts in the following figure.



Solution

This strip is divided into 5 equal parts. 2 out of 5 parts have one colour and 1 has another colour.

The fraction of blue coloured part = $\frac{2}{5}$

The fraction of yellow coloured part = $\frac{1}{5}$

Comparing the numerators 2 and 1, we find $2 > 1$

Therefore $\frac{2}{5} > \frac{1}{5}$.

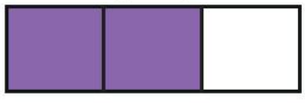
In like fractions, the fraction with the greater numerator is the greater fraction.

Comparing fractions with equal numerators

You have learnt that the value of fractions with numerator 1 decreases as the denominator increases.

Even if the numerator is not 1, the same rule applies for all the fractions that have a common numerator. For example, look at the figures below, all the shaded strips in the figure are alike.

2 out of 3 equal parts of the strip is given as



$\frac{2}{3}$

2 out of 4 equal parts of the strip is given as



$\frac{2}{4}$

N1WFT

2 out of 5 equal parts of the strip is given as



$\frac{2}{5}$

The figures show that $\frac{2}{3} > \frac{2}{4} > \frac{2}{5}$

Out of two fractions with equal numerators, the fraction with the greater denominator is the smaller fraction.

To compare unlike fractions, convert them into their equivalent fractions so that their denominators are the same.

Exercise 6.3

1. Write the appropriate symbol $<$, $>$, or $=$ in the box.

(i) $\frac{3}{5} \square \frac{2}{5}$ (ii) $\frac{2}{8} \square \frac{1}{8}$ (iii) $\frac{2}{11} \square \frac{10}{11}$ (iv) $\frac{3}{15} \square \frac{10}{30}$ (v) $\frac{3}{8} \square \frac{3}{7}$

(vi) $\frac{4}{7} \square \frac{4}{11}$ (vii) $\frac{5}{12} \square \frac{1}{6}$ (viii) $\frac{4}{9} \square \frac{4}{9}$ (ix) $\frac{3}{7} \square \frac{5}{9}$ (x) $\frac{4}{11} \square \frac{1}{5}$

Addition of like fractions

While adding like fractions, add only the numerators of the two fractions and write the denominator as it is.

Example 6.8

$\frac{3}{7} + \frac{1}{7} = ?$

Solution

Here, the denominators are the same, that is 7. So, add only the numerators.

$$\frac{3}{7} + \frac{1}{7} = \frac{3+1}{7} = \frac{4}{7}$$

Example 6.9

Add: $\frac{1}{8} + \frac{3}{8} + \frac{2}{8}$

Solution

Here, the denominators are the same, that is 8. So, add only the numerators.

$$\frac{3}{8} + \frac{2}{8} + \frac{1}{8} = \frac{3+2+1}{8} = \frac{6}{8}$$

Example 6.10

Add $\frac{2}{6}$ and $\frac{4}{6}$

Solution

Here, the denominators are the same, that is 6. So, add only the numerators.

$$\frac{2}{6} + \frac{4}{6} = \frac{2+4}{6}$$

$$= \frac{6}{6} = 1$$

Note: If the numerator and denominator of a fraction are equal, the fraction is equal to one.

Exercise 6.4

1. Add the following fractions

(i) $\frac{1}{5} + \frac{3}{5}$ (ii) $\frac{1}{7} + \frac{3}{7}$ (iii) $\frac{5}{12} + \frac{2}{12}$

(iv) $\frac{3}{9} + \frac{7}{9}$ (v) $\frac{2}{15} + \frac{3}{15}$ (vi) $\frac{2}{7} + \frac{1}{7} + \frac{3}{7}$

(vii) $\frac{3}{10} + \frac{5}{10} + \frac{2}{10}$ (viii) $\frac{2}{9} + \frac{1}{9}$ (ix) $\frac{3}{8} + \frac{2}{8}$

2. Mother gave $\frac{2}{8}$ of guava to Meena and $\frac{3}{8}$ of guava to Geetha. How many parts of the guava did she give them altogether?

3. The girls of Std V cleaned $\frac{3}{5}$ of a field, while the boys cleaned $\frac{1}{5}$ part of the field. What part of the field was cleaned altogether?

Subtraction of like fractions

When subtracting a like fraction from another like fraction, write the difference between the numerators in the numerator and write the common denominator in the denominator.



Example 6.11

Subtract $\frac{2}{13}$ from $\frac{5}{13}$

Solution

Here, the denominators are the same, that is 13. So, subtract only the numerators.

$$\frac{5}{13} - \frac{2}{13} = \frac{5-2}{13} = \frac{3}{13}$$

Example 6.12

If Raju got $\frac{7}{12}$ part of a sugarcane and Sanju got $\frac{5}{12}$ part of it, how much did Raju get as extra part?

Solution

To find out the extra part, we must subtract $\frac{5}{12}$ from $\frac{7}{12}$.

Raju's extra part $= \frac{7}{12} - \frac{5}{12}$

$= \frac{7-5}{12}$

$= \frac{2}{12}$

Thus, Raju got $\frac{2}{12}$ as extra part.

Exercise 6.5

1. Subtract the following.

(i) $\frac{4}{7} - \frac{1}{7}$ (ii) $\frac{4}{8} - \frac{3}{8}$ (iii) $\frac{5}{9} - \frac{1}{9}$ (iv) $\frac{7}{11} - \frac{3}{11}$

(v) $\frac{7}{13} - \frac{4}{13}$ (vi) $\frac{5}{10} - \frac{3}{10}$ (vii) $\frac{7}{12} - \frac{2}{12}$ (viii) $\frac{8}{15} - \frac{2}{15}$

2. $\frac{5}{10}$ of a wall is to be painted. Ramu painted $\frac{2}{10}$ of it.

How much more is to be painted?

Multiplication of fractions by a single digit number

While multiplying a fraction with a single digit number, the numerator only is multiplied with the single digit number and denominator remains the same.

Example 6.13

Multiply $\frac{2}{3}$ with 5.

Solution

$$\frac{2}{3} \times 5 = \frac{2 \times 5}{3} = \frac{10}{3}$$

Example 6.14

If Iniyan gets $\frac{1}{4}$ part of a chocolate bar everyday, then how much chocolate will he get for 3 days?

Solution

Part of the chocolate bar that Iniyan gets everyday = $\frac{1}{4}$

Part of the chocolate bar that Iniyan will get for 3 days = $\frac{1}{4} \times 3 = \frac{1 \times 3}{4}$

$= \frac{3}{4}$

Therefore, Iniyan will get $\frac{3}{4}$ parts of the chocolate bar for 3 days.

Exercise 6.6

1. **Multiply the following**

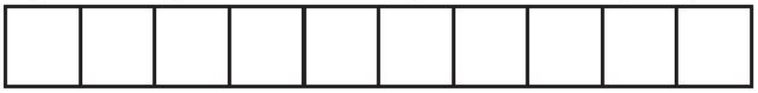
(i) $\frac{1}{7} \times 4$ (ii) $\frac{3}{8} \times 5$ (iii) $\frac{7}{11} \times 6$ (iv) $\frac{21}{50} \times 2$ (v) $\frac{15}{32} \times 3$

2. John has 300 ml of water in a glass and he drinks $\frac{2}{3}$ ml of water. How many ml of water does he drink?

Relationship between Fractions and Decimals

To introduce the concept of decimal

Take a rectangle and split the rectangle into 10 equal parts



How will you represent each part of the above rectangle?

That is $\frac{1}{10}$, $\frac{1}{10}$ and so on. Shade 1 part of the rectangle.



Here , 1 part is shaded out of 10 parts. Fractional representation is $\frac{1}{10}$. It can be written in another way as 0.1. In 0.1, 0 is called as the whole number part, 1 is called as the decimal part and "." is called as the decimal point which separates the unit place from tenth place.

The decimal number 0.1 is read as "zero point one".

Able to convert the fraction to decimals and vice versa

To convert a fraction to a decimal, keep the point before the numerator as per the number of zeros in the denominator.

Example 6.15

Convert the following fraction into decimals.

(i) $\frac{3}{10}$ (ii) $\frac{45}{10}$ (iii) $\frac{112}{10}$

Solution

(i) $\frac{3}{10} = 0.3$ (ii) $\frac{45}{10} = 4.5$ (iii) $\frac{112}{10} = 11.2$

Convert decimals to fractions.

To convert a decimal to a fraction, write the given number removing the decimal point as numerator and in the denominator put one and as many zeroes as the number of digits to the right of the decimal point in the decimal number.

Example 6.16

Convert the following decimals into fractions

(i) 3.6 (ii) 20.7 (iii) 18.9

Solution

(i) $3.6 = \frac{36}{10}$

(ii) $20.7 = \frac{207}{10}$

(iii) $18.9 = \frac{189}{10}$

Exercise 6.7

1. Write the following decimals in words

(i) 0.5 = _____

(ii) 0.8 = _____

(iii) 3.5 = _____

(iv) 6.9 = _____

2. Express the following fractions as decimals.

(i) $\frac{4}{10}$ (ii) $\frac{12}{10}$

(iii) $\frac{23}{10}$ (iv) $\frac{146}{10}$

3. Express the following decimals as fractions.

(i) 38.9 (ii) 9.8

(iii) 10.4 (iv) 0.8

Answers

1. Geometry

Exercise 1.1

1. 18 cm 2. 48 m 3. 24 m 4. 2 km 5. 4 km 400 m

Exercise 1.2

1. (i) 100 sq.m (ii) 25 sq.cm (iii) 225 sq.m (iv) 256 sq.cm
2. (i) 18 sq.cm (ii) 28 sq.m (iii) 40 sq.cm (iv) 54 sq.m
3. ₹1,20,000 4. 24cm; 36 sq.cm; 28cm; 40 sq.cm 5. ₹ 8,400

2. Numbers

Exercise 2.1

1. (i) 30 (ii) 70 (iii) 90 (iv) 80
2. 70 3. 90; 1 4. 50;1 5. 190 6. 100 7. 200 8. 11, 13

3. Measurements

Exercise 3.2

1. (i) 90 cu.cm (ii) 3600 cu.cm (iii) 3, 75, 000 cu.cm
   (iv) 1000cu.cm (v) 1 cu.cm.
2. (i) 480 cu.cm (ii) 45cm (iii) 3cm (iv) 20 cm (vi) 3m
3. 1200 bricks 4. 8000 sacks

Exercise 3.3

1. i) Millilitre ii) Kilolitre, 1000 iii) 7030l iv) 5400ml v) 1l 300ml

2. (i) 4500 ml - 4 l 500 ml

   (ii) 3250 ml - 3 l 250 ml

   (iii) 6500 ml - 6 l 500 ml

   (iv) 8200 ml - 8 l 200 ml

   (v) 7050 ml - 7 l 50 ml

3. i) 450 l 500ml ii) 3400 l 3ml iii) 287 l 080ml

4. i) 12 kl 485 l ii) 5 kl iii) 4 l 655ml

5. i) 25 l 600ml ii) 17 l 800ml iii) 26 l 500ml iv) 40 l 200ml

6. i) 3 l 40ml ii) 10 l 300ml iii) 3 l 70ml iv) 5 l 70ml

7. 6 l 250ml **8.** 34 l 800ml **9.** 68 l 600ml **10.** 5l 100ml

4. Algebra

Exercise 4.1

1. (6+6) = (8+4) = (9+3) 2. (8+8) = (18-2) = (8 × 2) = (32÷2)

Exercise 4.2

1. (i) True (ii) True (iii) False (iv) False (v) False (vi) True
   (vii) True (viii) False (ix) True (X) True
2. (i) > (ii) = (iii) <
3. (i) 9 (ii) 1, 2 (iii) 1, 2, 3,... (iv) 0 (v) 2 (vi) 4, 5, 6

5. Money

Exercise 5.1

1. (i) ₹ 40 (ii) ₹ 10,500 (iii) ₹ 770 (iv) ₹ 45.25
2. (i) c (ii) d (iii) b (iv) a
3. (i) ₹ 26,246.75 (ii) ₹ 1,30,412.50 (iii) ₹ 18,309.25
4. (i) ₹ 1,186.75 (ii) ₹ 473 (iii) ₹ 16,226.50
5. ₹ 49,553.25 6. ₹ 41,500 7. ₹ 3,85,838 8. ₹ 8,355

Exercise 5.2

1. (i) ₹ 375 (ii) ₹ 8.01 (iii) ₹ 7 (iv) ₹ 1,550
2. (i) ₹ 4,93,625 (ii) ₹ 4, 757.76 (iii) ₹ 4,348.44
   (iv) ₹ 11.59 (v) ₹ 997.5 (vi) ₹ 36.1
3. ₹ 75 4. ₹ 90 5. ₹ 4,608 6. ₹ 250 7. ₹ 140

6. Fractions

Exercise 6.1

1. (i) 4 (ii) 21 (iii) 22 (iv) 1
   (v) 7 (vi) 2 (vii) 4 (viii) 3

2. $\frac{9}{18}, \frac{12}{18}, \frac{12}{18}, \frac{4}{18}, \frac{14}{18}, \frac{30}{18}$

3. $\frac{2}{5}, \frac{2}{5}, \frac{2}{5}, \frac{3}{5}, \frac{4}{5}$

Exercise 6.2

1. (i) $\frac{8}{32}, \frac{12}{32}$ (ii) $\frac{14}{35}, \frac{5}{35}$ (iii) $\frac{20}{50}, \frac{15}{50}$ (iv) $\frac{12}{42}, \frac{7}{42}$
   (v) $\frac{4}{12}, \frac{9}{12}$ (vi) $\frac{25}{30}, \frac{24}{30}$ (vii) $\frac{7}{56}, \frac{24}{56}$ (viii) $\frac{9}{54}, \frac{24}{54}$

Exercise 6.3

1. (i) > (ii) > (iii) < (iv) < (v) < (vi) > (vii) > (viii) = (ix) < (x) >

Exercise 6.4

1. (i) $\frac{4}{5}$ (ii) $\frac{4}{7}$ (iii) $\frac{7}{12}$ (iv) $\frac{10}{9}$ (v) $\frac{5}{15}$
   (vi) $\frac{6}{7}$ (vii) $\frac{10}{10}$ (viii) $\frac{3}{9}$ (ix) $\frac{5}{8}$ 2. $\frac{5}{8}$ 3. $\frac{4}{5}$

Exercise 6.5

1. (i) $\frac{3}{7}$ (ii) $\frac{1}{8}$ (iii) $\frac{4}{9}$ (iv) $\frac{4}{11}$ (v) $\frac{3}{13}$
   (vi) $\frac{2}{10}$ (vii) $\frac{5}{12}$ (viii) $\frac{6}{15}$ 2. $\frac{3}{10}$

Exercise 6.6

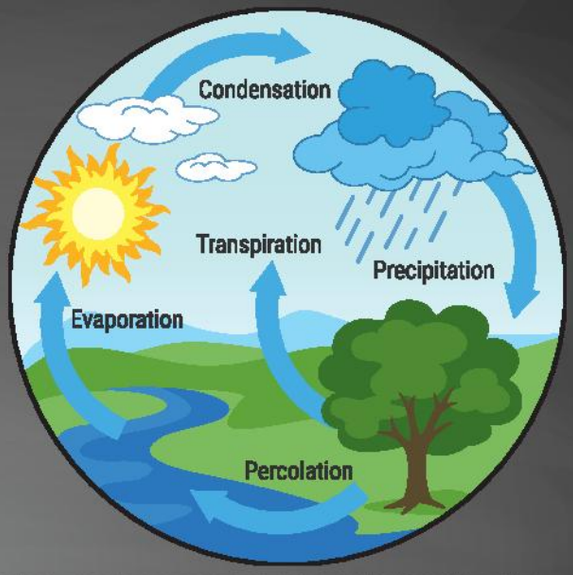
1. (i) $\frac{4}{7}$ (ii) $\frac{15}{8}$ (iii) $\frac{42}{11}$ (iv) $\frac{42}{50}$ (v) $\frac{45}{32}$ 2. 200 ml

Exercise 6.7

1. (i) Zero point five (ii) Zero point eight (iii) Three point five
   (iv) Six point nine 2. (i) 0.4 (ii) 1.2 (iii) 2.3 (iv) 14.6

3. (i) $\frac{389}{10}$ (ii) $\frac{98}{10}$ (iii) $\frac{104}{10}$ (iv) $\frac{8}{10}$


Science



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1 OUR ENVIRONMENT



Learning Objectives

HTKNA

After the completion of this lesson, students will be able to:

- Know about different types of farms.
- List out the economic importance of dairy farms and poultry farms.
- Know about Apiculture and the uses of honey.
- Understand different types of manures and their uses.
- Know about vermiculture and vermicompost.

Introduction

Environment is everything that is around us. There are two types of environment. They are physical environment and biological environment. Physical environment includes all non-living things like land, water and air. Biological environment includes the living things such as plants and animals. Natural environment has a lot of economic values. Plants and animals in our environment are useful to us in a number of ways. Animals like cow, buffalo and goat give us milk. Some animals are used for transportation. These animals are raised in farms. In this lesson we will learn about dairy farms, poultry farms, apiculture, manures and vermicompost.



I. Farms

Farming is the activity of growing crops and raising livestock. It is a part of agriculture. Agriculture is the cultivation of land and breeding of animals and plants to provide food, fiber, woods and medicinal plants to sustain and enhance life. But, farming is more profitable than agriculture. So, it is done on a commercial scale. An area of land with fields and buildings that is devoted primarily to growing crops or raising domestic animals or both as a business is called farm. Large scale farms grow one or two major crops or animals. Middle sized and small sized farms grow different types of crops and animals.

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1 Dairy Farm

Dairy farming is a type of agriculture that focuses on extraction of milk and preparation of various milk products like cheese, butter, curd etc. High milk producing cows along with bulls and oxen are raised in commercial dairy farms. Other animals raised in these farms include goats, sheep and camels.





Do you know?

'District Livestock Farm' in Hosur, Krishnagiri district of Tamil Nadu, is the biggest cattle farm in Asia. Total area of this farm is 1641 acres.



Activity 1

Visit an animal farm in your area and prepare a list of animals domesticated there. Also find out the products you can get from there.

❖ Cattle breeds

In India, there are 26 cattle breeds. They are domesticated for milk, agricultural work, transportation and many other needs. Gir, Sahiwal, Red Sindhi, Kangayam and Ongole are some of the cattle breeds found in India. Cattle breeds found in different states of India are given in the table.



Gir



Malvi



Nagari



Sahiwal



Red Sindhi



Ongole

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Cattle Breed	States
Gir	Gujarat, Rajasthan
Sahiwal	Punjab, Haryana, Uttar Pradesh
Red Sindhi	Andhra Pradesh
Malvi	Rajasthan, Madhya Pradesh
Nagari	Haryana, Uttar Pradesh, Rajasthan
Kangayam	Tamil Nadu
Ongole	Andhra Pradesh



Do you know?

India has the largest number of livestock in the world, holding 281 million. In 2008, our country housed the second largest number of cattle in the world with 175 million. (One million = Ten lakh)



Activity 2

Some of the cattle breeds found in Tamil Nadu are given below. With the help of your teacher find out the districts where they are found.



Kangayam



Bargur



Umblachery



Pulikulam

Apart from these animals, buffaloes are also domesticated in India. There are 7 buffalo breeds in India. Buffaloes produce more amount of milk than cows. Also, buffalo's milk has more nutrients than cow's milk. Murrah, Jaffrabadi, Bhadawari and Surti are the buffalo breeds that are found in India. India is the biggest buffalo milk producer in the world. Some of the buffalo breeds found in our country are given in the table.



Jaffrabadi



Surti



Nagpuri



Murrah



Bhadawari



Mehsana

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Buffalo Breeds	States
Murrah	Punjab, Haryana, Uttar Pradesh
Bhadawari	Uttar Pradesh, Madhya Pradesh
Jaffrabadi	Gujarat
Surti	Rajasthan, Gujarat
Mehsana	Gujarat
Nagpuri	Central and South India
Nili Ravi	Punjab, Haryana



Do you know?

White Revolution in India was launched in 1970s to make India self dependent in milk production. Dr. Verghese Kurien is called the Father of White Revolution.

❖ Feeding

Cattle need nutritious feed in order to be healthy and to produce high milk yield. The cattle feed includes roughage and concentrates. The roughage contains high amount of fiber and it includes fodder, hay, straw and silage. Concentrates include broken grams, cereals, millets, rice bran, cotton seeds and oil cakes. Apart from these feed, cattle need an adequate amount of fresh water.

❖ Diseases

Foot and mouth disease and anthrax are some of the common diseases found among cattle. Maintaining proper sanitation is necessary to stop the spread of these diseases. Timely vaccination can prevent most of the diseases. Veterinary medicine deals with the prevention, diagnosis and treatment of disease, disorder and injury among domestic and non-domestic animals.



Activity 3

Visit a veterinary hospital in your area and find out the common diseases found among the cattle in your area. Try to know how such diseases can be prevented.

❖ Uses

Cattle are useful to us in a number of ways. Some of them are listed below.

- We get milk from cows. Cow's milk contains essential minerals needed for us.
- Bullocks are used to plough land, harvest and thrash crops.
- Cattle are employed in transportation.
- Cattle dung is used as manure. It is also used as fuel and for generation of biogas.
- Panchagavya is an ayurvedic medicine used in agriculture to control pest and fungi. It is a mixer of dung and urine of cows, fresh milk, curd, jaggery and ghee.
- Leather goods are manufactured from cattle hides.



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2 Poultry Farm



In poultry farms, avian species are reared and bred for the purpose of egg, meat or both. Fowls, ducks, geese, turkeys and some varieties of pigeon are the most commonly reared species. Chicken occupy 90% of the total poultry. Poultry birds grown for meat are called broilers. Layers are the female fowls grown for egg production. The poultry industry is important in providing a balanced diet for human population. Proper management of poultry includes methods of hatching, rearing, housing, sanitation, prevention of diseases and a sound marketing system. In Tamil Nadu, famous poultry farms are found in places like Namakkal, Palladam and Chennai.

❖ Breeds

There are more than hundred breeds of fowls. Fowls are classified on the basis of their utility to us. They are: meat type (broiler), egg type (egg layer) and dual type. Aseel, Chittagong, Ghagus, Busra, Brahma and Cochin are some of the breeds found in our country. Local and indigenous birds are reared in rural places traditionally. These birds have a poor meat production capacity compared to commercial broilers and layers. But, meat and egg from this type of poultry are better than other commercial poultry.



Do you know?

India ranks third in egg production in the world.

White leghorn is the most egg yielding breed in the world.



Ghagus



Cochin



Brahma



Broiler



Chittagong



Plymouth



Aseel



Kadaknath

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❖ Feeding

Poultry birds need proteins, carbohydrates, fats, minerals and vitamins for egg and meat production. Bajra, barley, maize, wheat, rice bran, jowar, oil cake, fish meal, bread and green residues of vegetables are the feed given to the poultry birds.

❖ Poultry products

Poultry birds benefit us in many ways. Egg, meat and manure are the three main benefits we get from them.

- Poultry birds are good source of nutritive food.
- Eggs laid by them are rich source of protein. These are easily digestable. They contain minerals like calcium, potassium and iron, vitamins and moderate amount of fat.
- Their feathers are used for making pillows and quilts.
- Dropping of the poultry birds is used as manure. It is highly valuable for crops.



Do you know?

Egg contains minerals like calcium, phosphorus and sodium and vitamins like B_1, B_2 and D. Nutritious content of egg is: Water-66%, Protein-21%, Fat-9% and Minerals-3.5%.



❖ Poultry Diseases

If poultry animals are not cared or fed properly, they suffer from a number of diseases.

- Poultry birds affected by virus suffer from fever and diarrhea.
- Foul cholera is caused in them by bacteria.
- Over exposure to wet and cold conditions causes cramps in poultry birds.
- Poultry birds are affected by internal parasites like round worm and tap worm. They are also affected by external parasites like flies, lice, ticks etc.



Activity 4

Fill in the blanks using the words given below.

(Oilseeds, Egg, Honey, Food grains, Fish)

Green Revolution : _____

Blue Revolution : _____

Silver Revolution : _____

Gold Revolution : _____

Yellow Revolution : _____

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❖ Poultry management

Poultry birds need a clean environment. The following measures should be taken in order to avoid diseases.

- ➔ Poultry houses should be clean and disinfected.
- ➔ It should have windows for ventilation.
- ➔ Light is essential for high egg production.
- ➔ Poultry birds need clean and fresh water.
- ➔ Timely vaccination is necessary to prevent diseases.



II. Apiculture

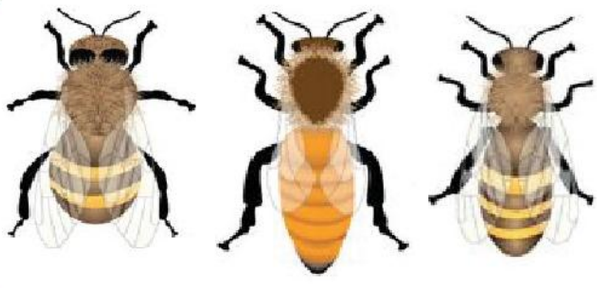
Rearing of honey bees for honey is known as apiculture. It is also called bee keeping. In this technique honey bees are reared in a specially designed wooden boxes. Honey bees have been very closely associated with humans since ancient times. Various products like honey and wax are obtained from honey bees. Earlier, honey was extracted from the hives in the forests. Nowadays they are domesticated by farmers to produce honey. Bee keeping is a profitable rural based industry. Honey bees are social insects. The nest of honey bee is known as the bee hive. They live in colonies and show division of labour.

1 Types of Honey Bee

Three types of honey bees are found in a colony. They are: Queen bee, the Drones and the Worker bees.

❖ Queen Bee

The queen bee is the largest member of the bee colony. There is only one queen and it is the fertile female of the colony. They are formed from fertile eggs. The queen is responsible for laying eggs in a colony. It lays about two thousand eggs per day. The life span of the queen bee is 3-4 years.



Queen Bee Drone Bee Worker Bee

❖ Drones

Drones are the fertile males. They develop from unfertilized eggs. They are larger than the workers and smaller than the queen. Their main function is to fertilize the eggs produced by the queen. They also help in maintenance of hive temperature. The number of drones in a colony amounts to hundreds and sometimes to thousands. The normal life span of a drone is 57 days.

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❖ Worker Bees

These are sterile female bees and the smallest members of the colony. These bees are very active. **Their function is to collect honey, look after the young ones, clean the comb, defend the hive and maintain the temperature of the bee hive. Life span of worker bee is six weeks.**



Do you know?

- One worker bee has to fly 90000 miles (three times around the globe) to make one pound of honey.
- Honey bee can fly up to six miles and as fast as 15 miles per hour.

2 Useful products from Honey Bees

Honey and bee wax are obtained from honey bees. Other products which are obtained from bees are bee venom, propolis and royal jelly.

❖ Honey

Honey is a sweet, viscous, edible natural food product. It contains proteins, free amino acids, vitamins and minerals like calcium, iron, phosphorus and manganese. The following are the uses of honey.

- Honey has an antiseptic and antibacterial property. It is an antibiotic also.
- It helps in building up haemoglobin content in the blood.
- It is used in Ayurvedic and Unani system of medicines.
- It prevents cough, cold, fever and relieves sore throat.
- It enhances digestion and appetite.
- It provides essential aminoacids required for the growth of the body.



Do you know?

Honey is the exciting source of natural sweet. It is also called as 'Liquid Gold'.



❖ Bee wax

Bee wax is secreted by the wax glands of worker bee to construct the combs of bee hive. Some of the uses of bee wax are given below.



- It is widely used in cosmetic industry.
- The wax is used in the preparation of shoe polish and manufacture of cold creams, lipsticks, candles and lubricants.
- It is also used in the preparation of ointments and in pharmaceutical industry.

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III. Manure

Manure is an organic matter used as fertilizer. It is mostly derived from animal and plant residues. It increases the fertility of the soil by adding nutrients such as nitrogen, phosphorus and potassium. It is a natural form of fertilizer and it is cheaper.

1 Types of Manure

Animal manure, green manure and compost manure are the different types of manures.

❖ Animal manure

Common form of animal manure is the farmyard manure. It contains the feces and urine of different livestock like horse, cattle, pig, sheep, chicken, turkey and rabbit. It contains nutrients like nitrogen, phosphorus and potassium. It increases the capacity of the soil to hold more water and nutrients.

❖ Green manure

This manure is obtained by the decomposition of green leaves, twigs of trees, shrubs and herbs which are added into the farm land before starting cultivation. Leguminous plants like wild indigo (kolunchi) are used for this purpose. These plants are ploughed in the soil. They fix nitrogen in the root of the plants. They also help in suppression of weeds and prevention of soil erosion.

❖ Compost

Compost is obtained by the decomposition of organic matter like crop residues, animal wastes and food wastes by various microorganisms like bacteria and fungi under controlled conditions. These microorganisms break down organic matter into simpler substances.



Activity 5

With the guidance of your teacher set up a compost pit within your school campus. Put all the organic wastes like food waste and cover it with soil. Wait for three weeks and then you can use this as manure for the plants in your school.



Animal manure



Green manure



Compost

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IV. Vermiculture

KHSU9

Vermiculture or Vermicomposting is a method of transforming organic wastes such as leaves, pieces of wood etc., into a nutrient rich fertilizer using earth worms. It is a healthy and clean way to eliminate wastes going into our landfills. It helps to keep the environment clean. Earthworms eat the organic wastes and excrete it in the form of castings. This is known as vermicompost. It is used as fertilizer for the soil and it improves the properties of the soil.

1 Materials used for Vermicomposting

Organic matters which are biologically degradable are used in vermicomposting. Some of them are given below.

- Crop residues like rice straw, rice husk, tea wastes and tobacco wastes.
- Fruit and vegetable wastes.
- Animal wastes like cattle dung, poultry droppings and droppings of goat and sheep.



2 Advantages of Vermicompost

- Vermicompost provides the essential nutrients such as nitrogen, potassium and phosphorus for the plant growth.
- It improves the water holding capacity of the soil and prevents soil erosion.
- It enhances plant growth, suppresses diseases in plants, increases porosity and improves water retention and aeration.
- It is used to clean sewage.
- It reduces the need for chemical fertilizers.



Do you know?

Common earth worms are not used for vermicomposting. Specialized breeds that multiple while living in colonies are used for this. The most common earth worms used are Red wigglers, European night crawlers, and African night crawlers.



Evaluation

JCOYR

I. Choose the correct answer.

1. Which of the following produces more milk?

a) Cow b) Yak c) Buffalo d) Goat

2. Poultry farming is rearing and breeding of _____.

a) chickens b) cows c) avian species d) animal

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3. _____ is the best fertilizer.

a) Vermicompost b) Fruits c) Synthetic fertilizer d) Urea

4. _____ is more profitable than agriculture.

a) Dairy farm b) Farming c) Cultivation d) Poultry

5. Poultry farm is famous in _____ district of Tamil Nadu.

a) Ariyalur b) Salem c) Namakkal d) Thanjavur

II Fill in the blanks.

1. There are _____ breeds of cattle in India.
2. The milk of _____ has more nutrients than cow's milk.
3. _____ contains high amount of fiber.
4. Droppings of poultry birds are used as _____.
5. Vermicomposting transforms _____ into a nutrient rich fertilizer.

III. Match the following.

1. Surti	-	Egg
2. White revolution	-	Transportation
3. Layers	-	Leguminous plants
4. Green manure	-	Buffalo
5. Cattle	-	Milk

IV. Say True or False. If false, correct the statement.

1. Farming is done on a commercial scale.
2. Vermicompost can be used to clean sewage.
3. Leguminous plants fix nitrogen in the leaves of the plants.
4. Namakkal district is famous for dairy farm.
5. Murrah is a buffalo breed.

V. Answer briefly.

1. What is farming?
2. Mention the types of farming.
3. Write a note on poultry farm.
4. What is farmyard manure?
5. Define Vermicompost.

VI. Answer in detail.

1. What are the uses of cattle?
2. How will you manage a poultry farm?

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2 ANIMALS



Learning Objectives

1XHZO

After the completion of this lesson, students will be able to:

- Understand reproduction in animals.
- Differentiate oviparous and viviparous animals.
- Know about endangered animals and the importance to save them.
- List out the importance of wildlife sanctuaries and national parks.
- Understand the need for the prevention of cruelty to animals.

Introduction

Our planet earth has countless number of organisms including plants and animals. Among them, animals are the most advanced organisms. Animals are a gift of nature to human beings. They are very closely associated with us in our daily life and contribute a lot to us. Man is exploiting nature nowadays more than ever before. Hence animals are affected and many of the plant and animal species are disappearing from the earth. We are going to study about this in this lesson. This lesson will also deal with reproduction in animals, extinction of animals and the ways to preserve them.

I. Reproduction in Animals

WVK2Q

Reproduction is the biological process by which an organism gives rise to a new organism. This process is seen in all living organisms - both plants and animals. Reproduction is essential for the continuation of similar kinds of species, generation after generation. In animals, two types of reproduction are seen. They are: sexual reproduction and asexual reproduction.

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1 Sexual Reproduction

Sexual reproduction is a natural way of reproduction in humans, animals and also in most of the plants. This type of reproduction is more complex and lengthy as compared to asexual reproduction. Different and unique offspring are produced by sexual reproduction. Sexual reproduction consists of the following stages.

a. Pre-fertilization b. Fertilization c. Post-fertilization

a. Pre-fertilization

This is the first stage of sexual reproduction. In this stage, gamete (sex cells) formation and transfer of gametes take place. In animals, males and females have different reproductive organs. The male reproductive organ is called testes and the female reproductive organ is called ovary. The testes produce the male gametes known as sperms and the ovaries produce the female gametes known as ova or eggs. The male gamete reaches the female gamete during this stage.

b. Fertilization

When the male gamete reaches the female gamete they begin to fuse together. The fusion of gametes is known as fertilization. During fertilization, the nuclei of the sperm and the egg form a single nucleus together, resulting in the formation of a fertilized egg, known as zygote.



Fertilization in animals takes place in two ways. They are: External fertilization and Internal fertilization.





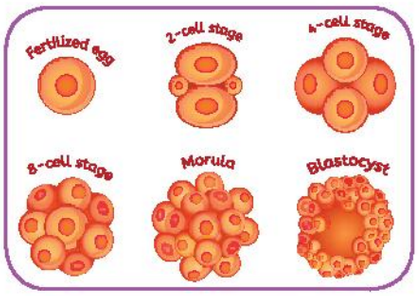
External fertilization takes place outside the animal's body. It usually takes place in aquatic environments where both eggs and sperm are released into the water. Fertilization in frogs and fish takes place by this method. When the fertilization takes place inside the animal's body, it is called internal fertilization. Internal fertilization takes place in animals like cat, dog, cow etc.

c. Post-fertilization

The zygote (fertilized egg) further divides repeatedly into group of cells. These cells develop into different tissues and organs constituting a full body. This structure is known as embryo.

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The embryo continues to develop in the uterus and it is developed into body parts such as head, face, hands, legs, etc. Based on whether the embryo develops outside or inside the body, animals are classified into oviparous animals and viviparous animals respectively.



❖ Oviparous animals

Animals in which embryo develops outside the body are called oviparous animals. They produce their offspring by laying eggs. In the case of birds new ones are produced from the eggs. The egg shell protects the embryo from outer environment and the embryo receives its nutrients from the egg yolk. In some of these animals the new born one will have different developmental stages.



For example, in butterfly, there are different developmental stages like egg, larva, pupa and adult. Each stage is different. The process in which a butterfly becomes an adult is called metamorphosis. The life cycle process can take a month to year.

Stage 1 - Eggs

In the first stage a butterfly lays eggs on the leaf. These eggs are very small and round. About five days after the eggs are laid, a tiny worm-like creature will hatch from the egg.

Stage 2 - Caterpillar (Larva)

The second stage is the caterpillar. It is also called larva. The caterpillar starts to eat leaves and flowers once it has hatched. It grows very fast because it eats a lot. As it grows fast, it sheds its old skin and gets new skin. A caterpillar shedding its outgrown skin is called moulting.

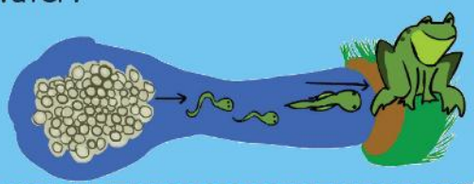
Stage 3 - Chrysalis (Pupa)

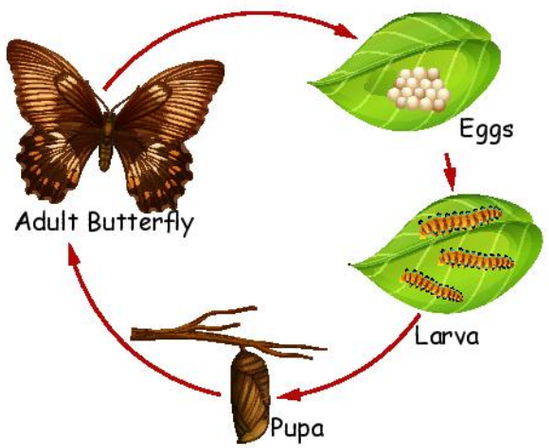
The third stage is the pupa. It is mostly brown or green. This is the resting stage as well as the changing stage. The caterpillar turns into a butterfly.



Do you know?

Amphibians are animals which have double life. The early part of an amphibian's life is spent in the water. As they get older, they spend time on land. Amphibians like frog lay thousands and sometimes millions of small, soft eggs in the water.





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Stage 4 - Butterfly (Adult)

In the fourth stage, the pupa opens and a butterfly comes out. A butterfly is sometimes called an imago. It is also called as adult. Butterflies are very colourful. When the butterfly first comes out it is very tired and so it rests. Then the butterfly will lay eggs and the life cycle will start all over again.

❖ Viviparous animals

Animals in which the embryo develops inside the body are called viviparous animals. These animals give birth to the young ones. The developing embryo gets its nutrients from the mother. Human, cow, deer and dog are examples for viviparous animals.



Oviparous animals	Viviparous animals
The development of the embryo takes place outside the animal.	The development of the embryo takes place inside the animal.
They produce their young ones by laying eggs.	They directly give birth to the young ones.
The embryo receives the nutrients from the egg yolk.	The embryo receives the nutrients from the mother.
Examples for oviparous animals are insects, fish, reptiles birds etc.	Examples for viviparous animals are cat, dog, lion, human etc.



Activity 1

Write down the names of any three oviparous and viviparous animals in the table given below.

Oviparous animals	Viviparous animals

2 Asexual Reproduction

The type of reproduction in which only a single parent gets divided into two or more new offspring is known as asexual reproduction. This type of reproduction takes place in micro organisms like hydra and amoeba. Asexual reproduction produces offspring that are identical to the parent. There are several ways by which animals reproduce asexually. Some of them are explained below.

❖ Fission

Fission occurs in some invertebrate (organisms without back bone), multi-celled organisms. In this method, an organism splits itself into two parts. For example, flatworms, sea anemones and sea cucumbers divide into two halves and regenerate the other half in each of the resulting individuals.

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❖ Budding

Budding is a form of asexual reproduction that results from the outgrowth of a part of the body. Then, the bud is separated from the original organism forming two individuals. Budding occurs commonly in some invertebrate animals such as hydras and corals.

❖ Fragmentation

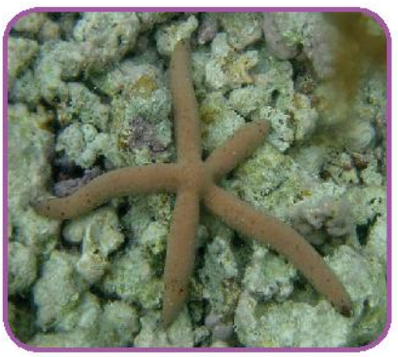
Fragmentation is the breaking of an individual into parts followed by regeneration. Reproduction through fragmentation is observed in sponges and sea stars. Fragmentation may occur through accidental damage, damage from predators, or as a natural form of reproduction.



Sea Anemone



Hydra



Star Fish

❖ Spores

Some protozoan, bacteria, plants and fungi reproduce via spores. Spores are the structures that naturally grow as part of an organism's life cycle. They are separated from the organism and dispersed through a medium such as air or water. In a suitable environment, the spores will develop into a fully grown organism.



Activity 2

Visit a nearby museum or a higher secondary school lab in your area. Find the specimens of starfish, cucumber and hydra there. Collect the pictures of these species and prepare an album.



II. Endangered Species

An endangered species is an animal or a plant that is at the risk of extinction. It means that they might extinct from the earth soon. It is reported that nearly 132 species of plants and animals are critically endangered in India. Snow leopard, Bengal tiger, Asiatic lion, Purple frog and Indian giant squirrel are some of the endangered animals in India. Similarly, plants like Umbrella tree, Glory lily, Rafflesia flower, Indian mallow and Musli plant are endangered.

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Lion tailed Macaque Asiatic Lion The Nilgiri Tahr Snow Leopard



Activity 3

Collect the pictures of different plants and animals. Prepare a poster showing the endangered animals and plants in India. Also find out where they are found.



Do you know?

An animal species is said to be endangered if its population has declined between 50 and 70 percent over ten years.



Indian Mallow Glory Lily Umbrella Tree Rafflesia Flower

1 Causes for Endangerment

The following are the reasons why an animal or a plant is endangered or extinct.

- Forests which provide food and shelter to animals are destroyed for human needs.
- Large number of animals are hunted for their horns, skin, teeth and many other valuable products.



Activity 4

Write few slogans for the conservation of forest and animals. Observe some important days related to nature like World Wildlife Day and organise a rally on those days.



Do you know?

In the recent years more number of animals are affected by wastes in the form of plastic. Animals mistake plastic as their food and eat them. Surgeons in Tamil Nadu Veterinary University, Chennai have removed 52kg of plastic wastes from a cow.

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- Pollutions like air pollution and water pollution affect the animals.
- Sometimes animals are taken to new habitat by people. They cannot survive there.
- Pesticides and chemicals which are used to get rid of insects, pests or weeds, poison the plants and animals.
- Natural disasters like flood, cyclone and fire also destroy animals.



2 Saving Endangered Species

Nature is beautiful and it is filled with varieties of plants and animals. But they are endangered mainly due to human activities. We need to take some measures to protect them.

- Hunting and poaching of animals should be prohibited.
- We should not pollute the environment.
- Limiting the usage of plastic and recycling it can save the endangered animals.
- Pesticides and chemicals which pollute the environment should be avoided.
- Planting native trees will provide food to the animals.
- We should buy eco friendly products only.



Activity 5

Plant native trees like Banyan tree, Neem tree, Umbrella tree and Java plum tree in your school area. These trees can benefit birds.



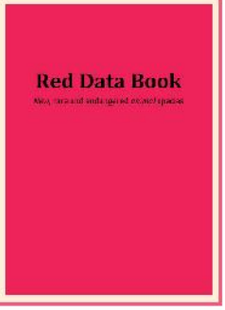
Do you know?

Project Tiger was initiated in India in 1972 to protect the Bengal tiger. It was launched on 1st April, 1973. Due to this project the population of tiger has increased in India from 1400 in 2006 to 2967 in 2018.

3 Red Data Book

The Red Data Book is a book maintained for recording rare and endangered species of animals and plants. This book is created to identify and protect the species which are about to extinct.

Black	Confirmed to extinct species.
Red	Endangered species.
White	Rare species.
Green	Formerly endangered species but started to recover.



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It is maintained by the International Union for Conservation of Nature (IUCN), an international organization working in the field of nature conservation. The Red Data Book contains colour-coded information sheets.

❖ Advantages of Red Data Book

- It helps to evaluate the population of a particular species.
- The data given in this book can be used at the global level.
- The risk of a species becoming globally extinct can be estimated with the help of this book.
- It provides the necessary guidelines for implementing protective measures.



Do you know?

Red Data Book of India contains the conservation status of animals and plants which are found in the Indian subcontinent. Surveys conducted by Zoological Survey of India and Botanical Survey of India provide the data for this book.



III. Conservation of Animals

Biodiversity is the term used to describe different plants, animals, microorganisms, and insects etc., that are found on the earth. Conservation of biodiversity helps us to protect, maintain and recover the endangered animal and plant species. Conservation of biodiversity is the protection, preservation, management of wildlife and natural resources. Endangered species are maintained in certain protected areas such as national parks and wild life sanctuaries. In India, there are about 73 national parks and 416 wild life sanctuaries.

1 National Parks

A national park is an area which is strictly reserved for the betterment of wild life. In these areas, activities like forestry, grazing or cultivation are not permitted. Even private ownership rights are not allowed in these areas. The national parks cover an area of 100 – 500 square kilometers.







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❖ Jim Corbett National Park

Jim Corbett National park is located close to Nainital, in Uttarakhand. Tigers are found in this park. Other animals found here include several species of deer, leopards, jackals, red foxes, black bear, sloth bear, and monkeys.

❖ Gir Forest National Park

It is located in Gujarat. Asiatic lions in their natural habitat can be seen here. Other animals that are found here include sambar, chinkara, chital, porcupine, wild boar and black buck.

❖ Kaziranga National Park

It is located in Assam. Wild animals such as rhinoceros, tiger, elephant, wild buffalo and swamp deer are seen here. This park also has bears, leopards, and several species of local and migratory birds. This park is famous for one horned rhino.



Do you know?

UNESCO (United Nations Educational, Scientific and Cultural Organisation) has declared Kaziranga National Park as a world heritage site.







❖ Sundarban National Park

Located in West Bengal, Sundarban National Park is a tiger and biosphere reserve on the Ganges delta. Bengal tiger, saltwater crocodile, wild boars, foxes, leopard cats, huge turtles, Ganges river dolphins and several other varieties of mammals and reptiles, along with a huge variety of local and migratory birds can be seen here.

❖ Kanha National Park

Kanha National Park, located in Madhya Pradesh was established as a part of Project Tiger. Apart from tiger, animals such as elephants, jackals, leopards, striped hyenas, monkeys, and several varieties of deer including black buck, swamp deer, chital and sambar are seen here.

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❖ Periyar National Park

Periyar National Park is in Thekkady, Kerala. Various species including the majestic elephants, royal tigers, fishes, reptiles and birds can be seen here.

Name of the Park	District
Gulf of Mannar National Park	Ramanathapuram
Indira Gandhi National Park	Coimbatore
Mudumalai National Park	The Nilgiris
Mukurthi National Park	The Nilgiris

❖ Guindy National Park

This park is located at the heart of the Chennai city, the capital of Tamilnadu. It is a home to spotted deer, black bucks, white bucks, river otter, hyena, bonnet monkey, civet cat, jackals, pangolin, hedgehog and common mongoose etc.

2 Wildlife Sanctuaries

A sanctuary is a protected area which is reserved for the conservation of animals. Harvesting of timber, collection of forest products and private ownership rights are allowed here. Tourist visit is also allowed in these places.

❖ Kalakkad Wildlife Sanctuary

Kalakkad wildlife sanctuary is famous for tigers. Lion tailed macaque, Nilgiri langur, bonnet macaque, langur, Nilgiri tahr, sambar, sloth bear, gaur, elephant, flying squirrel, panther, wild dog and pangolin are some of the animals found here.



Activity 6

List out the national parks and wild life santuaries in Tamil Nadu. Visit such places that are close to you and collect more information about the animlas found there.

❖ Mudumalai Wildlife Sanctuary

It is located in Ooty. Bengal tiger, giant elephant and leopard are found here. Elephant safari is famous in this sanctuary.

❖ Mundanthurai Wildlife Sanctuary

It is located in Thirunelveli district. Major wild life animal found here is tiger.







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❖ Anaimalai Wildlife Sanctuary

It is also called as Indira Gandhi Wildlife Sanctuary. It is situated in Coimbatore district. Dhole, wild dog and giant squirrel are seen here.

Name of the Santuary	District
Meghamalai Wildlife Sanctuary	Theni
Vandalur Wildlife Sanctuary	Chengalpattu
Kalakkad Wildlife Sanctuary	Thirunelveli
Grizzled Squirrel Wildlife Sanctuary	Virudhunagar

❖ Vedanthangal Bird Sanctuary

It is a very old sanctuary in Tamil Nadu. It is located in Chengalpattu district. It has many migratory birds like spoon bills, open billed storks, pelicans etc.

3 Advantages of Conservation

- Species can be adapted to their habitat.
- Species can interact with each other.
- Natural habitat of the animals is maintained.
- It is less expensive and easy to manage.



Do you know?

Point Calimere Bird Sanctuary	-	Nagapattinam
Karaivetti Bird Sanctuary	-	Ariyalur
Vaduvur Bird Sanctuary	-	Tiruvarur
Vallanadu Black Buck Sanctuary	-	Tuticorin
Viralimalai Bird Sanctuary	-	Trichy

IV. Prevention of Cruelty to Animals

Cruelty to animals includes capturing, trapping, poisoning of any wild animal collectively. There are many animal welfare organizations concerned with the health, safety and psychological wellness of animals. They include animal rescue groups which help animals in distress, and others which help animals suffering from some epidemic. Animal Welfare Board of India and National Institute of Animal Welfare are the government organizations which work for the welfare of animals. There are some private welfare organizations also.

1 Blue Cross

Blue Cross is a registered animal welfare charity in the United Kingdom. It was established in 1897 with the vision that every pet will enjoy a healthy life in a happy home. This charity provides support for pet owners who cannot afford private veterinary treatment, helps to find homes for unwanted animals, and educates the public in the responsibilities of animal ownership.

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Blue Cross of India was established at Chennai in the year 1959. Now, Blue Cross of India is one of the largest animal welfare organizations in India. Its main office is located at Guindy, Chennai, with all amenities like hospitals, shelters, ambulance services and animal birth controls etc. Activities of the organization include, providing shelters, adoption, maintaining hospitals and mobile dispensary and providing ambulance services.



Activity 7

Make a visit to a veterinary clinic near your area. Find how animals are affected by people. Discuss how you can prevent cruelty to animals.



Do you know?

Blue Cross of India was founded by Captain V. Sundaram of Chennai. He was an Indian pilot and animal welfare activist.



Evaluation

I. Choose the correct answer.

1. Fission is a way of _____ reproduction.
   - A) asexual
   - B) sexual
   - C) oviparous
   - D) viviparous

2. _____ is an oviparous animal.
   - A) Cow
   - B) Deer
   - C) Goat
   - D) Duck

3. Endangered animals are protected in _____.
   - A) museums
   - B) circus
   - C) farm
   - D) sanctuary

4. Mundanthurai sanctuary is located in _____ district.
   - A) Thiruppur
   - B) Tiruvarur
   - C) Thirunelveli
   - D) Thiruvallur

5. The vision of Blue Cross is _____ animals.
   - A) hunting
   - B) capturing
   - C) saving
   - D) neglecting

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II Fill in the blanks.

1. Animals which give birth to young ones directly are named as _____.
2. _____ of animals leads to endangered condition.
3. Gir National Park is famous for _____.
4. Blue Cross is an _____ welfare organization.
5. Nilgiri Tahr is an _____ species.

III. Match the following.

1. Zycote	-	Asexual Reproduction
2. Viviparous	-	Elephant
3. Endangered animal	-	Cat
4. Mudhumalai	-	Fertilized Egg
5. Fragmentation	-	Rhinoceros

IV. Answer in brief.

1. What is fertilization?
2. What are the different stages of sexual reproduction?
3. Mention the different types of asexual reproduction.
4. Differentiate between oviparous and viviparous animals.
5. Write a note on Blue Cross.

V. Answer in detail.

1. Explain the methods of asexual reproduction.
2. What are the causes for the extinction of animals?
3. Write an essay about national parks and wildlife sanctuaries.

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3 AIR



Learning Objectives

POIGC

After the completion of this lesson, students will be able to:

- Know about different layers of atmosphere.
- Understand the causes of air pollution.
- List out the ways of reducing air pollution.
- Know about the airborne diseases.
- Understand the importance of air in daily life.

Introduction

Air is present everywhere around us. Though we cannot see it, we can feel it. Air is a mixture of gases like oxygen, nitrogen, carbon dioxide and hydrogen. These gases act as an envelope around the earth and form the atmosphere. It is the presence of atmosphere that makes the earth a suitable place for living. In the recent years more number of industries have been established and they release excess of harmful gases like carbon dioxide into the atmosphere. Because of this, air is polluted more than ever before. In this lesson, we are going to study about different layers of atmosphere, air pollution, air borne diseases and the measures to control air pollution.

I. Atmosphere

The earth is surrounded by a layer of gases which is called atmosphere. It is composed mainly of nitrogen (78%) and oxygen (21%). Other gases like carbon dioxide and argon comprise 1% of the atmosphere by volume. The atmosphere is like a blanket that surrounds the earth. It protects the Earth from getting too cold or too hot.

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Atmosphere is divided into five different layers. The layers from the bottom upwards are: Troposphere, Stratosphere, Mesosphere, Thermosphere and Exosphere.

❖ Troposphere

The troposphere is the lowest layer of the atmosphere. From the sea level it extends upto about 10 km. It is the densest layer and almost 75% of the air in the atmosphere is found in this layer. This layer also has water vapour. We live in the troposphere and most of the weather like clouds, rain, snow are found in this layer. All weather changes also occur in this layer.

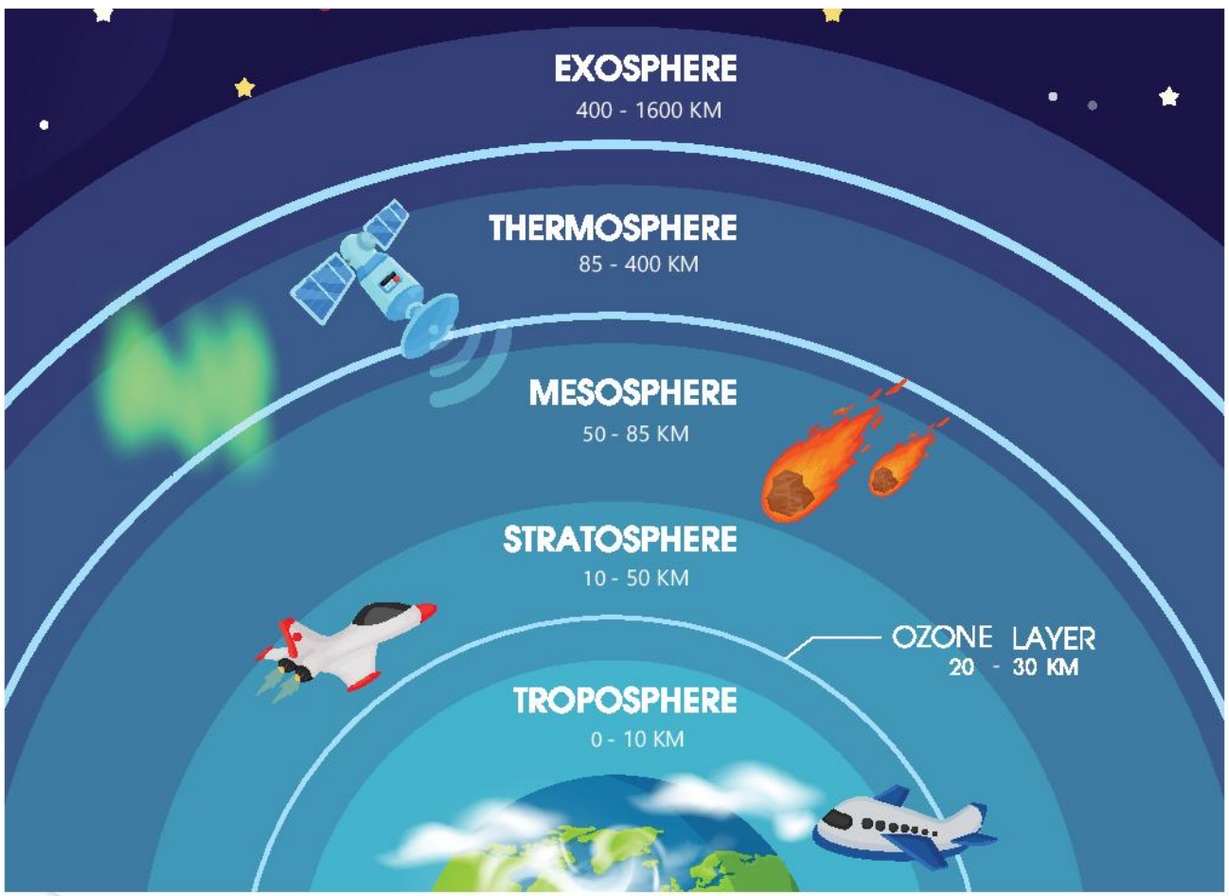


Activity 1

Read the weather news in a daily news paper and note down the changes in the weather over a week. In which layer these changes take place? Discuss in the classroom about these changes and record your points.

❖ Stratosphere

It extends from the top of the troposphere to about 50 km above the ground. Ozone layer found in this layer absorbs harmful ultraviolet rays which can cause damage to our skin and eyes. There is no water vapour in this layer. The temperature in this layer is around –55° C.



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❖ Mesosphere

The region above the stratosphere is called mesosphere. It extends upward to a height of about 85km from the ground. The temperature in this layer decreases with height and it is –100° C. Most of the meteors found in the sky burn in this layer.

❖ Thermosphere

The layer of very rare air above the mesosphere is called thermosphere. It is the fourth layer of the atmosphere.

❖ Exosphere

The outermost layer of the atmosphere is called exosphere. It lies between 400 - 1600 km above the earth. The air here is extremely thin.



Do you know?

As the height increases, amount of air in the atmosphere decreases and so the oxygen level will decrease. That is why mountain climbers carry oxygen cylinders while climbing mountains.



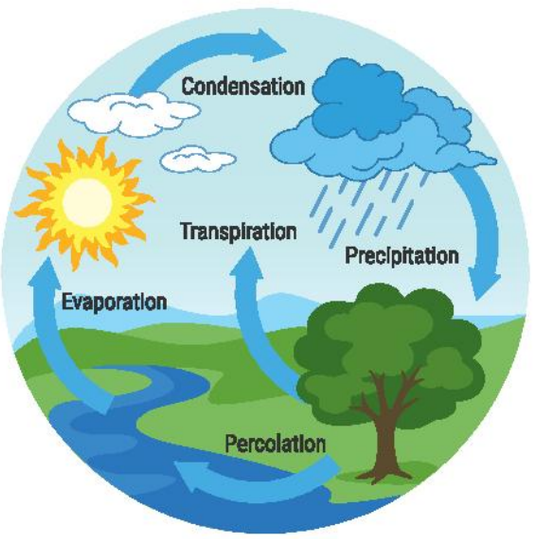


II. Importance of Air

Air is important for all the living organisms. Without air no life can exist on the earth. We take in oxygen from the air and release carbon dioxide. Plants in turn use carbon dioxide present in the air to produce their food. The gases such as oxygen, nitrogen, carbon dioxide and hydrogen present in the air are important to us for many reasons. Let us study about the importance of air in this section.

❖ Water Cycle

Water vapour present in the air is important for the formation of water cycle. Water from the water bodies such as rivers and oceans evaporates and becomes water vapour. This water vapour then forms the clouds. These clouds move to the land and get cooled to give us the rain. This movement of clouds is possible due to air.



❖ Supplies Energy

We breathe oxygen present in the air and it is supplied to the cells in our body. Body cells burn the food molecules with the help of oxygen and produce energy. With this energy we do all kinds of works.

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❖ Sound travels through air

We hear many things from the surrounding and people hear what we speak. This is possible due to air because sound needs a medium to travel. Sound travels from the point of generation to the listener through air.

❖ Useful for plants

Nitrogen present in the air is useful for plants. Nitrogen in the atmosphere is converted into easily absorbable nitrates by plants with the help of some microbes. It is known as nitrogen fixation. These nitrates are useful for the growth of plants. Also, air is helpful for the pollination of plants. Pollen grains travel from one plant to another plant through air. Thus, cross pollination is achieved with the help of air.

❖ Transport

Movement of air is called wind. This is helpful for the ships and boats to sail on the water. Airplanes and helicopters travel through air.

❖ Sports

Para-gliding is the recreational and competitive adventure sport of flying. In this sport, pilot sits in a harness suspended below a fabric wing. Hang gliding is also an air sport or recreational activity in which a pilot flies a light, non-motorized foot-launched air craft called a hang glider. Para-gliding and hang gliding are possible with the help of air. Other sports like wind surfing, kite surfing and sailing are also possible with the help of air.





Do you know?

Bir billing in Jogindernagar valley of Himachal Pradesh is known as para-gliding capital of India. In Tamil Nadu, Yelagiri is a good para-gliding spot.



Activity 2

Find out the places where wind energy is produced. Also discuss about the importance of wind energy in the classroom and make a report on your discussion.

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❖ Parachutes and Hot air balloons

Parachutes and hot air balloons are used to land from above. In case of emergency, we can use parachutes and come down slowly and safely with the help of air.

❖ Wind energy

Air flows from high pressure region to low pressure region. This flow of air at high speed is called wind. This wind is used to generate electric power with the help of wind mills.



III. Air Pollution

The presence of harmful substances in the air which can have an adverse effect on living beings and the environment is called air pollution. When harmful substances including gases like carbon dioxide, carbon monoxide, sulphur dioxide etc., and particles like dust and aerosols are released into the earth's atmosphere, air pollution occurs. These substances are released into the atmosphere at a rate which exceeds the natural capacity of the environment to absorb them. Air pollution may cause diseases, allergies and even death to humans. It may also cause harm to other living organisms such as plants and animals. It may damage the natural environment also.

1 Causes of Air Pollution

Air pollution is caused by both natural and manmade activities. Air pollutants are released into the atmosphere through human activities like burning of fuels, releasing industrial wastes, mining etc. Natural events like volcanic eruption also cause air pollution. Let us see about some of the causes of air pollution in detail.

❖ Industries

Many industries have been established to manufacture things. Large amount of carbon monoxide, hydrocarbons, organic compounds, and chemicals are released into the air by these industries. Because of these pollutants quality of air is affected very much.



Do you know?

The word pollution is derived from the Latin word 'polluere' which means contamination or make dirty.



Activity 3

Organise a debate in your class about the advantages and disadvantages of industries. Discuss in what way industries are responsible for air pollution. Also discuss what measures can be taken to minimise air pollution caused by industries.

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❖ Burning of fuels

Combustion of fossil fuels like coal and petroleum release sulphur dioxide which is an air pollutant. Major air pollutants are released by the vehicles including bus, cars, trains and airplanes. Improper or incomplete combustion of fuel releases carbon monoxide. Nitrogen oxides which are released by both natural and man-made processes, also cause air pollution.

❖ Agricultural activities

Use of insecticides, pesticides, and fertilizers in agricultural activities has increased in the modern days. They emit harmful chemicals such as ammonia into the air causing air pollution.



Do you know?

Taj Mahal in Agra is built entirely by white marbles. But, it has become yellow in colour in the recent years. It is because of air pollution. Industries located in these areas release lot of pollutants into the air. Every day 2000 metric tons of waste is being dumped into the city.



❖ Mining

Extraction of minerals from the earth is called mining. Mining processes release dust and chemicals into the air causing massive air pollution. This affects the health conditions of workers and people living in the surrounding areas.

❖ Household activities

Air is polluted through household activities also. While cleaning and painting, we use a lot of chemicals. These chemicals pollute the environment.



2 Effects of Air Pollution

Air pollution affects all living organisms including man. It causes serious health problems to human beings and affects both plants and animals. It brings about a lot of changes in the climate and environment also. In this section, let us learn about some of the effects of air pollution.

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❖ Diseases

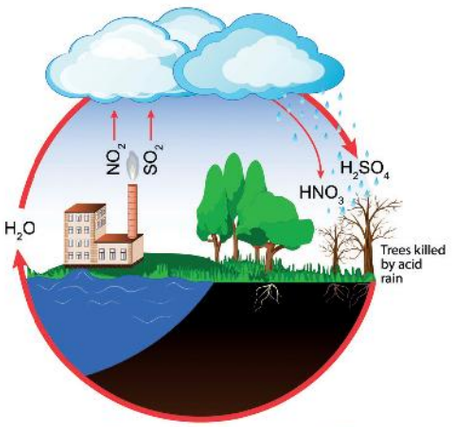
Air pollution causes several respiratory problems. Many people have died due to air pollution. Air pollutants cause pneumonia and asthma in children.

❖ Global warming



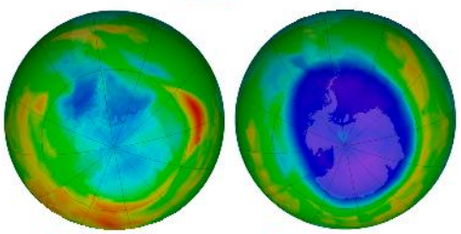
Air pollution results in the accumulation of carbon dioxide in the atmosphere. When gases like carbon dioxide are present in the atmosphere in large amount, they increase the atmospheric temperature. With increased temperature, melting of ice and icebergs in polar regions and increase in sea levels are taking place. It affects the organisms living there.

❖ Acid rain



As we saw earlier, harmful gases like nitrogen oxides and sulphur oxides are released into the atmosphere while burning fossil fuels. When it rains, the water droplets combine with these gases and fall on the ground in the form of acid rain. Acid rain affects human, animals, and crops.

❖ Depletion of ozone layer



Ozone layer in 1979 | Ozone layer in 2011

Ozone molecules are present in the Earth's stratosphere and they protect humans from harmful ultraviolet (UV) rays. Chlorofluorocarbons, released into the atmosphere by human activities deplete the ozone layer. As the ozone layer is depleted, UV rays reach the earth and they cause skin and eye related problems to us.

❖ Marine life

Large amount of nitrogen present in some fertilizers is washed into the water bodies. They cause the growth of green algae in the water bodies. This is called Eutrophication. This adversely affects fish, plants and animal species.

❖ Effect on wildlife

Harmful substances present in the air affect wild animals. Wild animals move to a new place when the air is polluted. When their habitat is changed they face extinction.



Do you know?

Chemicals like chlorofluorocarbon (CFC) which are used in refrigerators, spray cans and fire extinguishers, have reduced the amount of ozone in the stratosphere. It has resulted in depletion of ozone layer in the Antarctic region.

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3 Prevention of Air Pollution

If the air pollution increases at this rate, then there will be no life on the earth in the future. Future generation will be affected very badly. So, we need to take some measures to avoid air pollution. Some of them are discussed below.

- Major pollutants which cause air pollution come from automobiles. Using public modes of transport can reduce the rate of pollution. We should encourage others to use public transport.
- By reducing the usage of fossil fuels we can save the environment.
- Using non-renewable energy resources like solar energy and wind energy instead of conventional energy can reduce air pollution.
- We need to reduce our usage of things. We can reuse or recycle few items.
- Switch off fans and lights when you are not using them.
- CFL bulbs consume less electricity. By using these bulbs we can save energy.
- Planting more trees can reduce the amount of carbon dioxide in the atmosphere.



Activity 4

Find out the common air pollutants present in your area. Discuss about the effects of these pollutants. Record your observations in your note book.



IV. Airborne Diseases

Diseases which are caused by microorganisms and communicated through air are called airborne diseases. When we breathe in air, there are chances for the microorganisms present in the air to get into our body. Bacteria, virus and fungi are the microorganisms which cause airborne diseases. These microorganisms are transmitted through droplets caused by coughing or sneezing, breathing and talking. Let us study about some of the airborne diseases here.

1 Diseases caused by Bacteria

Diphtheria, Whooping Cough and Tuberculosis are some of the common airborne diseases caused by bacteria.

❖ Tuberculosis

Tuberculosis is caused by the bacteria, Mycobacterium tuberculosis. When we breathe, the bacteria present in the air get into the lungs and affect it. Infected person has to be treated with anti-tuberculosis drugs for a period of 6 months to 1 year.

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❖ Whooping Cough

Whooping cough is caused by Bordetella pertussis. It also affects the respiratory tract and causes mild fever, severe cough ending in whoop.

❖ Diphtheria

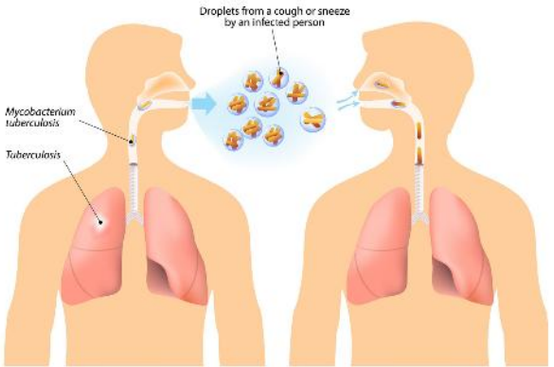
It is caused by the bacteria, Corynebacterium diphtheriae. It generally affects the upper respiratory tract (nose and throat) and causes fever, sore throat and chocking of air passage.



Do you know?

National TB Control Programme was started in 1962.

World Tuberculosis Day is observed on 24th March.



Disease	Causative Organism	Mode of Transmission	Tissue/Organ affected	Symptoms
Tuberculosis	Mycobacterium tuberculosis	Droplet infection from sputum of infected persons	Lungs	Persistent cough, Chest pain, Loss of appetite, Loss of weight
Whooping Cough	Bordetella pertussis	Droplet infection from sputum of infected persons, Direct contact.	Respiratory tract	Mild fever, Severe cough ending in whoop
Diphtheria	Corynebacterium diphtheriae	Droplet infection from sputum of infected persons	Upper Respiratory tract	Fever, Sore throat, Choking of air passage

2 Diseases caused by Virus

Some diseases are caused by the virus present in the air. Common cold, influenza, measles, mumps and chicken pox are some of the diseases caused by virus.

❖ Common cold

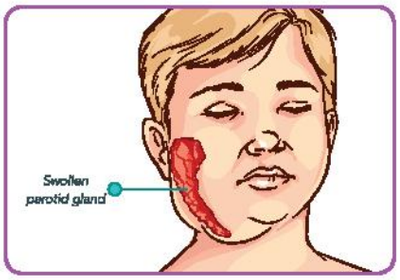
Common cold is an infectious disease which affects the upper respiratory system like nose and throat and it is easily spread. Symptoms of common cold include cough, painful throat, running nose and sometimes fever. Though many viruses can cause this, it is generally caused by Rhinovirus.

❖ Influenza

Influenza is commonly found during childhood. It is caused by the virus, Myxovirus and results in inflammation of nasal mucosa and pharynx. It is also known as flu.

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❖ Mumps



It is caused by Myxovirus parotitis and it affects the upper respiratory tract. Some of the common symptoms of mumps include fever, headaches, sore throat and swelling of parotid glands which makes the jaw movement difficult.

❖ Chicken pox

It is common among children but adults also may get it. Affected people will have blisters or spots in the body and face along with fever. Those blisters with fluid will drain but sometimes they may leave scars.

❖ Measles



Measles is caused by Rubeola virus and it is easily caught by people from other infected people. Symptoms of measles include eruption of small rashes in skin, cough, sneezing, redness of eye, pneumonia and bronchitis. There is no cure for this disease. Yet people can recover from this by proper rest and diet.

Disease	Causative Organism	Mode of Transmission	Tissue/ Organ affected	Symptoms
Common Cold	Rhino virus	Droplet infection	Upper respiratory tract (Inflammation of nasal chamber)	Fever, Cough, Running nose, Sneezing and Headache
Influenza	Myxovirus	Droplet infection	Respiratory tract (Inflammation of nasal mucosa, pharynx)	Fever, Body pain, Cough, Sore throat, Nasal discharge, Respiratory congestion
Mumps	Myxovirus parotitis	Droplet infection, Contact with infected person	Upper respiratory tract	Enlargement of parotid gland, movement of jaw becomes difficult
Chicken Pox	Varicella Zoster virus	Droplet infection, Direct contact with infected person	Respiratory tract	Eruptions of the skin, Fever and Uneasiness
Measles	Rubeola virus	Droplet infection, Direct contact with infected person	Respiratory tract	Eruption of small red spots or rashes in skin, Cough, Sneezing, Redness of eye, Pneumonia, Bronchitis

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3 Prevention

Prevention is better than cure. Airborne diseases can be prevented if we take certain measures.

- Avoid close contact with people who have active symptoms of disease.
- Maintain personal hygiene.
- Keep the patient in complete isolation.
- Cover nose and mouth while sneezing or coughing.
- Avoid touching the face with unwashed hands.
- Wash your hands thoroughly.
- Timely vaccination can prevent the diseases.



Activity 5

Divide the students in the class into different groups and discuss how airborne diseases can be prevented.



Evaluation

KOQAO

I. Choose the correct answer.

1. Chlorofluoro carbon is used in

   a) refrigerator b) air conditioners c) both d) none

2. Which of the following gas is released by automobiles?

   a) Carbon monoxide b) Oxygen c) Hydrogen d) Nitrogen

3. A wind mill is used to produce

   a) chemical energy b) mechanical energy c) electrical energy d) all of these

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4. Influenza is caused by

a) fungus b) bacteria c) virus d) protozoa

5. Height of mesosphere which lies after troposphere is

a) 70 to 75 km b) 75 to 80 km c) 50 to 85 km d) 85 to 90 km

II. Fill in the blanks.

1. Second layer of Earth's atmosphere is _____.
2. Releasing substances like chemical compounds into the atmosphere is known as _____.
3. Airborne diseases can be caused by _____.
4. The _____ layer protects us from the harmful UV rays coming from the sun.
5. _____ is used by plants as nitrates.

III. Match the following.

1. Troposphere	-	Satellite
2. Stratosphere	-	Space craft
3. Exosphere	-	Ozone layer
4. Thermosphere	-	Meteors
5. Mesosphere	-	Weather change

IV. Answer in brief.

1. What are the different layers of atmosphere?
2. What is air pollution?
3. Name some of the air borne diseases.
4. What is global warming?
5. Mention any two ways of controlling air pollution.

V. Answer in detail.

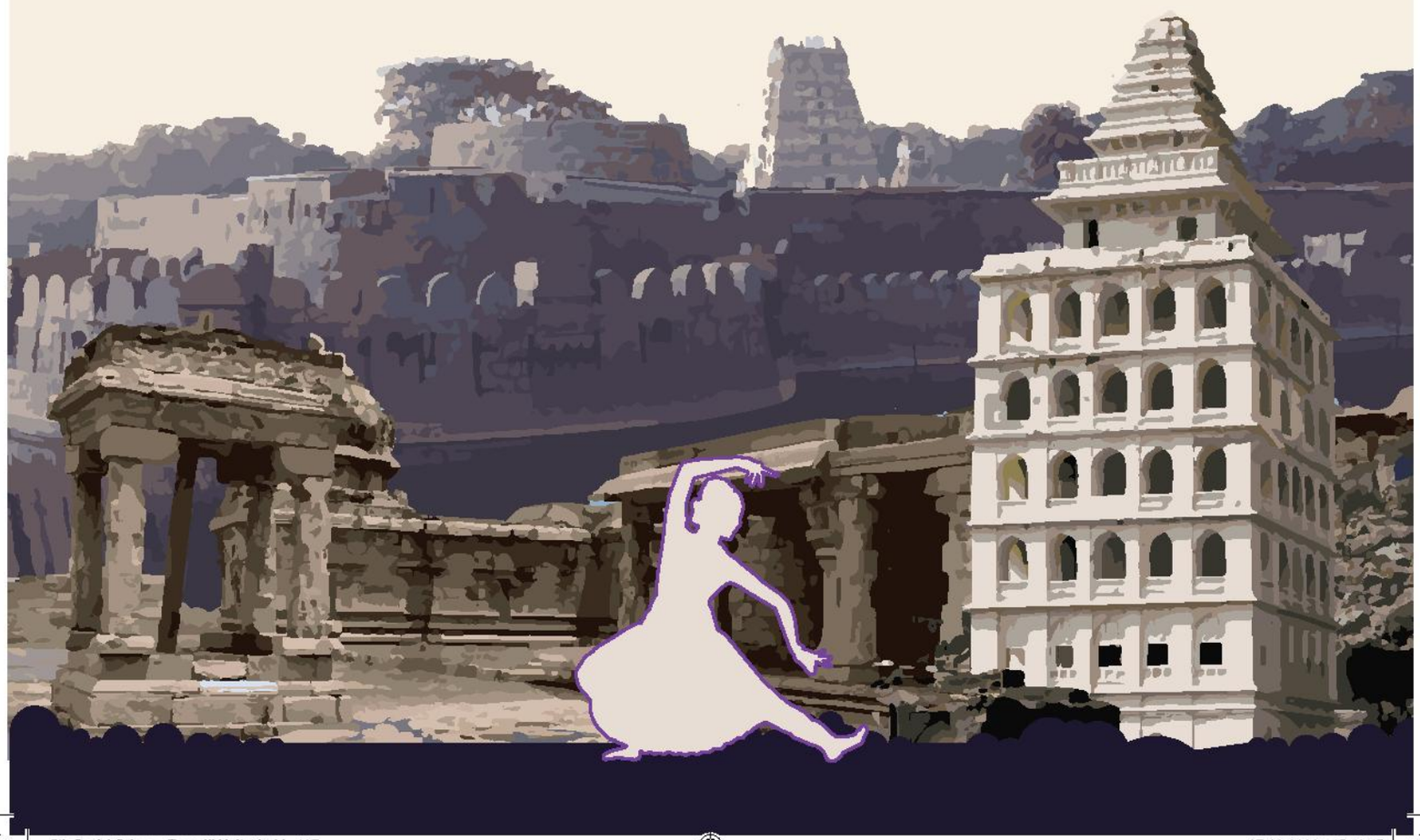
1. List the importance of air.
2. Explain any three airborne diseases.

VI. Higher Order Thinking Questions.

1. If there is no atmosphere, what will be the condition of earth ?
2. Give some suggestions to prevent air pollution.

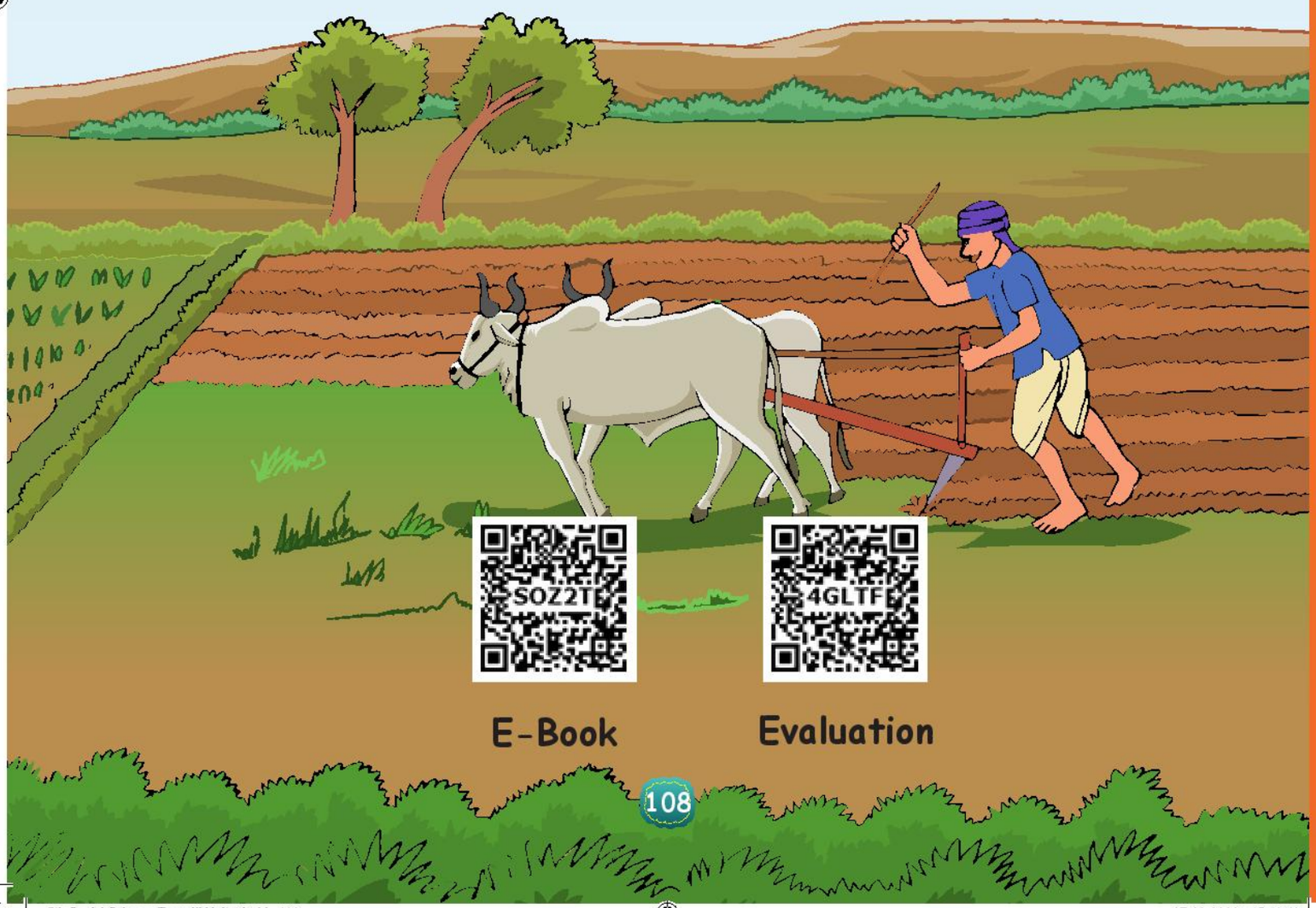
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SOCIAL SCIENCE



CONTENTS

UNIT	TOPIC	PAGE No.	MONTHS
1	Forts and Palaces	109	January, February
2	Agriculture	123	February, March
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E-Book

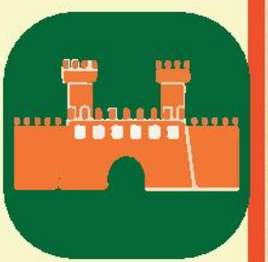
Evaluation

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UNIT 1

Forts and Palaces

Learning Objectives



Students will be able to:

- know the forts in Tamil Nadu.
- describe the palaces in Tamil Nadu.
- explain the history of forts and palaces in Tamil Nadu.

Y689B

Introduction

Tamil Nadu has been ruled by several empires especially by the **Chera, Chola, Pandya** and **Pallava rulers**.

Cholas, Pandyas and Nayakkars constructed magnificent forts and palaces in Tamil Nadu. The Dutch, the British and the French entered our country and they built forts to protect their territorries.

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Fort



The architectural monuments are now preserved in the form of **palaces, forts** and **other historical sites** in Tamil Nadu. Today, only a few palaces and forts are in good condition. They are the prime attractions for tourists in Tamil Nadu.

Vellore Fort

Vellore Fort is a 16th-century fort situated in Vellore, Tamil Nadu. It was built by the **Kings of Vijayanagara**.

Among the forts in Tamil Nadu, Vellore fort is considered to be one of the most invincible fort. It is surrounded by a deep and wide moat. The water of this moat was home to thousands of crocodile. It was feared by many raiders of the fort.

This fort is a good example of military architecture. It is studded with double fortifications. In 1799, Tipu Sultan's family was detained here by the British. The first rebellion against the British broke out at Vellore Fort in 1806.

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Vellore fort



J81YL

Inside the Vellore fort, there is a well-known temple called **Jalakanteswarar temple, a church, a mosque, a museum** and **several government offices**.

LET US KNOW

Vellore Fort has **five important Mahals**. They are:

- Hyder Mahal
- Tippu Mahal
- Begam Mahal
- Candy Mahal
- Badhusha Mahal



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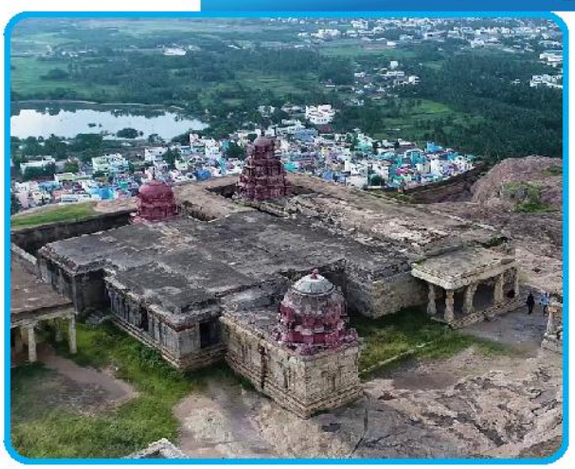
Dindigul Fort

Dindigul Fort is a 17th-century hill fort situated in **Dindigul**, Tamil Nadu. It is also called **Dindigul Malai Kottai**. In the 18th century, the fort was passed on to the Kingdom of Mysore.

Dindigul Fort was built by the Nayakkars of Madurai, in order to defend their region from the invading Mysore army. Presently, the fort is maintained by the Archaeological Survey of India.

The fort was cemented with double walls to withstand heavy **artillery**.

Dindigul Fort







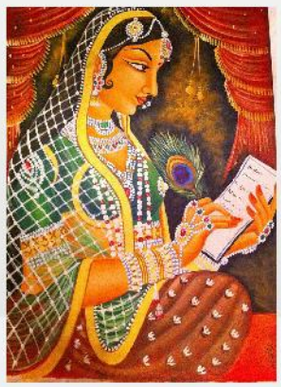
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ACTIVITY

Let us do

Name the following pictures.





_____ _____ _____ _____

(King, Queen, Prince, Princess)

Fort St. George is the first fort built by the British in India. Fort St. George is located in **Chennai**. State Secretariat is functioning inside the fort.

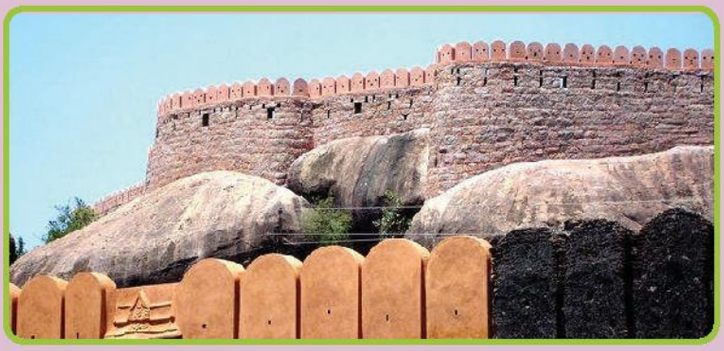




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LET US KNOW

- **Thirumayam Fort** is famous for its artistic work and architectural brilliance. It is located in Pudukottai, Tamil Nadu.
- **Thirumayam Fort** is popular for its large rock inscriptions.
- It is also known as **Oomayan Kottai**.



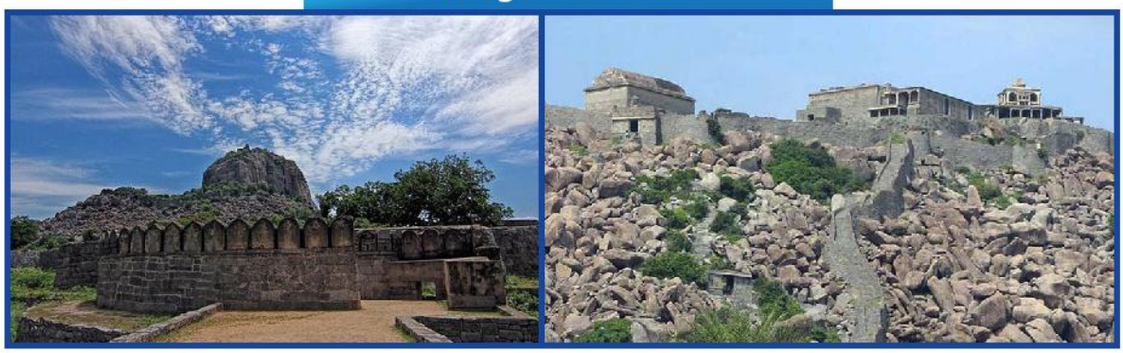


The magnificent **Sadras Fort** was built for commercial purposes by the **Dutch**. It is located in **Chengalpattu**.



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Gingee Fort

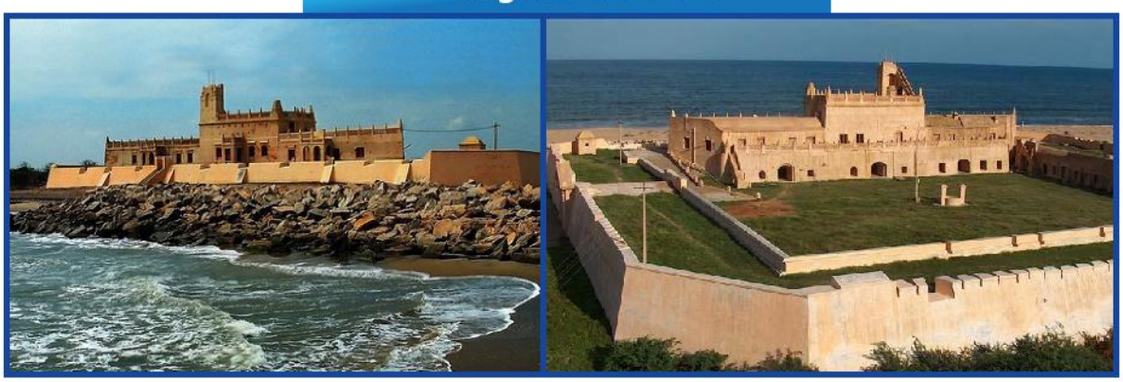


Gingee Fort

Gingee Fort is another beautiful fort in Tamil Nadu. It is located at **Villupuram** district. Gingee fort is built across three hills. The fort walls are 13 km long and the three hills are connected by walls. It is built at a height of 800 feet and protected by a 80 feet wide moat.

It is a huge fort with many attractions like Kalyan Mahal, temples, Aanaikulam pond, granaries and a watch tower.

Tharangambadi Fort



Tharangambadi Fort

Tharangambadi fort is locally called Danish fort. It is located on the shores of Bay of Bengal in **Tharangambadi** (**Tranquebar**), Tamil Nadu.

The fort is **trapezoidal** in shape with three rooms in the left wing. The central part of the fort has four domes. The central pillar of the hall holds the entire weight of the domes.

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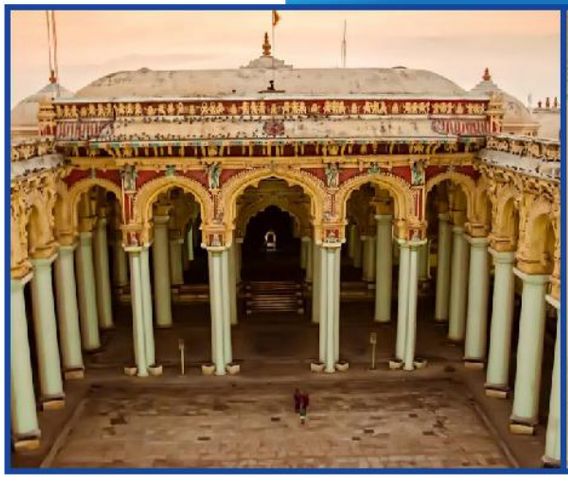
Tamil Nadu has great palaces in many places. Some are described here.

Thirumalai Nayakkar Palace

The majestic **Thirumalai Nayakkar Palace** is a 17th century architecture of Nayakkar dynasty. It is one of the most popular palaces in South India. Thirumalai Nayakkar Palace is located in the city of **Madurai**. This is one of the tourist spots of Tamil Nadu.

Thirumalai Nayakkar Palace is widely known for its giant pillars. It has an **archaeological museum**. The major attraction of this palace is the **courtyard** and **the dancing hall.**

Thirumalai Nayakkar Palace





LET US KNOW

Tamukkam Palace was the summer residence of the **Queen Rani Mangammal** of Nayak dynasty. It is located in **Madurai.**



5th Social Science Term III Unit 1.indd 116 27-09-2023 15:40:55

ACTIVITY
Let us do

Connect the following objects with their names.







Bow and Arrow | Sword | Throne | Shield | Crown

Fernhills Palace in **Ooty** served as the summer palace for the Kings of Mysore.




5th Social Science Term III Unit 1.indd 117 27-09-2023 15:40:58

Thanjavur Maratha Palace

Thanjavur Maratha Palace is popularly called **Thanjavur Aranmanai**.

Thanjavur Maratha palace was originally constructed by the rulers of **Thanjavur Nayakkar kingdom**. After the fall of the Thanjavur Nayakkar kingdom, it served as the official residence for **Thanjavur Maratha**.

Thanjavur Palace Complex is a tourist attraction which houses three separate venues: the **palace**, the **art gallery** and a **manuscript library (Saraswathi Mahal)**.

Thanjavur Maratha Palace



LET US KNOW

Saraswathi Mahal is considered as one of the oldest historical libraries in India. Saraswathi Mahal also has a museum.



The library has more than a million manuscripts in languages like **Tamil**, **Sanskrit**, **Marathi**, **Telugu** and **Manipravalam**.

5th Social Science Term III Unit 1.indd 118 27-09-2023 15:40:59

Padmanabhapuram Palace

Padmanabhapuram Palace is a beautiful historical monument that is situated at **Padmanabhapuram, Kanyakumari District**.It is also known as Kalkulam Palace.

Padmanabhapuram Palace is a wooden palace which is built in Kerala style of architecture. It is a fine example of art and craftsmanship.

The Padmanabhapuram Palace was built by the ruler of Travancore. The palace has various sections like **Queen Mother Palace, Council Chamber, Southern Palace** and so on.

Padmanabhapuram Palace





Recap

- Palaces and forts are the prime attractions of Tamil Nadu tourism.
- Vellore fort is a fine example of military architecture.
- The major attraction of Thirumalai Nayakkar Palace is the courtyard and the dancing hall.

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Glossary



Manuscript : a document written by hand

Moat : A deep, wide ditch surrounding a fort

Raiders : Invaders



EVALUATION



I. Choose the correct answer.

1. _____ fort was built by Kings of Vijayanagar.

   a) Udayagiri b) Vellore c) Gingee

2. Thirumalai Nayakkar Palace is situated in _____ .

   a) Salem b) Thirumalai c) Madurai

3. _____ Mahal is considered as one of the oldest histroical libraries in India.

   a) Saraswathi b) Lakshmi c) Durga

4. Padmanabhapuram Palace is in _____.

   a) Ooty b) Kanyakumari c) Chennai

5. _____fort is locally called Danish fort.

   a) Dindigul b) Gingee c) Tharangambadi

5th Social Science Term III Unit 1.indd 120 27-09-2023 15:41:01

II. Match the following.

1	Gingee fort	Pudukottai
2	Danish fort	Chennai
3	Tammukkam Palace	Villupuram
4	Thirumayam fort	Madurai
5	Fort St. George	Tharangambadi

III. True or False.

1. Tamil Nadu has been ruled by many rulers. Especially by the Chera, Chola, Pandya and Pallava rulers. ( )
2. Vellore Fort has five mahals. ( )
3. Dindigul Fort was built by the Nayaks of Madurai. ( )
4. Oomayan Kottai is the other name for Gingee fort. ( )
5. The Padmanabhapuram Palace was built by the ruler of Travancore. ( )

IV. Answer the following.

1. What are the prime attractions of Tamil Nadu tourism?
2. Write a short note on Tharangambadi fort.
3. Name some of the tourist attractions of Gingee fort.

5th Social Science Term III Unit 1.indd 121 27-09-2023 15:41:01

4. Give a short note on Thirumalai Nayakkar Palace.

5. Who built the Thanjavur Maratha Palace?
   Write some of its tourist attractions.

V. Answer in detail.

1. Describe the structure of the Vellore fort.

2. Write about Dindigul fort.

3. Describe the architecture and various sections of Padmanabhapuram Palace.



PROJECT

Create a model of any fort or palace.

5th Social Science Term III Unit 1.indd 122 27-09-2023 15:41:02

UNIT 2

Agriculture

Learning Objectives



Students will be able to:

- describe the features of agriculture.
- list and explain differnt types of farming and irrigation.
- name the various crops grown in Tamil Nadu.

BM0J2

Introduction

Agriculture is the art and science of preparing the soil for cultivation, growing crops and raising livestock. It has become a necessity for the humans. Agriculture led to the development of human civilisation.



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India is an agricultural country. One-third of our nation's income comes from agriculture. Agricultural development contributes to the economy of our country.

Farmers in India

A farmer is a person who cultivates crops and rears animals (poultry and other livestock). India is a land of farmers. It is called so because majority of Indians are directly or indirectly involved in agricultural activities. Agriculture is the backbone of our economy.





Farmers who cultivate in an area less than 1 hectare are called **micro farmers**.

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Types Of Farming

ZGY1W

There are several types of farming.

- Subsistence farming
- Commercial farming
- Plantation farming
- Mixed farming

Agricultural field



Subsistence Farming

In subsistence farming, crops are cultivated and used only for own family consumption. Such type of farming is adopted by small and marginal farmers on fragmented land holdings. The cultivated crops are usually food crops. The method of this farming is generally **archaic**.



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Commercial farming



Unlike subsistence farming, here the crops are cultivated for commercial use and is sold in markets. This method of farming is done by using modern tools and techniques.

Plantation Farming



Plantation Farming is done in an estate where a single cash crop is cultivated on a large scale. Examples: **Tea, Coffee and Rubber.**

Mixed Farming

Mixed farming refers to the rearing of animals along with the cultivation. This type of farming is economical.







The Government has set up agencies like the **Food Corporation of India** to purchase the farm products directly from the farmers at reasonable rates.

5th Social Science Term III Unit 2_new.indd 126 13-10-2022 17:28:52

ACTIVITY
Let us do

Help the farmer to reach his filed.









In order to eliminate the middlemen between farmers and consumers, the Government of Tamil Nadu introduced the new scheme, namely **UZHAVAR SANTHAI**.

5th Social Science Term III Unit 2_new.indd 127 13-10-2022 17:28:55

Water Resource for Agriculture

There are no perennial rivers in Tamil Nadu. Tamil Nadu depends on Northeast and Southwest monsoon. Hence, agriculture in Tamil Nadu is dependent on ground water.

Central Ground Water Board (CGWB) monitors the level and nature of ground water.

Irrigation

Irrigation is the artificial supply of water to land or crops for the purpose of agricultural production.

Types of Irrigation

- Well Irrigation
- Canal Irrigation
- Sprinkler Irrigation
- Drip Irrigation

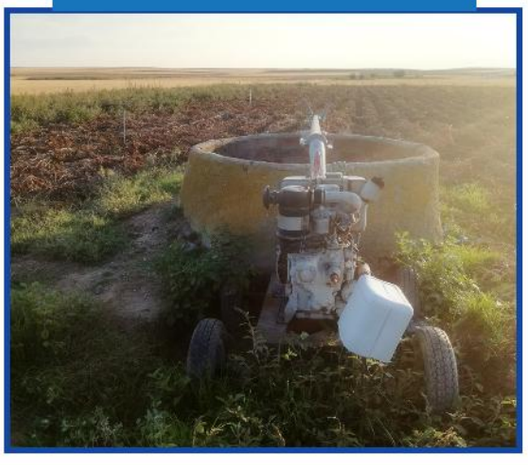
Well Irrigation

Well irrigation has been practised in Tamil Nadu for many generations. It is a less expensive type of irrigation.

Archaic Well irrigation



Modern Well irrigation



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Canal Irrigation

Canal irrigation is the most important form of irrigation in India. Most of the North Indian canals are perennial. The main canal irrigated areas are in the northern plains of India such as **Uttar Pradesh, Punjab, Haryana, Rajasthan** and **Bihar**.

Canal Irrigation





Green revolution is a process which brought an increase in crop production by using new varieties of seeds, pesticides and new agricultural techniques.



Dr.M.S. Swaminathan of Tamil Nadu is known as **Father of Green Revolution** in India.

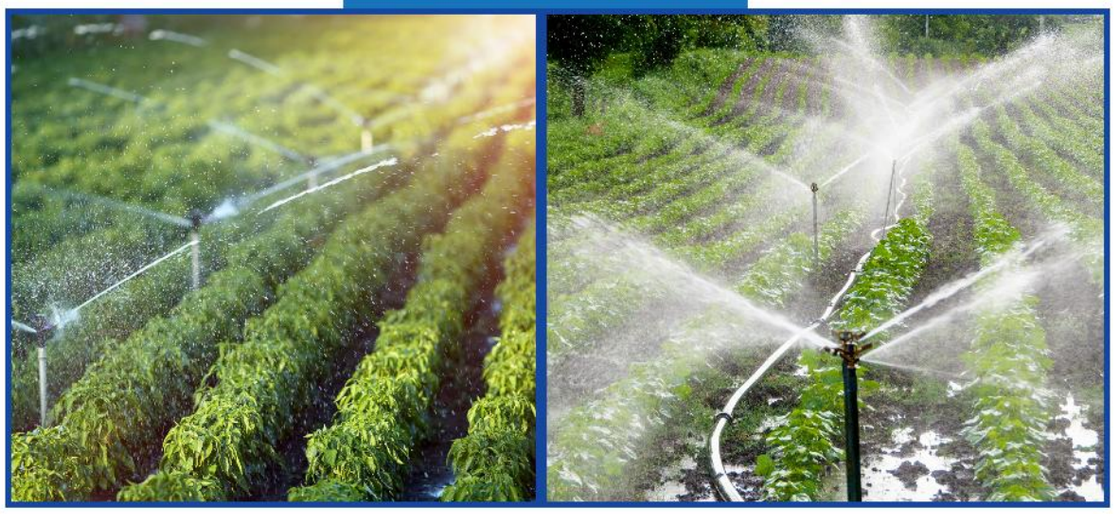


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Sprinkler Irrigation

Sprinkler irrigation is similar to natural rainfall. Water is sprayed through pipes in the air through sprinklers.

Sprinkler Irrigation



Drip Irrigation

Drip irrigation is a type of micro-irrigation system that saves water and soil nutrients. In this system water drips slowly into the roots of plants through pipes. Pipes can be either above the soil surface or buried below the surface. The water directly reaches the roots and minimises evaporation.

Drip Irrigation



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ACTIVITY

Let us write

(Tractor, Winnower, Farmer)

Find out the following.

1. One who produces food for us. _____

2. It is used for ploughing. _____

3. It is used for separating grain from hay. _____

LET US KNOW

Animal husbandry is the branch of agriculture. It is to raise animals for meat, fur, milk, eggs and other products.



Horticulture is the science or art of cultivating fruits, vegetables, flowers and ornamental plants.

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Important crops in Tamil Nadu

Tamil Nadu has different types of soil, rainfall and weather across its districts. It is suitable for the production of fruits, vegetables, spices, plantation crops, flowers, medicinal and aromatic plants. **Horticulture** is the fastest growing sector within agriculture in Tamil Nadu.

Paddy is grown in large areas because rice is the main staple food of the state.

The principal food crops are **rice**, **maize**, **jowar** (cholam), **bajra** (Kambu), **ragi**, and **pulses** (bengalgram, redgram, greengram blackgram and horsegram).

Paddy



Maize



Black gram



Sugarcane



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The **cash crops** include cotton, sugarcane, oilseeds, coffee, tea, rubber, coconut, gingelly and chillies.

Mango and **Banana** are the leading fruit crops of Tamil Nadu.

The main flowers grown in Tamil Nadu are **Jasmine**, **Chrysanthemum**, **Marigold** and **Rose**.



Thanjavur is an important agricultural centre located in the Cauvery Delta. It is known as the **Rice bowl of Tamil Nadu**.





Cropping seasons in Tamil Nadu

- Navarai
- Sornavari
- Kar
- Kuruvai
- Samba
- Thaladi



Coimbatore is the largest cotton producing district in Tamil Nadu. It is known as the **Manchester of South India**.

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Glossary



1. Archaic : Ancient
2. Minimize : Reduce
3. Perennial : Everlasting



Recap

- India is an agricultural country.
- Indian farmers are the backbone of the Indian economy.
- There are several methods of farming systems in India.
- There are four basic types of irrigation.
- The principal food crops are rice, maize, jowar, bajra, ragi and pulses.



EVALUATION



I. Choose the correct answer.

1. _____ is the cultivation of crops.

   a) Irrigation b) Agriculture c) Excavation

2. A _____ is a person who is engaged in agriculture.

   a) doctor b) teacher c) farmer

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3. _____ farming refers to the raising of animals along with the crops.

a) Commercial b) Mixed c) Subsistence

4. _____ monitors the level and nature of ground water.

a) Central Ground Water Board

b) Metro Water Board

c) Sewage Water Board



5. _____ is the largest cotton producing district in Tamil Nadu.

a) Coimbatore b) Chennai c) Cuddalore

II. Match the following.

1	Plantation farming	rearing of animals
2	Mixed farming	oldest method
3	Commercial farming	single cash crop
4	Well irrigation	for family consumption
5	Subsistence farming	for trade

III. True or False.

1. Rice is the leading food crop in Tamil Nadu. ( )
2. Tamil Nadu has two soil types. ( )
3. Drip irrigation is a type of micro-irrigation system. ( )
4. Jackfruit is an example of plantation crop. ( )
5. Mango is the leading fruit crop of Tamil Nadu. ( )

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IV. Answer the following.

1. What is agriculture?
2. Write about farmers.
3. Name the different types of farming.
4. What is well irrigation?
5. Give a short note on the Central Ground Water Board.

V. Answer in detail.

1. Write about mixed and plantation farming.
2. Explain any two types of irrigation.
3. Write about the important crops of Tamil Nadu.











FUN WITH ACTIVITY

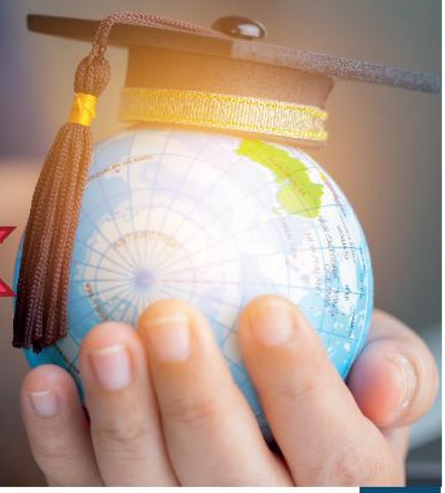
PROJECT

- Collect some varieties of grains like rice, maize, jowar, bajra, ragi and pulses.
- Put them in separate packets.
- Staple / Stick all the packets on a chart and name them.

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UNIT 3

Educational Rights



Learning Objectives

Students will be able to:

- describe the importance of Education.
- explain the various educational schemes.
- list the features of Right To Education .

Introduction

Education is important for people as well as the nation. Education is the first step for a child's development. Education improves knowledge, skills, values and the quality of one's life. It also helps in overall development of a country.



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Importance of Education

Education doesn't mean that one should be literate. It is more than literacy. Education helps to

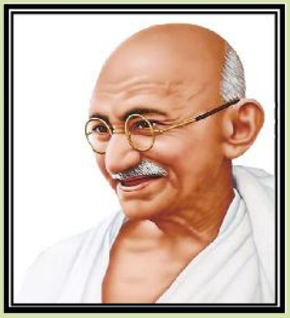
- analyse the reason.
- build skills to live.
- know what is right and wrong.
- lead a moral life.



"Literacy in itself is no education. Literacy is not the end of education."

"Real education consists in drawing the best out of yourself."

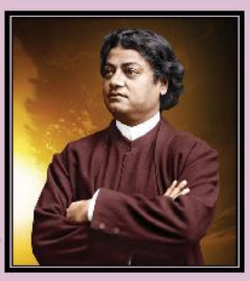
-Mahatma Gandhi



Education helps in broadening one's mind. It removes superstitious beliefs. Education helps in increasing awareness of surroundings, social and political issues. It develops wisdom.



Swami Vivekananda is best known for his speech which began with the words *"Sisters and brothers of America."*



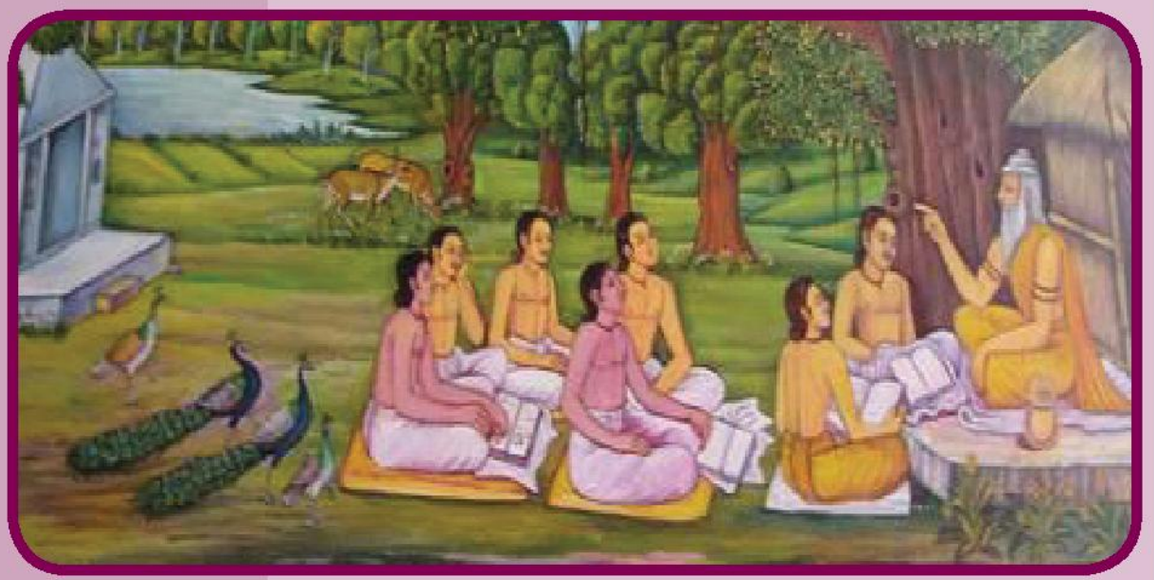
"Education is the manifestation of the perfection already in man."

-Swami Vivekananda

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LET US KNOW

Gurukulam is the system of education that was practised in ancient India. **Guru (teacher)** and the **Shishya (student)** lived in Ashram.



Educational Rights

DR15T

Every child has right to have free and compulsory education. **The Right to Education Act (RTE)** specifies different responsibilities to the local authorities and government to ensure free and compulsory education.

Right to Education Act (2009) describes the importance of free and compulsory education for children between 6 to 14 years of age.

Education should be affordable to the common people. There should be no discrimination in education. It should be based on need of the child and mould the child's thoughts. The child should be at the centre of an education system.

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ACTIVITY

Let us do

Solve the Puzzles.

1. I am white when I am dirty and black when I am clean.

   Who am I?

2. I am tall when I am young and I am short when I am old.

   Who am I?

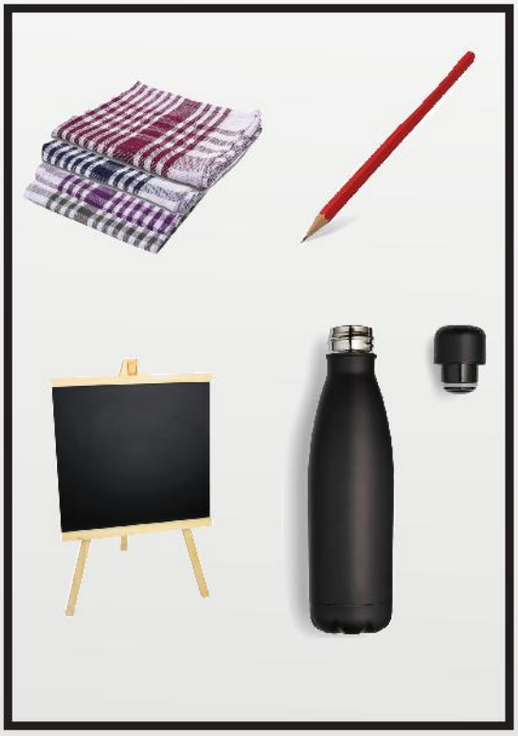
3. I am wet when I am drying.

   Who am I?

4. I have a neck but no head.

   Who am I?

Hints



The legislative section is divided into three lists: **Union List**, **State List** and **Concurrent List**. **Education** comes under **Concurrent list**.

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Important features of RTE

- Until the completion of elementary education, no student is stopped from school.
- Twenty-five percent reservation is given to the economically Underprivileged people in all private schools.
- Improvement in the quality of education.
- School infrastructure should be improved every three years.
- Finances will be shared between the state and the central government.



The first **National Policy on Education** was implemented in 1968 followed by the second one in 1986.



Child labour is not allowed in our country. All children are entitled to have free and compulsory education.



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Educational Schemes

The most important milestone in education is the **free mid-day meal** programme which was implemented by the former Chief Minister of Tamil Nadu, **K.Kamaraj.**

Indian educational system is mainly divided into four stages. They are:

- Primary
- Upper primary
- Secondary
- Higher secondary

The **Sarva Shiksha Abhiyan (SSA)**, **the Right to Education Act (RTE)** have improved the educational performance.

Sarva Shiksha Abhiyan (SSA) (Education for All) was launched in the year 2001.

Objectives of Sarva Shiksha Abhiyan

- Increasing the enrolment in primary schools
- Getting access to the free and compulsory education for children up to age 14.
- Improving the quality of education.



Samagra Shiksha subsumes the three erstwhile Schemes of **Sarva Shiksha Abhiyan (SSA), Rashtriya Madhyamik Shiksha Abhiyan (RMSA) and Teacher Education (TE).**

5th Social Science Term III Unit 3.indd 142 13-10-2022 18:33:25

Rashtriya Madhyamik Shiksya Abhiyan (RMSA) was launched in 2009.

The aim of this programme

- Raising the minimum level of education to class X.

Later in 2018, the government of India wanted to provide a single scheme for school education starting from pre-school to Class XII. This scheme is known as **Samagra Shiksha (SS)**.

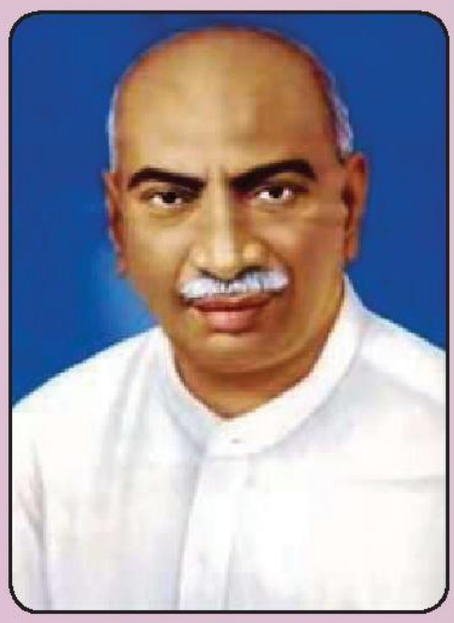
Objectives of Samagra Shiksha

- Providing quality education and improving learning outcomes of students.
- Supporting all state governments in implementing RTE.
- Focusing on girl education.
- Focusing on digital education.

In the past two decades, India has achieved a maximum enrollment of students in schools.



In Tamil Nadu Perunthalaivar **K. Kamaraj's** birth anniversary (15th of July) is celebrated as **Educational Development Day** in recognition of his contribution to the development of education.



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Glossary



1. Ensure : assure
2. Erstwhile : Former
3. Superstitions : Irrational belief



Recap

- Education is very important for every individual.
- Every child has the right to have free and compulsory education.
- Education should be affordable to common people.
- The Right to Education Act (2009) describes the importance of free and compulsory education for children between the 6 to 14 years of age.
- Samagra Shiksha Scheme improves the quality of education and the learning of students.

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EVALUATION



I. Choose the correct answer.

1) Education comes under _____.

a) Union list b) State list

c) Concurrent list

2) Educational development day in Tamil Nadu is celebrated on _____ .

a) 15th July b) 15th August

c) 15th September

3) "Education is the manifestation ofthe perfection already in man" is the famous quote of _____.

a) Mahatma Gandhi b) Dr. Radhakrishnan

c) Swami Vivekananda

4) _____ describes the importance of free and compulsory education for children.

a) The Right to Literacy Act

b) The Right to Education Act

c) The Right to School Act

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II. Match the following.

1	Gurukulam	2009
2	K. Kamaraj	2018
3	Right to Education Act	develops wisdom
4	Education	ancient Indian educational system
5	Samagra Shiksha	free mid-day meal

III. True or False.

1. Every child has the right to have free and compulsory education. ( )
2. Education helps in increasing awareness of surroundings, social and political issues. ( )
3. Right to School Act describes the importance of free and compulsory education for children. ( )
4. Numeracy is the first step towards making one educated. ( )
5. The former Chief Minister of Tamil Nadu, K.Kamaraj was implemented Free mid-day meal programme. ( )

IV. Answer the following.

1. Write about the importance of education.
2. Write a short note on Educational Rights.
3. What is the role of Sarva Shiksha Abhiyan?
4. Write any two features of Samagra Shiksha.

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V. Answer in detail.

1. Write about the Indian education system.
2. Write about the Right to Education Act in detail.
3. Write about Samagra Shiksha in detail.






FUN WITH ACTIVITY

PROJECT

Go to Library and write your observations.

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