

**CRITICAL AND CREATIVE THINKING ITEMS**

**CLASS VIII : CHAPTER 1: RATIONAL NUMBERS**

**INDEX**

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## MATHEMATICAL UNIT 1: SWEET SHOP

Three friends Ram, Rahim and David went to “RADHEY SWEET MART” to purchase some sweets, namkin and cold drinks for New year party. The following chart shows the price and available stock of sweets and namkin in the shop.

S.NO.	SWEETS AND NAMKIN	AVAILABLE STOCK	PRICE
1	SWEET LADDU	10 Kg	₹ 400 per Kg
2	JALEBI	8 Kg	₹ 360per Kg
3	BARFI	7 Kg	₹ 300 per Kg
4	MIX-NAMKIN	100 packets	₹ 80 per packet
5	POTATO CHIPS	80 packets	₹ 30 per packet
6	COLD DRINKS	50 Bottles	₹ 50per bottle
7	ROASTED DRY FRUITS	12 Kg	₹ 1000 per Kg

**Question 1.1:** After purchasing 500gm of sweet laddu, jalebi and barfi each, Ram had ₹150 left with him. How much money does Ram had before the purchase? Show your work.

**Question 1.2:** Ram wants to purchase one packet of Mix-Namkin and two packets of potato chips with the remaining ₹150. Explain whether he can purchase it or not.

**Question 1.3:** Rahim had ₹200 and wants to purchase one packet of Mix-Namkin, one packet of potato chips, 250gm Sweet laddu and one bottle of cold drink. But due to insufficient money he had to reduce the quantity of one of the item. Find out the name of that item along with reason.

**Question 1.4:** David had ₹250 and wants to purchasethose items which were not purchased by his friends. Choose the correct list of items he will purchase.

- (i) Jalebi
- (ii) Roasted Dry fruits
- (iii) Barfi
- (iv) Potato chips

<b>DOMAIN:</b> Mathematical Literacy	<b>TOPIC:</b> RATIONAL NUMBERS	<b>CLASS:</b> VIIIITH <b>EXPECTED TIME:</b> 15 min <b>TOTAL CREDIT:</b> 8 points
<b>DESCRIPTION OF ITEM:</b> The item has a table along with some text describing about the contents of table.	<b>LEARNING OUTCOME:</b> To apply the concept of rational numbers for solving problems	

### **MATHEMATICAL LITERACY: QUESTION 1.1**

<b>FRAMEWORK</b>	<b>CHARACTERISTICS</b>
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<b>COMPETENCY CLUSTER</b>	<b>Connection and integration for problem solving</b>
<b>OVERARCHING IDEA</b>	Quantity
<b>CONTEXT</b>	<b>Personal</b>
<b>ITEM FORMAT</b>	<b>Closed constructed response</b>
<b>COGNITIVE PROCESS</b>	Evaluate
<b>PROFIENCY LEVEL</b>	<b>2</b>

### CREDIT PATTERN

Sweet shop scoring 1.1

**FULL CREDIT:350**

**PARTIAL CREDIT: ₹ 200 for 500gm laddu**

**NO CREDIT:**other responses and missing

Full credit of 2 points will be given if the correct answer is 350 as the cost of 50 gm laddu is 200 which when added to remaining ₹150 equals 350. Partial credit of 1 point will be given if the student find out the cost of 500gm laddu.

### MATHEMATICAL LITERACY:QUESTION 1.2

<b>FRAMEWORK</b>	<b>CHARACTERISTICS</b>
<b>COMPETENCY CLUSTER</b>	<b>Connection</b>
<b>OVERARCHING IDEA</b>	Quantity
<b>CONTEXT</b>	<b>Personal Process</b>
<b>ITEM FORMAT</b>	<b>Closed Constructed Response</b>
<b>COGNITIVE PROCESS</b>	Employ
<b>PROFIENCY LEVEL</b>	<b>3</b>

### CREDIT PATTERN

Sweet shop scoring 1.2

**FULL CREDIT:**Yes with correct justification

**NO CREDIT:**other responses and missing

Give 2 points for the correct answer Yes supported with plausible reasoning.

Cost of 1 packet mix-namkin = ₹ 80

Cost of 2 packets of potato chips = ₹ 60

So he need ₹ 140 and he had ₹ 150.

### MATHEMATICAL LITERACY: QUESTION 1.3

<b>FRAMEWORK</b>	<b>CHARACTERISTICS</b>
<b>COMPETENCY CLUSTER</b>	<b>Reproduction</b>

<b>OVERARCHING IDEA</b>	Quantity
<b>CONTEXT</b>	<b>Personal</b>
<b>ITEM FORMAT</b>	<b>Open Constructed Response</b>
<b>COGNITIVE PROCESS</b>	Evaluate and Interpret
<b>PROFIENCY LEVEL</b>	<b>3</b>

**CREDIT PATTERN**

Sweet shop scoring 1.3

**FULL CREDIT:**(i) Laddu

**NO CREDIT:**other responses and missing

Give 2 points for the correct answer Laddu as it is not possible to reduce quantity of other items except laddu. Instead of buying 250gm laddu, he can buy 100gm of laddu.

**MATHEMATICAL LITERACY: QUESTION 1.4**

<b>FRAMEWORK</b>	<b>CHARACTERISTICS</b>
<b>COMPETENCY CLUSTER</b>	<b>Connection</b>
<b>OVERARCHING IDEA</b>	Quantity
<b>CONTEXT</b>	<b>Personal Process</b>
<b>ITEM FORMAT</b>	<b>MCQ</b>
<b>COGNITIVE PROCESS</b>	Interpret
<b>PROFIENCY LEVEL</b>	<b>3</b>

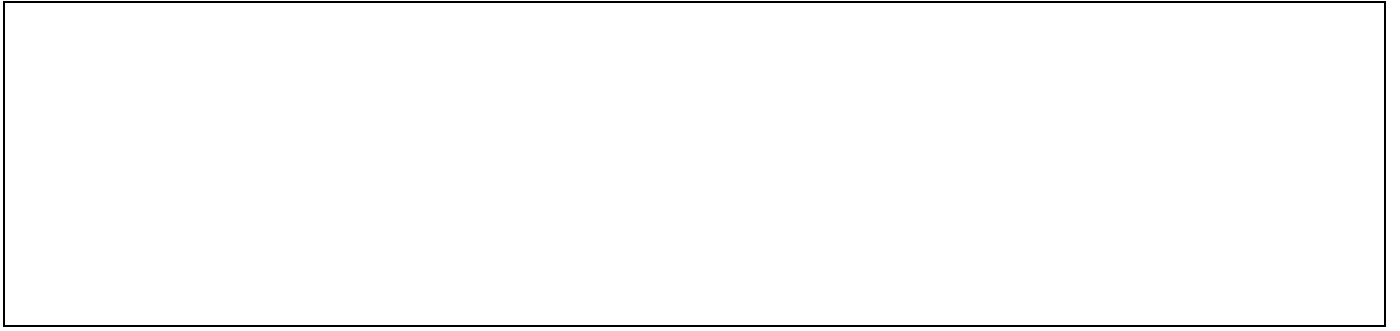
**CREDIT PATTERN**

Sweet shop scoring 1.4

**FULL CREDIT:**(ii) Roasted Dry fruits

**NO CREDIT:**other responses and missing

Give 2 points for the correct answer Roasted Dry Fruits.



**CRITICAL AND CREATIVE THINKING ITEMS**

**CLASS VIII : CHAPTER 2: LINEAR EQUATION IN ONE VARIABLE**

**INDEX**

<b>S.No.</b>	<b>Theme of the item</b>
<b>1.</b>	Mela
<b>2.</b>	Parking area
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<b>4.</b>	Playground
<b>5.</b>	Workshop
<b>6.</b>	Selling half of an egg but not boiled!
<b>7.</b>	Who is older
<b>8.</b>	Fruit market
<b>9.</b>	Travelling
<b>10.</b>	Two Friends guessing age while dealing with Car!
<b>11.</b>	Number game
<b>12.</b>	Picnic

## TEST ITEM 4\_Mela

Domain: Mathematical Literacy

Class: VIII

Context: Social

Two sisters Riya and Tanu went to a mela organized in their society on the occasion of New Year. Their mother gave them Rs. 200. They bought some toys for them. Tanu spent Rs. 20 more than Riya. When they returned home from the mela, they had Rs. 20 left with them.



- 4.1. Find the amount spent by Riya.
- 4.2. Find the amount spent by Tanu.
- 4.3. Determine the ratio of amount spent by Tanu to that of Riya.
- 4.4. What type of motion is exhibited by Giant-wheel?

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## TEST ITEM 5\_ PARKING AREA

**Domain: Mathematical Literacy**

**Class: VIII**

**Context: Social**

The parking area of a Mall has a fixed-parking charges of Rs 50 for cars and Rs 20 for scooters. Further one has to pay Rs 20 per hour for parking his car and Rs 10 per hour for parking his scooter.

5.1. Varun came to the mall by his car and paid Rs 130 for the time he spent in the mall. Find the time spent by Varun in the mall.

5.2. Find the difference in amount paid by Varun for parking if he would have come by scooter instead of car.

5.3. One day Mr.Jagannath went to enjoy a movie “Mission Mangal” of duration 3 hours in the mall and parked his car but due to urgent call from home he had to leave the mall after  $1\frac{1}{2}$  hours. What would be the difference in amount of payment for parking if he would have enjoyed the full movie?

5.4. Area required for Parking a car is 3 times the area required for parking a scooter. The mall management wants to convert the parking area wholly either for car or for scooter. In which case it would be more profitable?

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## TEST ITEM 6\_ FARMING

**Domain: Mathematical Literacy**

**Class: VIII**

**Context: Social**



Raghu wants to plough his 4 hectares of agricultural land for transplantation of paddy. It needs ploughing three times for better production of crop. For a tractor, fixed hiring charge is Rs 300(for driver) and rates for ploughing per acre for the first round, second round and third round are given in the following table.

[ 1 hectare = 2.5 acres approx.]

Sl.No.	Slab of areas	Rate of first time ploughing	Rate of second time ploughing	Rate of third time ploughing
1.	Up to 2 acres	Rs. 2300/acre	Rs. 1600/acre	Rs. 1400/acre
2.	More than 2 acres to 4 acres	Rs. 2200/acre	Rs. 1500/acre	Rs. 1300/acre
3.	Above 4 acres	Rs. 2000/acre	Rs. 1400/acre	Rs. 1200/acre

6.1. How much amount does he need to pay to make the field ready for transplantation by ploughing thrice?

6.2. If area of the field is  $x$  hectare (where  $x > 2$ ) and the amount to be paid is  $y$ , write a relation between  $x$  and  $y$ .

6.3. Why is the rate of ploughing the field for the third time the least in the slab?

6.4. If the rate of each phase of ploughing is Rs. 2000 per acre then which option will be cheaper for Raghu whether this option or the rates given in the slab?

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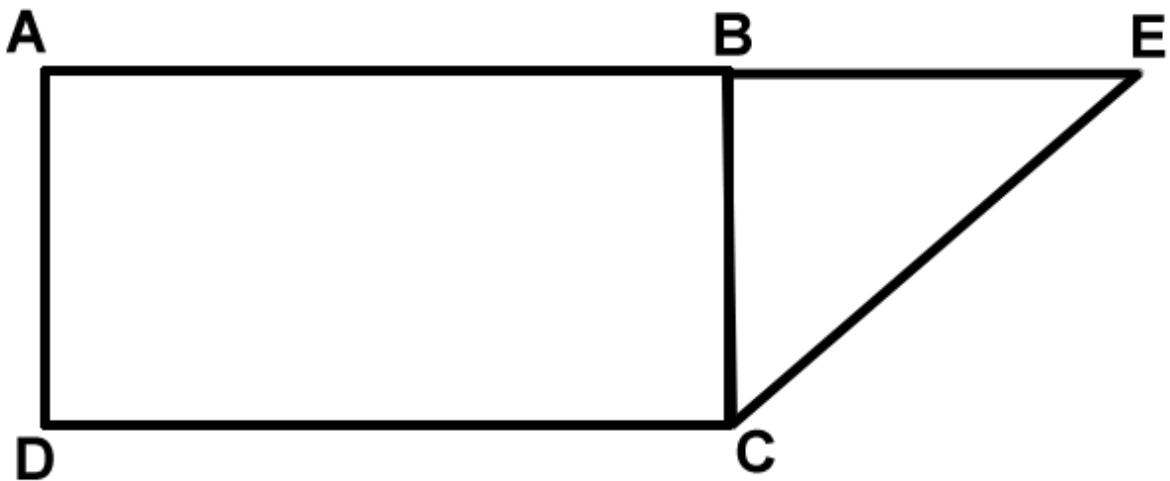
## TEST ITEM 2\_PLAYGROUND

Domain: Mathematical Literacy

Class: VIII

Context: Social

A school has rectangular playground, whose breadth is two-third of its length. Adjacent to this ground, a right Isosceles triangle shaped piece of land is there, which is to be developed as rose garden. A nearby hardware whole sale shop comes forward to donate 200m of wire.



2.1. If the total length of the wire required for fencing the ground is 630m. Form a linear equation, if the length of the ground is ' $x$ ' metres.

2.2. Find the number of rose saplings to be purchased for the garden, if each sapling requires  $2 \text{ m}^2$  of land.

2.3. The remaining length of the wire is to be purchased for fencing the playground by the school at the rate of Rs20 per metre. How much amount is to be spent by the school?

2.4. Find the difference between the areas of playground and the rose-garden.

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## TEST ITEM 3\_WORKSHOP

**Context: Social**

A workshop was organised at KV no 1 Salt Lake, Kolkata. The number of participants were 10 more than 8 times the number of mentors and the total strength in the conference hall was 100.

3.1. Find the number of mentors in the conference hall?

3.2. Tea and snacks were being served during the breaks, costing Rs 25 per person per break. What would be the total cost incurred during 3-day workshop with 2 breaks each day, excluding mentors.

3.3. The conference hall was rectangular in shape with length being 5 times than that of the breadth. If total area covered was 125 square meter then what were the exact dimensions of the floor of the hall?

3.4. For seating arrangement of the participants in the hall, how many chairs are needed in each row such that the number of rows is a perfect square number?

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**TEST ITEM 4\_ SELLING HALF OF AN EGG BUT NOT BOILED!**

**Context: Social**

An egg merchant has sold out almost all the eggs he had. A few eggs were left with him to sell to finish the stock. He gave an offer: -

**"Buy half of the eggs I have and take half of an egg free".**

Then 3 customers came to buy eggs and he left with no egg.

4.1. How many eggs were there with egg merchant at the time of declaring the offer?

4.2. Can you solve this problem without framing equation? Justify your answer.

4.3. Are you able to observe a specific pattern in the number of eggs sold to consecutive customers? If yes, reveal it.

4.4. If the total number of eggs were sold to 5 customers consecutively under this offer then find the number of eggs were there at the time of declaring the offer.

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## TEST ITEM 2\_WHO IS OLDER?

**Domain: Mathematical Literacy**

**Class: VIII**

**Context: Personal**

Abhi is the only child of Mr.Ajit Singh and Ashu Singh. They live in a joint family at Jabalpur. One day he is getting bore at home. Suddenly an idea came to his mind and he began to note down the ages of his family members. For 15 minutes, he was thinking about the ages of his mother, father, grandfather and his own. Then he jumped into the relationship among the ages of the family members.

He went to his mother and said “Mom, your age is 6 years more than twice of mine. Papa’s age is two and half times of my age. You know that the sum of ages of both of you is 5 years less than the age of grandfather. You know Mom, my age would be square of the smallest composite number after two years.”

2.1. Abhi’s age after 11 years would be: -

- A) 9 years                  B) 16 years                  C) 25 years                  D) 36 years

2.2.Mr.Ajit Singh’s age after 1 year would be: -

- A) 34 years                  B) 35 years                  C) 36 years                  D) 37 years

2.3. Grandfather’s age is

- A) 74 years                  B)75 years                  C) 76 years                  D) 77 years

2.4. What was the age of Abhi’s mother when he was born?

- A) 20 years                  B)25 years                  C) 30years                  D) 35 years

## TEST ITEM 3\_Fruit Market





**Domain: Mathematical Literacy**

**Class: VIII**

**Context: Social**

Karuna went to Big Bazaar with her four friends. There she saw many fruits in the

food bazar section. They purchased some fruits as per the given table.

NAME	FRUIT	NUMBER OF FRUITS	Total cost of number of fruits shown
SAROJ	MANGO		48
HAMEEDA	APPLE		102
KARUNA	BANANA	????????????	168
JOSEPH	GUAVA		18
SUKHVINDER	LICHI		15

Karuna told her friends that three times the number of bananas she had bought is equal to four less than ten times the total number of fruits her friends had bought.

- 3.1. How many bananas had Karuna bought?
- 3.2. Hameeda replied to Karuna, “ You have the number of bananas which is equal to two less than six times the number of fruits Saroj and I had.” Was Hameeda right?
- 3.3. Find the ratio of Number of bananas to the number of other fruits.
- 3.4. Which fruit is the cheapest among all?

## TEST ITEM 6\_TRAVELLING

**Domain: Mathematical Literacy**

**Class: VIII**

**Context: Social**

Two friends Raju and Sanju plan to go from Asansol to Kolkata by car. They travelled by a car with a uniform speed of 40 kmph and reached the destination in x hours. Next day, Raju alone travelled from Asansol to Kolkata on his new sports bike with a uniform speed and reached the place one hour earlier than their previous travel time. The total time taken for travelling both the days is 9 hrs.

6.1. What was the speed of the sports bike?

- A) 60kmph      B) 50kmph      C) 70kmph      D) 80kmph

6.2. What is the distance between Asansol and Kolkata:-

- A) 500km      B) 400km      C) 200km      D) 120km

6.3. If with the same motor-bike we have to travel 600 km without any stop with same uniform speed, how much time will be required?

- A) 6 hours      B) 12 hours      C) 18 hours      D) 24 hours

6.4. If the motor-bike goes 80 km in 1 litre of petrol where each litre of petrol costs Rs.80 then how much money was spent by them to buy fuel for the journey from Asansol to Kolkata?

- A) Rs. 500      B) Rs. 400      C) Rs. 200      D) Rs. 120
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## TEST ITEM 3\_Two Friends guessing age while dealing with Car!

Domain: Mathematical Literacy

Class: VIII

### Context: Personal

In a village Rampur a woman purchased a car for Rs 5,00,000. After using for some years she sold it to her friend for Rs 3,50,000. She said to her friend that when she had bought the new car, her age was three times of her son's age and her husband's age was five years more than her age. Five year ago (from that day) her son was  $\frac{1}{6}$  of his father's age.



- 3.1. What was the age of her son when she purchased the car?
  - 3.2. What was the age of her husband when she purchased the car?
  - 3.3 What was the age of the woman when she purchased the car?
  - 3.4. When the car was sold, its depreciated market price was Rs. 3,75,000. Did the woman incur any loss? If yes, find how much.
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## TEST ITEM 4\_ NUMBER GAME

Domain: Mathematical Literacy

Class: VIII



## Context: Personal

Nandini and Bhumika are very good friends. They decided to play a game. Nandini asked Bhumika to think of a number and subtract  $\frac{2}{3}$  from it. Then she asked to multiply the result by 6 again, she asked to add 8 in the result. Now Bhumika said, "The number I obtained is 7 times the same number I thought of."



4.1. Write the equation to find the number that Bhoomika thought of. Also find the number.

4.2. What would be the number if Bhoomika Subtracts  $\frac{3}{2}$  instead of  $\frac{2}{3}$  ?

4.3. What is the difference between both the results?

4.4. What will be the result, when the original number is multiplied with the square of the difference obtained in Q3?

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## TEST ITEM 5\_PICNIC

**Domain: Mathematical Literacy**

**Class: VIII**

### Context: Social

Four friends- Sumit, Ajoy ,Parul and Nandini decided to go out for a picnic. If they travel with a speed of 40 km/hr, they reach 30 minutes later than their scheduled time. And if they go with a speed of 60 km/hr, they reach 30 minutes early. They start their journey at 8 a.m.

5.1. What is their scheduled time to reach the picnic spot?

5.2. How far is the picnic spot?

5.3. By what speed they have to travel to reach on time?

5.4. If half the distance is covered with half of the average speed thought of to reach in time, what will be the required speed to travel the remaining distance in time?

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**TEST ITEM 4**

**TEMPLATE FOR PREPARATION OF PRACTICE ITEMS FOR MATHEMATICAL LITERACY:**

<b>Domain:</b> Mathematical Literacy	<b>Theme:</b> Mela	<b>Class:</b> VIII <b>Expected Time:</b> 6 min. <b>Total Credit:</b> 8
<b>Description of the item:</b> Text and image	<b>Learning outcome:</b> Able to Frame the equation and apply it to solve daily life problem	

<b>FRAMEWORK</b>	<b>CHARACTERISTICS</b>
Competency Cluster	Connection
Overarching idea	Change and relationship
Context	Social
Item format	Closed constructed response
Cognitive Process	Interpret, Formulate, Employ and Evaluate
Proficiency Level	Level II

**Description of Answer Key and credits:**

<p><b>4.1 Full Credit: Rs. 80</b>  <b>Partial Credit :</b> For framing correct equation only  <b>No Credit:</b>For any other response</p>
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4.2

**Full Credit:-** Rs. 100

**No Credit:**For any other response

4.3

**Full Credit:**100:80 or 5:4

**No Credit:**For any other response

4.4

**Full Credit:** Periodic, Oscillatory or circular motion

**No Credit:**For any response related to non-periodic motion

## TEST ITEM 5

### TEMPLATE FOR PREPARATION OF PRACTICE ITEMS FOR MATHEMATICAL LITERACY:

<b>Domain:</b> Mathematical Literacy	<b>Theme:</b> PARKING AREA	<b>Class:</b> VIII <b>Expected Time:</b> 8 min. <b>Total Credit:</b> 8
<b>Description of the item:</b> Text and image	<b>Learning outcome:</b> Able to Frame the equation and apply it to solve daily life problem	

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connection
Overarching idea	Change and relationship
Context	Social
Item format	Closed constructed response
Cognitive Process	Interpret, Formulate and evaluate
Proficiency Level	Level II

#### Description of Answer Key and credits:

5.1

**Full Credit:**4 hours

**No Credit:**For any other response

5.2

**Full Credit:-** Rs.70

**No Credit:** For any other response

**5.3**

**Full Credit:**Rs. 20

**No Credit:**For any other response

**5.4**

**Full Credit:** Scheme of converting the parking area wholly for scooters will be more profitable.

**No Credit:**For any other response

**TEST ITEM 6****TEMPLATE FOR PREPARATION OF PRACTICE ITEMS FOR MATHEMATICAL LITERACY:**

<b>Domain:</b> Mathematical Literacy	<b>Theme:</b> FARMING	<b>Class:</b> VIII <b>Expected Time:</b> 8 min. <b>Total Credit:</b> 8
<b>Description of the item:</b> Text	<b>Learning outcome:</b> Able to Frame the equation and apply it to solve daily life problem	

<b>FRAMEWORK</b>	<b>CHARACTERISTICS</b>
Competency Cluster	Connection
Overarching idea	Change and relationship
Context	Social
Item format	Open &Closed constructed response
Cognitive Process	Employ, Formulate and evaluate
Proficiency Level	Level III

**Description of Answer Key and credits:**

<b>6.1</b>	<b>Full Credit:</b> Rs. 48500 <b>No Credit:</b> For any other response
<b>6.2</b>	<b>Full Credit:</b> - $y=2500+11500x$ <b>No Credit:</b> For any other response
<b>6.3</b>	<b>Full Credit:</b> Because the soil become loose. <b>No Credit:</b> For any other response
<b>6.4</b>	<b>Full Credit:</b> The offer given in the slab will be cheaper. <b>No Credit:</b> For any other response

## TEST ITEM 2

### TEMPLATE FOR PREPARATION OF PRACTICE ITEMS FOR MATHEMATICAL LITERACY:

<b>Domain:</b> Mathematical Literacy	<b>Theme:</b> Playground	<b>Class:</b> VIII <b>Expected Time:</b> 8 min. <b>Total Credit:</b> 8
<b>Description of the item:</b> Text and image	<b>Learning outcome:</b> Able to form equations from any give situation and apply it for solving daily life problems.	

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connection
Overarching idea	Change and relationship
Context	Social
Item format	Closed costructured response
Cognitive Process	Formulate and evaluate
Proficiency Level	Level 2

#### Description of Answer Key and credits:

<b>2.1</b> <b>Full Credit:</b> $2(x + \frac{2}{3}x) = 630$ <b>No Credit:</b> For any other response
<b>2.2</b> <b>Full Credit:</b> - 3969 <b>No Credit:</b> For any other response
<b>2.3</b> <b>Full Credit:</b> 8600 <b>No Credit:</b> For any other response
<b>2.4</b> <b>Full Credit:</b> 15876 <b>No Credit:</b> For any other response

## TEST ITEM 3

**TEMPLATE FOR PREPARATION OF PRACTICE ITEMS FOR MATHEMATICAL LITERACY:**

<b>Domain:</b> Mathematical Literacy	<b>Theme:</b> WORKSHOP	<b>Class:</b> VIII <b>Expected Time:</b> 6 min. <b>Total Credit:</b> 8
<b>Description of the item:</b> Text	<b>Learning outcome:</b> Able to form equations from any give situation and solve it.	

<b>FRAMEWORK</b>	<b>CHARACTERISTICS</b>
Competency Cluster	Connection
Overarching idea	Change and relationship
Context	Social
Item format	Closed costructured response
Cognitive Process	Formulate and evaluate
Proficiency Level	Level 2

**Description of Answer Key and credits:**

<p><b>3.1</b> <b>Full Credit:</b> 10 <b>No Credit:</b>For any other response</p> <p><b>3.2</b> <b>Full Credit:-</b> 13500 <b>No Credit:</b> For any other response</p> <p><b>3.3</b> <b>Full Credit:</b>length 25m, breadth 5m <b>Partial Credit:</b> Any one correct answer. <b>No Credit:</b>For any other response</p> <p><b>3.4</b> <b>Full Credit:</b> 10 <b>No Credit:</b>For any other response</p>
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**TEST ITEM 4**

**TEMPLATE FOR PREPARATION OF PRACTICE ITEMS FOR MATHEMATICAL LITERACY:**

<b>Domain:</b> Mathematical	<b>Theme:</b> SELLING HALF OF AN	<b>Class:</b> VIII
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Literacy	EGG BUT NOT BOILED!	<b>Expected Time:</b> 10 min. <b>Total Credit: 8</b>
<b>Description of the item:</b> Text	<b>Learning outcome:</b> Able to employ, formulate and evaluate	

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connection
Overarching idea	Change and relationship
Context	Social
Item format	Closed constructed response
Cognitive Process	Formulate and evaluate
Proficiency Level	Level 4

### Description of Answer Key and credits:

<p><b>4.1</b></p> <p><b>Full Credit:</b> For framing equation and getting number of eggs = 7 <b>No Credit:</b> For any other response</p> <p><b>4.2</b></p> <p><b>Full Credit:-</b> For getting Correct Answer i.e number of eggs =7 by any other method <b>No Credit:</b> For any other response</p> <p><b>4.3</b></p> <p><b>Full Credit:</b>Yes, It is 4,2,1. <b>No Credit:</b>For any other response</p> <p><b>4.4</b></p> <p><b>Full Credit:</b> number of eggs = 31 <b>No Credit:</b>For any other response</p>
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## TEST ITEM 2

### TEMPLATE FOR PREPARATION OF PRACTICE ITEMS FOR MATHEMATICAL LITERACY:

<b>Domain:</b> Mathematical Literacy	<b>Theme: Who is older</b>	<b>Class: VIII</b> <b>Expected Time:</b> 6 min. <b>Total Credit: 8</b>
<b>Description of the item:</b> Text	<b>Learning outcome:</b> able to frame the equation and solve it.	

<b>FRAMEWORK</b>	<b>CHARACTERISTICS</b>
Competency Cluster	Connection
Overarching idea	Change and relationship
Context	Personal
Item format	Closed constructed response
Cognitive Process	Formulate and evaluate
Proficiency Level	Level II

#### Description of Answer Key and credits:

**2.1**

**Full Credit:**25 years

**Partial Credit:** for getting answer as 14 years

**No Credit:**For any other response

**2.2**

**Full Credit:**- 36 years

**No Credit:** For any other response

**2.3**

**Full Credit:**74 years

**No Credit:**For any other response

**2.4 Full Credit:** 20 years

**No Credit:**For any other response

## TEST ITEM 3

**TEMPLATE FOR PREPARATION OF PRACTICE ITEMS FOR MATHEMATICAL LITERACY:**

<b>Domain:</b> Mathematical Literacy	<b>Theme:</b> Fruit Market	<b>Class:</b> VIII <b>Expected Time:</b> 8 min. <b>Total Credit:</b> 8
<b>Description of the item:</b> Text	<b>Learning outcome:</b> Able to Frame the equation and apply it to solve daily life problem	

<b>FRAMEWORK</b>	<b>CHARACTERISTICS</b>
Competency Cluster	Connection
Overarching idea	Change and relationship
Context	Social
Item format	Closed constructed response
Cognitive Process	Formulate and evaluate
Proficiency Level	Level II

**Description of Answer Key and credits:**

<p><b>3.1</b>  <b>Full Credit:</b>42 bananas  <b>No Credit:</b>For any other response</p> <p><b>3.2</b>  <b>Full Credit:</b>- No  <b>No Credit:</b> For any other response</p> <p><b>3.3</b>  <b>Full Credit:</b>42:13  <b>No Credit:</b>For any other response</p> <p><b>3.4</b>  <b>Full Credit:</b>Lichi  <b>No Credit:</b>For any other response</p>
--

**TEST ITEM 6**

**TEMPLATE FOR PREPARATION OF PRACTICE ITEMS FOR MATHEMATICAL LITERACY:**

<b>Domain:</b> Mathematical Literacy	<b>Theme:</b> TRAVELLING	<b>Class:</b> VIII <b>Expected Time:</b> 9 min. <b>Total Credit:</b> 8
<b>Description of the item:</b> Text	<b>Learning outcome:</b> Able to form equations from any give situation and apply it for solving daily life problems.	

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connection
Overarching idea	Change and relationship
Context	Social
Item format	Closed costructured response
Cognitive Process	Formulate and evaluate
Proficiency Level	Level 3

**Description of Answer Key and credits:**

<b>6.1</b>	<b>Full Credit:</b> 50 kmph <b>No Credit:</b> For any other response
<b>6.2</b>	<b>Full Credit:-</b> 200 km <b>No Credit:</b> For any other response
<b>6.3</b>	<b>Full Credit:</b> 12 hrs <b>No Credit:</b> For any other response
<b>6.4</b>	<b>Full Credit:</b> Rupees 200 <b>No Credit:</b> For any other response

### TEST ITEM 3

#### TEMPLATE FOR PREPARATION OF PRACTICE ITEMS FOR MATHEMATICAL LITERACY:

<b>Domain:</b> Mathematical Literacy	<b>Theme:</b> Two Friends guessing age while dealing with Car!	<b>Class:</b> VIII <b>Expected Time:</b> 8 min. <b>Total Credit:</b> 8
<b>Description of the item:</b> Text and image	<b>Learning outcome:</b> Able to Frame the equation and to solve it	

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connection
Overarching idea	Change and relationship
Context	Personal
Item format	Closed constructed response
Cognitive Process	Formulate and evaluate
Proficiency Level	Level II

#### Description of Answer Key and credits:

<b>3.1 Full Credit:</b> 10 years <b>No Credit:</b> For any other response
<b>3.2</b> <b>Full Credit:-</b> 35 years <b>No Credit:</b> For any other response
<b>3.3</b> <b>Full Credit:</b> 30 years <b>No Credit:</b> For any other response
<b>3.4</b> <b>Full Credit:</b> Rs. 25000 <b>No Credit:</b> For any other response

### TEST ITEM 4

**TEMPLATE FOR PREPARATION OF PRACTICE ITEMS FOR MATHEMATICAL LITERACY:**

<b>Domain:</b> Mathematical Literacy	<b>Theme:</b> Number Game	<b>Class:</b> VIII <b>Expected Time:</b> 8 min. <b>Total Credit:</b> 8
<b>Description of the item:</b> Text	<b>Learning outcome:</b> Able to formulate and evaluate	

<b>FRAMEWORK</b>	<b>CHARACTERISTICS</b>
Competency Cluster	Connection
Overarching idea	Change and relationship
Context	Personal
Item format	Closed constructed response
Cognitive Process	Formulate and evaluate
Proficiency Level	Level 2

**Description of Answer Key and credits:**

<b>4.1</b>	<b>Full Credit:</b> $6(x - 2/3) + 8 = 7x$ , the number thought of = 4 <b>Partial Credit:</b> Equation is correct <b>No Credit:</b> For any other response
<b>4.2</b>	<b>Full Credit:</b> - 1 <b>No Credit:</b> For any other response
<b>4.3</b>	<b>Full Credit:</b> $4 - (- 1) = 5$ <b>Partial Credit:</b> $- 1 - 4 = - 5$ <b>No Credit:</b> For any other response
<b>4.4</b>	<b>Full Credit:</b> 100 <b>No Credit:</b> For any other response

**TEMPLATE FOR PREPARATION OF PRACTICE ITEMS FOR MATHEMATICAL LITERACY:**

<b>Domain:</b> Mathematical Literacy	<b>Theme:</b> PICNIC	<b>Class:</b> VIII <b>Expected Time:</b> 8 min. <b>Total Credit:</b> 8
<b>Description of the item:</b> Text	<b>Learning outcome:</b>	

<b>FRAMEWORK</b>	<b>CHARACTERISTICS</b>
Competency Cluster	Connection
Overarching idea	Change and relationship
Context	Social
Item format	Closed constructed response
Cognitive Process	Formulate and evaluate
Proficiency Level	Level 2

**Description of Answer Key and credits:**

<p><b>5.1</b>  <b>Full Credit:</b>10:30 am  <b>No Credit:</b>For any other response</p> <p><b>5.2</b>  <b>Full Credit:</b>- 120 km  <b>No Credit:</b> For any other response</p> <p><b>5.3</b>  <b>Full Credit:</b>48 kmph  <b>No Credit:</b>For any other response</p> <p><b>5.4</b>  <b>Full Credit:</b> Impossible to reach the venue on time.  <b>No Credit:</b>For any other response</p>
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**CRITICAL AND CREATIVE THINKING ITEMS**

**CLASS VIII : CHAPTER 3 : UNDERSTANDING QUADRILATERALS**

**INDEX**

<b>S.No.</b>	<b>Theme of the item</b>
<b>17.</b>	Fire cracker
<b>18.</b>	Mt everest
<b>19.</b>	Himalayan range
<b>20.</b>	Raju's Day out
<b>21.</b>	Climbing a wall
<b>22.</b>	Decoration of pandal
<b>23.</b>	Sheet folding

CCT PRACTICE ITEM

Domain: Mathematical Literacy	Theme: Fire Cracker	Class: 8 Expected Time: 8 min Total Credit: 8
<p><b>Q.03</b> Burning fire cracker is symbol of joy and happiness in many countries. It mainly burns during new year and special occasion of the different countries. During new year Amit and his family went to an orphanage to share happiness with other needy children. They distributed sweets and crackers to them. Shape of one cracker is shown below. While burning, a question came to the mind of a child. Help him to find the answers</p> <div style="text-align: center;">  </div> <p>i) What is the shape of the cracker?                  ii) After lightning the cracker at what angle with respect to the edge sparks ejected if the shape is regular.                  iii) What is the interior angle of the cracker?                  iv) What is the total angle covered by cracker in ten rotation.</p>	Learning Outcome: <ol style="list-style-type: none"> <li>1. Identification of shapes.</li> <li>2. Sum of total exterior angle of a polygon</li> <li>3. Comprehensive ability an analytical approach.</li> <li>4. Computation skill</li> </ol>	
<p><b>Answer:</b> 1. Hexagon <span style="float: right;">FC 02</span>                  Any other response <span style="float: right;">NC 00</span></p> <p>2. <math>\frac{360^\circ}{6} = 60^\circ</math> <span style="float: right;">FC 02</span>                  Any other response <span style="float: right;">NC 00</span></p> <p>3. <math>120^\circ</math> <span style="float: right;">FC 02</span>                  Any other response <span style="float: right;">NC 00</span></p> <p>4. <math>360^\circ \times 10 = 3600^\circ</math> <span style="float: right;">FC 02</span>                  Any other response <span style="float: right;">NC 00</span></p>		



FRAMEWORK	CHARACTERISTICS
Competency Cluster	Analysis, computation, justification
Overarching idea	Connections between work and ability
Context	Real life situation
Item Format	Simple MCQ, short response, closed constructed – response
Cognitive Process	Scientific
Proficiency Level	Skill , confidence and accuracy

Credit Pattern :

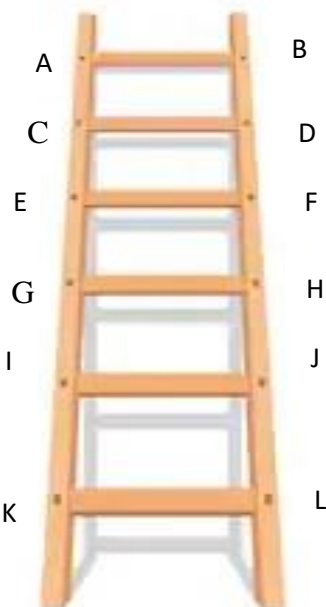
Full Credit: 02

Partial Credit: 01

No Credit : 00

Prepared by- Kendriya Vidyalaya Sangathan, Silchar Region.

CCT PRACTICE ITEM

<p>Domain: Mathematical Literacy</p>	<p>Theme: Mt Everest</p>	<p>Class: 8 Expected Time: 6 min Total Credit: 06</p>
<p><b>Q.04</b> 'Krushnaa Patil is the youngest woman who successfully climbed Mount Everest. She achieved this at the age of 19, in 2009. At a very early age she was passionate about mountain climbing. During her childhood most of her vacations were on Himalaya'. By reading this article a child of class 9 also gets passionate about mountaineering and searches for different instruments required for that. He made a ladder of a given shape. The distance between two consecutive rungs is 50cm on both sides.</p> <div style="text-align: center;">  </div> <p>i) What shape is formed by two consecutive rungs with adjacent side? a) Trapezium    b) kite</p> <p>ii) If <math>m\angle BAC = 110^\circ</math>, find <math>m\angle ACD</math></p> <p>iii) What should be the measures of <math>\angle ABD</math> &amp; <math>\angle BDC</math></p>	<p>Learning Outcome:</p> <ol style="list-style-type: none"> <li>1. Identification of geometrical shapes.</li> <li>2. Application of geometrical principle in real life situation.</li> <li>3. Thrill/self-confidence /dare to accept challenges of daily life.</li> <li>4. novelty</li> </ol>	
<p>Answer :</p> <p>1. Isosceles Trapezium                      FC 02 Any other response                      NC 00</p> <p>2. <math>70^\circ</math> FC 02 Any other response                      NC 00</p>		

3. $110^\circ$ and $70^\circ$ <i>any one angle</i> Any other response	FC 02 PC 01 NC 00	
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### Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Analysis, computation, justification
Overarching idea	Connections between real life with geometry.
Context	Real life situation
Item Format	Simple MCQ, short response, closed constructed – response
Cognitive Process	Scientific
Proficiency Level	Skill , confidence and accuracy

#### Credit Pattern:

Full Credit: 02 if all three answer is correct

Partial Credit: 01 if two of them is correct

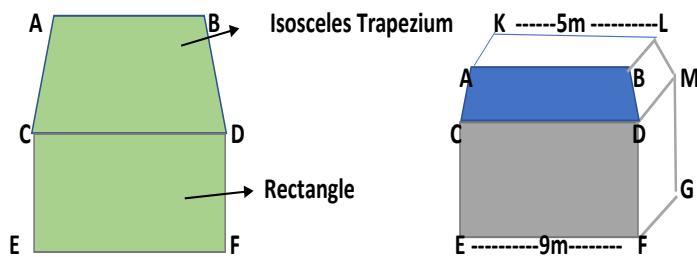
No Credit: 00 any other answer or missing answer

Prepared by- Kendriya Vidyalaya Sangathan, Silchar Region.

Domain: Mathematical Literacy	Theme: Himalayan Range	Class: 8 Expected Time: 8 min Total Credit: 06
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**Description of item:**

The high altitudes of mountainous regions of the Himalayan range has scarcity of certain food items due to weather conditions. The Green House Chamber stores the maximum light for plants as well protects them from worst effects of strong winds and other adverse climatic situations/conditions of particular region. A Child Mohan of class 9 of Ladakh, wants to help his parents in increasing the production of vegetables in their farm. For that he designed a green-house chamber of height 6m as shown:



- Identify the shape of the roof (Top and lateral)
- If he found  $MG=5m$ ,  $FG=10m$  and  $BL= 8m$  then what is length of  $AK$ ?
- Count the number of polygonal faces.
- This program is the part of which revolution in our country.....  
 a) White revolution b) Blue revolution c) Green revolution

**Learning Outcome:**

- Identification of shapes.
- Application of the property of Trapezium and rectangle.
- Importance of green house.
- Comprehensive ability- an analytical approach.

**Answer :**

- Top : rectangle and lateral : Trapezium FC 02  
Any one correct PC 01  
Any other answer NC 00
- $AK = BL = 8 m$  FC 02  
Any other answer NC 00
- 9 FC 02  
Any other answer NC 00
- Green revolution / food for all program FC 02  
Any other answer NC 00

**Mathematical Literacy**

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Analysis, understanding,application of geometrical principle.
Overarching idea	Connections in geometrical activity
Context	Activity

Item Format	Short response, constructed response
Cognitive Process	Scientific
Proficiency Level	Application of geometry for fun

Credit Pattern :

Full Credit: 02

Partial Credit: 01

No Credit : 00

Prepared by- Kendriya Vidyalaya Sangathan, Silchar Region.

### Practice items for Mathematical Literacy

<b>Domain:</b> Mathematical Literacy	<b>Theme:</b> Raju's Day out	<b>Class(es): VIII</b> <b>Expected time:10 min</b> <b>Total Credit:06</b>
<p style="text-align: center;"><b><u>Raju's Day Out</u></b></p> <p>On a particular day, Raju starts from his house in the morning and walks 3 km towards East to reach his school. After school, he turns towards North from school and goes 4 km to reach the market for buying notebooks. Raju's uncle is admitted at the hospital which is at 6 km from the market. Raju turns towards East from the market and goes to the hospital to visit his uncle. From the hospital Raju turns South and travels 4 km to reach his tuition classes. After the classes are over, Raju goes to his friend's house for a birthday party. His friend's house is situated at a distance of 3 km towards East from his tuition. Three roads of length 5 km, 6km and 5 km connect Raju's home to the market, school to tuition and hospital to his friend's home.</p> <p><b>QUESTIONS :</b></p> <p><b>[Q01].</b>Trace Raju's route using the story given and identify the figure enclosed by Raju's home, Market, Hospital and his friend's home.</p> <p><b>[Q02].</b>How many triangles are there? Are they congruent? Justify.</p> <p><b>[Q03].</b>Identify the closed figure enclosed by School, Tution, Hospital and Market.</p>	<b>Learning Outcome:</b> <b>(As per NCERT)</b> <ol style="list-style-type: none"> <li>I. <b>Students will get a proper concept about direction.</b></li>   <li>II. <b>Students can draw figures by following direction.</b></li>   <li>III. <b>Students can identify various types of quadrilaterals.</b></li> </ol>	

#### **Mathematical Literacy**

<b>FRAMEWORK</b>	<b>CHARACTERISTICS</b>
Competency Cluster	Reflection
Overarching Idea	Space and Shape, Application of geometry to real life
Context	Scientific
Item Format	Subjective and close constructed response.
Cognitive Process	Scientific and analytical
Proficiency Level	High

#### **Credit Pattern:**

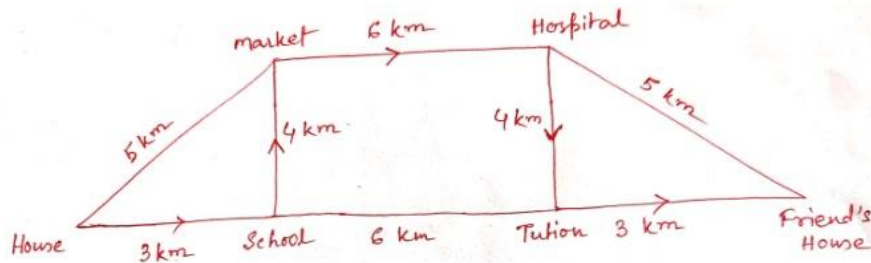
Full Credit: 02

Partial Credit: 01

Nil Credit: 00

**Description of Answer Key and Credit:**

**[Q01]: Full Credit:**



CS Scanned with CamScanner

Trapezium

**Partial Credit :**Correct tracing of figure but no name is mentioned.

**No Credit:** Any other answer or missing answer

**[Q02]: Full Credit:** 2 triangles. They are congruent. Justification can be given by SSS or RHS or SAS congruency.

**Partial Credit:** No justification given for congruency of triangles.

**No Credit:** Any other answer or missing answer

**[Q03]: Full Credit:** Rectangle

**No Credit:** Any other answer or missing answer

**Practice items for Mathematical Literacy**

<b>Domain:</b> Mathematical Literacy	<b>Theme:</b> <b><u>Climbing</u></b> <b><u>a wall</u></b>	<b>Class(es):</b> VIII <b>Expected time:</b> 10 MIN <b>Total Credit:</b> 06
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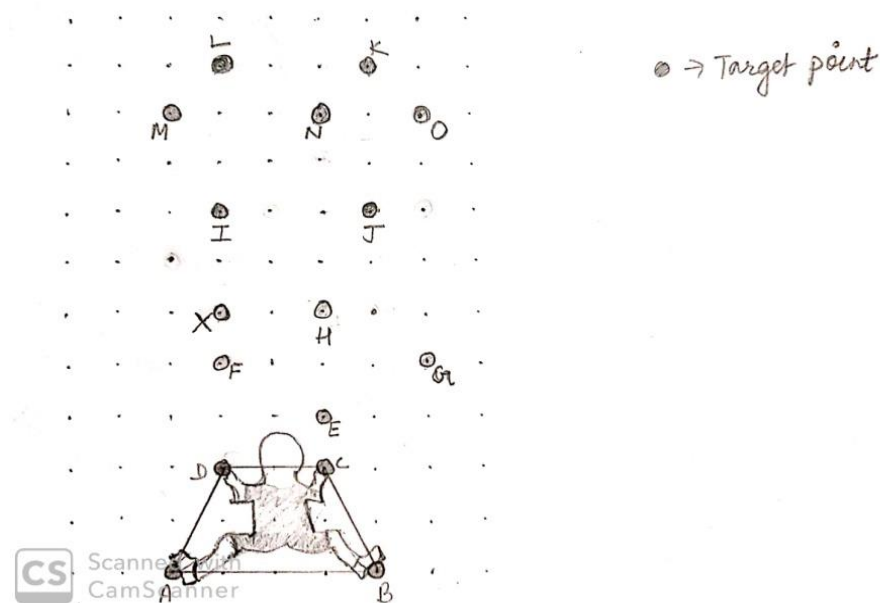
### Climbing a wall

In an adventure training camp, Rohan's coach gave him a task to climb a wall by following certain instructions.

- a) Rohan should start climbing from the bottom of the wall.
- b) The wall had certain target points (shown in figure), only which Rohan must use while climbing.

Rohan starts climbing in such a way that by placing his hands and feet on four target points, he obtains a trapezium. Similarly, he can make other shapes such as square, rhombus, rectangle and parallelogram during his climbing task.

S



#### QUESTIONS:

- (1) Which figure do you get by joining the points –  
 (a) D,C,H,X    (b) E,F,G,H    (c) I,J,K,L    (d) I,J,M,N
- (2) In which of the shapes, the diagonals are perpendicular bisectors of each other?
- (3) Trace at least one quadrilateral which is different in shape from the one mentioned in question (1) and name it.

#### Learning Outcome: (As per NCERT)

- Student learns to identify the different types of quadrilaterals.
- Student learns to apply properties of quadrilaterals in real life situations.

### Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Reflection and Reproduction
Overarching Idea	Similarity and differences of shapes, properties of geometrical shapes
Context	Real life situation
Item Format	Close structured short responses
Cognitive Process	Scientific and analytical
Proficiency Level	Average



**Credit Pattern:**

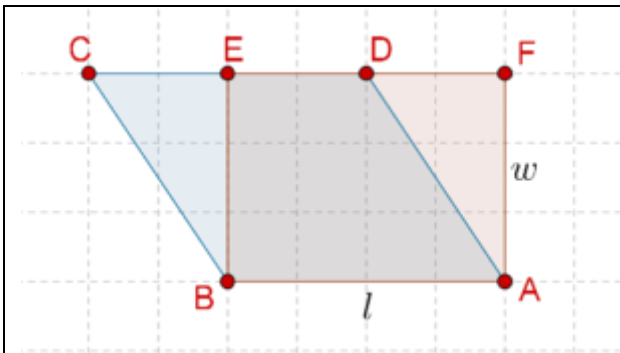
Full Credit: 02

Partial Credit: 01

No Credit: 00

**Description of Answer Key and Credit:****[Q01]: Full Credit:** (a) Rectangle (b) Rhombus (c) Square (d) Parallelogram**Partial Credit:** Any 2 – 3 correct answers.**No Credit:** 0 – 1 correct response.**[Q02]: Full Credit:** Square and Rhombus**Partial Credit:** If any one of the shapes is mentioned.**No Credit:** Any other answer or missing answer**[Q03]: Full Credit:** Tracing the shape KOJN , Kite**Partial Credit:** The shape is traced but name of the figure is not mentioned.**No Credit:** Any other answer or missing answer**Practice items for Mathematical Literacy**

<b>Domain:</b> Mathematical Literacy	<b>Theme:</b> <u><b>DECORATION OF PANDAL</b></u>	<b>Class(es): VIII</b> <b>Expected time: 06 MINS</b> <b>Total Credit: 04</b>
<p align="center"><b><u>DECORATION OF PANDAL FOR CRAFTS MELA</u></b></p> <p>A Craft Mela is to be organized by a Welfare Association to promote the art and culture of tribal people. The pandal is to be decorated by using a string of bulbs all around the field. There are two options for doing the same – either to arrange the string of bulbs in a rectangular pandal ABEF or in a parallelogram pandal ABCD of equal areas.</p>	<b>Learning Outcome:</b> <b>(As per NCERT)</b> <ul style="list-style-type: none"> <li>• <b>Students will analyse and compare the perimeters of rectangle and parallelogram by visualizing the problem.</b></li> <li>• <b>Students will apply the properties of quadrilaterals to solve the problem.</b></li> <li>• <b>Students will relate the problem to real life.</b></li> </ul>	



**QUESTIONS :**

**[Q01]** What shape of the pandal should be chosen to minimize the expenses of using bulbs and why?

**[Q02]** Suppose the pandal chosen is to be divided into two equal triangular parts – one for displaying bamboo made exhibits, and the other for displaying jute made exhibits, how will you do so ?

**Mathematical Literacy**

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Reproduction and Connection
Overarching Idea	Perimeter of Shapes
Context	Scientific and Analytic
Item Format	Subjective, Close structured and Short Response
Cognitive Process	Scientific and Analytical
Proficiency Level	Average

**Credit Pattern:**

Full Credit: 02

Partial Credit: 01

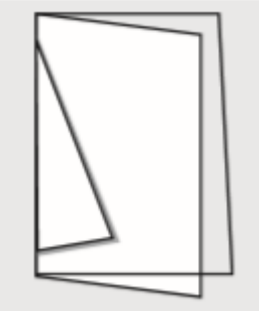
No Credit: 00

**Description of Answer Key and Credit:**

**[Q01]: Full Credit:** Rectangle / ABEF / Rectangle ABEF, Because of lesser perimeter.  
**Partial Credit:** If only the name of the shape is mentioned but no reason is given.  
**No Credit:** Any other answer or missing answer

**[Q02]: Full Credit:** By joining vertices A,E or B,F / By drawing any of the diagonals.  
**No Credit:** Any other answer or missing answer

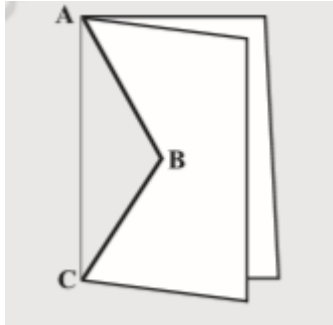
Prepared by- Kendriya Vidyalaya Sangathan, Silchar Region.

<p>Domain Mathematical Literacy</p>	<p>Theme Sheet Folding</p>	<p>Class : 8 Expected Time:15 min Total Credit: 8</p>
<p><b>Description of the Item</b></p> <p>A student takes a white sheet. He then folds it once as shown in the diagram. He then draws two line segments of different lengths as shown in the figure. If he cuts it along the line segments and opens up.</p>  <p>(a) What shape you will get? .....</p> <p>(b) Does the shape obtained have a line of symmetry? .....</p>	<p>Learning Outcome :( As per NCERT)</p> <p>Understanding the types of quadrilaterals.</p>	

(c) Give a method to check whether the diagonals of the shape obtained bisect each other?

.....  
 .....  
 .....  
 .....

(d) If the line segments are equal (refer to the figure given below), then what shape the student will get?



.....

**Answer key**

1. Kite FC:02  
Any Other Response NC: 00
2. Yes, 1 line of Symmetry FC: 02  
Any other Response NC: 00
3. By Paper Folding or Measurement FC:02  
If any one of the method mentioned PC: 01  
Any other response NC:00
4. Rhombus FC: 02  
Any other response NC: 00

**Credit pattern**

**: Full credit- 2,**

**Partial credit: 1**

**No Credit: 0**

Mathematical Literacy

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connections
Overarching Idea	Space and Shape
Context	Educational
Item Format	Closed and open structured response

Prepared by- Kendriya Vidyalaya Sangathan, Silchar Region.

**CRITICAL AND CREATIVE THINKING ITEMS**

**CLASS VIII : CHAPTER 4 : PRACTICAL GEOMETRY**

**INDEX**

<b>S.No.</b>	<b>Theme of the item</b>
<b>24.</b>	Construction of quadrilateral when all four sides and one diagonal is given
<b>25.</b>	Construction of square
<b>26.</b>	Golden Quadrilateral
<b>27.</b>	Size of paper

<b>28.</b>	Golden Ratio
<b>29.</b>	Math Garden
<b>30.</b>	Area Comparison
<b>31.</b>	Construction of rhombus, given a side and a diagonal

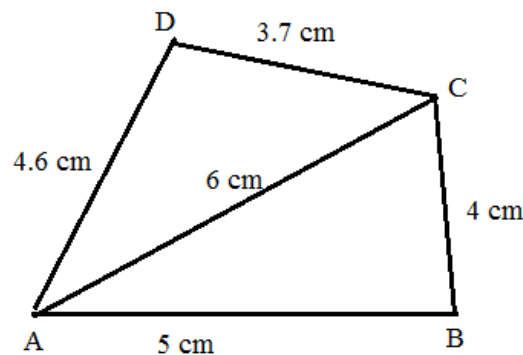
Name of the Vidyalaya: K .V. NEW CANTT , ALLAHABAD

KVS Region: VARANASI

Domain: Mathematical Literacy	Theme: Construction of quadrilateral when all four sides and one diagonal is given	Class(es):VIII expectedtime: 10 min. Total Credit:2*5=10
Description of Item:	Learning Outcome: understanding and calculation of Area of Quadrilateral.	
YES	Text	
YES	Image	
	Table	
	Graph	
	Map	
	Poem	

A park to be constructed in the middle of society, the measurements for the boundaries of the park are as AB = 5 cm BC = 4 cm CD = 3.7 cm and AD = 4.6 cm. (where 1 cm is equal to 10 m)

A single path also needs to be constructed as the diagonal of the park with a measurement of 6 cm (1 cm = 10 m). But before starting the construction process the engineer made a sketch based on the measurement. The rough sketch of the park looks like as follows:-



Now to get an exact shape they thought of constructing this shape using Geometrical instruments on paper.

Q. 1:- How many elements a quadrilateral having?

- A) 4
- B) 6
- C) 8
- D) 10

FRAMEWORK	CHARACTERISTICS
Competency Cluster	reproduction
Overarching Idea	quantity
Context	SCIENTIFIC

Item format	MCQ
Cognitive Process	INTERPRET
Proficiency Level	Proficiency Level 1

CreditPattern

Q.1:- Full Credit: - Option D  
No Credit: - Any other option.

Q. 2:- To draw a quadrilateral how many independent elements must be given?

- A) 3    B) 4  
C) 5    D) 6

FRAMEWORK	CHARACTERISTICS
Competency Cluster	REPRODUCTION
Overarching Idea	SPACE AND SHAPE
Context	SCIENTIFIC
Item format	MCQ
Cognitive Process	INTERPRET
Proficiency Level	Proficiency Level 1

Credit Pattern:

Q. 2:- Full Credit: - Option C  
No Credit: - Any other option.

Q. 3:- how many angles does a quadrilateral have?

- A) 2    B) 3  
C) 4    D) All of these

FRAMEWORK	CHARACTERISTICS
Competency Cluster	CONNECTION
Overarching Idea	QUANTITY
Context	SCIENTIFIC
Item format	MCQ
Cognitive Process	INTERPRET
Proficiency Level	Proficiency Level 1

Credit Pattern:

Q. 3:- Full Credit: - Option C

No Credit: - Any other option.



Q. 4:- Find the length of the boundary of the park.

FRAMEWORK	CHARACTERISTICS
Competency Cluster	CONNECTION
Overarching Idea	QUANTITY
Context	PUBLIC
Item format	MCQ
Cognitive Process	INTERPRET/ EVALUATE
Proficiency Level	Proficiency Level 1

Credit Pattern

Full Credit: - boundary of the park = 173 m  
 (The length of the boundary of the park = some of all sides =  $5+4+3.7 +4.6 = 17.3$  cm  
 SINCE Given that 1 cm = 10 m  
 So boundary of the park = 173 m)  
 No Credit: - Any other answers or wrong calculation.

Q.5:- If the rate of fencing of park is Rs.18 per meter, the find the cost of fencing of the park.

FRAMEWORK	CHARACTERISTICS
Competency Cluster	CONNECTION
Overarching Idea	QUANTITYCHANGE AND RELATION
Context	SCIENTIFIC
Item format	MCQ
Cognitive Process	INTERPRET AND EVALUATE
Proficiency Level	Proficiency Level 2

Credit Pattern:

Q. 5:- Full Credit: - The Cost of fencing= Rs 3114/-  
 (The cost of fencing of the park =  $173 \times 18 = 3114/-$ )

No Credit: - Any other answers or wrong calculation.

Name of the Teacher/Item Writer: Avinash Gupta

Designation: TGT – MATHS

Email : avihary@gmail.com

Phone No.: 9451894640

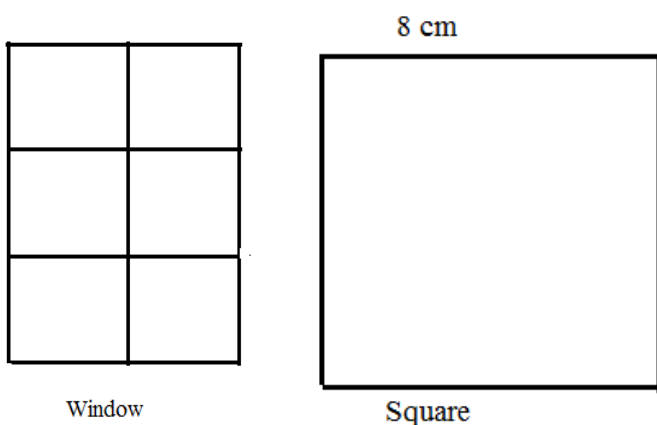
Name of the Vidyalaya: K.V NEW CANTT , ALLAHABAD

KVS Region: VARANASI

Domain: Mathematical Literacy	Theme (Construction of square)	Class(es):VIII Expected time: 20 MIN Total Credit: 10												
Description of Item: <table border="1"><tr><td>yes</td><td>Text</td></tr><tr><td>yes</td><td>Image</td></tr><tr><td></td><td>Table</td></tr><tr><td></td><td>Graph</td></tr><tr><td></td><td>Map</td></tr><tr><td></td><td>Poem</td></tr></table>	yes	Text	yes	Image		Table		Graph		Map		Poem	Learning Outcome:  (As per NCERT) UNDERSTANDING , PROPERTIES OF SQUARE AND FINDING AREA AND PERIMETER .	
yes	Text													
yes	Image													
	Table													
	Graph													
	Map													
	Poem													

On a very fine day of monsoon Ramesh felt a flow of rainy air in his room. After inspecting he found out that one of the window panes in his room was broken. So to renovate the broken part of the window, he thought to take the measurement.

After taking measurement he found that all the sides of the window panes are equal and a quadrilateral having all the four sides equal is known as square. Now he needs to draw that square shape on the glass to cut it neatly. But before drawing on the glass it would be wiser to draw on a paper and practice it. Now help him to construct (draw) square if its side is 8 cm each.



Q. 1:- Which of the following statements are true for a square.

- (i) It has all its sides of equal length.
- (ii) Its diagonals are equal to its sides.
- (iii) Its diagonals bisect each other at right angles.

(iv) Its opposite angles are not equal.

FRAMEWORK	CHARACTERISTICS
Competency Cluster	CONNECTION
Overarching Idea	SPACES AND SHAPES
Context	SCIENTIFIC
Item format	Simple MCQ
Cognitive Process	INTERPRATE
Proficiency Level	Proficiency Level 1

Credit Pattern:

Q.1:- Full Credit: - (i) True  
(ii) False  
(iii) True  
(iv) False

Partial credit: - 1 mark for any two or three correct answers

No Credit: - Any one part or wrong answer

Q. 2:- The measurement of each angle of square is

A)  $60^{\circ}$

B)  $90^{\circ}$

C)  $120^{\circ}$

D)  $180^{\circ}$

FRAMEWORK	CHARACTERISTICS
Competency Cluster	QUANTITY
Overarching Idea	SPACE AND SHAPE
Context	SCIENTIFIC

Item format	Simple MCQ
Cognitive Process	INTERPRATE
Proficiency Level	1

Credit Pattern:

Q. 2:- Full Credit: - Option B No Credit: - Any other answer
---

Q. 3:- The diagonals of a square are

A) Equal

B) Not equal

C) Twice of its side

D) None of these

FRAMEWORK	CHARACTERISTICS
Competency Cluster	CONNECTION
Overarching Idea	SPACE AND SHAPE
Context	SCIENTIFIC
Item format	Simple MCQ
Cognitive Process	INTERPRATE
Proficiency Level	Proficiency Level 1

Credit Pattern:

Q. 3:- Full Credit: - Option A No Credit: - Any other option
---

Q. 4:- Find the area of window panes.

FRAMEWORK	CHARACTERISTICS
Competency Cluster	CONNECTION
Overarching Idea	CHANGE AND RELATION
Context	SCIENTIFIC
Item format	CLOSE ENDED
Cognitive Process	EVALUATE
Proficiency Level	Proficiency Level 2

Credit Pattern:

Q. 4:- Full Credit: - Area of square = side x side = 8 cm x8 cm = 64 cm<sup>2</sup>  
 Partial credit : correct formula but wrong calculation  
 No Credit: - Any other answers.

Q.5:- If the cost of window panes is Rs.16 per square cm, then what is the cost of one window panes?

FRAMEWORK	CHARACTERISTICS
Competency Cluster	REPRODUCTION/ CONNECTION
Overarching Idea	CHANGE AND RELATIONSHIP
Context	SCIENTIFIC
Item format	CLOSE ENDED
Cognitive Process	EVALUATION
Proficiency Level	Proficiency Level 3

Credit Pattern:

Q. 5:- Full Credit: - Cost of window pane = Rs. 1024  
 (Cost of window pane = Area x Rate =  $64 \times 16 = 1024$ )  
 No Credit: - Any other answers or wrong calculation.

Name of the Teacher/Item Writer: Avinash Gupta

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**Creative and Critical Thinking (CCT) Practice Assessment of Mathematical  
literacy**

**Name of the Vidyalaya: K.V. OLD CANTT. , ALLAHABAD**

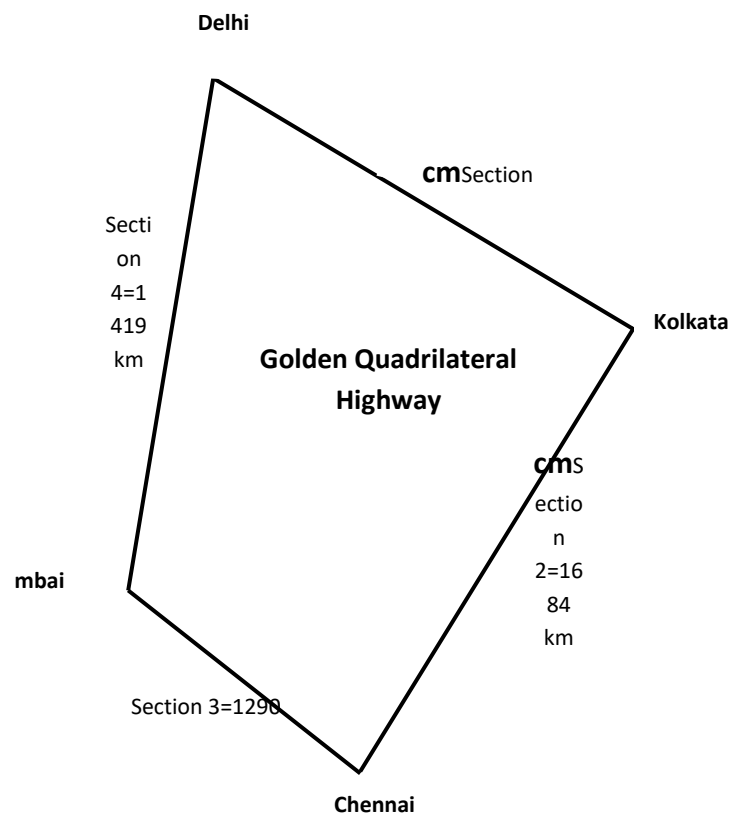
**KVS Region: VARANASI**

**Theme 1**

Domain: Mathematical Literacy	Theme:Golden Quadrilateral	Class(es):VIII expected time: 15min. Total Credit:2*5=10												
Description of Item: <table border="1" data-bbox="161 1917 435 2123"> <tr><td>YES</td><td>Text</td></tr> <tr><td>YES</td><td>Image</td></tr> <tr><td></td><td>Table</td></tr> <tr><td></td><td>Graph</td></tr> <tr><td></td><td>Map</td></tr> <tr><td></td><td>Poem</td></tr> </table>	YES	Text	YES	Image		Table		Graph		Map		Poem	Learning Outcome: understanding and calculation of Perimeter of Quadrilateral.	
YES	Text													
YES	Image													
	Table													
	Graph													
	Map													
	Poem													

India is one of the largest countries in the world and the second most populated country in the world after China. Golden Quadrilateral is the largest highway project completed in India. It is also the fifth longest highway project in the world. The project was launched by NDA Government led by the Prime Minister Shri Atal Bihari Vajpayee in 2001. Shri Atal Bihari Vajpayee once said, "Our roads don't have a few potholes. Our potholes have a few roads."

Upon completion, it connected four major metro cities of India i.e. Delhi, Mumbai, Chennai and Kolkata. The Golden Quadrilateral project passes through 13 states of India. Andhra Pradesh shares the highest length of road 1014 km and Delhi has the lowest 25 km. Project was officially started in 2001. Project was divided into four sections. Each section is approximately a side of Quadrilateral. Metro cities Delhi, Kolkata, Chennai and Mumbai are vertices of this Golden Quadrilateral.



A tourist started his journey from a Metro city on Sunday to visit all four Metro cities by car. He drives his car at uniform speed 60km/hr. He will drive only 8 hours per day. On arriving the next Metro city, he will take rest on that particular day. Next day he will start for next Metro city.

Q.1. What will be Total length of Golden Quadrilateral Project

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connections
Overarching Idea	Quantity
Context	Public
Item format	Closed Constructed Response
Cognitive Process	Evaluate
Proficiency Level	Proficiency Level 1

Credit Pattern:

Full Credit: If response is 5846 km.



Partial Credit: If response is 5846.

Nil Credit: Other response.

Description of Answer Key and Credits:

1453+1684+1290+1419=5846 km

Q.2. In which state does he drive the car for the longest time.

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Reflection
Overarching Idea	Quantity
Context	Public
Item format	Close Constructed Response
Cognitive Process	Interpret
Proficiency Level	Proficiency Level 3

Credit Pattern:

Full Credit: If response is Andhra Pradesh.

Partial Credit: NA.

Nil Credit: Other response.

Description of Answer Key and Credits:

Andhra Pradesh because 1014km highway in Andhra Pradesh

Q.3. From which Metro city should he start journey to reach all Metro cities taking minimum days.

a) Dehli      b) Kolkata      c) Chennai      d) All

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connection
Overarching Idea	Change and Relationship

Context	Public
Item format	Complex MCQ
Cognitive Process	Interpret
Proficiency Level	Proficiency Level 4

Credit Pattern:

Full Credit: If response is D.

Partial Credit: Other response.

Nil Credit: NA.

Description of Answer Key and Credits:

Delhi- Kolkata-Chennai-Mumbai = 11 days Delhi-Mumbai-Chennai-Kolkata = 10 days Kolkata-Chennai-Mumbai- Delhi = 10 days Kolkata-Delhi-Mumbai-Chennai = 10 days Chennai-Mumbai- Delhi- Kolkata = 10 days Chennai -Kolkata-Delhi-Mumbai = 11 days Mumbai- Delhi- Kolkata -Chennai = 11 days Mumbai -Chennai -Kolkata-Delhi = 11 days
--

Q.4. Minimum how many Kilo meter will he drive to reach all metro cities.

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connection
Overarching Idea	Change and relationship
Context	Public
Item format	Closed constructed response
Cognitive Process	Interpret
Proficiency Level	Proficiency Level 3

Credit Pattern:

Full Credit: if response is 4162 km

Partial Credit:4162

Nil Credit:other response

Description of Answer Key and Credits:

1290+1419+1453=4162km
-----------------------

Q.5. If he starts journey from Delhi, which day will he arrive to Kolkata.

A) Monday B) Tuesday C) Thursday D) Friday

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connection
Overarching Idea	Change and relation
Context	Public
Item format	Complex MCQ
Cognitive Process	Interpret
Proficiency Level	Proficiency Level 4

Credit Pattern:

Full Credit: if response is Tuesday

Partial Credit: na

Nil Credit: other response

Description of Answer Key and Credits:

Delhi to kolkata – Wednesday Delhi to Kolkata via Mumbai ,Chennai –Tuesday
---

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**Creative and Critical Thinking (CCT) Practice Assessment of Mathematical literacy**

**Name of the Vidyalaya: K.V. OLD CANTT. , ALLAHABAD**

**KVS Region: VARANASI**

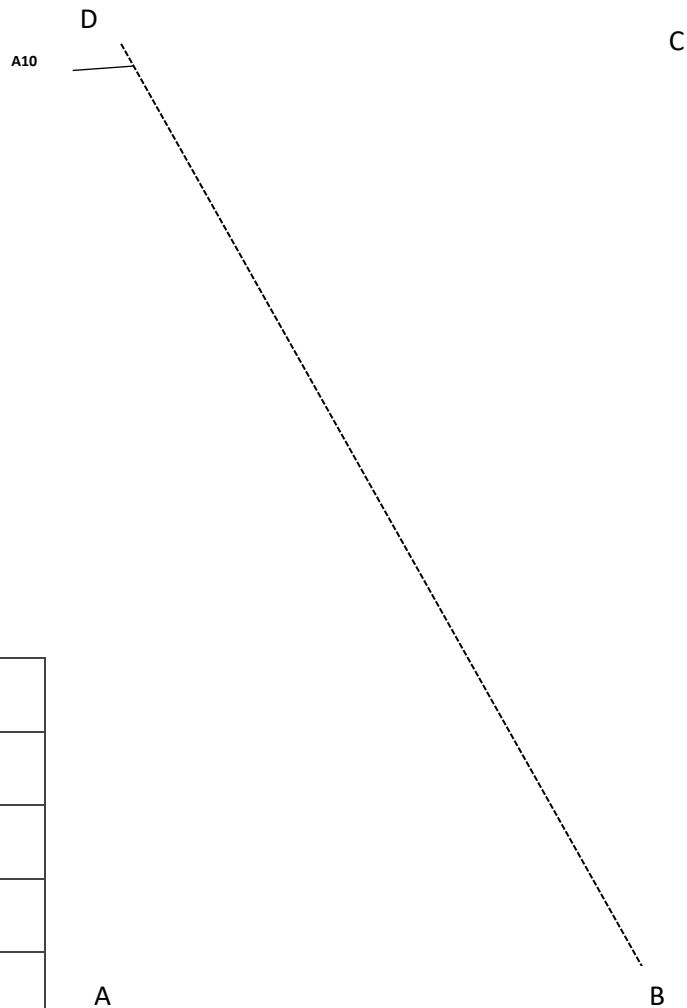
**Theme 2**

Domain: Mathematical Literacy	Theme: Size of paper	Class(es):VIII expected time: 15min. Total Credit:2*5=10												
Description of Item: <table border="1"> <tr><td>YES</td><td>Text</td></tr> <tr><td>YES</td><td>Image</td></tr> <tr><td></td><td>Table</td></tr> <tr><td></td><td>Graph</td></tr> <tr><td></td><td>Map</td></tr> <tr><td></td><td>Poem</td></tr> </table>	YES	Text	YES	Image		Table		Graph		Map		Poem	Learning Outcome: understanding and calculation of side of Quadrilateral.	
YES	Text													
YES	Image													
	Table													
	Graph													
	Map													
	Poem													

AS, We all have heard about A4 size paper. A0 is the largest size of it; each size after that becomes progressively smaller. Specifically, each subsequent size is simply the result of cutting the previous size in half, so the proportions of length to width are preserved. A10 is the smallest size of A-series paper. The measurement of A4 size paper is 297mm X 210mm.

Here ABCD is rectangle which represent A0 size paper.  $AB=x$   $BC=y$ ,  $AC=z$ ,  $\sqrt{2} = 1.414$

Q.1 How many A4 size paper can be cut from A0 size paper. Show the calculation.



FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connection
Overarching Idea	Quantity
Context	Public
Item format	Closed constructed response
Cognitive Process	Evaluate
Proficiency Level	Proficiency Level 2

Credit Pattern:

Full Credit: if response is 16

Partial Credit:na

Nil Credit:other response

Description of Answer Key and Credits:

A0=2 A1=2\*2 A2=2\*2\*2 A3= 2\*2\*2\*2 A4 =16 A4

Q.2 Approx. ratio of length to width of A2 size paper is

A)  $1:\sqrt{2}$       B)  $\sqrt{2}:\sqrt{3}$       C)  $\sqrt{2}:1$       D)None

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connection
Overarching Idea	Quantity
Context	Public
Item format	Mcq
Cognitive Process	Evaluate
Proficiency Level	Proficiency Level 2

Credit Pattern:

Full Credit:if response is C

Partial Credit:na

Nil Credit:other response

Description of Answer Key and Credits:

--

297/210 = 1.41428... =  $\sqrt{2}$  (approx.)  
Option C is answer

Q.3 Approx value of y will be

- a) 1184mm    b) 1185mm    c) 1189mm    d) 1190mm

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connection
Overarching Idea	Quantity
Context	Public
Item format	Mcq
Cognitive Process	Interpret
Proficiency Level	Proficiency Level 3

Credit Pattern:

Full Credit: C

Partial Credit: D

Nil Credit: other response

Description of Answer Key and Credits:

Length of A0 = 48 length of A4 = 48 \* 297 = 1188mm  
Option C is answer

Q.4 Value of x:y:z is

- A) 1:2:3    B)  $\sqrt{1} : \sqrt{2} : \sqrt{3}$  C)  $\sqrt{2} : \sqrt{3} : \sqrt{4}$  D)  $1 : \sqrt{2} : 3$

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Reproduction
Overarching Idea	Change and relationship
Context	Public

Item format	Mcq
Cognitive Process	Evaluate
Proficiency Level	Proficiency Level 4

Credit Pattern:

Full Credit: B

Partial Credit:na

Nil Credit:other response

Description of Answer

Ratio of width to length = $1:\sqrt{2}$ Now x:y:z = option B
---

Q.5 If A10 represents 1GB and A0 represents 1TB, then how many GB in 1TB.

a) 1000

b) 1020

c)1024

d)1080

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connection
Overarching Idea	quantity
Context	Public
Item format	Mcq
Cognitive Process	Interpret
Proficiency Level	Proficiency Level 2

Credit Pattern:

Full Credit: if response is option c

Partial Credit:na

Nil Credit:other option

Description of Answer Key and Credits:

<p>1 A0=2 A1 = 2*2 A2= 2*2*2 =A3= 2*2*2*2 A4= 2*2*2*2*2 A5= 2*2*2*2*2*2 A6= 2*2*2*2*2*2*2 A7= 2*2*2*2*2*2*2*2 A8= 2*2*2*2*2*2*2*2*2 A9= 2*2*2*2*2*2*2*2*2*2 A10= 1024 A10 1TB=1024GB</p>
--

Name of the MASTER TRAINER/Item Writer: DEEPENDRA PRATAP SINGH

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Name of the Vidyalaya: K.V. NEW CANTT , ALLAHABAD

KVS Region: VARANASI

Domain: Mathematical Literacy	Theme; Math Garden	Class(es):VIII Expected time: 20 MIN Total Credit: 10										
Description of Item: <table border="1"><tr><td>YES</td><td>Text</td></tr><tr><td>NO</td><td>Image</td></tr><tr><td></td><td>Table</td></tr><tr><td></td><td>Graph</td></tr><tr><td></td><td>Map</td></tr></table>	YES	Text	NO	Image		Table		Graph		Map	Learning Outcome: UNDERSTANDING QUADRILATERALS	
YES	Text											
NO	Image											
	Table											
	Graph											
	Map											

Sam, Tim, Elle and Vinni participated in Mathematical Garden competition. In this they have to make a garden with the application of Mathematics. They asked their teacher for help. Their teacher suggested to form a garden of quadrilateral shape. Teacher asked them to stand at the four corners(vertex) such that they form a quadrilateral. The order for them to stand has been decided as Sam, Elle, Tim and Vinni. Teacher had given the distance between Sam and Tim as 16m whereas between Elle and Vinni as 30m also the distance between consecutive positions are equal. Now, the teacher had asked the students to complete the garden in 10 days.

1. Which type of quadrilateral is possible in the given condition?

(a) Trapezium

(c) Rectangle

(b) Kite

(d) Rhombus

FRAMEWORK	CHARACTERISTICS
Competency Cluster	CONNECTION
Overarching Idea	SPACE AND SHAPE
Context	SCIENTIFIC
Item format	Simple MCQ
Cognitive Process	INTERPRETATION

Proficiency Level	Proficiency Level 1
-------------------	---------------------

Explain expected answer and the respective credits

1. Full credit – Option D

No credit – Any other option

Credit Pattern:

2. For the quadrilateral shape garden the distance between Sam, Tim ,Elle and Vinni. represents which part of quadrilateral?

- (a) Sides (b) Angles
- (c) Diagonals (d) Vertex

FRAMEWORK	CHARACTERISTICS
Competency Cluster	CONNECTION
Overarching Idea	SHAPE AND SIZE
Context	SCIENTIFIC
Item format	Simple MCQ
Cognitive Process	INTERPRETATION
Proficiency Level	Proficiency Level 1

Credit Pattern:

2. Full credit – Option a AND c  
 Partial credit- option a or c  
 No credit – Any other option

3. The students thought of planting rose plants at the distance between Sam-Tim and Elle- Vinni .A Ficus plant at the centre of these. Calculate the distance of Ficus plant from Elle?

(a) 15 m

(b) 13m

(c) 11m

(d) 12m

FRAMEWORK	CHARACTERISTICS
Competency Cluster	CONNECTION
Overarching Idea	SHAPE AND SIZE
Context	SCIENTIFIC
Item format	Simple MCQ
Cognitive Process	EVALUATION
Proficiency Level	Proficiency Level 1

Credit Pattern:

3. Full credit – Option A No credit – Any other option
---

4. What will be the distance between Tim and Elle?

(a) 1200 cm

(b) 1300 cm

(c) 1500 cm

(d) 1700 cm

FRAMEWORK	CHARACTERISTICS
Competency Cluster	CONNECTION
Overarching Idea	SPACE AND SHAPE
Context	SCIENTIFIC
Item format	Simple MCQ
Cognitive Process	EVALUATION
Proficiency Level	Proficiency Level 1

Credit Pattern:

4. Full credit – Option D  
No credit – Any other option

5. Give the measurement of the angle formed at the ficus plant from Sam and Elle ?

(a)  $120^{\circ}$

(b)  $90^{\circ}$

(c)  $60^{\circ}$

(d)  $180^{\circ}$

FRAMEWORK	CHARACTERISTICS
Competency Cluster	CONNECTION
Overarching Idea	SHAPE AND SIZE
Context	SCIENTIFIC
Item format	SimpleMCQ
Cognitive Process	INTERPRETATION
Proficiency Level	Proficiency Level 1

5. Full credit – Option b

Credit Pattern:

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**Creative and Critical Thinking (CCT) Practice Assessment of Mathematical literacy**

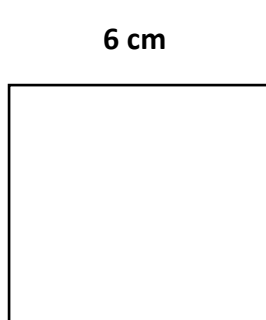
**Name of the Vidyalaya: K.V. OLD CANTT. , ALLAHABAD**

**KVS Region: VARANASI**

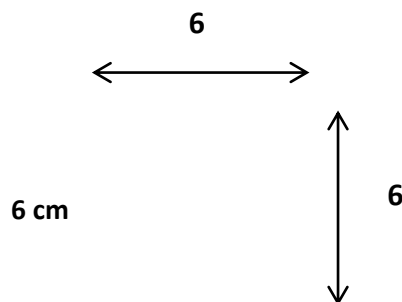
**Theme 4**

Domain: Mathematical Literacy	Theme:Area Comparson	Class(es):VIII expected time: 15min. Total Credit:2*5=10												
Description of Item: <table border="1"> <tr><td>YES</td><td>Text</td></tr> <tr><td>YES</td><td>Image</td></tr> <tr><td></td><td>Table</td></tr> <tr><td></td><td>Graph</td></tr> <tr><td></td><td>Map</td></tr> <tr><td></td><td>Poem</td></tr> </table>	YES	Text	YES	Image		Table		Graph		Map		Poem	Learning Outcome: understanding and calculation of Area and perimeter of Quadrilateral.	
YES	Text													
YES	Image													
	Table													
	Graph													
	Map													
	Poem													

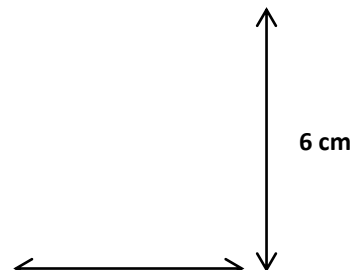
**Look at following pictures**



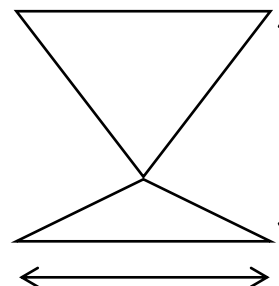
**A**



**BMu**



**C**



**D**

Q1. Which has largest Area and give reasons.

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connection

Overarching Idea	Change and relationship
Context	Scientific
Item format	Closed constructive response
Cognitive Process	interpret
Proficiency Level	Proficiency Level 2

Credit Pattern:

Full Credit: if response is picture A

Partial Credit:na

Nil Credit: other response

Description of Answer Key and Credits:

All picture will fit into picture A
-------------------------------------

Q2. What is perimeter of picture B

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Reproduction
Overarching Idea	Evaluate
Context	Scientific
Item format	Closed constructive response
Cognitive Process	Evaluate

Proficiency Level	Proficiency Level 2-3
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Credit Pattern:

Full Credit: if response is 24 unit

Partial Credit:na

Nil Credit: other response

Description of Answer Key and Credits:

Total length of horizontal parts =6, total length of vertical parts =6, Perimeter = 6+6+6+6=24 unit
--

Q3. Discuss how will you find Area of picture C.

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Connection
Overarching Idea	Change and relationship
Context	Scientific
Item format	Open constructive response
Cognitive Process	Interpret
Proficiency Level	Proficiency Level 4-6



Credit Pattern:

Full Credit: if response is in the direction of right concept

Partial Credit: If response is approximately in the direction of right concept

Nil Credit: Other response

Description of Answer Key and Credits:

1. Draw picture on the graph paper and count the number of square which lie partially and fully in the picture.
2. Draw the many pieces of same picture and stacked up. Fill the water and measure the volume of water and then divide by height of 3D object.
3. Other response to find area which is correct.

Q4. Discuss how you will find Perimeter of picture C.

FRAMEWORK	CHARACTERISTICS
Competency Cluster	Reproduction
Overarching Idea	Change and relationship
Context	Scientific
Item format	Open constructive response
Cognitive Process	Interpret
Proficiency Level	Proficiency Level 4-6

Credit Pattern:

Full Credit:if response is in the direction of right concept

Partial Credit:If response is approximately in the direction of right concept

Nil Credit: other response

Description of Answer Key and Credits:

Measure perimeter of picture using thread.  
Cut into many parts and arrange along to a line then measure.

Q5. Approx perimeter of picture D will be.

- a) 20      b) 22      c) 23      d) 25

FRAMEWORK	CHARACTERISTICS
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Competency Cluster	Connection
Overarching Idea	Quantity
Context	Scientific
Item format	MCQ
Cognitive Process	Interpret
Proficiency Level	Proficiency Level 2

Credit Pattern:

Full Credit: option d

Partial Credit:na

Nil Credit:other response

Description of Answer Key and Credits:

Sum 2 sides of triangle will be greater than third side
---

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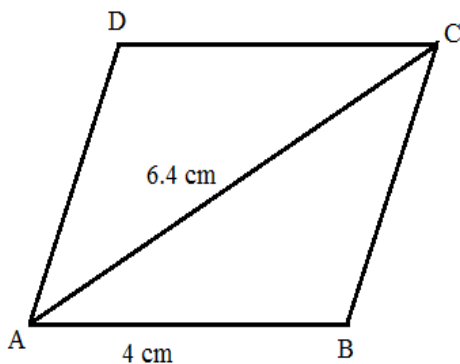
Phone No.: 8800767323

Name of the Vidyalaya: K .V. NEW CANTT , ALLAHABAD

KVS Region: VARANASI

Domain: Mathematical Literacy	Theme(Construction of rhombus, given a side and a diagonal):	Class(es):VIII Expected time: 5 minutes Total Credit: 2*5=10												
Description of Item: <table border="1"> <tr><td>Yes</td><td>Text</td></tr> <tr><td>Yes</td><td>Image</td></tr> <tr><td></td><td>Table</td></tr> <tr><td></td><td>Graph</td></tr> <tr><td></td><td>Map</td></tr> <tr><td></td><td>Poem</td></tr> </table>	Yes	Text	Yes	Image		Table		Graph		Map		Poem	Learning Outcome: Understanding and calculation of Area of Rhombus.	
Yes	Text													
Yes	Image													
	Table													
	Graph													
	Map													
	Poem													

Shyam is hard working child. He is studying hard because tomorrow he has a mathematics test but he was stuck in a construction problem, where the problem says that to construct a rhombus ABCD in which a side AB = 4 cm and diagonal AC = 6.4 cm. So he asks his father to help him with the problem. His father says since rhombus has all its sides are equal and the diagonals bisect each other at 90°. It is easy to construct if 5 independent elements are given as a side and diagonal,so construct a rhombus with a side and a diagonal. Shyam construct rhombus by given information with the help of Geometrical instruments on paper.



Q. 1:- A Parallelogram, having a pair of adjacent sides is equal then it becomes a

- A) Square
- B) Kite
- C) Rectangle
- D) Rhombus

FRAMEWORK	CHARACTERISTICS
Competency Cluster	REPRODUCTION
Overarching Idea	SPACE AND SHAPE

Context	SCIENTIFIC
Item format	COMPLEX MCQ
Cognitive Process	INTERPRET
Proficiency Level	Proficiency Level 1

Credit Pattern:

Q.1:- Full Credit: - Option D  
 Partial Credit: option A  
 No Credit: - Any other option

Q. 2:- Fill in the blanks

(i) A rhombus has all sides of ..... length.

(ii) The diagonals of a rhombus ..... each other at ..... angles.

FRAMEWORK	CHARACTERISTICS
Competency Cluster	CONNECTION
Overarching Idea	QUANTITY
Context	SCIENTIFIC
Item format	Simple MCQ
Cognitive Process	INTERPRET
Proficiency Level	Proficiency Level 1

Credit Pattern:

Q. 2:- Full Credit: - (i) Equal  
 (ii) Bisect and right  
 Partial credit: - 1 mark for any one correct response.  
 No Credit: - Incorrect / vague answers

Q. 3:- The opposite angles of a rhombus are

- A) Equal  
C) Not Equal

- B) half of another angle  
D) None of these

FRAMEWORK	CHARACTERISTICS
Competency Cluster	CONNECTION
Overarching Idea	SPACE AND SHAPE
Context	SCIENTIFIC
Item format	Simple MCQ
Cognitive Process	INTERPRET
Proficiency Level	Proficiency Level 2

Credit Pattern

Q. 3:- Full Credit: - Option A  
No Credit: - Any other option

Q. 4:- Find the perimeter of given rhombus.

FRAMEWORK	CHARACTERISTICS
Competency Cluster	CONNECTION
Overarching Idea	CHANGE AND RELATIONSHIP
Context	SCIENTIFIC
Item format	CLOSE ENDED
Cognitive Process	EVALUATION
Proficiency Level	Proficiency Level 1

Credit Pattern:

Q. 4:- Full Credit: - Perimeter of the rhombus =  $4 \times \text{side} = 4 \times 4 \text{ cm} = 16 \text{ cm}$   
Partial credit : only formula but wrong calculation  
No Credit: - Any other answers or wrong calculation

Q.5:- If the diagonals of a rhombus are 12 cm and 16 cm, find the length of side.

FRAMEWORK	CHARACTERISTICS
Competency Cluster	CONNECTION
Overarching Idea	CHANGE AND RELATIONSHIP
Context	SCIENTIFIC
Item format	CLOSE ENDED
Cognitive Process	EVALUATE
Proficiency Level	Proficiency Level 3

Credit Pattern:

Q. 5:- Full Credit: - Side<sup>2</sup> =  $(\frac{12}{2})^2 + (\frac{16}{2})^2 = (6)^2 + (8)^2 = 36 + 64 = 100$ , Side = 10 cm

Partial credit : only formula(Pythagoras theorem) but wrong calculation

No Credit: - Any other answers or wrong calculation

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**CRITICAL AND CREATIVE THINKING ITEMS**

**CLASS VIII : CHAPTER 5 : DATA HANDLING**

**INDEX**

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37.	Activities of school
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## ITEM 1 : BRIDGING THE GAP

Domain : Mathematical Literacy	Topic: Data Handling  Learning Outcome :Understand, Interpret data (As per NCERT)	Class: VIII Expected Time : 10-15 Total Credit:10
Description of item:	Understand , analyse and evaluate the data provided	

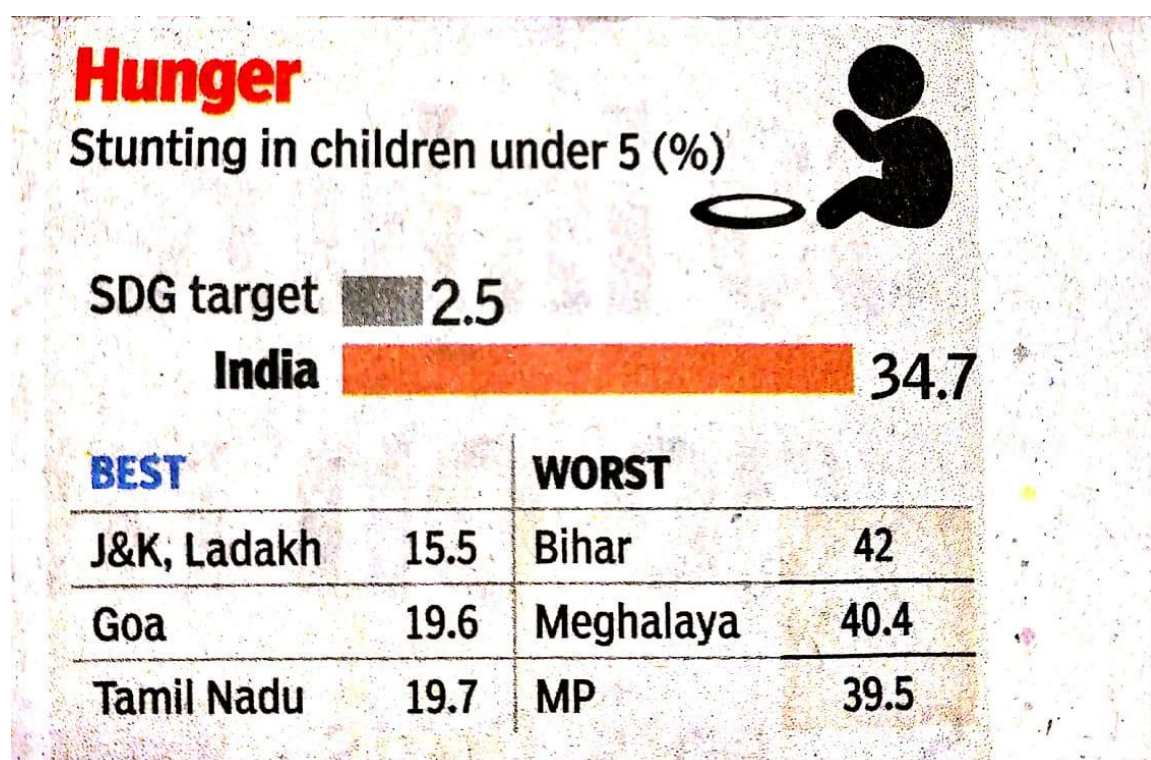
Mal -Nutrition under 5 years of age is one of the biggest challenges that we face in India today. A large number of children below 5 years do not get proper food due to various socio-economic factors.

Different programmes are taken up both by the central and the state Governments to eradicate mal nutrition among children.

The United Nations has set a target to end this problem by 2030 under Sustainable Development Goals(SDG). The following data by NITI AYOOG gives a brief idea of India's progress in the matter.

Read the report and answer the questions .

( Source: Times of India Dated January 6, 2020) All the figures given below are in terms of percentages.





Q1. By 2030, the SDG target to be achieved shows that only 2.5% of children would be hunger prone. But what is the actual % today?

-----

Q2. Name the state which fared the best in preventing hunger among children?

-----

Q3. By what percentage is Bihar more than India's percentage of hungry children below age 5?

-----

Q4. Read the 2 sentences below and choose the correct options:

- I) Goa and Tamil Nadu have the same percentage in the given data.
- II) The % of hungry children in the state of Bihar is found to be alarmingly high.

- (a) Both (I) and (II) are true
- (b) Both (I) and (II) are false
- (c) Only (II) is true but (I) is false
- (d) Only (I) is true but (II) is false

Q5. If India has to reach the target set by United Nations by 2030, approximately how much % decrease should we achieve every year, assuming the percentage of decrease remains the same?

-----

## ITEM 2 :TRASH MATTERS

Domain : Mathematical Literacy	Topic: Data Handling  Learning Outcome :Understand, Interpret data (As per NCERT)	Class: VIII Expected Time :10-15 Total Credit:10
Description of item:	Understand , analyse and evaluate the data provided	

Modernisation has made our life easier . Machines and gadgets have become our extended hands , making day to day work easier and faster .

One of the biggest problems of modernisation is waste management. Cities are struggling how to keep themselves free of garbage. Our coastal cities are flooded with garbage both on land and water which is affecting all living forms.

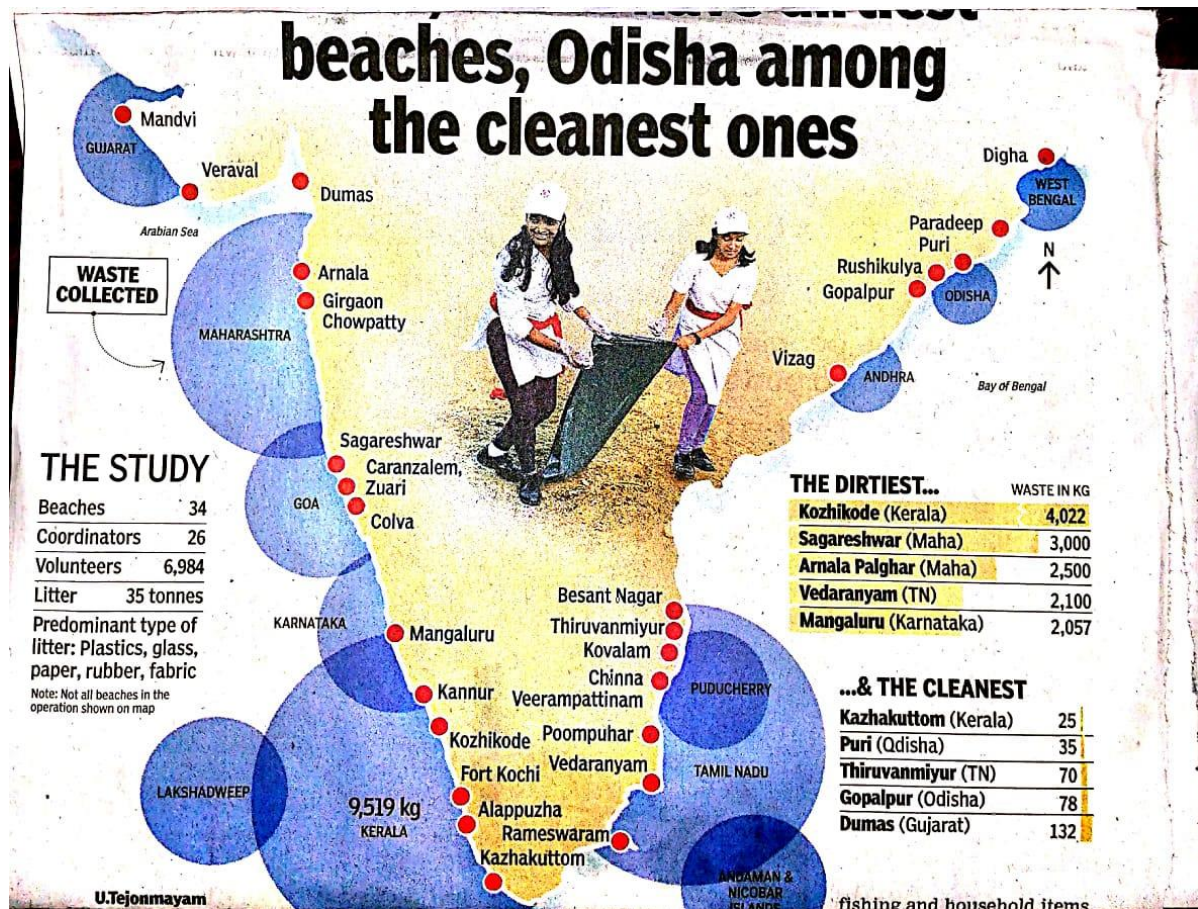
A research was conducted by a group of volunteers of National Centre for Coastal Research in September 2019. They went on a clean-up drive on the beaches. Ashika , a class VIII student also volunteered in the clean-up drive.

She was shocked to see tons of waste piled up .( 1 ton = 1000kg approx.)

She found that waste collected mainly comprised of plastic, glass, paper and general waste left behind by tourists. It also had pieces of fishing nets and waste flowing down the backwaters from different areas.

The group tried to rate the cleanest and the dirtiest of our beaches based on the amount of waste collected on a particular day in 2 hours. The findings are shown below.

(Source: Times of India Dated 9<sup>th</sup> January 2020)



Q1. What was the study about?

- To find out which beach was the cleanest.
- To find out which beach was the dirtiest.
- To rate the beaches based on the waste generated there.
- All of the above.

Q2. Which state has 2 beaches rated among the top 5 cleanest places?

-----

Q3. How many beaches did the volunteers collect waste from?

-----

Q4. According to the survey, which beach generated the maximum waste?

What are the predominant type of waste collected?

-----

Q5. As a volunteer, how much waste each one must have collected on an average?

-----

### ITEM 3 :FARE HIKE IS FAIR ENOUGH !

Domain : Mathematical Literacy	Topic: Data Handling  Learning Outcome :Understand, Interpret data (As per NCERT)	Class: VIII Expected Time :10-15 Total Credit:15
Description of item:	Understand , analyse and evaluate the data provided	

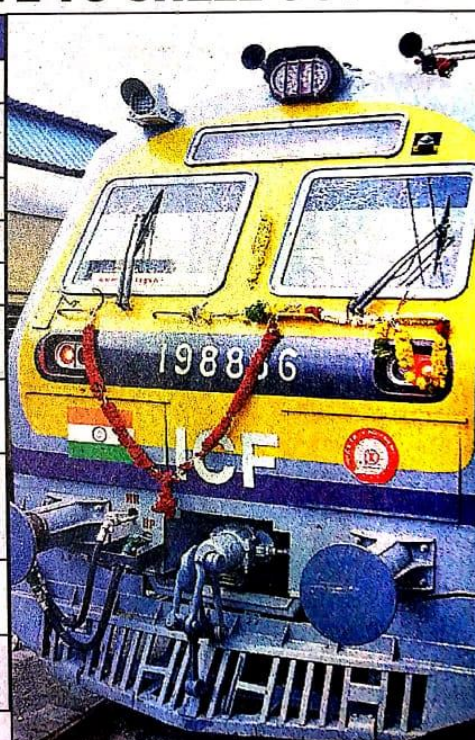
Recently, the Indian Railways increased the cost of tickets in many of its routes. Although it is an extra burden for the common man, such an increase is unavoidable for the Railways if they want to take up new projects, improve safety of passengers and modernise the equipment.

Read the data given below. (Source: Times of India Dated 2<sup>nd</sup> January 2020)

### HOW MUCH MORE WILL YOU HAVE TO SHELL OUT

Route	Sleeper Class fare (₹)		AC 3-Tier fare (₹)	
	Earlier	Revised	Earlier	Revised
Bengaluru – Belagavi	315	330	840	865
B'luru – Hubballi	250	260	660	680
B'luru – New Delhi	765	815	1950	2045
B'luru – Ernakulam	325	340	860	885
B'luru – Chennai (Kaveri Express)	230	235	620	635
B'luru – Mysuru (Kaveri Express)	140	145	495	505
B'luru – Hyderabad (Kacheguda Express)	370	385	980	1005
B'luru – Mumbai (Udyan Express)	1375	1425	505	530
B'luru – Mangaluru (Karwar Express)	255	265	685	705

Source: South Western Railway



Q1. How many trains in the given list originate from Bengaluru/B'luru?

-----

Q2. Lekhashree had booked a ticket in AC class in Karwar Express before the fare was increased. What is the difference amount she has to pay to travel as per the new fare?

-----

Q3. Shreya had booked a ticket from B'luru to Delhi in sleeper class before revision of fares . But now wants to upgrade to AC coach. What is the extra amount she needs to spend ?

-----

Q4. Which train has the maximum increase in fare in AC class and by how much?

-----

Q5. Vinu's family of 6 members who had bought sleeper class tickets(old fare) to travel from B'luru to Belagavi has to upgrade to AC coach in the revised fare. What is the extra amount they have to spend now?

-----

#### ITEM 4 :THE BROKEN LADDER

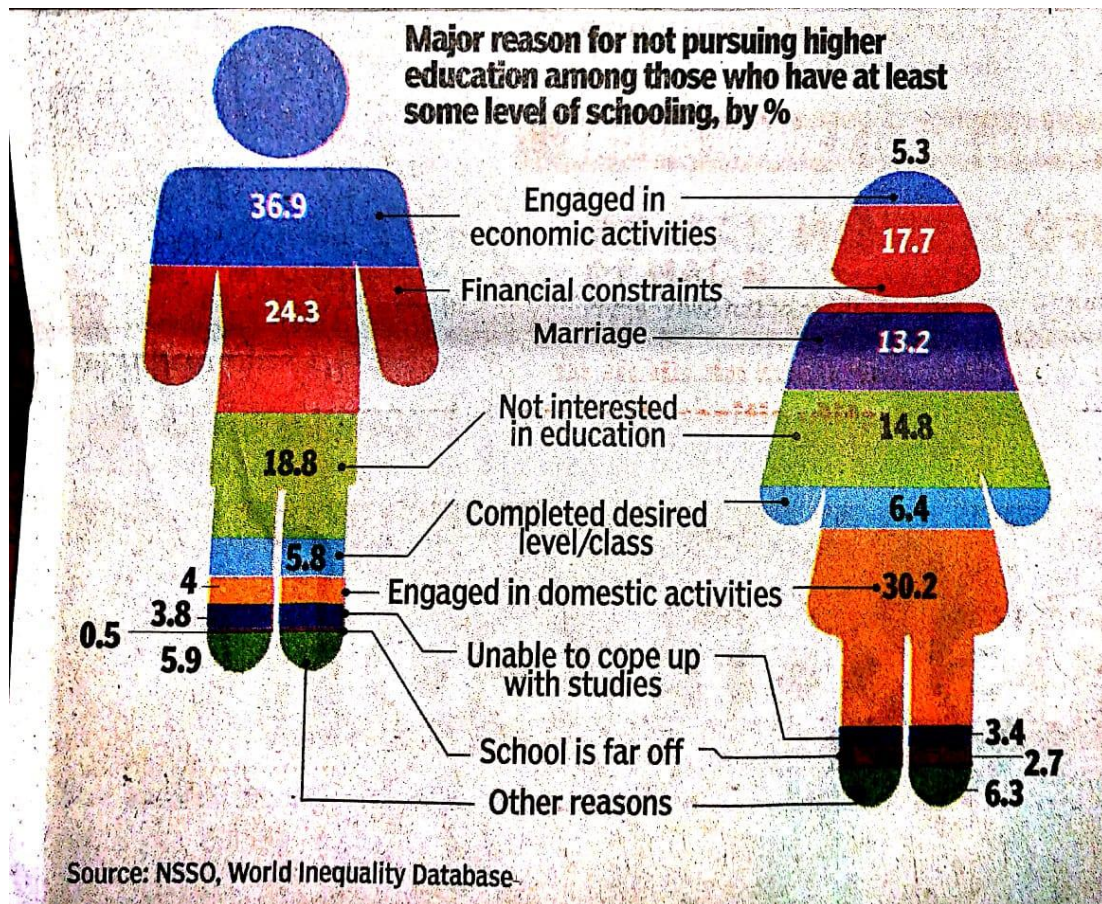
Domain : Mathematical Literacy	Topic: Data Handling  Learning Outcome :Understand, Interpret data (As per NCERT)	Class: VIII Expected Time :10-15 Total Credit:15
Description of item:	Understand , analyse and evaluate the data provided	

Indians are among the most sought after workforce in all areas across the globe. Areas like scientific research, medicine or Information technology has a large number of our young generation taking keen interest.

A recent survey report published by the **Times Of India ( Dated January 5th 2020)** points out the situation may not be so good anymore. A lot of students do not or cannot pursue higher education because of various reasons. So what's stopping them from pursuing education after graduation?

In spite of subsidies and initiatives by the Government to encourage students there are other socio -economic factors that affect the decision to do higher studies.

Compare the inequality data given below and answer the questions.



Q1. Compare the reasons for not pursuing higher studies in boys and girls. Answer true or false against these statements .

- All the reasons are common to both genders.-----
- More girls than boys drop out of higher education because school is far off.-----

Q2. Which of these reasons is preventing only girls from higher education but not boys?

- Financial constraints
- Marriage
- Engaged in economic activities
- Completed desired level.

Q3. Answer True or False.

- The biggest reason for girls not able to pursue higher studies is that they are not interested in studies.
- Approximately, one fourth of boys discontinue because of financial reasons.
- Boys are more engaged in economic activities compared to girls.

d) The percentage of boys and girls engaged in domestic activities is the same.

Q4. What is the percentage of boys and girls together who do not continue studies due to financial constraints?

-----

Q5. According to the survey, 30.2% of girls did not go for higher education because they were engaged in domestic activities( household duties such as maids, housekeeping and baby sitting) but among boys it was only 4% .

Which one of these options is the most appropriate reason for this situation?

- a) Girls themselves choose domestic work because they like it
- b) Boys are not capable of any domestic work
- c) Gender bias in society that girls should take care of house hold chores than take up studies.
- d) Boys perform better in studies than girls.



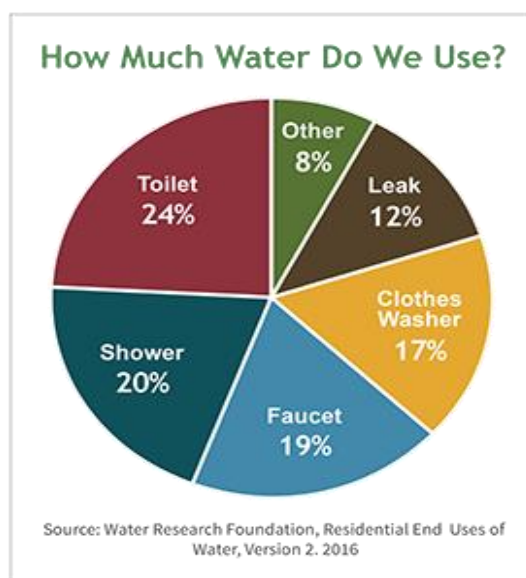
## ITEM 5 : **WOTTA CRISIS!!**

Domain : Mathematical Literacy	Topic: Data Handling  Learning Outcome :Understand, Interpret data (As per NCERT)	Class: VIII Expected Time :10-15 Total Credit:10
Description of item:	Understand , analyse and evaluate the data provided	

Water is the basic necessity of all life. In recent years , people are facing severe water shortage due to various factors . Srihari , a student of class VIII observed the usage pattern of water at his home. On normal days the daily supply of water was 1200 litres and all of it was used up. In summer, the Water Board of the city decreased the amount supplied daily to only 1000 litres per household .

He realised that the only way to solve water crisis is to manage whatever water is available as the supply of water will be limited. He made a study of the amount of water used for various purposes in his house and came out with a data as follows.

Then he would analyse how to save or minimise wastage of water.



Q1. For which purpose Srihari's family is using up maximum water among the data given?

-----  
Q2. Srihari found that 12% of water was getting leaked through different taps on a normal day. By fixing leaking taps, one could save water. How many litres would he save?

-----  
Q3. During summer when the water supply is reduced to only 1000 litres per day, What is the volume of water his family needs for :

a) Shower

-----

b) Faucet (taps in kitchen , hand wash etc)

-----

Q4. What is the central angle for the part shown as 'shower' in the pie chart?

-----

Q5. Water management involves recycling of water which can be re used for other purposes like gardening, cleaning floor or outdoors.

If water used for washing clothes and faucet were recycled during summer how many litres of water would be available?

-----

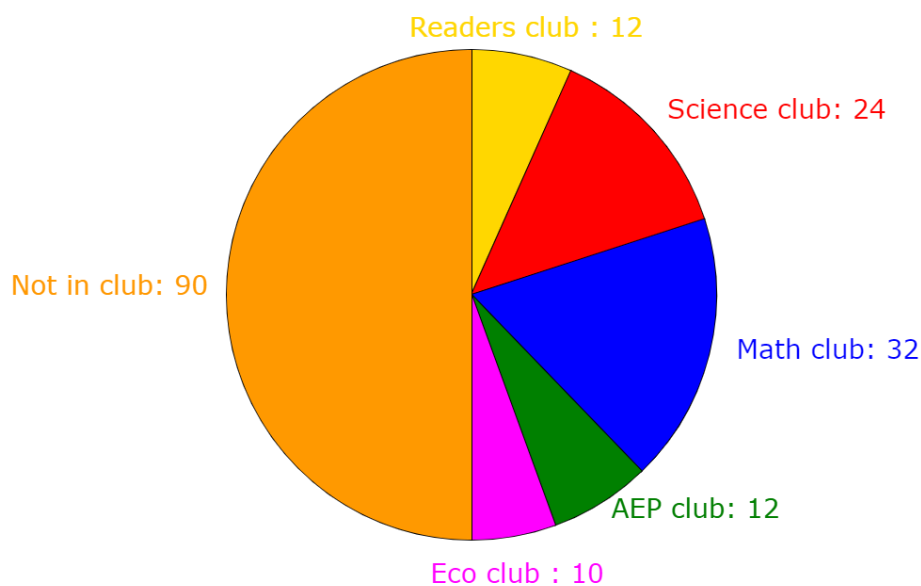
## ITEM 6 : **ACTIVITIES OF SCHOOL**

Domain : Mathematical Literacy	Topic: Data Handling  Learning Outcome :Understand, Interpret data (As per NCERT)	Class: VIII Expected Time :20 min Total Credit: 8
Description of item:	Understand , analyse and evaluate the data provided	

A school has formed 5 clubs to conduct various co curricular activities. Students were told to join the clubs of their choice. The same data is shown in the form of a pie chart.

Club name	Number of students
Math club	32
Science club	24
Eco club	10
AEP club	12
Readers club	12
Not in any club	90
Total	180

school clubs



Q1. Among the 5 clubs , which club has highest number of students?

-----

Q2. Read the statements and write True or False

a) Half of the total students have not joined any club. -----

b) Eco club has 10% of the students.-----

Q3. What is the measure of the central angle for Science club ?

-----

Q4. Which two clubs have the same number of students?

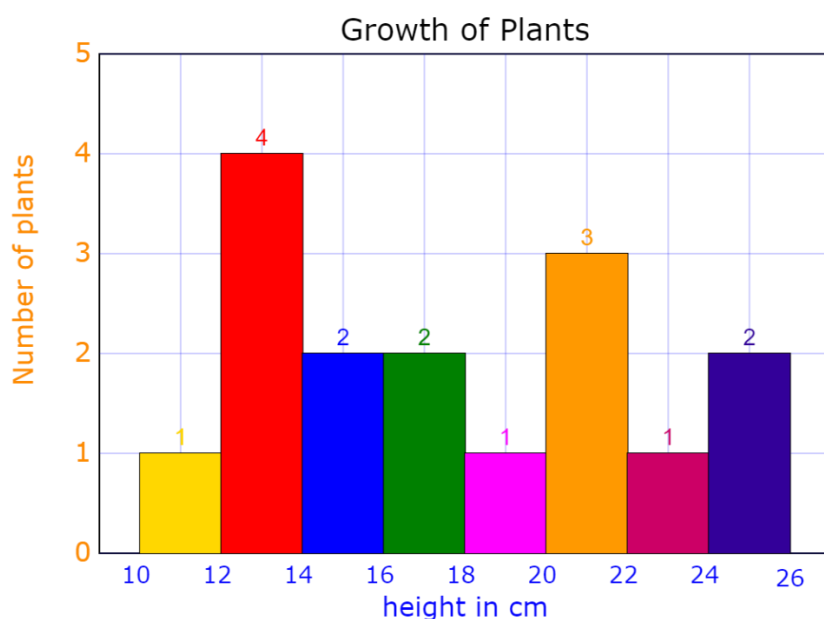
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## ITEM 7 :GROWTH OF PLANTS

Domain : Mathematical Literacy	Topic: Data Handling  Learning Outcome :Understand, Interpret data (As per NCERT)	Class: VIII Expected Time :20min Total Credit: 8
Description of item:	Understand , analyse and evaluate the data provided	

In order to create awareness about environment, a group of students of Eco Club were told to grow one plant each in the space allotted in the school garden.

They recorded the height of plants at the end of the month and prepared a graph of the data.



Q1. What name is given to this type of graph?

-----

Q2. What is the total number of students shown in the data?

-----

Q3. What is the range of height of plants ?

-----

Q4. How many plants are there whose height is more than 20cm?

-----

**ITEM -8UNDERSTANDING HEART RATE AND HEALTH**

Domain : Mathematical Literacy	Topic: Data Handling  Learning Outcome :Understand, Interpret data (As per NCERT)	Class: VIII Expected Time : 10 min  Total Credit: 6
Description of item:	Understand , Analyses and evaluate the data provided	

**Taxonomy of Objective: The child develops the ability of understand and interpret the results related to the given data.**

---

1. If heart rate readings seem like a jumble of numbers, cardiologist El Shahawy is here to help dispel your confusion and arm you with knowledge.

***What can your heart rate really even tell you?***

A person's resting heart rate is how many times their heart beats per minute when they are otherwise resting or inactive.

A healthy resting heart range, according to local Sarasota cardiologist Dr. El Shahawy, is anywhere from about 50 to 75 beats per minute.

Maximum heart rate is the maximum number of times the heart should beat per minute while engaged in exercise. To calculate this number, Shahawy says a person can typically subtract their age from 220.

If a person exceeds their maximum heart rate, they could be at risk of having a heart attack or otherwise injuring their cardiovascular system.

(Source from cardiologic centre)

## ♥ HEALTHY HEART BEATS

Heart rates vary by age, but generally speaking should fall within these ranges.

Age (years)	50% to 75% Moderate Exercise	70% to 85% Vigorous Exercise	Maximum Heart Rate (beats per min.)
20	100-140 bpm	140-170 bpm	200 bpm
30	95-133 bpm	133-161.5 bpm	190 bpm
40	90-126 bpm	126-153 bpm	180 bpm
50	85-119 bpm	119-144.5 bpm	170 bpm
60	80-112 bpm	112-136 bpm	160 bpm
70	75-105 bpm	105-127.5 bpm	150 bpm
80	70-98 bpm	98-119 bpm	140 bpm
90	65-91 bpm	91-110.5 bpm	130 bpm

(i) According to Dr Shahawy, For example, if somebody is 50 years old, they wouldn't want their heart rate to exceed how many beats per minute while exercising

- a) 170 beats per minute
- b) 70 beats per minute
- c) 100 beats per minute
- d) None of the above

(ii) Which age group gets highest variation of maximum Heart beat rate

- a) 20 to 30 years
- b) 80 to 90 years
- c) 30 to 40 years
- d) 50 to 60 years

(iii) From what age does the maximum heart rate decrease?

a) From 20 years   b) From 40 years   c) From 60 years

d) Cannot be explained

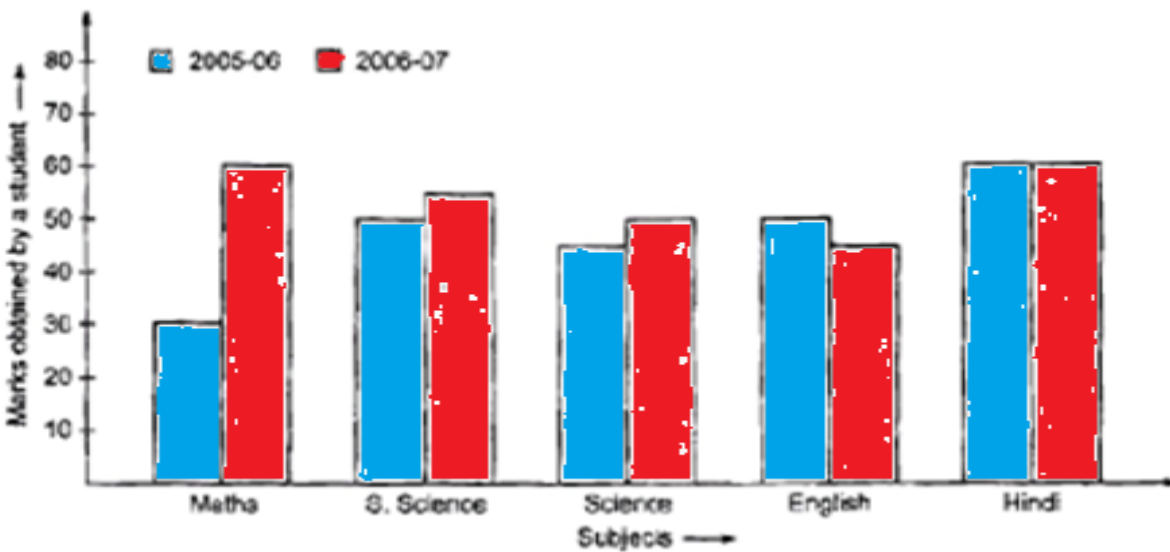


## ITEM -9 :GOLU'S ACADEMIC PERFORMANCE

Domain : Mathematical Literacy	Topic: Data Handling  Learning Outcome: Understand, Interpret data (As per NCERT)	Class: VIII Expected Time : 20min  Total Credit: 8
Description of item:	Understand , Analyses and evaluate the data provided	

**Read the following bar graph and answer the following questions.**

(Source:Class VIII reference book)



- i. What is the information given by the double bar graph?
- ii. In which subject has the performance improved the most?
- iii. In which subject the performance deteriorated?
- iv. In which subject is the performance at par?

**ITEM -10 :TARUN'S TIMETABLE**

Domain : Mathematical Literacy	Topic: Data Handling  Learning Outcome: Understand, Interpret data (As per NCERT)	Class: VIII Expected Time : 20 min  Total Credit: 8
Description of item:	Understand , Analyses and evaluate the data provided	

Look at the following pie chart and answer the questions given below:



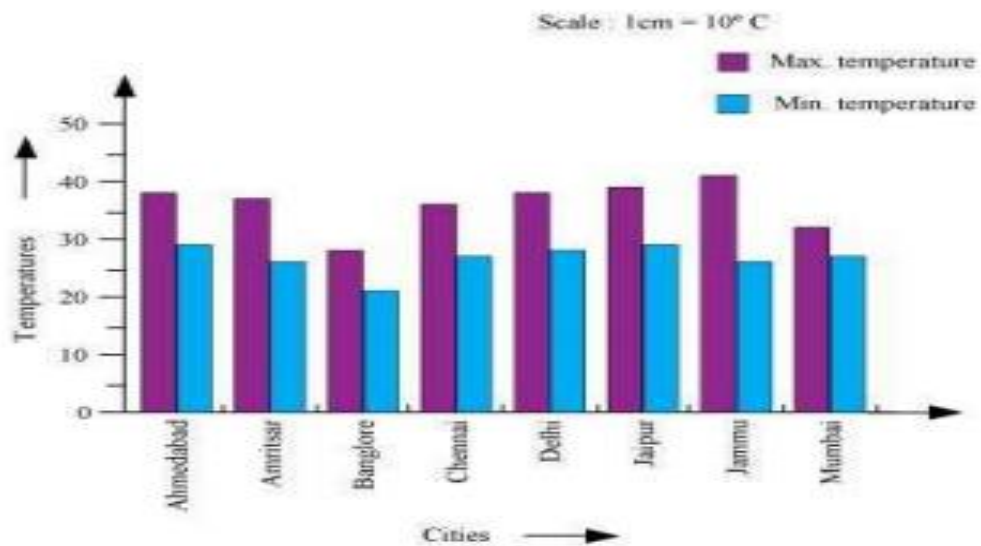
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- 
- (i) What is the central angle corresponding to the activities “Play and Home work”?
- (ii) On which activity Tarun spends maximum time?
- (iii) On which two activities Tarun spends same time?
- (iv) Find the fraction for the time Tarun sleeps?

**ITEM -11 :MIN -MAX TEMPERATURE OF INDIAN CITIES**

Domain : Mathematical Literacy	Topic: Data Handling  Learning Outcome: Understand, Interpret data (As per NCERT)	Class: VIII Expected Time : 20 min  Total Credit: 8
Description of item:	Understand , Analyses and evaluate the data provided	

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Read the following bar graph and answer the following questions

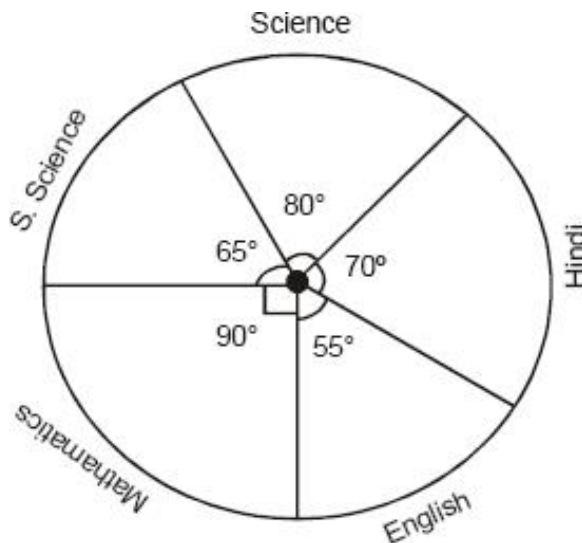


- (i) Which city has maximum difference in temperature
- (ii) Which city is hottest and which is coldest?
- (iii) Which two cities are having same minimum temperature?
- (iv) Which city has the least difference in its maximum and minimum temperature?

**ITEM -12 :MARKS COMPARISON**

Domain : Mathematical Literacy	Topic: Data Handling  Learning Outcome: Understand, Interpret data (As per NCERT)	Class: VIII Expected Time : 20 min  Total Credit: 6
Description of item:	Understand , Analyses and evaluate the data provided	

The adjoining pie chart gives the marks scored in an examination by a student in Hindi, English, Mathemahcs, Social Science and Science. If the total marks obtained by the students were 540 answer the following questions.



---

(i) In which subject did the student score 105 marks?

(ii) How many more marks were obtained by the student in Mathematics than in Hindi?

(iii) Examine whether the sum of the marks obtained in Social Science and Mathematics is more than that in Science and Hindi.

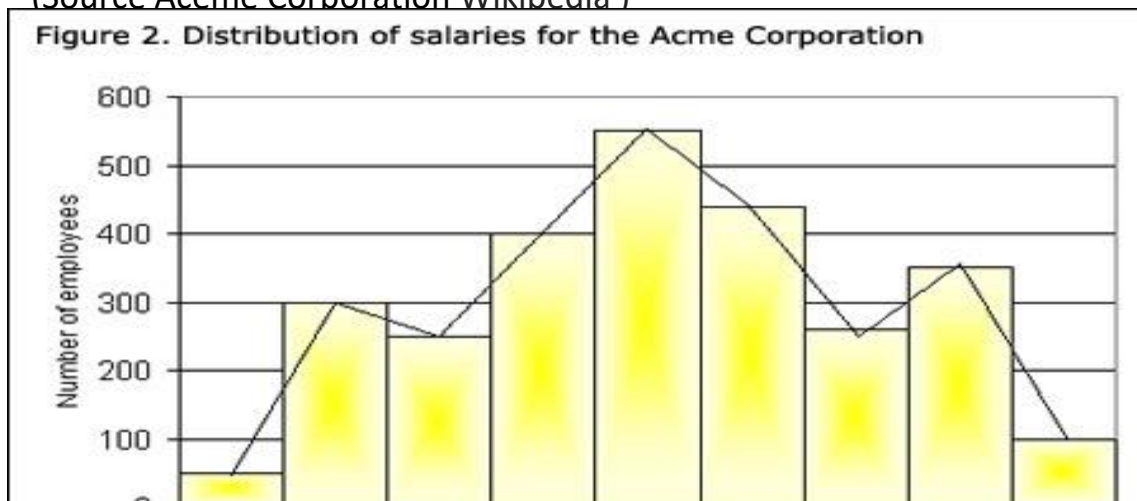
**ITEM -13 :DISTRIBUTION OF SALARIES**

Domain : Mathematical Literacy	Topic: Data Handling (Histogram) Learning Outcome: Understand, Interpret data (As per NCERT)	Class: VIII Expected Time : 20 min  Total Credit: 12
Description of item:	Understand , Analyses and evaluate the data provided	

Taxonomy of Objective: The child develops the ability to understand the given Histogram and interpret the results related to the given data.

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(Source Aceme Corporation Wikipedia )



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1. What is the highest range of the salary scale which is paid to the maximum number of employees?

- a) 33-43 \$ thousands
- b) 44-54 \$ thousands
- c) 77-87 \$ thousands
- d) Cannot predict

2. Which range of salaries is nearly equal?

- a) 11-21 \$ and 66-76 \$
- b) 22-32 \$ and 66-76 \$
- c) 11-21 \$ and 44-54\$
- d) None of above

3. How many employees are drawing the salary upto \$32 thousands?

- a) Nearly 100 employees
- b) Nearly 300 employees
- c) Nearly 600 employees

---

d) All employees

4) What is the difference of the number of employees drawing the highest salary and the

lowest salary?

a) 50 employees

b) 500 employees

c) 400 employees

d) None of above

5) What is the least number of employees who are paid the lowest salary?

a) 250 employees with 22-32 \$ thousands

b) 100 employees with \$88 thousands

c) Nearly 50 employees 0-10 \$ thousands

d) 50 employees with 12-22 \$ thousands

6) How many employees do you feel are drawing each scale of salary?

a) 50 employees

b) 100 employees

c) 500 employees

d) Cannot infer



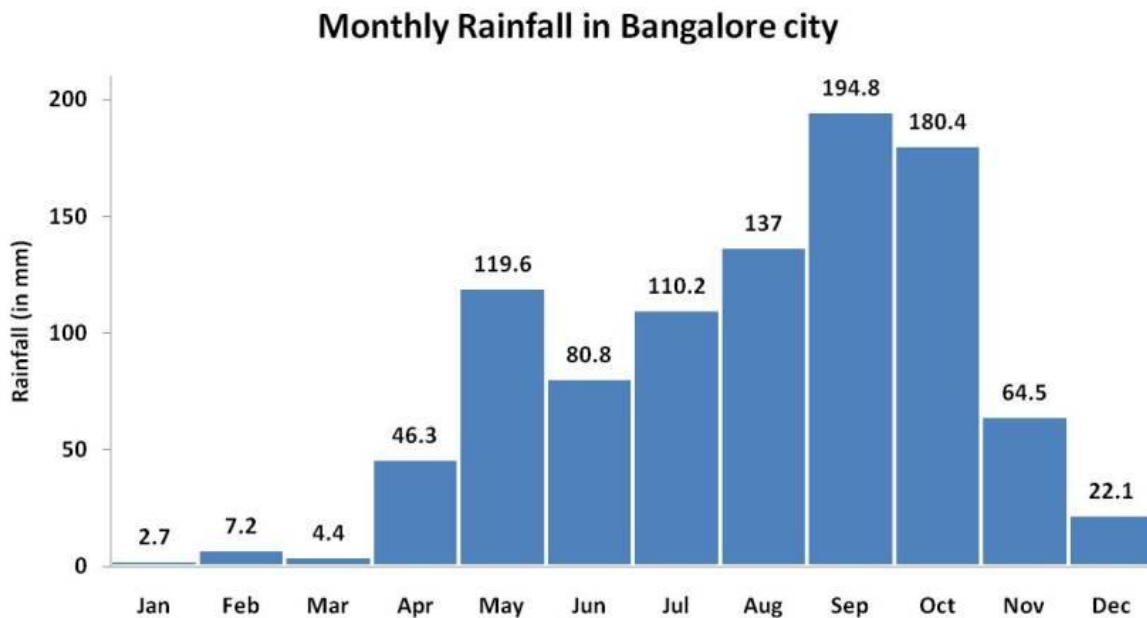
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### ITEM -14 :MONTHLY RAINFALL IN BANGALORE

Domain : Mathematical Literacy	Topic: Data Handling  Learning Outcome: Understand, Interpret data and compute (As per NCERT)	Class: VIII Expected Time : 20 min  Total Credit: 10
Description of item:	Understand , Analyses and evaluate the data provided	

The following is a table showing rainfall in the city of Bangalore. Read the table and answer the questions that follow.



(Source: Deccan Herald - year 2018)

- i. In which month was the rainfall the maximum and in which month was it minimum?

- ii. Which month recorded almost double the rainfall of the month of December?
- iii. This month recorded rainfall that was the same as that received in the months of April and November. Which month is this?
- iv. Which quarter of the year received most rainfall?
- v. Which three months gave maximum business to the umbrella manufacturers?

**ITEM -15 :TRAIN TO DELHI**

Domain : Mathematical Literacy	Topic: Data Handling  Learning Outcome: Understand, Interpret data (As per NCERT)	Class: VIII Expected Time : 20 min  Total Credit: 10
Description of item:	Understand , Analyses and evaluate the data provided	

The following is the schedule for train from Bangalore to Delhi.

S. No.	Station Code	Station Name	Route No.	Arrival Time	Departure Time	Halt Time (In Minutes)	Distance	Day
1	YPR	YESVANTPUR JN	1	Source	22:00	--	0	1
2	DMM	DHARMAVARAM JN	1	00:35	00:40	05:00	175	2

S. No.	Station Code	Station Name	Route No.	Arrival Time	Departure Time	Halt Time (In Minutes)	Distance	Day
3	KRNT	KURNOOL CITY	1	04:25	04:27	02:00	374	2
4	KCG	KACHEGUDA	1	08:20	08:30	10:00	610	2
5	BPQ	BALHARSHAH	1	14:00	14:05	05:00	984	2
6	NGP	NAGPUR	1	17:10	17:15	05:00	1195	2
7	BPL	BHOPAL JN	1	23:00	23:10	10:00	1590	2
8	JHS	JHANSI JN	1	02:50	03:00	10:00	1881	3
9	GWL	GWALIOR	1	04:09	04:11	02:00	1978	3
10	NZM	H NIZAMUDDIN	1	09:15	--	--	2284	3

(Source:Indian Railways website)

- (i) What is the total duration of the journey?
- (ii) Which stations have the minimum halt time?
- (iii) Bhasker is going to Gwalior. He boarded the train at Balharshah. How long was he in the train?
- (iv) What is the distance between Kurnool City and Bhopal?
- (v) What is the total distance the train covers?

Prepared By

Items 1 to 7

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