



Education Department, UT Chandigarh

Critical and Creative Thinking

Mathematics Practice Booklet
Class: 8



राज्य शैक्षिक अनुसंधान और प्रशिक्षण परिषद्
STATE COUNCIL OF EDUCATIONAL RESEARCH AND TRAINING
SECTOR-32 UT CHANDIGARH



Websites/links to download CCT Resource Material

CCT Tracker:

- URL: <https://pisa.diksha.gov.in>
- User Id: utcschools
- Password: Utcschools@01

SE Shagun Portal:

- <http://pisa.seshagun.gov.in/codes.html>
- <http://pisa.seshagun.gov.in/?AspxAutoDetectCookieSupport=1>
- <http://pisa.seshagun.gov.in/cct/>

DIKSHA:

- <http://diksha.gov.in>
- QR code and link for CCT Weekly- R5Z7P5
- <https://diksha.gov.in/get/dial/R5Z7P5>

OECD – PISA:

- <https://www.oecd.org/pisa/>
- <https://www.oecd.org/pisa/publications/>



NCERT: CLASS 8 CURRICULUM

Chapter No. & Name	Experiential learning*	CCT Literacy Area	Learning Outcomes	Integration with other subjects
1. Rational numbers	<p>Visit to a playground or sports complex.</p> <p>To find time taken to cover a particular distance in various races and events of athletics. To compare age and date from given data.</p>	Quantity	<p>The learner generalizes properties of addition, subtraction, multiplication and division of rational numbers through patterns</p> <p>The learner finds out as many rational numbers as possible between two given rational numbers.</p>	<p>Science- Study of the body weight, ratio of age to body weight and height,</p> <p>Calculation of calories burnt while playing different types of sports</p>
2. Linear Equations in one Variable	Figuring out income, overtime, calculating mileage rates or predicting profit.	Change & Relationship	The learner solves puzzles and daily life problems using variables.	Accounts- learning how to maintain accounts of a small business house
3. Understanding Quadrilaterals	<p>Used in construction of buildings, printing industry, interior designing</p> <p>(False ceiling), furniture designing and architecture.</p> <p>Visit to a printing factory, furniture factory or construction sites</p>	Shape & Space	<p>The learner solves problems related to angles of a quadrilateral using angle sum property.</p> <p>The learner verifies properties of parallelograms and establishes the relationship between them through reasoning.</p>	<p>English –</p> <p>A conversation between 2 toys describing different shapes they are made from.</p> <p>Art – Drawing an amusement park scene with</p>



Challenge Yourself...



				understanding of different shapes of the swings in the park, studying interior designing etc.
5.Data Handlings	Record of libraries, surveys done on census and demography, record of hospital management, etc. Visit to a library, clinics etc.	Shape & Space	The learner makes hypotheses on chances of future events on the basis of its earlier occurrences or available data like , after repeated throws of dice and coins.	Social Studies- Graphical representation of different types of geographical data. Library Studies- Recording data of different types of books available in the library of your school.
6. Squares & Square Roots	Measurements taken by architects, carpenters, engineers. Visit to architect's office/construction site.	Quantity	The learner finds squares and square roots of numbers using different methods. The learner finds the zeroes of a polynomial.	Physics– Calculation of different distances.
7. Cubes & Cube Roots	Used in astronomy & finding large astronomical distances. Visit to science city	Quantity	The learner finds cubes and cube roots of numbers using different methods.	Science – Study of astronomical distances
8.Comparing Quantities	Learning profit, loss, discount, sale tax, GST, learning bills/invoice, creating bills and invoices. Calculate	Change & Relationship	The learner applies the concept of percentage in profit and loss situation in finding discount, VAT and compound	Hindi/Punjabi- Writing a letter to the manager of a bank asking the procedure and the



Challenge Yourself...



	<p>interest on savings and FD's.</p> <p>Visit to shopping Malls , markets, banks, etc.</p>		<p>interest, for example, calculate discount per cent when marked price and actual discount are given or find profit per cent when cost price and profit in a transaction are given.</p> <p>The learner understands different procedures of bank.</p>	<p>documents required for opening an account in a bank.</p>
9. Algebraic Expression & Identities	<p>To apply in business & finance management, sports, cooking, etc.</p> <p>Visit to a hotel management institute, business house.</p>	Change & Relationship	<p>The learner uses various algebraic identities in solving problems of daily life</p>	<p>Economics- Studying the finance policy of the country or any institute.</p>
10. Visualizing Solid Shapes	<p>Solving Rubric's Cube, playing football etc.</p> <p>Visits to pyramid sites and other historical monuments.</p>	Shape & Space	<p>The learner represents 3D shapes on a plane surface, such as sheet of paper, blackboard, etc.</p> <p>The learner verifies Euler's relation through pattern.</p>	<p>English - Poem on different geometrical figures /Dialogue writing for conversation between two geometrical shapes</p>
11. Mensuration	<p>Construction of swimming pool in school, construction of school auditorium, playing fields, etc.</p> <p>Finding volume of cylindrical, conical</p>	Shape & Space	<p>The learner estimates the area of shapes like trapezium and other polygons by using square grid/graph sheet and verifies using formulas.</p> <p>The learner finds the</p>	<p>Chemistry- Finding volume using Boyle's law Charle's law etc.</p> <p>Sports/Life Skills-Helping</p>



Challenge Yourself...



	objects. Visit to an auditorium or swimming pools.		area of a polygon and also the surface area and volume of cuboidal and cylindrical objects.	the school supporting staff in preparing the field for a Kabaddi match or for sports day of the school
12.Exponents & Powers	Used in computers where data needs to be compressed & stored. For example, Gigabytes. Used in astronomy. Visit to a computer lab ,science city etc.	Change & Relationship	The learner solves problems with integral exponents..	Computer Studies- Learning web designing
13.Direct & Inverse Proportion	Used by cartographers in making of scaled maps to show relation between actual distance on land and the measurement on the map. Used by dietician to personalize diet plans. Visit to Survey of India, dietician etc.	Change & Relationship	The learner solves problems based on direct and inverse proportions	Biology-Diet plans Civics-Rights and duties of citizens etc.
14. Factorization	Dividing pizza into equal pieces, exchanging money, comparing prices, planning vacation trip. Visit Grocery store or any eating joint , etc.	Change & Relationship	The learner multiplies algebraic expressions, for example $(2x-5)(3x^2+7)$.	Value Education– Studying the values of life like sharing, caring, empathy and equal division of share.
15. Introduction to Graphs	Statistical record of cricket and other sports, election	Quantity	The learner draws and interprets bar	Physical Education- Statistical record



Challenge Yourself...



	<p>results, AQI index, etc.</p> <p>Visit to Indian Statistical institute and universities</p>		<p>charts and pie charts.</p> <p>The learner calculates mean, median and mode for different sets of data related with real life contexts.</p>	<p>of the inter house matches of the school</p>
16. Playing with Numbers	To sharpen mental ability and reasoning power.	Quantity	The learner proves divisibility rules of 2, 3, 4, 5, 6, 9 and 11.	English-Dialogue writing for conversation between different numbers expressing each one's qualities

*These are only suggestive activities other activities can also be further conducted as per need of the topic



**Challenge
Yourself...**



LIST OF CONTENT

<i>S.No.</i>	<i>Title</i>	<i>Page No.</i>
<i>1.</i>	<i>MOVING TO MARS</i>	<i>12-15</i>
<i>2.</i>	<i>COVID 19</i>	<i>16</i>
<i>3.</i>	<i>BIRD FLU</i>	<i>17-18</i>
<i>4.</i>	<i>FAMILY OF NUMBERS</i>	<i>19</i>
<i>5.</i>	<i>MORNING WALK</i>	<i>20</i>
<i>6.</i>	<i>CRICKET SCORES</i>	<i>21</i>
<i>7.</i>	<i>TEST RESULTS</i>	<i>22</i>
<i>8.</i>	<i>SIZE OF TABLES</i>	<i>23</i>
<i>9.</i>	<i>ORGANISING BIRTHDAY PARTY</i>	<i>24</i>
<i>10.</i>	<i>FENCING THE YARD</i>	<i>25</i>
<i>11.</i>	<i>FLIGHT OF BIRDS</i>	<i>26-27</i>
<i>12.</i>	<i>DAILY WAGES</i>	<i>28</i>
<i>13.</i>	<i>MYSTERY OF GROWING TREE</i>	<i>29</i>
<i>14.</i>	<i>CAPACITY OF PEN DRIVE</i>	<i>30</i>
<i>15.</i>	<i>FRIENDS GET-TOGETHER</i>	<i>31</i>
<i>16.</i>	<i>AGE MYSTERY</i>	<i>32</i>
<i>17.</i>	<i>POCKET MONEY</i>	<i>33</i>
<i>18.</i>	<i>PAYING GUEST AND HIS CARD</i>	<i>34</i>
<i>19.</i>	<i>INVESTMENT IN SHARE MARKET</i>	<i>35</i>
<i>20.</i>	<i>FAVOURITE TV SHOW</i>	<i>36</i>
<i>21.</i>	<i>DONATION BOX</i>	<i>36-37</i>
<i>22.</i>	<i>MOVIE TICKET</i>	<i>38</i>



Challenge Yourself...



23.	<i>VARIABLE GAME</i>	39
24.	<i>PUNJABI TREAT RESTAURANT</i>	40-41
25.	<i>RESULT BOARD</i>	42-43
26.	<i>BRANCHES OF ARMED FORCES</i>	43-44
27.	<i>SUMMER CAMP</i>	45-46
28.	<i>THE PET SHOP</i>	47
29.	<i>YEARLY EXPENDITURE</i>	48
30.	<i>T.V TIME</i>	49
31.	<i>SOFIA'S GARDEN</i>	49-50
32.	<i>SCHOOL AUDITORIUM</i>	50-51
33.	<i>TEACHER'S TABLE</i>	51-52
34.	<i>SWIMMING POOL</i>	53
35.	<i>GAME OF DICE</i>	54
36.	<i>JOURNEY FROM 2-D TO 3-D SHAPE</i>	54-56
37.	<i>CUBE</i>	56-57
38.	<i>FRUIT SHOP</i>	58
39.	<i>SHOPPING DURING SALE</i>	59
40.	<i>ROHAN AND HIS TAXI</i>	60
41.	<i>LANDSCAPING</i>	61
42.	<i>SHAPE WITH A SHEET</i>	62
43.	<i>PICNIC TO SHIMLA</i>	63
44.	<i>CAR MANUFACTURING COMPANY</i>	64
45.	<i>WEDDING RECEPTION PARTY</i>	65
46.	<i>GREEN SUSTAINABLE HOUSES</i>	66-68



**Challenge
Yourself...**



47.	<i>CALORIE COUNT</i>	69
48.	<i>CONGRUENCE OF TRIANGLE</i>	70-72
49.	<i>TRUSS BRIDGES</i>	73-74
50.	<i>TREE PLANTATION DRIVE</i>	75-76
51.	<i>UTTARAKHAND GLACIER DISASTER</i>	77
52.	<i>KITCHEN GARDEN</i>	78
53.	<i>SHOP TILL YOU DROP</i>	79-82
54.	<i>BIRTHDAY GIFT</i>	83-84
55.	<i>DECLINE OF DEER POULATION</i>	85-86
56.	<i>COFFEE MACHINE</i>	87
	<i>ANSWER KEY</i>	88-100



**Challenge
Yourself...**



MOVING TO MARS



Abhishek and his friend Rudar were working on a science project and had a discussion regarding rocks on other planets



Do you know Rudar, that the scientists have found rocks on Mars that had a peculiar chemical composition? It is a combination of minerals and carbon compounds. I have heard that they might also have some microbes on that planet!!!.

Yes, I know that, Abhishek!! But do you know that the rock also had crystals of iron oxide called magnetite, which is produced by bacteria!!!!



Wow! It means that there is a possibility of life on Mars!



If I get a chance to move on Mars, I'll make a beautiful garden there.





Challenge Yourself...

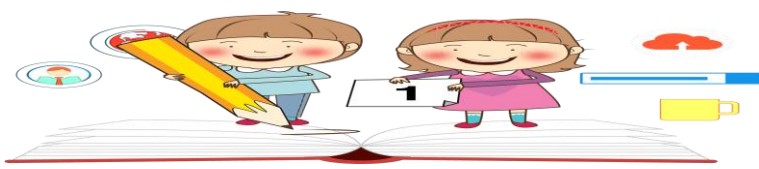


Rudar, I have two designs on my mind. Let's find out how much space will be required for making our dream garden on Mars.....



These designs are so simple and boring. Think of some compound designs, with some more area and longer boundary for flowers.

Design 1	Design 2
<p>32 m</p> <p>20 m</p> <p>20 m</p> <p>32 m</p>	<p>12 m</p> <p>20 m</p> <p>16 m</p>
Area=	Area=
Perimeter=	Perimeter=

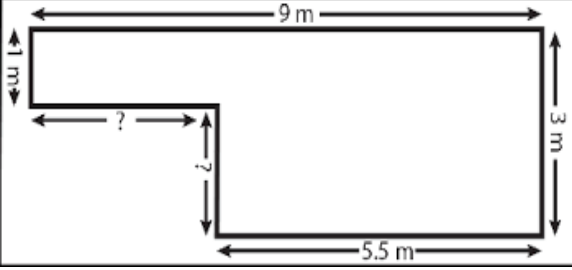
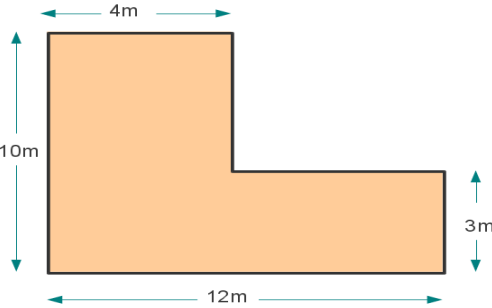


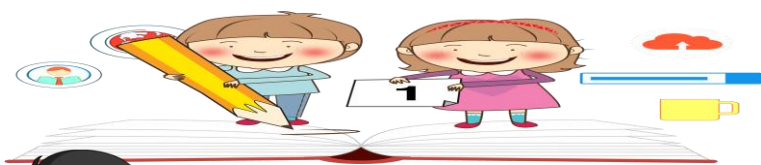
Challenge
yourself...



They decided to look at garden spaces with compound shape designs.

These are the 2 new garden space designs for Mars. Find the perimeter and area for each design.

Design 1	Design 2
	
Perimeter =	Perimeter=
Area=	Area=



Challenge Yourself...



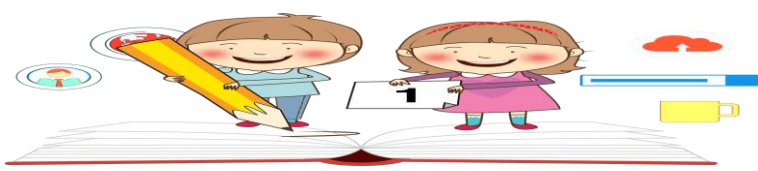
Wow these shapes are really interesting!!! Let's explore some more such shapes with bigger area for landscape, walking track and of course ...a boundary which has maximum flowers

They finalized 2 designs. Work out the perimeter and area for the following designs.

Show your working.

Design 1	Design 2
P =	P =
A =	A =

Which design do you think will the two friends finalize and why?

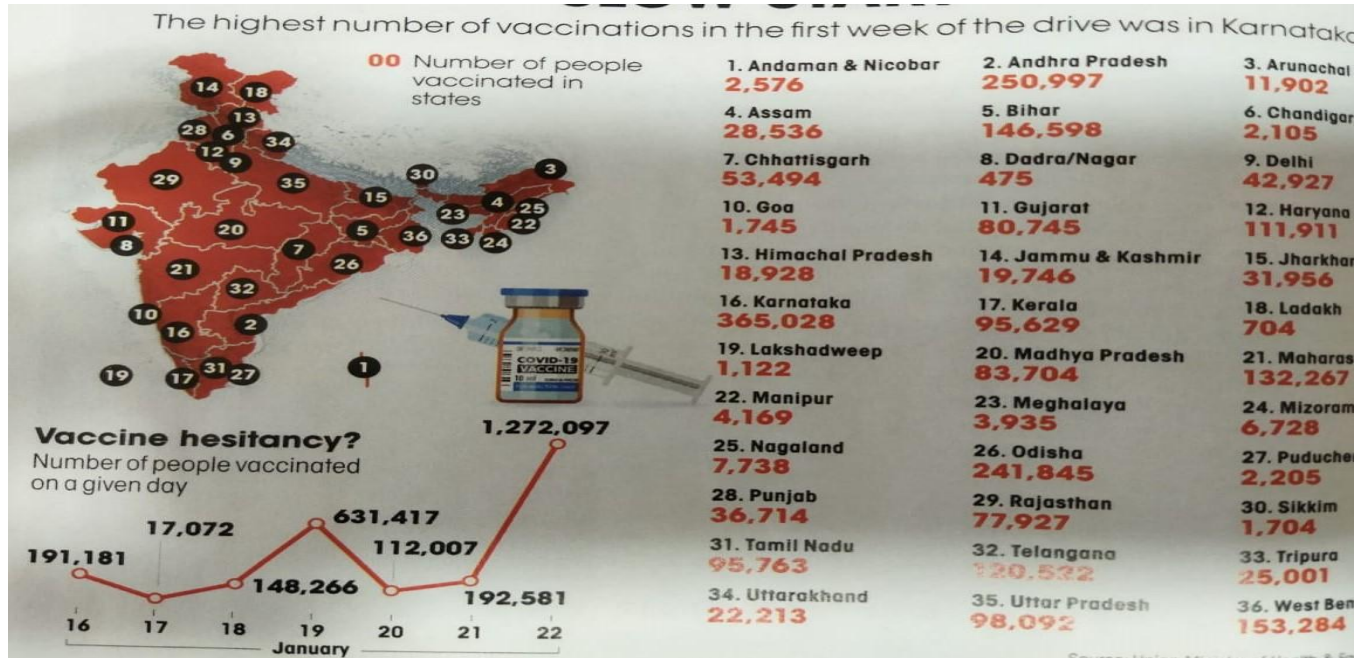


**Challenge
Yourself...**



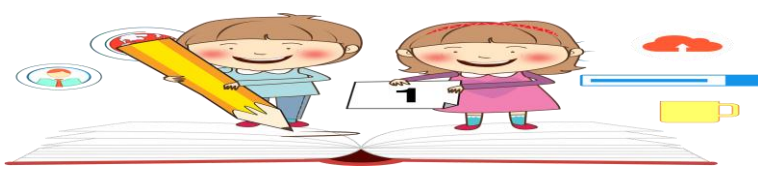
COVID19

Role of Data scientist is to help companies interpret and manage data and solve complex problems using expertise in variety of data resources



Shyama is a data scientist and has recorded data related to number of people vaccinated against Corona in different states and union territories of India in the first week of the drive. She made a line graph to show number of people vaccinated from January 16, 2021 to January 22, 2021. Help her to draw some more information from the given data:

1. According to above information Karnataka has highest number of people taking vaccination in the first week. Name next three states which follow the charts (write names of three states in decreasing order which follow Karnataka)
2. Find the difference between number of people taking vaccination in Gujarat and Kerala.
3. On which dates did the line graph show downward trend.
4. Find the two states/union territories which were having least number of people vaccinated and write the number given to these states in the Map of India

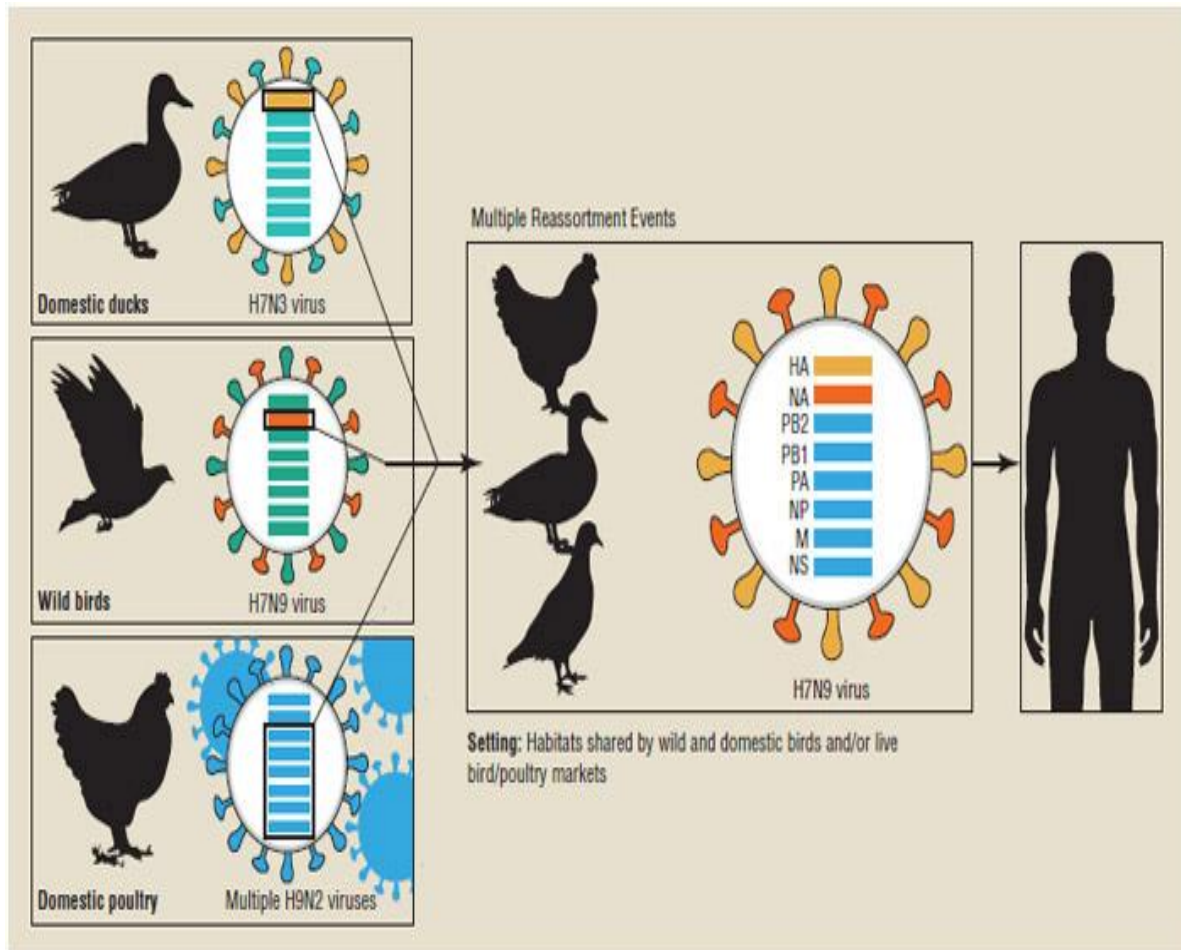


Challenge
yourself...



BIRD FLU

Bird Flu or Avian influenza, is a viral infection spread from bird to bird. The most common kind of bird flu is the H5N1 strain. It's mostly a threat to birds and doesn't spread easily among people, but there was a major outbreak of bird flu in people in 2014. The very few cases of human-to-human transmission were among people with exceptionally close contact.



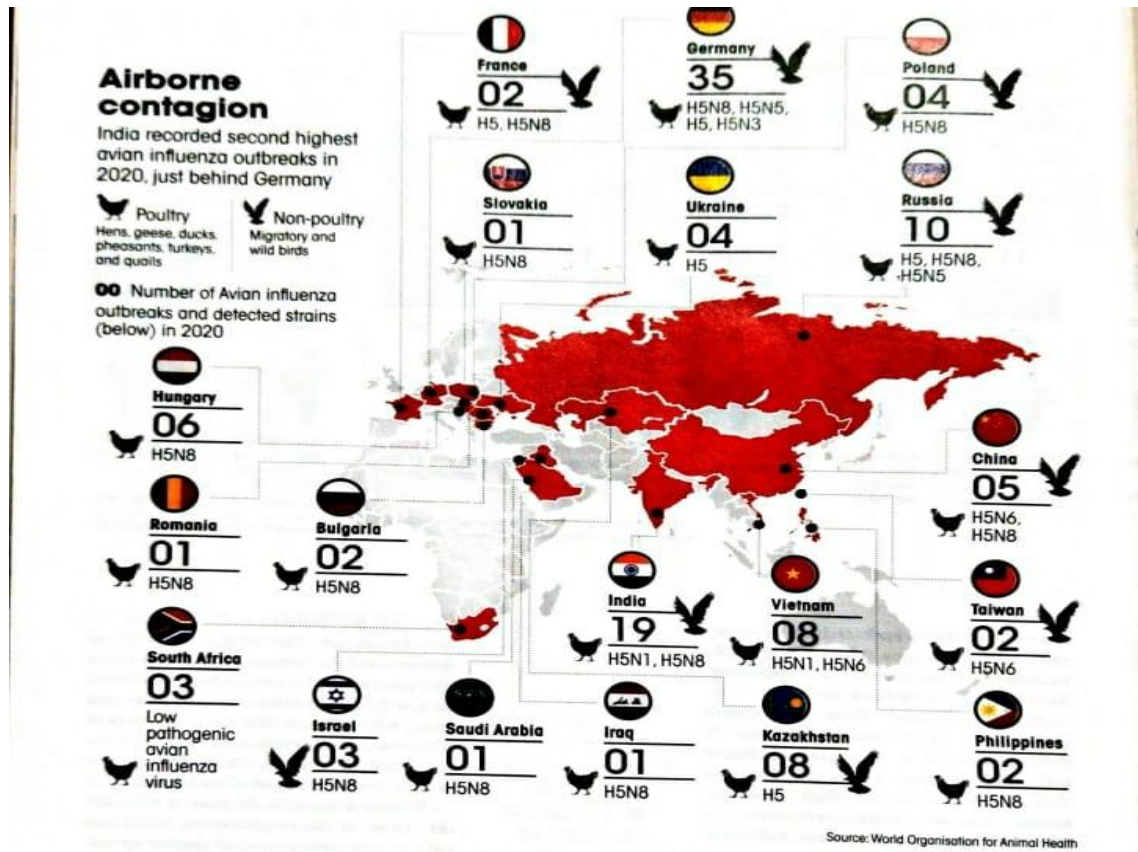
Migrating water fowl -- most notably wild ducks -- are the natural carriers of bird flu viruses. It's suspected that infection can spread from wild fowl to domestic poultry.

Shaiza is a bird watcher and was very worried when she heard about outbreak of bird flu. She closely observed the data and was surprised to know that Germany and India has recorded highest bird flu outbreaks in 2020

The infection has spread both through poultry and non poultry birds. Help her read the details carefully and draw following inferences.



Challenge Yourself...



1. How many countries had the disease due to poultry birds only ?

2. How many countries had the disease due to non poultry birds migratory and wild birds only ?

3. Find ratio of number of Avian influenza outbreak in Vietnam to number of Avian influenza outbreak in Russia.

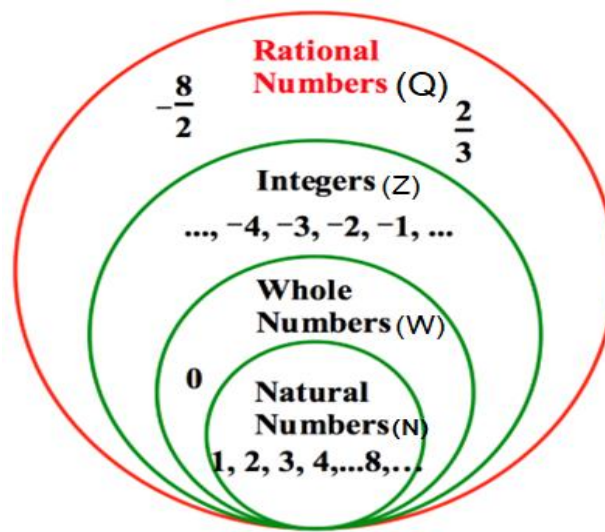


Challenge Yourself...



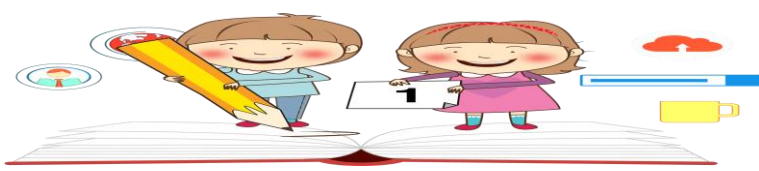
FAMILY OF NUMBERS

Jordon learnt about family tree, in which all the members of the family are shown in pictorial form. He made family tree of numbers as shown below. If Rational Numbers (Q) is Grand Mother of Jordan, Integers (Z) is Mother of Jordan, and Natural numbers (N) is the daughter of Jordan, then how whole numbers (W) are related to Jordan?



2. Mark in appropriate column.

Number	Natural Number	Whole Number	Integer	Rational Number
-8				
5				
$\frac{2}{3}$				
0				



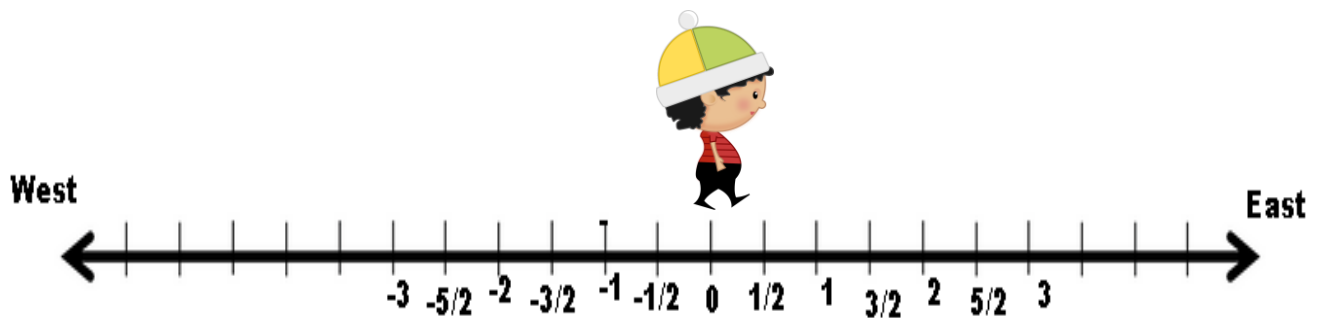
Challenge
yourself...



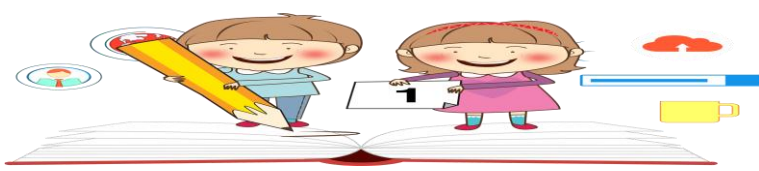
MORNING WALK

Regular walk can help in maintaining healthy life. Parth goes for a walk in a park which has a number line drawn on it. He starts from 0 on a number line. He walks $\frac{3}{2}$ km in East direction, then walks back $\frac{5}{2}$ km in west direction.

1. What is his final position? Also mark his position as P on the number line.



- (a) Between 0 to $\frac{1}{2}$
(b) Between $-\frac{1}{2}$ to 0
(c) Between $-\frac{3}{2}$ to $-\frac{1}{2}$
(d) Between -1 to 0
2. Now, Parth is standing at position P and saw his friend Hrithik is standing $\frac{1}{2}$ km towards west. He was very happy to see him. He started running towards him. Can you guess at what position Hrithik is standing now? Mark this position as Q.



Challenge
yourself...

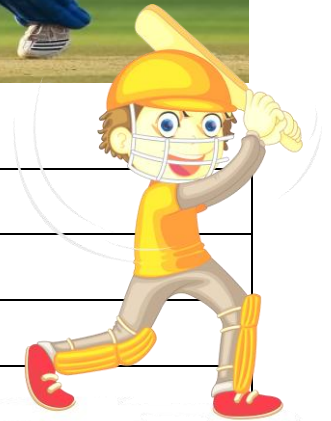


CRICKET SCORES

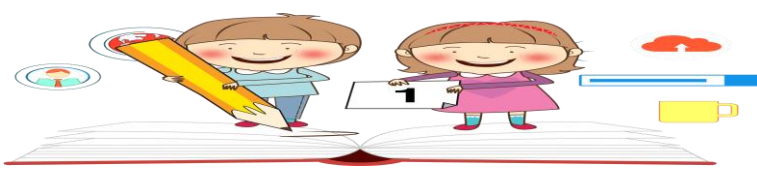
Amrit is watching Sachin Tendulkar's innings in a test match (India Vs Australia). He started a fun game with fruits in accordance with the runs scored by Sachin, the details of which are given below:



1 run	An orange is placed in the basket
2 runs	An apple is placed in the basket
3 runs	A pear is placed in the basket
4 runs	A pear and an apple are removed from the basket



Initially, the basket was empty. The sequences of the runs scored by Sachin in two consecutive over's were 1,1,2,3,2,4,1,1,2,3,4. At the end of two overs, how many oranges and apples were in the basket?



Challenge
yourself...



TEST RESULTS

A candidate appears for a test and attempts all the 100 questions in it. While a correct answer fetches 1 mark, wrong answers are penalized as follows:

- one-tenth of the questions carry $1/10$ negative mark each,
- one-fifth of the questions carry $1/5$ negative mark each
- The rest of the questions carry $1/2$ negative marks each.

Un-attempted questions carry no marks. What is the difference between the maximum and the minimum marks that he can score?



Best of Luck



**Challenge
Yourself...**



SIZE OF TABLES

A carpenter was asked to make four table tops as given below.

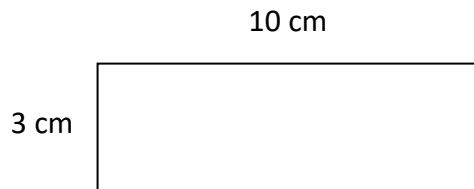


Figure 1

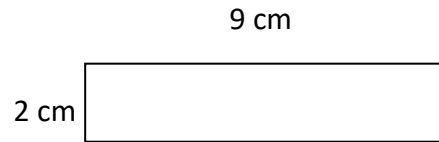


Figure 2

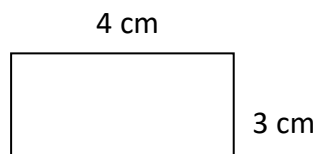


Figure 3

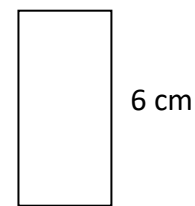
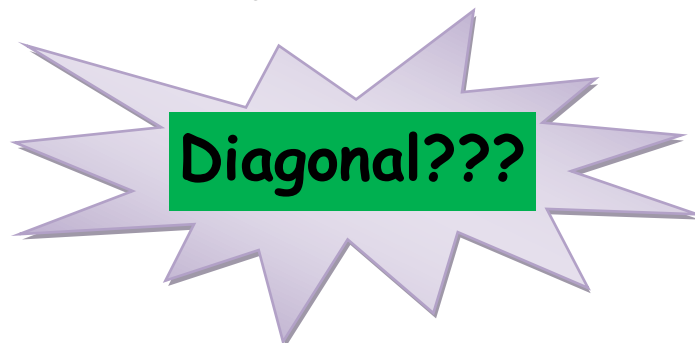
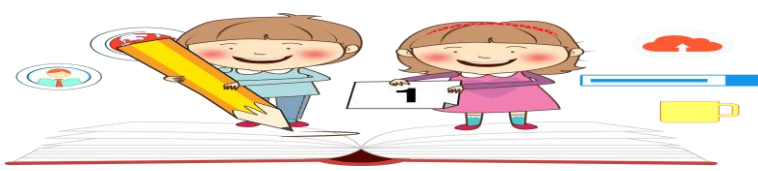


Figure 4

Students accompanied the teacher to a carpenter's room. The teacher asked the students:

- Name the shape of all the figures.
- Which figure has the smallest perimeter?
- Four students were chosen at random and asked to find the diagonals of all the above figures. Can you tell which figure has a rational number as the length of the diagonals?
- Also find the area of the figure with rational number as its diagonal?





Challenge
yourself...



ORGANISING BIRTHDAY PARTY

Adrian was given ₹ 16,000/- by his parents to arrange his birthday party. He planned to spend $\frac{1}{4}$ on food, $\frac{3}{10}$ of remainder on decoration and $\frac{5}{21}$ of the remaining money on the return gifts to be given.

His parents were very happy to see his planning as he could save some amount. Suddenly they came to know that Adrian needs ₹ 10,000/- urgently as his friend is in need. How much money will Adrian borrow from his parents so that he can help his friend (he will add the left over amount to make ₹ 10,000/-).



INTERESTING

Show your working



Challenge
yourself...



FENCING THE YARD

Mr. Yadav has a kitchen garden in the backyard, whose boundaries are fenced by barbed wires. A cow would often break through the wire and destroys the garden. He decided to fence it with sections of wood frames. The fence comes in sections that are $4\frac{2}{3}$ feet long. If his backyard is 42 feet long, how many sections of wood frames will he need to buy to fence his entire back yard?

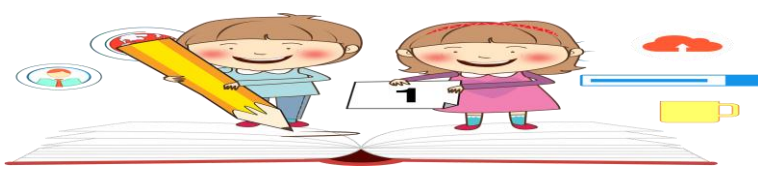


Do you know?

**1 foot =
30.48 cm**

Measure your height

<i>My height</i>	<i>In (cm)</i>	<i>In (feet)</i>



**Challenge
Yourself...**



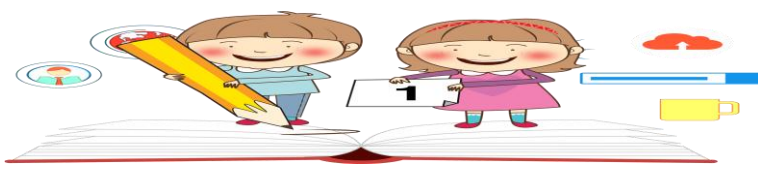
FLIGHT OF BIRDS

Birds have many physical features, besides wings, that work together to enable them to fly. They need lightweight, streamlined, rigid structures for their flight. The shape of a bird's wing is important for producing lift. The increased speed over a curved, larger wing area creates a longer path of air. This means the air is moving more quickly over the top surface of the wing, reducing air pressure on the top of the wing and creating lift. Also, the angle of the wings (tilted) deflects air downwards, causing a reaction force in the opposite direction and creating the lift.

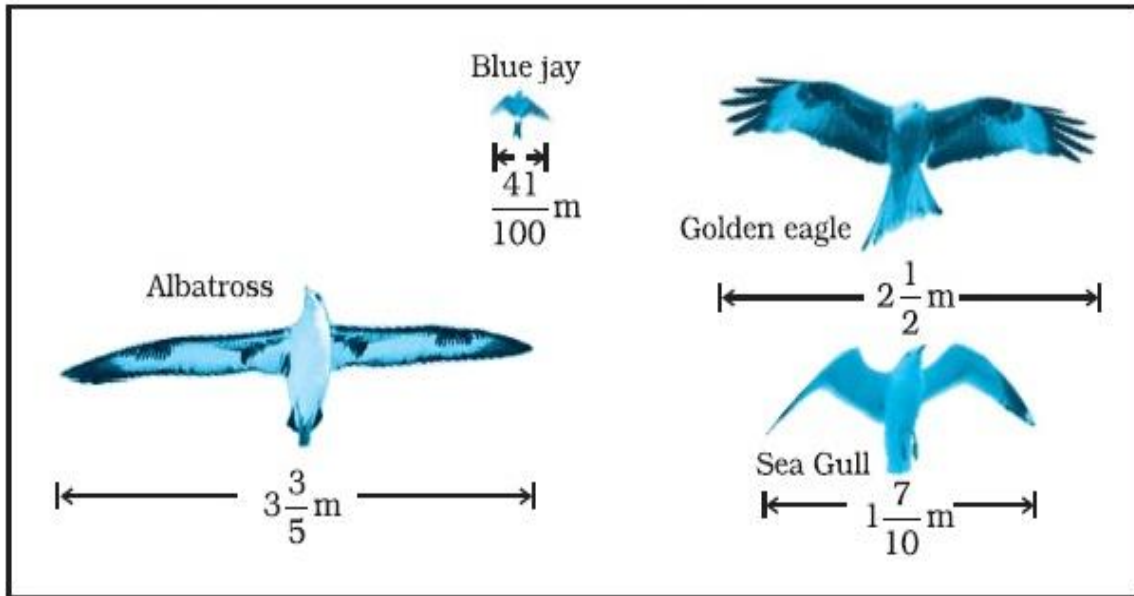
Larger wings produce greater lift than the smaller wings. So smaller-winged birds (and planes) need to fly faster to maintain the same lift as those with larger wings.



The diagram shows the wing spans of different species of birds. Use the diagram to answer the question given below:

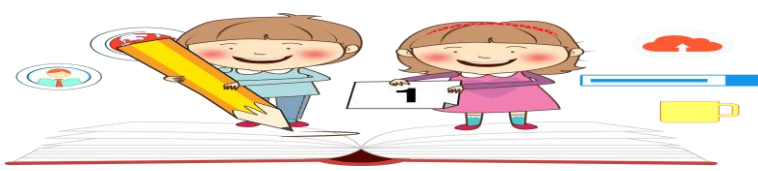


Challenge
yourself...



- (a) How much longer is the wingspan of the Albatross than the wingspan of a Sea Gull?

- (b) How much longer is the wingspan of a Golden eagle than the wingspan of a Blue jay?



Challenge
yourself...



DAILY WAGES

Roger gets ₹40 per day as wages and ₹ 4.50 as commission for every pair of shoes he sells in a day. His daily earning goal is ₹ 112.



1. Write an equation to determine how many pair of shoes, Roger, must sell in a day to meet his daily earning goal. Let pair of shoe be represented by 'p'

2. Find the number of pair of shoes he must sell to meet his daily earning goal.

3. Can he meet his daily earning by selling 12 pair of shoes in a day? Justify your answer.



**Challenge
Yourself...**



MYSTERY OF GROWING TREE

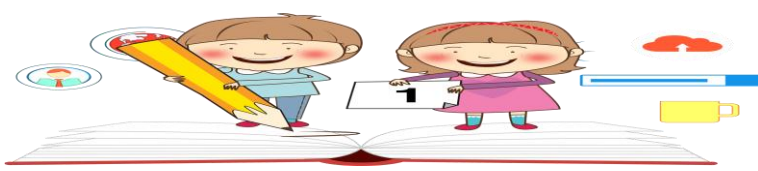
Last month, Margo bought a tree that grows 2.5cm per day. It was 5cm tall when she bought it and now it is 65 cm tall. Find the number of days Margo has owned the plant.



**BRAIN
TEASER**

$$\begin{array}{rcl} \square & + & \square = 8 \\ + & & + \\ \square & - & \square = 6 \\ = & & = \\ 13 & & 8 \end{array}$$





**Challenge
Yourself...**



CAPACITY OF PEN DRIVE

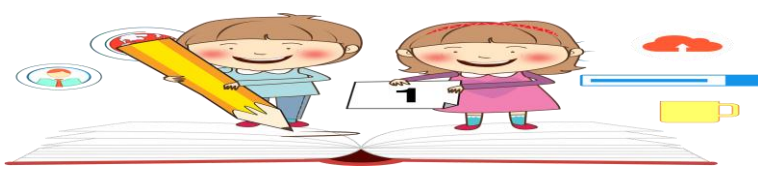


During COVID-19, all teaching work was online. It is a new and innovative experience for teachers, students as well as parents. Rohit, a class 8 student, is very sincere student. He used to send all assignment in time. Moreover he used to participate in virtual competition like singing, reading challenge while sending that he thought of transferring files from the mainframe into his pen drive. The drive showed that 50 megabytes were used (before the transfer). The transfer happened at a constant rate. After 100 seconds, drive showed 550 megabytes were used.

1. Calculate the rate at which transfer of files occurred. (Show your working)

-
2. If the drive had a maximum capacity of 1000 megabytes. How much more time will the drive take to be completely full? Show the working. And tick the correct option.

- (a) 50 sec
- (b) 60 sec
- (c) 90 sec
- (d) 100 sec



Challenge
yourself...



FRIENDS GET-TOGETHER



Rohan and his friends went to a restaurant for a get-together as they were meeting after one year

They want tea or coffee, as they want to spend good time with each other.

They went to a cafeteria.

On the board of the cafeteria, the following was mentioned

- 4 cups of coffee and 4 cups of tea cost ₹ 120.
- 3 cups of coffee cost as much as 2 cups of tea.



He was a very smart boy. He immediately calculated that he can easily order 5 cups of coffee and 5 cups of tea with the amount he has in his wallet.

Find money in his wallet?

Show your working



Challenge
yourself...



AGE MYSTERY

Father and Son were having discussion on their ages.

The son said to his father that if I add twice of my age to your age the sum is 56.

To this father added, that if I add twice of my age to your age the sum will be 82.

Is this information given by them enough to find their ages.

If yes, calculate their ages?



**Try
to
Solve**



Challenge
yourself...



POCKET MONEY

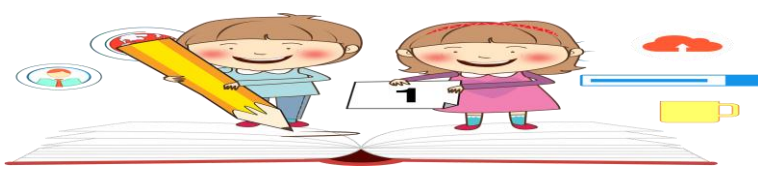
In a family there are three sisters named Shivani, Rekha and Vrinda. Pocket money to be given to each girl is a multiple of their ages. The eldest will get maximum and youngest will get the minimum. The following information is also given about their ages.

Shivani is twice as old as Rekha and Vrinda is 9 years older than Rekha.

Three years ago, Shivani was nine less than three times Rekha's present age.

1. Find their individual ages to calculate their pocket money.
2. Calculate the pocket money of Shivani if each one is getting money twice of her age.
3. Find the ratio of the pocket money of Rekha to Vrinda.





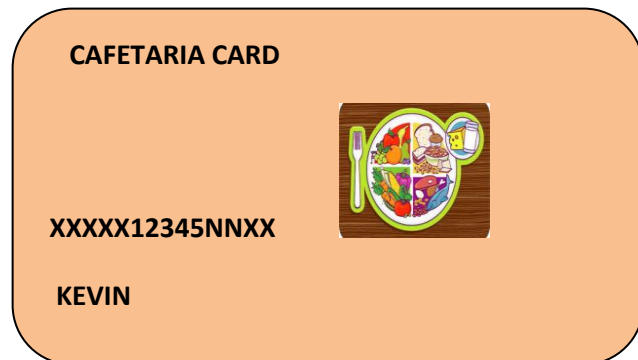
**Challenge
Yourself...**



PAYING GUEST AND HIS CARD

Kevin lives as a paying guest in a town. He cannot cook for himself and the landlord provides him his meals except breakfast. For breakfast he uses his office cafeteria. He has ₹ 1600 on his cafeteria card. Every time he orders breakfast, ₹ 25 is deducted from the value on his card.

One day he receives a SMS that he has ₹ 250 balance in his card. And he started calculating the number of times he has swiped his card for eating breakfast. Can you tell the answer?



Multiplication and Division

4

●	●	●	●
●	●	●	●
●	●	●	●
●	●	●	●
●	●	●	●
●	●	●	●

6

Fact Family

$6 \times 4 = 24$ $24 \div 4 = 6$

$4 \times 6 = 24$ $24 \div 6 = 4$



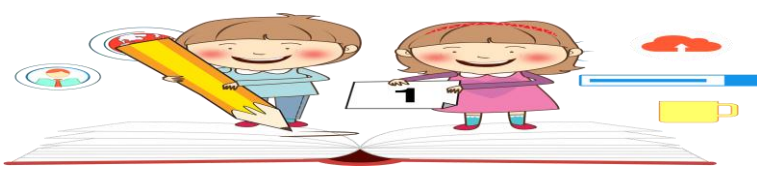
INVESTMENT IN SHARE MARKET

Sehaj got interested in the share market. After discussing the details with his friend he decided to invest in two stocks. He bought a total 360 shares of those two stocks. The price of one of the stock is ₹ 35 per share, while the price of the other stock is ₹ 45 per share. He spent a total of ₹ 15000 on these shares.

1. How many shares of each stock did he buy?



2. Suddenly one day market crashed and the prices of the shares decreased. However his one stock costing ₹ 35 each devalued to ₹ 20 each. What was his total loss?



**Challenge
yourself...**



FAVOURITE TV SHOW

Hridyaa looks at her watch and notices that she still has M minutes remaining for her favorite show to start on T.V. Since she is very anxious, she takes a look at her watch again and notices that only 5 minutes have passed. How many minutes are left for her favorite T.V show to start? What will be the linear expression for the same?



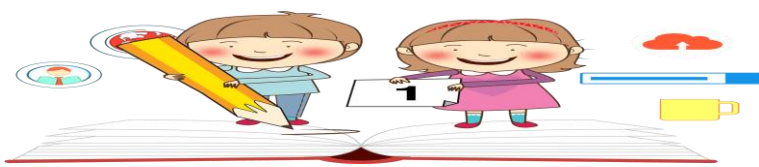
DONATION BOX



Dadu, where are you going?

I am going to the temple.
Come with me, I will show you something.

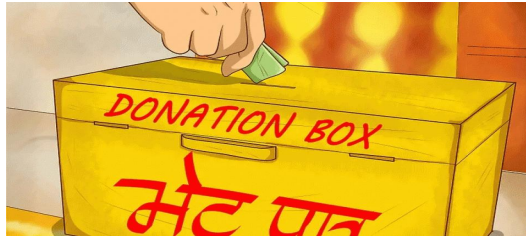




Challenge
yourself...



Dadu, what is this?



This is a Donation box,

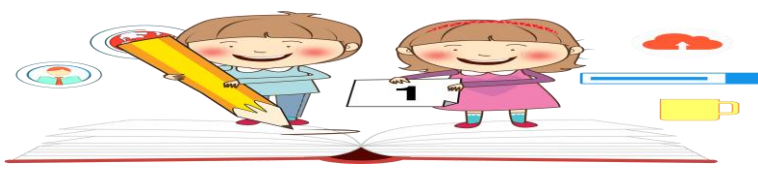
Many people visit the temple for prayers. They donate some amount as per their wish in the donation box placed in the temple. Pandit ji uses the money from this box to buy his daily bread.



At the end of one day, Pandit ji finds that there are ₹ 500 in the box. Next morning he notices that “n” number of people put ₹ 10 in the box and (n+1) number of people put ₹ 5 in the box.

1. Write an expression for the total amount in the box at the end of that particular day?

2. Find the number of people who visited the temple that day, if the amount at the end of the day is ₹ 995?



Challenge
yourself...



MOVIE TICKET

Simi and her friend planned to watch a movie. After they booked the tickets, their ticket numbers were two consecutive odd numbers. On adding the numbers on the tickets, they found their sum was equal to 68. Find the actual ticket number of their movie tickets.



Show your work



**Challenge
Yourself...**



VARIABLE GAME

In a region, there are some Mexican, Chinese and Indian people.

1. The number of Chinese is three times the number of Mexicans.
2. The Number of Indians is 6 less than the number of Chinese.
3. The number of people in the region is 5 times the number of Indians

Which of the following equations can help to find out the number of Mexicans?

(Assume the number of Mexican = x)

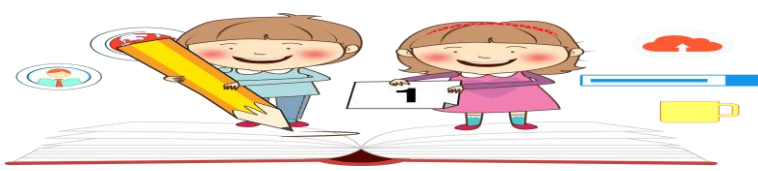
- (a) $x + 3x + 3x + 6 = 5 (3 x + 6)$
- (b) $7x - 6 = 15x - 30$
- (c) $7x - 6 = 15x - 38$
- (d) $x + 3x + x + 6 = 5 (x + 6)$

FACTS

Mexico: It is one of the oldest and largest city in America.

China: It is world's most populous country, with a population around 1.4 million in 2019. It's world's third or fourth largest country by area.

India: It is second most population country, the seventh largest country by land area and most populous democracy to the world.



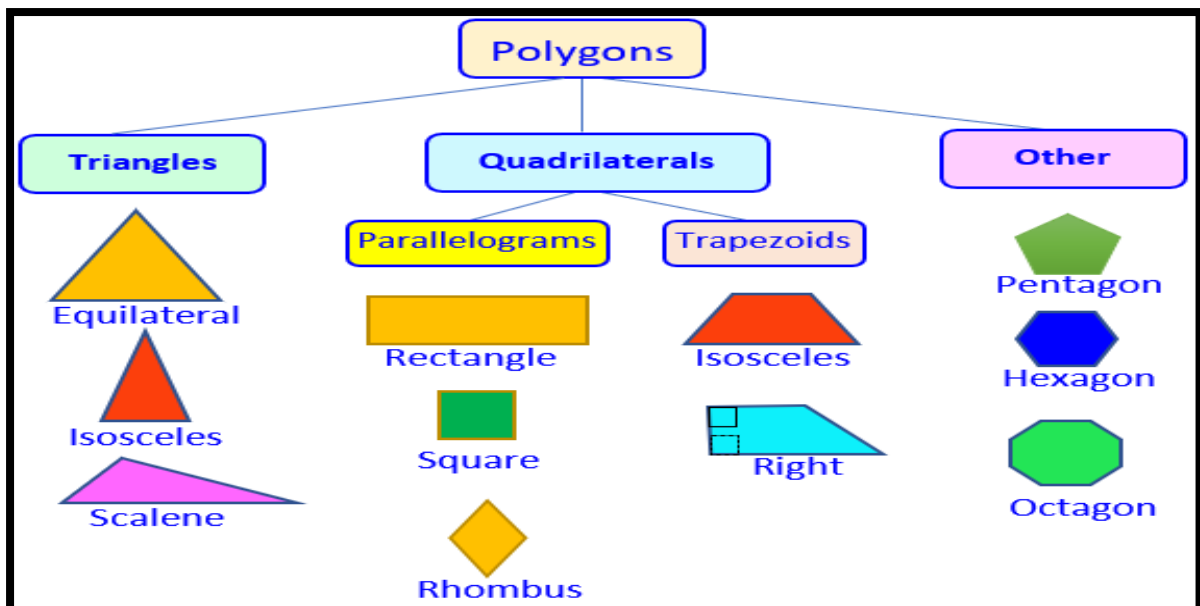
**Challenge
Yourself...**



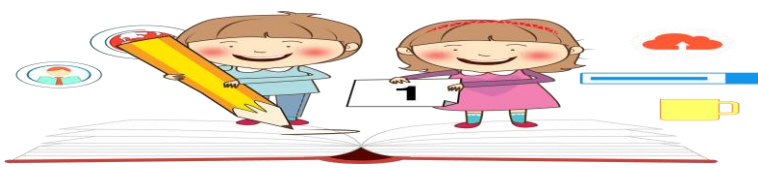
PUNJABI TREAT RESTAURANT

Entry/	Table 1	Table 6	Table 11	Table 16	Table 21	Washroom
Exit	Table 2	Table 7	Table 12	Table 17	Table 22	Washroom
Cash Counter	Table 3	Table 8	Table 13	Table 18	Table 23	Kitchen
Cash Counter	Table 4	Table 9	Table 14	Table 19	Table 24	Kitchen
	Table 5	Table 10	Table 15	Table 20	Table 25	

Points to ponder



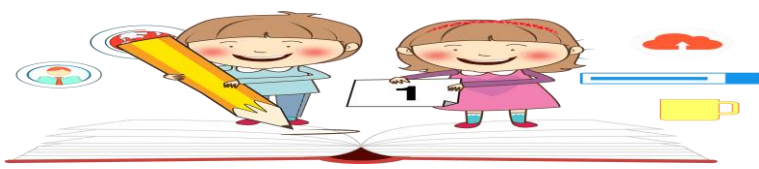
Rishika went to a Punjabi Treat Restaurant with her family for dinner. After ordering the food she observed the layouts of the Punjabi restaurant carefully to answer the questions asked by her father.



Challenge Yourself...



1. Which polygon is represented by the whole layout of the restaurant?
 - (a) Square
 - (b) Trapezium
 - (c) Rectangle
 - (d) Rhombus
2. If a pentagon is formed by tables, what formula will represent the sum of angles of this pentagon?
 - (a) $(n - 2) \times 360^\circ$
 - (b) $(n - 2) \times 180^\circ$
 - (c) $n \times 180^\circ$
 - (d) $2n \times 180^\circ$
3. If a rope is to be tied around tables 17, 18, 23 and 22, what will the length of rope required if each table covers 2 ft X 2ft of space?
4. If a rope is tied around tables 17, 18, 23 and 22, what will the area covered by this rope if each table covers 2 ft X 2ft of space?
5. If during renovation, a square portion has to be formed in the restaurant including the kitchen area, which tables would be taken along with the kitchen for the purpose?
6. Which tables would you take to form a trapezium whose parallel sides are 2 and 4 units and distance between them is 4 units?

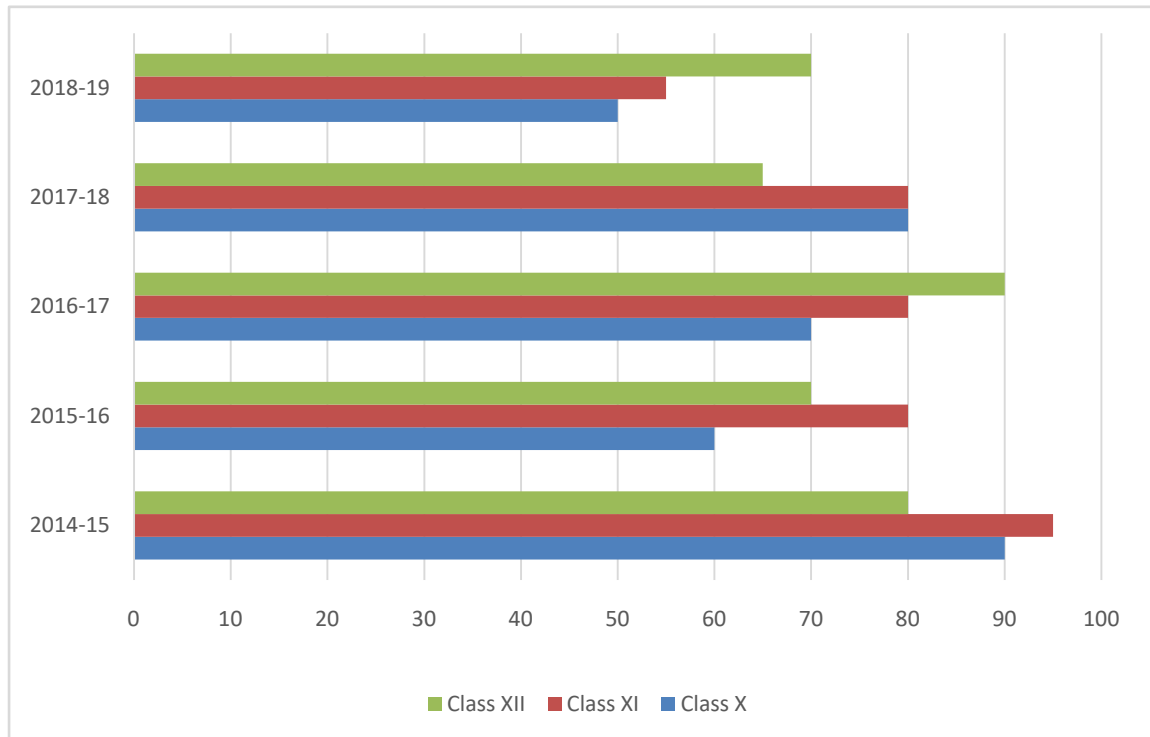


**Challenge
Yourself...**



RESULT BOARD

High school students are performing well in the studies as well as co-curricular activities. The following graph shows the pass percentage for the classes X, XI, XII of a school for consecutive five years.



1. In which year there is a uniform increase in pass-percentage for classes X, XI, XII?
 - (a) 2014-15
 - (b) 2017-18
 - (c) 2018-19
 - (d) 2016-17



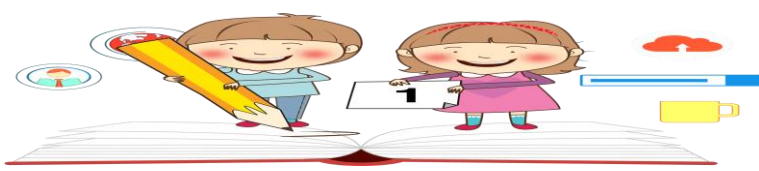
Challenge
yourself...



2. What is the maximum fall in the pass-percentage for class X in comparison to its previous year?
 - (a) 60
 - (b) 50
 - (c) 30
 - (d) 25

3. What is the decrease in the pass-percentage for classes X and XII in year 2018-19 than in the year 2014-15?
 - (a) 40, 20
 - (b) 40, 80
 - (c) 40, 10
 - (d) 30, 40

4. The school is worried about the results of these classes for the session 2018-19. If in 2019-20 the school wants to achieve the pass percentage of the three classes to the maximum of the past years. How much increase in percentage the school should aim for classes X, XI and XII?
 - (a) 50, 40, 40
 - (b) 40, 40, 20
 - (c) 40, 50, 20
 - (d) 20, 20, 40

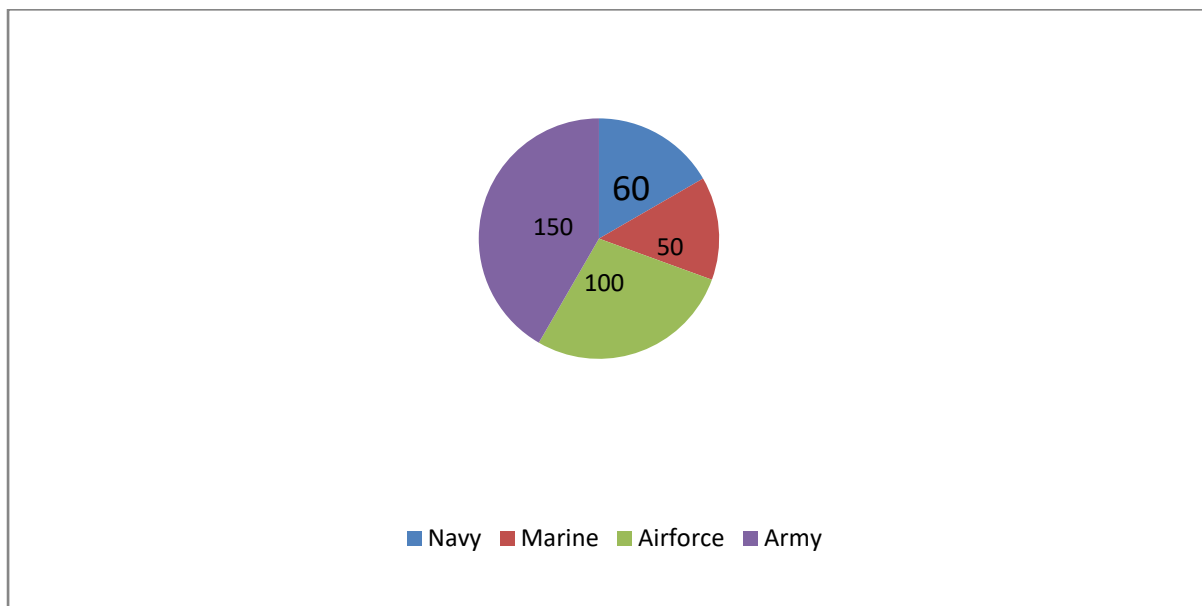


**Challenge
Yourself...**



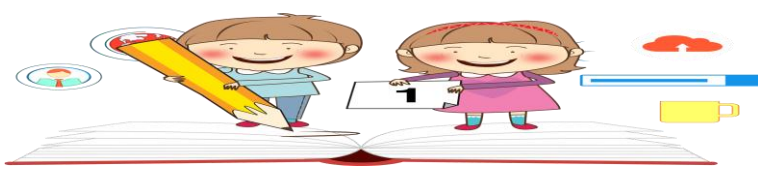
BRANCHES OF ARMED FORCES

Our Soldiers are our pride. It's their selfless love towards their nation that makes them offer the supreme sacrifice. Inspired by their selfless service, many youth joined the armed forces last year. Nine hundred men volunteered for the armed forces. The pie chart represents the proportion of men in the different armed services. (Data represents central angle in degrees)



1. How many men volunteered for Marine and Navy altogether?
 - (a) 275
 - (b) 325
 - (c) 250
 - (d) 375

2. What is the percent difference of the men volunteered to join Air force and the Army?
 - (a) 41.67
 - (b) 16.66
 - (c) 13.89
 - (d) 27.7



**Challenge
Yourself...**

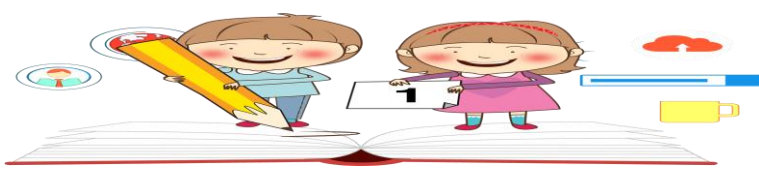


SUMMER CAMP

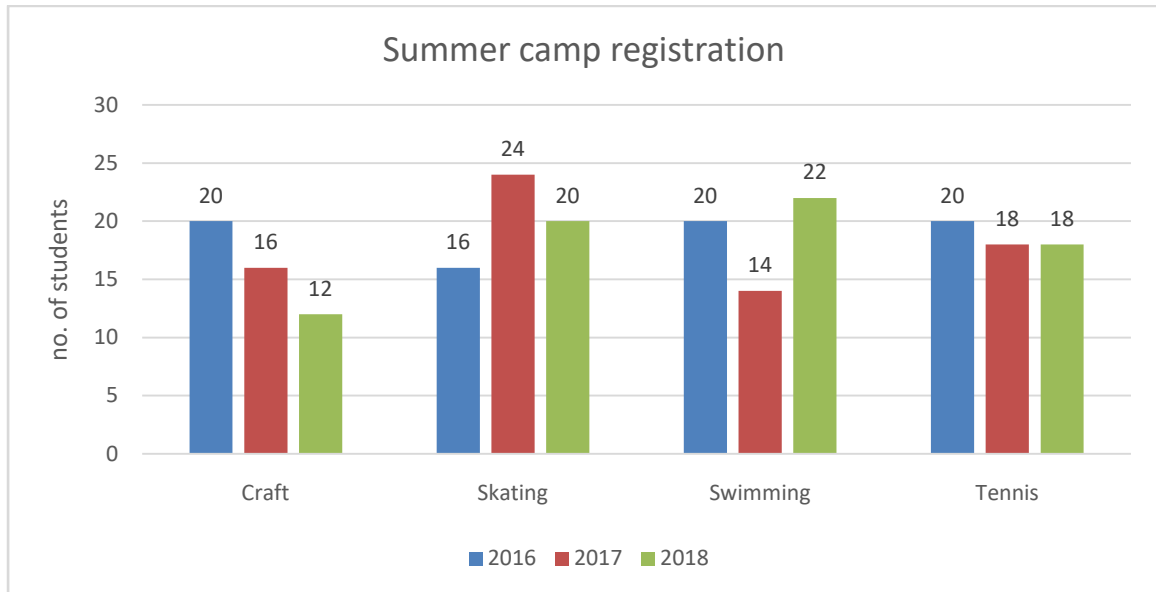


All through spring and the summer months the students can join summer camps and participate in different activities. It's always amazing to see just how many students are having a great time with their camp experience. Here is the data showing the number of students who registered for a summer camp in 2016, 2017 and 2018 in different activities of Vivekananda school.

Every year school organizes Summer camp for students during summer vacation. School prepares a bar graph to show the number of students who registered for a summer camp in 2016, 2017 and 2018 in different activities.



Challenge
yourself...

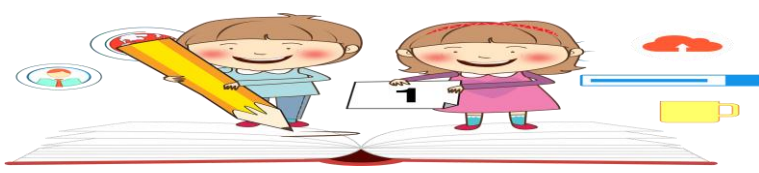


1. Find the ratio of the number of students who registered for skating to the number of students registered for Tennis in the year 2017.

2. In 2016, the fee charged for Craft was ₹ 1500 per student and for swimming it was ₹ 2200 per student.

Find the total amount collected from these two activities in 2016

3. What fraction of the students of 2017 attended crafts?

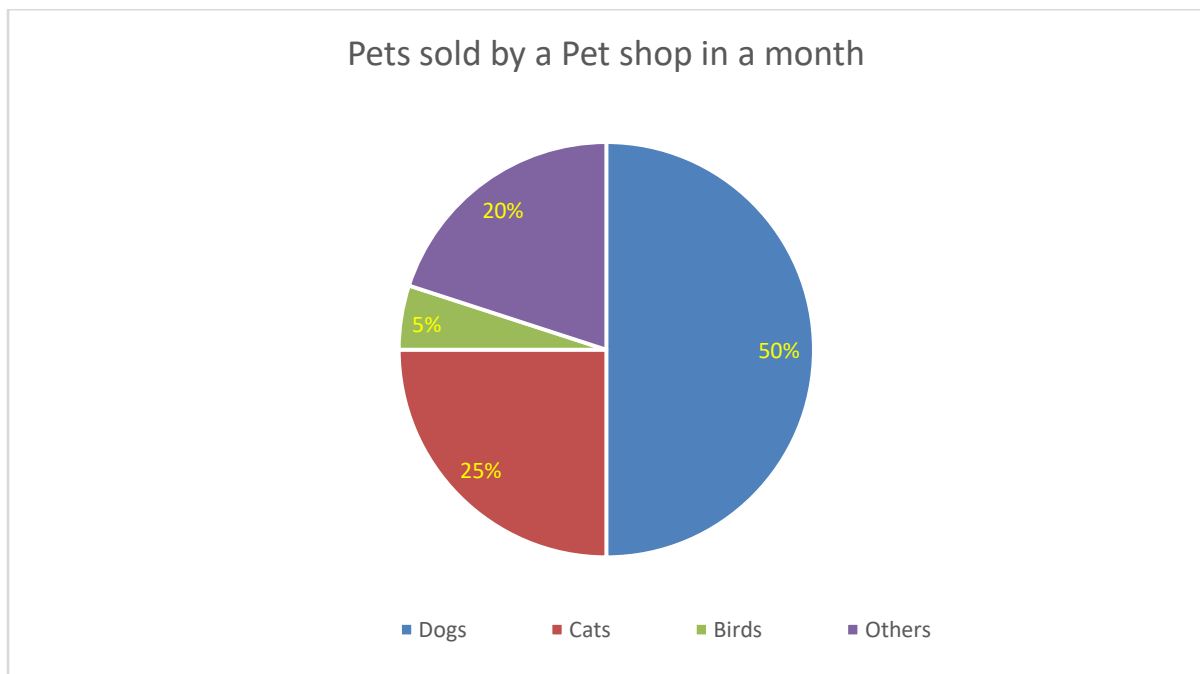


**Challenge
Yourself...**



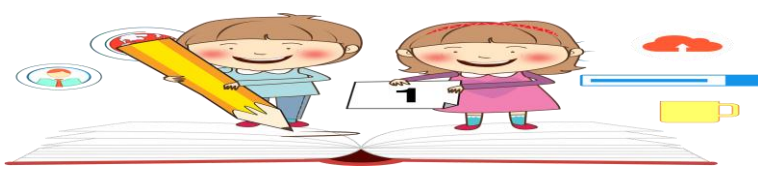
THE PET SHOP

Our pets play an integral role in bringing joy and cheerfulness to our house. The unconditional love they provide us is a healing force in itself. 'Pets World', the leading pet shop in the city offers you top quality pets. You will have a smooth and seamless experience of buying different types of pets. The given pie chart depicts the sale of pets in the last month at Pets World.



If the number of total pets sold is 1,500, find the following?

1. The number of birds sold.
2. The difference between number of cats sold and the number of other pets sold.
3. The ratio of total number of cats to the number of dogs sold.



**Challenge
Yourself...**



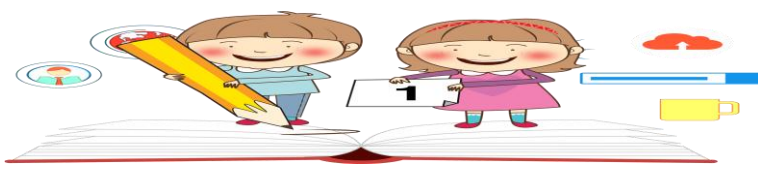
YEARLY EXPENDITURES

Study the following table and answer the questions based on it.

Expenditures of a Company (₹. in Lakhs) per Annum Over the given Years.

Year	ITEM OF EXPENDITURE				
	Salary (₹.in lakhs)	Fuel and Transport (₹.in lakhs)	Bonus (₹.in lakhs)	Interest on Loans (₹.in lakhs)	Taxes (₹.in lakhs)
1998	288	98	3.00	23.4	83
1999	342	112	2.52	32.5	108
2000	324	101	3.84	41.6	74
2001	336	133	3.68	36.4	88
2002	420	142	3.96	49.4	98

- What is the average amount of interest per year which the company had to pay during this period?
 - ₹. 32.43 lakh
 - ₹. 33.72 lakh
 - ₹. 34.18 lakh
 - ₹. 36.66 lakh
- The total amount of bonus paid by the company during the given period is approximately what percent of the total amount of salary paid during this period?



**Challenge
Yourself...**



- (a) 0.1%
- (b) 0.5%
- (c) 1%
- (d) 1.25%

T.V. TIME

Romi is a student. He is allowed to watch T.V. at most for an hour between 7:30 pm and 10:00 pm. He checked for the TV programs between 7:30 pm and 10:00 pm on different channels and made the list of his favorite shows along with their timings.

Time	Program	Duration
7:30 pm	America's Funniest videos	30 minutes
7:30 pm	Big Bang Theory	30 minutes
8:30 pm	Tom and Jerry	1 hour
9:00 pm	Blue Planet	30 minutes
10:00 pm	Friends	1 hour

1. Romi wants to watch two programs. Which two programs can he watch completely?
2. Romi has to take dinner at 9:00 p.m, because of which he has to miss Blue Planet. What options are now left for him to watch?

SOFIA'S GARDEN

Sofia is fond of gardening. She bought 3590 flower saplings of two different kinds (Roses and Tulips) in equal quantity as she wants to impress the visiting neighbors' and family friends by arranging her saplings in such a manner that they



**Challenge
Yourself...**



are arranged in 's' rows and each row has 's' number of saplings. She finds that she cannot do this with the number of saplings she has.



1. What is the minimum number of saplings she needs to add to get this type of arrangement?
 - (a) 6
 - (b) 2
 - (c) 10
 - (d) 18
2. If the cost of each sapling of Rose is ₹ 5 and ₹ 2.50 for each sapling of Tulip. Find the ratio of cost of each sapling of Rose to Tulip.

SCHOOL AUDITORIUM

In a school auditorium the number of chairs in a row is same as the number of rows in which the chairs are kept. There are 7033 students in school it was found that less than 31 chairs were empty. How many chairs were empty after all students sat down? Calculate to nearest perfect square.



**Challenge
Yourself...**



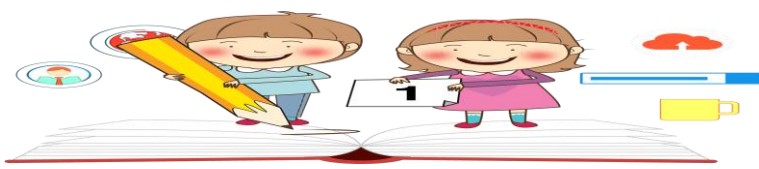
Show your work using method of estimation



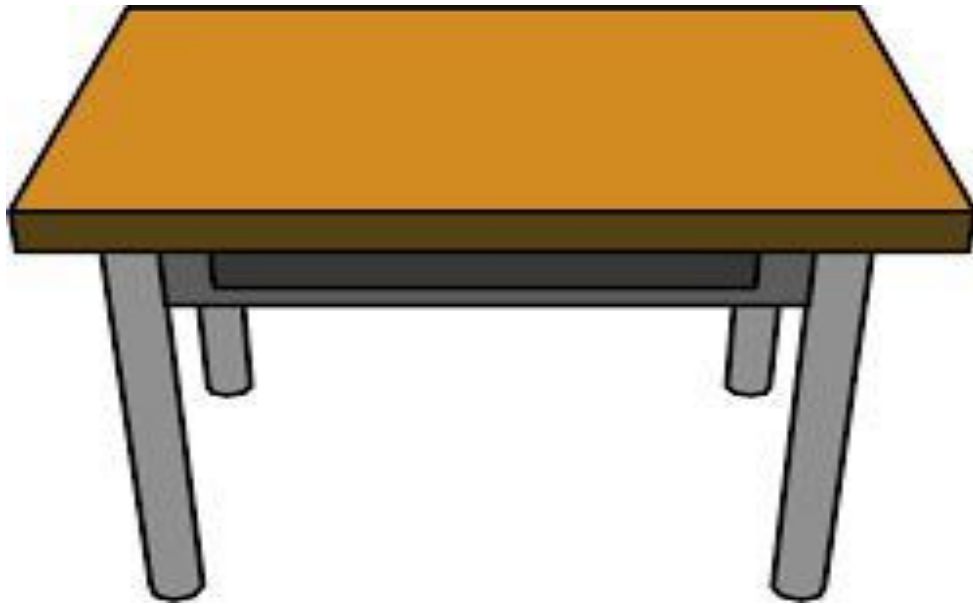
- (a) 23
- (b) 24
- (c) 25
- (d) 26

TEACHER'S TABLE

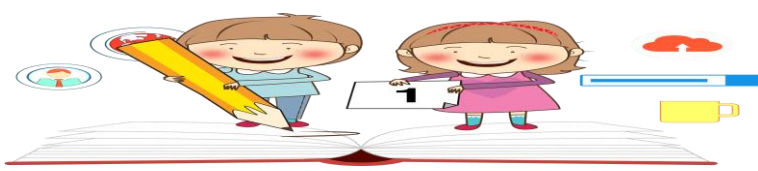
Mrs. Smita, Math teacher of class 8 was on leave. Mrs. Vaishali, the Music teacher was deputed in her absence. There were 35 students in her class. The class was very naughty. To keep the class busy Mrs. Vaishali puts a question to students that:



Challenge
yourself...



1. The square shaped teacher's table has area of 2.25m^2 . What will be the measurement of sides of the teacher's table?
2. The teacher asked the students to decorate the edges of the table with a ribbon. How much ribbon is required for the same?
3. Find the sum of the lengths of the diagonals of the square shaped table top.

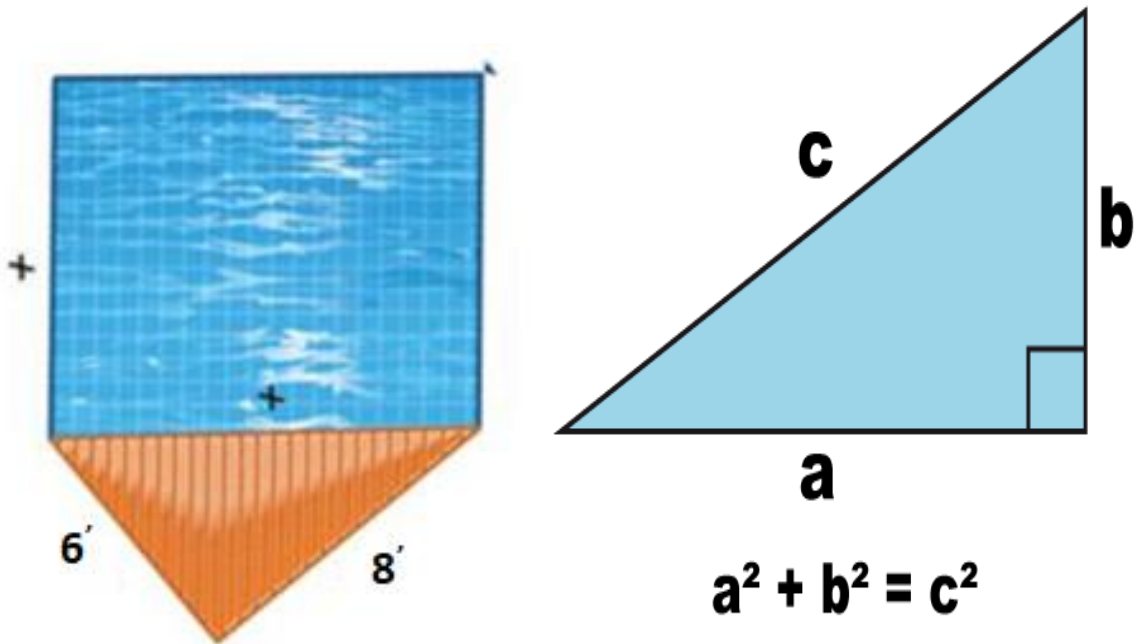


Challenge
Yourself...



SWIMMING POOL

An architect wants to put a square pool next to triangular deck, as shown in the picture. The triangular deck is a right angled triangle, with legs of length 6 feet and 8 feet, and the pool will be adjacent to the hypotenuse

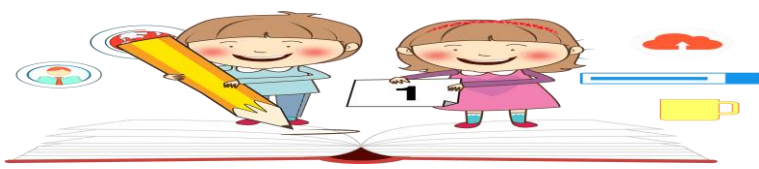


1. Find the length of a side of the pool.

2. Find the Area of the pool.

3. Find the exact area of the triangular deck.

4. Find the Ratio of the Area of pool to the Area of triangular deck.

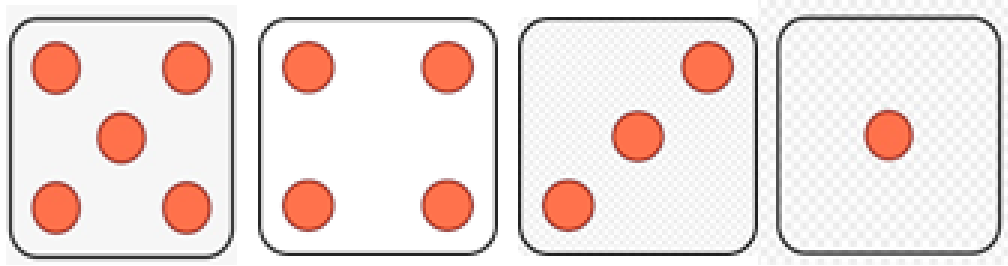


**Challenge
Yourself...**



GAME OF DICE

Four usual dice are thrown on the ground. The total of numbers on the top faces of these four dice is 13 as the top faces showed 4, 3, 1 and 5 respectively. What is the total of the faces touching the ground?

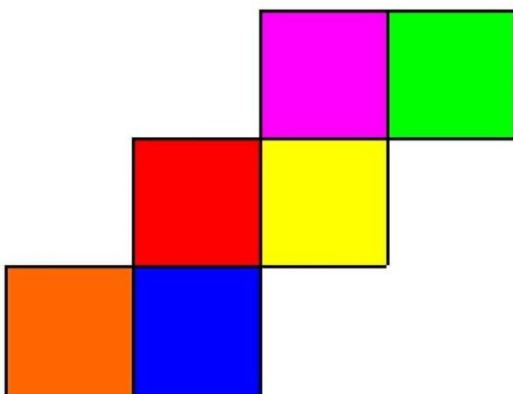


- (a) 12
- (b) 13
- (c) 15
- (d) Cannot be determined

*SUM OF THE DOTS
ON OPPOSITE FACES
IS 7.*

JOURNEY FROM 2-D TO 3-D SHAPES

Samaria saw a cardboard cutout in a shop and enquired about it from the shop keeper.





Challenge
yourself...



He informed her that they will fold it into a box for packing. Samaira got curious and requested the shop keeper to show how a plain piece of paper will change into a box and asked following questions:

1. What will be the shape of the box?

Shop keeper informed her that box will have 6 faces.

2. Now Samaria wants to know which colored face will be opposite to green color and which one will be opposite to orange.




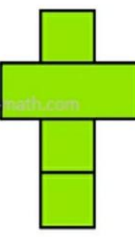

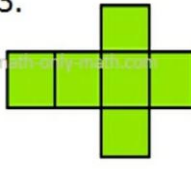


Challenge

Shop keeper informed her that these 2-D shapes are called nets and can be used to make various 3-D shapes.



Challenge Yourself...



(i)		1.	
(ii)		2.	
(iii)		3.	
(iv)		4.	

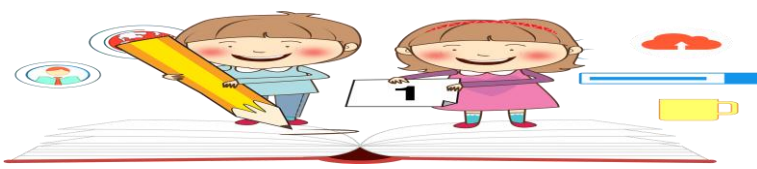
That's true!!! Two dimensional shape, when folded changes into a three dimensional shape. Match the following shape with its net

CUBE

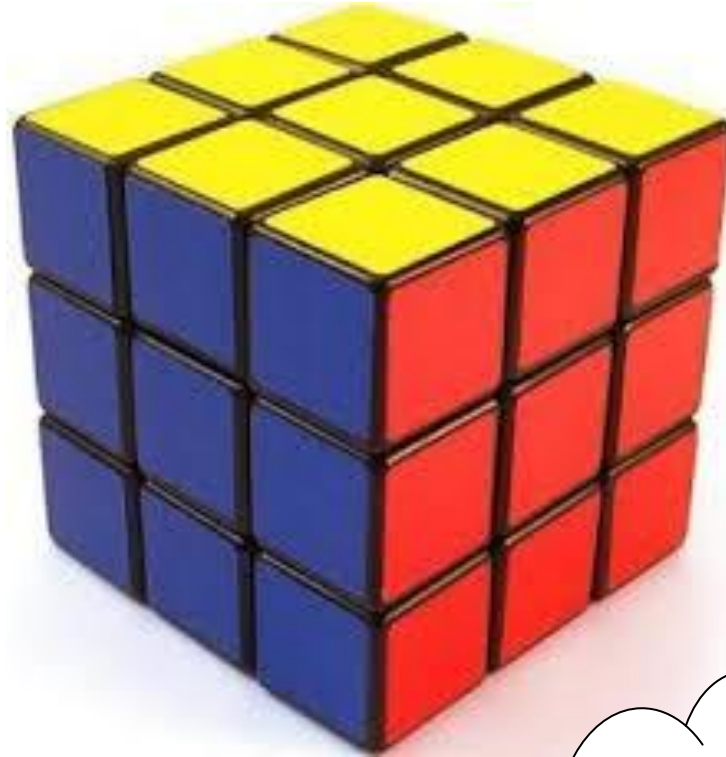
Rohan and Rakhee were struggling to solve the rubrics cube. Finally Rakhee was able to solve it as shown in the figure. Rohan asked her which four colours are adjacent to green color?

Rakhee gave following 5 clues to him:

- Red face is opposite to the black.
- The green face between the red and black.



Challenge
yourself...

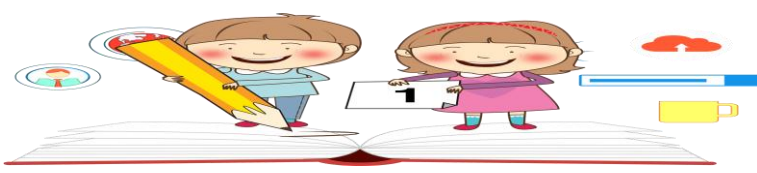


- The blue face is adjacent to the black face
- The yellow face is adjacent to the blue.
- The red face is at the bottom.

Which of the following options is correct

- (a) Black, blue, yellow, red
- (b) Black, blue, yellow, white
- (c) Black, blue, red, white
- (d) Black, yellow, red, white

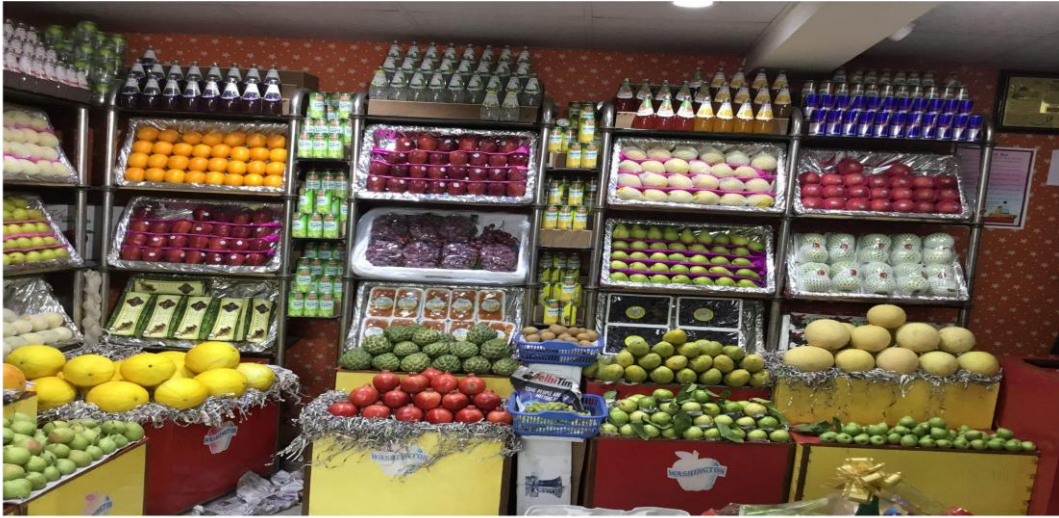
Help Rohan
find which four
colors are
adjacent to
green color.



Challenge
yourself...



FRUIT SHOP

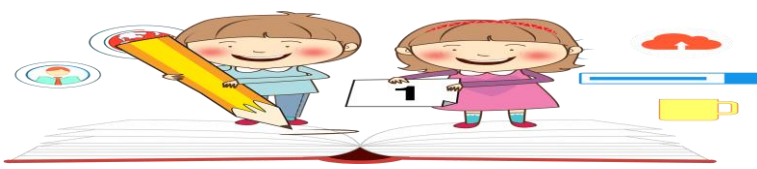


Richa went to a fruit shop to buy some fruits for making a dessert for a party at her home. At the fruit shop, she came across that cost of Nagpuri Oranges and Kinnauri Apples is ₹ 240/- for 6 kg and ₹ 280/- for 4 kg respectively. She decided to purchase Kinnauri Apples.

1. Which of the following statement is true related to Richa purchase?

- (a) Cost (per kg) of Nagpuri Oranges is more than Kinnauri Apples.
- (b) Cost (per kg) of Kinnauri Apples is more than Nagpuri Oranges.
- (c) Cost (per kg) of Kinnauri Apples and Nagpuri Oranges is same.

2. Give the relevant explanation and show your work.



Challenge
yourself...



SHOPPING DURING SALE

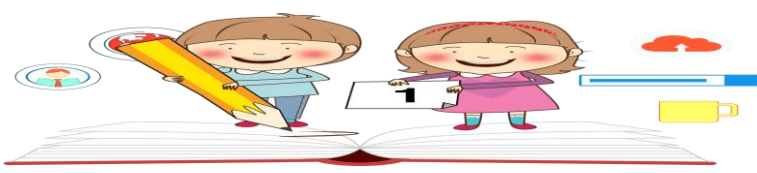


Annanya and Bhavin went to Elante Mall on 15th January. Winter Bonanza sale was going on all the clothing showrooms were offering 40% discount on all their products except Lewis. It was offering 25% discount on its products.

- Annanya bought one cardigan at marked price ₹ 1600/- from Monte Carlo outlet and two denims from Lewis outlet at marked price ₹ 2200/- each.
- Bhavin bought only one jacket from Puma outlet at sale price of ₹ 1600/-.

1. What amount did Anaya pay in total? Show your work.

2. What is the marked price of Bhavin's jacket? Explain how you find your work.



Challenge
yourself...



ROHAN AND HIS TAXI



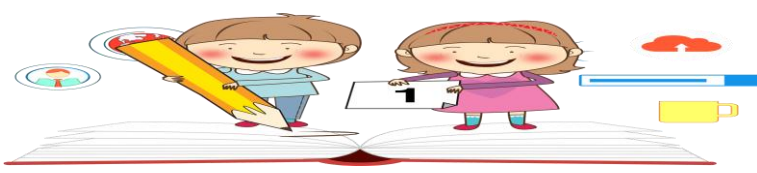
Rohan is a taxi driver and he sets a target to earn ₹4,000 daily . Meter charges for the customer are ₹20 per kilometer. Driver gets only 80% of the amount paid by the passenger. 20% of the total amount is deducted by the taxi company. For how many kilometers should he drive to achieve his target?

(a)
200

(b)
250

(c)
300

(d)
450



**Challenge
Yourself...**



LAND SCAPING

Piyush is a landscape designer and plans to create a cactus garden, flower beds and running track for his new project. He had created a model of this rectangular garden whose total area is $x^2 - 7x + 12$. If square cactus garden in one corner has area = $(x-2)^2$



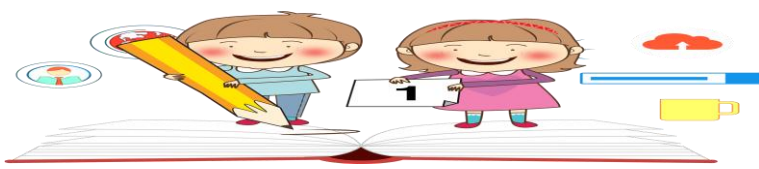
Which of the following expression represents the remaining area of the garden left for flower beds and running track?

(a) $x^2 - 3x + 8$

(b) $3x - 8$

(c) $x^2 + 3x - 8$

(d) $8 - 3x$



Challenge
yourself...

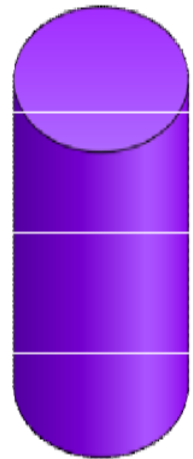


SHAPES WITH A SHEET

A teacher conducted an experiment where she gave a rectangular aluminum sheet to her students and instructed them to form a can along its shorter side, so that the radius of can so formed is $y-3$ units.

If the curved surface area is given by

$2\pi (y^2 - 7y + 12)$ sq. units. Find the height of the can.



(Curved surface area of cylinder $= 2\pi rh$)

(a) $y+4$

(b) $y+3$

(c) $y-4$

(d) $y-3$



**Challenge
Yourself...**



PICNIC TO SHIMLA



Shimla, capital of Himachal Pradesh, is well known for its mesmerizing view. It is a well known tourist spot. Sugul went on picnic along with his friends to Shimla. Sugul's parents gave him money as:

Relation	Amount (in Rs.)
Mother	$4xy^2$
Father	$5xy^2+10$

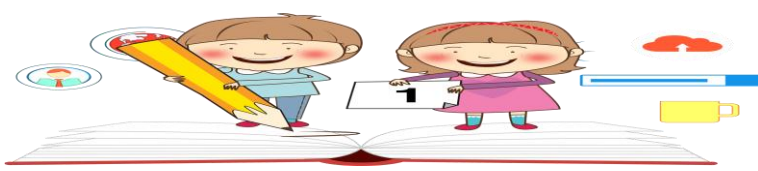
Out of the total money he spent ₹.($10-3xy^2$) during his trip to Shimla. What percentage of total money is left unspent with Sugul?

(a) $\left(\frac{9xy^2+10}{6xy^2}\right) * 100$

(b) $\left(\frac{9xy^2}{6xy^2+10}\right) * 100$

(c) $\left(\frac{6xy^2+10}{6xy^2}\right) * 100$

(d) $\left(\frac{6xy^2}{9xy^2+10}\right) * 100$



Challenge
yourself...



CAR MANUFACTURING COMPANY



Hitz is a car manufacturing company and wants to compile a profit/loss statement. Total sale of Hitz company for the year 2019 is given by expression

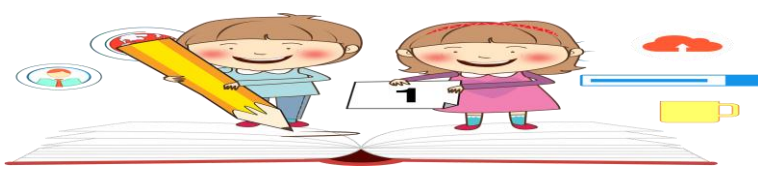
$-0.85x^2 + 1.85x + 7$ where x represents the number of cars manufactured per year.

The total cost of producing x cars is given by expression $0.03x^2 + 1.34x - 4$. What is the total profit earned by the company for the year 2019?

- (a) $-0.88x^2 + 0.51x + 11$
- (b) $0.88x^2 + 0.51x + 11$
- (c) $0.88x^2 + 0.51x - 11$
- (d) $0.88x^2 - 0.51x + 11$

PROFIT??

To get profit,
simply
subtract cost
price from
selling price.



Challenge
yourself...



WEDDING RECEPTION PARTY



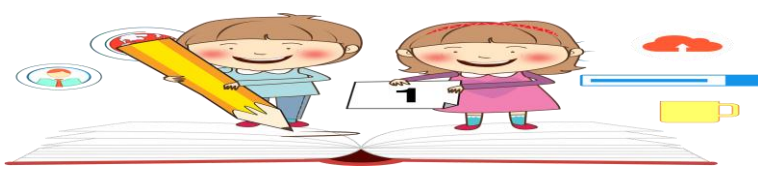
Reema's aunt is planning to host her cousin's wedding reception party at solitaire banquets. Total 150 guests are invited. A hall is booked for

₹ 2, 00, 000 and charge per plate is ₹ 600 as per following menu:

MENU
One Salad
One Non Veg, One Veg
Two side dishes
One Dessert

1. Write an algebraic expression to determine the total expenditure on food including the hall, if 'g' represents the number of guests attending the party.
2. Determine the total expenditure of party if number of guests are 150.

SHOW YOUR WORK



**Challenge
Yourself...**



GREEN SUSTAINABLE HOUSES

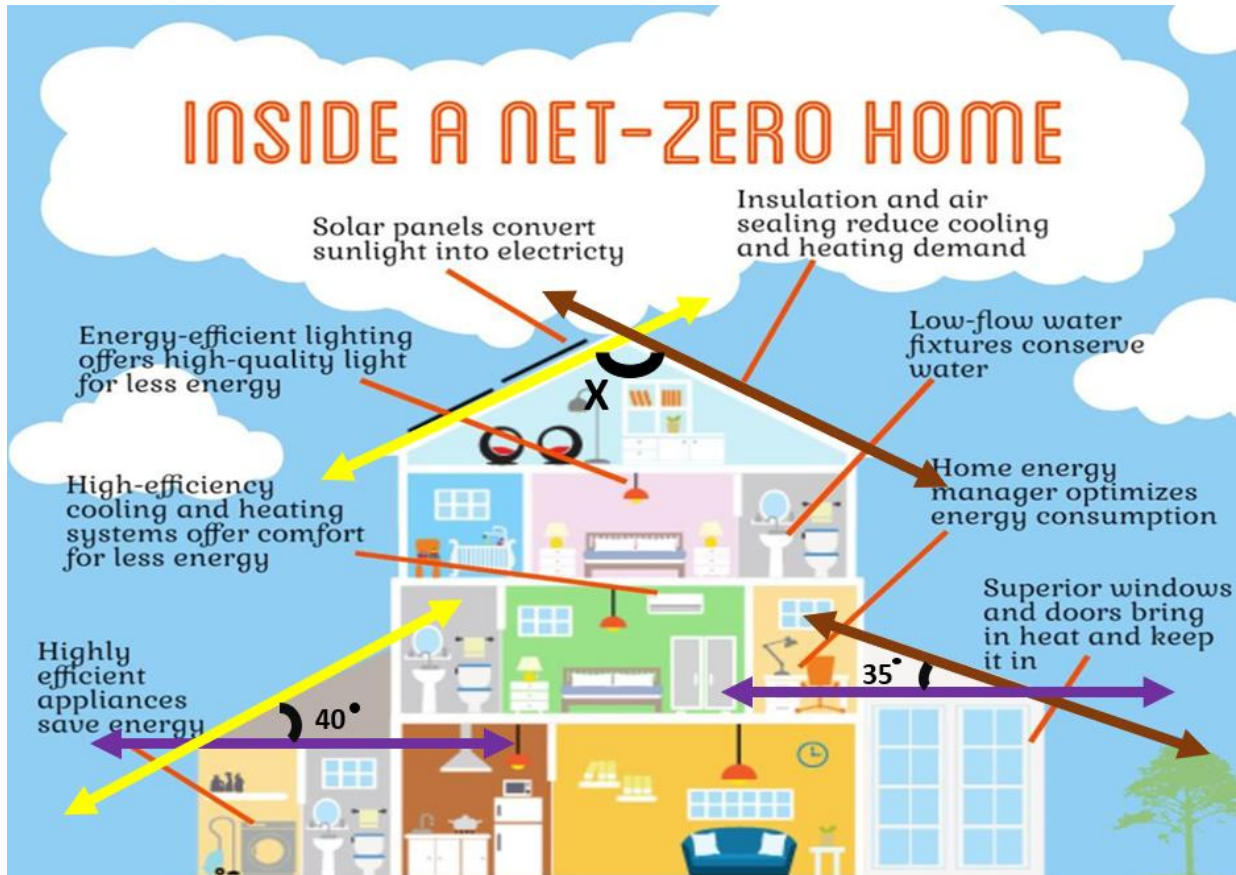
Green sustainable house construction begins with intelligent design. By thinking strategically and adopting the right materials and technology early, you can help save the environment while saving you money. Here are few steps to build green sustainable house.

- 1. Be Smart When It Comes to Design***
- 2. Consider the Placement of Windows***
- 3. Invest in Proper Insulation***
- 4. Research Ways to Keep Your Roof Cool-***
- 5. Use Sustainable, Biodegradable, and Recyclable Materials Where Possible***
- 6. Install Water Saving Fixtures.***
- 7. Determine Whether Property Can Be Run on Solar***





Challenge
yourself...

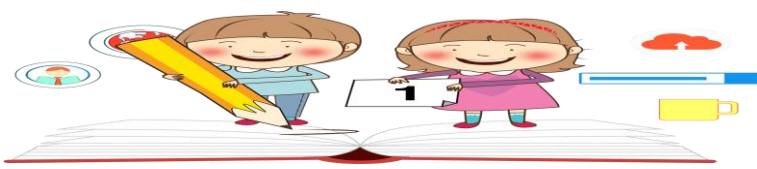


Let's create our dream house.

Make a model house from waste material available at your home (e.g. Cartons, shoe box, Cardboard roles, newspapers etc.)

Example:





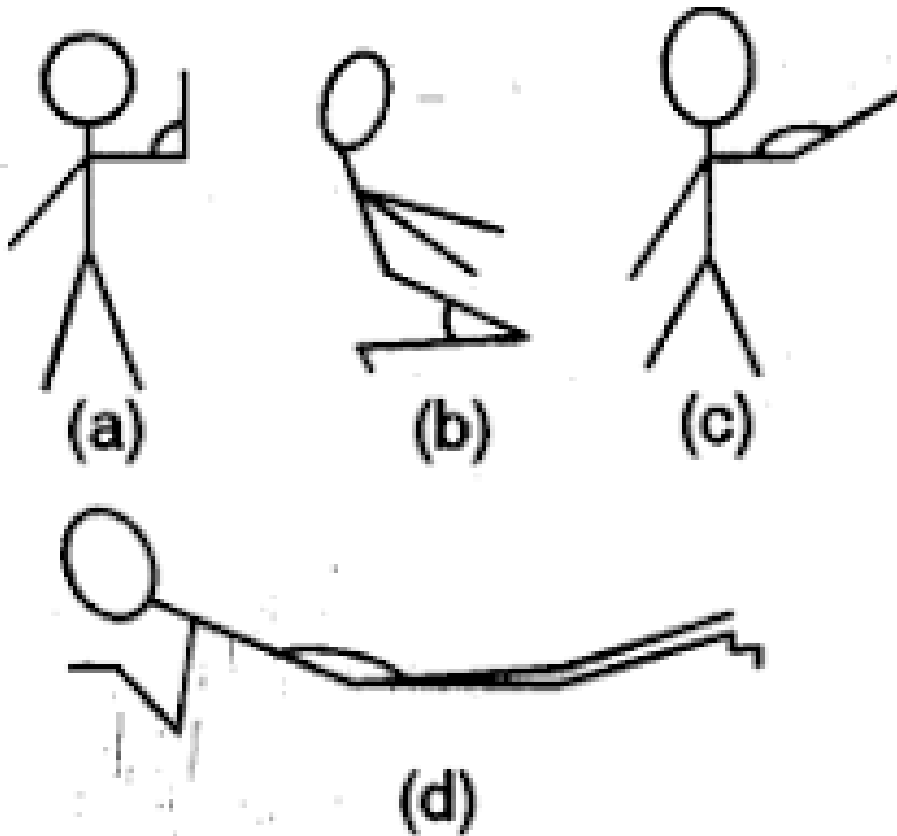
Challenge
yourself...



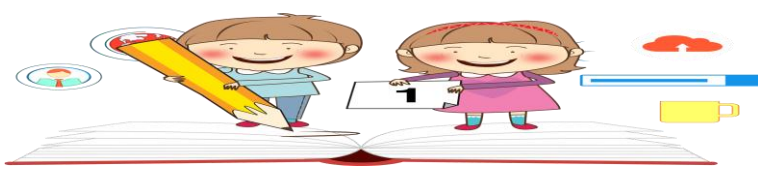
Challenge for you

1. Radhika too wants to construct the green sustainable house for which she has been given the above layout. Help her find the angle x of the roof.
2. At what angle with respect to the ground level, do the solar panels have to be installed?
3. What are advantages of green sustainable houses?

IDENTIFY THE TYPES OF ANGLES IN THE FOLLOWING IMAGES:



!!!!!!THINK ABOUT THE BODY ANGLES AND POSTURES IN YOGA!.



**Challenge
Yourself...**



CALORIE COUNT

Raj came across an introductory advertisement along with a sample of 100gm chips which is as follows:

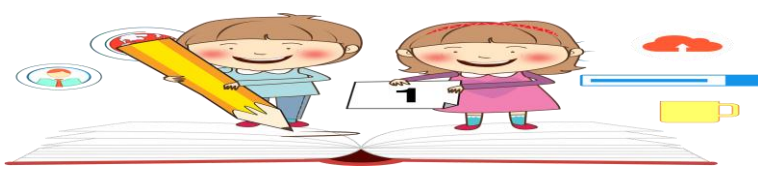
Bingo! Starters is a unique range of snacks, which offer tasty yet healthy light bites. Pulse Chips is the first offering under Bingo! Starters which is made of pulses (dal), unlike any other regular snack available in the market. Pulse Chips are completely baked and are an extremely good source of protein & dietary fibre.



Bingo! Starters Pulse Chips (Minty)

Nutritional information (Approximate Values)	*Per 100 g	Per Serve (24 g)	+% RDA per serve (24 g)
Energy (kcal)	519	124	6%
Protein (g)	13.5	3.2	-
Carbohydrate (g)	53.3	12.8	-
Of which Sugar (g)	1.7	0.4	1%
Fat (g)	27.9	6.7	10%
Saturated Fatty Acids (g)	13.1	3.1	-
Monounsaturated Fatty Acids (g)	12.1	2.9	-
Polyunsaturated Fatty Acids (g)	2.7	0.6	-
Trans Fatty Acids (g)	< 0.1~	0.0	0%
Cholesterol (mg)	1.0	0.2	-
Dietary fibre (g)	6.1	1.5	-
Salt (g)	2.4	0.6	12%

1. Raj's calorie intake for bingo was approx. 2600 kcal. How many packets of chips he consumed? Can he eat another packet for that day?
2. What is the calorific value of protein he had?
3. Why does a human body need calories to survive?



**Challenge
Yourself...**

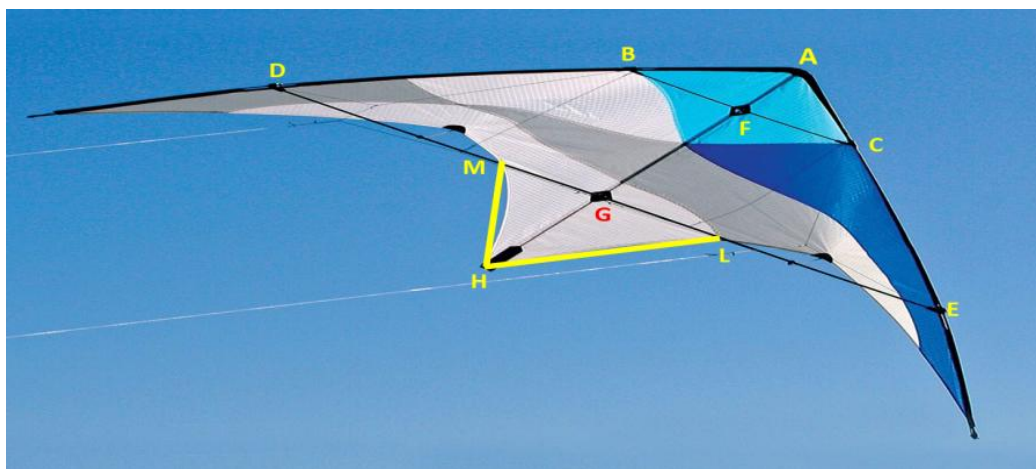


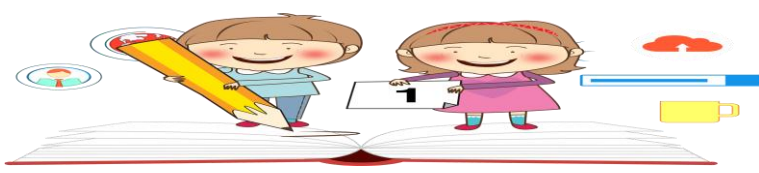
CONGRUENCE OF TRIANGLES



3-D DELTA SPORTS KITE

One common configuration for a sport kite is a roughly triangular "delta" shape, with two lines for control. Another common configuration is a W-shaped panel with four lines for control. These kites are normally constructed from lightweight ripstop nylon or ripstop polyester with spars made from carbon fibre tubing. The flying lines are made from braided ultra-high-molecular-weight polyethylene, which is light, does not stretch under tension and stays slippery even when wrapped many times.





**Challenge
Yourself...**



Challenge for you

1. Sam too is planning to construct the 3D delta sports kite himself; he knows that AH is perpendicular bisector of BC, help him to find out whether the

$$\triangle ABF \cong \triangle ACF?$$

2. Sofia said to Sam that looking at the 3D delta sports kite picture above, she thinks that $\triangle AGD \cong \triangle AGE$. Sam says that

$$\triangle ADG \cong \triangle AGE. \text{ Both of them know } BD = CE.$$

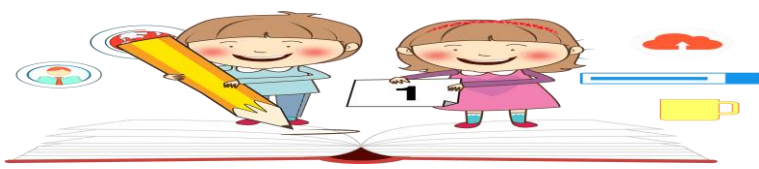
Whose statement is correct? Give reasons.

3. Is $\triangle GHM \cong \triangle GHL$? Given $MH = HL$

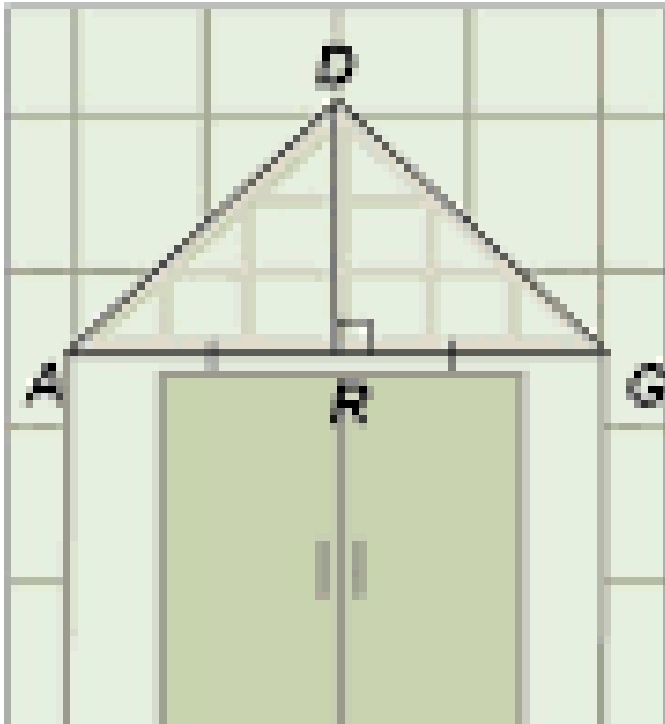
Let's have fun

1. You are designing the window shown below. You want to make $\triangle DRA$ congruent to $\triangle DRG$. You design the window so that $DR \perp AG$ and $RA = RG$.

Can you conclude that $\triangle DRA \cong \triangle DRG$

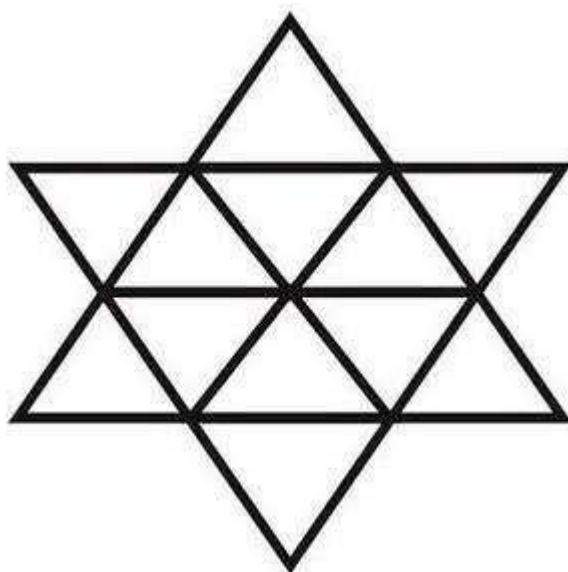


**Challenge
Yourself...**



BRAIN EXERCISE

Count the maximum number of triangles in the image given below. let's see what maximum number you can give ??????????





Challenge
yourself...

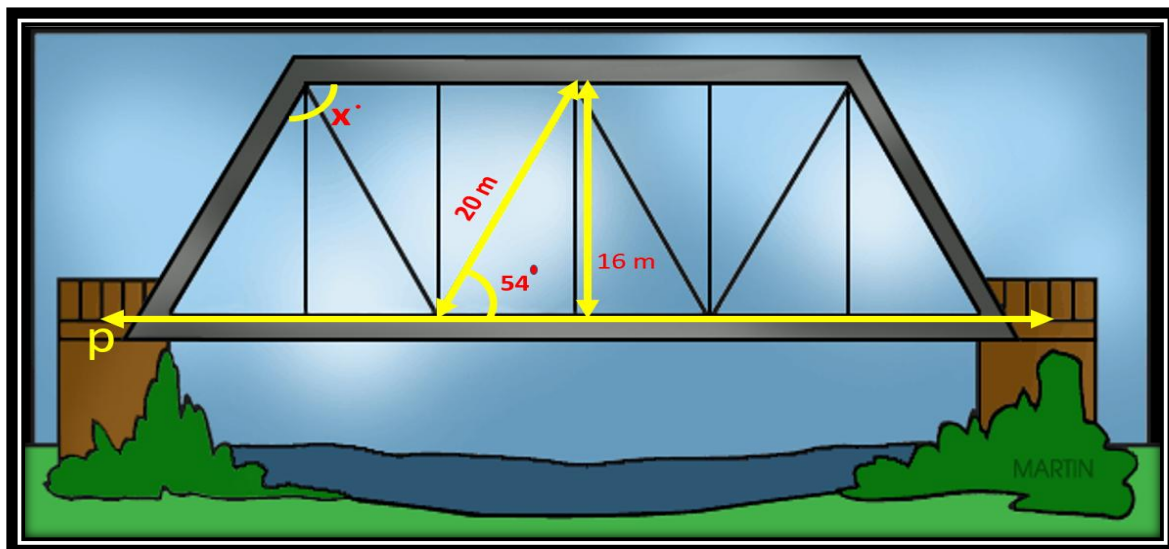


TRUSS BRIDGES

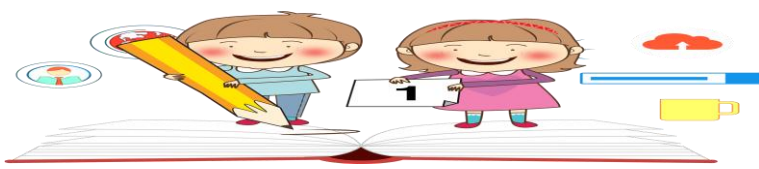
A truss is a structure that consists of members organized into connected triangles so that the overall assembly behaves as a single object. Trusses are most commonly used in bridges, roofs and towers.

A truss is made up of a web of triangles joined together to enable the even distribution of weight and the handling of changing tension and compression without bending or shearing. The triangle is geometrically stable when compared to a four (or more) -sided shape which requires that the corner joints are fixed to prevent shearing. When force is applied on a rectangular shape, it will flatten out.

The bridges used to be very weak and could not hold much weight before triangular shapes were incorporated in their structure.



1. What is the length of the above bridge?
2. Find the value of X° .
3. Why a three-sided polygon is used for truss?



Challenge
yourself...



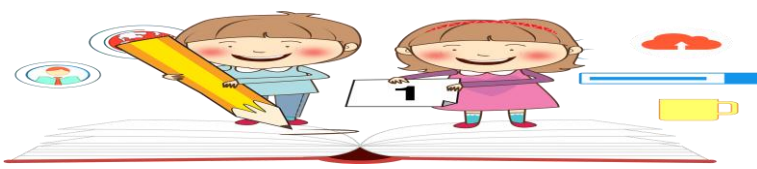
TRIANGLES AROUND US



Make a triangular pyramid using 6 straws with the help of 4 triangles. Also, identify pyramids and prisms from following image and tabulate them as under:



SWING	
TENT	
WATERMELON SLICE	
CHEESE SLICE	
PASTRY	
HOUSE	



**Challenge
Yourself...**



TREE PLANTATION DRIVE



Rotary club Chandigarh organized a tree plantation drive by planting more than 2500 saplings in 24 hours. Over 150 volunteers took part in the campaign which witnessed participation from club members, school staff and students of class 8. The volunteer planted saplings at designated spots in school and along with a road side of school.

The drive encouraged many students. Reena, a student of class 8 also decided to plant trees. So she shared the plan with her parents.

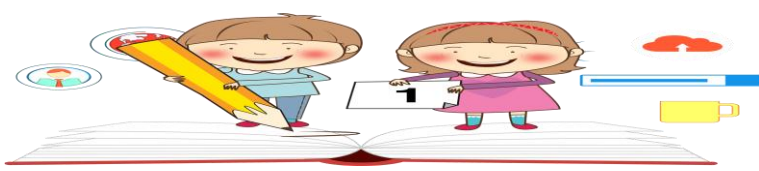


Mom, Rotary club Chandigarh has introduced a tree plantation drive. I also want to be part of it

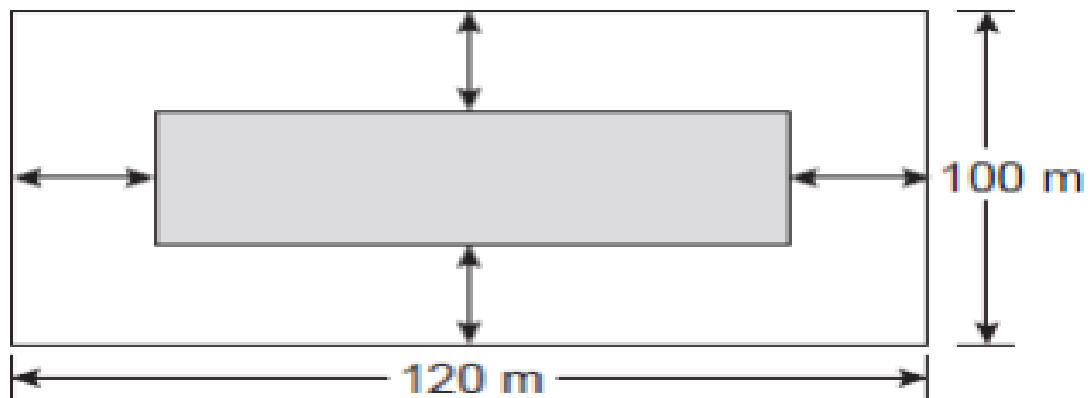
Yes Reena! That is good idea. How can I help you?



Mom, we have the rectangular plot of land of dimensions 120 m X 100. Can I plant trees in it?



**Challenge
Yourself...**



Yes, you can plant trees in the center of a rectangular plot at equal distance from both sides such that the area of remaining part of the plot is 10500 m^2

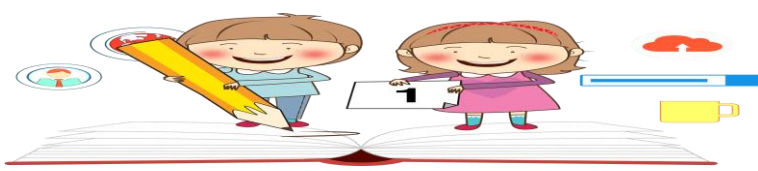


1. Find the dimensions of the area to be planted with trees.

2. What is the difference of perimeter of rectangular plot and the rectangular portion that is to be planted?

3. If the dimensions of plantation area are increased by 10m, then what would be the increase in the area of plantation?

- | | |
|--------|--------|
| a) 30% | b) 40% |
| c) 60% | d) 75% |



UTTARAKHAND GLACIER DISASTER

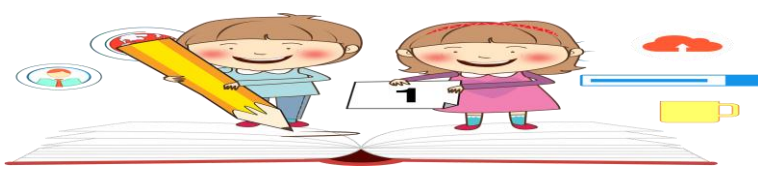
Disaster struck Uttarakhand's Chamoli district on February 7, 2021 in the form of an avalanche and deluge, after a portion of the Nanda Devi glacier broke off.

The sudden flood in the middle of the day in the Dhaul Ganga, Rishi Ganga and Alaknanda rivers — all intricately linked tributaries of the Ganga — triggered widespread panic and large-scale devastation in the high mountain areas.

Two power projects — NTPC's Tapovan-Vishnugad hydel project and the Rishi Ganga Hydel Project — were extensively damaged with scores of labourers trapped in tunnels as the waters came rushing in.



1. A locality raised fund of ₹62500/- to contribute for fund, each family of a locality of a town donated equal amount of money. If the total donation of ₹. 62500/- is equal to half of the cube of number of family then find the number of families who donated money.
2. As per question 1, how many rupees each house contributed?
3. Two friends Suzan and Kerry, native of the nearby village decided to help flood victims. Suzan contributes as much money as the cube root of the amount contributed by Kerry. Kerry's amount is a perfect cube. If the sum of



**Challenge
Yourself...**



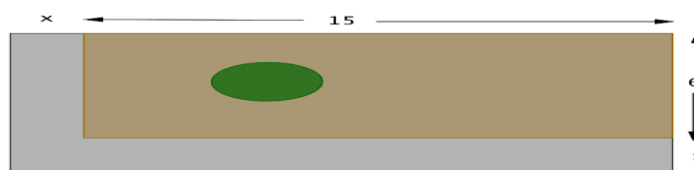
the amounts contributed by two friends is ₹ 1,010. Then find the contribution of each friend.

KITCHEN GARDEN

Kitchen gardening is something that all of us can do to make our surroundings green. Also, vegetables grown in our own garden promote health as they'll be rich in nutrients and pesticide free.



1. Keeping this same concept in mind, Rahul wants to create a kitchen garden. He plans to put a stone border of width x meter along two adjacent sides of a rectangular garden that measures 6 m by 15 m. His budget limits him to cover only 46 square meter of area with stones. How wide should the border be?



2. If area of the garden is $p^2 - 17p - 38$ then what could be the dimension of the garden.

(a) $(p-19)(p+2)$

(b) $(p-19)(p-2)$

(c) $(p+19)(p+2)$

(d) $(p+19)(p-2)$



**Challenge
Yourself...**



SHOP TILL YOU DROP

10% discount on all Purchase.

30% off on purchase of Rs 500/-

Buy One Get one Free

Each time during festive season, we hear about various deals and offers through advertisements, pamphlets, flyers or newspapers. We also visit malls or stores for shopping.

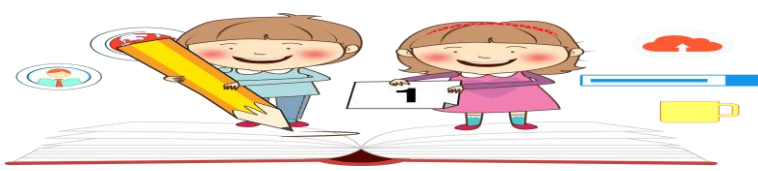
Shopping is always enjoyable when we get offers and discounts .Discount can be availed on Marked Price .Final amount paid is always less than the marked price.

These days we shop through online mode as well where we get great deals.

1. Akash's mother told him to buy groceries from nearby shop. Akash was very tired but could not refuse his mother; He quickly browsed through net and found some wonderful offers.



His mother told him to get a packet of tea, a bottle of shampoo and a packet of washing powder.



**Challenge
Yourself...**



He told his mother about these offers and she started enquiring about the final amount to be paid for each item.

1. Please help Akash to answer his mother's queries:

- (1) How much discount is being offered on a packet of washing powder?
- (2) What is percentage discount on bottle of shampoo?
- (3) Marked price of a packet of tea is Rs 145/ what will be the final price after discount?

His mother was really happy to know how his son has contributed to family's Savings.

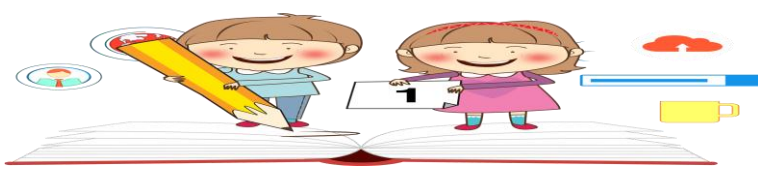
She told her son to call his friends for a party and she will gift the money saved by above offers to him to buy food for his friends.

2. Akash called his friends to his place immediately and looked for some more offers for home delivery

He came across a new online store to buy burgers and placed his order



Party time



Challenge Yourself...



Akash's mother gave him Rs 300/ for the party. Marked price of each burger was Rs 104 and he placed his first order of 6 burgers. Did he save any money or had to spend more from his pocket. Calculate money saved or spent.

3. One Sunday, Aakash goes to a Shopping Mall and finds out that the sale is going on, of different brands. The sale/discount on three different brands was as follows:



BRAND X	Buy 1 get 1 free
BRAND Y	Flat 50% off
BRAND Z	40% +20% off

He had Rs. 4000 with him and he decided to shop. MRP for different brands were as follows:



Challenge
yourself...



Brand Name	MRP
BRAND X Jeans	2600/-
BRAND Y Jeans	1800/-
BRANDZ Jeans	2000/-

Hint : please check the discount offers by various brands.

1. Find out how much money Aakash will spend if he buys 2 jeans of brand X?
2. Find out how much money Aakash will spend if he buys 1 Jeans of brand X and 1 Jeans of brand Y.
3. How much money will be left with him if he decides to buy 3 jeans of brand Z?
4. If the total amount is Rs. 4000, find out the brand in which he will get maximum number of Jeans and will have maximum saving?
5. If he wanted to buy 2 Jeans of each brand i.e. 2 jeans of brand X, 2jeans of brand Y and 2 Jeans of brand Z, how much money he will pay for shopping?



Challenge
yourself...



BIRTHDAY GIFT

For Ram's birthday, his family gave him Rs 3000. Ram decided to buy 2 tickets for himself and his friend Gurvinder to Sonu Nigam's concert. Each ticket costs Rs 45. He bought the tickets on Jan 1, 2021 and the concert was exactly 3 weeks later. The concert started at 7:30 pm, But Ram and Gurvinder were so excited that they reached the venue two and a half hour early.



They bought popcorns for Rs 224 and saw a counter that was selling T-shirts with Sonu Nigam's signatures for Rs 350. Ram bought 3 shirts. The boys found their seat and sat down 1 Hour 15 minutes before the concert started. When it was time for the concert to start the arena was full and fans were screaming. The arena had capacity of 7528 seats and every seat was filled. Sonu Nigam announced that he had a special surprise for some special fans. He had backstage passes for 3 dozen fans. Ram and Gurvinder were both chosen to get backstage passes. After the concert the fans who received backstage passes were divided into two even groups and were taken back stage. Sonu Nigam signed autograph and took pictures with everyone. Ram and Gurvinder enjoyed the evening.

1. Calculate the total money spent by Ram?

2. Find the date of concert?

3. At what time did they reach the venue?

4. At what time did they occupy their seats for the concert?

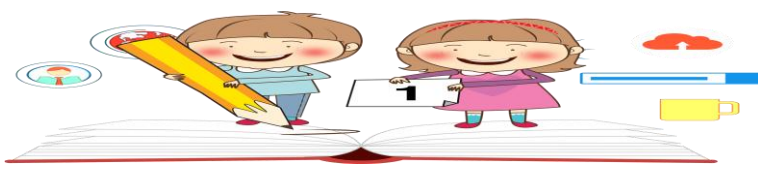


Challenge
yourself...



5. What percentage of Sonu Nigam's fans got special surprise and what was the surprise?

**SURPRISE
IS ALWAYS
WELCOME!**

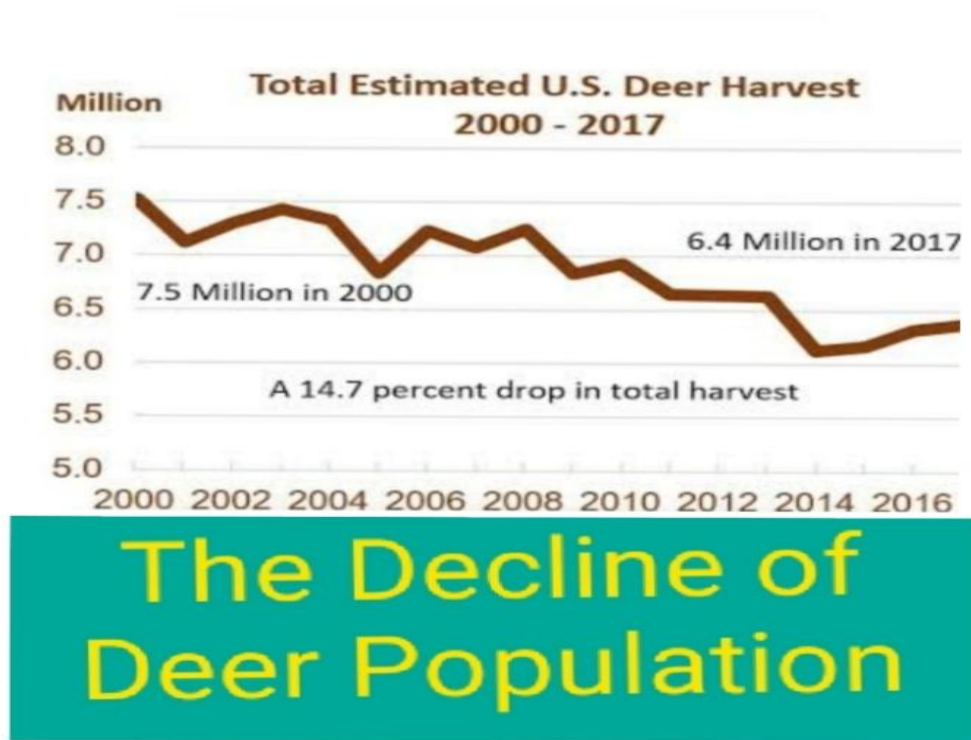


**Challenge
Yourself...**



DECLINE OF DEER POPULATION

Read the bar graph and answer the questions:

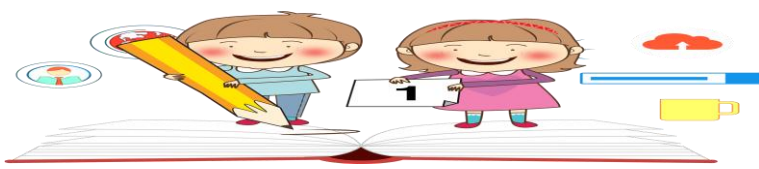


1. Which country's data is shown in this bar chart?

- a) England
- b) United States of America
- c) France
- d) Germany

2. What is the highest data of deer harvest?

- a) 6.5 million
- b) 8.0 million
- c) 7.5 million
- d) 6.0 million



**Challenge
Yourself...**



3. How many years data is shown in this bar chart?
- a) 13
 - b) 15
 - c) 16
 - d) 17
4. What was the estimated data of deer harvest in 2017?
- a) 6.5 million
 - b) 6.3 million
 - c) 6.4 million
 - d) 6.2 million
5. What is the range of data (in million) between 2000 and 2017?
- a) 1.3
 - b) 1.2
 - c) 1.0
 - d) 1.1



Challenge
yourself...



COFFEE MACHINE

Akshay is a very talented and hard working boy.

He decided to open a coffee shop. First thing a good coffee shop needs is a good espresso coffee machine. He explored the market for all possible options and found three options which suits him well:

- He can buy a new machine for Rs.8000
- He can pay rent of Rs 60 per week for a machine provided he signs a 3 year contract.
- He pays 20% of the cost of new machine and further continues to pay rent of Rs 60 per week for next two years, without any contract.

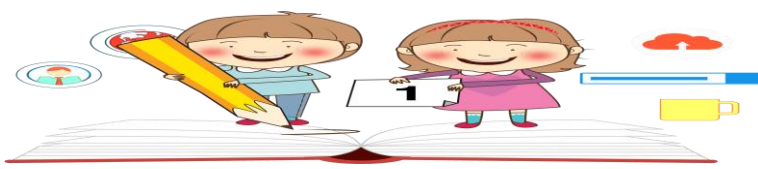


1. How much will it cost Akshay to rent the machine for 3 years?

2. Calculate the total amount Akshay will pay for the coffee machine if he rents then buys.

3. Why the rent-then-buy option suits Akshay better than buying a new machine?





Challenge
yourself...



ANSWER KEY

MOVING TO MARS

TASK 1 DESIGN 1 $P=104\text{m}$ $A=640\text{m}^2$

DESIGN 2 $P=48\text{m}$ $A=96\text{m}^2$

TASK 2 DESIGN 1 $P=24\text{m}$ $A=20\text{m}^2$

DESIGN 2 $P=44\text{m}$ $A=64\text{m}^2$

TASK 3 DESIGN 1 $P=66\text{m}$ $A=99\text{m}^2$

DESIGN 2 $P=68\text{m}$ $A=111\text{m}^2$

COVID19

1. Andhra Pradesh, Odisha, West Bengal

2. 14884

3. 16th January-17th January and 19th January-20th January

4. 8, 18

BIRD FLU

1. 10

2. 1

3. 4:5



**Challenge
Yourself...**



FAMILY OF NUMBERS

1 Jordan himself is a Whole Number as per this venn diagram

2. Mark in appropriate column(s).

<i>Number</i>	<i>Natural Number</i>	<i>Whole Number</i>	<i>Integers</i>	<i>Rational Number</i>
-8			✓	✓
5	✓	✓	✓	✓
$\frac{2}{3}$				✓
0		✓	✓	✓

MORNING WALK

1.(c)

2. $-\frac{1}{2}$

CRICKET SCORES

ORANGES =4 APPLE=1

TEST RESULTS

MAXIMUM MARKS-MINIMUM MARKS =140

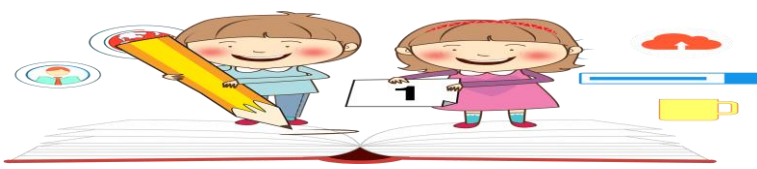
SIZE OF TABLES

(a) RECTANGLE

(b) FIGURE 3

(c) FIGURE 3

(d) 12 CM^2



**Challenge
yourself...**



ORGANISING BIRTHDAY PARTY

₹ 3600

FENCING THE YARD

9 Sections (Approximately)

FLIGHT OF BIRDS.

Wing span of Albatross - wingspan of a Sea Gull = $3.6 \text{ m} - 1.7 \text{ m} = 1.9 \text{ m}$

Wing span of Golden Eagle - wingspan of a Blue jay = $2.5 \text{ m} - 0.41 \text{ m} = 2.09 \text{ m}$

DAILY WAGES

(1) $40 + 4.5p = 112$

(2) he must sell 16 pair of shoes

(3) yes, because 20 is greater than 16

MYSTERY OF GROWING TREES

24 days

CAPACITY OF PEN DRIVE

1) $V = 5 \text{ MB/SEC}$

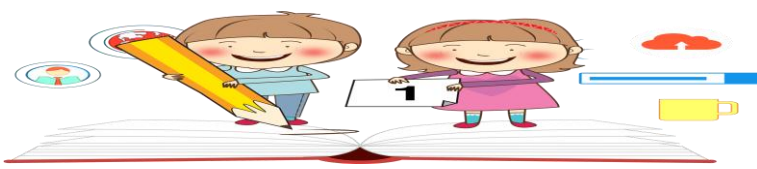
2) 90 SECONDS

FRIENDS GET-TOGETHER

₹. 150

AGE MYSTERY

Age of son = 10 YEARS



**Challenge
yourself...**



Age of father = 36 YEARS

POCKET MONEY

1. REKHA = 6 YEARS

SHIVANI = 12 YEARS

VRINDA = 15 YEARS

2. ₹.24

3. $12:30 = 2:5$

PAYING GUEST AND HIS CARD

54 Times

INVESTMENT IN SHARE MARKET

1. 120 - FIRST STOCK

240 - SECOND STOCK

2. LOSS OF ₹ 1800

FAVOURITE TV SHOW

(M-5) MINUTES LEFT

DONATION BOX

1. $10n + 5(n+1) = 15n + 5$

2.66



**Challenge
Yourself...**



MOVIE TICKET

33 , 35

VARIABLE GAME

(b) $7x-6=15x-30$

PUNJABI TREAT RESTAURANT

1. (c) Rectangle
2. (b) $(n-2) \times 180^0$
3. 16 ft .
4. 16 sq. ft.
5. Table nos. 18,19,20,25,24,23
6. Open Ended (as per choice of the student)

RESULT BOARD

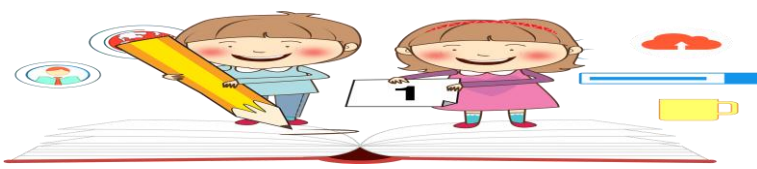
1. (d) 2016-17
2. (c) 30
3. (c) 40,10
4. (b) 40,40,20

BRANCHES OF ARMED FORCES

1. (a) 275
2. (c) 13.89

SUMMER CAMP

1. 4:3
2. Rs 74,000



**Challenge
Yourself...**



3. $16/72$

THE PET SHOP

1. 75

2. 75

3. $25:50 = 1:2$

YEARLY EXPENDITURES

1. (d) 36.66 lakhs

2. (c) 1%

T.V. TIME

1. a) America's Funniest videos and blue planet

b) Blue planet and Big bang theory

c) blue planet

2. America's Funniest videos/Big bang theory

SOFIA'S GARDEN

1. (c) 10

2. 2:1

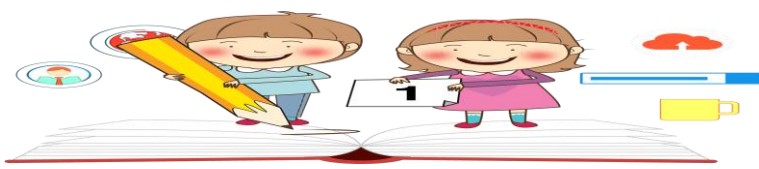
SCHOOL AUDITORIUM

(a) 23

TEACHER'S TABLE

1. 1.5m

2. 6.0m



**Challenge
Yourself...**



3. $2\sqrt{4.5}$

SWIMMING POOL

1. 10 ft

2. 100 ft^2

3. 24 ft^2

4. $25:6$

GAME OF DICE

(b) 15

JOURNEY FROM 2-D TO 3-D

1, cube

2. Red, yellow

Challenge

Shape	net
(i)	3
(ii)	1
(iii)	4
(iv)	2

CUBE

(d)



**Challenge
Yourself...**



FRUIT SHOP

1. b) Rate of Kinnauri Apples is more than Nagpuri Oranges

2. Cost of Nagpuri oranges = ₹ 40 per Kg

Cost of Kinnauri Apple = ₹ 70 per Kg

SHOPPING DURING SALE

1. ₹. 4260

2. ₹. 2666.60

ROHAN AND HIS TAXI

b) 250km

LANDSCAPING

(c) $8-3x$

SHAPES WITH A SHEET

(c) Y-4

PICNIC TO SHIMLA

(d)

CAR MANUFACTURING COMPANY

(a) $-0.88x^2+0.51x+11$



**Challenge
Yourself...**



WEDDING RECEPTION PARTY

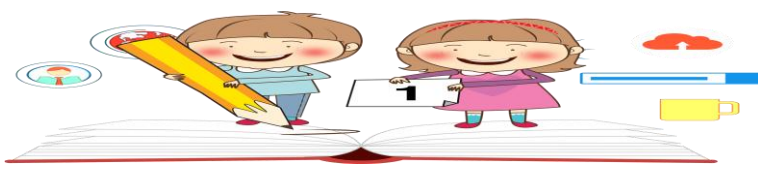
1. $200000 + 600 \text{ g}$
2. 290000

GREEN SUSTAINABLE HOUSES

1. $X = 105^0$
 2. Solar panel should be installed at an angle of 40° from ground level.
 - 3 Advantages of green sustainable houses are:
 - Use of Solar panel
 - Insulation and air sealing which reduces cooling and heating demand
 - Energy efficient lighting
 - Low flow water fixtures
 - Window designing
 - Optimises energy consumption
 - Save energy
 - Offer comfort for less energy
- (a) Right angle
(b) Acute angle
(c) Obtuse angle
(d) Obtuse angle

CALORIE COUNT

1. 5, No
2. 270 kcal
3. Human body needs calories so
 - (a) Cells in the body can be divided.



**Challenge
Yourself...**



(b) Heart and lungs to work properly.

(c) Organs be able to carry out the basic processes needed for living.

CONGRUENCE OF TRIANGLES

Task 1: Challenge for you

1. Yes, by SAS Congruence
2. Sofia is correct
3. Yes, by RHS Congruence

Task 2: let's have fun

1. Yes, SAS

Brain Exercise

There are a total of 20 triangles.

TRUSS BRIDGES

1. Length of bridge = 72m
2. $X = 126^\circ$
3. Reasons for using 3-sided polygon

(a) Even distribution of weight and the handling of changing tension and compression without bending or shearing.

(b) Geometrically stable when compared to a four (or more) -sided shape which requires that the corner joints are fixed to prevent shearing. When force is applied on a rectangular shape, it will flatten out.



**Challenge
Yourself...**



TRIANGLES AROUND US

<i>SWING</i>	<i>Prism</i>
<i>TENT</i>	<i>Prism</i>
<i>WATERMELON SLICE</i>	<i>Prism</i>
<i>CHEESE</i>	<i>Prism</i>
<i>PASTRY</i>	<i>Prism</i>
<i>HOUSE</i>	<i>Prism</i>

TREE PLANTATION DRIVE

1. 50m, 30m
2. 280m
3. 60%

UTTARAKHAND GLACIER DISASTER

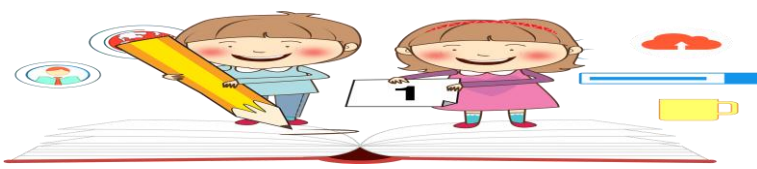
1. Number of Houses =50
2. ₹.1250
3. ₹ 1000 and ₹ 10

KITCHEN GARDEN

1. Width of border=2m
2. $(a)(p-19)(p+2)$

SHOP TILL YOU DROP

TASK 1



**Challenge
yourself...**



1)RS 104

2)45%

3)55/-

TASK2

Extra money spent =Rs 12

Task 3

1)2600/-

2)3500+1 brand x jean

3)2880/-

4) BRAND Y

5) 2220/-

BIRTHDAY GIFT

1).1274

2)22ND JANUARY,2021

3) 5PM

4) 6.15PM

5) 0.47%

DECLINE OF DEER POPULATION

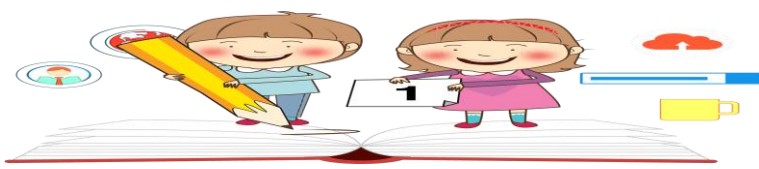
1)b

2)c

3)d

4)c

5)d



**Challenge
Yourself...**



COFFEE MACHINE

- 1) 9360/-
- 2) 7840/-
- 3) Profit of 60/-

Credits:

Coordinators:

- Mrs. Kavita C. Das, Principal, St. John's High School-26, Chandigarh
- Mr. Rajeev, Principal GMSSS-22, Chandigarh
- Ms. Rajeesvari (KVS, ZIET, Chandigarh)

Resource Group:

- Ms. Neeru Sood Abrol (St. John's High School-26, Chandigarh)
- Ms. Nisha Behl (St. John's High School-26, Chandigarh)
- Ms. Gurpreet Kaur (GMSSS-23, Chandigarh)
- Ms. Abha Kumar (GMSSS-19, Chandigarh)
- Ms. Hemlata Malhotra (GMSSS-21, Chandigarh)
- Mr. Vijaypal Singh (GMSSS-20, Chandigarh)
- Ms. Garima Aneja (DPS-40, Chandigarh)
- Ms. Sangeeta Gill (DAV Model-15, Chandigarh)
- Ms. Jyoti Sharma (GMSSS -15, Chandigarh)
- Mr. Kapil Mohan Sood (GHS-53, Chandigarh)
- Ms. Vineeta Sharma (Sacred Heart-26, Chandigarh)
- Ms. Monika Khurana (Bhavan Vidyalaya-27, Chandigarh)
- Mr. Pardeep Singh (GMSSS-40B, Chandigarh)
- Mr. Dilpreet Singh (GHS-54, Chandigarh)
- Ms. Gorvi Bedi (Chitkara International-25, Chandigarh)
- Ms. Simmi Puniani (Carmel Convent-9, Chandigarh)
- Ms. Gurpreet Kaur (GMSSS-Khuda Alisher, Chandigarh)

- Ms. Simranjeet Kaur (GHS-Maloya, Chandigarh)
- Ms. Gurleen Kaur (SGGSCPS-26, Chandigarh)
- Ms. Poonam Kukreja (St. Anne's Convent-32, Chandigarh)
- Ms. Shifali Singla (SCERT-32, Chandigarh)
- Ms. Sugandha Rampal (St. Kabir Public School -26, Chandigarh)
- Mr. Navjot Singh (GMHS-25, Chandigarh)
- Mr. Vikram Singh Yadav (SCERT, Chandigarh)
- Ms. Pardeep Rani (JNV, Chandigarh)
- Ms. Rachna Tuteja (KV-47, Chandigarh)
- Ms. Geetanjali Kalia (St. Stephen's-45, Chandigarh)
- Mr. Gaurav Sharma (FirstSteps IB World School, Chandigarh)
- Ms. Indu Bala (GMHS-40A, Chandigarh)
- Mr. Baljit Singh (GMSSS-22A, Chandigarh)

CRITICAL AND CREATIVE THINKING (CCT)

Resource Material Developed

Mathematical Literacy

- 4 modules (classes 7 to 10) in English and Hindi medium
- 'Step by Step' Mathematics Booklet Series
- 'Mathlete' fortnightly series
- CCT Booklets for classes 8th, 9th and 10th (100 pages)

Scientific Literacy

- 5 Modules (classes 6 to 10) in English and Hindi medium
- 'Harshit /Joyful Learning' weekly series
- CCT Booklet for classes 8th -10th (100 pages)

Reading Literacy English

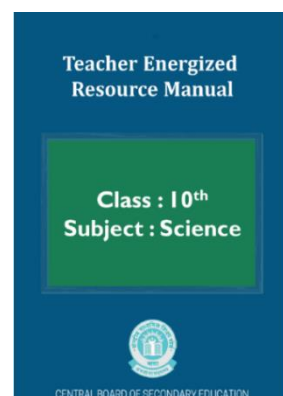
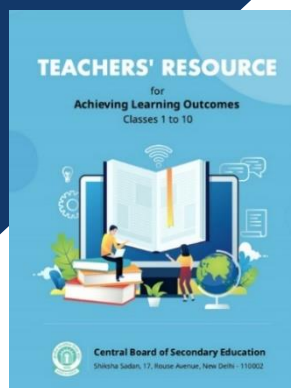
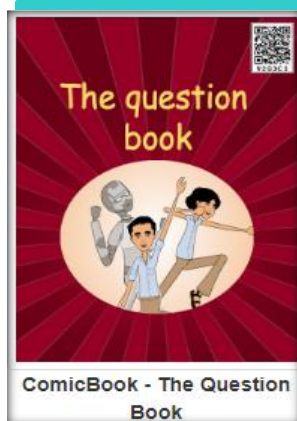
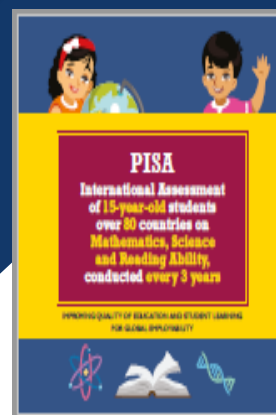
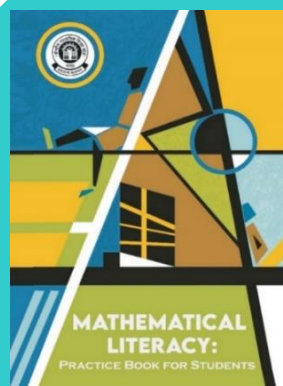
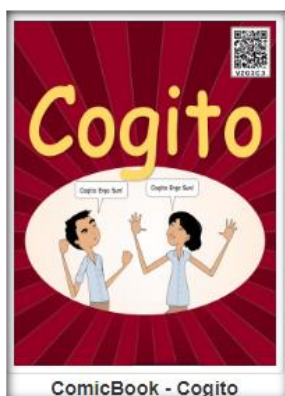
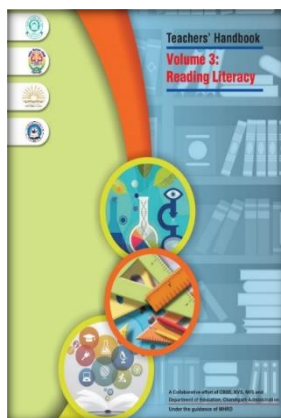
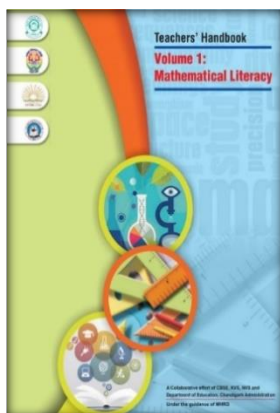
- 5 Handbooks/modules of Reading Literacy (classes 6 to 10)
- 3 Handbooks/modules of Reading Literacy for supplementary reader (classes 8 to 10)
- CCT Booklets for classes 8th, 9th and 10th (100 pages)

Reading Literacy Hindi

- 5 modules (Classes 6 to 10)
- 'Sankalp' Fortnightly Series
- Monthly CCT booklets for classes 6th- 8th and 9th-10th (January 2021 onwards)
- CCT Practice Booklets for classes 8th, 9th and 10th (100 pages)

CBSE Handbooks

- Vol.I Mathematical Literacy
- Vol.I Scientific Literacy
- Vol.I Reading Literacy
- Experiential Learning
- Joyful Teaching and Learning of Mathematics
- Art Integration
- Self-learning Resources
- Artificial Intelligence Integration Manual
- The Question Book
- Cogito
- 21st Century Skill Handbook
- Cyber Safety Manual
- Mathematical Literacy: Practice Book for Students
- PISA Primer
- Handbook of Joyful Learning



STATE COUNCIL OF EDUCATIONAL RESEARCH AND TRAINING (SCERT)
 Sector- 32, UT Chandigarh, Email id : scert-chd@nic.in, Phone No: 0172-2676011