SRI SRI RAVISHANKAR VIDYA MANDIR

BANGALORE SOUTH

Presents

THE MATH COMPASS

Journey Through Math with Hands-On Adventures

An Annual Mathematics Newsletter

By

Middle wing, Secondary and Senior secondary

2024 – 25

ACKNOWLEDGEMENT

We would like to express our heartfelt gratitude to our Principal B. Gayathri Rao for her constant support and encouragement throughout the year. We are grateful to our administrator Mrs. Manjari Goutham for her wonderful guidance. We would like to thank all Mathematics facilitators for their unwavering support, guidance and encouragement throughout this academic year. Your dedication and commitment to nurturing student's growth, both academically and personally, have been invaluable.

Thank you for being such remarkable mentors and for making a lasting impact on students. Keep doing your good creative work and making SSRVM, Bangalore South, feel proud with your sincere efforts to excellence.

CONTENTS

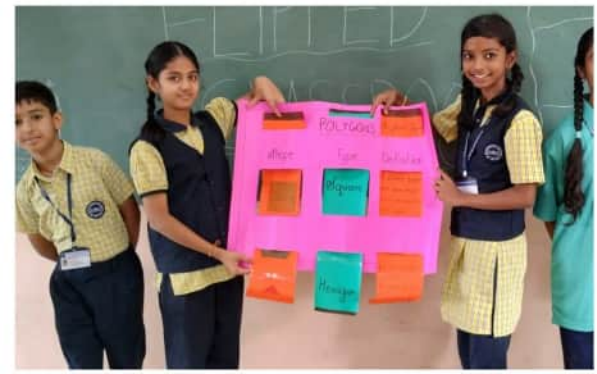
Math Explorers

(By grade 6 students)

Vedic Math is indeed an incredibly efficient method for performing calculations, offering students a faster and more intuitive approach to solving problems. At SSRVM Bangalore South, students are embracing Vedic Math, enhancing their mathematical skills in a way that supports quick and accurate problem-solving. Being part of Prudence 2024 was a wonderful experience, as it provided valuable insights and opportunities to promote the application of Vedic Math, helping both educators and students grasp its benefits more effectively.


VERTICALLY AND CROSSWISE METHOD

In a flipped classroom, the facilitator designs the content, plans the homework, and creates a welcoming learning environment for students to explore. This approach was implemented in Class VI with the topic "Basic Geometrical Ideas." Students took the lead by explaining the concept using PowerPoint presentations, charts, and working models.



Engaging activities and hands-on exercises made learning enjoyable and interactive, providing a solid foundation for future mathematical concepts. An origami activity was incorporated to help students understand the basics of geometry in a creative and practical way.


Science
Maths


Sub Maths
Activity


STORY TELLERS
Y
X
130,000
440,000
330,000
940,000
160,000
150,000
1,450,000
Districts


Crop Production

Students explore foundational concepts like the area of squares, rectangles, and triangles through videos or reading materials at home. During class, they engage in interactive activities, such as measuring objects, solving real-life area problems, and group discussions. This method allows students to apply their knowledge, ask questions, and deepen their understanding of area while working collaboratively with their peers. It also gives teachers more opportunities to address individual learning needs.

Math relay

In a math relay activity for grade 6, students work in teams to solve a series of math problems related to their curriculum. Each team member solves one problem and passes the answer to the next person, whose question depends on the previous solution. The relay continues until all problems are solved. This activity promotes teamwork, quick thinking, and accuracy while making math fun and engaging for the students. It also helps reinforce their understanding of concepts in an exciting and competitive way.


Group - F
Group - C
Group - A
Group - E
Group - F
Group - D


Group - G
Shakuntala Devi
(1929-2013)
Group - C
Group - A
Group - E
Group - F
Group - D
Group - G


Group – A
Aryabhatta
(476-550)
CE


Group – B


Group – D


Group - A


Group - C


Group - B


Group - A


Group - B


Group - F


Group – B
Brahmagupta
(598-668 CE)
Group – G
Shakuntala Devi
(1929-2013)
Group – A
Aryabhatta
(476-550)
CE
Group – D
Madhava of
Sangamagrama
(1340-1425)
Group – E

Math Marvels
(By grade 7 students)

Activity on Simple Equation

It was an individual activity where children had to frame an equation with one variable, and solve using Systematic method or Transpose method. Children had to use only waste materials and display their simple equations and solve.

Twigs, cut pieces of waste clothes, dried petals and leaves, small barks, pencil waste, bottle caps, tamarind seeds, burnt matchsticks were few things used to showcase their equations.

PRUDENCE:

Students of 4 Sections of grade 7 enthusiastically participated in the mega event PRUDENCE 2024-25

Time Travel was the topic of 7 A where children explained Speed, Distance and Time taken to travel from one district headquarters to the other.

Davanagere Benne Dose was the topic of 7 B where children used Circular Dosa, Conical Dosa to explain the concepts of Circle and Cone.

Hills to Falls was the topic of class 7 C where children could very well explain the concept of integers, taking tip of the peak of Sahyadri mountains as positive integers and drop of Jog Falls as negative integers.

Lessons from Lakes was the topic of Class 7 D where children made the parents to play a treasure hunt game using math tricks to make them reach to a lake and explain the latest situation of the lake.

0

Activity on Decimals and Fractions

This was a group activity where children made attractive charts to display the questions on converting Fractions to Decimals and vice versa. Charts contained pouches to attach the options of correct answers. Charts with questions were interchanged with other groups.

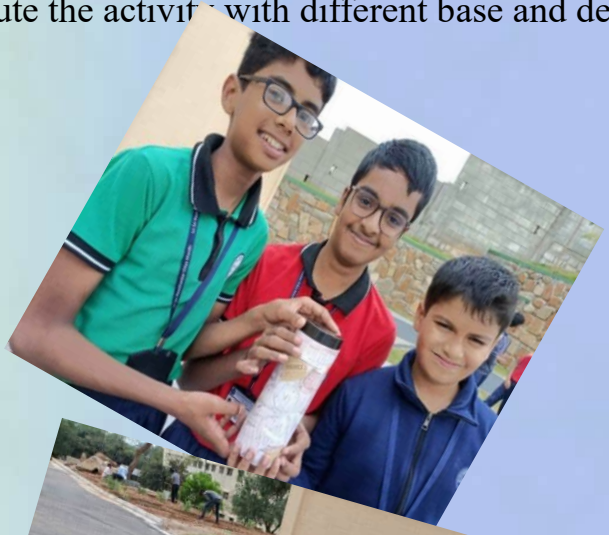
Children in groups had to quickly solve the given questions and finish the task.

Activity on Percentage

An activity on sales and purchase was done to find the profit / loss and to calculate its percentage. This activity not only improved their calculation skills but could exhibit their artistic skills too. Many children sold the same (with fake notes) which indeed made them delighted.

Activity on congruency

A group activity was done to make children understand congruency. The layering technique created a sense of depth and texture, resulting in unique multi-dimensional art work. The concept of placing images in congruency, where each layer added a new dimension, demonstrated that using different dimensions - whether through size, placement, or pattern—enhances the overall visual impact. Children were thrilled to execute the activit with different base and decoupage art papers.



Activity on Integers

An engaging classroom activity on integers was conducted, where students were divided into rows, and each row participated in a game involving rolling coloured dice, colours represented positive and negative integers. The goal of the game for a row was to reach +414 or -414.

This activity encouraged children to practice their skills with integers while fostering teamwork and strategy. By working together, students could think critically about how best manage their rolls to reach the target. The game offered a fun, interactive way to reinforce mathematical concepts while promoting friendly competition among classmates.

Math Wizards
(By grade 8 students)

"PRUDENCE: Unveiling the Mathematical Marvels of Mysore"

The Math Department at SSRVM Bangalore South proudly presented "PRUDENCE," an exhibition that showcased the intrinsic connection between mathematics and the cultural heritage of Mysore.

Our grade 8 students embarked on an exciting journey to explore the mathematical concepts that underlie the architecture, handicrafts, and festivities of Mysore.

Math in Mysore Palace Architecture

Our students discovered that the majestic Mysore Palace is a testament to the ingenuity of ancient Indian architects, who employed mathematical concepts like geometry, symmetry, and proportion to design this iconic structure. The intricate carvings, ornate domes, and perfectly aligned columns all bear witness to the mathematical precision that went into building this palace.

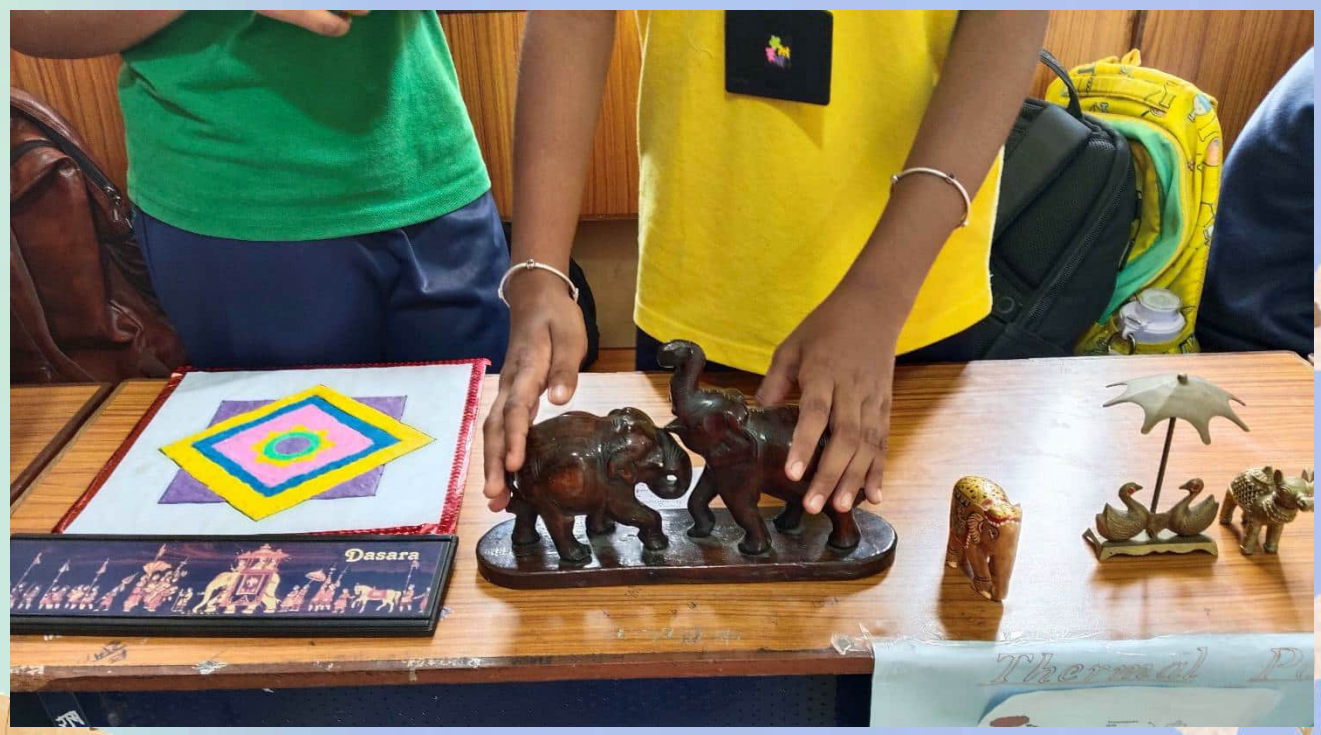
Mathematical Patterns in Handicrafts

The students also explored the traditional handicrafts of Mysore, such as woodcarvings, stone sculptures, and silk weaving. They identified the mathematical patterns and symmetries that are inherent in these crafts, demonstrating how mathematics is an integral part of our cultural heritage.

Calculating Dasara Festivity Income and Expenditure

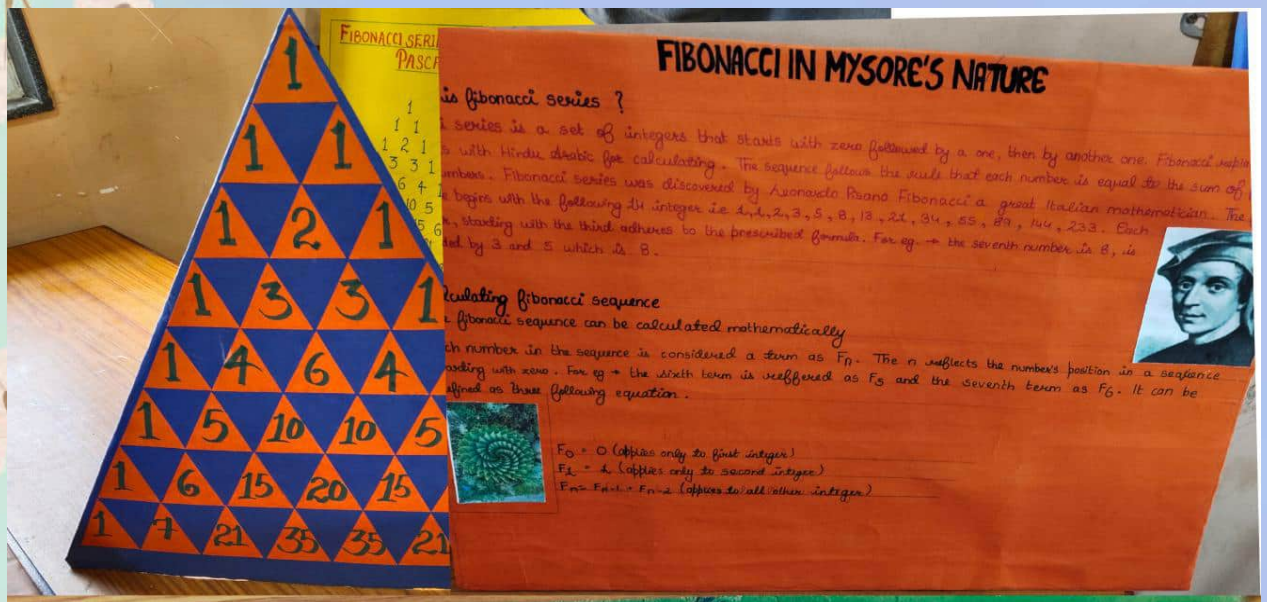
One of the highlights of the exhibition was the calculation of the approximate income and expenditure of the Mysuru Dasara festivity using a pie chart. Our students collected data on the various sources of income, such as ticket sales, sponsorships, and donations, as well as the expenditures, including decorations, security, and entertainment. By analyzing this data, they created a pie chart that provided a visual representation of the festivity's financial breakdown.


GEOMETRY
MYSORE SILK SA
DHOKRA ART


Dasara


DESIGNS IN MYSORE'S TRADITIONAL
MYSORE ROYAL CREST
MYSORE ROYAL EMBLEM
Description :-
Symbolizing Royalty and heritage, this crest features geometric shapes and symbols.
Significance :-
Represents the rich history and culture legacy of Mysore.
Description :-
Regal Emblem featuring geometric shapes and symbols.
Significance :-
Embodies the power and prestige of Mysore's royal lineage.
SYMMETRY IN MYSORE PALACE ARCHITECTURE
Types of Symmetry & Description
Example in Mysore Palace
Image/Diagram
LINE SYMMETRY
Reflection Symmetry across a line
Archways, doorframes and corridors
ROTATIONAL SYMMETRY
Same pattern after a rotation
Ceiling designs, Rosewood inlays and tile work
REFLEXIONAL SYMMETRY
Mirror image on either side
Staircases, windows and door panels
TRANSLATIONAL SYMMETRY
Flooring with tiles and wood carvings
OTHER DESIGNS


Maths


FIBONACCI IN MYSORE'S NATURE
is fibonacci series ?
culating fibonacci sequence

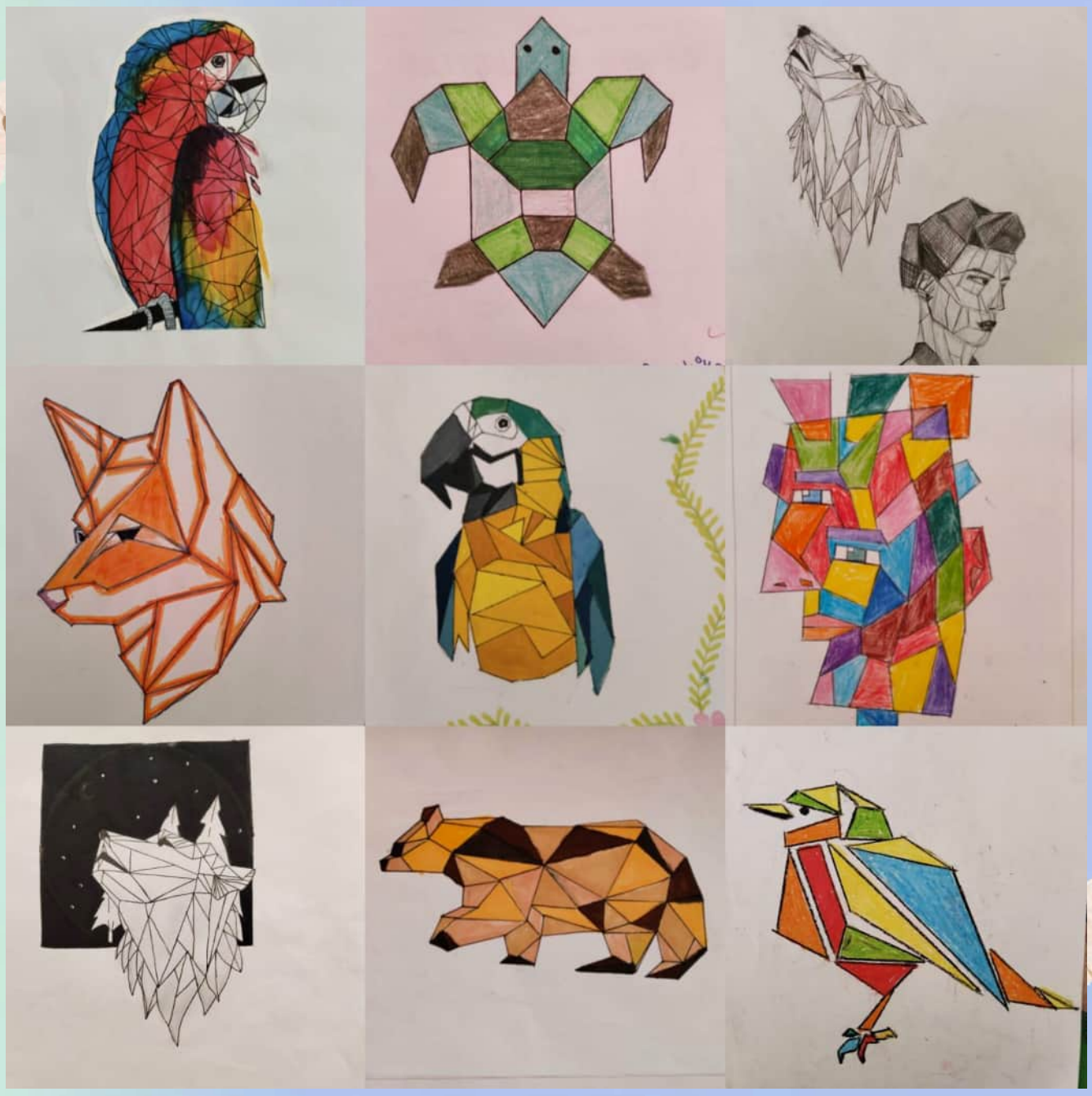

GOLDEN RATIO
as Divine proportion. It is strongly associated with fibonacci sequence
mber is added to the last.
55
34
21
13
GOLDEN RATIO


SYMMETRY IN
MYSORE PALACE
ARCHITECTURE


4-5 crores
1.5-2 crores
2-3 crores
Flower Show
CAFE

The purpose of studying polygons was not so clear for a few students. The following activity of Polygonal Art made everyone thought about the importance of polygons.

POLYGONAL ART



"Coordinate Chaos!

Our Grade 8 students had an absolute blast learning about coordinates in a fun and interactive way!

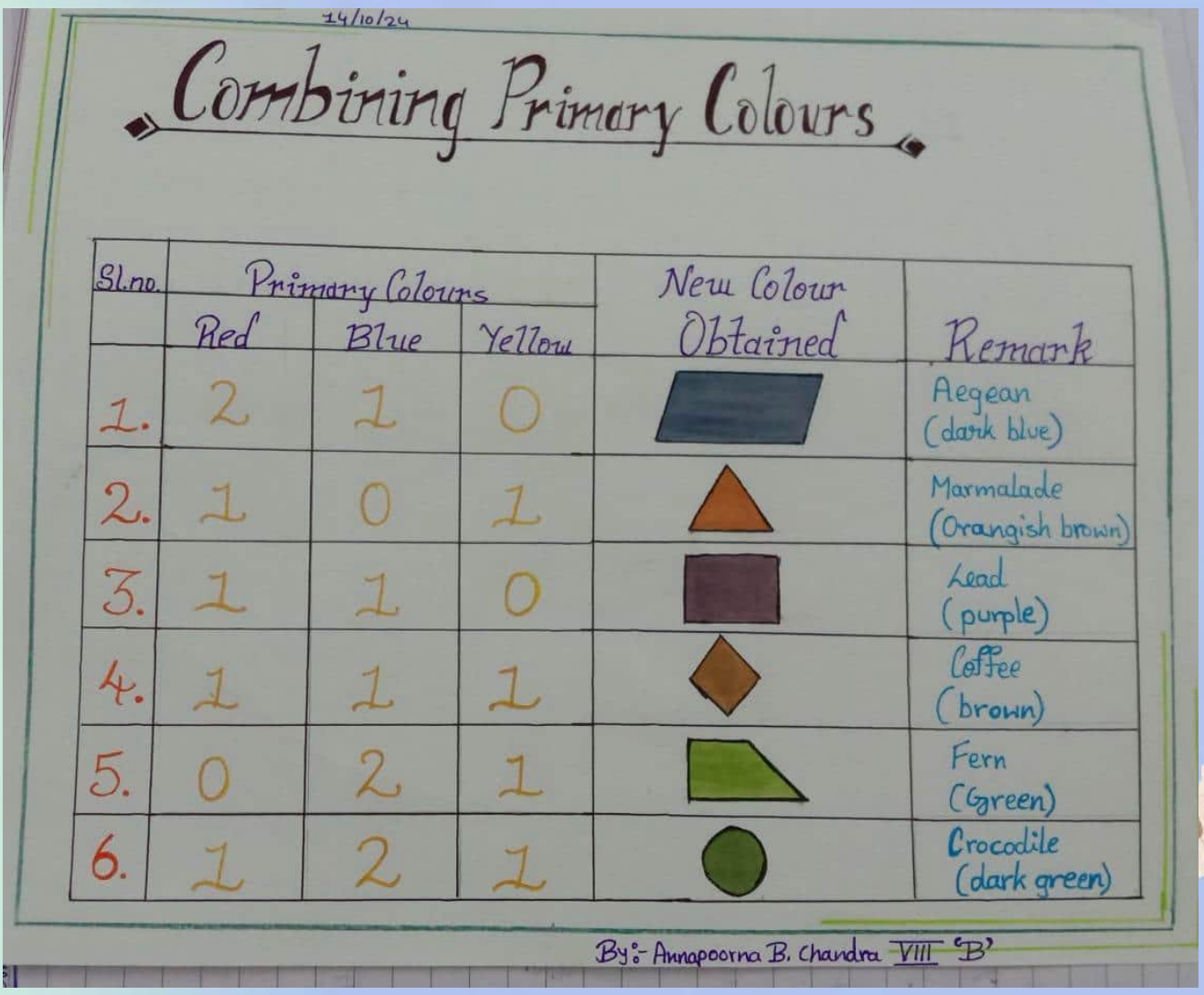
Watch as they divide into teams and take turns giving each other coordinates to stand in. The team with the most correct positions wins!

A huge thank you to our amazing students and teachers for making learning so much fun!

"Mixing Magic: A Colorful Math Adventure"

In a vibrant and interactive activity, our students delved into the world of colors, exploring the fascinating realm of primary and secondary colors. By mixing primary colors in various ratios, students discovered the art of creating new hues and shades.

Through this engaging activity, students experienced the magic of math in action, witnessing firsthand how ratios and proportions can create an astonishing array of colors. As they explored the intersection of art and mathematics, students developed a deeper appreciation for the beauty and complexity of color theory.



"Measuring Up the Fun!

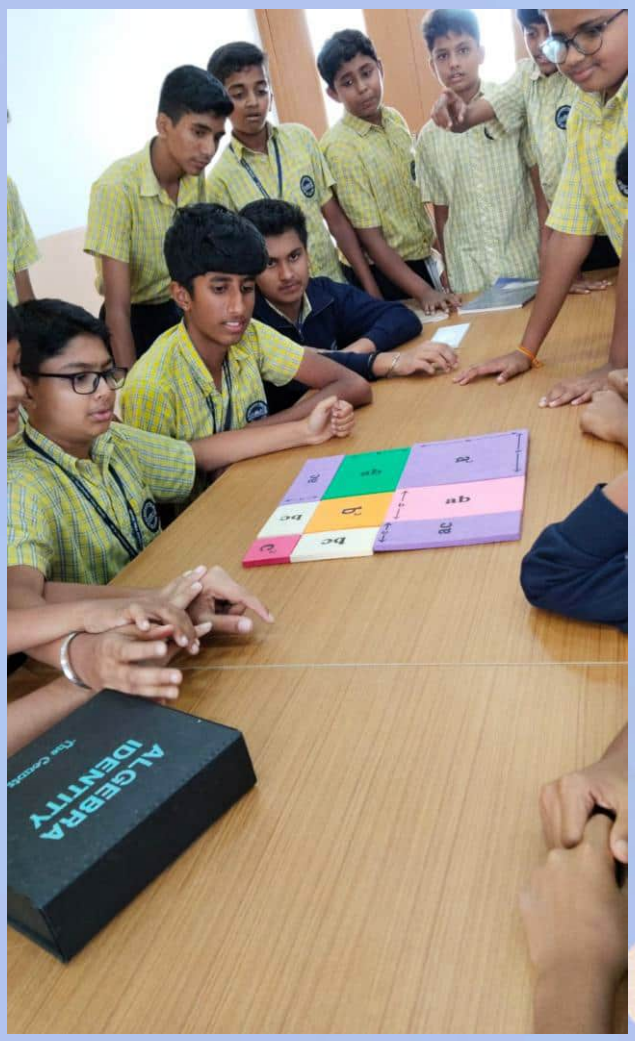
Understanding the concept and verifying it is very important in Mathematics. Students explored the concept of volume as base area × volume for a cuboid taking some unit cubes and making various cuboids having different dimensions. They dove into the world of Volume in Math Lab, and it was a splashing success! With hands-on activities and experiments, they explored the concept of volume in a fun and interactive way.

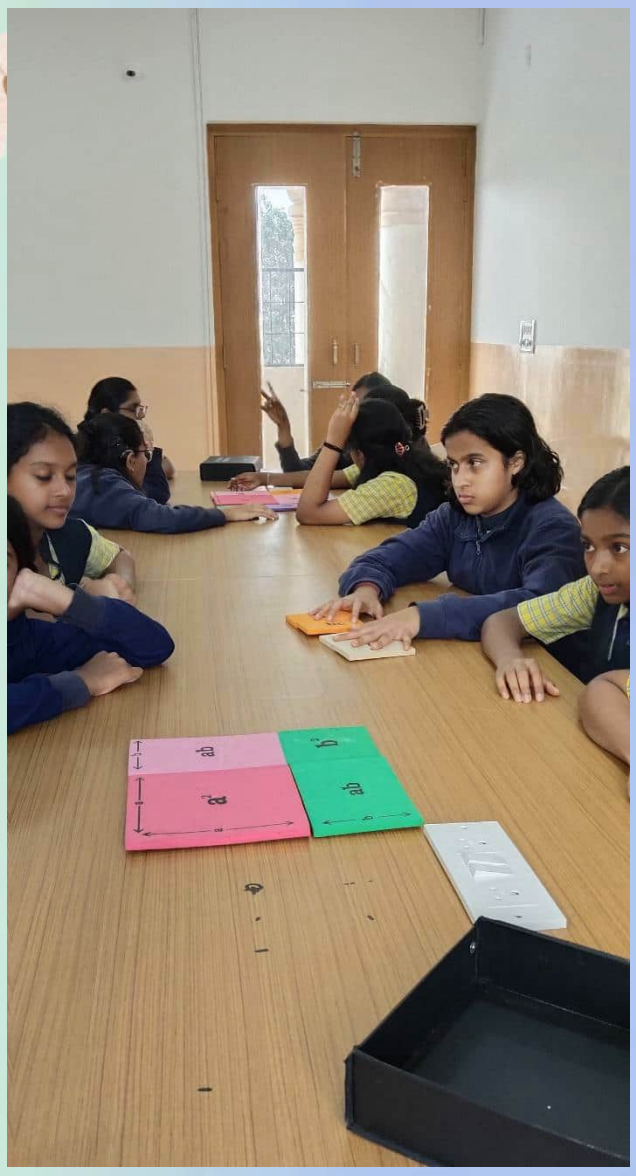

00:43
00:58

"Algebraic Identities Unlocked!

Our Grade 8 students unleashed their math superpowers in Math Lab, exploring algebraic identities with infectious enthusiasm!

With interactive activities, games, and challenges, they mastered the art of simplifying expressions and solving equations.





"Piecing Together the Past: Uncovering the Mathematician's Identity"

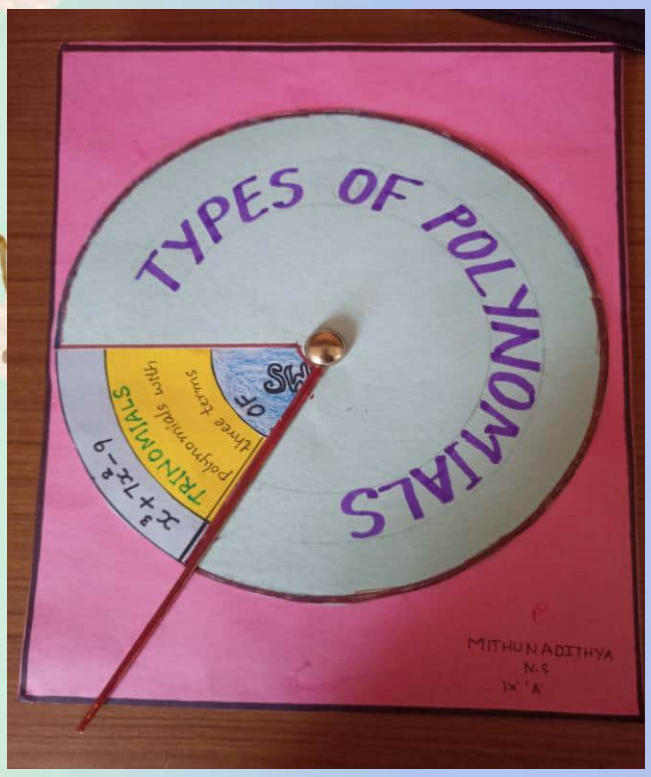
On the occasion of National Mathematics Day, our Grade 8 students participated in a thrilling jigsaw puzzle competition, "Who Am I." This engaging activity challenged students to solve a puzzle and uncover the picture of a renowned mathematician.

Few pictures are given below.

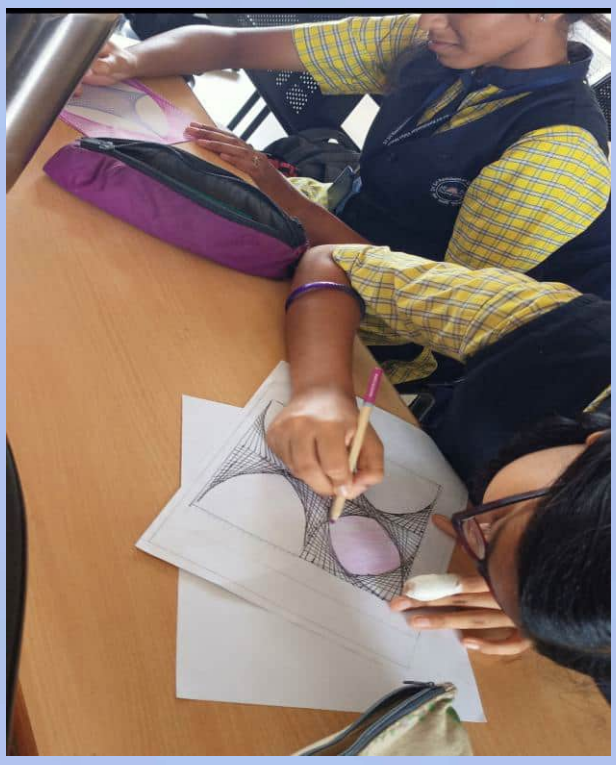
Math Pioneers
(By grade 9 students)

Learning identities through cutouts was one of the best ways for students to understand it and apply it in solving problems.

- Drawing their favourite cartoon using coordinates geometry and coloring was fun-filled activity. Students of grade 9 enjoyed it.



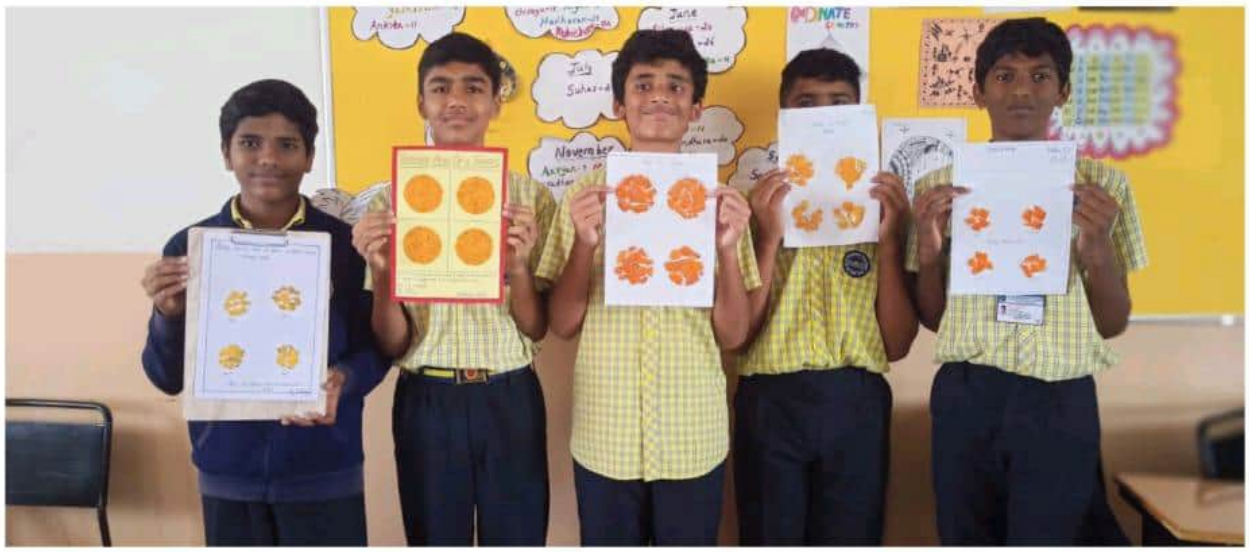
Making a Spin wheel to learn types of polynomials



Connecting different coordinates to make an amazing design was such a satisfying thing for students of grade 9.

Exploring in Math Lab

Surface Area of Sphere (Orange Activity)



Plotting Co-ordinates

Enjoying Pictionary

What makes a math problem unsolvable?

Axiom 1: Math = terror. Axiom 2: Most (real) Math problems are unsolvable (just like life) - they must be lived. But hope remains that maybe you are right that the question is wrong.

Here are a few more reasons (that sound brainier) about why a math problem seems unsolvable to all of us:

1. Inconsistent or Contradictory Information:

When information about the problem is inaccurate, we seem to be unable to solve the problem. For example in the given equation:

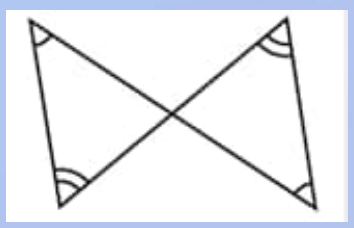
$x+y=5$ when $x=6$ and $y=8$

Yeah, right. We all know that this is impossible even if math normally eludes us. Of course, we have extremely qualified math teachers who would never give us a problem like this, but printers may not be as intelligent and typos loom in front of us as problems. And we still need to solve them hoping for grace marks for even trying!

2. Lack of Necessary Information:

Another scenario of when we are unable to solve the problem though our IQ may be 200 is when enough information regarding the problem is not available. For example:

You need to prove that these triangles are congruent where only two equal angles are shown without fulfilling the conditions for any of the congruence criteria:



3. Non-Existence of Solutions:

Certain equations or problems have no real solutions at all. For instance:

The equation $x^2+1=0$ has no real solution as square root of -1 does not exist. The square roots of negative numbers are not defined and are non-existent.

We have discussed several reasons as to why a problem is unsolvable, but here is an example of a problem *made* to be unsolvable, shattering all you ever believed about a universal fact that 2 is greater than 1!

The "1 = 2" Fallacy:

1. **Start with an assumption**: **Let a=b.**
2. **Multiply both sides by a: $a^2=ab$**
3. **Subtract b^2 from both sides**: **$a^2-b^2=ab-b^2$**
4. **Factorise both sides**: **$(a-b)(a+b)=b(a-b)$**
5. **Cancel (a−b) from both sides**: **a+b=b**
6. **Since a=b, substitute b for a: b+b=b**
7. **Simplify**: **2b=b**
8. **Divide both sides by b: Then, 2=1**

The Error:

The error occurs in **Step 5,** where the term (a−b) is canceled from both sides. Since a=b we have a−b=0, and division by zero is undefined. Therefore, the cancellation of (a−b) is a mathematical mistake.

This is an example of a mathematical fallacy, which is a math problem where the solution it points to is incorrect but appears right in the most unimaginable way.

When you make numbers your friend, a math problem becomes like a game and nothing seems to be impossible because you are enjoying the process.

However, in reality, math problems with definite solutions are only made for such things which are measurable in nature. The real "unsolvable" problems are those where the solution is impossible to measure by us, infinite. It just keeps going on and on, and that is its beauty.

Padmini Harish and Yashaswini

(Grade IX)

Maths in Psychology

Math is used in psychology in two main ways:

Mathematical psychology

Uses math to predict individual behaviour by translating theories of behaviour and cognitive processes into mathematical models. This uses a variety of mathematical techniques, including probability theory, algebraic models, and statistical methods. The goal of mathematical psychology is to develop general theories that are supported across experiments. A solution that works in all situations can be created by analyzing the behavior, thinking processes and reactivity of humans.

Psychometrics

Uses math to predict the behaviour of populations in general. Factor analysis is a major focus of research in psychometrics.

The application of mathematics to certain problems within the field of psychology dates to at least the seventeenth century. These applications later led to the field of psychometrics in the 1930s; and the former led to the field of mathematical psychology in the 1950s, and both fields are active today. Early mathematical psychology was characterized by testable, formal theories in the areas of learning and memory, perception and psychophysics, choice and decision making, language and thinking, and measurement and scaling; and these areas still characterize the field today.

A topic

The math and science behind our decisions is called the game theory. It happens in all interactions, between multiple people in which they are affected by each other's decisions. One common example is the Prisoner's Dilemma.

In this scenario, two partners of a crime are caught and put behind bars. They are then separated and given an option to confess or not to confess. If both would confess, they each get 5 years in jail. If do not confess they would get only 2 years of jail each.

However, if only One of them confesses, the one who doesn't confess gets 10 years in jail. In this scenario, the best would be for neither of them to confess. However, since they cannot trust each other, they both are most likely to confess, and so they get the most optimal solution. This is called the "Nash Equilibrium."

- **Fundamental theorem of game theory**

  States that in a broad category of games, an equilibrium can always be found where neither player should unilaterally deviate.

- **Proof of optimal mixed strategies**

  In 1928, von Neumann proved that every two-person, zero-sum game must have optimal mixed strategies and an expected value.

	**Hate Hitler**	**Support Hitler**
Jews	Threat of death but, right thing to do 1,0	Betray humanity 0,0
Nordic Aryan Germans	In threat, doing the right thing 0,1	Stability 1,1

Although the equilibrium here is for Germans to support Hitler, it wasn't the morally right thing to do. However, since it benefitted the Germans, to have some sense of stability.

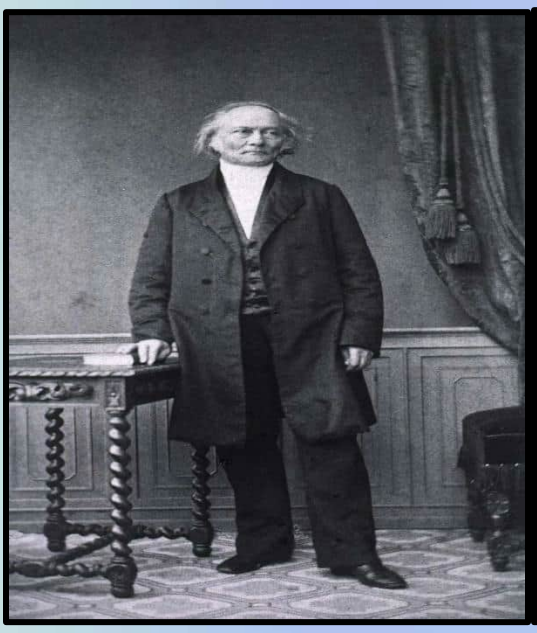
GLOSSARY:

Cognitive- connected with the processes of understanding

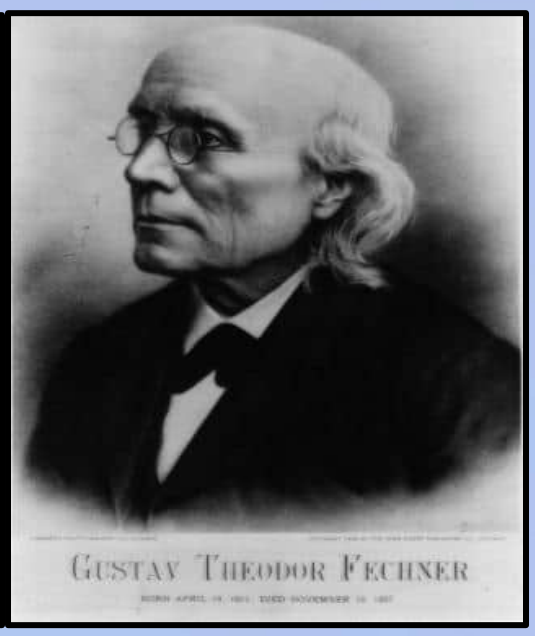
Psychometrics- the field in psychology devoted to testing measurement, assessment and related Activities

Unilaterally- decided by only one person

FEW PEOPLE INVOLVED IN THE DISCOVERY OF MATHEMATICAL PSYCHOLOGY:



Ernst Heinrich weber



Gustav Fechner

Sanvi Singh
Chinmayi P

Math Crusaders
(By grade 10 students)

“Teaching of Angle of Elevation by Integrating Angle Measurement in Ancient Egyptian Mathematics"

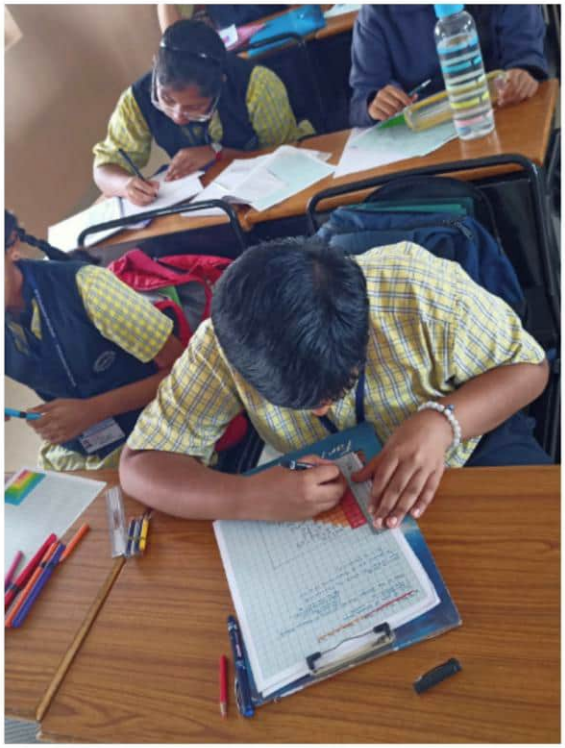
Students of grade X have been assigned two tasks to accomplish in this activity:

They need to make their clinometer (a simple version of surveying equipment) and find the height of an object they choose.

This study aimed to stimulate reflection and determine the effects of teaching trigonometry by integrating its history through experiential learning.

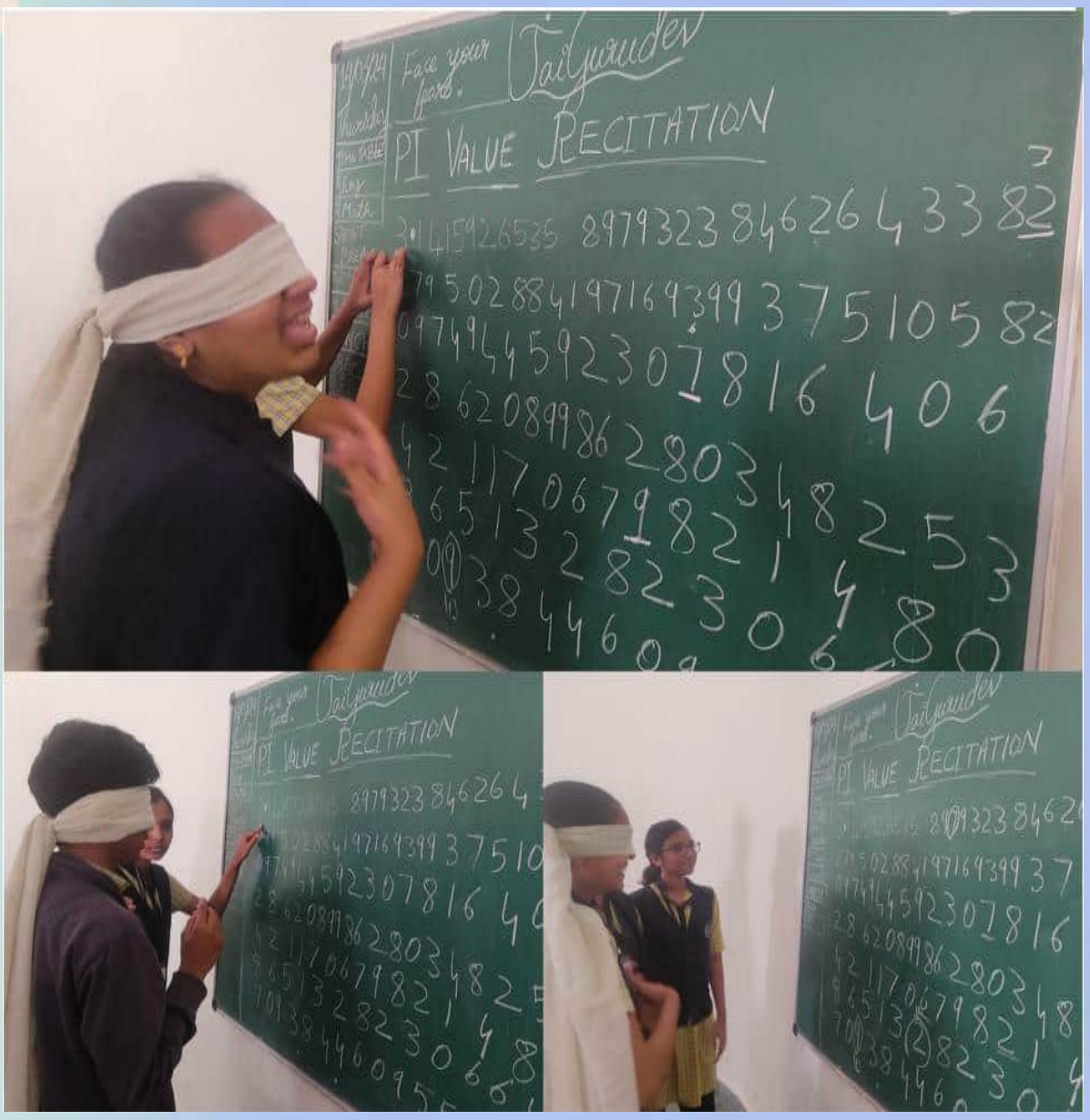
AN ACTIVITY ON ARITHMETIC PROGRESSION

Finding the sum of first n terms of an arithmetic progression using graphical method was the easiest way to understand the formula for grade 10 students.



PI DAY ACTIVITY

Fun activities has been organized to honor the mathematical constant pi(π). On March 14,2024 students competed to see who can memorised the most digits of pi. They have participated in Poster making and Model making to promote active and engaging learning experience.


Face your fears.
Taiyaude
PI VALUE RECITATION

Grade 10 students having fun with JAM (Just a minute talk)

On account of National Mathematics Day, students of grade 10 participated in **JUST A MINUTE TALK competition where they will be given a topic and a minute to talk about it.**

S

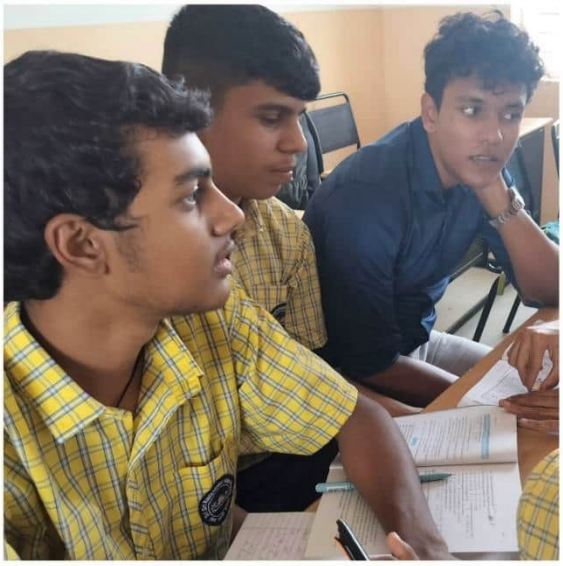
Math Pinnacle
(By grade 11 & 12 students)

Students of grade 11 and 12 learn functions and their graphs through GEOGEBRA.

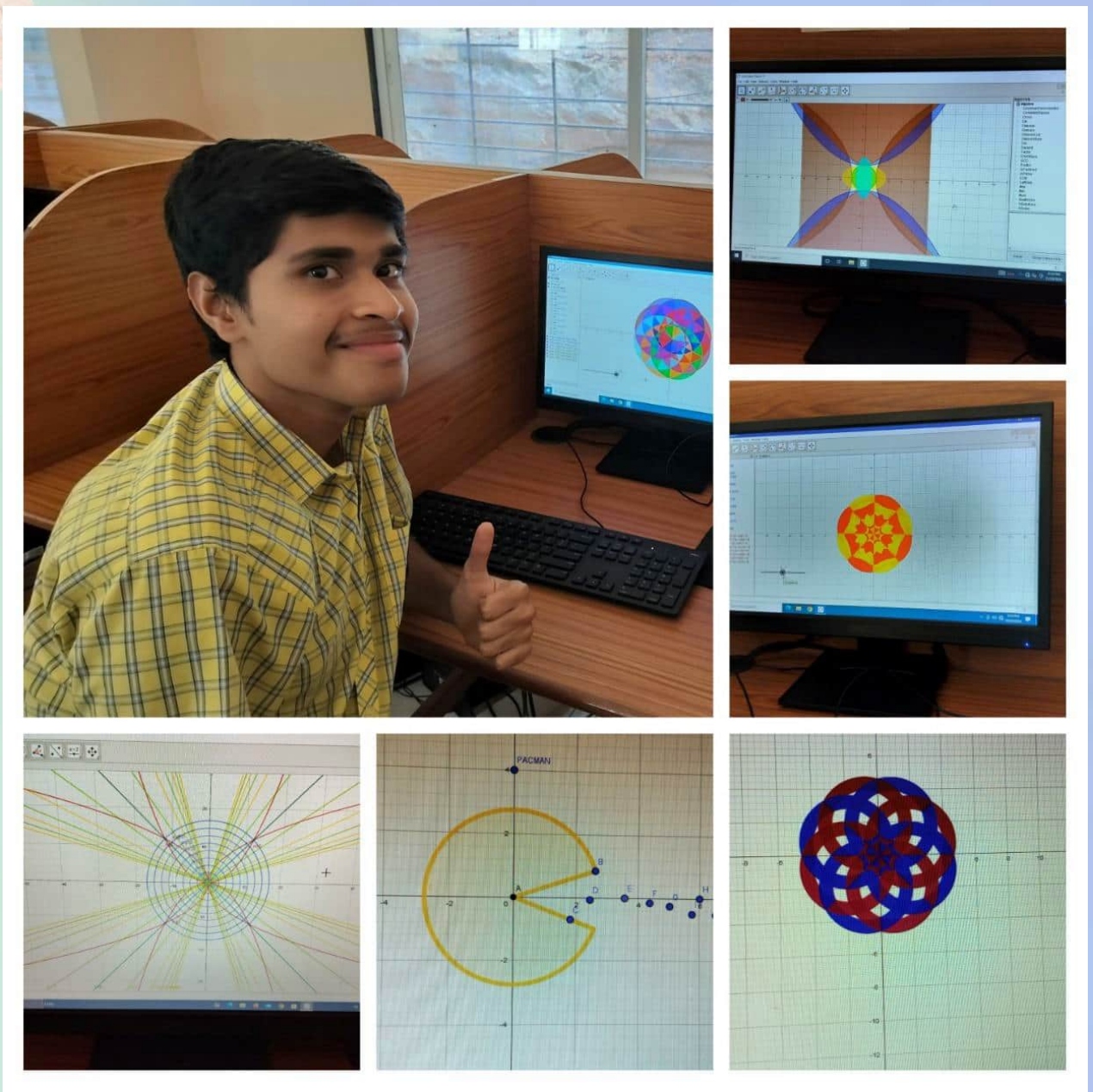
They even explored the graphs of various conic sections. They enjoyed creating digital patterns.

Students of grade11 enjoyed solving a puzzle on Arranging perfect squares in a circle



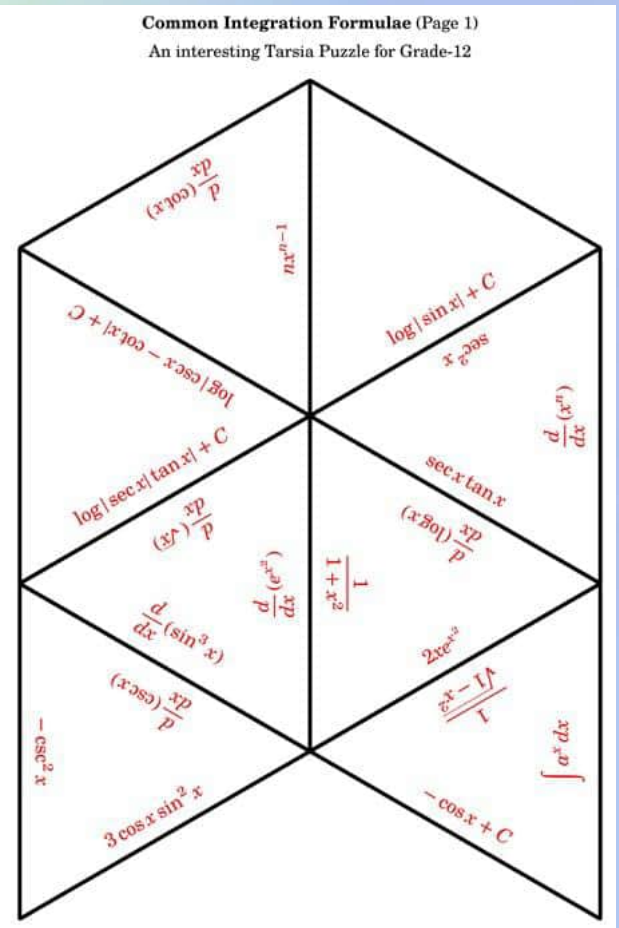

Students of grade 11 actively participated in creating digital patterns on GEOGEBRA



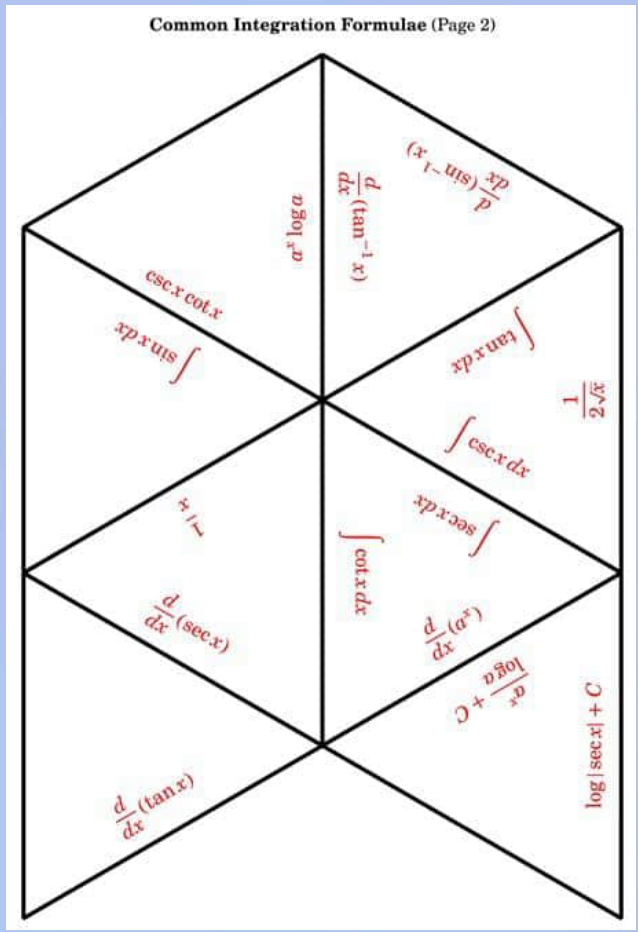
Students of Grade11 enjoyed solving puzzles on Trigonometric ratios and formulae

Common Integration Formulae (Page 1)

An interesting Tarsia Puzzle for Grade-12



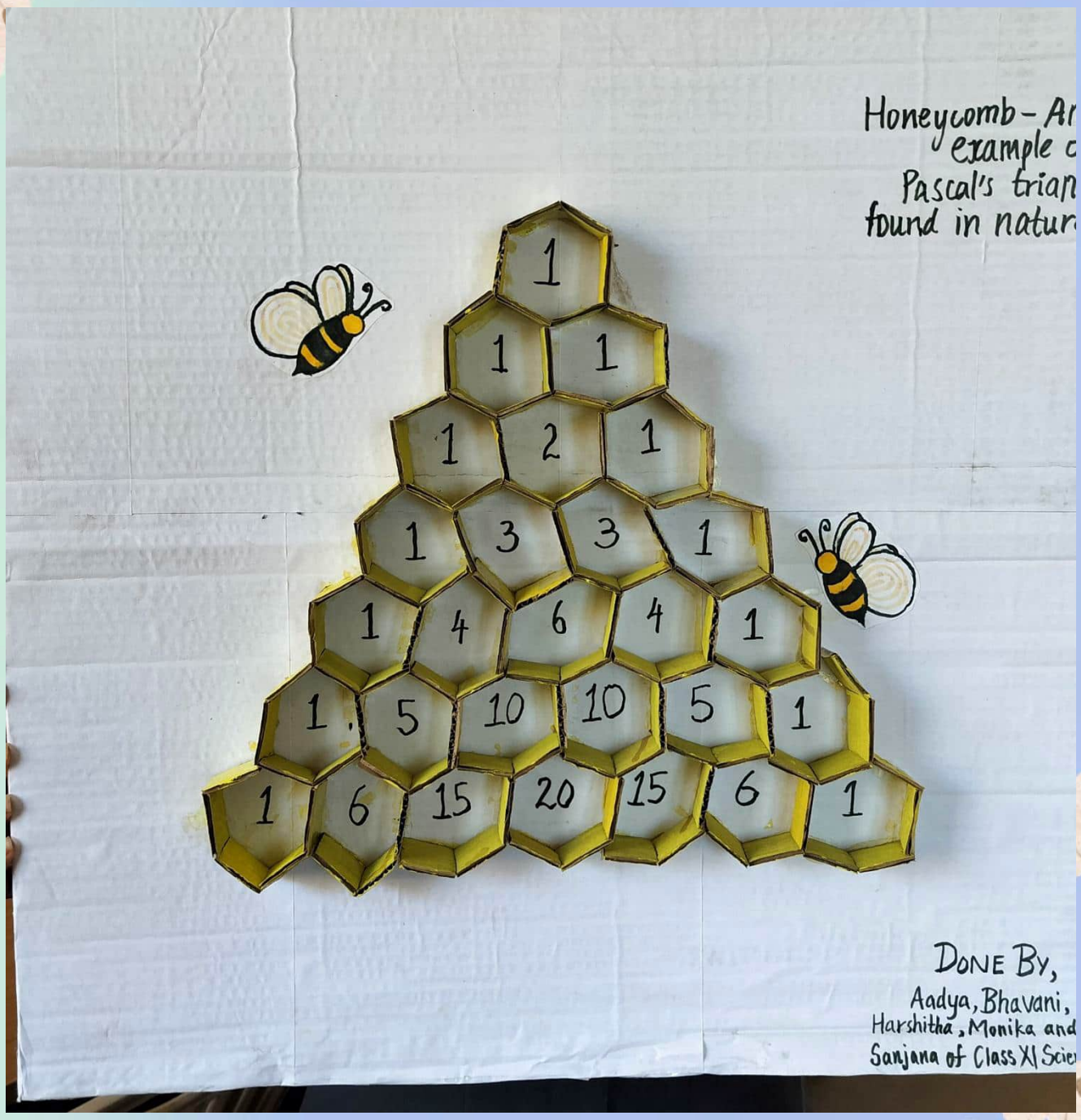
Common Integration Formulae (Page 2)



Students of grade11 enjoyed making a 3D model of OCTANTS which made them understand easily to find the position of a point in space.

PASCAL's TRIANGLE

Students of grade 11 worked in groups to make a model of Pascal's trianglewhich is named after a French mathematician Blaise Pascal. It is also known as Meru prastara by PINGALA. It is used in Binomial expansion.

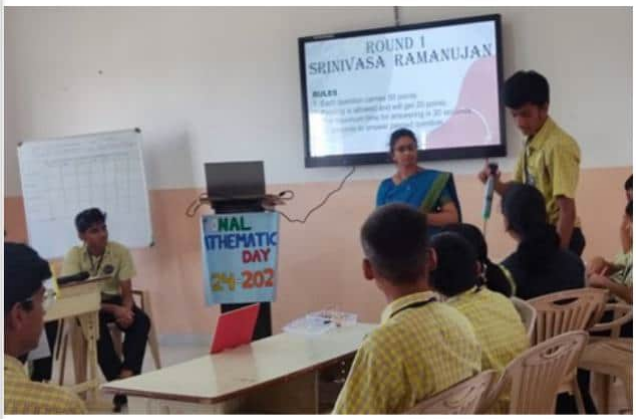


NATIONAL MATHEMATICS DAY CELEBRATION

National Mathematics Day is celebrated to commemorate the contributions of Srinivasa Ramanujan in the field of Mathematics. His contributions are innumerable. He had provided a new dimension to infinite series, number theory, mathematical analysis, etc. thus, the celebration of the National Mathematics Day started to inspire more youth to pursue their dreams and ambitions.

Quiz on National Mathematics Day

Mathematics Quiz competition has been conducted on account of the birth anniversary of Srinivasa Ramanujan, an Indian Mathematician. This activity helped students to know more about Ramanujan's contributions and fostered an interest in learning mathematics.



"Twisting and Turning to Victory: Celebrating National Mathematics Day with Rubik's Cube Solving"

Our school celebrated National Mathematics Day with a thrilling Rubik's Cube Solving Competition, aptly named "**Rubik's Race**." The event witnessed an overwhelming response from students across various grades, all eager to showcase their problem-solving skills and strategic thinking.

The competition was divided into [number] rounds, with each round presenting a new challenge for the participants. The students were given a set amount of time to solve the Rubik's Cube, and the one who solved it the fastest would move on to the next round. The atmosphere was electric, with students cheering each other on and displaying remarkable sportsmanship.

After a series of intense rounds, **Sarath** K from XII Science emerged as the winner, solving the Rubik's Cube in 24.82 seconds. The runner-up was Prathamesh from Grade 8(solved in 24.92sec), who also demonstrated exceptional problem-solving skills.

NATIONAL MATHEMATICS DAY SPECIAL ASSEMBLY

Celebrating the Beauty of Mathematics!

Mathematics Department of SSRVM Bangalore South concluded its **National Mathematics Day** celebrations with a grand finale!

Throughout December, our young math enthusiasts participated in exciting competitions like Math Quiz, Rubik's Cube Solving, JAM, Pictionary, Puzzles, Math Relay, and 3D Art.

The special assembly was a showcase of talent, with students mesmerizing the audience with a dance, reciting shlokas on Vedic Math, and delivering a thought-provoking talk on Ramanujan's contributions.

We're proud of our students for embracing the joy of mathematics and celebrating the legacy of the legendary mathematician, Srinivasa Ramanujan.

Winners of Mathematics Olympiads

Preparing for the IOQM has been a rewarding journey driven by my love for mathematics. It challenges me to think creatively and improve constantly. My preparation involves exploring key concepts and solving past problems, with support from my school to balance it alongside academics.

MATHEMATICS TEACHERS' ASSOCIATION (INDIA)

Indian Olympiad Qualifier in Mathematics
IOQM 2024 - 25

CERTIFICATE OF MERIT

This Certificate is issued to

NEEL AVINASH

IOQM 2024-25 being in the top 10% of the students who participated in IOQM 2024 - 2025

Prithwijit De
Prof. Prithwijit De
National Coordinator
Mathematical Olympiads

Vaibhav
Dr.Vaibhav Vaish
Chief Examination Coordinator
IOQM 2024 - 2025

WINNERS OF IMO-INTERNATIONAL MATHS OLYMPIAD

A few students achieved the prestigious Gold Medal of Excellence in the SOF International Mathematics Olympiad (IMO), showcasing their exceptional mathematical skills and dedication. This recognition highlights their hard work and mastery of challenging concepts, making them stand out as remarkable achievers in the competition.

Chandra Shekhar, Grade VI, School Rank 1, Gold Medal of excellence

I, Chandrashekhar, participated in the IMO. I used various books to study and found the content very easy. The event took place on 22nd October.

Soubhagya, Grade VI, School Rank 2, Gold Medal of excellence

I am Soubhagya and I study in class 6. Recently I have attempted the IMO math Olympiad. So, I would like to share with you how I got my gold medal. I practiced the book that I got for my exam with great enthusiasm. I did 10 questions for practice and managed to finish the book on time. I learnt some Vedic math in my class that help me a lot. I also learn Abacus and have won 3rd runner up trophy in international competition. Also I have done intuition process that help me to keep my mind calm so this is it I would like to share with you.

Debabrata Ray Chaudhury, Grade VI, School Rank 3, Gold Medal of excellence.

My name is Debabrata Ray Chaudhury and I have a deep passion for mathematics. Recently, I was honored to win a gold medal in the International Mathematics Olympiad (IMO). To achieve this milestone, I diligently practiced using the book provided by SOF-IMO, which played a significant role in my preparation. Additionally, Vedic math tricks greatly enhanced my ability to perform calculations with incredible speed, proving invaluable in the competition.

Anurag singh: Grade VII, school rank 1: Gold medal of excellence

My name is Anurag Singh. I scored 48 out of 60 marks in Maths Olympiad and school rank 1. I solved RD Sharma along with NCERT Maths book and try to understand core concepts. My Maths teacher Rajni ma'am helped in understanding the concept and Sumita ma'am taught Vedic Maths which helped me to do faster calculation. Credit for my success goes to my mother as she teaches me in home.

Anagha Balachandra, Class: VII, School Rank 2: Gold medal of excellence

I am Anagha from grade VII.

Math is a subject I am very interested in. I love the way it makes my brain work; I enjoy solving problems and challenges, all which is done through math.

I worked hard for the Olympiad. I studied the prep guide and workbook. I was always guided by my mother whenever I was stuck. I also received help from my classmates and Rajani ma'am.

Overall, this has been a thrilling experience, and I will definitely take part in Olympiad next year as well.

Aparna Nair, Grade VII, School Rank 3, Gold Medal of excellence

I'm Aparna, and I won a gold medal in the Math Olympiad (3rd place). I worked really hard and used Vedic Math to help me solve problems faster. I'm proud of my achievement, but I'll keep working hard to do even better next time. I hope this inspires others to pursue their math goals.

SSRVM MATH DEPARTMENT

THANK YOU

****