STEAM

Bal Bharati PUBLIC SCHOOL ROHINI

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Inside This Issue

Mathematics is one of the oldest established academic subjects and the most important to connect a human being with the world he/she inhabits. From the date we mark our calendars to the collection of data for statistical studies, Math is embedded in every iota of our being. In addition to the traditional roles of mathematics in building mental discipline and encouraging logical reasoning & mental rigour, the newest of technological & professional opportunities have woven mathematical skills in everything. Thereby, promoting the need for STEAM based academic fervour. This final edition of the STEAM Stories is rightly dedicated to the study of numbers, shapes & space, called Math and with that we rest our faith in the imperitive STEAM based learning.

Geeta Gangwani
Principal

"M" for mathematics

Dear Readers,
We bring to you our special series on STEAM stories, a display of our students' work in using multidisciplinary and experiential learning. This special series comprises of five different editions-each emphasizing on the individual element . Here is the Edition 5 which deals with Mathematics .

STEAM

STEAM: Mathematics

MATHEMATICS-The M in STEAM

The Cambridge Dictionary describes Mathematics as **"The study of numbers, shapes, and space using reason and usually a special system of symbols and rules for organizing them."**

Math is literally everywhere as an integral part of all fields of study. It is largely considered as 'the language' that is unequivocally used by all, regardless of culture, religion and gender. Mathematics has historically been taught in a traditional way, hence, it does not appeal to all learning styles. Thereby, making it difficult for some learners to engage fully, which leads to a lack of understanding of the essential mathematical concepts. One way to improve learning outcomes is to try to teach mathematics by framing some of the traditional math problems in an integrated problem.

Some of the most effective strategies aligned with the STEAM Education include framing a math problem in a transdisciplinary context such as "*Project Based Learning*" which not only encourages learners to work in groups to solve the problem but also allows them to propose one or two innovative solutions to solve the challenge. This helps improve their academic engagement and promote higher order thinking and problem solving.

Math is the means and foundation to the solid development of the skills of learning, logical thinking and reasoning. Mathematics plays a key role in physics and engineering. STEAM projects show learners that math is not confined to paper and is a part of a rich network of disciplines that help us understand the physical world. Mathematics helps to bind the other elements together as it is needed to solve problems in the fields of science, technology and engineering while providing structure to art. As opposed to traditional models of teaching, educators using the STEAM framework bring the disciplines together. Through this holistic approach, students are able to exercise both sides of their brain at once.

I'd like to quote from the movie Abstract, **"What can I make next? That drive never goes away"**

Ms. Sapna Makan
TGT (Mathematics)

Bal Bharati PUBLIC SCHOOL ROHINI

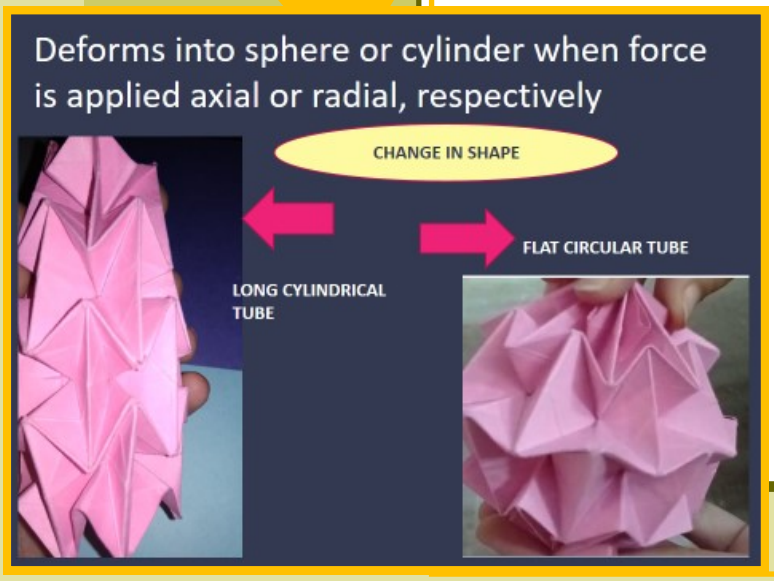
STEAM

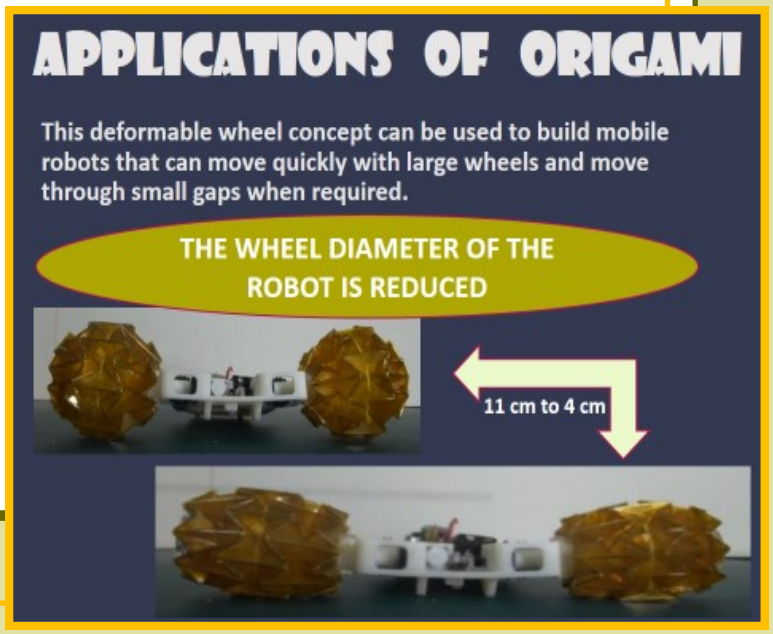
30 30 STEM EKLAVYA SERIES Spicing up the curriculum

In a CBSE- IIT Gandhi Nagar Initiative- Demystifying NEP, Nurture Creativity, Out-of-box thinking and Conceptual understanding; the students of classes VI to IX designed Diwali Lamps with the help of Inspiring DIY project videos. The lamps were created using locally available material and helped them connect the curriculum to life.

DEFORMABLE WHEEL Robot based on Magic-Ball Origami Structure

Anushka Gupta, X-A, explored and represented the deformable wheel robot design based on the magic-ball origami structure. By using this origami structure, she mastered the art of using a single piece of sheet, with specific folds and bagged the Third Prize in an interschool event. This specific design, courtesy Seoul National University, was a perfect example of STEAM Design execution.





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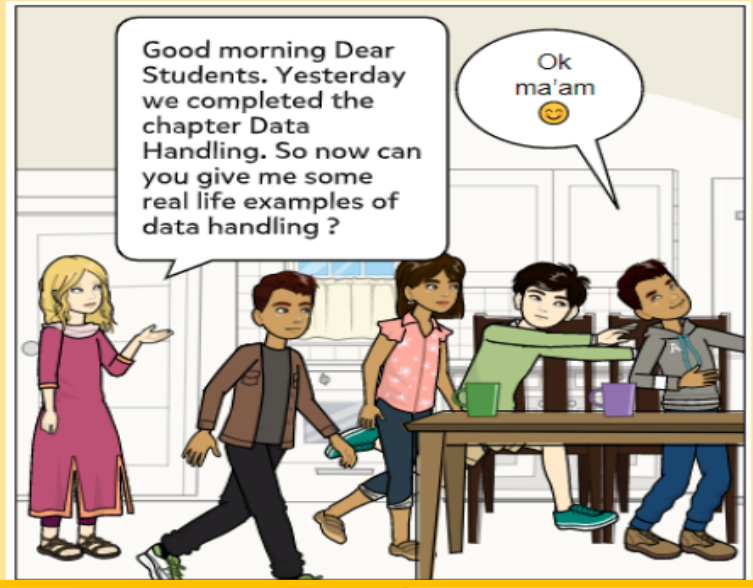
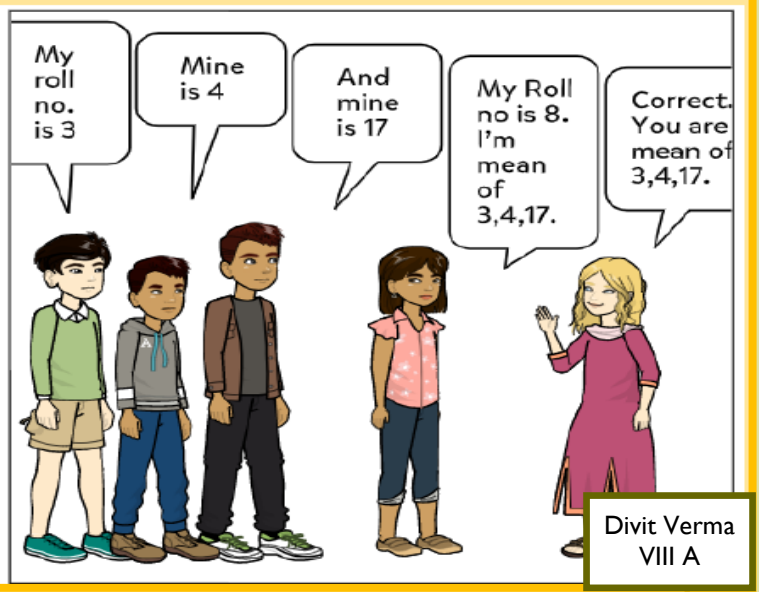
WEAVING MATHEMATICS With DIFFERENT DOMAINS

Math for Good Health and Well-being

The students used Digital Comic Strip designing to spread the message of balanced number of calories, sufficient sleep, proper water intake and a regular exercise routine. Mathematical calculations were effectively used to calculate and design a daily fitness regime.





Divit Verma
VIII A

Math In Designing Sustainable Cities And Communities

Nitin Singh
X A

The students digitally designed a Mathematical City. The students racked their brains to mark residential, commercial and cultural facilities promoting zero-carbon and energy-efficient designs.

Math For Depicting Life Below Water

Sharabya Banerjee
III A

Numeric Drawing for numbers from 1 – 10 was used as a medium to create awareness about the life below water and the ways to sustainably preserve it. The activity was an instant hit with the students with the ultimate goal of creating an aware and responsible generation of students.

STEAM

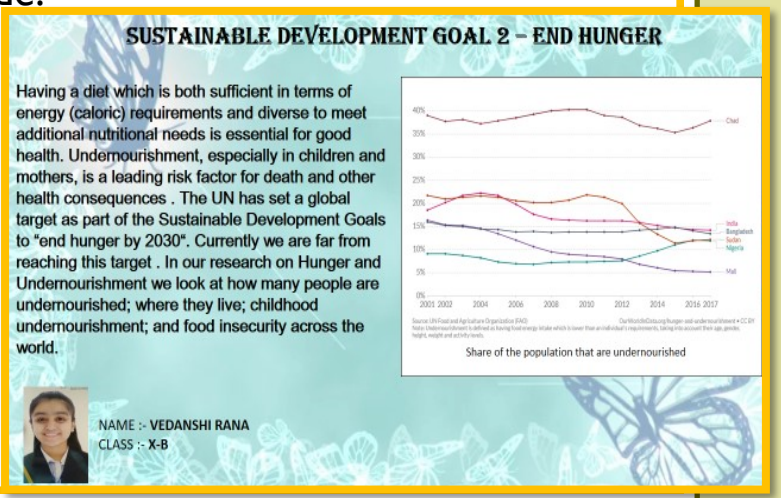
NATIONAL STATISTICS DAY

To mark the National Statistics Day, the students analysed the graphical representation on End Hunger, achieve food security and improved nutrition and promote sustainable agriculture worldwide.

Quick World Hunger Statistics

1. 10,000 children die daily from chronic poor nutrition
2. 99% of malnourished people live in countries that are underdeveloped.
3. Today, approximately 10% of the global population suffer from hunger, compared to 24% in 1990.
4. World hunger is on the rise - and is caused by war, weather and poverty.
5. Asia has the most hungry people, but sub-Saharan Africa has 25% of their population who suffer from hunger, making it the highest prevalence.
6. Females make up 60% of malnourished people worldwide.
7. 45% of all deaths of children under 5 are due to the lack of food – that's almost 3 million lives a year.
8. 780 million people - or 11% of the global population - live on less than $1.90 US/ day
9. Experts disagree on how much money it would take to end world hunger, their best guess range anywhere from $7 billion to $265 billion a year.

JINISHA JAIN
X-A
10139



MATHEMATICAL JINGLE

The students composed a jingle on experience with Mathematics in following a healthy life style. This helped students to remember important math skills using lyrics.

MATH JINGLE

Mathematics in daily life,
Gives good health & positive vibes.
Helps us to exercise our brain,
Boosting capacity, a perfect gain.
Aerobics helps us to grow tall,
Basic operations are for all.

Have a good diet for optimum health,
Count your calories coz health is wealth.
Drink water 8 glasses a day,
Avoid things that cause tooth decay.
Walking 100 steps in a go,
Keeps you fit and never feel low.

Eight hours for a normal sleep
206 bones in a body deep
60 to 100 beats per second,
Quick maths I reckon.

One apple a day and you will never creep,
Healthy body and you'll never weep.
Yoga angles are good for the soul,
Loving body and maths is our goal.

Math puts life in order,
It is fun & our fodder.
Reasoning, thinking, problem solving,
Math is all about exploring.
Let us all accept the fact,
We are surrounded by Math!

By
Himanshi Nathani
III-B

ORIGAMI CRAFT

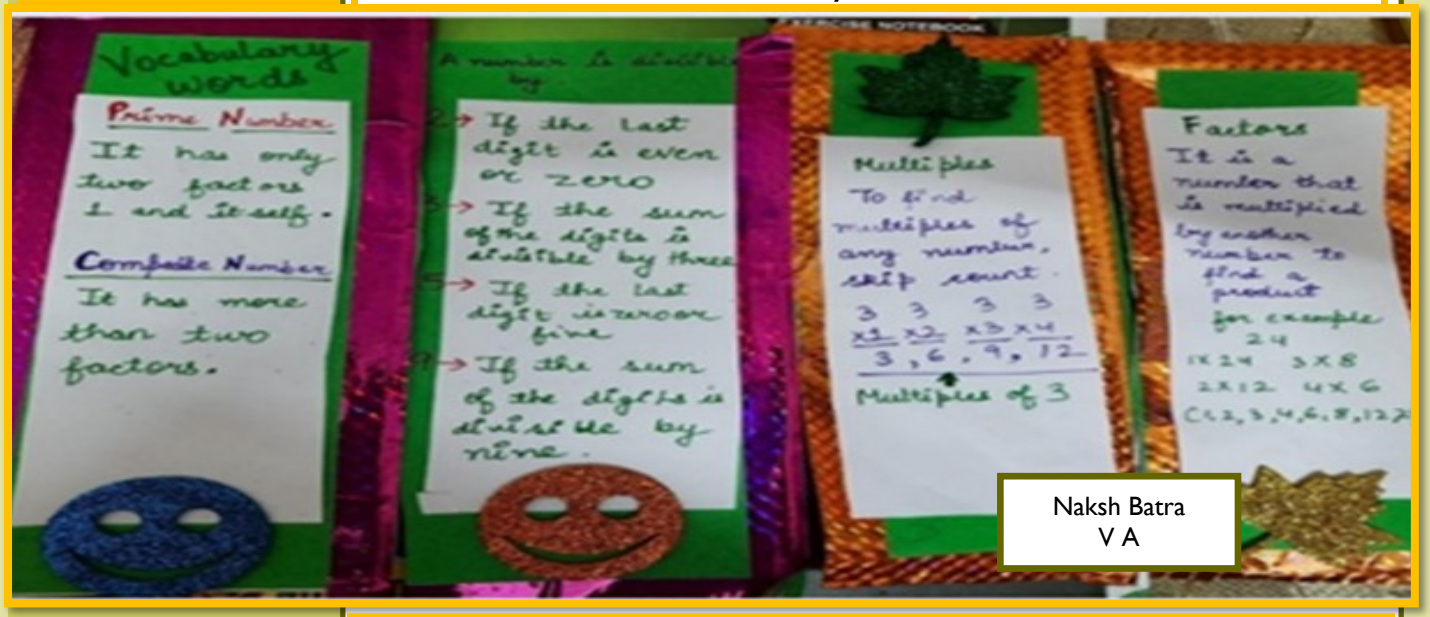
A plethora of sessions were conducted to enhance constructive and spatial visualisation skills in the students of pre-primary classes through the art of origami. The aim of the sessions was to achieve a clearer understanding of various geometrical shapes and lines while automatically building on their gross-motor skills.

Vinayacka Sharma
PS A

STEAM

VOCABULARY FACTBOOK

Students of Primary Department prepared Math fact books In which they wrote terms and facts related to mathematics like prime numbers, composite numbers, multiples and factors etc. This enhanced their math vocabulary.



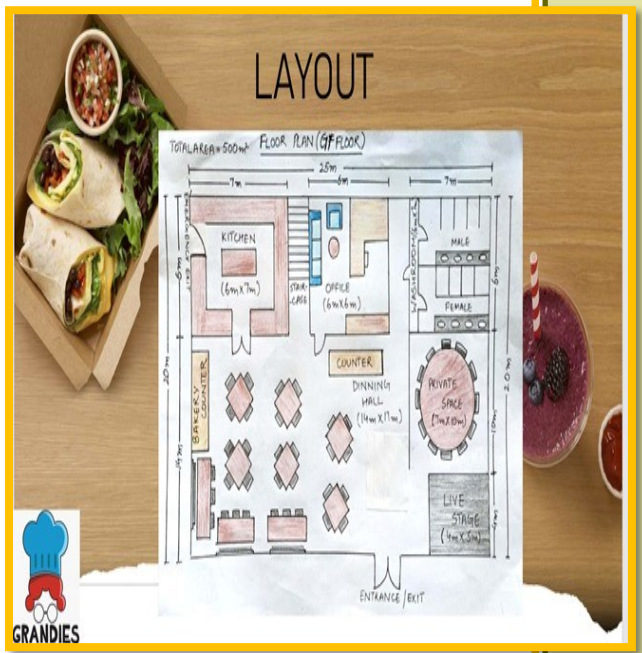
PROJECT BASED LEARNING

It is an instructional approach designed to give students the opportunity to develop knowledge and skills through engaging projects set around challenges and problems they may face in the real world.

The key elements to project design include:

- A challenging problem or question
- Sustained inquiry
- Authenticity
- Student voice and choice
- Reflection
- Critique and revision
- Public product

Class 5



INQUIRY QUESTION –SETTING UP OF A SMALL CAFE FOR ELDERLY IN A GIVEN SPACE.

LEARNING OF MATHEMATICS Students apply their mathematical skills while budgeting the expenditure , expenses, profit margin, proposed invested amount etc .They learn to squeeze the expenses within the limits of budget. Mathematical skills will be fruitful while designing the lounge, sitting area and kitchen designing them using Perimeter, Area and other dimensions along with symmetry and patterns.

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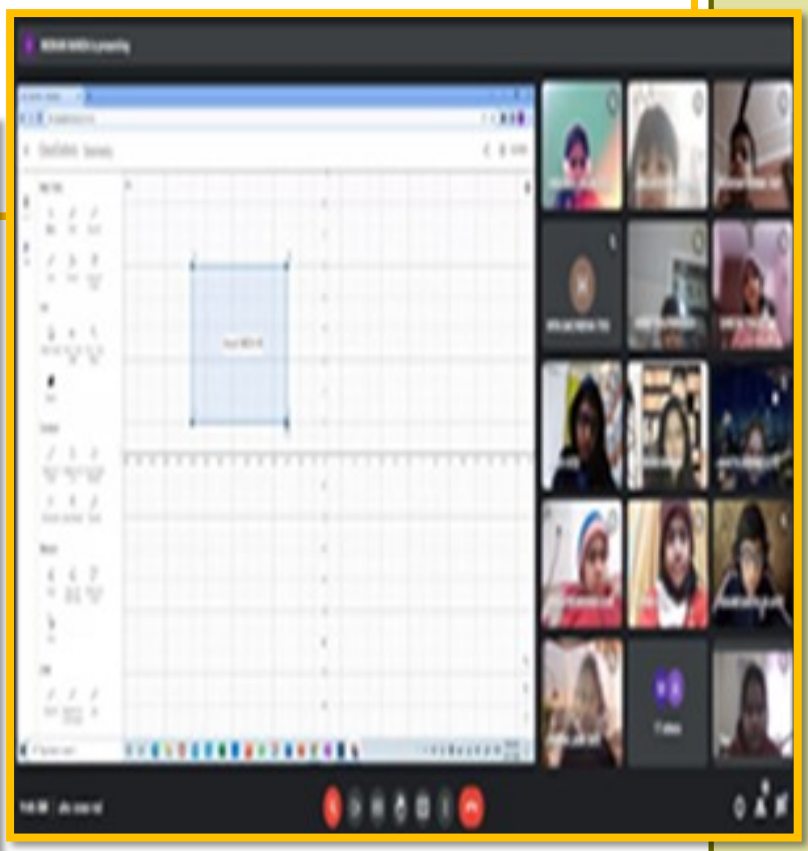
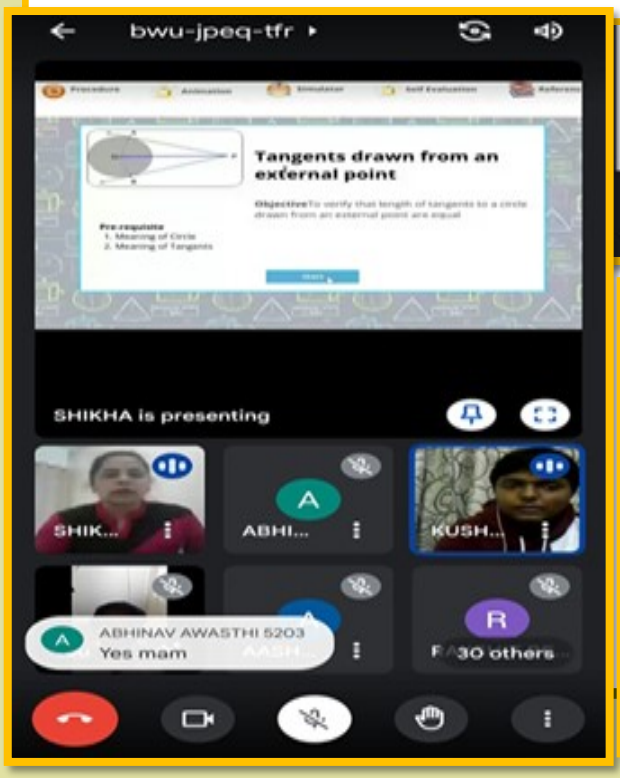
EFFECTIVE INTEGRATION OF TECHOLOGY TOOLS

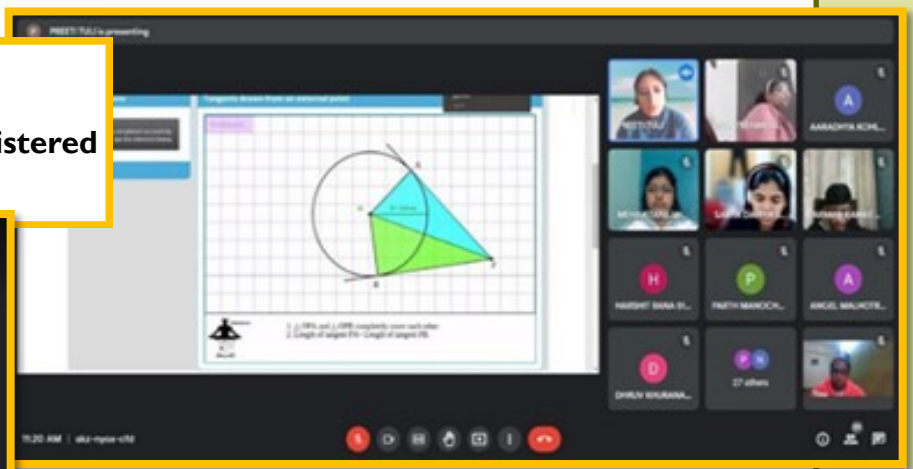
A variety of ICT tools and e-Resources are used to meet the different learning styles.

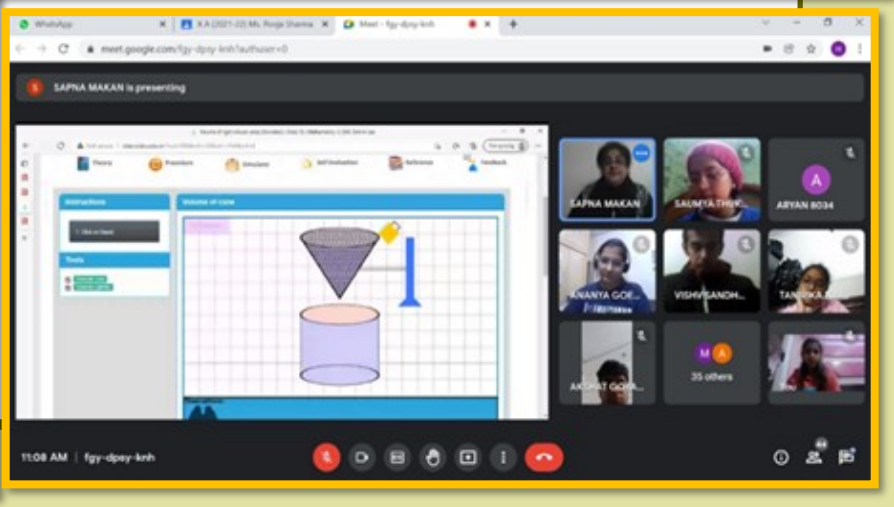
GEOGEBRA- Interactive mathematics software suite for learning and teaching



OLABS
Learning Through Virtual LABS
All students of classes IX-X are registered on OLABS







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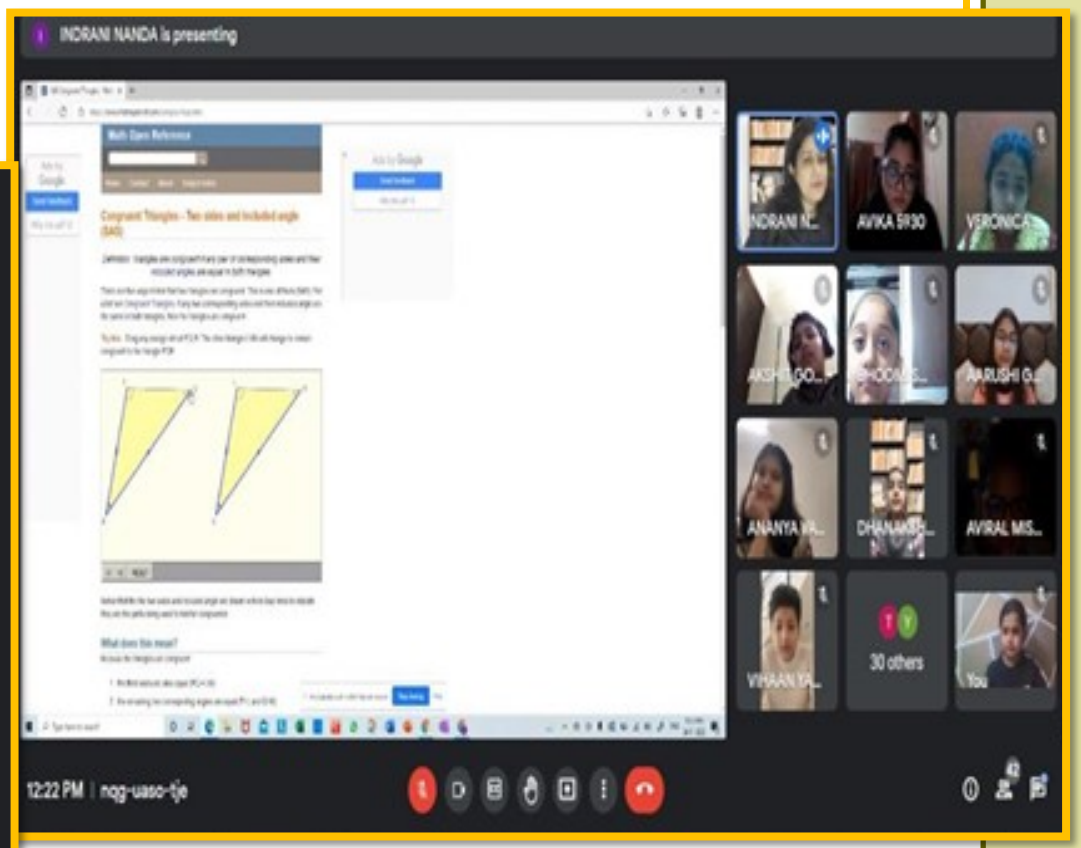
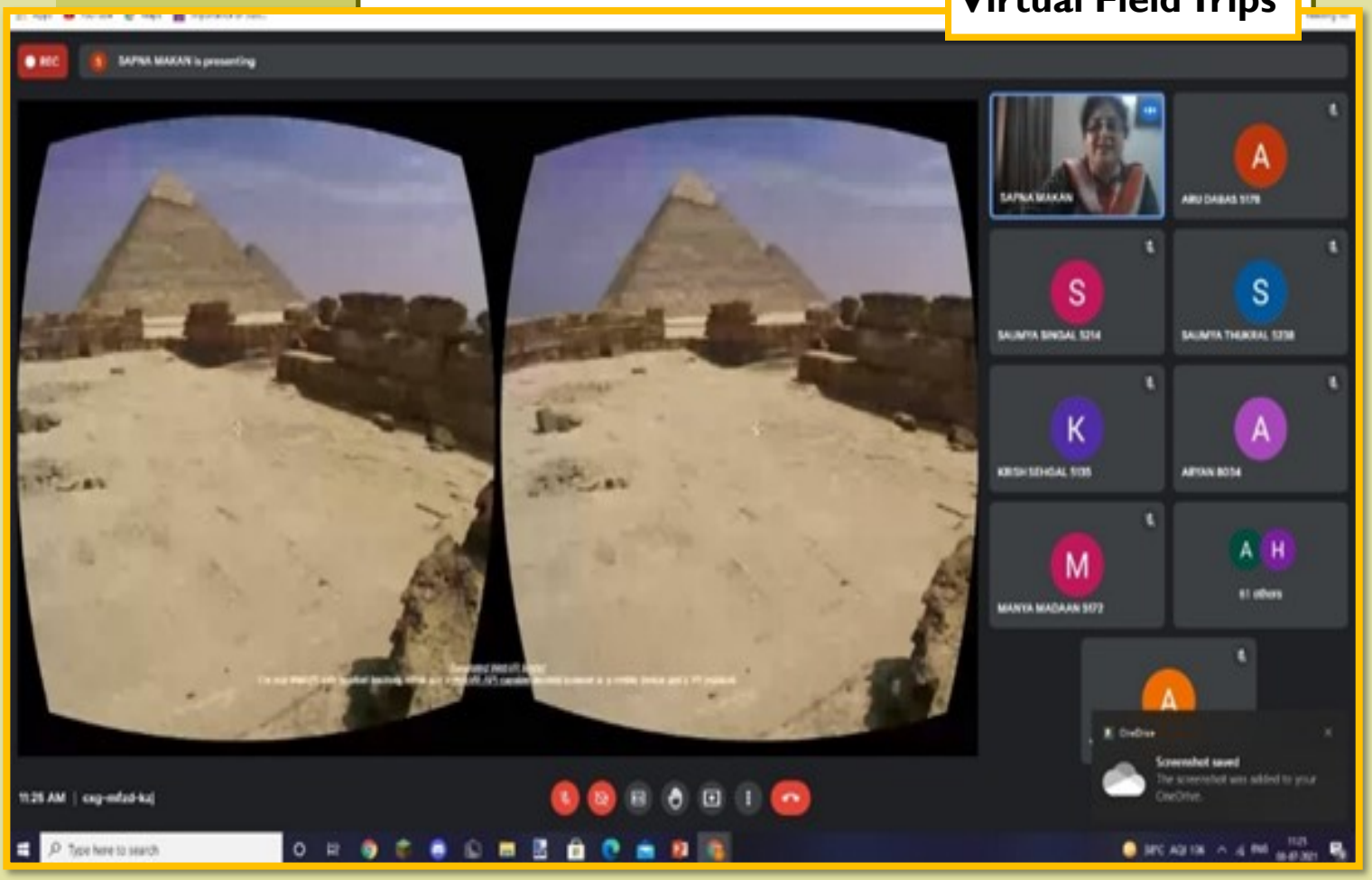
EFFECTIVE INTEGRATION OF TECHOLOGY TOOLS

Mathopen reference- 'Digital Manipulatives' to demonstrate mathematical concepts.



Virtual Field Trips



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QUESTIONING TECHNIQUE

Framing of questions is an important 21st Century Skill so the students of primary classes used it in mathematics to relate the real-world mathematics problems with their curriculum. They framed their own word problems and illustrated them with related pictures to grasp the concept easily.

Ayaansh Kohli
III A

Multiple Intelligences and CHOICE BOARD

The choice board was used to explore different Multiple Intelligences by trying out simple activities. Students selected activities from the given options and worked through at their own pace.

SUBJECT-MATHEMATICS

CLASS-X

CHOICE BOARD TOPIC-SIMILAR TRIANGLES

Instructions

1. Choose any 3 activities
2. These activities may be in a horizontal, vertical or diagonal line
3. The quiz is compulsory

Linguistic Intelligence **STORY/POEM ON SIMILARITY** • Write a Story/Poem on similarities between mother earth and your mother. • Enhance by adding images of mother earth.	***Musical Intelligence*** **SONG** • Write a song on Pyramids of Giza or Matryoshka Dolls. • Enhance by adding suitable images	***Bodily Kinesthetic Intelligence*** **SPORTS INTEGRATION** • Compare the yoga postures from various Asans and find the instances for similarity. • Explain why you find them similar. • Enhance by adding suitable
Logical Mathematical Intelligence **STUDY ON TYPE OF PARAMETERS** • Find atleast two examples in which • 3- Dimensional figures/objects are similar. Give reasons using similarity rules. • Enhance by adding suitable images	**COMPULSORY** ***QUIZ MINDS*** MCQ CASE STUDY BASED	***Interpersonal Intelligence*** **ROLE PLAY** • Write a discussion between "congruency" and "similarity" consisting of atleast five dialogues. 3- Dimensional figures/objects may be used in discussion. • Enhance by adding suitable images
Visual – Spatial Intelligence **ART INTEGRATION** Draw and colour two Warli stick figures using 2-3 similar triangles. Explain the concept of similarity used in the figures.	***Intrapersonal Intelligence*** **SELF-REFLECTION** • Write a paragraph on "*Experiences of being Similar to other figures*". • Word limit=100 words • Enhance by adding suitable images	***Naturalistic Intelligence*** **NATURE BASED** • Find atleast 2-3 similar looking plants/ flowers. For eg-Flowers that look like ROSES • Find the instances for similarity. • Enhance by adding suitable images

STEAM

Linguistic Intelligence

STORY/POEM ON SIMILARITY

Poem on mother earth and my mother

The lovable component of our life.

Both mother earth and my mother are similar,
they offer unconditional love to their children,
Both of them can't see their children in pain
They both can bear but will not let their children bear the pain.

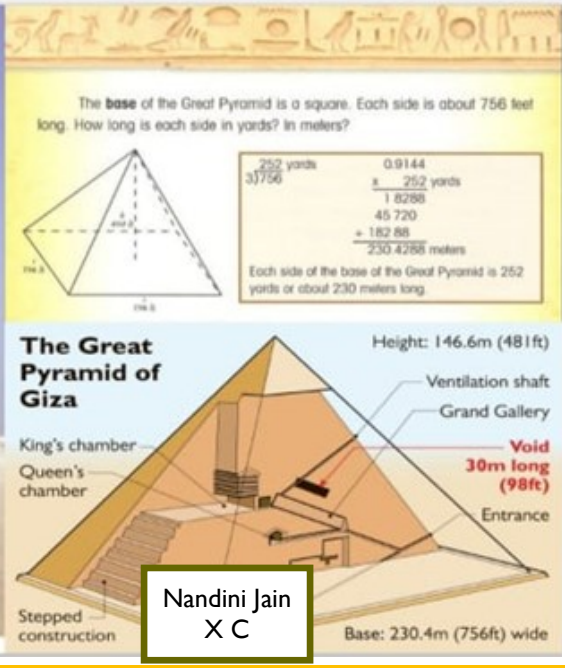
Oh my dear child don't go away from me,
They both can't live away from their kids,
Pain is immense but it can't over shadow their love
They both are similar in every way

Arunima Mohan
X A

Musical Intelligence

GIZA

Four millennia ago,
Egyptians built Pyramids,
Based on Golden Triangles,
Whose mystery shall be untangled.
These pyramids makes me wonder,
About the mathematics hidden under.
They raise the palms of either hand,
Among the eighth of wonderlands.
The glory of pyramids so high,
Makes me ponder about the mathematics of Phi.
Area of face equal to Area of square formed by height, the best design,
to make all angles well- defined.
For 20 years, the workers worked hard
To make pyramids with a volume of 3175199 cubic yards.
Made in harmony with mathematics,
Pi, Phi and Euler makes it a classic.
With a Pythagorean triplet of 3, 4 and 5,
the king's burial chamber is built inside.
The center of landmass of la Tierra (The Earth),
It was made in the ancient era.
Aligned perfectly with the north pole,
The pyramids give us ideal Maths goals.
Now, the mystery is about to unfold,
You guessed it right!
The story of great pyramids of giza was told.



Nandini Jain
X C

Bodily Kinesthetic Intelligence

YOGA ASANS AND SIMILARITIES!

Aru Dabas
X B

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Logical Mathematical Intelligence

STUDY ON TYPE OF PARAMETERS

Two figures are said to be similar if they are of the same shape. In more mathematical language, two figures are similar if their corresponding angles are congruent , and the ratios of the lengths of their corresponding sides are equal.

Similar triangles have the same shape, but not necessarily the same size. In the figure below we can see that the shape of a *triangle sandwich* is similar to that of *nachos from a nachos bag* due to the AA property as we can see that the angles in both these triangles are congruent i.e. 60° since both are equilateral triangles.

Prathu Chadha
X A

Interpersonal Intelligence

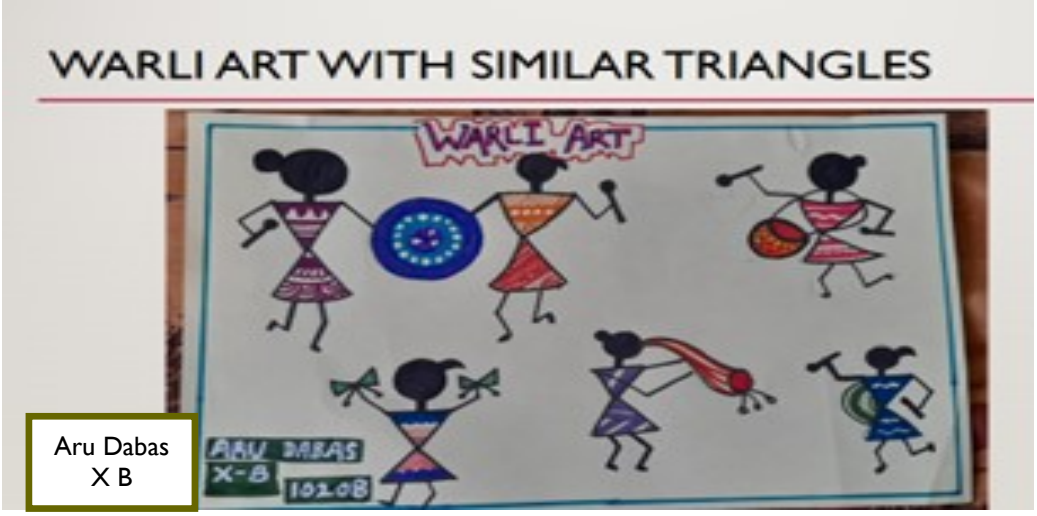
RENDEZVOUS WITH MR CONGRUENCY & MS SIMILARITY

BY AASHNA: 10446

Aashna
X D

STEAM

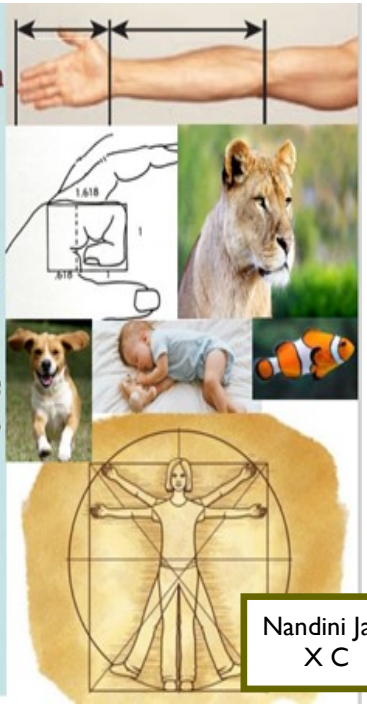
Visual – Spatial Intelligence



Aru Dabas
X B

Intrapersonal Intelligence

Whenever I sit and imagine about myself being similar to a subject, the only thought that pops up in my mind is that I am similar to Mathematics!
Mathematics is a methodical application of matter which makes our life orderly and similar to is the identity that I have. Being creative, abstract and having high critical thinking is what is share in common with Mathematics. Well, I do find myself similar to many figures in nature- swimming like a fish, sleeping like a baby, fierce as a lioness, calm as flowing water and playful as a dog. But, I found that I am more similar to Maths. Whenever, I reflect upon my body, the number of Maths concepts arising as a result are astonishing. The body being bilaterally symmetrical, the presence of the golden ratio and the concepts like differentiation, integration, geometry volume and areas is what Maths & I have in common. Looking around yourself and finding that there are figures that are similar to me and figures that I could relate to brings a joy in my heart. This is what I have experienced of being similar to figures



Nandini Jain
X C

Naturalistic Intelligence

Two plants looking similar to each other : - Venus Flytrap and Sundew

They look similar to me because both of them have the same characteristic that is to kill insects for obtaining nutrition as the cannot do photosynthesis and both of them are found in groups and both of them have tentacles which are used to grab hold of their prey and then they close their mouths and obtain nutrition from their prey by secreting digestive juices on them and both of them are green in colour with the inner portion of the space used for capturing the prey being red in colour.

Venus Flytrap

Sundew

Krish Chaudhary
X B