MATH-O-ART- MATH & ARTS INTEGRATION

Bal Bharati PUBLIC SCHOOL
Sector-XIV, Rohini

VOLUME IV, ISSUE X, MARCH 2021

INSIDE THIS ISSUE:

TEACHERS' TAKE	2-3
PRE-PRIMARY DEPT. INTEGRATION OF MATH AND ARTS	4-5
PRIMARY DEPT. INTEGRATION OF MATH AND ARTS	6-10
MIDDLE DEPT. INTEGRATION OF MATH AND ARTS	11-14
SECONDARY DEPT. INTEGRATION OF MATH AND ARTS	15-16
SENIOR SECONDARY DEPT. INTEGRATION OF MATH AND ARTS	17-18
DIY ACTIVITY	19

FROM THE PRINCIPAL'S DESK

Dear Parents,

CBSE defines Art-Integration as a cross curricular pedagogical approach that utilizes various aspects and forms of art and culture as the basis for experiencing the learning of concepts across subjects. With increased emphasis on experiential learning, Art Integrated education aspires not only to create joyful classrooms but also to imbibe the Indian ethos through integration of Indian art and culture in the teaching and learning process at every level. This art-integrated approach strengthens the linkages between education and culture.

The journey to introduce art integrated learning in a systematic manner was exciting as well as challenging one. After understanding the basic tenets of the practice, the faculty incorporated all elements of Art Integration into well-defined activities and projects. The entire journey was filled with creativity, richness of our culture and possibility of long-lasting impact on learning outcomes. I was amazed to see the sense of engagement and excitement in the children when they were asked to explore their artistic sensibilities through well-defined activities. The creative expression of the students was extremely heartening and, therefore, gave us the idea to share these beautiful and meaningful creations with all stake holders. In this compilation, we present before you the creative outcomes of our children in Art Integration activities for Math.

The most crucial feature in the success of such an innovative practice is consistency in its implementation. Therefore, we look forward to many exciting rendezvous in the world of Art and culture.

Kudos to joyful learning!

Geeta Gangwani

Principal

TEACHERS' SPEAK

"God used beautiful Mathematics in creating the world."

-Paul A.M. Dirac

Mathematics is a creative subject. Although there is only one correct answer to a given problem, there are many possible ways to find it, one of which can often be through art. Art Integration plays a vital role in developing the 21st Century Skills of Critical Thinking, Creativity, Communication, and Collaboration.

Art integration is adopted to encourage students to construct and demonstrate understanding through art forms. Inserting art into Mathematics classes motivates the students to learn not just for test results but for the learning experience itself. Such a perspective in Mathematics leads to opportunities for presenting difficult concepts visually, making them easier to understand. Art is directly related to our visual experiences. Art makes these images clearer and more concrete. The integration lends itself to imbibe a greater appreciation and understanding of the art form utilized for the process. In art integrated classrooms learners create works of art that reflects their core understanding of the scholastic concepts. The experiential aspect of art helps one go deeper into other elements of life. The learners develop aesthetic sense by discovering symmetries in shapes like triangles, circles and quadrilaterals.

When art is integrated with education, it helps the child apply art-based enquiry, investigation and exploration, critical thinking and creativity for a deeper understanding of the concepts. Art integrated learning is a strong contender for experiential learning as it enables the learner to construct their own understanding and knowledge of the subject, through experiencing things and reflecting on those experiences. The students learn to provide reasoning and convincing arguments to justify their own conclusions in Mathematical context. Art Integrated education is embedded in classroom transactions for creating joyful classrooms and imbibing Indian ethos. It has a positive impact on the development of life skills such as communication and enquiry skills. This further helps the learners improve decision making, boost the self-confidence and make them more self-assured. Art integrated learning broadens the mind of the students and enable them to establish multidisciplinary links between subject and real life. It empowers students to investigate, to make sense of and to construct Mathematical meanings from new situations. They are able to find out Mathematics in all walks of life including art. They should not find the subject in isolation with other subjects or life, rather be able to make use of their learning in day to day life.

To sum up in the words of Julia Marshall, Professor of Art education, San Francisco State University, USA " The focus is not on the colour choices but rather the meaning, thinking and reasoning that the artistic process generates."

Ms.Sapna Makan

(TGT) Mathematics

TEACHERS' SPEAK

"Art makes abstract Math concepts concrete, understandable, and approachable."

-Anza Brezovnik

The importance of the integration of Art into learning Mathematics is nothing new but this way of teaching is a developing field. Mathematics has been used to create works of art–perspective, the golden ratio, division, the illustration of the fourth dimension and relationships between objects or body proportions. Both artists and Mathematicians have been enthusiastic about the same natural phenomena: why flowers have five or eight petals and only rarely six or seven; why snowflakes have a 6-fold symmetric structure; why tigers have stripes and leopards have spots, etc. When students see a certain object, they are able to create an appropriate mental image for it and then name and label them in terms of length, time, and mass.

Participation in art activities offers advantages related to Mathematical reasoning, such as intrinsic motivation, visual imagination and reflection on how to generate creative ideas. Thus art is the basis from which a successful curriculum is implemented.

Shikha Chadha

T.G.T. (Mathematics)

"Only way to learn Mathematics to do Mathematics."

- Paul Halmos

Mathematical experiences for a very young child should build largely upon their play. The natural relationships between learning and gaining knowledge in their daily activities, interests and questions help in enhancing their interest for the subject. Play moves maths instruction beyond rote memorization to more extensive understanding of Mathematics. Encouraging students to talk, think, reason and wonder as they move through problems can do wonders. Creating a sense of curiosity, even for a simple concept, engages students in a playful way. Involving students in maths activities such as sorting, organizing, patterning, mapping and making pictures or drawing to find the answers to maths problem can intensify their creativity, critical thinking and application skills. They understand in a way that Maths is multidimensional. Experiential learning, projects, Mathematical games, quizzes, puzzles, real life experiences, art and performing art integration in the subject, role play are some of the ways that create interest amongst the students for the subject and slowly move their understanding of a Mathematical concept from abstract to concrete.

Manisha Mathur

Assistant Teacher (Mathematics)

INTEGRATION OF MATH & ARTS

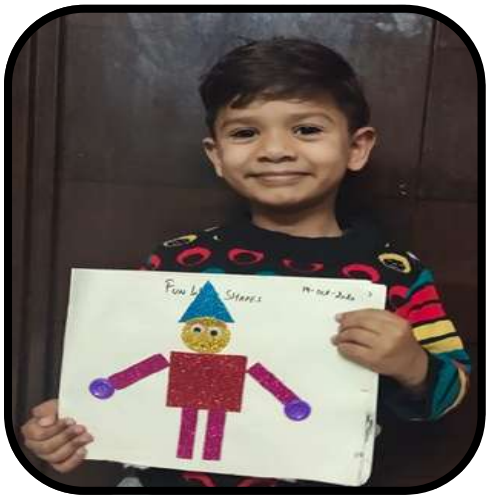
PRE-PRIMARY DEPARTMENT

CORRELATION OF NUMBER WITH OBJECTS

FUN WITH SHAPES

PUPPET MAKING

PUPPET MAKING



FUN WITH SHAPES

SHAPE-CIRCLE AND SEMI-CIRCLE

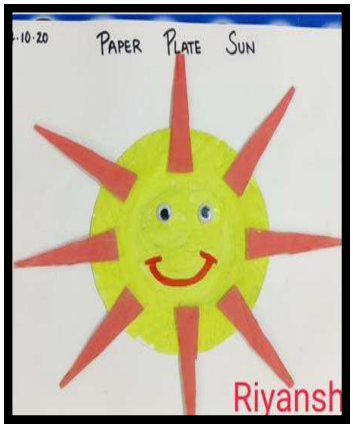
INTEGRATION OF MATH & ARTS

PRE-PRIMARY DEPARTMENT

DIAMOND SHAPE WALLHANGING

POPSICLE CRAFT

TRANSPORT TRAIN



SHAPE-CIRCLE AND SEMI-CIRCLE

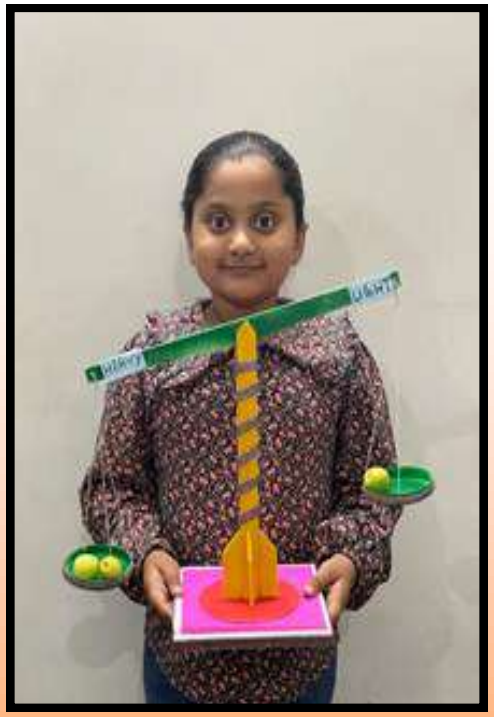
PUPPET MAKING
USING MATHEMATICAL SHAPES

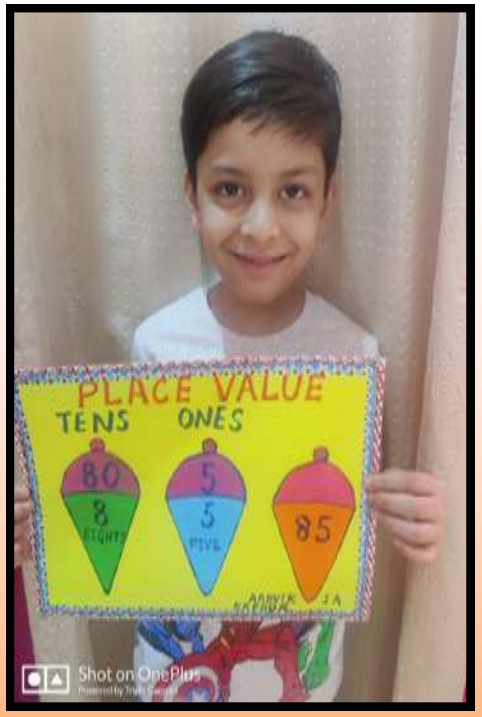
INTEGRATION OF MATH & ARTS

PRIMARY DEPARTMENT

ODD/EVEN-DRAWING AND COLOURING BUNCH OF GRAPES

ADDITION– USING DIFFERENT SHAPES ON BOTH THE WINGS OF BUTTERFLY



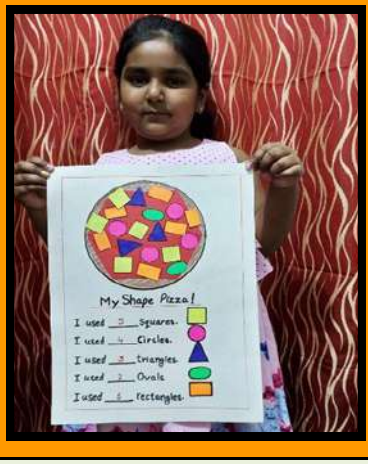


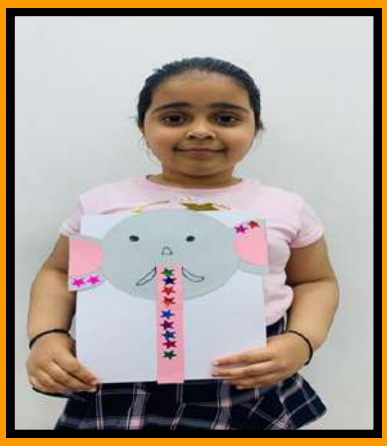
WEIGHT –MAKING BEAM BALANCE USING WASTE MATERIAL

PLACE VALUE– USING ICE CREAM CONES

INTEGRATION OF MATH & ARTS

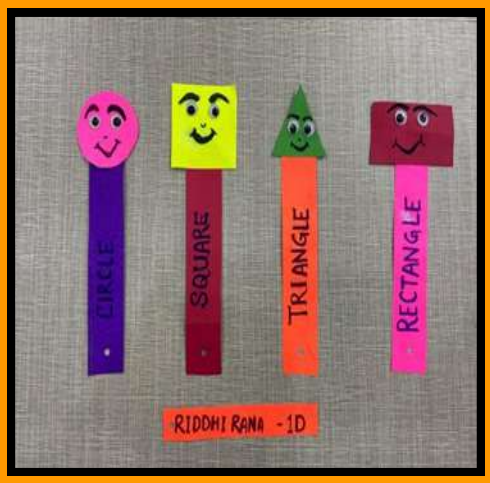
PRIMARY DEPARMENT





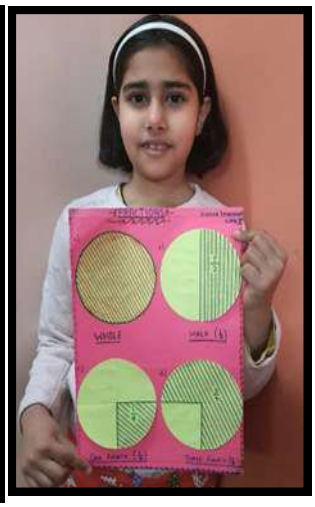
SHAPES - i) SORTING AND IDENTIFYING SHAPES
ii) USING SHAPES TO MAKE ANIMAL
iii) MAKING BOOKMARKS USING SHAPES.

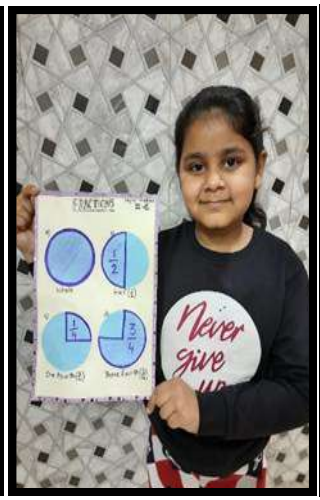
CALENDAR –CONCEPT OF CALENDAR WAS TAUGHT BY PAPER FOLDING.

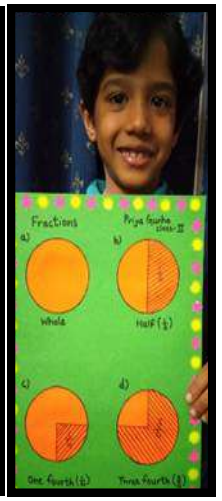


SHAPES USING MATHEMATICAL CONCEPTS

INTEGRATION OF MATH & ARTS-PRIMARY DEPARTMENT





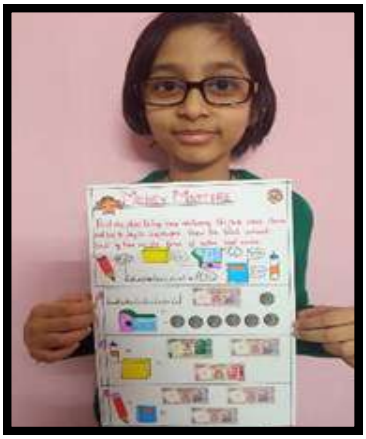


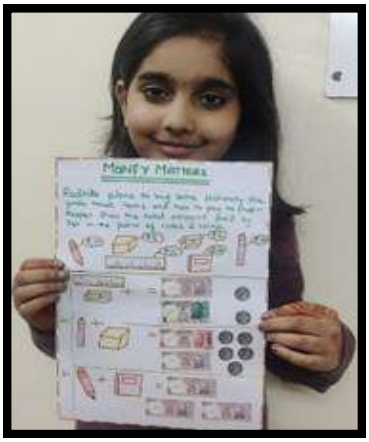
FRACTIONAL CHARTS USING ORIGAMI

SIKKIM PROJECT-FLOWER VASE MAKING USING GEOMETRICAL PATTERNS

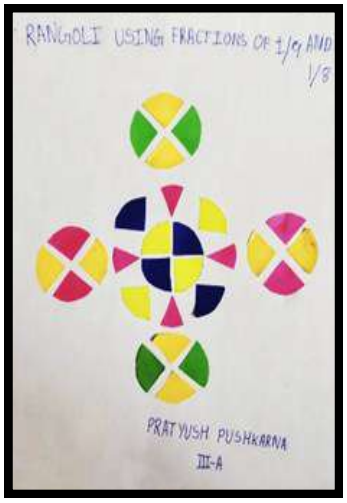
SIKKIM PROJECT-DAZZLING CARCANET USING GEOMETRICAL

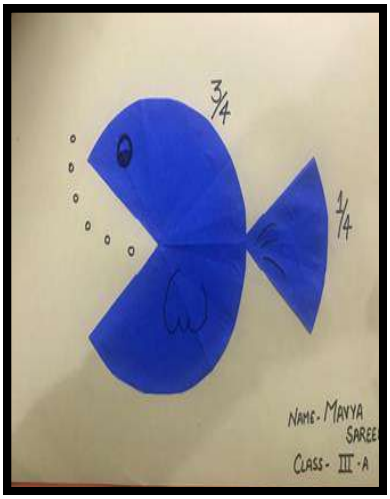
INTEGRATION OF MATH & ARTS-PRIMARY DEPARTMENT

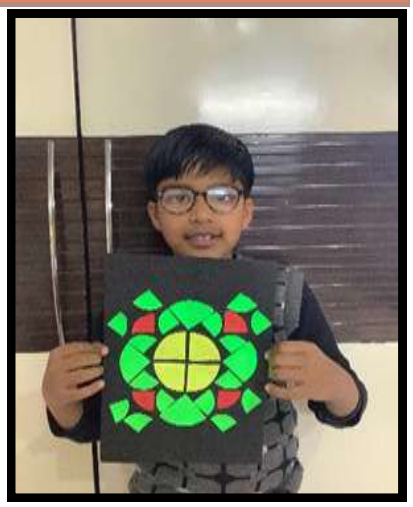




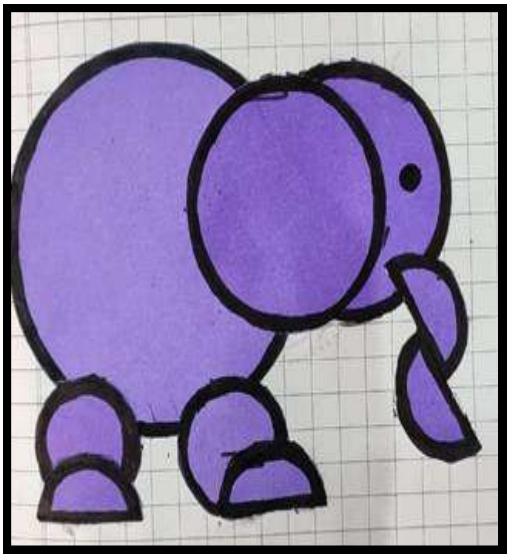
PRESENTING CONCEPTS OF MONEY USING MATHEMATICAL CONCEPTS





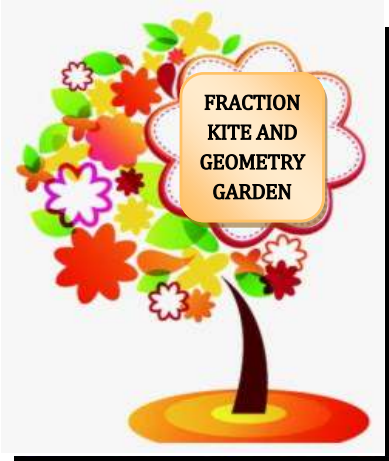


MAKING A COLOURFUL FISH USING SHAPES USING ORIGAMI



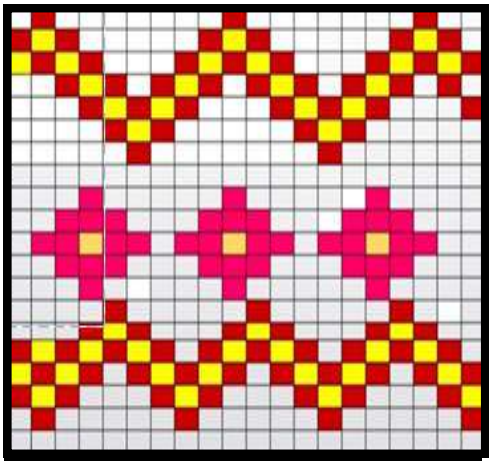
SHAPES OF ANIMALS USING CIRCLES ONLY

INTEGRATION OF MATH & ARTS-PRIMARY DEPARTMENT

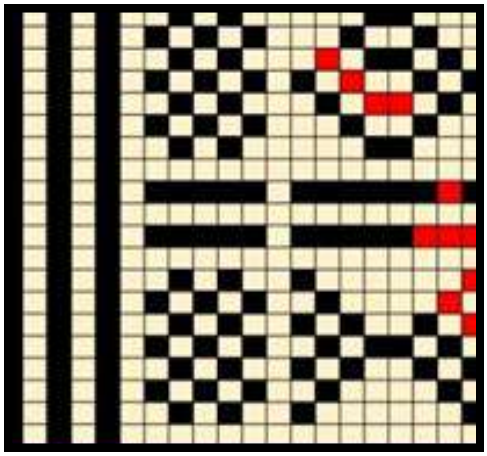


SCENARY ON MATHS IN EVERYDAY LIFE

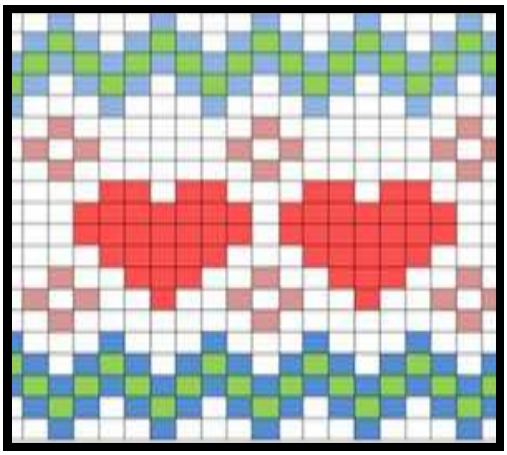
MAKING COLOURFUL BAGS BASED ON MATHEMATICAL CONCEPTS WITH SIKKIM ART



AREA OF THE FILLED BOXES: 158 X 1 Sq.



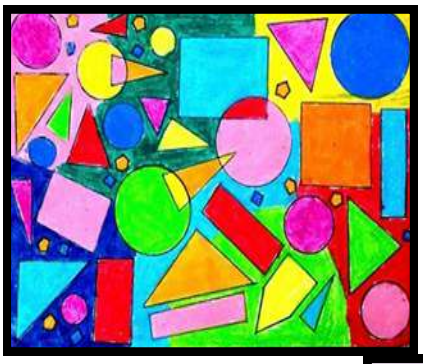
AREA OF SQUARE: 20 X 20 =400 Sq. UNIT AREA

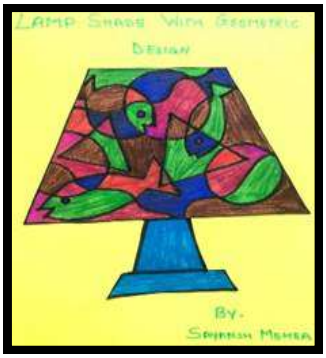


AREA OF SQUARE: 20 X 20 =400 Sq. UNIT AREA OF MOTIF: 198 SQ. UNIT

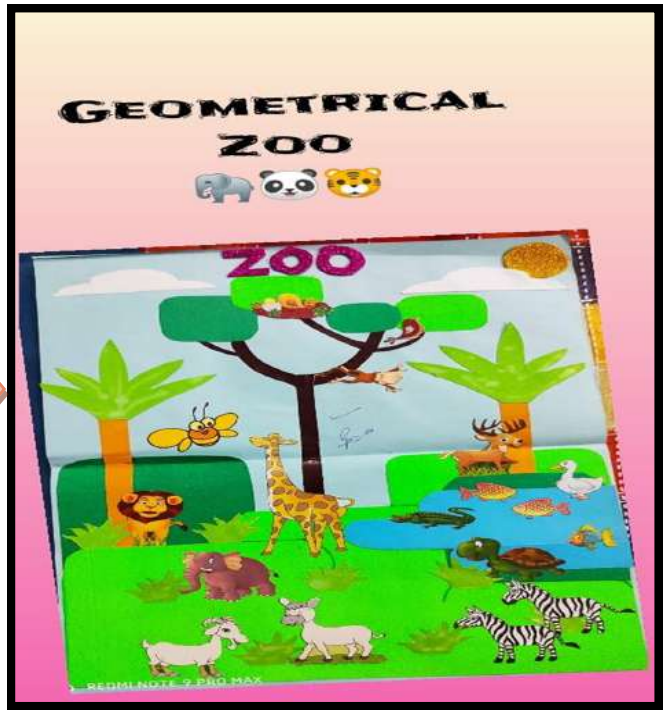
CALCULATING AREA BASED ON LEPCHA SHAWL DESIGN OF SIKKIM

INTEGRATION OF MATH & ARTS-PRIMARY DEPARMENT



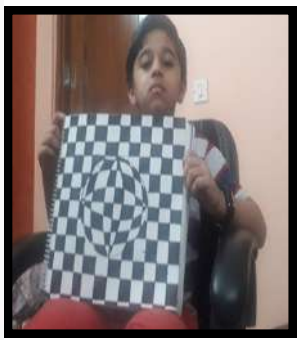


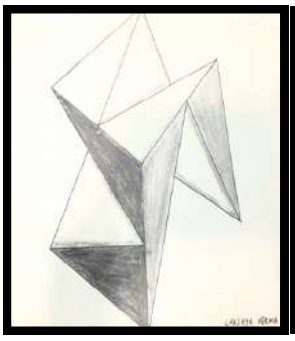
ABSTRACT ART DESIGNS BASED ON 2 D AND 3 D MATHEMATICAL SHAPES



TANGRAMS AND GEOMETRICAL ZOO

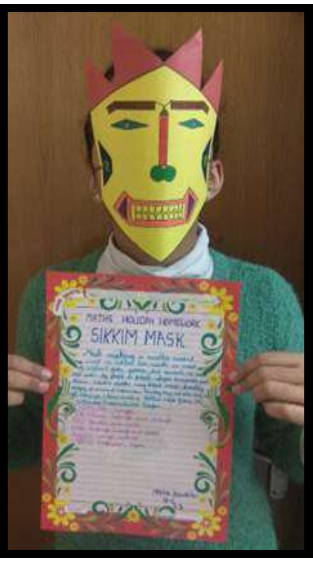
INTEGRATION OF MATH & ARTS-PRIMARY DEPARTMENT

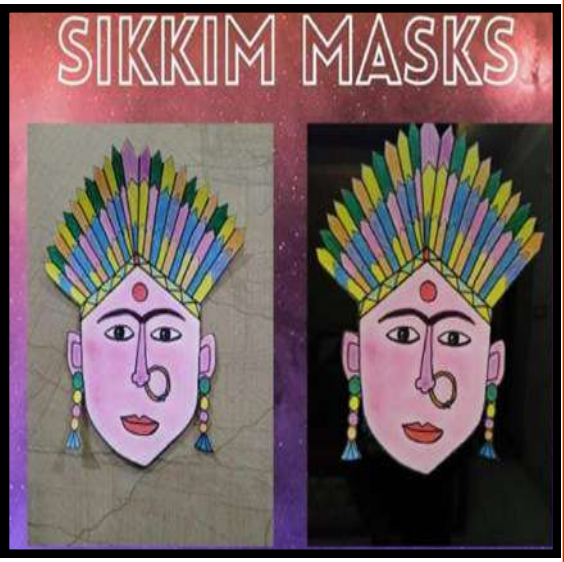




CREATING OPTICAL ILLUSIONS USING VARIOUS FORMS OF MATHEMATICAL PATTERNS

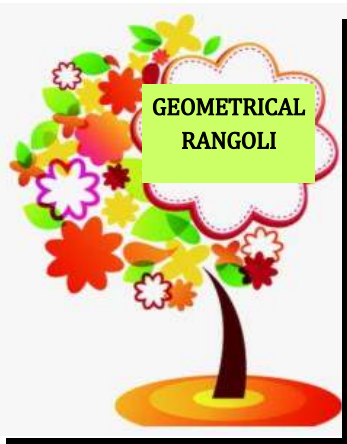
INTEGRATION OF MATH & ARTS-MIDDLE DEPARTMENT

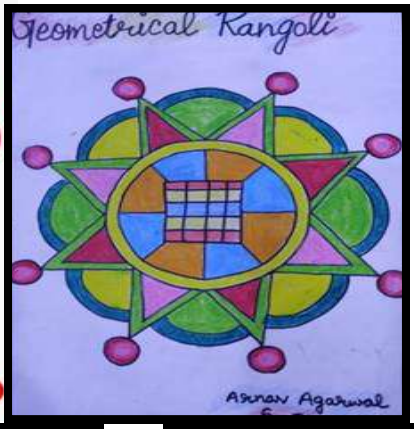


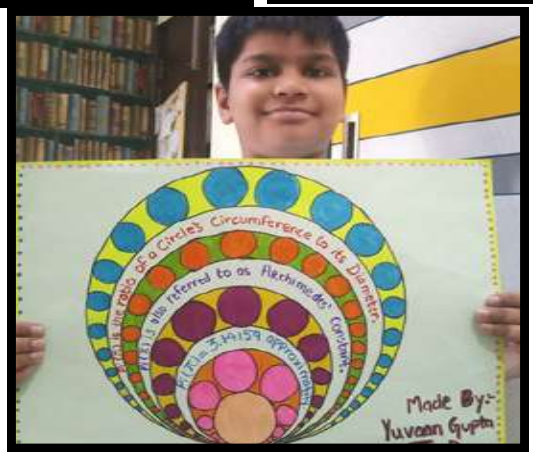


PRESENTATION OF VIBRANT MASKS WORN BY PEOPLE OF SIKKIM DURING FESTIVALS AND CEREMONIES

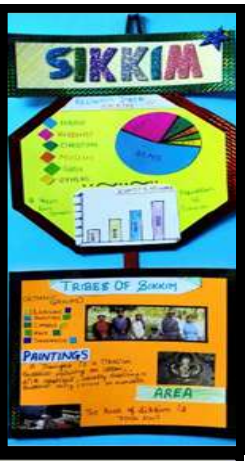
INTEGRATION OF MATH & ARTS–MIDDLE DEPARTMENT





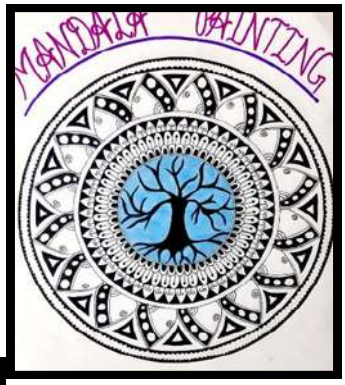


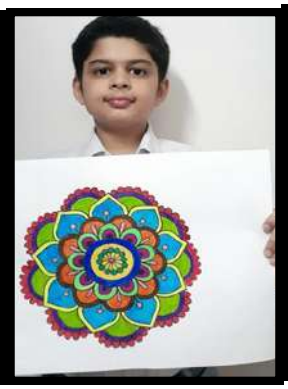
RANGOLI DESIGNS USING MATHEMATICAL SHAPES AND PATTERNS

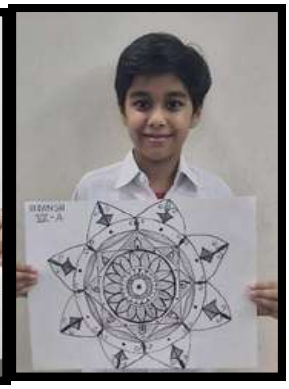


WALL HANGINGS USING MATHEMATICAL SHAPES AND DEPICTING VARIOUS ASPECTS, POPULATION, CULTURE, RELIGION ETC.

INTEGRATION OF MATH & ARTS-MIDDLE DEPARTMENT



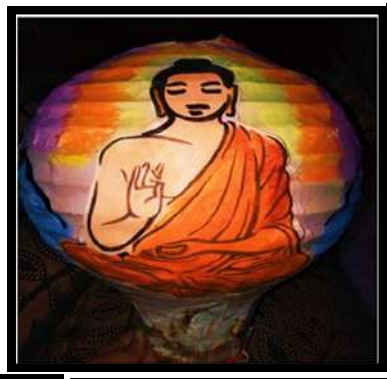


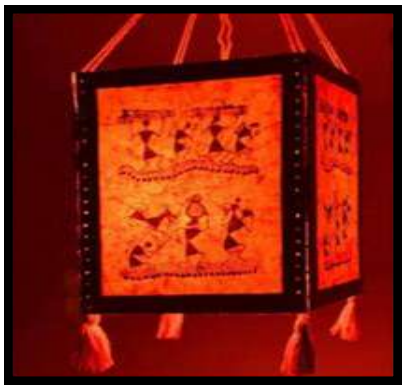


DEPICTION OF MANDALA ART IN MATHS

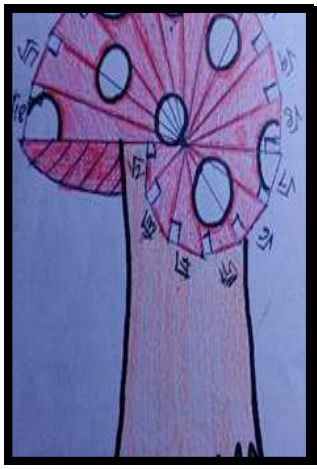
A CREATIVE 3 D PRSENTATION OF CULTURAL DIVERSITY OF SIKKIM ON A POLYHEDRON

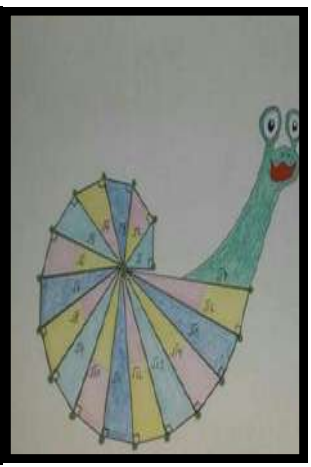
INTEGRATION OF MATH & ARTS–SECONDARY DEPARTMENT





MAKING LAMPSHADES DEPICTING MOTIFS OF SIKKIM ART BASES ON DESIGNS AND PATTERNS FORMED OUT OF MATHEMATICAL SHAPES





SQUARE ROOT SPIRAL

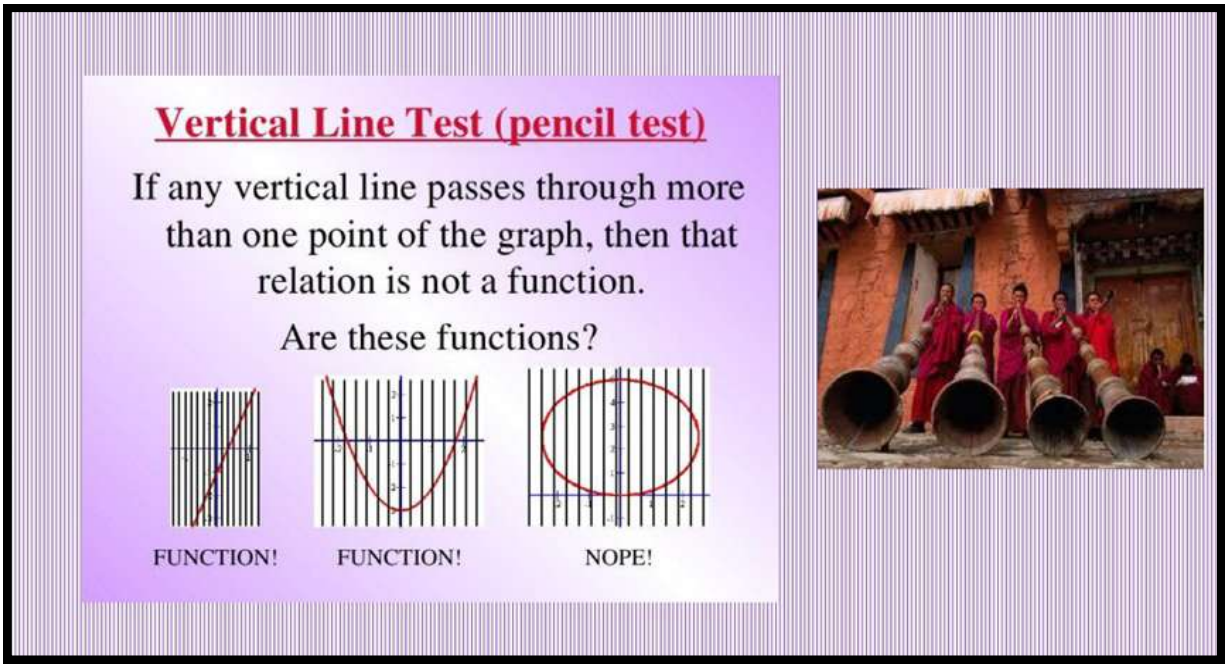
INTEGRATION OF MATH & ARTS–SECONDARY DEPARTMENT

CREATIVE PROJECTION OF ARITHMETIC PROGRESSION THROUGH ART

THANGKA PAITINGS USING MATHEMATICAL CONCEPTS THROUGH ART

WARLI ART-USE OF GEOMETRICAL FIGURES SUCH AS SIMILAR TRIANGLES, CIRCLES, DOTS AND CROOKED LINES TO REPRESENT HUMAN FIGURES, ANIMAL FIGURES, CROPS ETC.

INTEGRATION OF MATH & ARTS-SENIOR SECONDARY DEPARTMENT

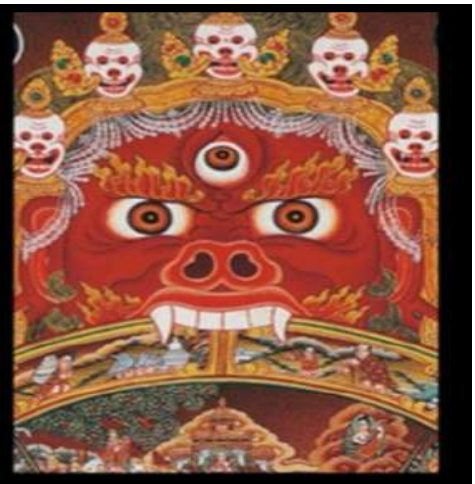


MAPPING MATHEMATICAL CONCEPTS WITH SIKKIM ART AND CULTURE-MUSICAL HORNS ARE MAPPED TO THE MATHEMATICAL CONCEPT 'FUNCTIONS'

CONIC SECTIONS-CIRCLES, ELIPSE, PARABOLA, HYPERBOLA IN ART AND ARCHITECTURE OF SIKKIM

INTEGRATION OF MATH & ARTS-SENIOR SECONDARY DEPARTMENT

Mathematics plays a key role in determining proportion, symmetry, shape and patterns, and is therefore an integral part of visual art. Mathematics can be used to explain and describe works of art and architecture. The use of lines and the creation of planes or three dimensions in a two-dimensional painting can be achieved through the use of mathematical principles. Artist M.C. Escher created and manipulated the illusion of planes and structures that were actually mathematically impossible, but which appeared plausible. Many of the canons of traditional art are based on mathematical principles, such as the creation of perspective and patterning, which creates ornamental effects. The composition of the Thangka is very complex and elaborate, and often incorporates the central figure - normally a deity - surrounded by many smaller figures, in a symmetrical design.



INTEGRATION OF STRAIGHT LINES AND SYMMETRY WITH THANGKA PAINTINGS

INTEGRATION WITH SIKKIM ART

The painting given is better known as Buddhist Art in Sikkim. The painting appears to be too vibrant but it is actually painted by a combination of only five acrylic colours.

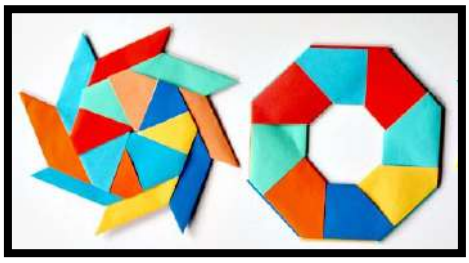
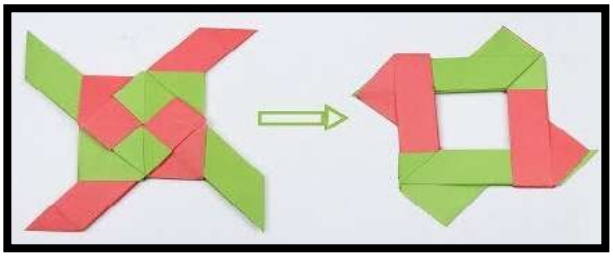
Generally, colours taken are the basic shades and then different colours are chosen to mix and obtain new colours. This is the basic of combination. Some colours are taken at random where their order is immaterial and new colours obtained from them are used to beautify the painting.

PERMUTATIONS AND COMBINATIONS IN

DIY ACTIVITY

DIY MATH ART ACTIVITY

Making Beautiful Origami Ninja Stars (Paper Transforming Ninja Star, 16-Point Ninja Star etc)

This is a creative Math Art n Craft activity. You will love these origami transforming paper stars. This activity combines math, art and paper engineering.



It is a modular origami model which means that you can make the transforming ninja star by interlocking the units together.The 16 pointed ninja star-a Classic Origami Model is also called the "Spiky Star". Like the Transforming Ninja Star, the 16-Pointed Ninja Star is also a type of modular origami model. This means that it is made up of smaller modular units which are all identical. Once you make 16 of them, you can then interlock or fit the pieces into one another in order to get the Ninja Star.

See these videos to make beautiful and easy origami Ninja Stars.

https://youtu.be/PRRMGdo41wk

https://youtu.be/p8QSMzgnLf0