

DATE 27.05.2014
ŞCOALA GIMNAZIALA "LIVIU REBREANU" MIOVENI, ARGES, ROMANIA LEVEL: $7^{\text {th }}$
TEACHERS: MARIANA RADULESCU \& DANIELA BERECHET CURRICULUM: MATH \& SCIENCE
SUBJECT: MATHEMATICS
TITLE: FUNNY and APPLIED MATHEMATICS
TYPE: training skills and abilities
CONTENTS: Activities with synthetic materials - paper

- combination of techniques used to obtain useful products


## OBJECTIVES:

1.2: to combine various techniques and tools to achieve an intended purpose;
2.1: to create useful products for everyday life after a schedule combining techniques learned.
$\mathbf{O O}_{1}$ : use right and proper working tools;
$\mathbf{O O}_{2}$ : to verbalize actions that define stages of product;
$\mathbf{O O}_{3}$ : to assemble and glue correctly to get the final product;
$\mathbf{O O}_{4}$ : to assess the quality of finished products based on simple criteria data in relation to the product model.
TIMING: 45 min .

## TEACHING STRATEGIES:

a) METHODS and PROCEDURES: explanation, conversation, instruction, demonstration, exercises, practical work, brainstorming;
b) MEANS OF EDUCATION:

- informative demonstration: the models proposed, the working stages ppt presentation, video projector,
- the practice and skills training: White and colored cardboard, scissors, colors, glue FORMS OF ORGANIZATION: workshop, frontal, individual and group activity; RESOURCES: WorkSheets, Puzzles, Crosswords, WordSearch, Maze, Origami


## FUNNY MATHEMATICS - WORKSHOP

## 1. Geometry and ORIGAMI

2. Maths Games (Puzzle, WordSearch, Quizzes, Crossword, Grid, Graph, etc...)
3. Quilling and Maths
4. Polyhedrons - build and calculate

I explain to students that in this time, they made from white paper and various colorful paintings, combining geometric objects and learning techniques or learning new techniques; students will solve some fun themes using crossword, word search, puzzle, maze, Origami, Quilling; at the end of the lesson students will appreciate the quality of work and product model and comparison with those of other colleagues.

## * Description:

Each child will have the necessary material.

- Presentation of the product model and its exposure to the class to be easily viewed
- The intuition stages work by students, the additions made necessary by teachers:
$\checkmark$ I show students' work technique, work phases are displayed as slide
$\checkmark$ I explain to students that the technique is working closely with compliance work stages.
If the steps are followed step by step, the final product will be very successful.
I will list the rules to be followed in carrying out the work: proper and careful use of tools, pleasant mix of materials and colors, the aesthetics of the final products, the timing of work.


## Evaluation:

- Perform an exhibition of student work.
- Students appreciate the appearance of works by colleagues.
- It evaluates and seeks usefulness own product.
- General and individual evaluation
- Students are rewarded with diplomas.
- Gathering materials and clean workplace.


## References:

## 1. Geometry and ORIGAMI

http://creativplace.blogspot.ro/2012/06/matematica-si-origami.html
http://www.langorigami.com/science/math/math.php
http://www.mathigon.org/origami/
http://www.paperfolding.com/math/
http://www.youtube.com/watch?v=8tCkTY94dJE
http://en.origami-club.com/unit/index.html

2. Maths Games (Puzzle, Word Search, Quizzes, Crossword, Grid, Graph, etc...)<br>http://www.teachers-direct.co.uk/resources/wordsearches/subjects/Mathematics.aspx<br>http://math4children.com/Grade6/worksheets/index.html<br>http://school.discoveryeducation.com/index.html<br>http://www.discoveryeducation.com/free-puzzlemaker/index.cfm?campaign=footer_teacher_puzzle

## 3. Quilling and Maths

http://miragami-ro.blogspot.ro/p/quilling-arta-rularii-hartiei.html
http://quilling-mv.blogspot.ro/2011_11_01_archive.html

## 4. Polyhedrons - build and calculate .... (tetrahedron; cube, rectangular prism)

WORD SEARCH - SCHOOL

Try to find in this square the next words: BUS; CLASS; CRAYON; FRIEND; FUN; LEARN; LUNCH; MATH; PAPER; PENCIL; PLAY; READ; SING; TEACHER; TEST; THINK; WRITE

| $\mathbf{F}$ | $\mathbf{Q}$ | $\mathbf{R}$ | $\mathbf{W}$ | $\mathbf{K}$ | $\mathbf{F}$ | $\mathbf{V}$ | $\mathbf{B}$ | $\mathbf{Q}$ | $\mathbf{W}$ | $\mathbf{I}$ | $\mathbf{D}$ | $\mathbf{H}$ | $\mathbf{B}$ | $\mathbf{E}$ |
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AREA and VOLUME WORDSEARCH

| $\mathbf{E}$ | $\mathbf{T}$ | $\mathbf{A}$ | $\mathbf{L}$ | $\mathbf{U}$ | $\mathbf{C}$ | $\mathbf{L}$ | $\mathbf{A}$ | $\mathbf{C}$ | $\mathbf{V}$ | $\mathbf{S}$ | $\mathbf{S}$ | $\mathbf{M}$ | $\mathbf{S}$ | $\mathbf{B}$ |
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| $\mathbf{K}$ | $\mathbf{L}$ | $\mathbf{Q}$ | $\mathbf{J}$ | $\mathbf{S}$ | $\mathbf{P}$ | $\mathbf{A}$ | $\mathbf{U}$ | $\mathbf{W}$ | $\mathbf{T}$ | $\mathbf{I}$ | $\mathbf{Q}$ | $\mathbf{U}$ | $\mathbf{E}$ | $\mathbf{R}$ |
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Words to find in this table:

AREA
CUBOID
HEIGHT
RECTANGLE
VERTICES

CALCULATE
EDGES
LENGHT
SQUARE
VOLUME

CUBE
FACES
NET
SURFACEAREA
WIDTH

| $\mathbf{E}$ | $\mathbf{D}$ | $\mathbf{N}$ | $\mathbf{O}$ | $\mathbf{G}$ | $\mathbf{A}$ | $\mathbf{T}$ | $\mathbf{P}$ | $\mathbf{E}$ | $\mathbf{H}$ | $\mathbf{L}$ | $\mathbf{R}$ | $\mathbf{P}$ | $\mathbf{T}$ | $\mathbf{H}$ |
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| $\mathbf{G}$ | $\mathbf{N}$ | $\mathbf{S}$ | $\mathbf{N}$ | $\mathbf{O}$ | $\mathbf{G}$ | $\mathbf{O}$ | $\mathbf{T}$ | $\mathbf{C}$ | $\mathbf{O}$ | $\mathbf{R}$ | $\mathbf{R}$ | $\mathbf{O}$ | $\mathbf{A}$ | $\mathbf{X}$ |
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Words to find in this table:

CIRCLE
FLATSHAPE
ISOSCELES
PARALLELOGRAM
QUADRILATERAL
SCALENE
TRAPEZIUM

TWODIMENSIONAL
HEPTAGON
KITE
PENTAGON
RECTANGLE TRIANGLE

EQUILATERAL
HEXAGON
OCTOGON
POLYGON
RHOMBUS
SQUARE

SUMMER TIME - WORD SEARCH

| $\mathbf{P}$ | $\mathbf{O}$ | $\mathbf{N}$ | $\mathbf{L}$ | $\mathbf{X}$ | $\mathbf{P}$ | $\mathbf{D}$ | $\mathbf{S}$ | $\mathbf{O}$ | $\mathbf{S}$ | $\mathbf{B}$ | $\mathbf{I}$ | $\mathbf{Y}$ | $\mathbf{T}$ | $\mathbf{M}$ |
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| $\mathbf{L}$ | $\mathbf{Y}$ | $\mathbf{A}$ | $\mathbf{L}$ | $\mathbf{P}$ | $\mathbf{R}$ | $\mathbf{H}$ | $\mathbf{T}$ | $\mathbf{S}$ | $\mathbf{U}$ | $\mathbf{G}$ | $\mathbf{U}$ | $\mathbf{A}$ | $\mathbf{F}$ | $\mathbf{E}$ |
| $\mathbf{Y}$ | $\mathbf{Y}$ | $\mathbf{T}$ | $\mathbf{C}$ | $\mathbf{U}$ | $\mathbf{A}$ | $\mathbf{Z}$ | $\mathbf{M}$ | $\mathbf{B}$ | $\mathbf{L}$ | $\mathbf{M}$ | $\mathbf{U}$ | $\mathbf{W}$ | $\mathbf{Y}$ | $\mathbf{B}$ |
| $\mathbf{R}$ | $\mathbf{O}$ | $\mathbf{P}$ | $\mathbf{P}$ | $\mathbf{S}$ | $\mathbf{W}$ | $\mathbf{P}$ | $\mathbf{C}$ | $\mathbf{N}$ | $\mathbf{T}$ | $\mathbf{B}$ | $\mathbf{A}$ | $\mathbf{L}$ | $\mathbf{L}$ | $\mathbf{C}$ |
| $\mathbf{H}$ | $\mathbf{B}$ | $\mathbf{O}$ | $\mathbf{I}$ | $\mathbf{V}$ | $\mathbf{V}$ | $\mathbf{O}$ | $\mathbf{K}$ | $\mathbf{K}$ | $\mathbf{V}$ | $\mathbf{M}$ | $\mathbf{E}$ | $\mathbf{Y}$ | $\mathbf{C}$ | $\mathbf{F}$ |

Find these words in the puzzle. Words are hidden $\rightarrow$ and $\downarrow$.

| AUGUST | BALL | BEACH |
| :--- | :--- | :--- |
| CAMP | FRIEND | HOT |
| ICECREAM | JULY | KIDS |
| OUTSIDE | PLAY | POOL |
| SUNNY | WARM |  |



## N <br> 

## Across

5. A four-sided polygon
6. The distance around a circle
7. A ten-sided polygon
8. Two lines in a plane that never intersect are $\qquad$ lines.
9. An eight-sided polygon
10. The distance around a figure
11. A straight path with no endpoints; it goes on forever in both directions
12. A figure formed by two rays with the same endpoint
13. An angle that measures less than 90 degrees
14. An angle that measures 90 degrees
15. A closed plane figure with any number of sides
16. Figures that have the same size and shape are $\qquad$ _.
17. A line that divides a figure into two matching parts is a line of $\qquad$ .
18. A flat surface that goes on and on in all directions
19. A parallelogram with four right angles
20. The common endpoint of two rays

## Down

1. A line that divides an angle in half
2. A closed plane figure having all points an equal distance from the center
3. A five-sided polygon
4. A part of a line that has one endpoint and goes on forever in one direction
5. Lines that share a common point are ___ lines.
6. A quadrilateral in which the opposite sides are parallel and congruent
7. Figures that have the same shape but not necessarily the same size are said to be $\qquad$ .
8. A six-sided polygon
9. Lines that intersect and form right angles are $\qquad$ lines.
10. A rectangle with four equal sides
11. A subset of a line which contains two endpoints
12. The number of square units needed to cover a region or figure
13. An angle that measures more than 90 degrees
14. A three-sided polygon


## Down

1. a model or drawing based on a ratio
2. a graph that uses bars to display data
3. the lowest value in a set of numbers through the highest value in the set
4. the use of rounding to determine a reasonable answer
5. the number found most often
6. any symbol that could represent a number
7. average
8. the horizontal and vertical number lines used in a graph

## CROSSWORD - ADDITION AND SUBSTRACTION

| Across |
| :--- |
| $2.11-3$ |
| $4.7-3$ |
| $5.12-7$ |
| $8.9-7$ |
| $10.9+9$ |
| $13.5+8$ |
| $14.11-2$ |
| $15.9+8$ |
| $16.7+7$ |
| $17.8+8$ |



20 of 20 words were placed into the puzzle. Created by Puzzlemaker at DiscoveryEducation.com



## Across

4. A mass of material with a long tail that travels around the Sun
5. The movement of the Earth around the Sun
6. The largest planet in our solar system
7. The planet closest to the Sun
8. An instrument that makes distant objects look larger and closer
9. Small rocky objects that revolve around the sun, mostly in the area between Mars and Jupiter
10. The planet with rings
11. The distance light travels in one year
12. A scientist who studies stars and planets

## Down

1. Number of stars in the Big Dipper
2. Another name for the North Star
3. The planet closest to Earth
4. A group of stars with a definite pattern or arrangement
5. A star much larger than our sun
6. A star's brightness is called its $\qquad$ .
7. The "Red Planet"
8. The spinning of the Earth on its axis
9. A large group of stars, gas and dust
10. A very small star
11. The name of our galaxy

20 of 20 words were placed into the puzzle. Created by Puzzlemaker at DiscoveryEducation.com




Write the ordered pair for each of the objects listed.
example: television $(7,3)$
a. helicopter $\qquad$ b. shoes $\qquad$ c. pepper
$\qquad$
d. wizard's hat $\qquad$ e. fish $\qquad$ f. golf cart $\qquad$
Tell which object is located at each point.
e. $(3,4)$
f. $(2,6)$ $\qquad$ g. $(1,4)$


|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
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| 9 |  |  |  |  |  |  |  | $\checkmark$ |  |  |  |  |  |  |  |  |  |  |  |
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| f |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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## GRAPH

Below is a graph showing the location of places in (X, Y) coordinates. Look at the graph and answer the following questions.


1) $(1,6)$
2) $(3,4)$
3) $(6,6)$
4) $(9,4)$


5) Store

Which place is this?
$\qquad$ 5) Cinema
6) Church
7) Market
$\qquad$
$\qquad$

Write the number pair $(X, Y)$
$\qquad$

## 





## a



## 



## BUILD and CALCULATE ....

## AREA ad VOLUME!

1. REGULAR TETRAHEDRON
$\mathrm{L}=12 \mathrm{~cm}$
$A_{l}=3 \frac{L^{2} \sqrt{3}}{4} ; A_{t}=4 \frac{L^{2} \sqrt{3}}{4} ; V=\frac{A_{B} \square H}{3} ; H=\frac{L \sqrt{6}}{3}$
2. CUBE
$\mathrm{L}=10 \mathrm{~cm}$

$$
A_{l}=4 L^{2} ; A_{t}=6 L^{2} ; \mathrm{V}=\mathrm{L}^{3}
$$

## 3. REGULAR PRISMA QUADRILATERAL

$\mathrm{L}=8 \mathrm{~m}$
$\mathrm{H}=10 \mathrm{~cm}$
$A_{l}=4 L \square H ; A_{t}=A_{l}+2 L^{2} ; \mathrm{V}=\mathrm{L}^{2} \cdot \mathrm{H}$
4. RECTANGULAR PARALLELEPIPED
$\mathrm{L}=8 \mathrm{~cm}$
$\mathrm{L}=\mathbf{6 c m}$
$\mathrm{H}=10 \mathrm{~cm}$
$A_{l}=2(L+l) \square H ; A_{t}=A_{l}+2 L \square ; \mathrm{V}=\mathrm{L} \cdot 1 \cdot \mathrm{H}$

## a

$\star 6$ pieces units are used


Finished

*Copyright:Mitsunobu sonobe Diagram:Fumiaki Shingu

Cube(Sonobe type unit)
$\star 12$ pieces units are used

(1) Fold in half to make a crease and fold little back

(3) 12 pieces units are prepared
(2) unit for polyhedron

*Copyright:Mitsunobu sonobe
DiagramFumiaki Shingu
Trisoctahedron
(Sonobe type unit)


Fold in the dotted lines to make creases and unfold


Fold in the dotted lines to meet the center *Traditional Diagram:Fumiaki Shingu



4

Fold in the creases creases



A
(1) Fold in half twice to make crease

.

.

$\sqrt{12}$
$\frac{1}{1}$
4
$\frac{1}{1}$
$\frac{1}{\square}$
$\frac{1}{\square}$
$\frac{1}{\square}$

4 Turn over
(1) Fold in the dotted line

3
Fold in the dotted I ine

(2) Fold in the dotted line

(5) Finished, but one more part to go


Fold in the dotted line
©
 Fold in the dotted line

(4) Turn over
A Sunflower

$\qquad$

(1) Fold in half


