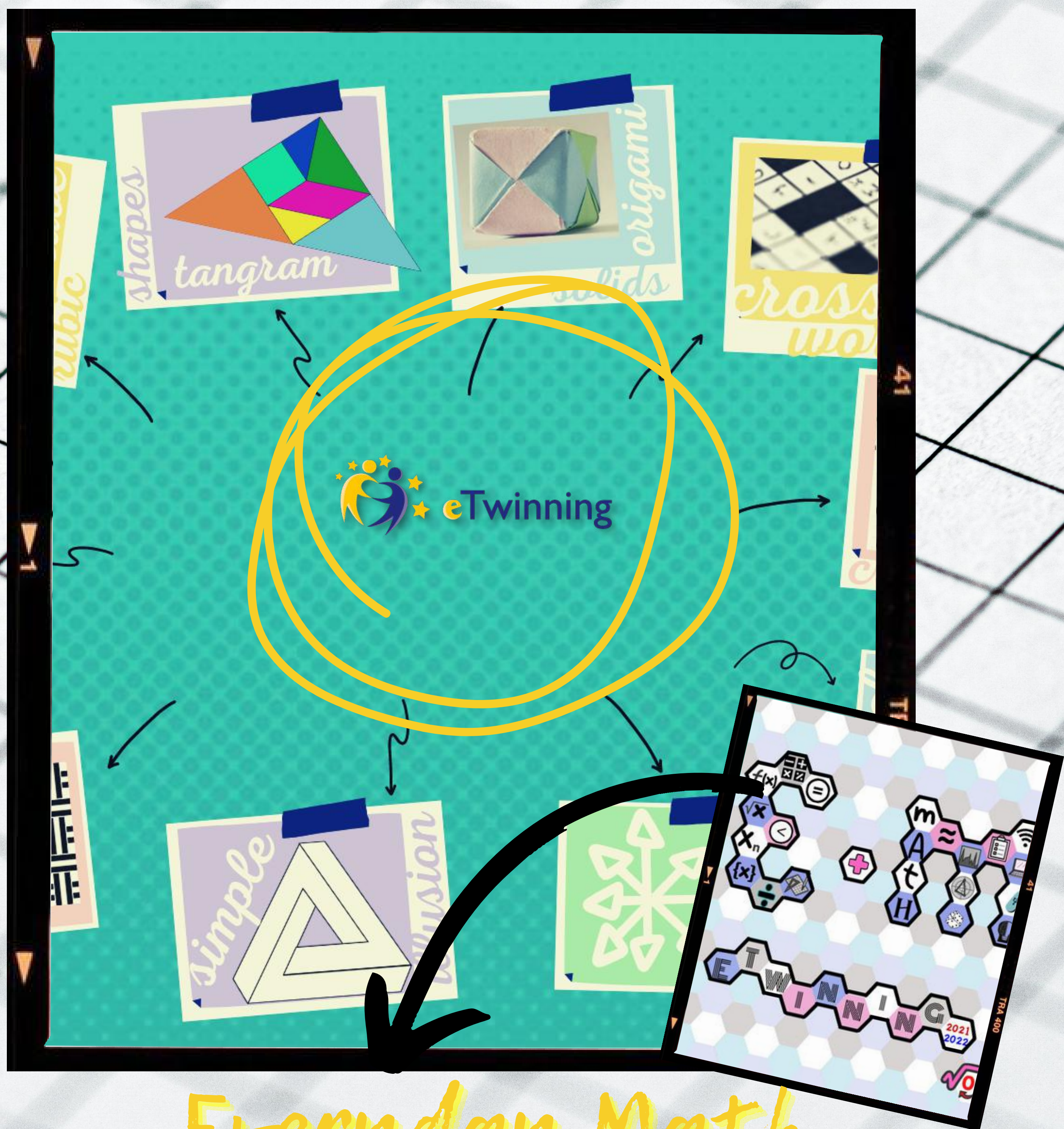


Play with us,
Math is fun!
e-book



Everyday Math

ETWINNING PROJECT 2021/2022

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Chapter 0

Introduction

of the e-book
"Play with us, Math is fun!"

A few words to start

Dear reader,

our e-book is about fun and entertaining math. In 10 chapters we will show you how to happily discover geometric shapes or solids, how to combine painting, illusions and patterns with mathematics. And you will also find mathematics when solving crosswords or a popular Rubik's cube.

E-book "**Play with us, math is fun!**" was created as a result of the common work of students in the December eTwinning activity of the Everyday Math project, which took place in the school year 2021/2022.

All the information used in the e-book was prepared by almost 150 students in ten international work groups. Each work group worked in the TwinSpace Discussion Forum, where members communicated, exchanged information, created the content of individual chapters and consulted the graphical representation of the information collected and created in this e-book.

Each chapter includes history, solution principles, examples and interesting facts. In most chapters, students also prepared fun tasks for independent solution.

Dear reader,

we believe that the e-book will be your guide to fun math, and with it you will get to know the happier side of the field, which seems to many people to be a language difficult to understand full of mysterious characters and numbers.

HAVE FUN!

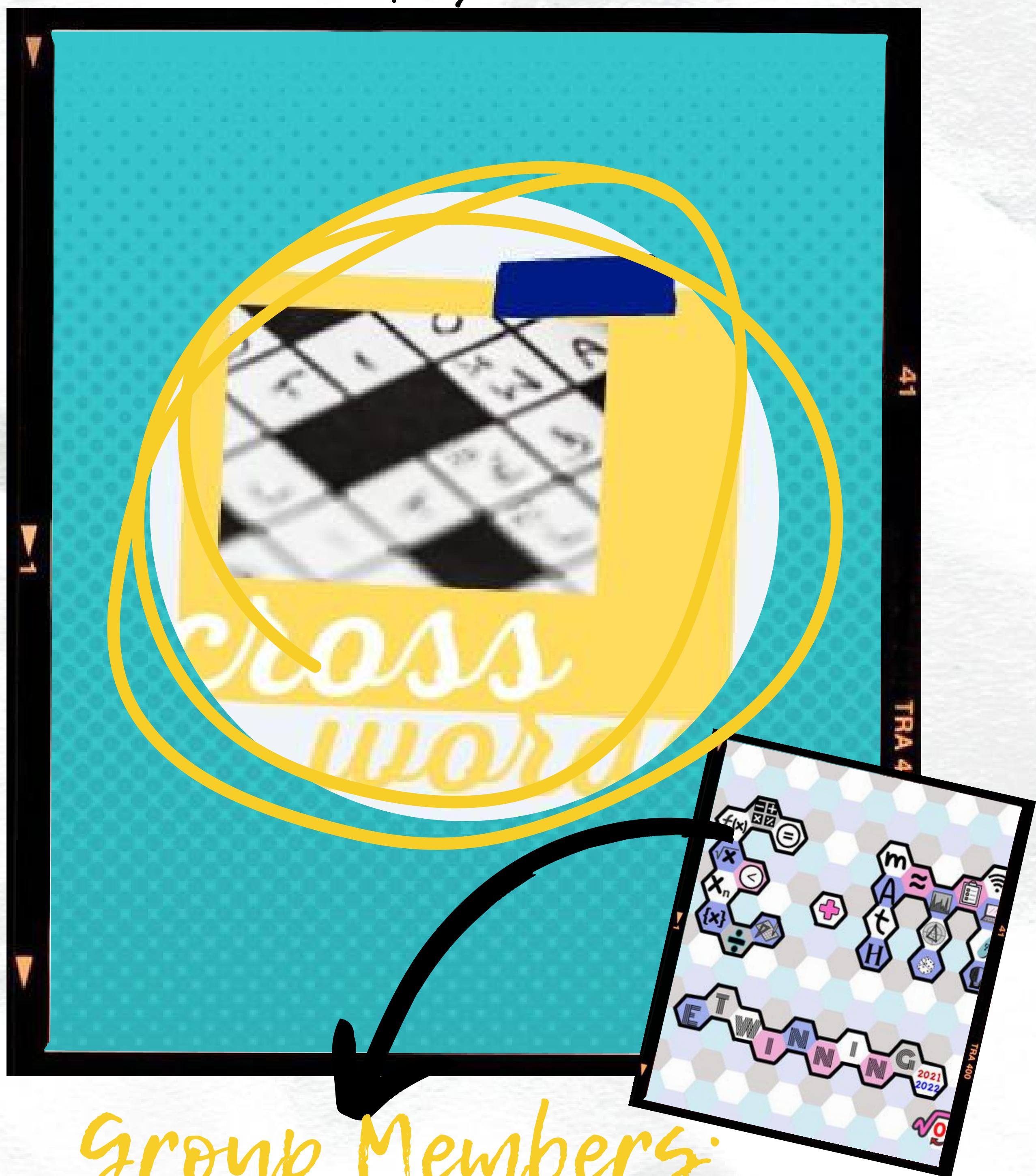
Everyday Math

ETWINNING PROJECT 2021/2022

Chapter 1

Crosswords

of the e-book
"Play with us, Math is fun!"



Group Members:

tr Asude/Kırıkkale , tr Hayriye/Kırıkkale, tr Sudenaz/Kırıkkale, sk. natty, sk.val,
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What is a Crossword?

A crossword is a word puzzle that usually takes the form of a square or a rectangular grid of white- and black-shaded squares. The game's goal is to fill the white squares with letters, forming words or phrases, by solving clues, which lead to the answers. In languages that are written left-to-right, the answer words and phrases are placed in the grid from left to right ("across") and from top to bottom ("down"). The shaded squares are used to separate the words or phrases.



tr Sudenaz/ Kırıkkale

Crossword History

The crossword in its current form was invented by **Artur Wynne**, editor of the New York World newspaper, where the first crossword puzzle was published in December 1913 under the name "**Word-Cross**".

The first book of crossword puzzles was published by **Simon & Schuster** in 1924, after a suggestion from co-founder Richard Simon's aunt. The publisher was initially skeptical that the book would succeed, and only printed a small run at first. The book was promoted with an included pencil, and "This odd-looking book with a pencil attached to it" was an instant hit, leading crossword puzzles to become a craze of 1924. To help promote its books, Simon & Schuster also founded the **Amateur Cross Word Puzzle League of America**, which began the process of developing standards for puzzle design.

FUN'S Word-Cross Puzzle.

FILL in the small squares with words which agree with the following definitions:

2-3. What bargain hunters enjoy.	10-18. The fibre of the gomuti palm.
4-5. A written acknowledgement.	6-22. What we all should be.
6-7. Such and nothing more.	4-26. A day dream.
10-11. A bird.	2-11. A talon.
14-15. Opposed to less.	19-28. A pigeon.
18-19. What this puzzle is.	F-7. Part of your head.
22-23. An animal of prey.	23-30. A river in Russia.
26-27. The close of a day.	1-32. To govern.
28-29. To elude.	33-34. An aromatic plant.
30-31. The plural of is.	N-8. A fist.
8-9. To cultivate.	24-31. To agree with.
16-17. What artists learn to do.	3-12. Part of a ship.
20-21. Fastened.	20-29. One.
24-25. Found on the seashore.	5-27. Exchanging.
	9-25. Sunk in mud.
	13-21. A boy.

Recreation of Arthur Wynne's original crossword puzzle from December 21, 1913



A 1925 Punch (British weekly magazine of humore and satire) cartoon about "**The Cross-Word Mania**". A man phones his doctor in the middle of the night, asking for "the name of a bodily disorder of seven letters, of which the second letter must be 'N'".

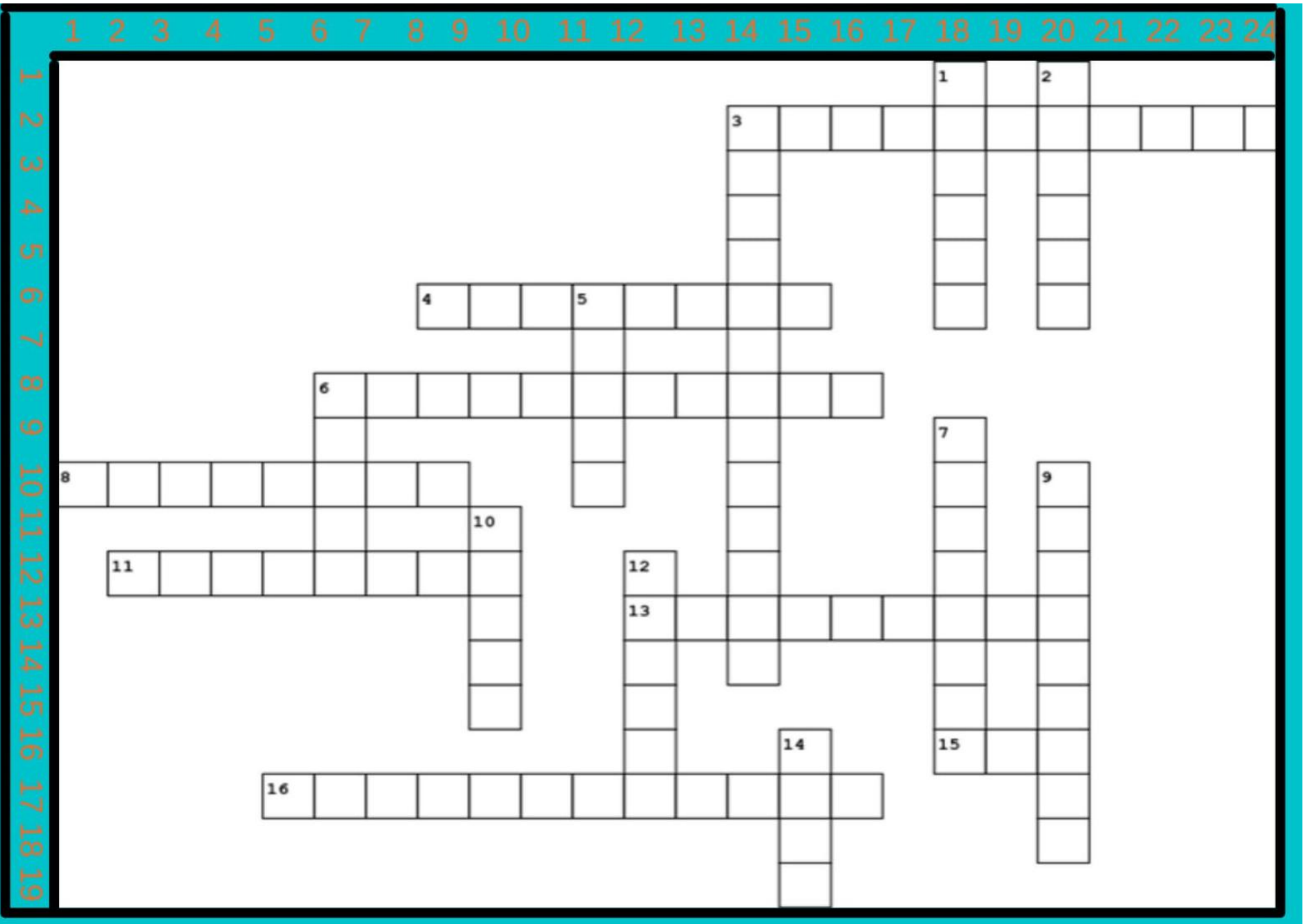
According to **Guinness World Records**, May 15, 2007, the most prolific crossword compiler is **Roger Squires** of Ironbridge, Shropshire, UK. On May 14, 2007, he published his **66,666th crossword**, equivalent to 2 million clues. He also holds the record for the longest word ever used in a published crossword—the 58-letter Welsh town **Llanfairpwllgwyngyllgogerychwyrndrobwlllantysiliogogogoch** clued as an anagram.

Source: [wikipedia.org](https://en.wikipedia.org/wiki/Roger_Squires)

Solve the our Crossword

We have prepared a crossword of math-related terms for you. A famous mathematical sentence is hidden inside the crossword. Solve the crossword first. Then decode the hidden sentence.

Note: 10.6 means the letter in column 10 and row 6.
Good Luck!



tr Hayriyel Kırıkkale & trAsudel Kırıkkale

DOWN

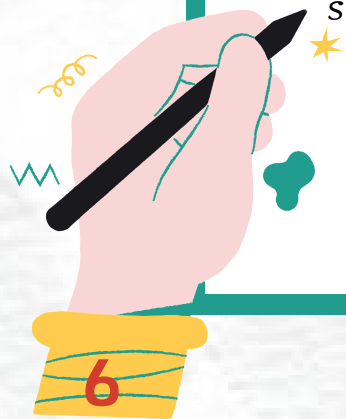
- 1. A planar formation whose all points are equidistant from the center.
- 2. What is the function that is a straight line and passes at the origin?
- 3. A quadrilateral whose opposite sides are parallel and have the same lenght.
- 5. Type of triangle with three angles less than 90 °.
- 6. Type of triangle that has one angle that measures 90 °.
- 7. What is the function that presents a horizontal line?
- 9. These are the rules in mathematics that accept variable numbers as inputs and generate an output number from them.
- 10. The combination of two rays whose starting points are the same.
- 12. By adding the angles we get 360 °. Each angle is 90°. What is it?
- 14. A body that has all sides the same.

ACROSS

- 3. The math subject about calculating the probability of an event occurring.
- 4. After summing up all the internal angles, we get 180°. What is it?
- 6. In the number system, it is simply a combination of rational and irrational numbers.
- 8. The sum of its internal angles is exactly 540 °.
- 11. Equality with at least one unknown.
- 13. What is the function that the U-shape have?
- 15. Even prime number.
- 16. What are the first three numbers in Pi?

HIDDEN SENTENCE

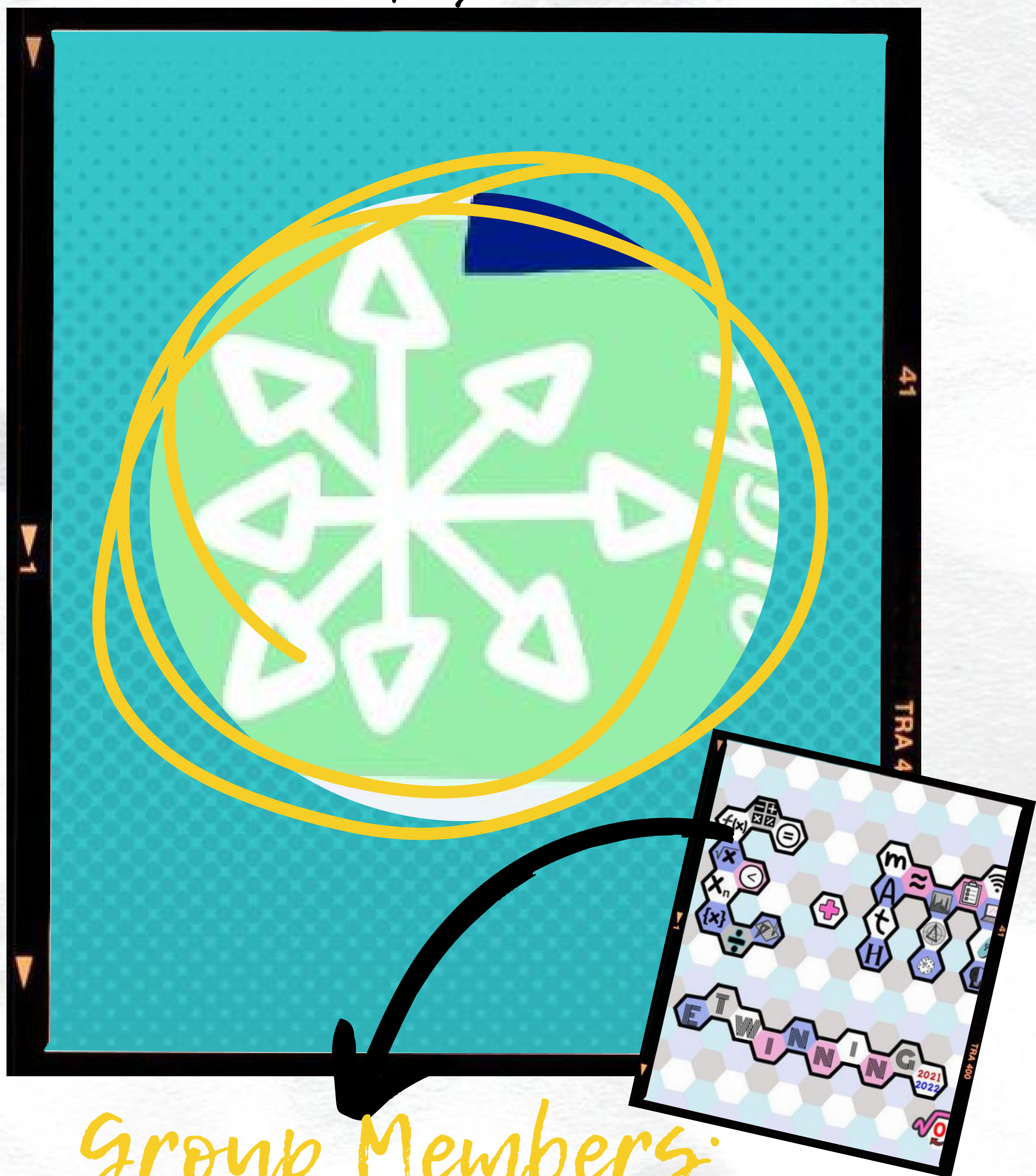
10.6/13.17 - 14.2/20.4/15.2/14.2/20.1/20.4 -
15.13/15.2/10.8/23.2 - 19.2/15.6/14.6/6.9/15.6/V/15.6-
12.8/11.6/23.2/6.11 - 10.6/16.2 - 20.4/8.8/17.2/24.2-
19.13/8.6- 6.9/18.12 - 15.2/12.6/9.14/24.2-
15.18/15.6/18.1/11.6/11.8/16.2/ 20.4- 23.2/6.11/7.8/24.2 -
15.13/15.2/10.8/23.2- 15.8/7.8/11.6/20.1/6.9/Z/2.10 -
6.11/15.2/19.16- 15.16/7.10/12.8/14.2/14.6/22.2/11.7/
11.6/8.6/15.6/15.13- 14.7/22.2/ 13.17/20.4 - 6.9/17.2



Chapter 2

Eight Directions

of the e-book
"Play with us, Math is fun!"



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sk.andreaa, sk. ivana, sk.domca, sk.helenka, sk.sima

Advisor teacher: Monika Poľanská, Slovakia

Eight-directions puzzle

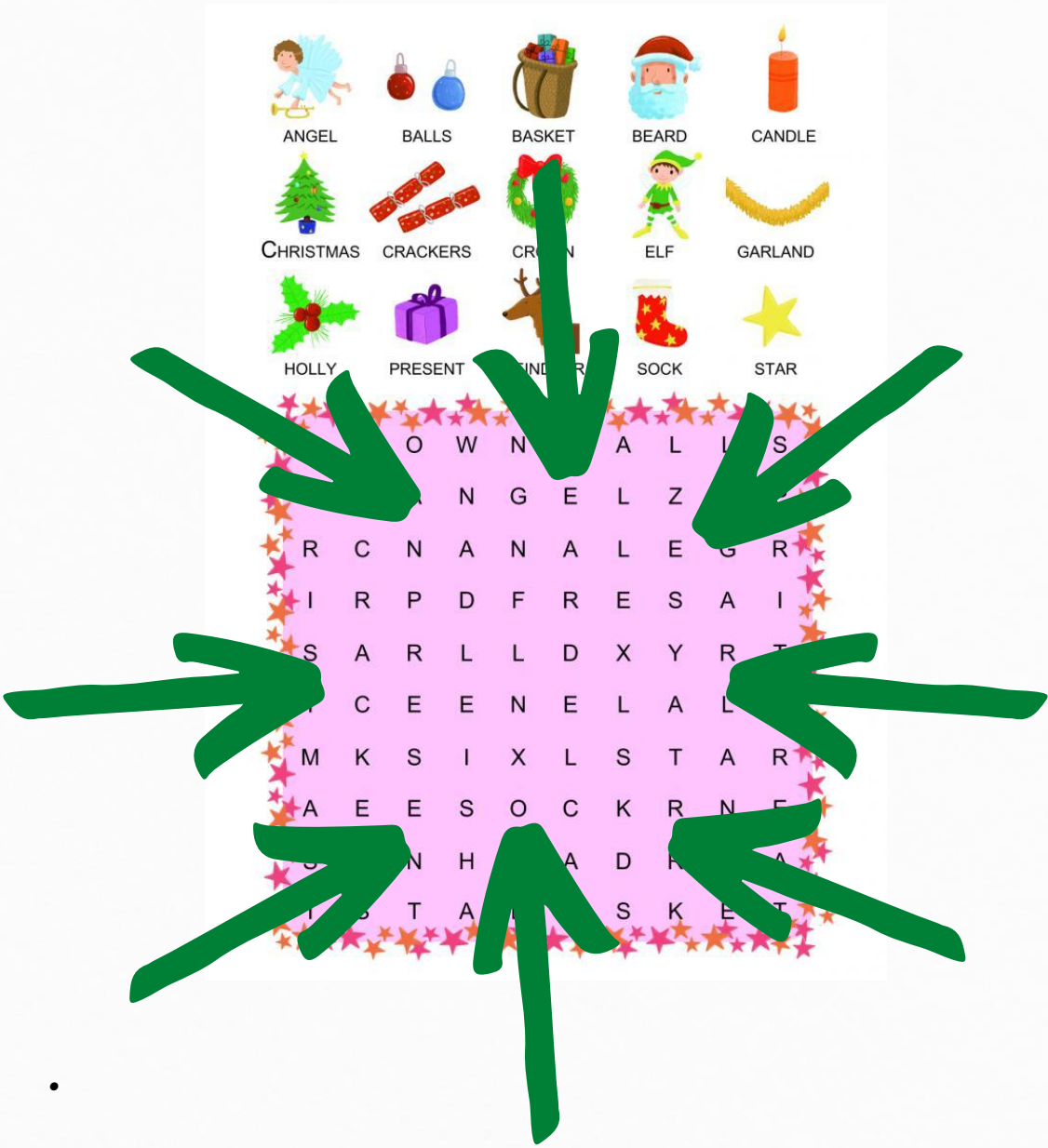
Eight direction indicator is a puzzle game, funny puzzle or word puzzle. It consists of the body of an eight-way (square, circle, triangle, etc...) and from the word list. In the body, eight indicators are randomly sorted at first glance side by side and in the lines by filling it all in. Words in the word list should be searched for and crossed out by the finder in the game box

The words EIGHT indicators can be throttled in eight directions:

left to right
right-to-left
top-down
bottom-up

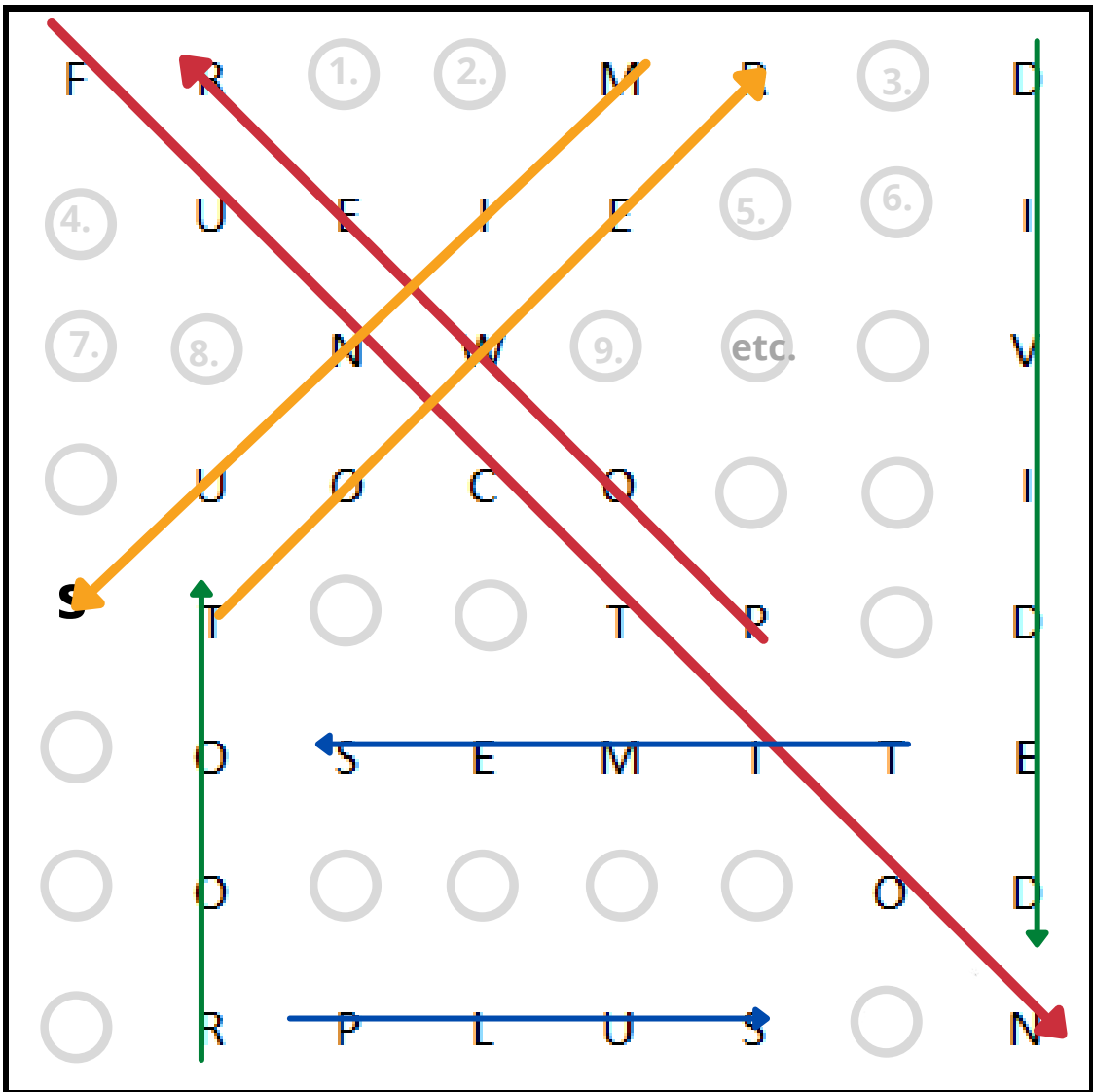


top to bottom obliquely to the right
top to bottom diagonally to the left
bottom-up obliquely to the right
bottom-to-top diagonally left

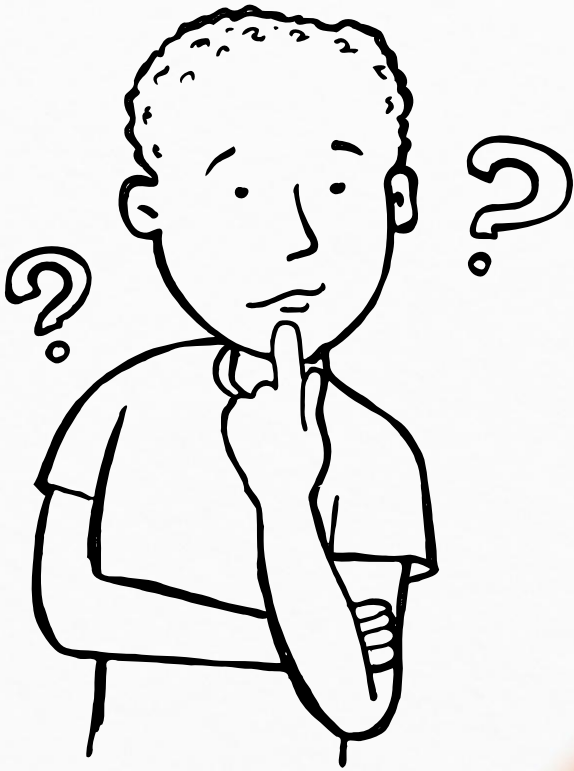


When all the words are crossed out, the letters that make up the secret remain. Secret letters need to be read from top to bottom and left to right.

Find the hidden words



The example



Plus times tower power
Minus divided root function

When you find all the words, the letters that remain uncrossed will create a solution in the order you see in the picture.
Good luck :)



Solve the Eight-directions puzzle with us

We hid the statement of a famous mathematician in a crossword puzzle. Find and delete the letters of these words:

ANGLE

COSINE

DIVISION

FRACTION

GEOMETRIC

ADDITION

COSECANT

COTANGENT

EQUATION

FUNCTION

GROUP

LINE

NUMBER

NUMBER

PRIME

ROOT

SECANT

SHAPE

SINE

STRAIGHT

SUBTRACTION

TANGENT

TRIGONOMETRY

WORK

G C A R L F R N I E D R I C H G

R A U S P S O S A Y S T H A T M

O A T R H I E M A T I C S I S T

U T I H T S U B T R A C T I O N

P M E C N U M B E R E N I S Q E

E E N T U E E N O I T A U Q E G

E U L H N S P N O F R E B M U N

F D T G H E A C I E S C T E I A

A I E I N C H O I L N N C N E T

D V S A W A S S A R E N D I N O

D I U R O N M E B G T E R S T C

I S H T R T E C N O R E Y O I S

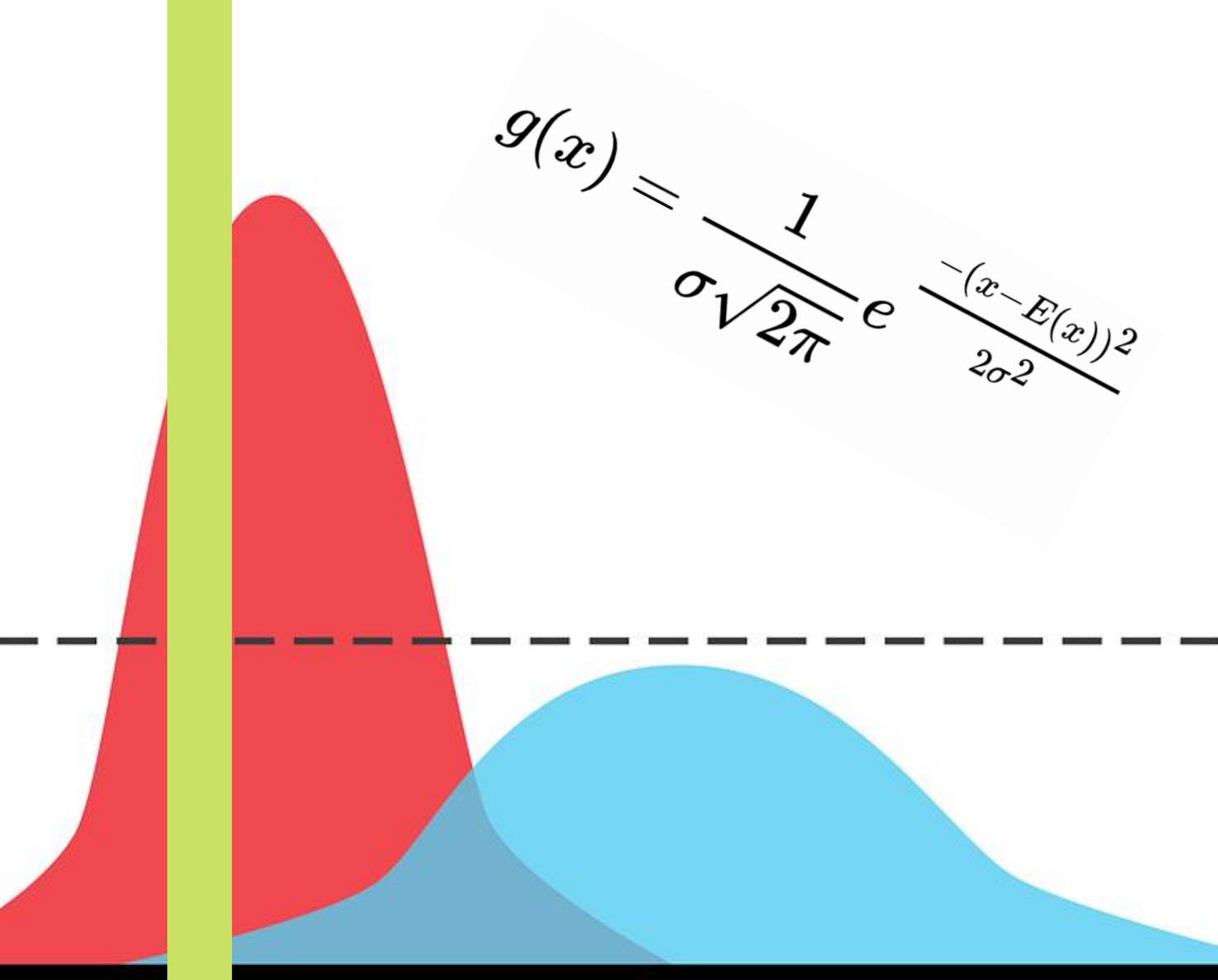
T I T S K T H A E Q U E M C E N

I O O O F M T N A T H E M O A T

O N O I N O I T C A R F C S E

N Y R T E M O N O G I R T G

tr.Irem/Kirikkale
and sk.ivana, tr.Seher/Kirikkale, tr.Nehir/Kirikkale. sk.domca



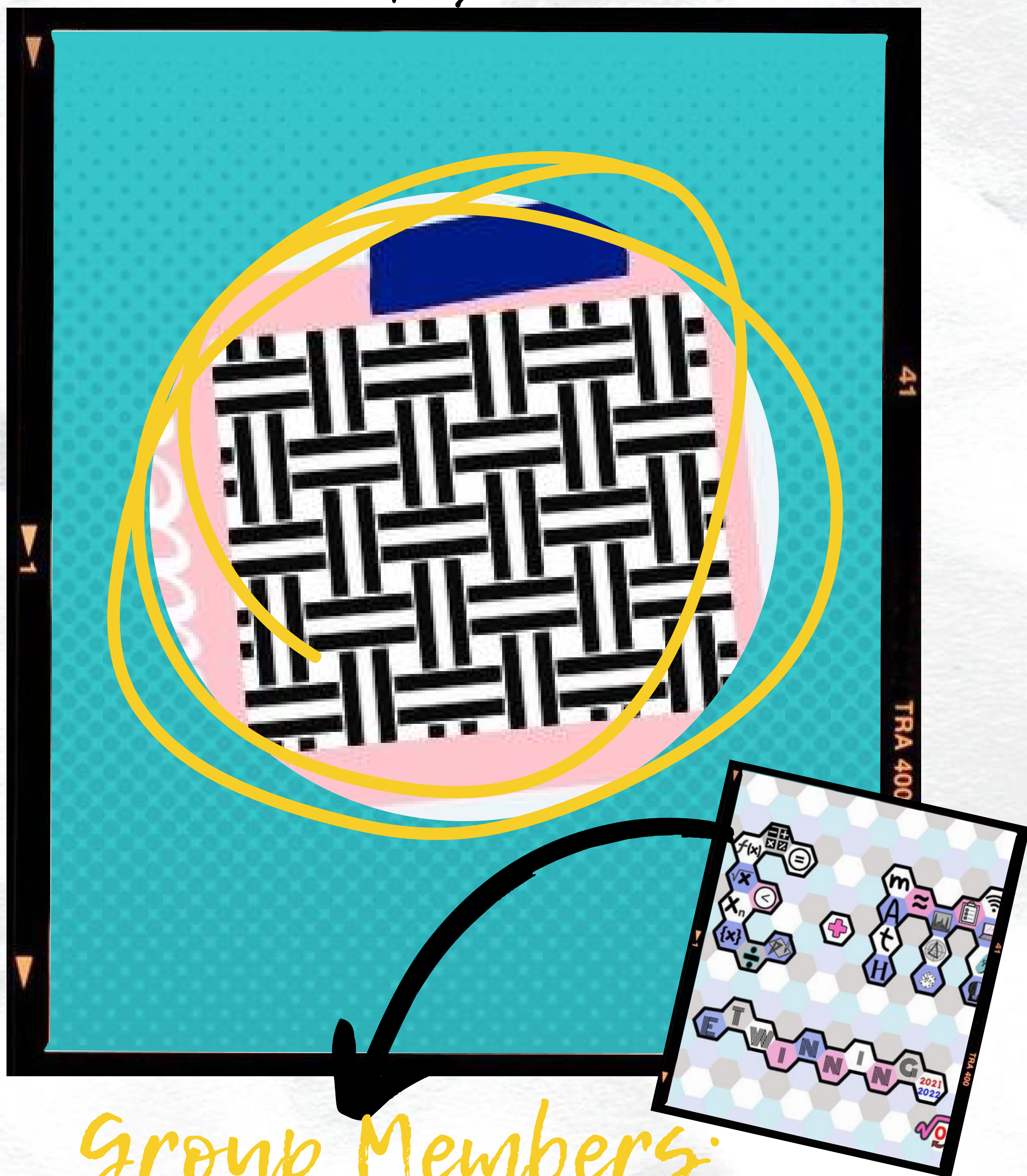
Carl Friedrich Gauss
Source: [wikipedia.org](https://en.wikipedia.org/wiki/File:Gauss.jpg) (CC)



Chapter 3

Geometric Pattern

of the e-book
"Play with us, Math is fun!"



Group Members:

cz.janka, cz Jana, sk.daniela, sk.slavka, sk.mata, sk.alex, Rüstü Eren/Ankara, tr Efe N./Ankara

Advisor teacher: Magali Kervennic, French Guiana

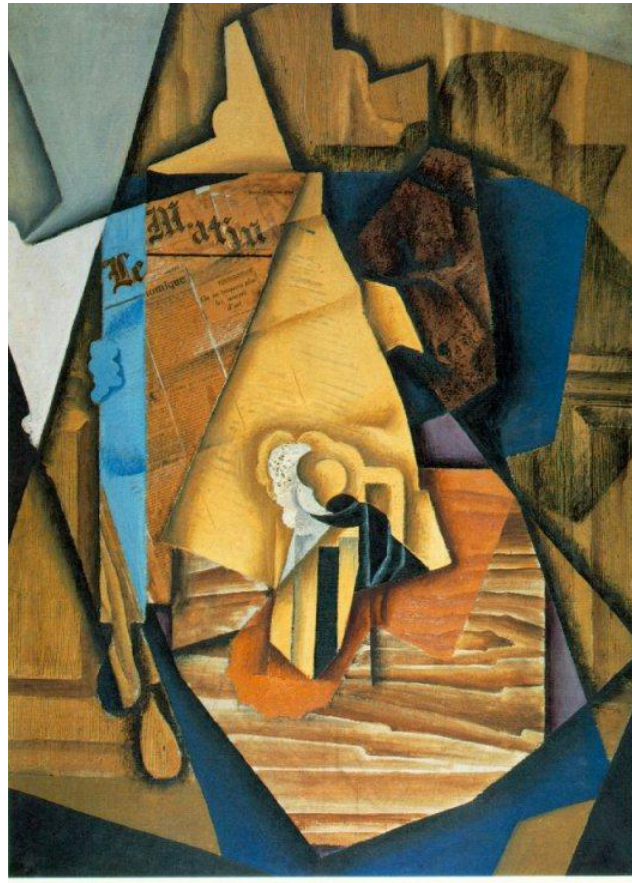
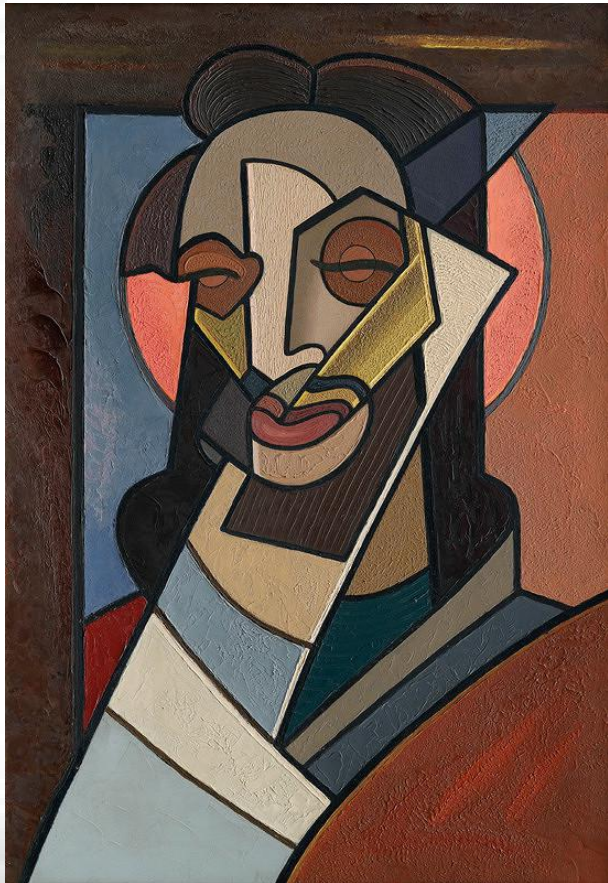
What is Geometric pattern ?

A geometric pattern is one containing objects, shapes, pictures, or other elements that repeat themselves. This repetition might be regular and obvious—such as squares repeated on a grid—or more irregular or asymmetrical, creating a more abstract-looking pattern.

cz.janka
source: [skillshare.com](https://www.skillshare.com)

Geometric pattern in Cubismus

Geometry and shapes are all around us. Do you know that they are also part of art? Do you know what **cubism** is? It is an artistic style in which geometric shapes are used. The depicted object was broken down into the simplest geometric shapes (especially cubes), which were subsequently fantasized into the image, so that the depicted objects appear to be distorted and appear from several perspectives. Cubism was also used by the famous artist Pablo Picasso and other lesser-known painters such as Georges Braque or Juan Gris. **Cubism** was used in literature and especially in architecture.



sk.alex
Source: sk.wikipedia.org/wiki/Kubismus

Geometric pattern in bee hive

A bee hive is an hexagonal geometrical pattern found in nature. Bees have to store as much honey as possible but they also need to use the least amount of wax as possible for that storage. The solution they came up with was to make a geometrical pattern of hexagons which has the largest volume and wastes the least amount of wax.



cro.petar
Photos: pixabay.com

Geometric pattern in snowflakes

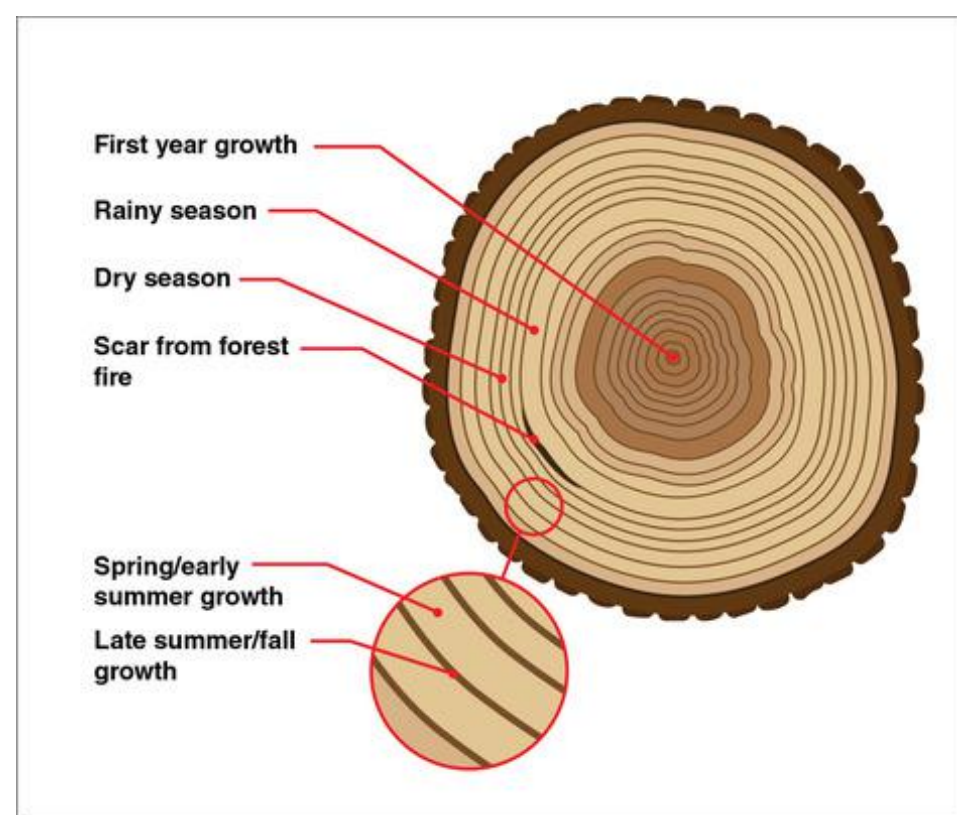
Did you know that all of the snowflakes are unique and have their own geometric patterns? Here's how the snowflakes take their shapes:
Water (or water vapour) molecules attach to a dust particle and form the beginnings of a snowflake. These molecules crystalize to a hexagonal plate form, every snowflake is formed around this shape. Every one will have repeated hexagon design but each snowflake will be slightly different.



Efe.N
Photos: pixabay.com

Geometric pattern with rings

We all probably heard about rings in trees that show us the age of the tree. Those rings are called dendrochronology. Those rings are perfect examples of a round geometrical pattern. But what exactly do these rings tell us about the tree? Look at the picture...



Rüştü Eren P.

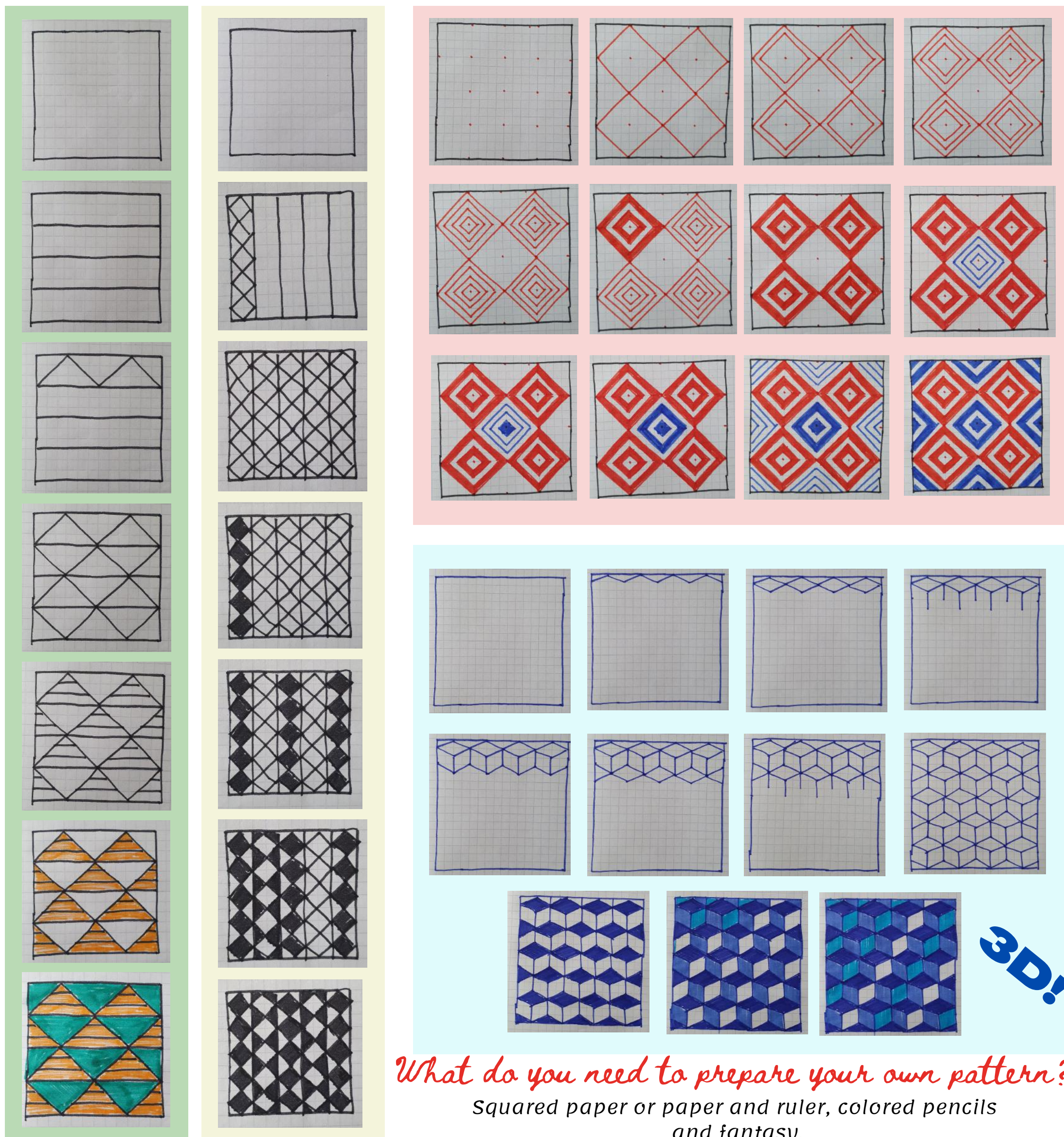
Draw a pattern, relax your mind

If you have never considered drawing a meditation practice, try it now. You can calm your mind by drawing a pattern and creating something beautiful. And for starters, you need nothing more than a piece of paper and your favorite drawing tool.

Geometric patterns contain familiar shapes and create fun patterns.

It's a job with simple shapes and clean lines. You can combine shapes and lines in different ways to create a unique geometric design - then turn it into a pattern by repeating it on the page.

TRY THESE SIMPLE PATTERNS IN A FEW STEPS :-)

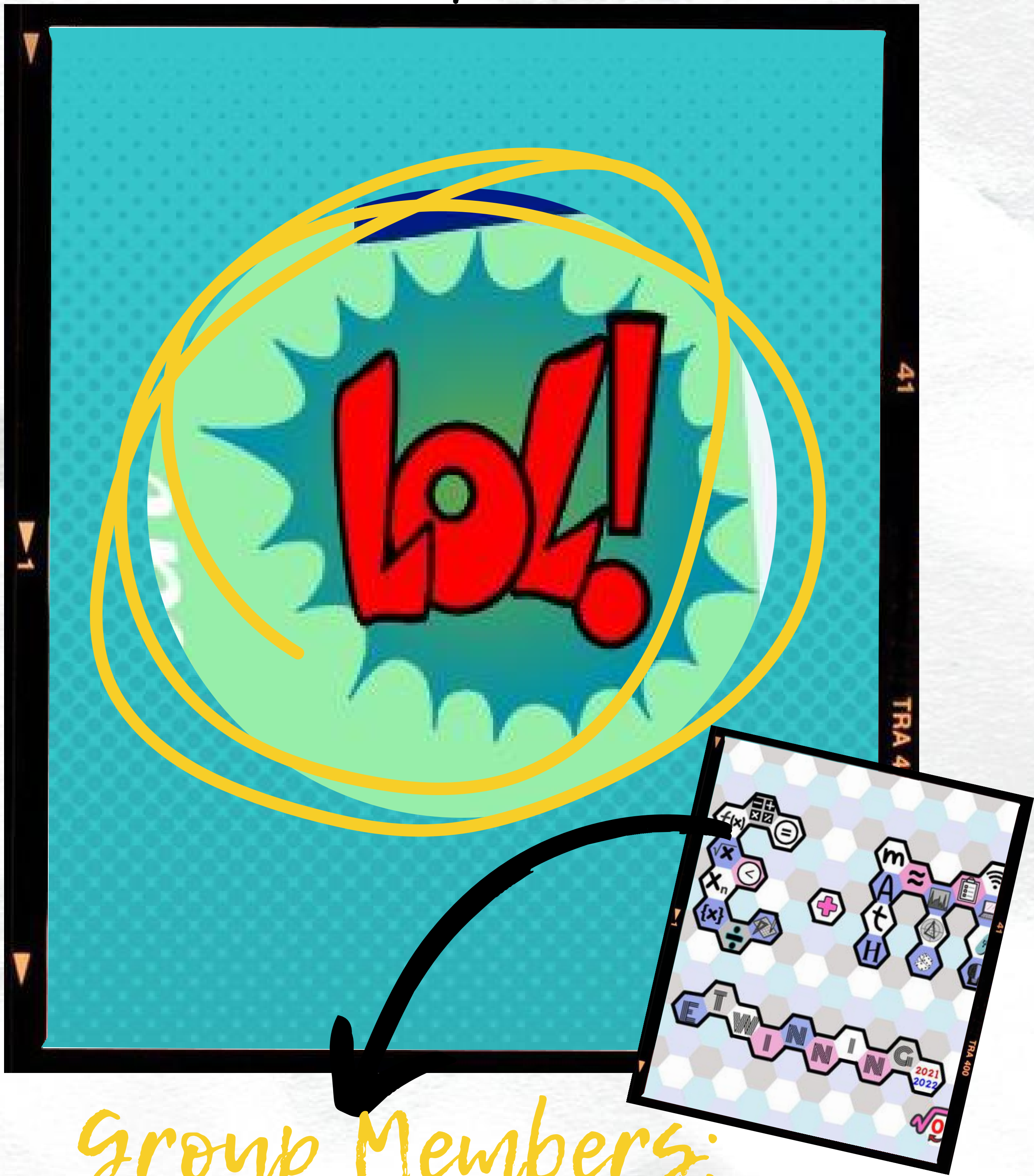


What do you need to prepare your own pattern?

Squared paper or paper and ruler, colored pencils and fantasy.

Chapter 4 Math Meme & Jokes

of the e-book
"Play with us, Math is fun!"



Group Members:

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fr Castor-Stanley, cz Simon, cz Martin, sk laurika, sk.bibiana

Advisor teacher: Nevin Bilgiçli, Turkey/Kırıkkale

MULTIPLY
PARABOLA
TANGENT
THEOREM



Curious eyes see math everywhere every day
Equations, operations force students someday
There should be easy math calculate in some way
Let's think together and find that easy way

(tr group)
(tr Bengü)
(tr Büşra)
(tr İbrahim)

In fact, mathematic is like everyday life
Sometimes it makes you sad and sometimes nice
We have a headache sometimes and we fly with joy other times
And so easy and adorable when you understand once
How math simply describes our complex life

(tr group)
(tr Çağrı)
(sk. laurika)
(fr stanley castor)
(sk bibiana)

Mathematics in nature, art, sports, buildings and everywhere
Mathematics is **M**ysterious **A**wesome **T**axing **H**onourable
Essential **M**arvellous **A**tttractive **T**empting **I**mportant **C**ool **S**plendid
Mathematics provides us with a wonderful experience of discovery and resolution (cz group)

(tr group)
(cz group)
(cz group)

$\sin(\text{go})/\cos(\text{go})=?$

Hint: most mathematical
dance!



MODULAR
ARITHMETIC
TETRAHEDRON
HIGH-ORDER
POSSIBILITY
INFINITE



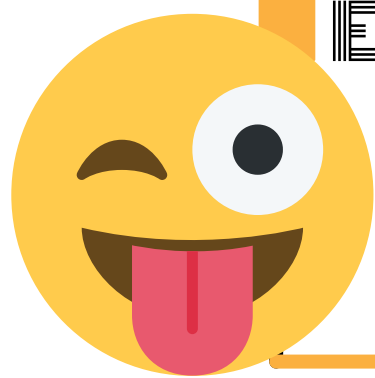
$\cos(\text{ton})/\sin(\text{ton})=?$

Hint: most mathematical
soft fabric!



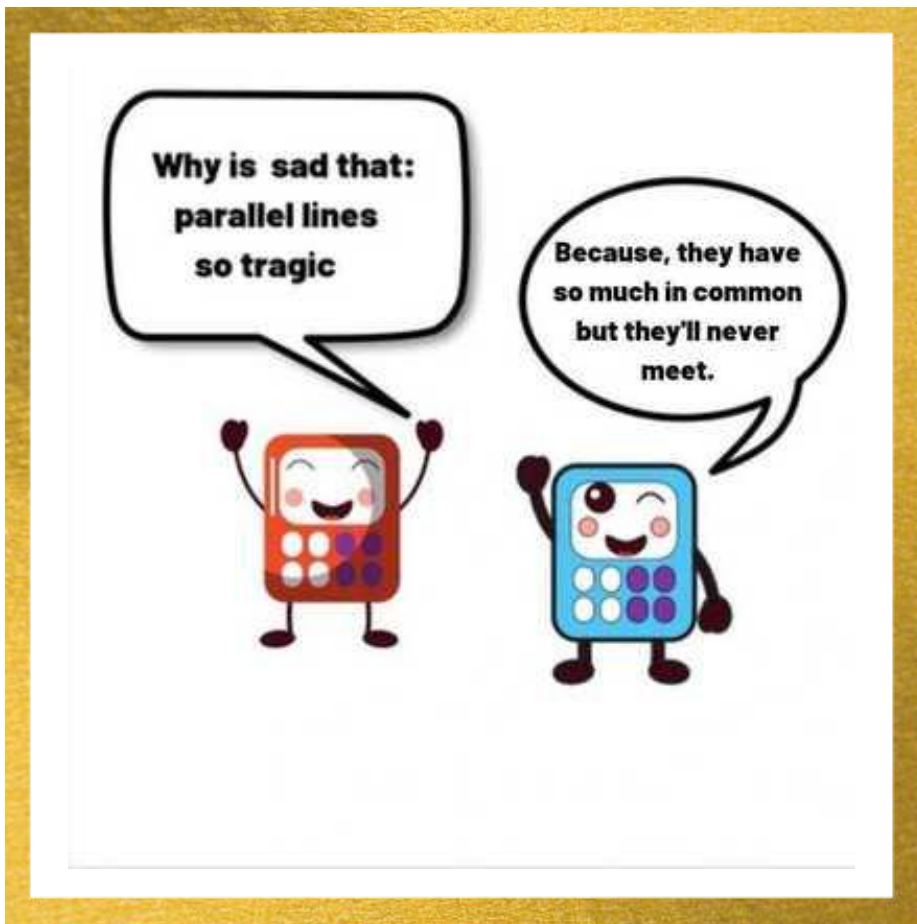
tr Bengül/ Kırıkkale,
tr Büşra/ Kırıkkale,
tr İbrahim/ Kırıkkale,
tr Çağrı/ Kırıkkale,
fr Castor-Stanley,
cz Martin, sk laurika,
sk.bibiana



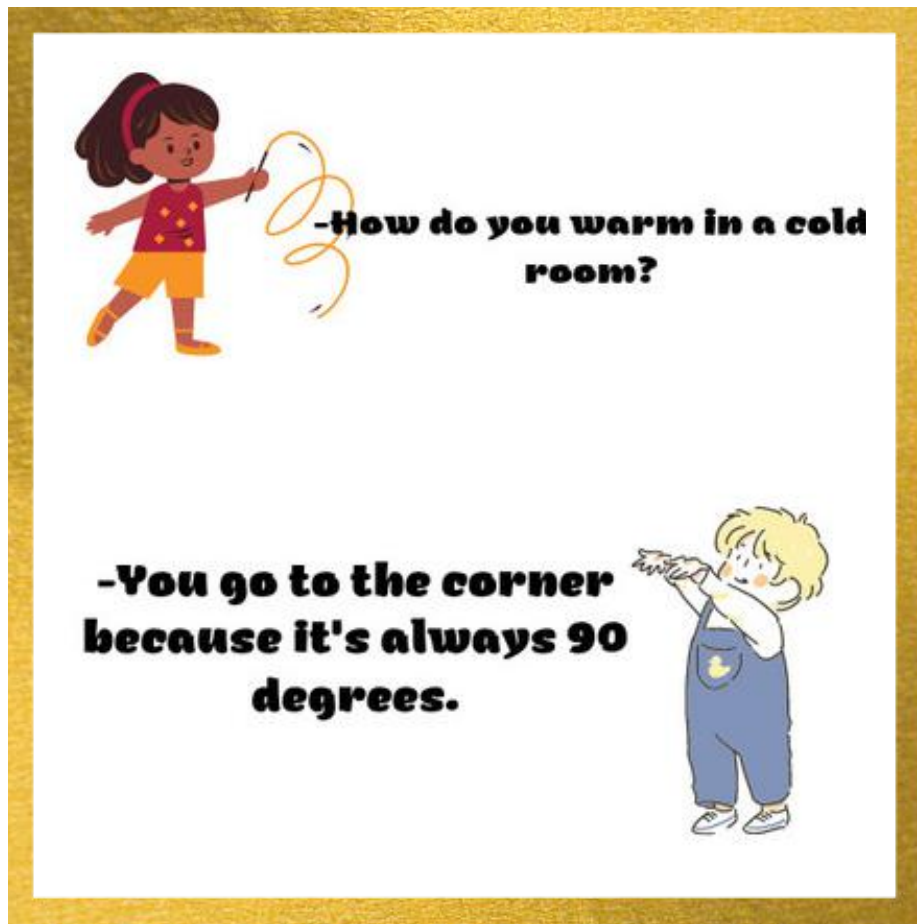


MAJOR
EQUATIONS
MATH KEY
HYPOTENUSE
RADIUS

tr ilbrahim/Kirikkale



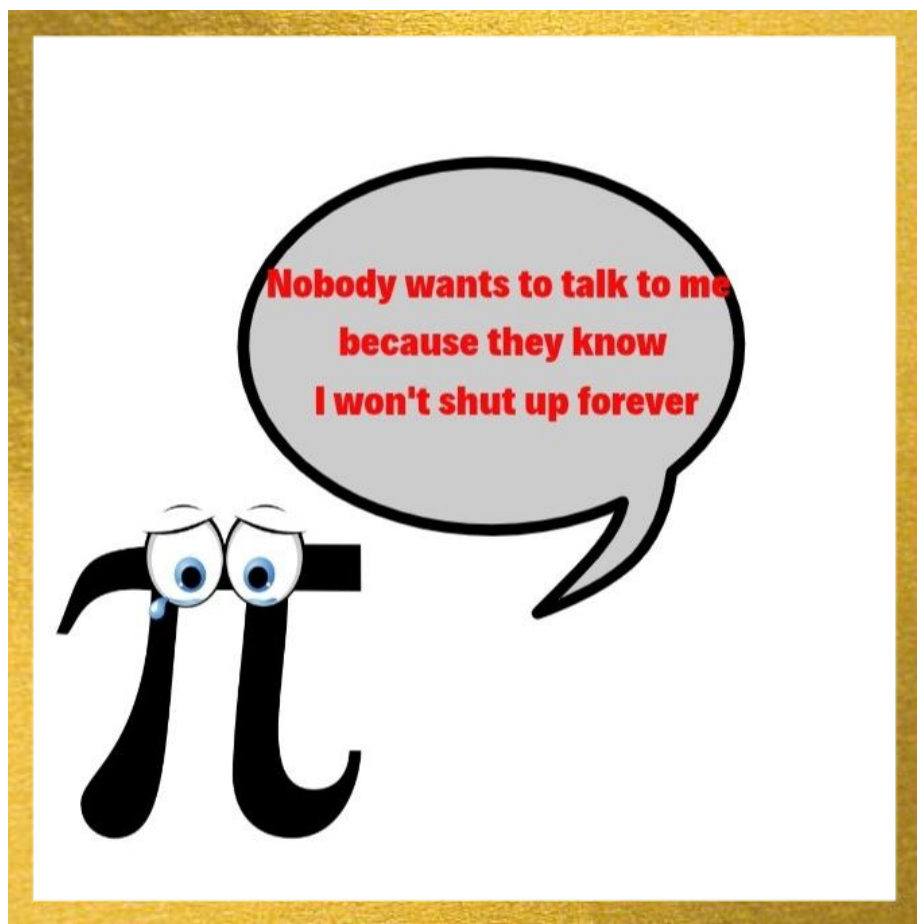
tr Büşra/Kirikkale



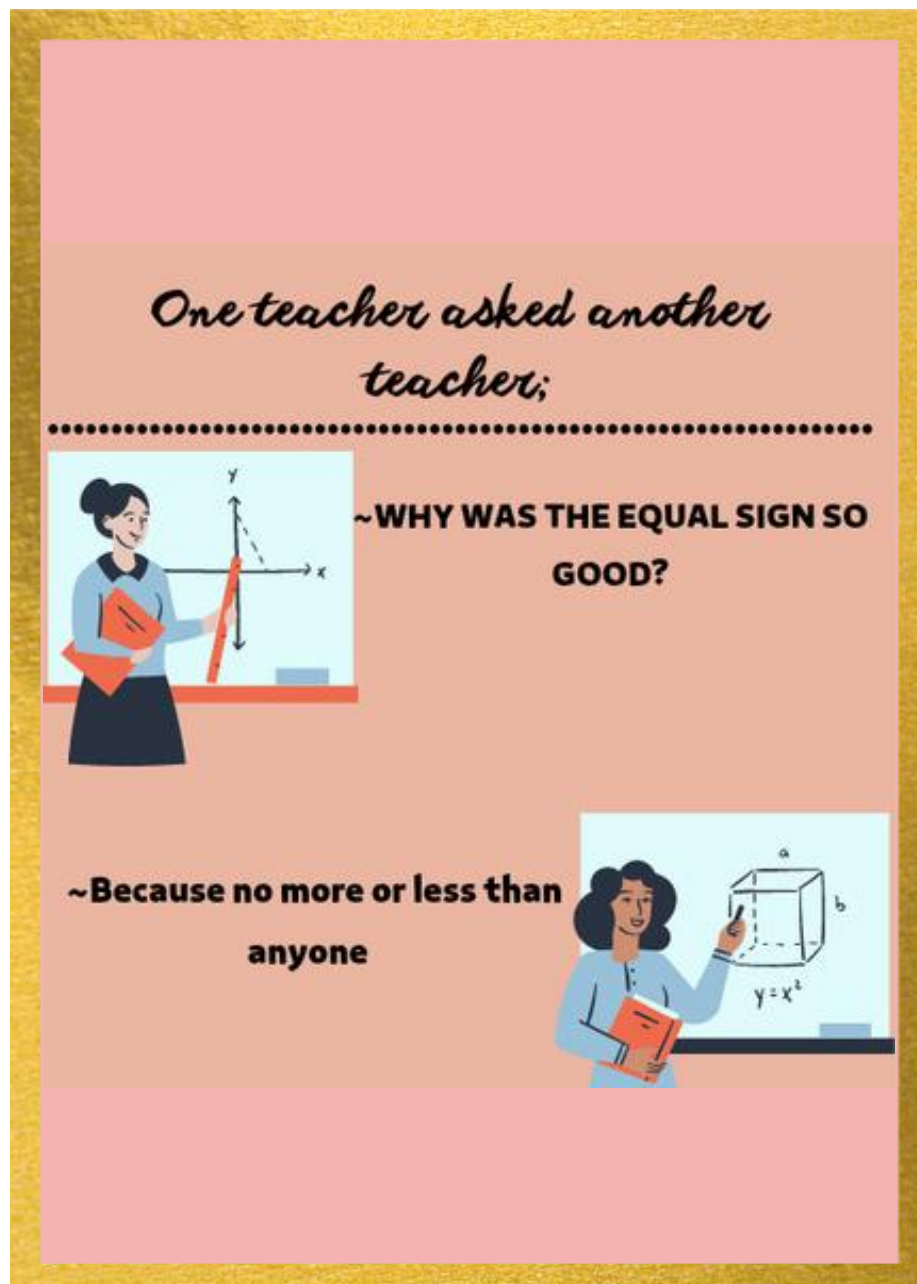
tr Bengü/Kirikkale



cz Martin



tr Bengü/Kirikkale



tr Bengü/Kirikkale

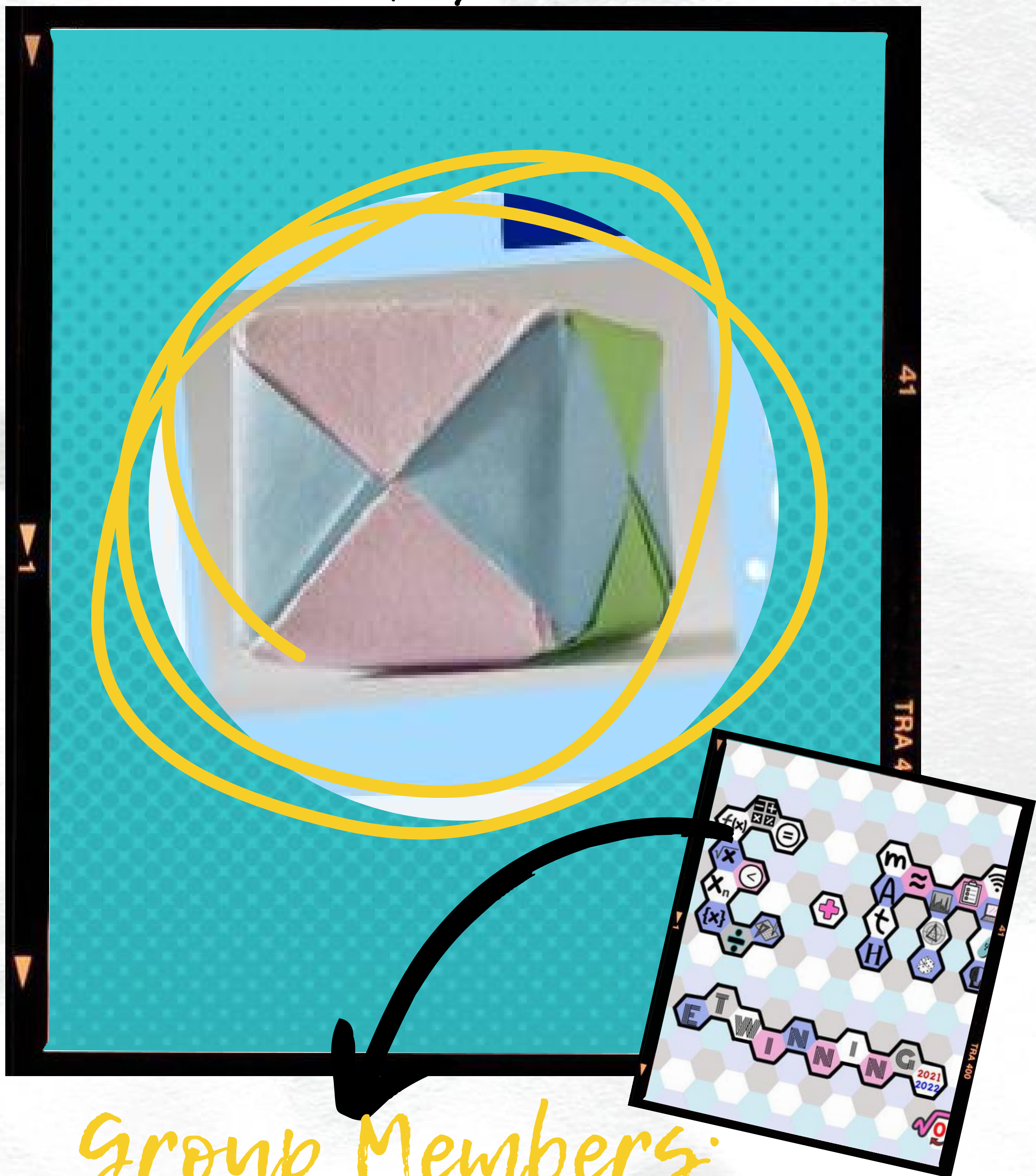


sk bibiana

Chapter 5

Origami Solids

of the e-book
"Play with us, Math is fun!"



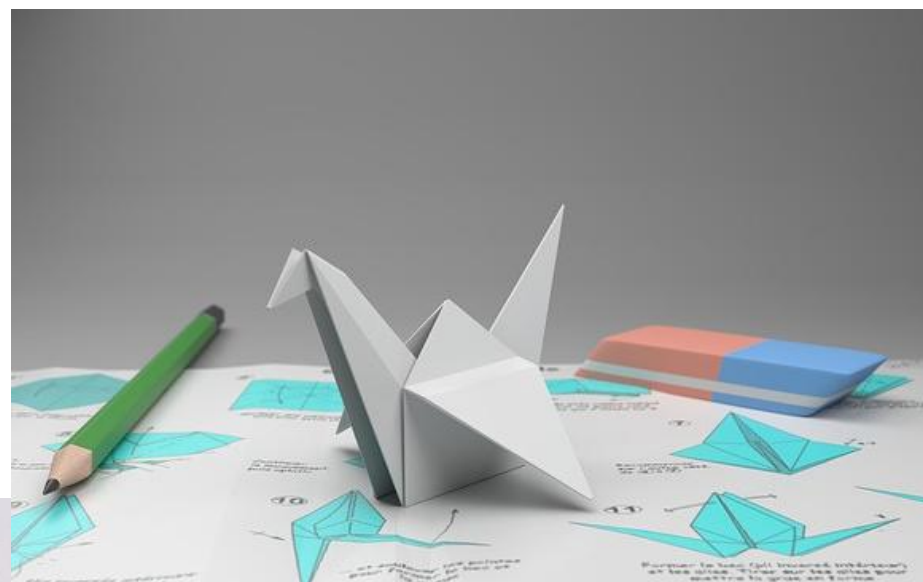
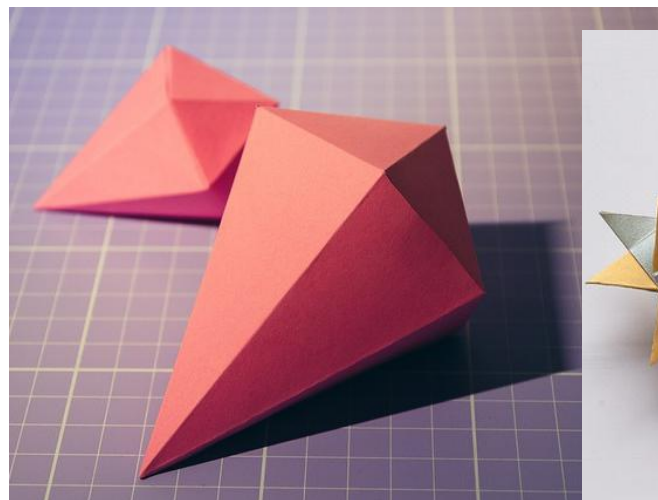
Group Members:

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Advisor teacher: Maja Carević, Croatia

Origami - math and art -

Origami is an ancient Japanese **art of paper folding**. The term "origami" in Japanese literally means "folding paper" and consists of the words 折る folding, 紙 kami paper. It is used for all types of paper puzzles, even those that are not originally Japanese.



Origami combines the power of the spirit, the imagination of the mind and the dexterity of the hands.

Origami uses only a **few simple ways to fold paper**, but combining them can create very interesting and complicated shapes. The starting point is a sheet of **paper in the shape** of a square, which is (traditionally) white on one side and colored or patterned on the other.

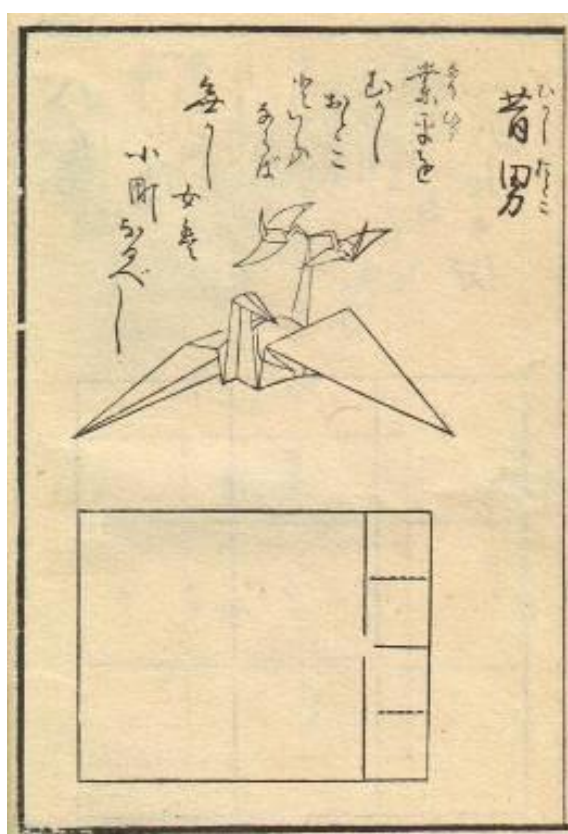
No glue and **no scissors** is used for origami puzzles.



Source: pixabay.com

History of Origami

It is believed that origami originally originated in China around 105 along with the invention of paper. Thanks to the monks, he got from Japan to Japan, where he settled down. Japanese origami probably evolved from the ceremonial folding of paper, such as the so-called "Nosi" - folded packaging for festive, especially floral gifts, or small gift jigsaw puzzles for good happiness. The oldest mentions of origami in Japan date from the 9th century. As entertainment, origami did not spread in Japan until sometime in the 17th century. The puzzles have gradually found a wide range of enthusiasts and fans all over the world.



The preview is from the oldest known book that made origami famous in the world.

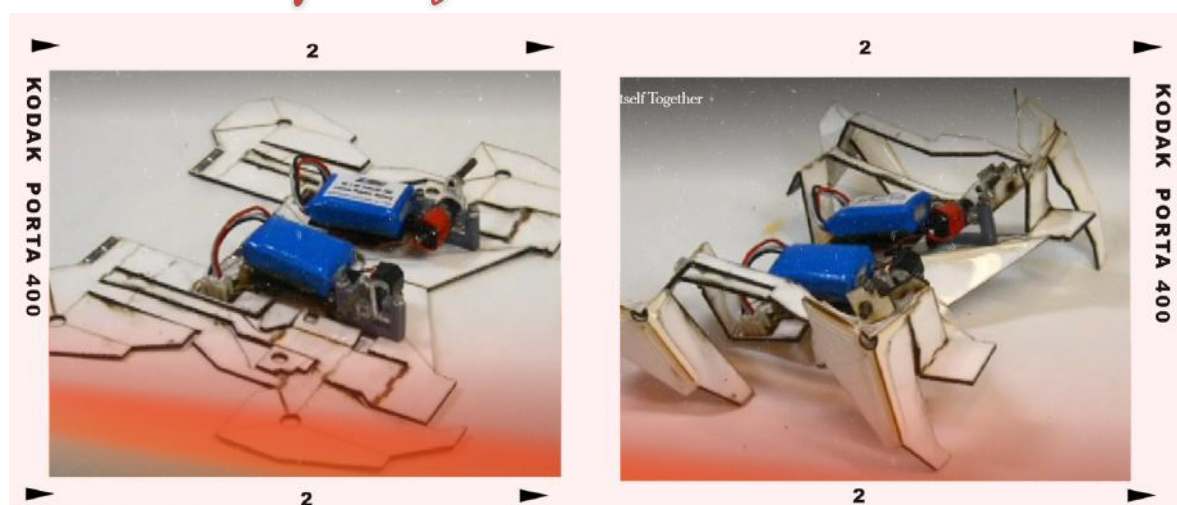
The book was called

"Hiden Senbazuru Orikata",
or
"The Secret of a Thousand Paper Cranes"

and was published in 1797.

Source: nissubashi.org

Present of Origami



Using flat materials and a **design inspired by origami**, the art of paper folding, researchers have created a robot that can assemble without human intervention.

Source: [The New York Times](https://www.nytimes.com)

From a practical point of view, origami is used in everyday life for the production of decorative ornamental packaging (boxes, boxes, envelopes, etc.), fashion accessories, small gifts.

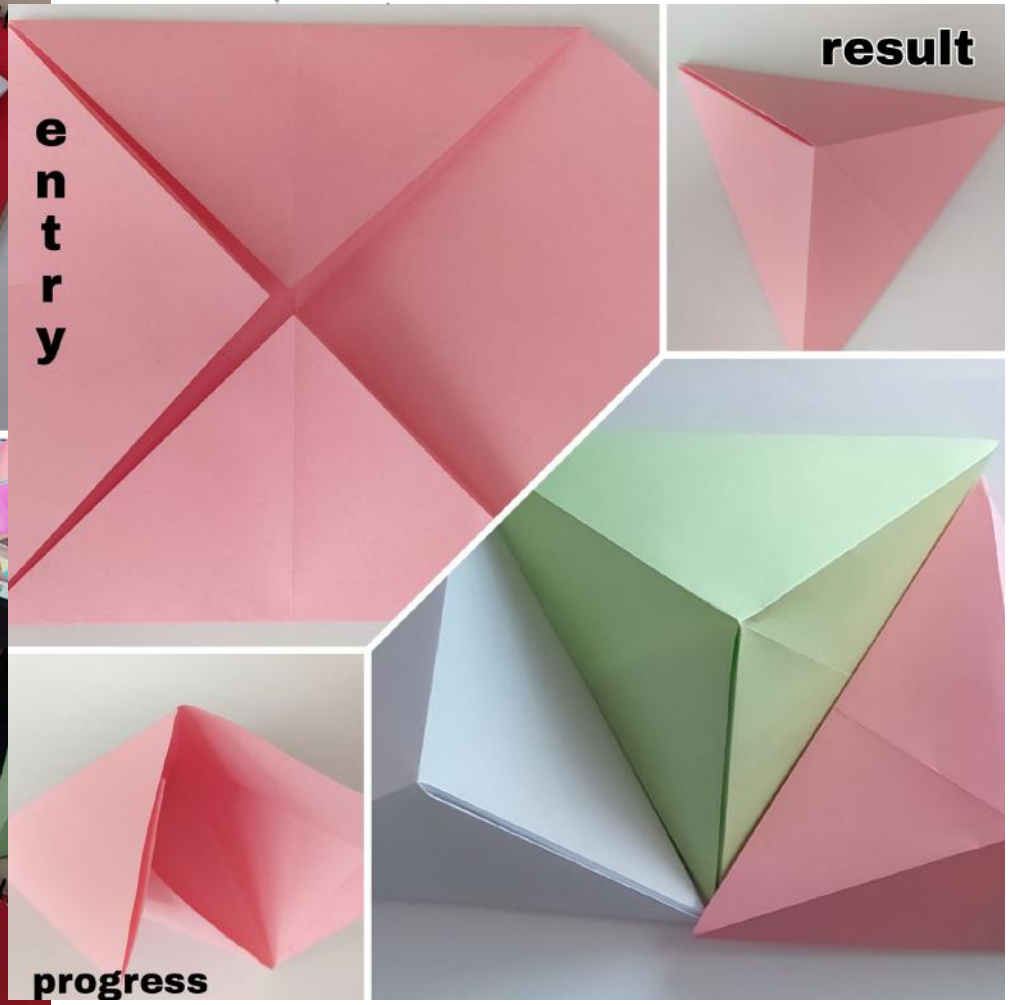
But it is of great practical importance in space engineering in the production of space robots.

Origami, the Japanese tradition of paper-folding, has inspired a number of unique spacecraft designs here. It's little wonder that **it fascinates NASA engineers**: origami can seem deceptively simple, hiding complex math within its creases.

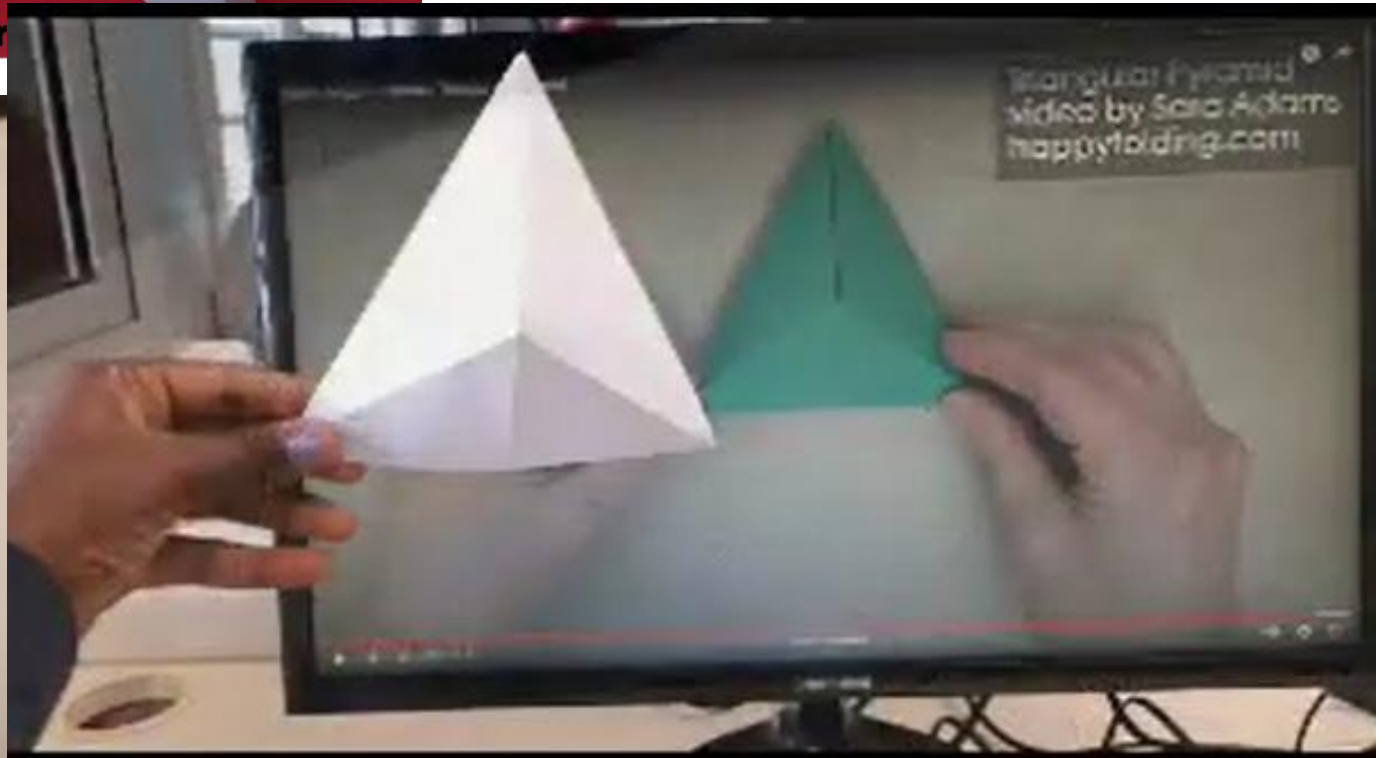
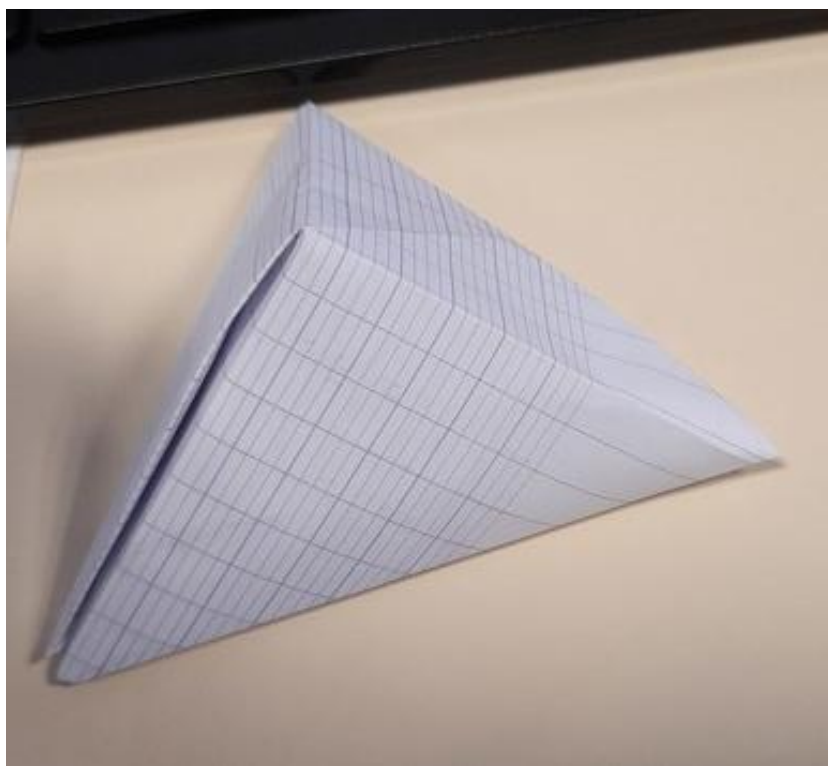
Source: [nasa.gov](https://www.nasa.gov)



Our origami works

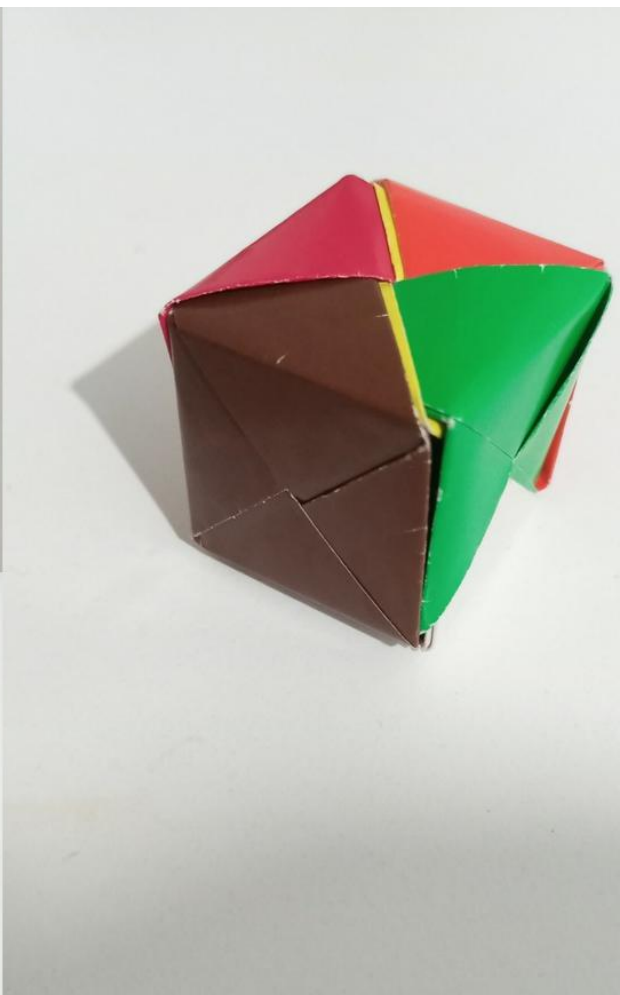


tr Elif Kırıkkale



Video Introduction by Woodline

fr Woodline

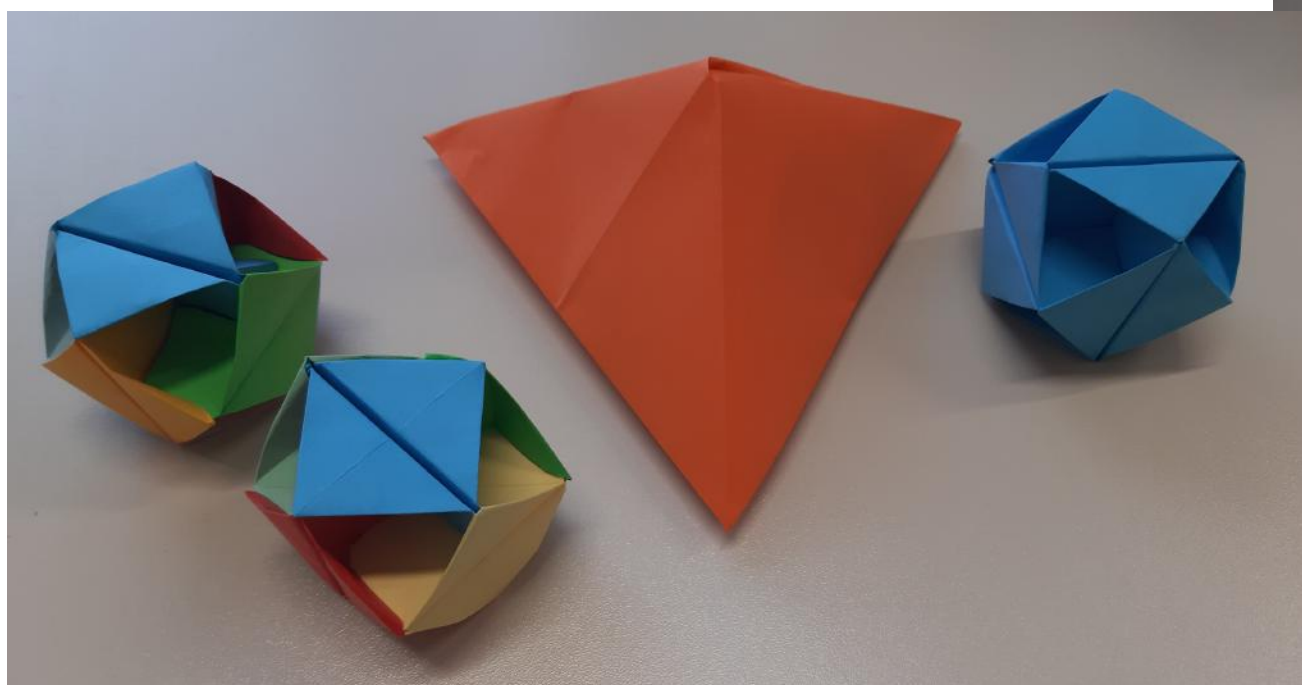


Video introduction by Derya

tr Derya Kırıkkale



cro. Petar, cro.Matija, cro.Lana, cro. Filip



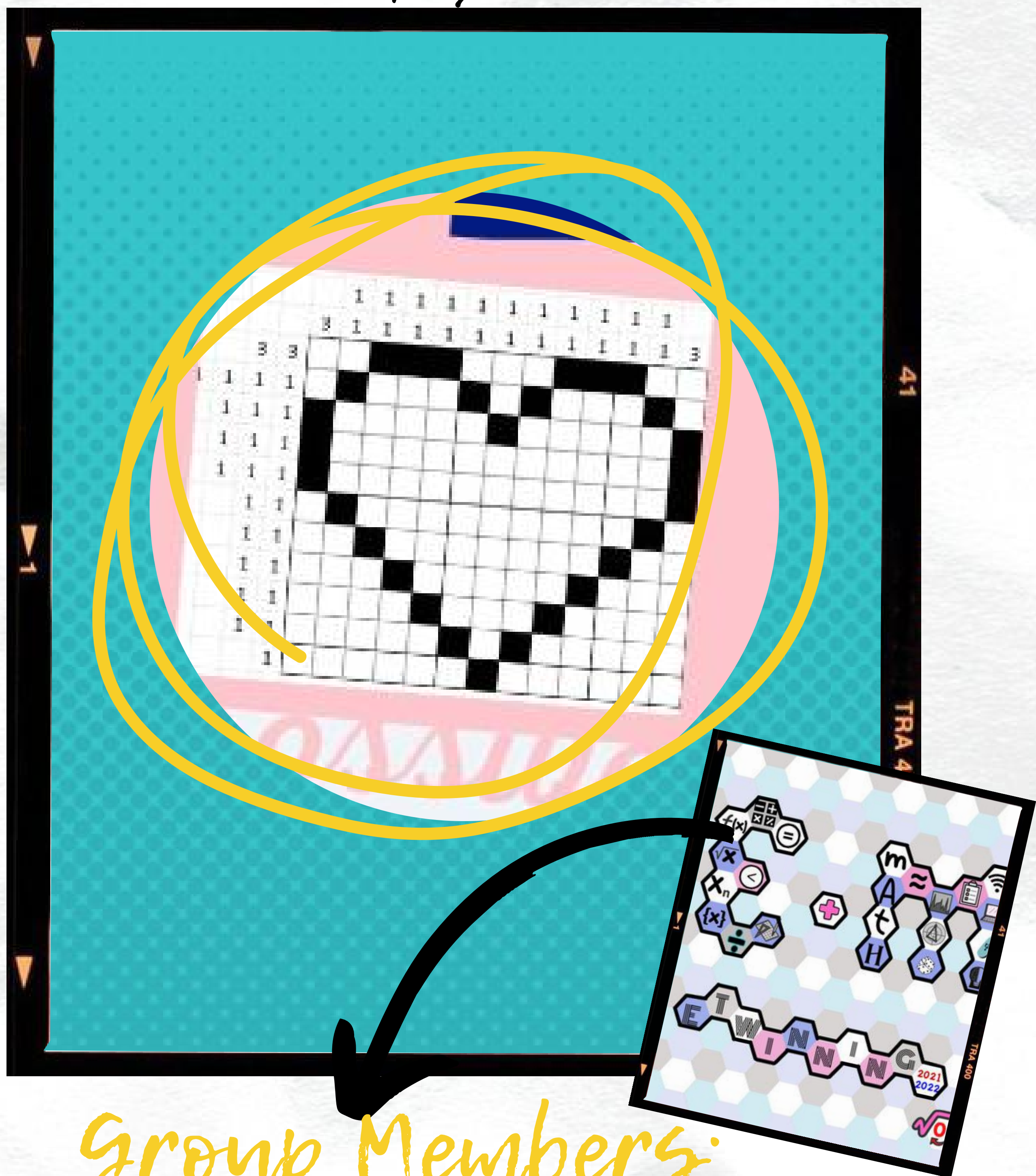
cro.Matija, cro.Petar,
cro.Karlo

Our origami works

Chapter 6

Painted Crosswords

of the e-book
"Play with us, Math is fun!"



Group Members:

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Advisor teacher: Cláudia Campos, Portugal

What is painted crossword?

Painted crosswords are logical puzzles in which a legend with numbers is placed around the grid and a picture is created.

Each number in the legend specifies the number of consecutive squares of the same color.



There is always at least one empty square between the individual numbers.



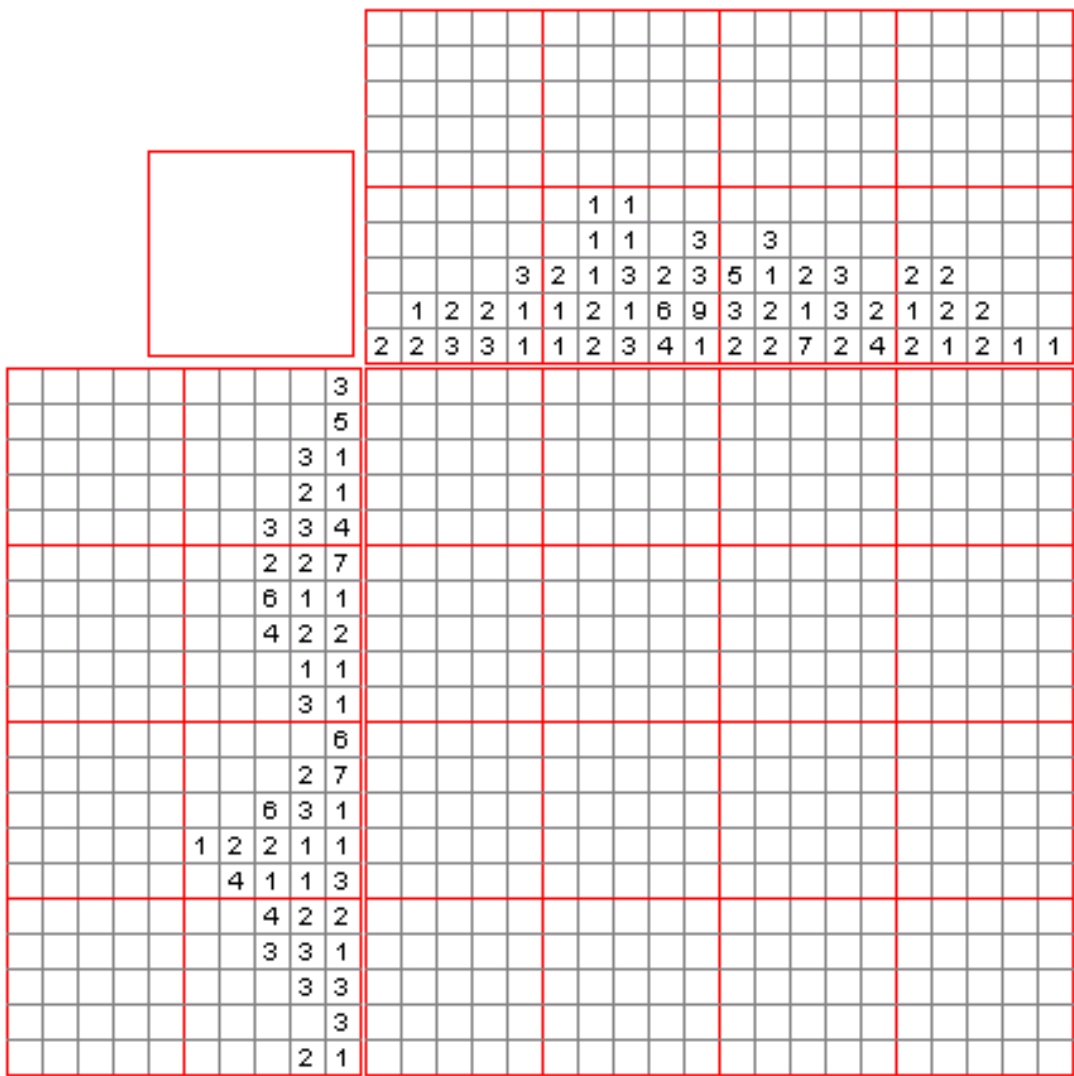
The numbers in the legend are already arranged in the correct order.



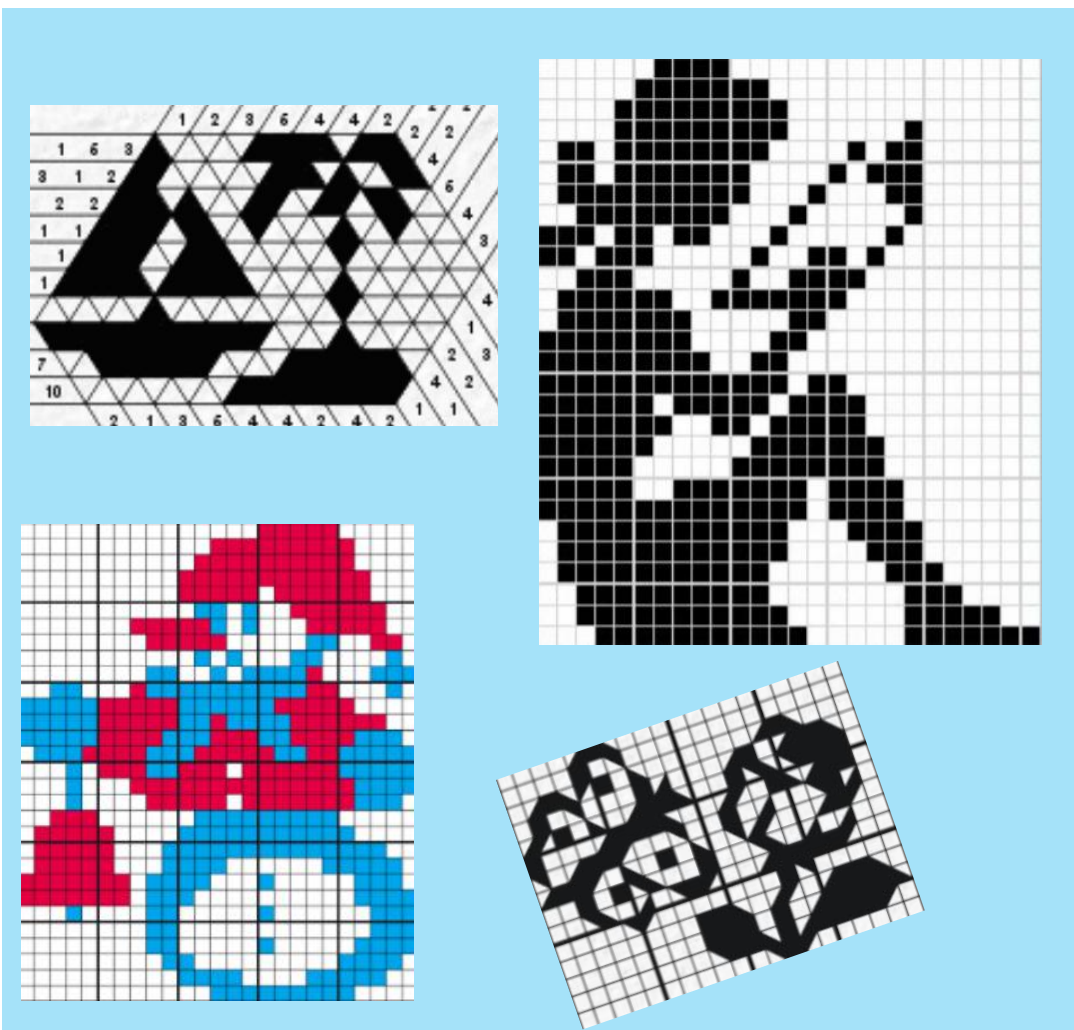
The legendary numbers of the legend may or may not be separated by a blank square



Here is a short gif as an example of solving a crossword puzzle:
(Some solution steps are put together.)



The author: Juraj Simlovic (CC BY-SA)



How we can solve them?

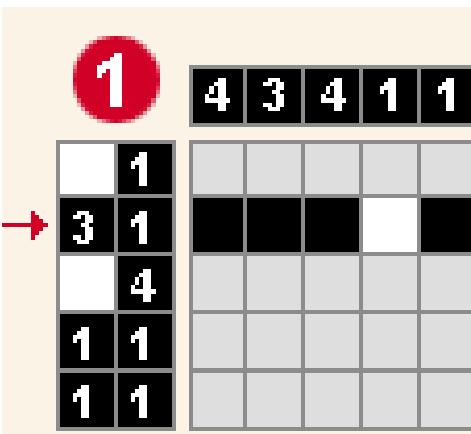
Two basic rules apply to the solution:

- 1.The number of consecutive fields such as the number entered at the beginning of a row or column should be painted.
- 2.If more than one number is entered in a row or column, at least one non-painted field must always be omitted between them (the number of empty fields is not specified).

Step-by-step solution:

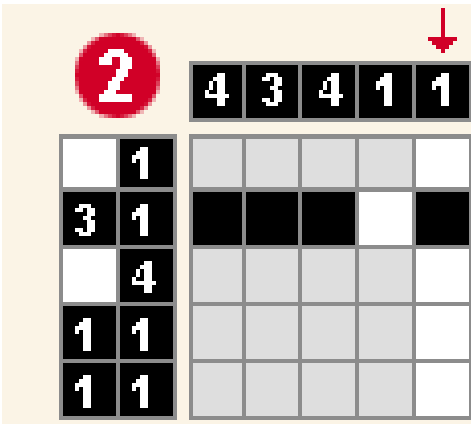
Row 2:

The sum of the legend numbers (3.1) with 1 empty square (background color) between them is equal to the 5 available squares



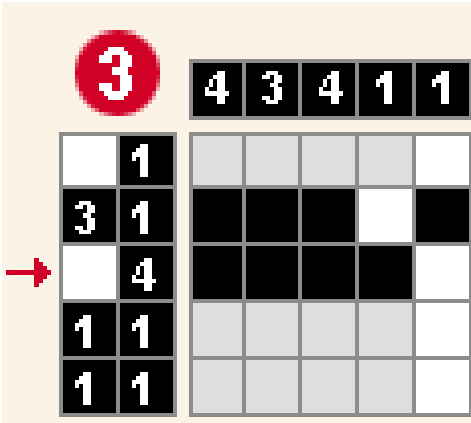
Column 5:

Legend number 1 is already in the grid. We can fill in the remaining squares of the given column with the background color.



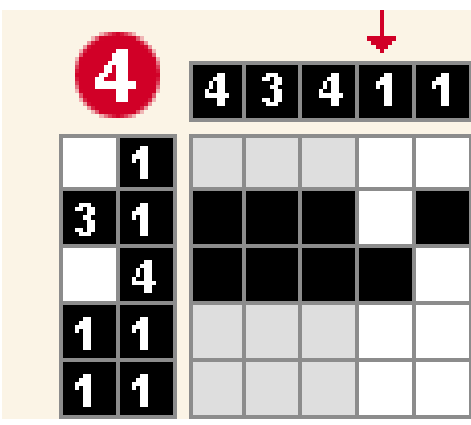
Row 3:

There are only 4 squares left in the grid, in which we can place the legend number 4.



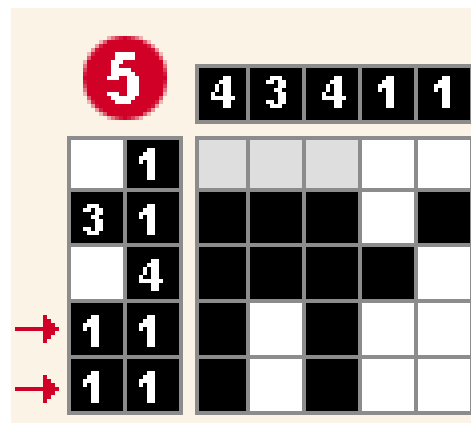
Column 4:

Legend number 1 is already in the grid. We can fill in the remaining squares of the given column with the background color.



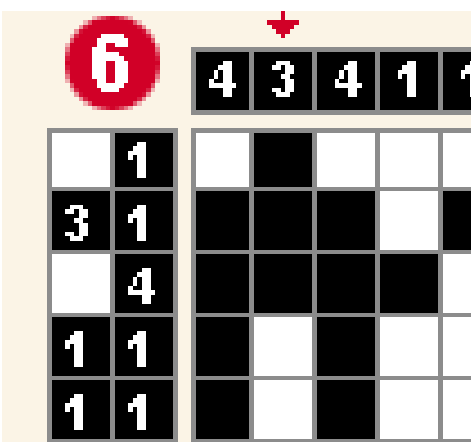
Hints 4/5:

The sum of the legend numbers (1,1) with 1 empty square between them is equal to the 3 squares available



Column 2:

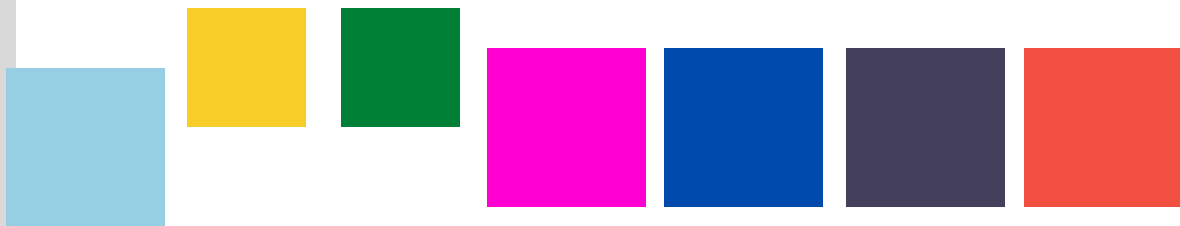
There is only 1 square left to complete the number 3. The crossword puzzle is solved.



Source: sk.wikipedia.org

Euler's Identity

Euler's Identity is the most beautiful equation in math because it combines the most beautiful constants known. Solve the puzzles so you can write the equation (replace the colored squeres with your solutions of puzzles).



	0	0	10	10	2-2	2-2	10	10	0	0
6										
6										
2-2										
2-2										
2-2										
2-2										
2-2										
2-2										
6										
6										

tr Ramsin

	0	0	0	1	0	0	0
	0	0	0	4	1	0	0
1							
0							
1							
1							
1							
1							
1							

		0	0	0	1	1	0	0
		0	0	1	1	1	2	0
		0	3	1	1	1	1	0
0	2							
1	1							
1	1							
1	2							
0	1							
1	1							
0	2							

		0	0	0	1	0	0	0
		0	0	1	1	7	1	0
0	1							
0	2							
1	1							
0	1							
0	1							
0	1							
0	3							

	2	2	10	10	2	2	10	10	2	2
10										
10										
2-2										
2-2										
2-2										
2-2										
2-2										
2-2										
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2-2										

tr Gül

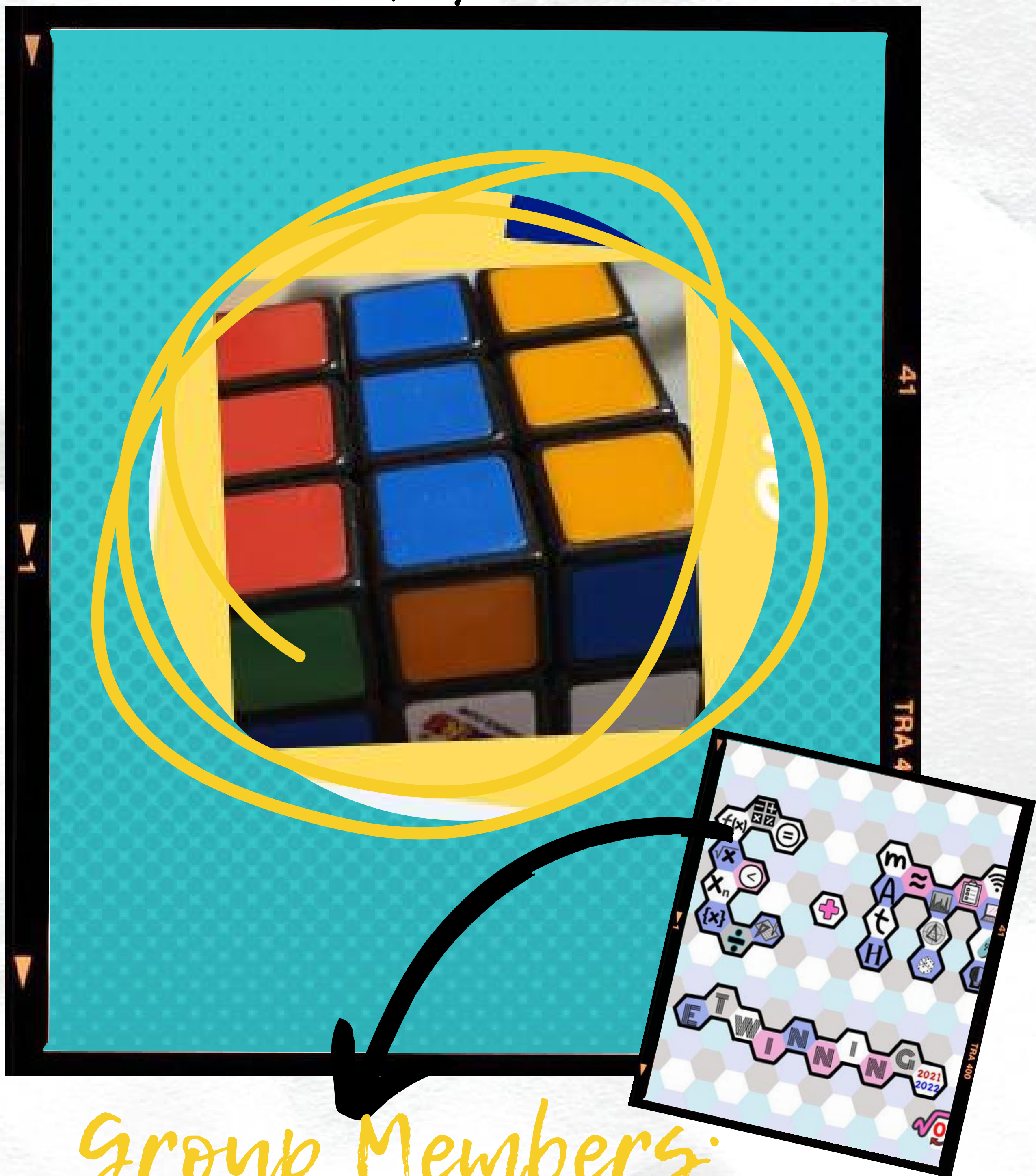
	2	2	2	2	2	2	2	2	2
0	2	2	2	2	2	2	2	2	0
0									
0									
8									
8									
0									
0									
8									
8									
0									
0									

	2	2	2	2	10	10	2	2	2	2
2										
2										
2										
2										
10										
10										
10										
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2										
2										
2										

Chapter 7

Rubic's Cube

of the e-book
"Play with us, Math is fun!"



tr.Sümeyye/ Kırıkkale, tr.Ceylin/ Kırıkkale, tr.Ege U/Ankara, tr.Elifnaz B./Ankara, cz.Artur, cz.Voloda, cz.Ondrej, sk.nika, sk.Maruska, sk.viktoria, sk.nikolas, sk.fl11p, Gonçalo F, kymia bayonne joseph

Advisor teacher: Monika Poľanská, Slovakia

History of Rubik's Cube

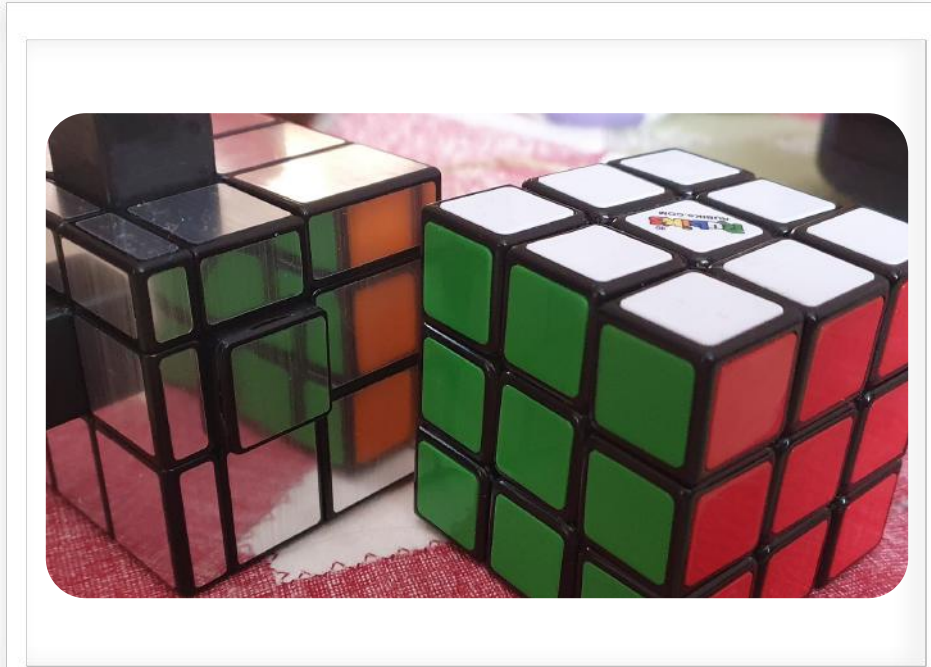
Rubik's Cube is a mechanical puzzle invented in 1974 by the Hungarian sculptor and architect Ernő Rubik.

It was extremely popular in the 70's and 80's, when it was produced in million series.

The small cubes are connected by a movable mechanism that allows any layer of 9 cubes to rotate a multiple of 90 °.

The task is to assemble the cube to its original state after mixing the individual colors.

sk.viktoria



Other Cubes

Mirror cube



The braille Rubik's cube



13x13 power speed cube



QUERTY cube



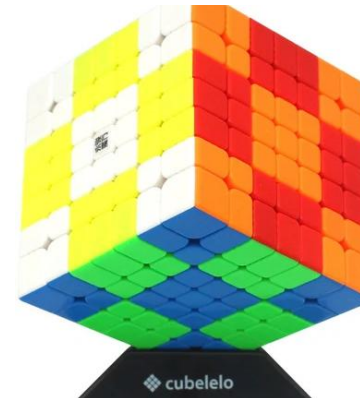
Square



Skewb



7x7 cube



sk.nika & sk.maruska & sk.nikolas

Resources: cubelelo.com - coolest-rubiks-cubes, cubelelo.com - types-of-rubiks-cube, instructables.com - How-to-make-a-QWERTY-Rubik-Cubes/

1974 The cube is invented

1975 Patent obtained

1977 Test batches released in Hungary

1980 Rubik's Cube made its international debut in toy fairs across the world

1981 The Rubik's Cube received the UK Toy of the Year award

1982 The first Rubik's Cube World Championship was held

2003 World Cube Association was founded.

2021 The World Championships and European Championships are still held every 2 years

tr.Ceylin/ Kırıkkale

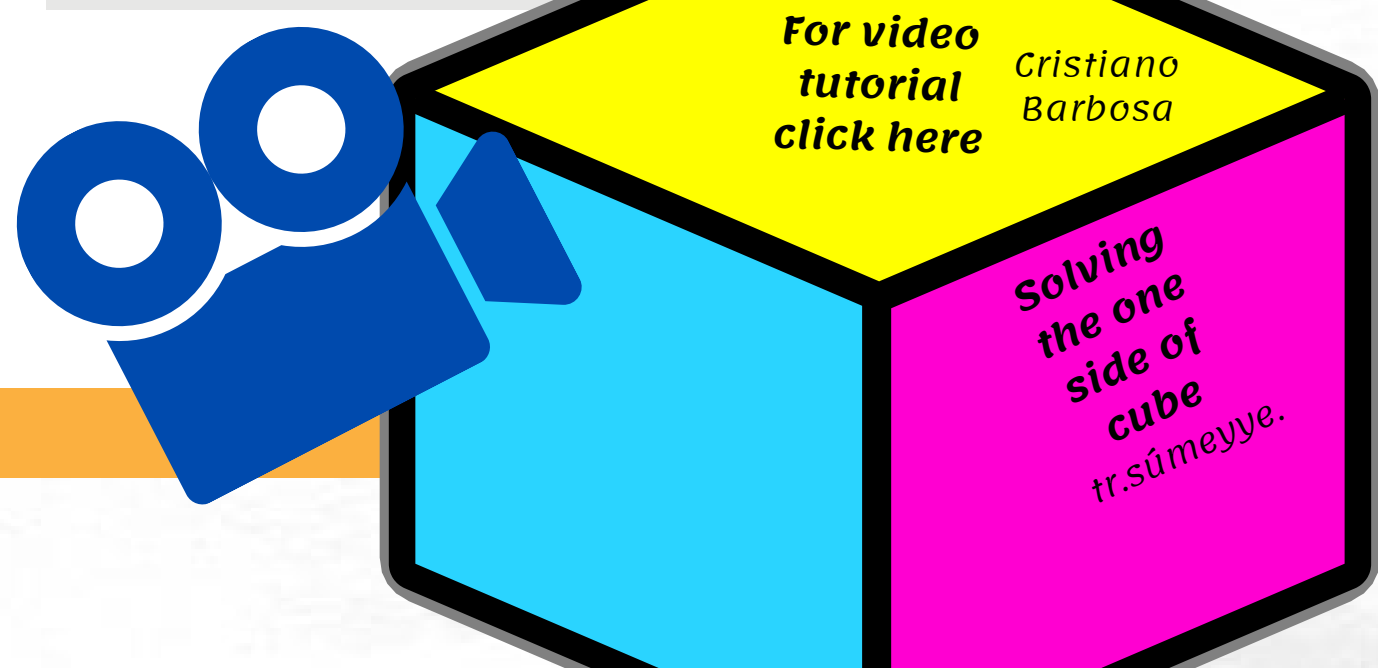
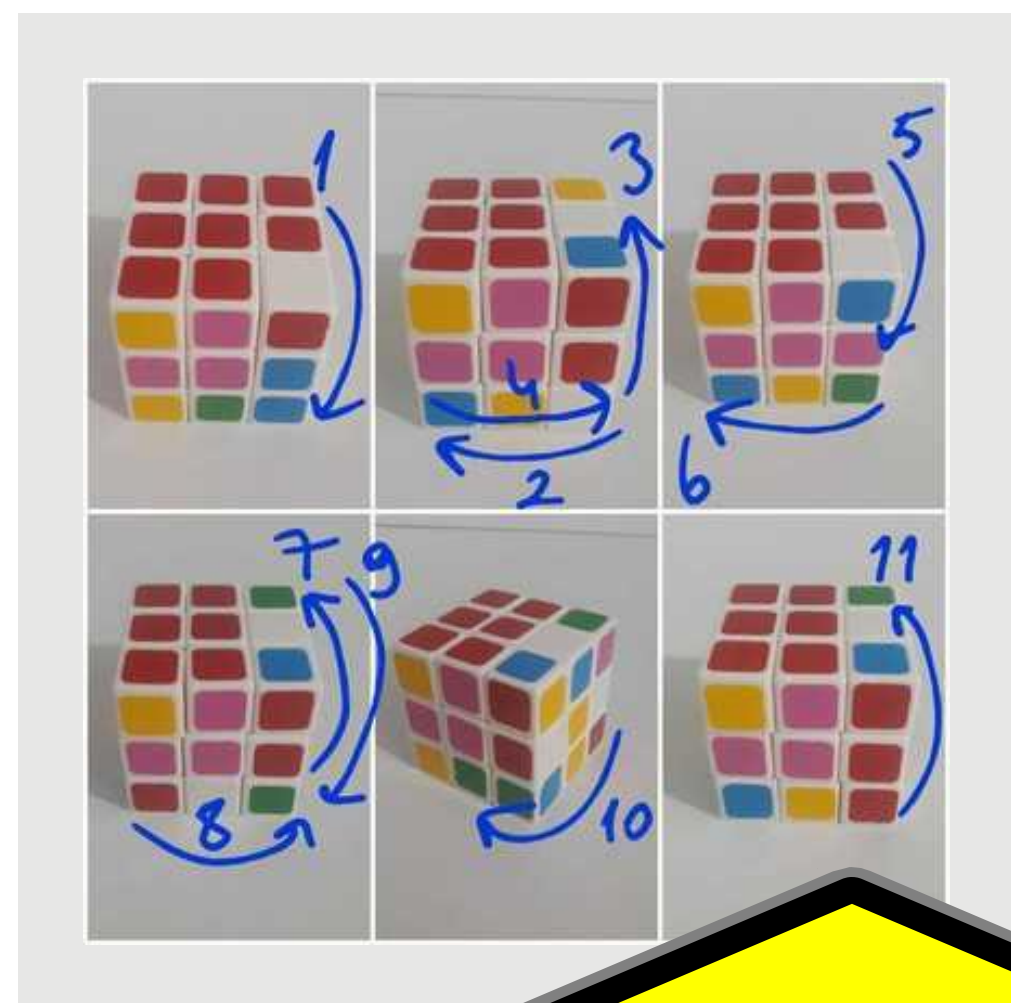
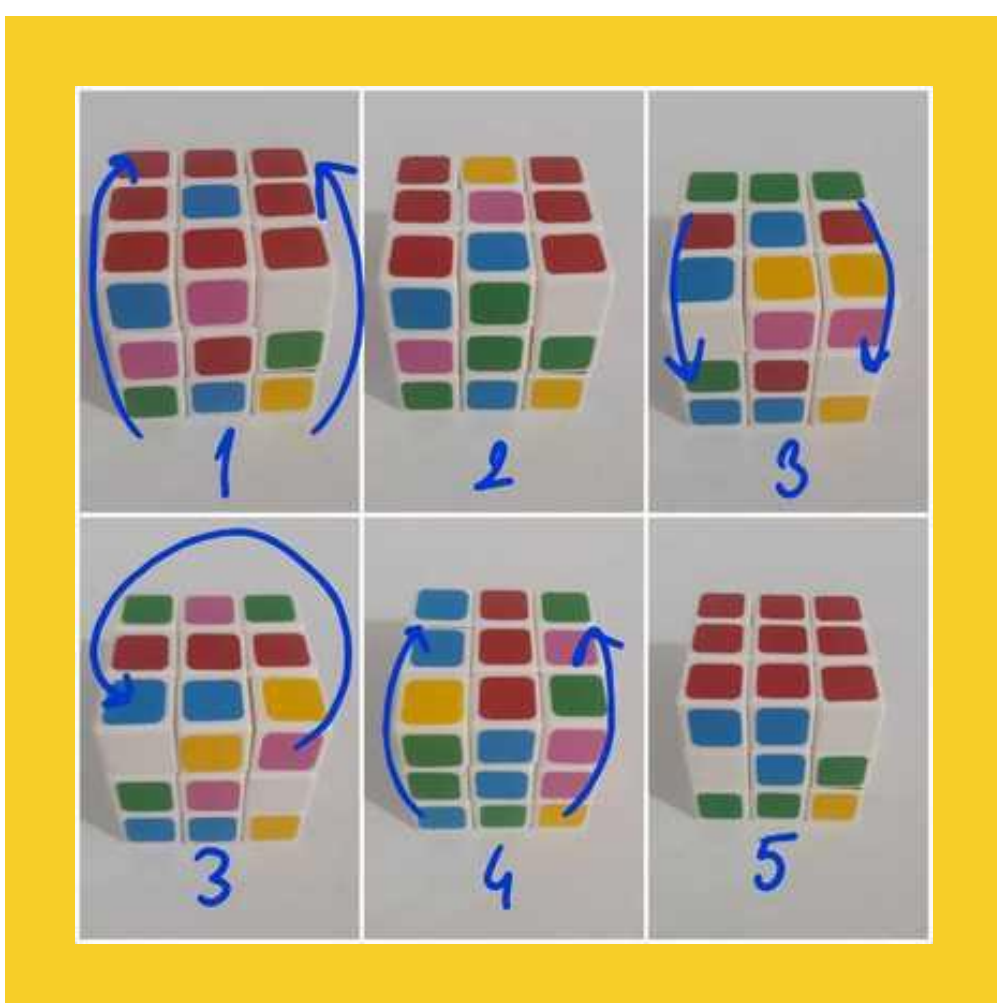
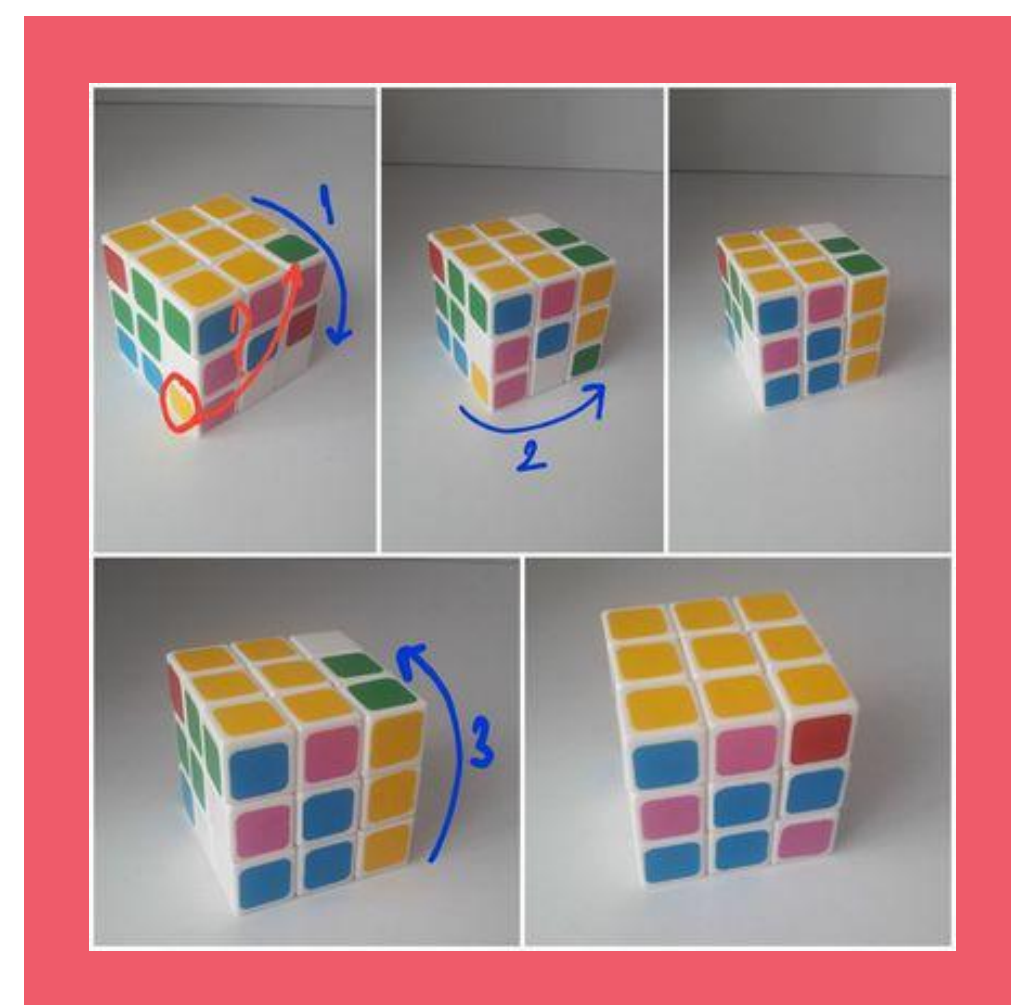
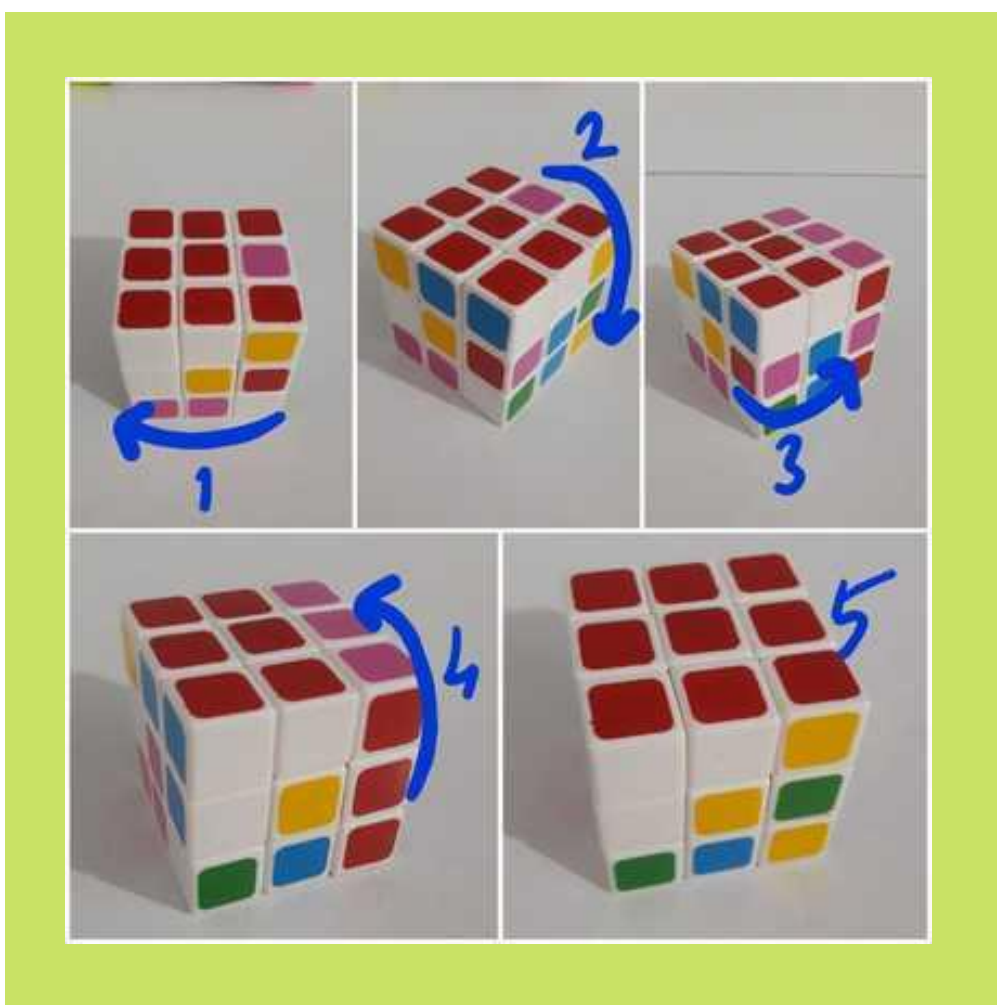
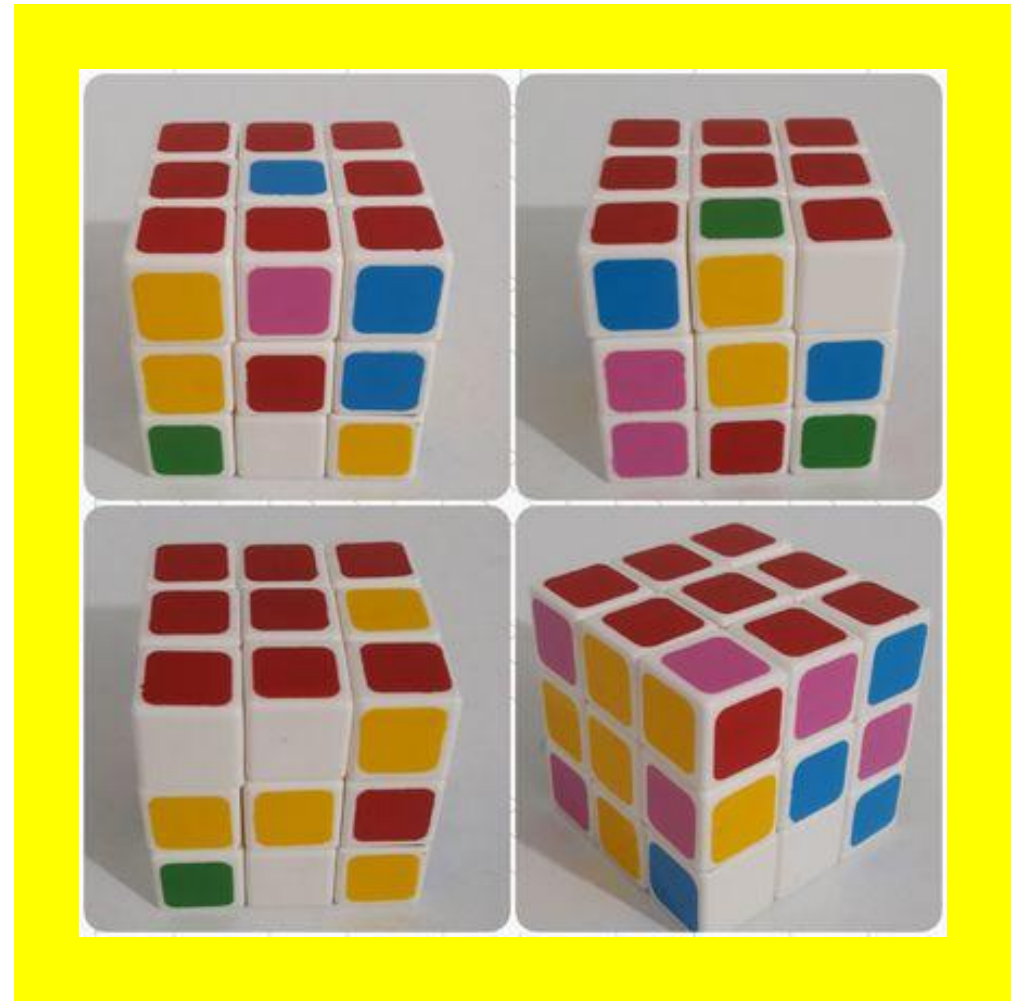
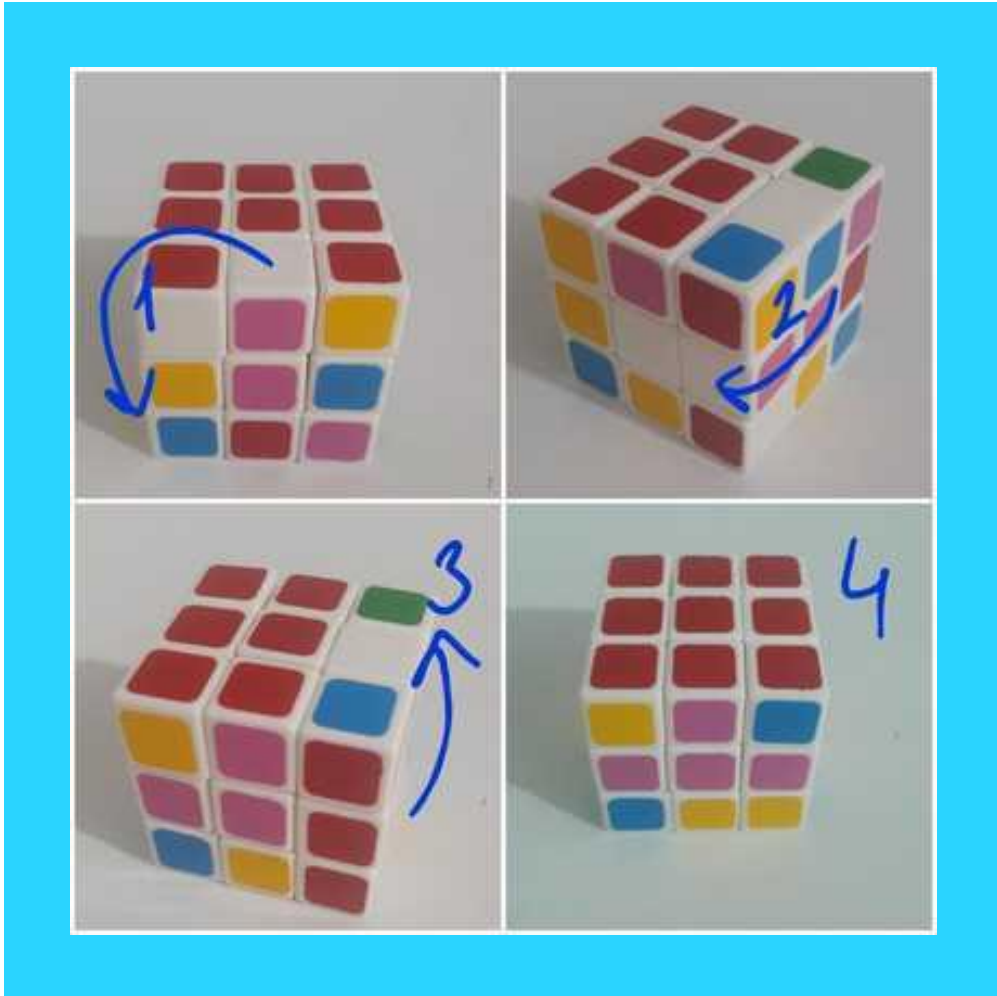
Source: <https://ruwix.com/>



Photo-Tutorial for one side solving

How we can solve one side of the cube, you can see in these photos. Important - according to the situation on your cube, find the relevant part according to the first picture and follow the other pictures.

tr.sûmeyye/ kırıkale



For video
tutorial
click here

Cristiano
Barbosa

Solving
the one
side of
cube
tr.sûmeyye.

Three most Interesting facts about the Rubik's cube



The classic cube has 43,252,003,274,489,856,000 possible combinations, which makes it almost impossible to solve it by pure luck.

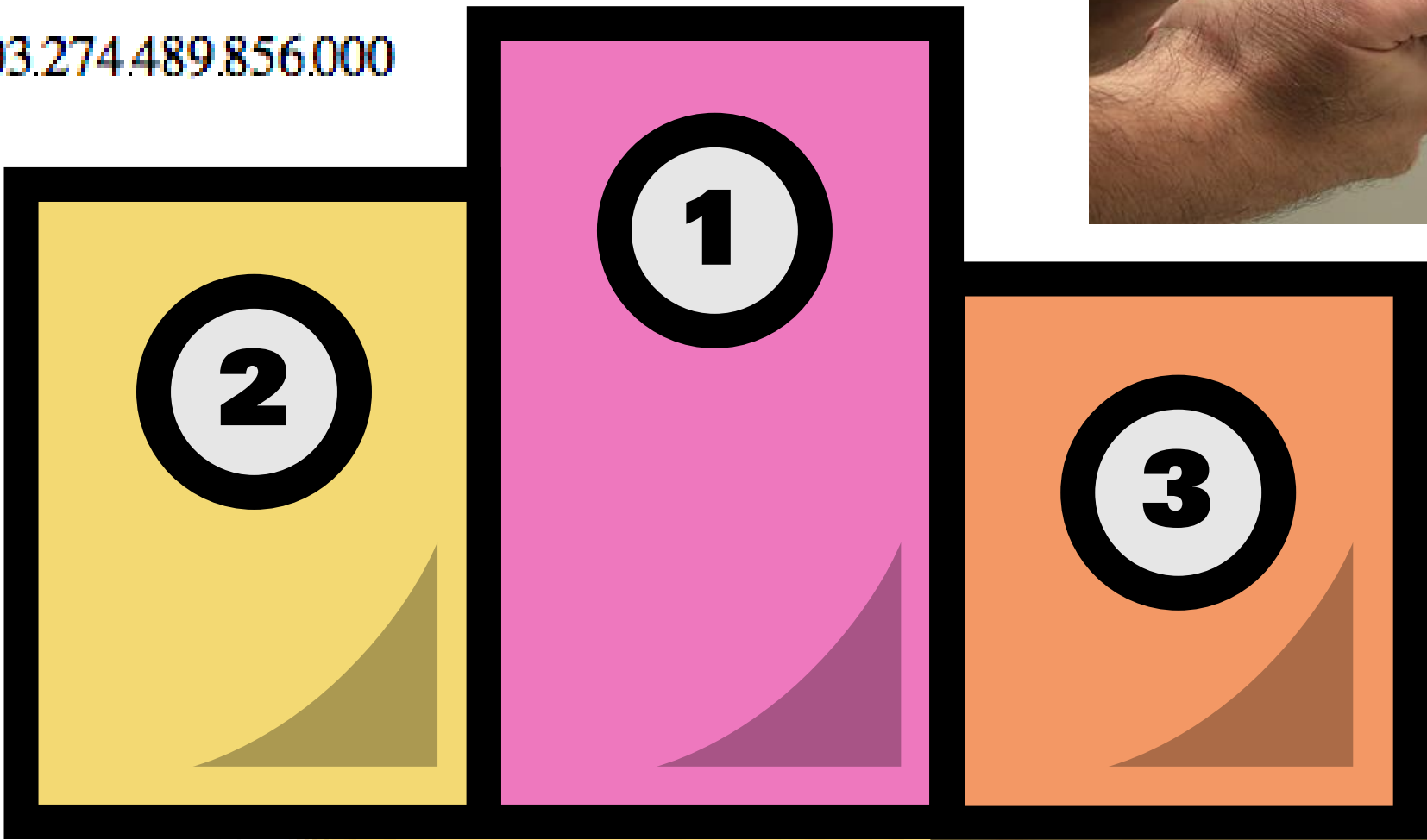
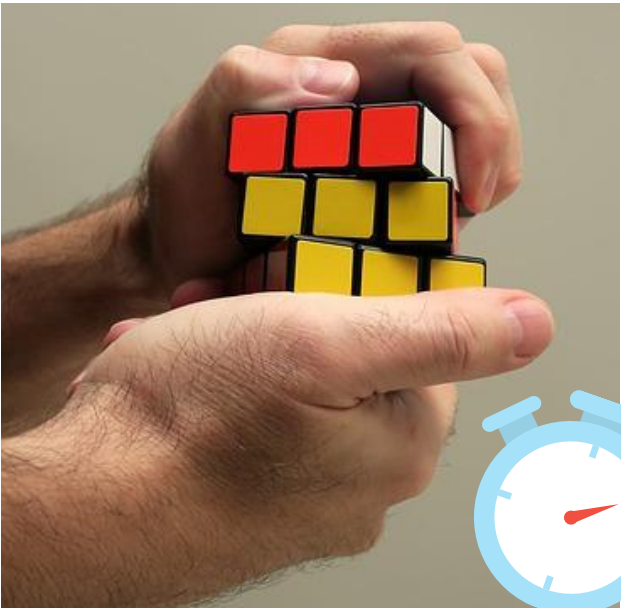
$$\frac{8! \cdot 12! \cdot 3^8 \cdot 2^{12}}{2 \cdot 3 \cdot 2} =$$

43.252.003.274.489.856.000

The most expensive Rubik's Cube ever was created by Fred Cueller along with Diamond Cutters International and is worth US \$2.5 Million.



4.90 seconds is a world record in the composition of the Rubik's Cube with hands and is from November 2015. The cube can also be folded with his feet, and it was the fastest in 20.57 seconds. A Robot named Sub1 solved the Rubik's Cube in 0.887 seconds!



Source 2

Source 1

Source 3a
Source 3b

sk.maruska, Ege Alper U., Elifnaz B, cz Artur, sk.fl11p

Solve with us!

The task is to assemble one side of the cube according to Figures 1 to 5.

Take a picture and share your solution in the TwinSpace discussion forum.

Figure # 1

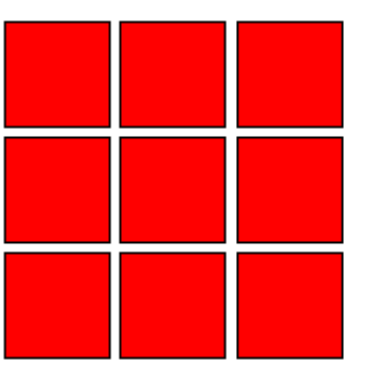


Figure #2

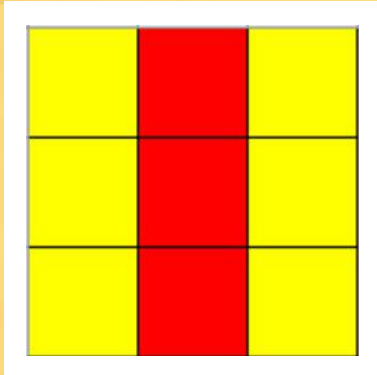


Figure #3

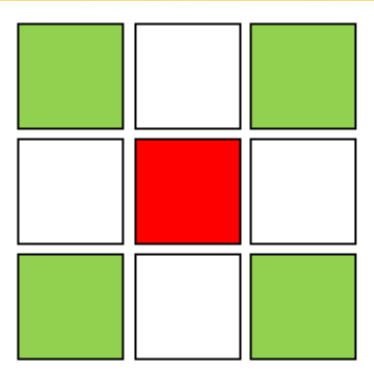


Figure #4

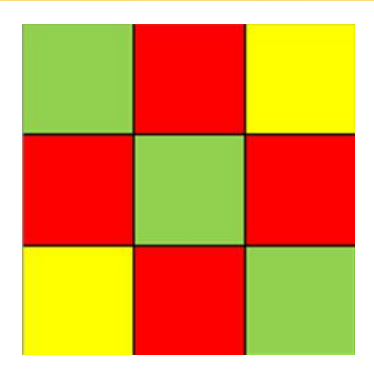
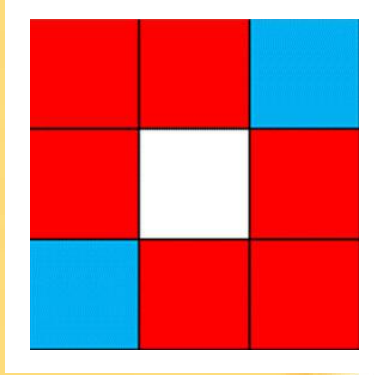


Figure #5



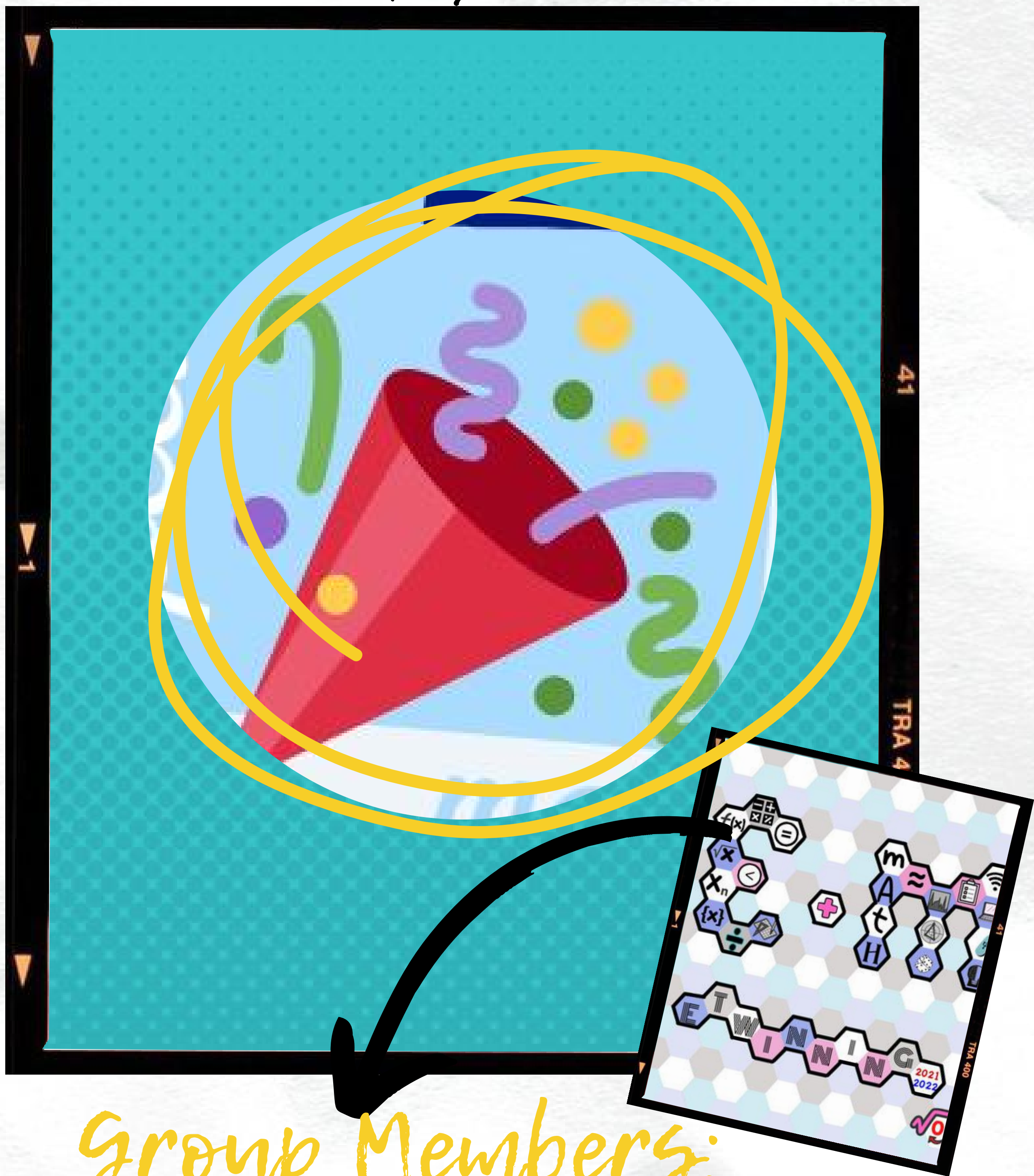
What your solution should look like this



sk.nika

Chapter 8 Special Math Days

of the e-book
"Play with us, Math is fun!"



Group Members:

tr.bengisu/Kırıkkale, sk.Renatka, sk.agnes, cz.karolina, sk.vaness, sk.Vanesa, tr Ahmet/Kırıkkale, Fr.Diane-Elodie, pt.Daniel Pinheiro, cz.Michal, cz Terka, pt Rúben Neves

Advisor teacher: Gabriela Svobodová, Czech Republic

Mathematics Holidays to Celebrate

Did you know there are special mathematics holidays?

There is a wide variety of holidays related to mathematics. These days we celebrate mathematics or the contributions of famous mathematicians.

We present to you here:

Yellow Pig Day, Mind Day, Pi Day π , Square Root Day, Phi Day ϕ , Fibonacci Day, Pythagorean Theorem Day, (Mole Day)

However, there are several other mathematical holidays throughout the year that honor mathematicians and their work.

Because mathematics is not everyone's favorite subject most people do not know these special mathematics days. We hope you find your favourite special mathematics day.



YELLOW PIG DAY

July 17



Despite its name, this day is not a celebration of pigs, but a celebration of number 17.

Number 17 is a prime number with a special property. It is the **sum of the first four prime numbers** - 2, 3, 5 and 7.

Prime numbers are numbers that can only be divided by 1 and by themselves.

This unofficial holiday was created by mathematics students -David Kelly and Michael Spivak, while working on the **special properties of number 17.**



sk Renatka

CELEBRATION OF THE MIND DAY

Celebration of the Mind Day is observed on October 21, on the birthday of the famous mathematician, Martin Gardner. Developed by the Gathering 4 Gardner Foundation.



October 21

tr Ahmet/ Kırıkkale

We celebrate



March 14. - day π

In the example of the number pi, we understand that infinity is not as infinity.

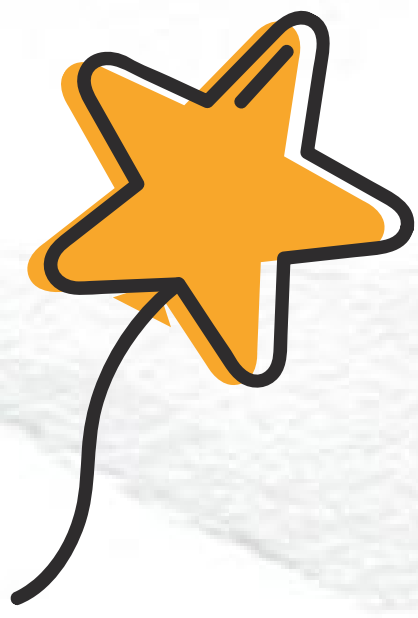


Day pi is a celebration of the well-known mathematical symbol π , which represents the **ratio of the circumference of a circle to its diameter.**

The number has no end, it is infinite. The abbreviated sequence of the number is **3.14**, which explains why Pi Day is celebrated every year on the **14th day of the 3rd month.**

$\pi = 3,14159\ 26535\ 89793\ 23846\ 26433\ 83279\ 50288\ 41971\ 69399\ 37510\ldots$

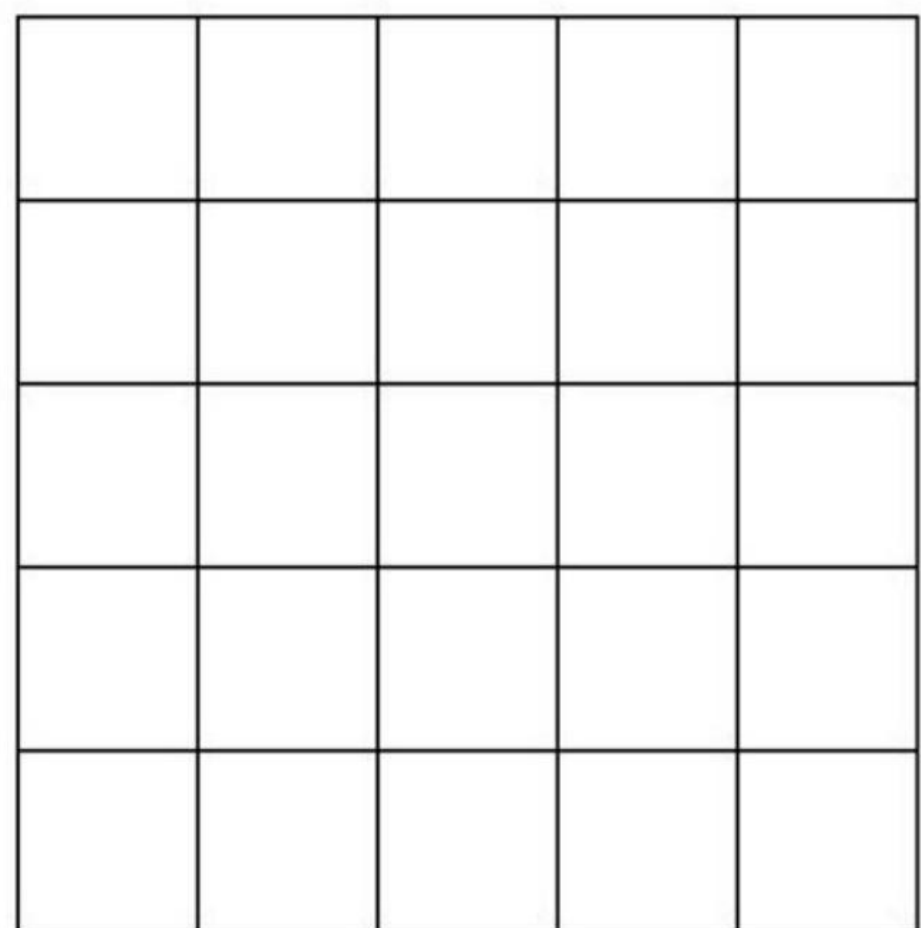
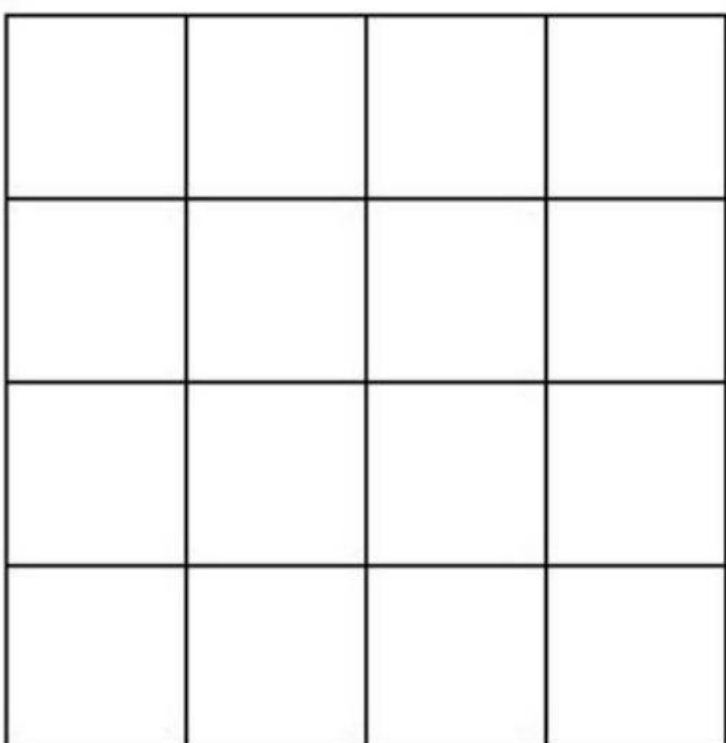
sk Vanesa



*We
celebrate*



Square Root Day



$$4 \cdot 4 = 16$$

$$5 \cdot 5 = 25$$

The only thing square about Square Root Day is the date. When the day and the month are both the square root of the last two digits of the year, we have a Square Root Day.

April 4, 2016 (4/4/16) was a Square Root Day, but the next one won't be until May 5, 2025 (5/5/25)! Get radical and make these special days square-themed.



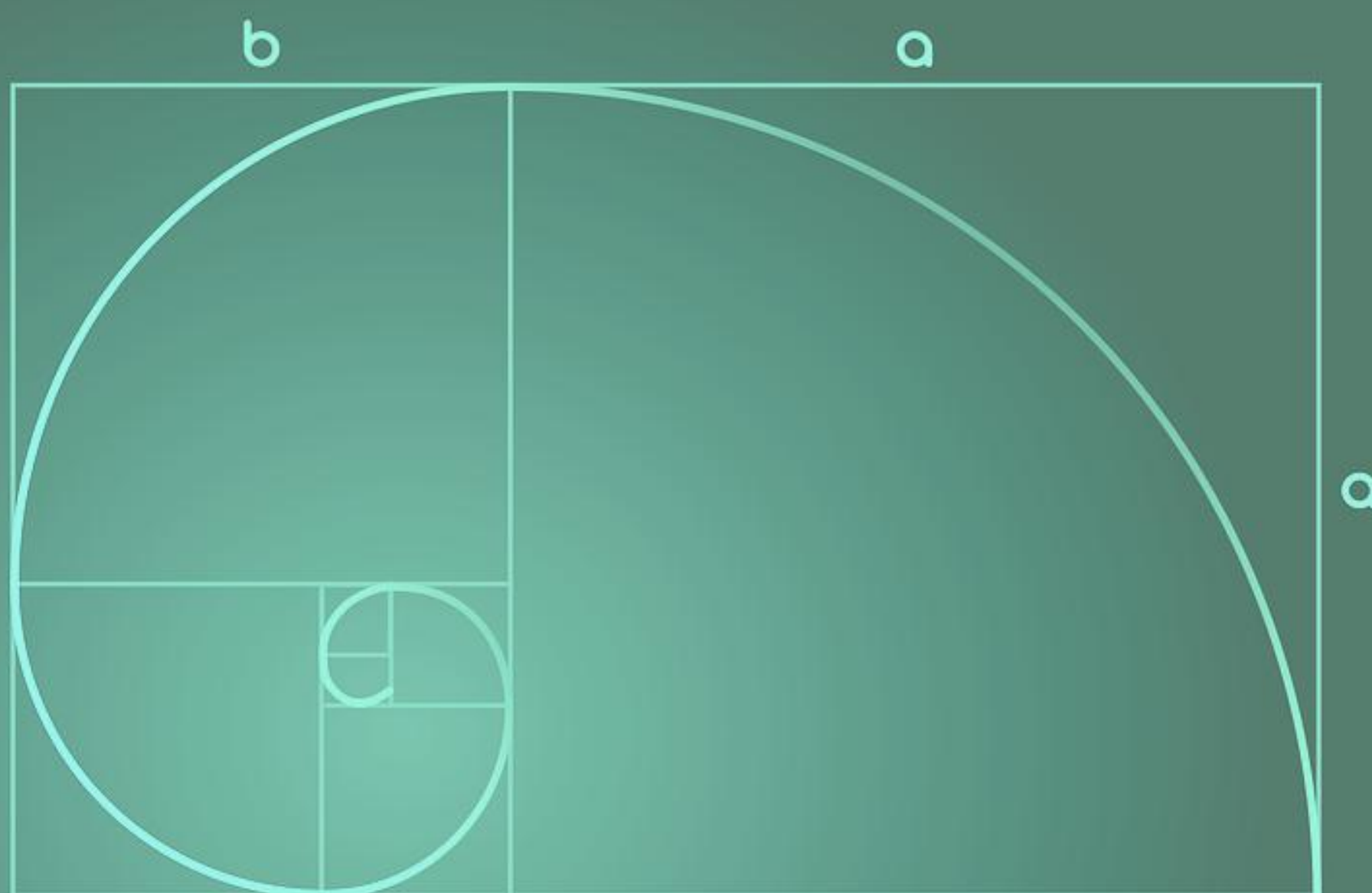
It is celebrated
on 6 Jan 2018 (1/6/18)
and the following
on 6 Jan 2118 (1/6/18)



PHI DAY

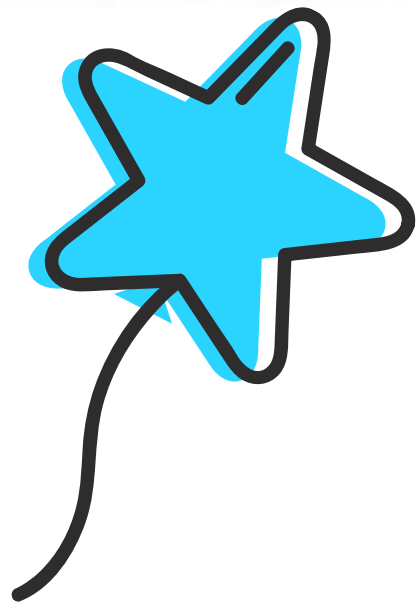
PHI DAY IS ABOUT THE 'GOLDEN RATIO' OF APPROXIMATELY 1.618 DENOTED BY THE GREEK LETTER PHI. ARTISTS LOVE THIS RATIO FOR PAINTINGS (LONG SIDE TO SHORT SIDE).

THE FAMOUS MONA LISA PAINTING USES THE GOLDEN RATIO IN MANY WAYS FROM HER FACE, TO THE POSITION OF HER EYES.

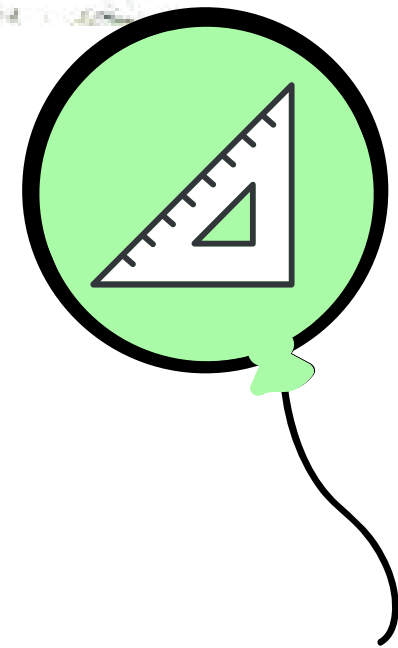


$$\frac{a+b}{a} = \frac{a}{b} = \Phi = 1.61803...$$

cz Terka



We
celebrate



$$a^2 + b^2 = c^2$$

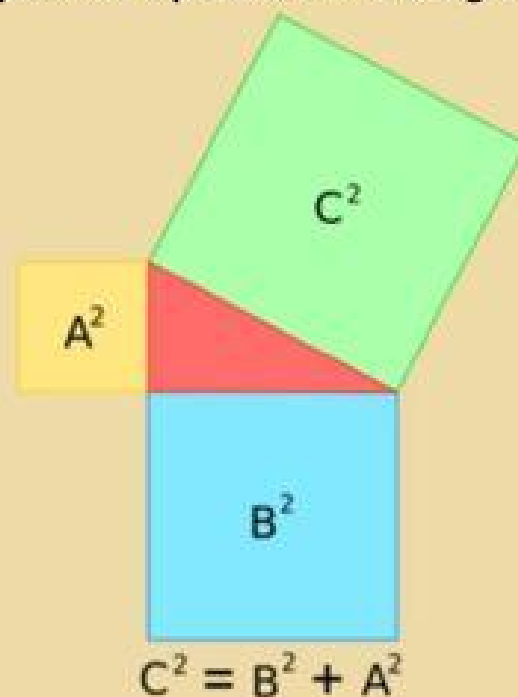
Pythagorean Theorem Day

THE THEOREM IS NAMED AFTER GREEK
MATHEMATICIAN AND PHILOSOPHER,
PYTHAGORAS.

Pythagoras Theorem Day is celebrated when the sum of the squares of the first two
digits in a date equals the square of the last digit in the date.

The holiday gets its name from
Pythagoras' Theorem, which
defines the relationship between
the sides of a right triangle –
where one angle is at 90 degrees.

According to the Theorem, in
a right triangle, the square of
the hypotenuse is equal to
the sum of the square of the
other two sides.

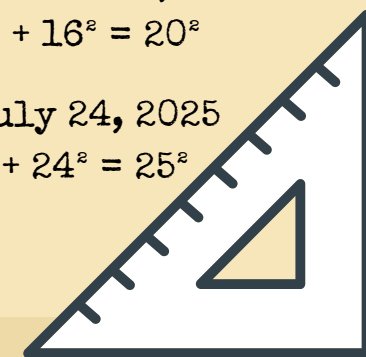


Celebration

This formula is celebrated
on days of the year that match
the formula.

on December 16, 2020
 $12^2 + 16^2 = 20^2$

on July 24, 2025
 $7^2 + 24^2 = 25^2$



sk Agnes

What is the Power of Ten?

Power of Ten, in mathematics, any
of the whole-valued (integer)
exponents of the number 10. A
power of 10 is a many number 10s
as indicated by the exposant
multiplicated together. Thus,
shown in long form, a power of 10 is
the number 1 followed by n zeros,
where n is the exponent and is
greater than 0.



The Power of Ten

When is this day?

This day takes place on
October 10th every year.



diane-elodie nino

23
NOVEMBER

F
i
B
O
N
A
C
C
i
D
A
Y

1
1
2
3

233
377
610
987

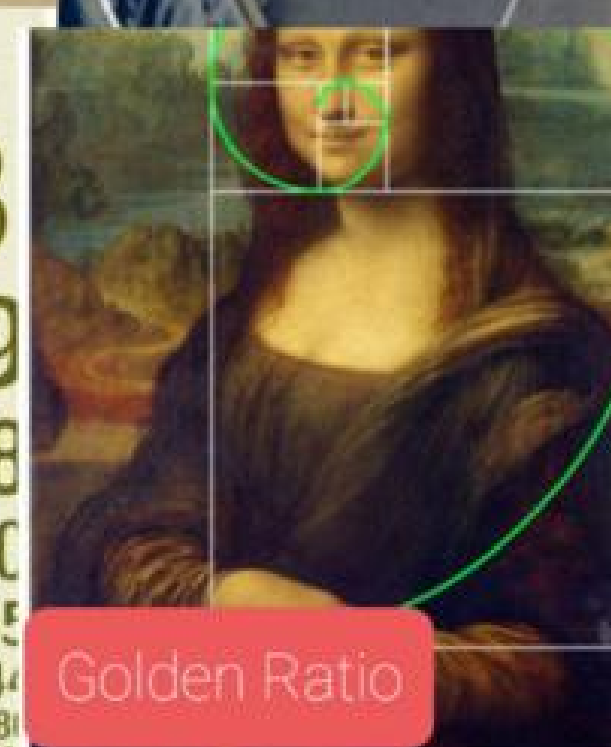
34
55
89
144

5
8
13
21

987
1597
2584
4181



Φ
1.61803
398874989
48482045868
34365638117720
309179805762862135
4486227052604628189024
9707207204189391137484754088
7538689175212663386222353693179318008
0766736166411180086466819487005618177366111007878



Golden Ratio

- The terms in the Fibonacci sequence are obtained by adding the two preceding terms.

1,1,2,3,5,8,13,21,34,55,89,...

- The ratio of consecutive terms gets closer to the golden ratio.
- 11,23 which is formed by the combination of the first numbers 1,1,2,3, that is the 23rd day of the 11th month is celebrated as the Fibonacci day.

tr Bengisul Kırıkkale

Now it's your turn

1st TASK

Which day do we celebrate on June 28?

Clues:

- 1) The date is connected with this number.
- 2) This sound is connected with this day: <https://youtu.be/4rA4ZRErjIE>

2nd TASK

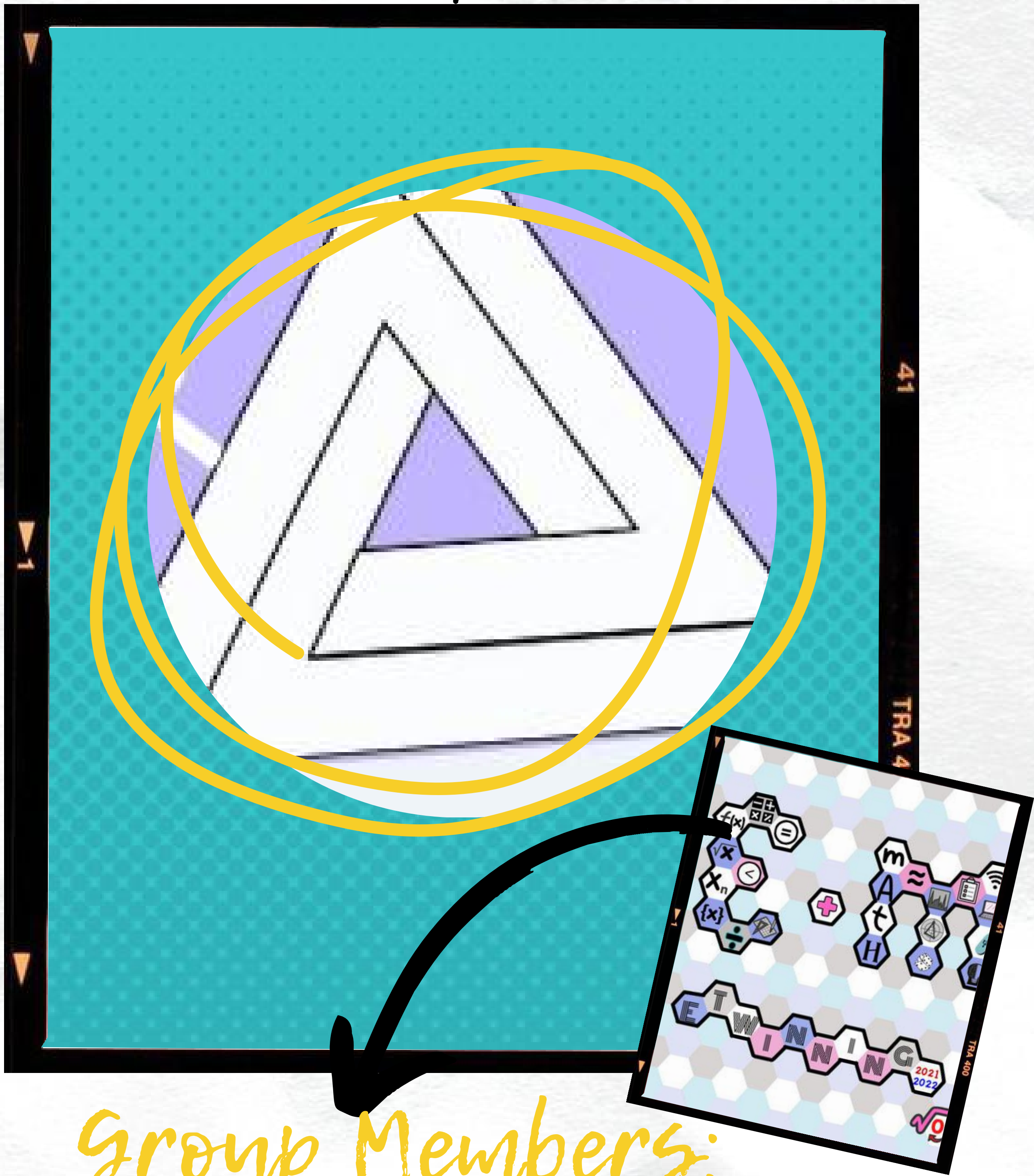
Try write the date when we could or will be able celebrate Palindrome Day?

Clues:

- 1) Palindrome days fall on any dates where the numbers of the month, day, and year are the same both forward and backwards.
- 2) Start with five-digit Palindrome dates (M/DD/YY) and work up to eight-digit dates (MM/DD/YYYYY).

Chapter 9 Simple Illusions

of the e-book
"Play with us, Math is fun!"



Group Members:

tr Seda/Kırıkkale, tr Rumeysa/Kırıkkale, Tr Demirhan/Ankara, tr Bilal/Kırıkkale,
sk.tomnoho, cz Nikola, cz Tereza

Advisor teacher: Nuriye Pinar Tozman, Turkey/ Ankara

Information about Illusion

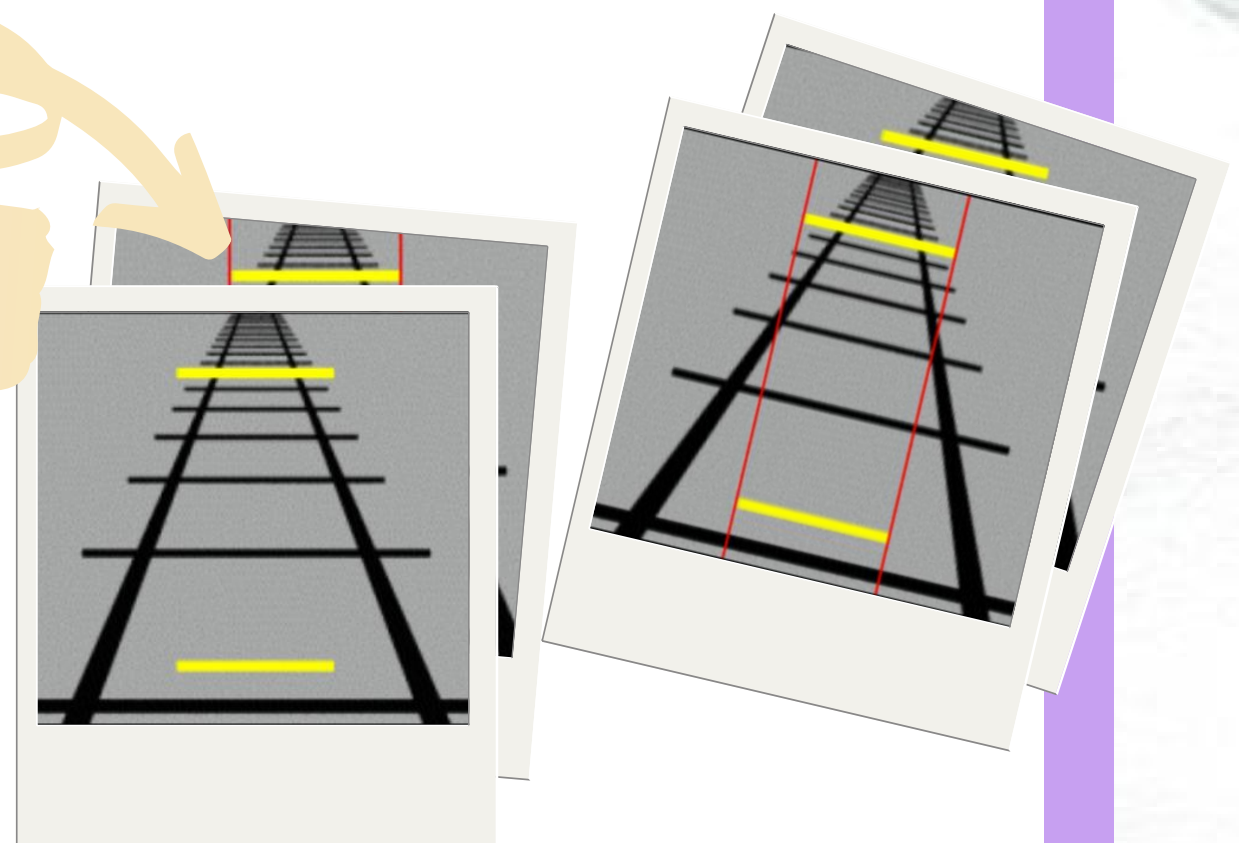
Creation and testing of perceptual illusions has been a fruitful approach to the study of perception—particularly visual perception—since the early days of psychology. People often think that visual illusions are simply amusing tricks that provide us with entertainment. Many illusions are fun to experience, but perception scientists create illusions based on their understanding of the perceptual system. Once they have created a successful illusion, the scientist can explore what people experience, what parts of the brain are involved in interpretation of the illusion, and what variables increase or diminish the strength of the illusion. Scientists are not alone in this interest. Visual artists have discovered and used many illusion-producing principles for centuries, allowing them to create the experience of depth, movement, light and shadow, and relative size on two-dimensional canvases



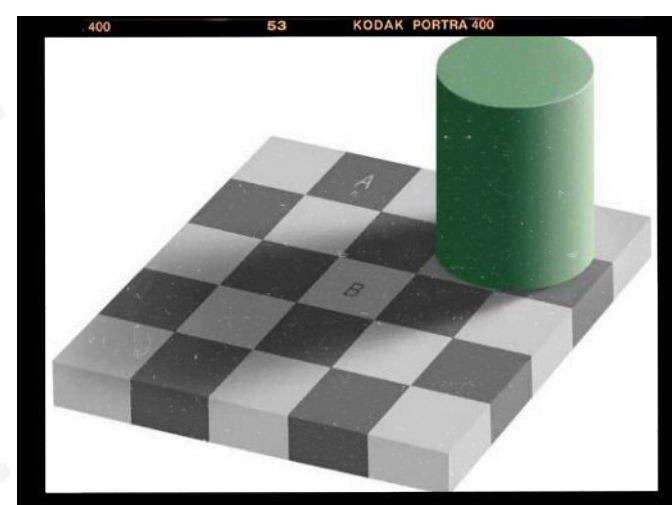
Almost all geometrical optical illusions have components that are at present not amenable to physiological explanations. The subject, therefore, is a fertile field for propositions based in the disciplines of perception and cognition. To illustrate: Instead of interpreting them as just a pair the sloping lines within which one feature is seen smaller than an identical one nearer to the point of convergence, the Ponzo pattern may be taken for a railroad track rendered as a perspective drawing. A barrel lying within the rails would have to be physically wider to cover the increased portion of the width of the track if it were farther away. The consequence is the judgment that the barrels differ in diameter, whereas their physical size in the drawing is equal.

TR.DEMIRHAN/ANKARA

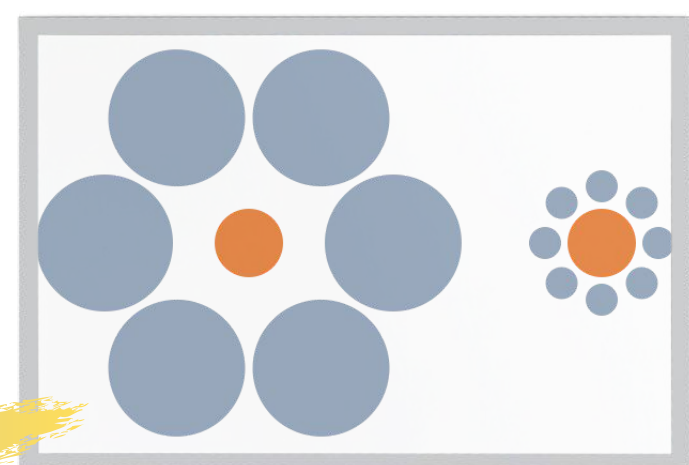
Look at Figure 2 below. Which of the two horizontal yellow lines looks wider, the top one or the bottom one?



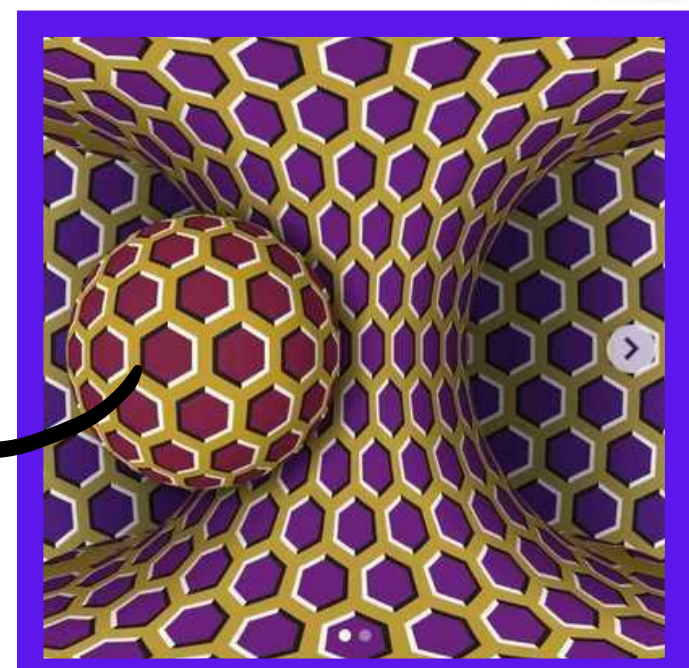
Our visual systems work with more than simple contrast. They also use our knowledge of how the world works to adjust our perceptual experience



Most people see the circle on the right as larger than the one on the left. The two orange circles are exactly the same size. The Ebbinghaus illusion again illustrates the tendency of our perceptual systems to adjust our experience of the world to the surrounding context.



Illusion that claims to reveal how stressed you are. The optical illusion has been going viral with a caption that explains that if the image appears still to a viewer, it means they are calm. However, if it moves slightly, it indicates they are slightly stressed, and if it moves like a carousel, it means they are very stressed.

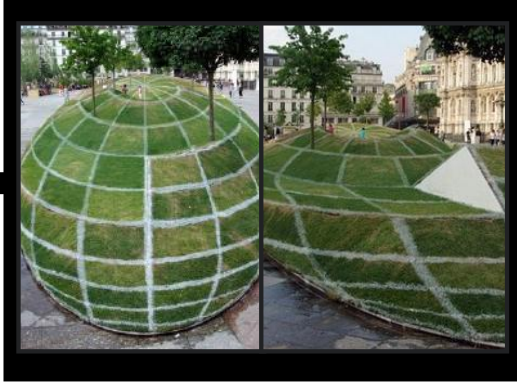


TR.SEDA/KIRIKKALE

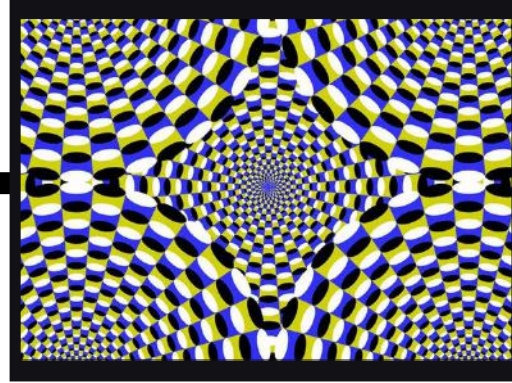
SOURCE-1

SOURCE-2

Interesting images about illusion



TR.SEDA/KIRIKKALE



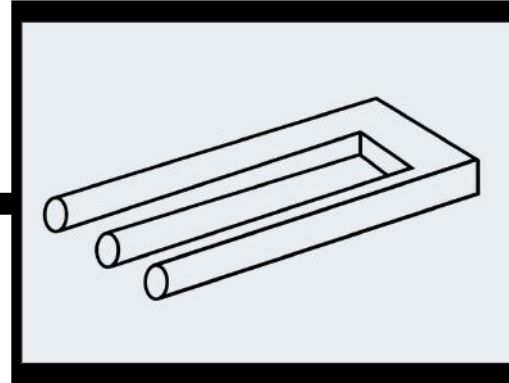
TR.ERCAN ALI/ANKARA



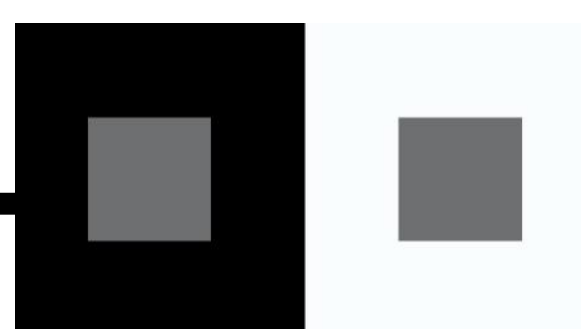
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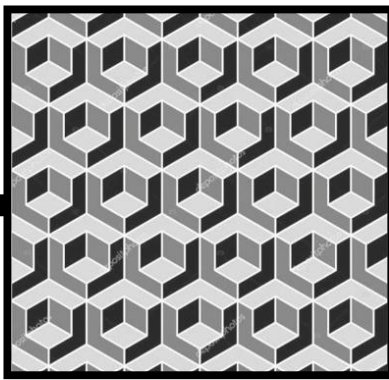
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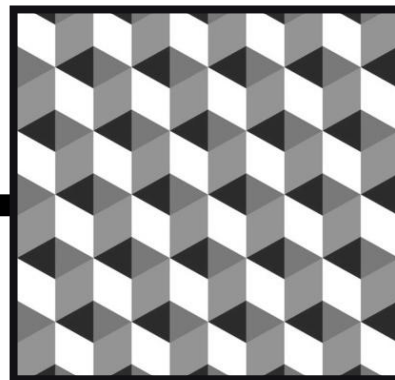
CZ.TEREZA



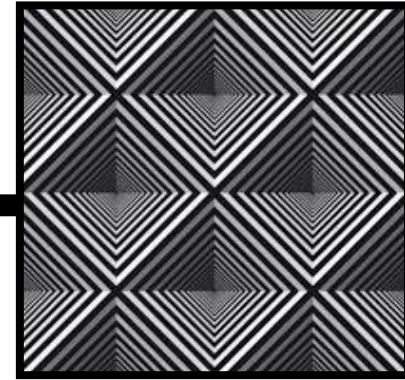
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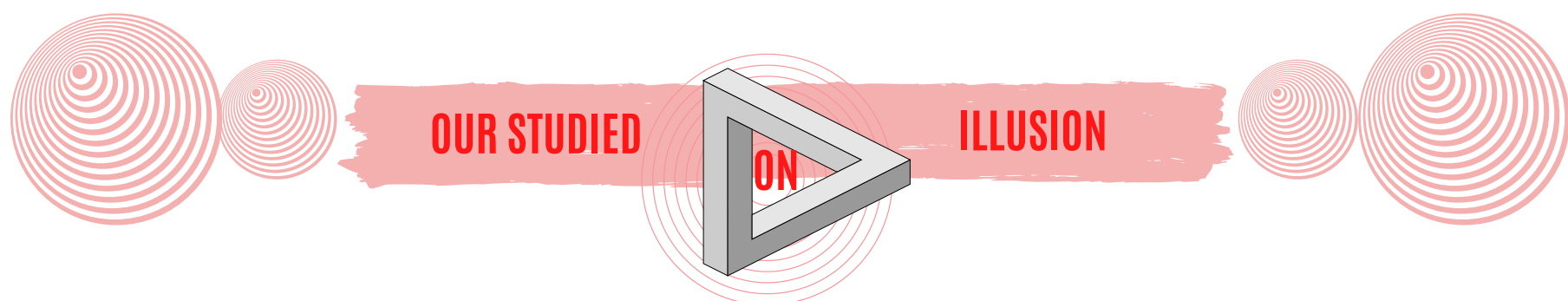
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TR.DEMIRHAN/ANKARA

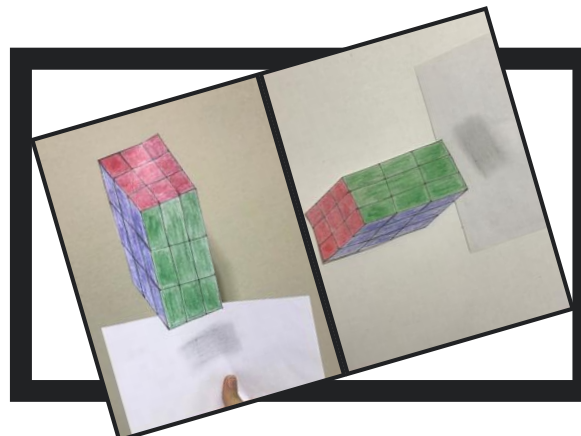


TR.SELIM EMRE/ANKARA



[YouTube](#)

TR.SEDA/KIRIKKALE



[YouTube](#)

TR.RÜMEYSA/KIRIKKALE



[YouTube](#)

TR.BILAL/KIRIKKALE

Chapter 10

Tangram Shapes

of the e-book
"Play with us, Math is fun!"



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fr.Manuella, fr.Milove, cz Lucka, cz.amalka sk Katarina, sk Emka, sk Michaeela

Advisor teacher: Gabriela Svobodová, Czech Republic

What is a tangram?

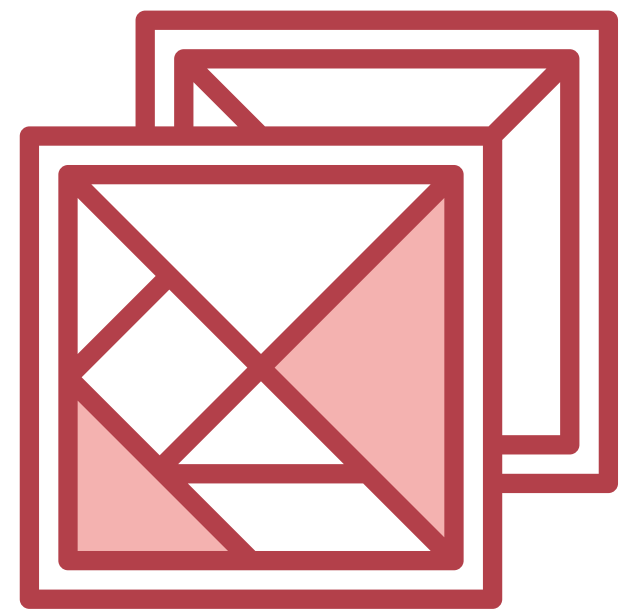
Tangram is a Chinese puzzle that consists of the following seven basic parts:

square

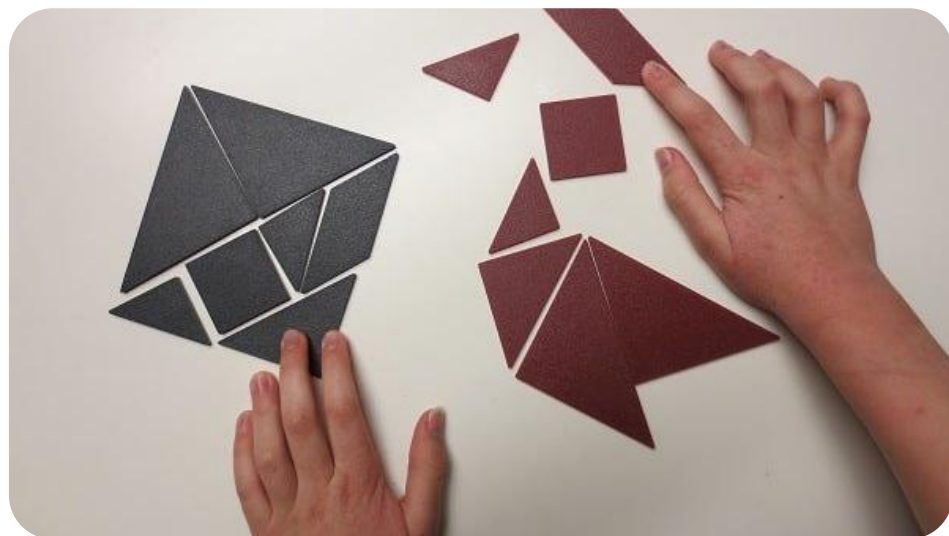
5 triangles.

parallelogram

The essence of the puzzle is to put together a square of all the above parts so that no shapes overlap. Gradually, further modifications of the puzzle emerged. The goal was to use Tangram parts to assemble pre-drawn figures or objects.



sk.emka



Tangram Shapes

Why Do We Use Tangram?

Like building blocks, tangrams can develop problem-solving and logical thinking skills, perceptual reasoning, visual-spatial awareness, creativity, and many mathematical concepts such as congruency, symmetry, area, geometry, and perimeter. They help kids learn geometric terms and develop stronger problem-solving abilities. Children can perform better in tests of basic arithmetic with the help of tangrams. There are over 6,500 shapes and pictures that can be created using a tangram puzzle.

tr Aminel Kırıkkale

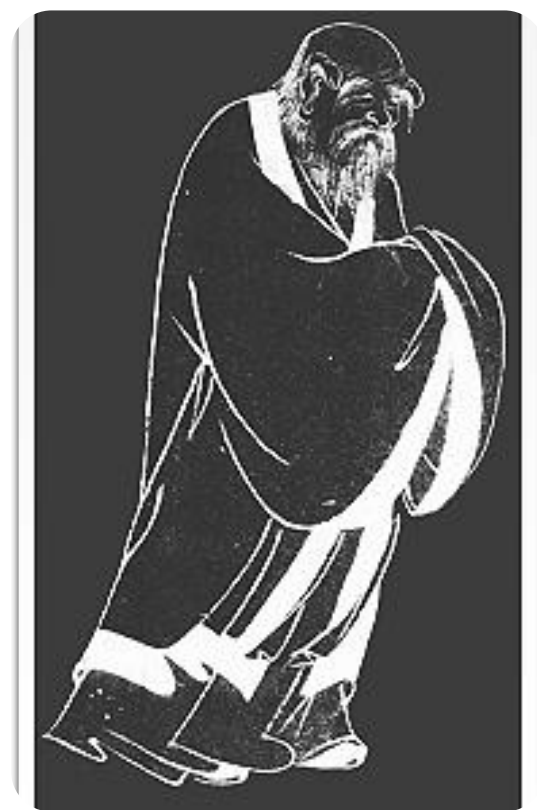
History of The Tangram Puzzle

Tangram puzzles originated in Imperial China during the Tang Dynasty, they are thought to have travelled to Europe in the 19th century on tradinships.

Tangram puzzles were popular during World War 1 and have become the most popular dissection puzzle in the world. Besides, tangram patterns have also been described as early psychological tests.

Tangram patterns are called in China "Chin-Chiao Pan" meaning intriguing seven piece puzzle. A book published in China in 1815 by Shan-Chiao contains 374 puzzle patterns. Early Chinese mathematicians manipulated geometric shapes in their problem solving. A technique that is still applied in classrooms today, inter alia, through the use of tangrams.

tr Amine/Kırıkkale

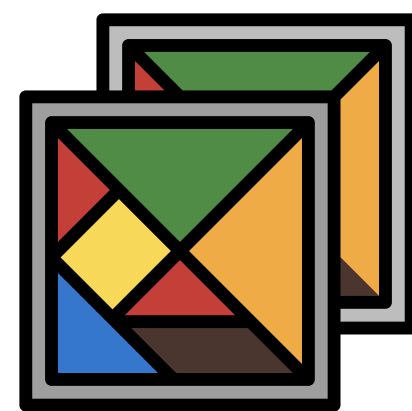


The Legend of The Tangram

How to Use Tangram in Education

- Congruent and similar polygons can be created
- Area and perimeter calculations can be made
- Skills related to ground-direction-direction relationships can be developed
- The properties of geometric objects and shapes can be learned and used in problem solving.
- Relationships between geometric objects and shapes can be determined
- Symmetry information available

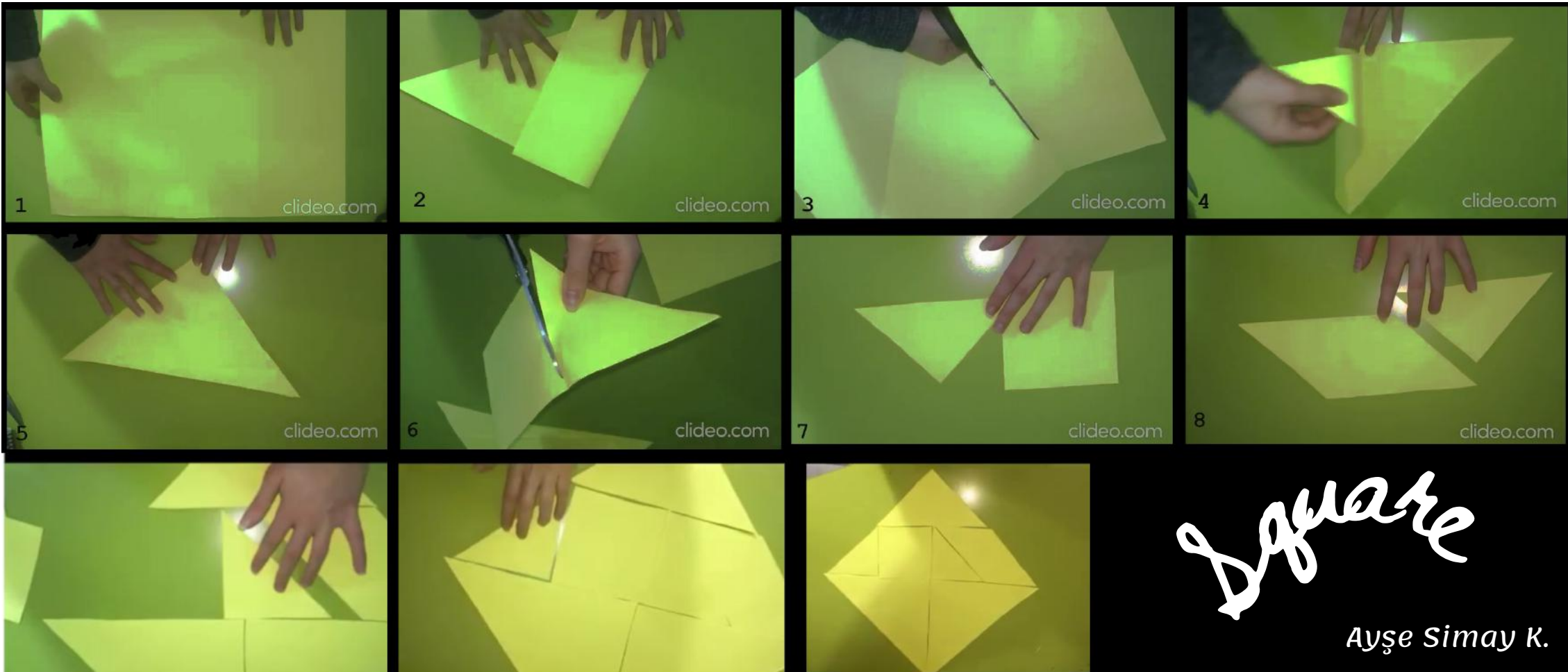
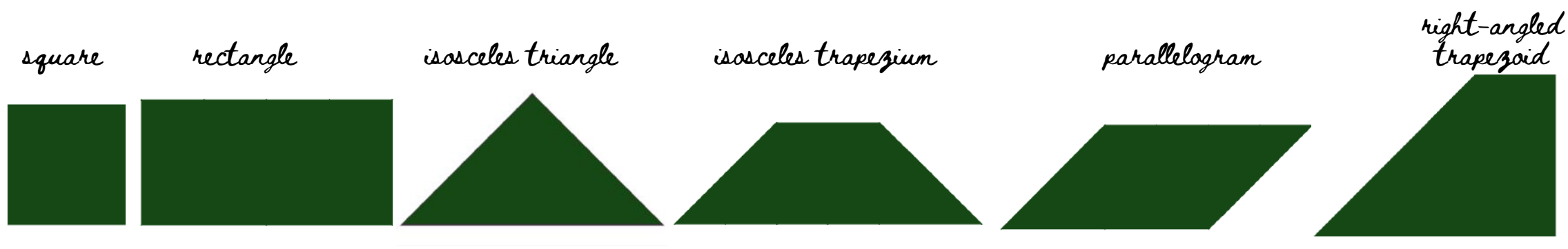
tr Levent/ Kırıkkale



The Preparation of Challenge

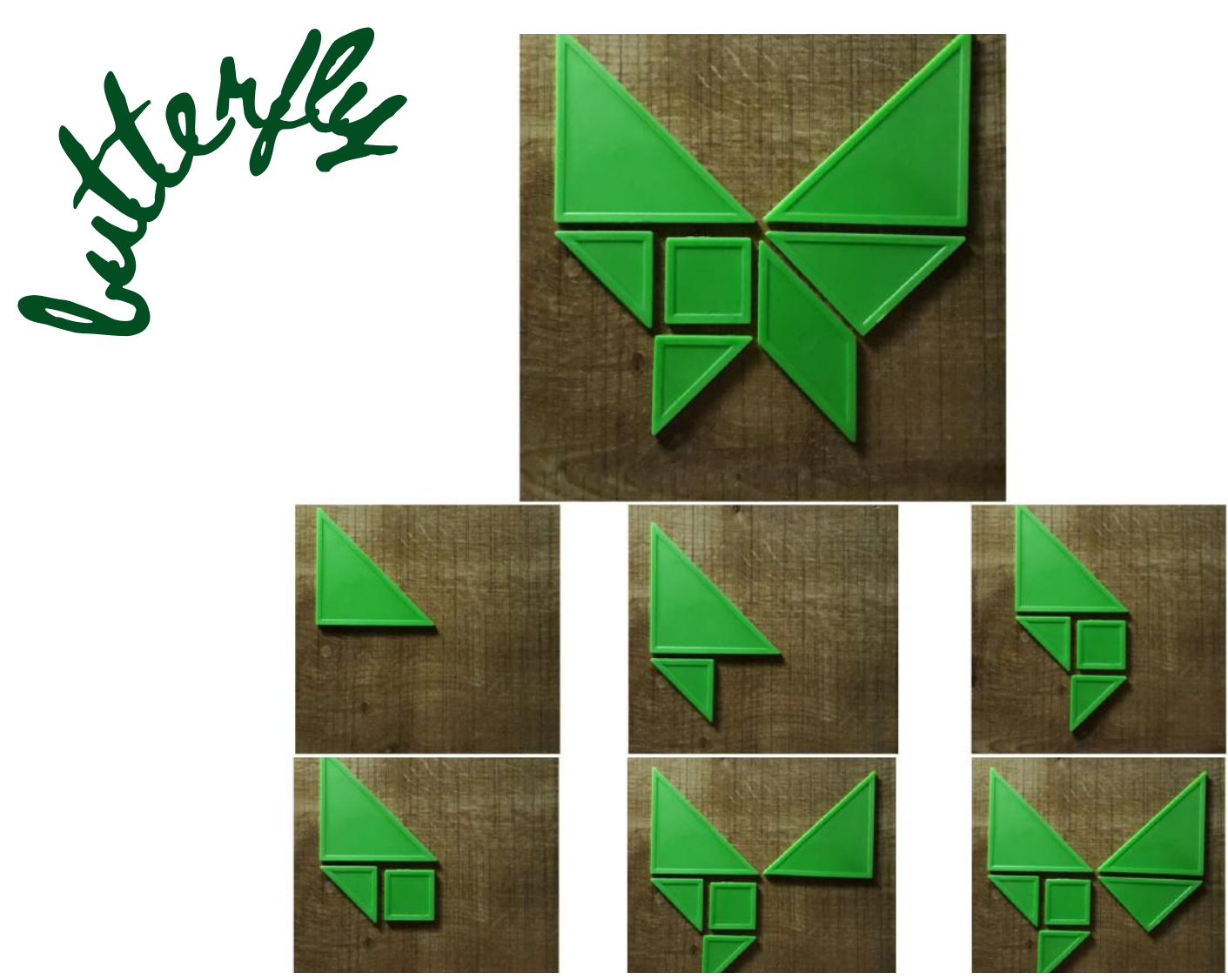
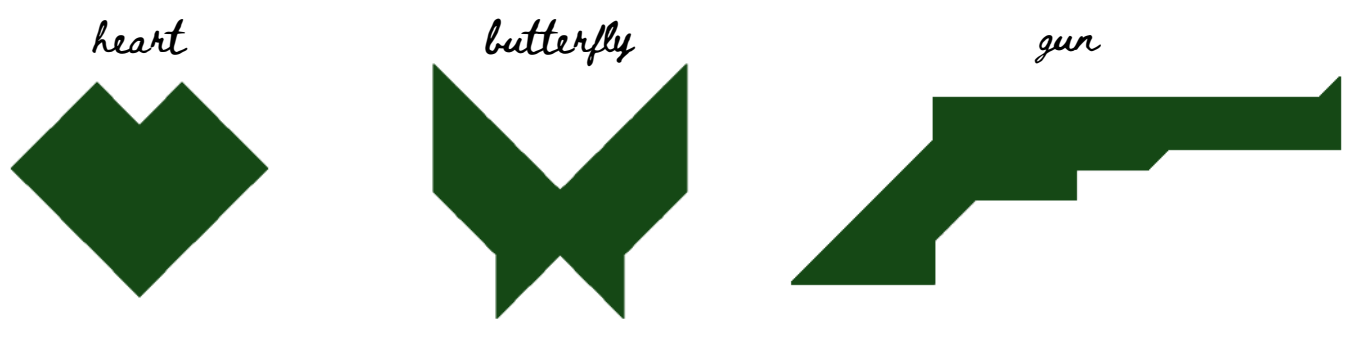
Use the tangram pieces to assemble these geometric shapes. Take pictures of your solutions and post them in the forum in the December assignment evaluation section. You can also try other interesting shapes (below).

The Geometric Shapes



<https://youtu.be/20DnpZR9X6o>

Our Other Interesting Tangram Shapes



https://youtu.be/ufA_owQST_U

tr Amine/Kırıkkale

Chapter 11

The right solutions

of all tasks presented in the e-book
"Play with us, Math is fun!"

Chapter 1

Result of crosswords on page 6 is:

coming
soon

Chapter 2

Result of Eight Directions
crosswords on page 9 is:

coming
soon

Chapter 4

Result of riddles on page 15 is:

coming
soon

Chapter 6

Result of painted crosswords on
page xx is:

coming
soon

Chapter 8

coming
soon

Chapter 10

coming
soon

The e-book
Play with us, Math is fun!
was created by students from



Croatia



Czech Republic



French Guiana



Portugal



Slovakia

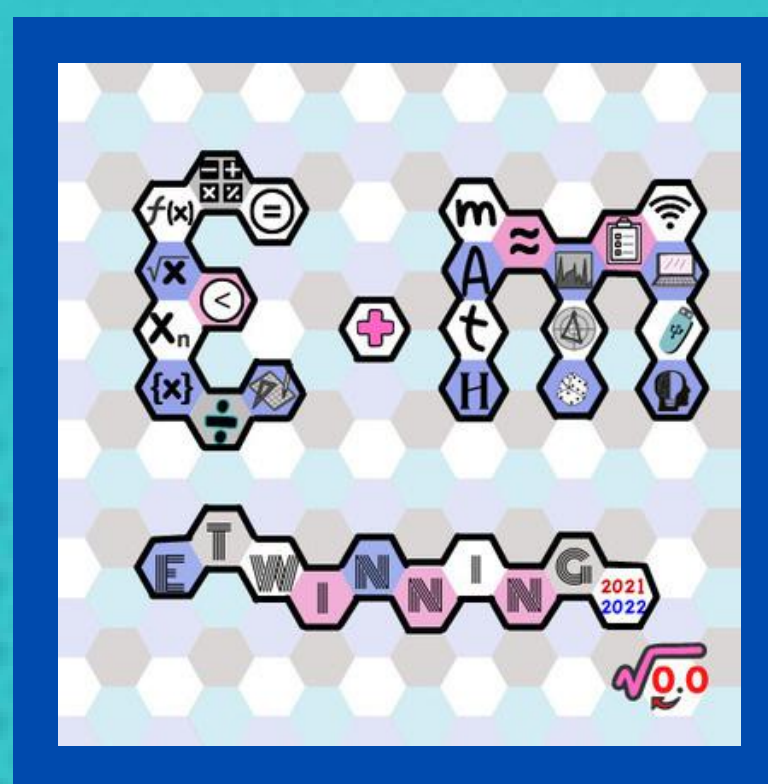


Turkey

Srednja škola Jelkovec
Zagreb
Croatia

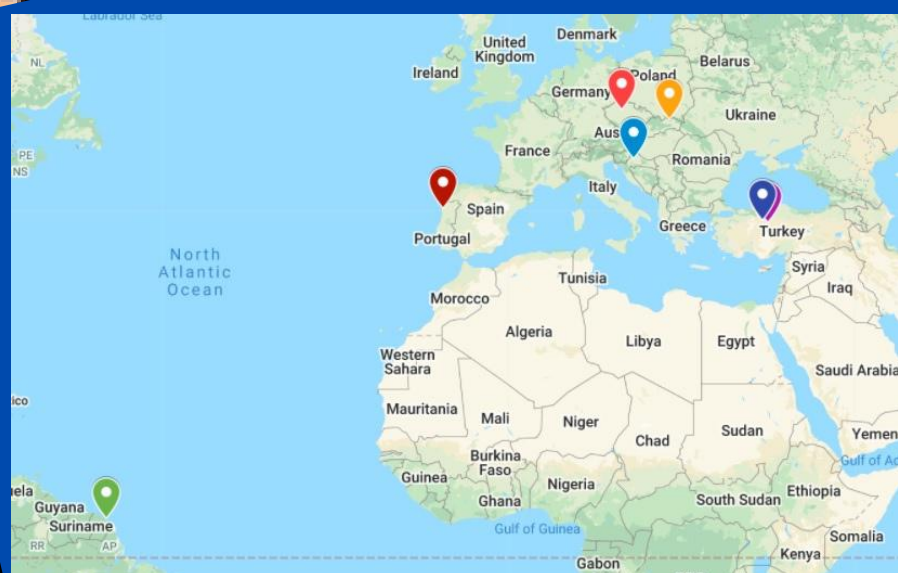
Vocational School of
Logistic Services
Prague
Czech Republic

Balata's high school
Matoury
France/French Guiana



Business Academy
Stara Lubovna
Slovakia

Kırıkkale High School,
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Everyday Math

eTwinning project 2021/2022