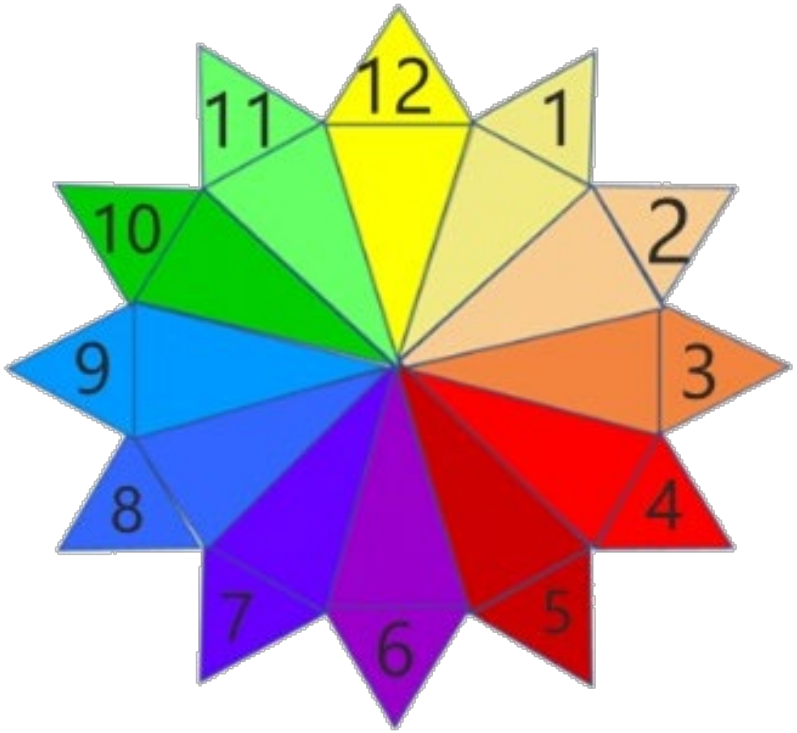
“The Clock” Project



Elementary School ,,Vuk Karadžić”,
Belgrade

The aims of the project

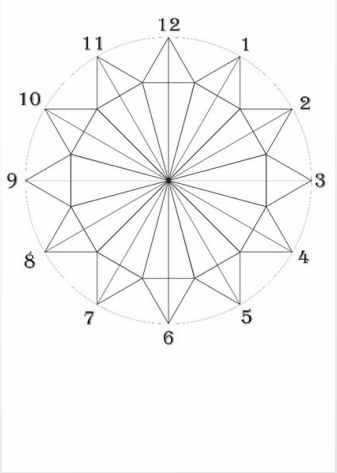
- Developing creative approach through implementation of mathematical knowledge;
- Enabling students to use different software tools;
- Encouraging students' teamwork in order to overcome generation gaps;
- Enabling students to acquire practical knowledge by developing subject correlation

Project Development

- Students apply for project work by writing motivational letters;
- Students choose the best among project ideas and clock models according to set criteria;
- Realization planning and distribution of duties;
- Students engage in project realization during various classes and in free time;
- Presentation of the finished project.

Project Presentation

- Power Point presentation;
- Sway presentation;
- Film, photos and video clips;
- Exhibition of all students' drawings;
- Catalogue published by Elementary School "Vuk Karadžić".



Students' ideas

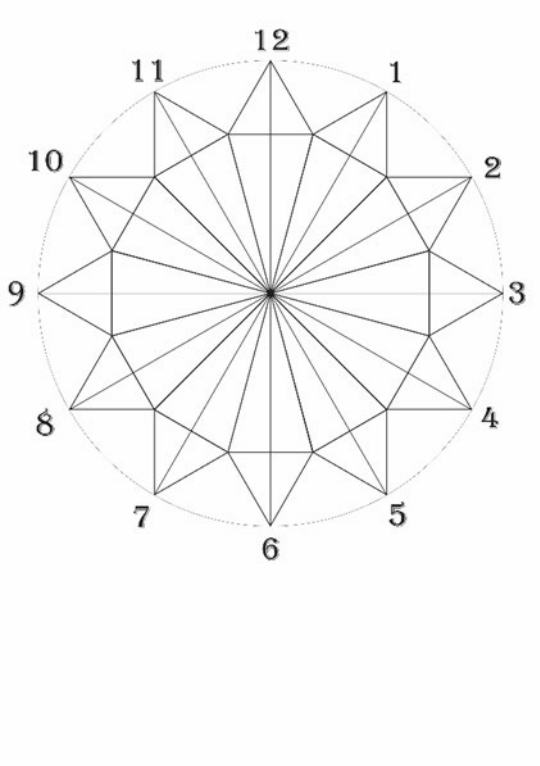
The game for young students

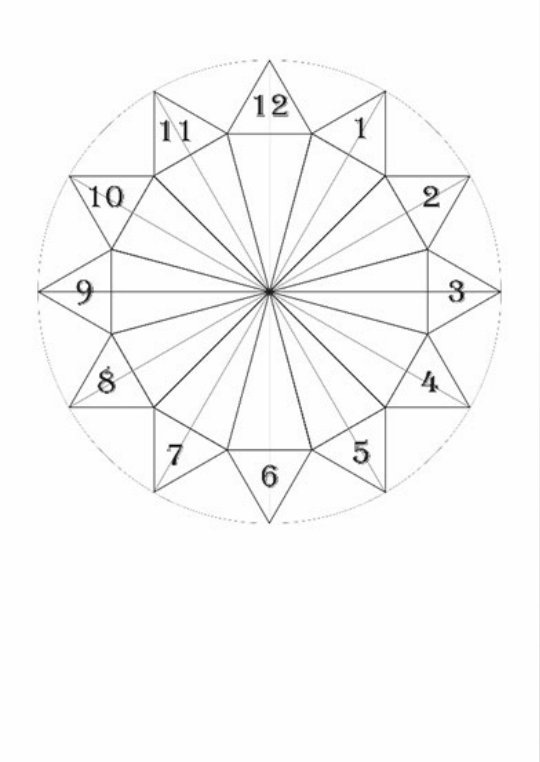
Author: Nina Ilić

The first clock model

Author: Nikolina Jovanović

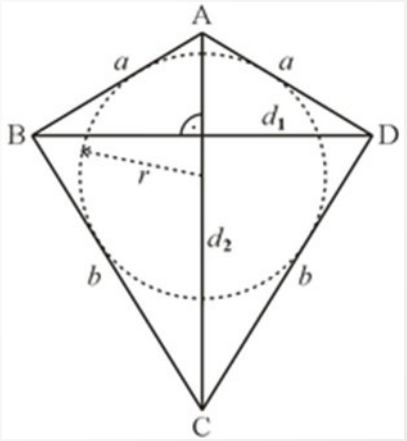
The clock assembled from 12 kites using Illustrator computer program





Author: Nikola Šaranović

Kite (Deltoid)



A Kite is a quadrilateral figure with:

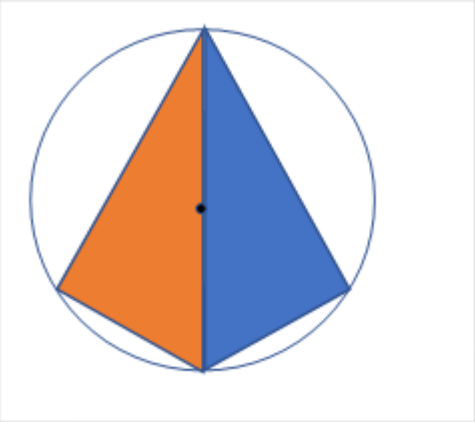
- Two pairs of equal-length sides that are adjacent to each other;
- A pair of equal angles;
- One axis of symmetry.
- Diagonals that cross each other at right angles;
- Two isosceles triangles with the same base.

It was named deltoid because it resembles the letter delta Δ from the Greek alphabet.

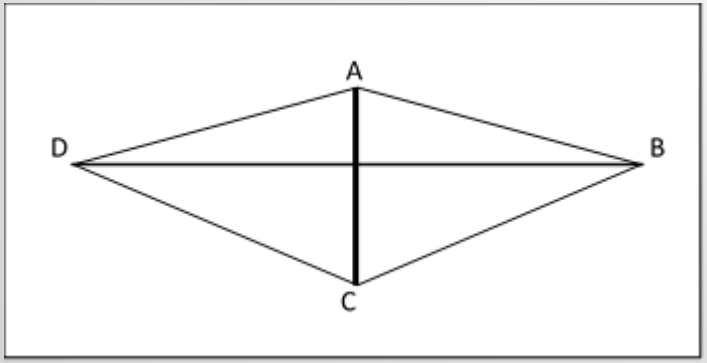
A deltoid has an inscribed circle which makes it a tangential quadrilateral.

Authors: Simon Rapaić and Anja Radošević

Deltoid



- A deltoid can have a circumscribed circle if it has two right angles, if the centre of the circle is in the middle of the shared hypotenuse, ie. in the middle of the diagonal line – the line of symmetry.



- A tangent deltoid is made of two orthodiagonal right angled triangles.

Authors: Simon Rapaić and Anja Radošević

” A dozen ” as a set of 12 elements

- The Moon goes through 12 cycles of Moon phases during one year, ie. it is the number of times the Moon orbits the Earth while The Earth orbits the Sun only once;
- A day has 12 hours while a calendar has 12 months;
- The Ancient Greeks had 12 Olympian gods of the Pantheon;
- The Romans had The Law of 12 Tables, Duodecim Tabulae, which was the foundation of Roman law;
- In Ancient Times there were many alliances of 12 cities;
- Jacob from the Bible had 12 sons who were the progenitors of the 12 Tribes of Israel.

Sets with 12 elements

- In Christian legends Jesus had 12 apostles;
- British King Arthur had 12 knights;
- The Zodiac has 12 signs;
- A computer keyboard has 12 functions;
- The Beaufort scale which measures wind intensity has 12 degrees;
- The European Union Flag has 12 yellow stars;
- According to the Standard Model of Particle Physics, the entire world is made of 12 elementary particles, 6 leptons and 6 quarks.

Author: Iva Bukilić

Number 12

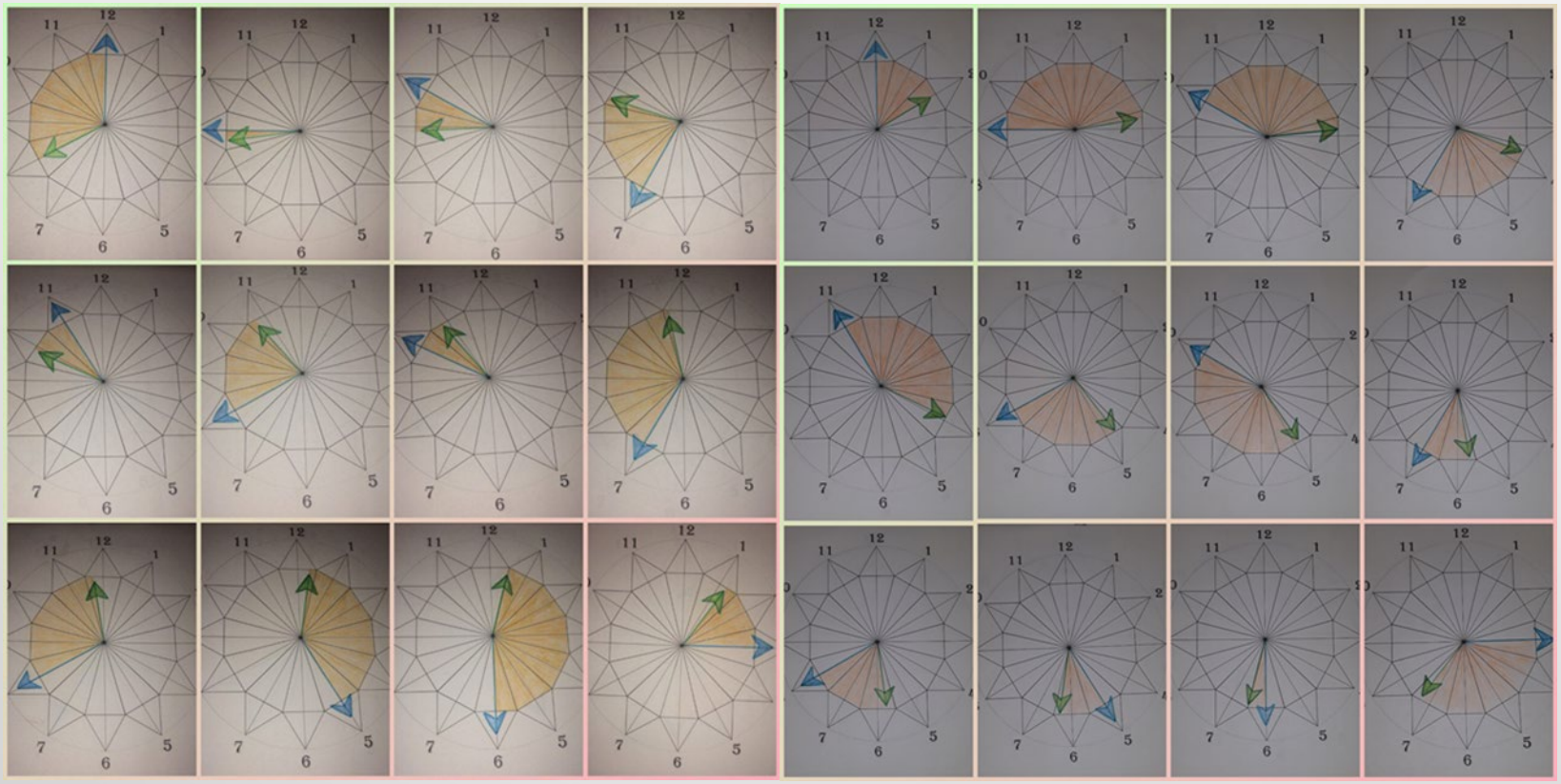
- Number 12 is interesting because of its divisibility.
- It is divisible by the first prime numbers 2 and 3 and 50% of its precedents, including 12, its denominators are (1,2,3,4,6,12).
- This is only characteristic of number 8.
- Number 12 is the first number smaller than the sum of its denominators and precedents 1,2,3,4,6.

Author: Iva Bukilić

Calculating the sum of non-reflex angles between the hands of a clock when the school bell rings

Преподневна смена				
Редни број часа	Време почетка часа	Конвексни угао који заклапају казаљке	Време завршетка часа	Конвексни угао који заклапају казаљке
I	8:00	120°	8:45	7° 30'
II	8:50	35°	9:35	77° 30'
III	9:55	32° 30'	10:40	80°
IV	10:50	25°	11:35	137° 30'
V	11:40	110°	12:25	137° 30'
VI	12:30	165°	13:15	52° 30'
Послеподневна смена				
Редни број часа	Време почетка часа	Конвексни угао који заклапају казаљке	Време завршетка часа	Конвексни угао који заклапају казаљке
I	14:00	60°	14:45	172° 30'
II	14:50	145°	15:35	102° 30'
III	15:55	147° 30'	16:40	100°
IV	16:50	155°	17:35	42° 30'
V	17:40	70°	18:25	42° 30'
VI	18:30	15°	19:15	127° 30'

Non-reflex angles between the hands of a clock when a school bell rings



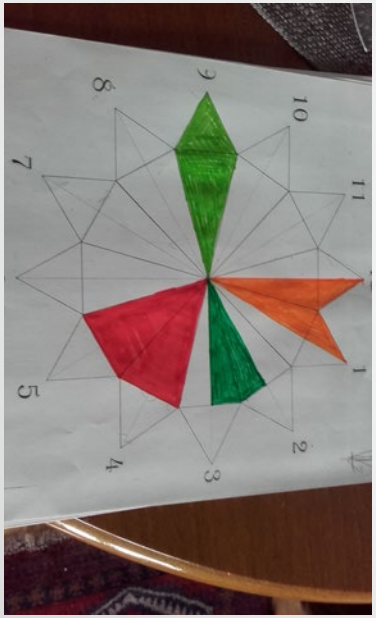
Author: Milica Burgić

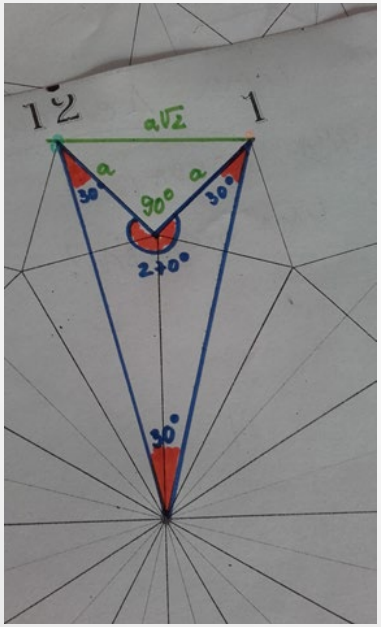
Author: Tara Takić

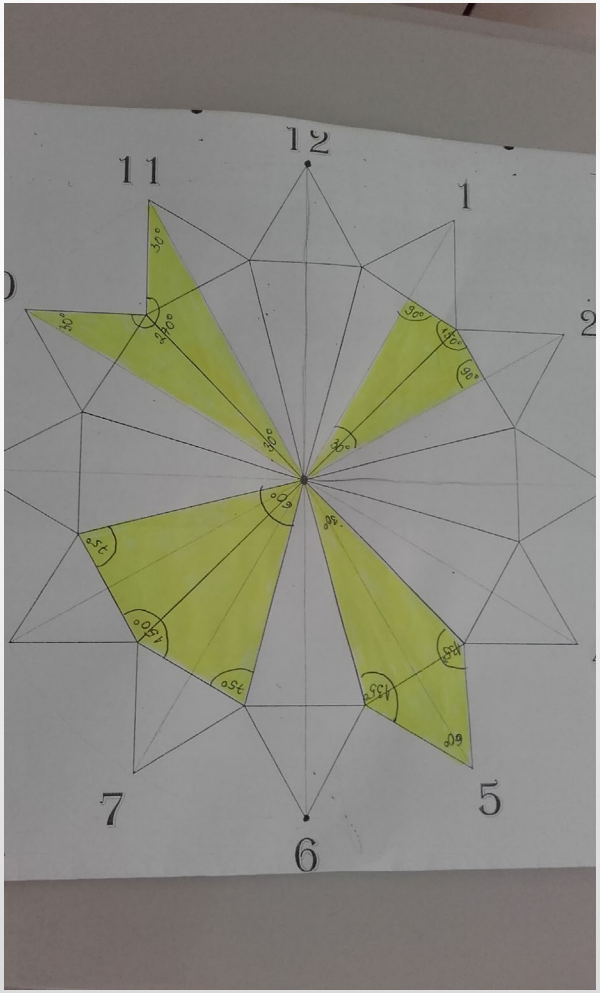
Calculating non-reflex angles between the hands of a clock

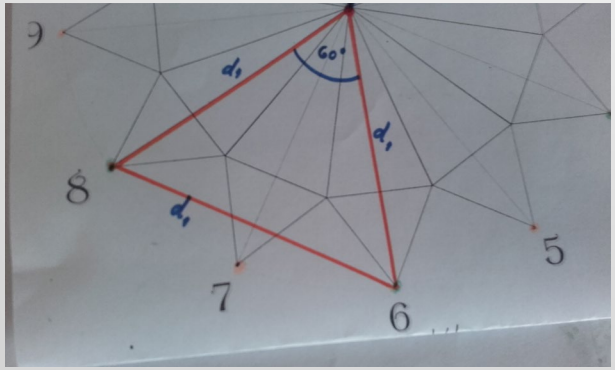
- In one hour the Minute hand turns a full circle, that is, 360°.
- In one hour the Hour hand turns 30°.
- The Minute hand is 12 times "faster" than the Hour hand.
- Analysing the previous calculations regarding the angle between the hands of a clock and the time they show, we have found a formula that can calculate the angle between the clock hands: $\alpha=|30\cdot h-5.5\cdot m|$, where h stand for hours, while m stands for minutes.
- We have used this formula to calculate the angles and to check the data shown in the previous table.
- The clock hands will overlap if the angle is $\alpha=0$.

Students' drawings in Math class

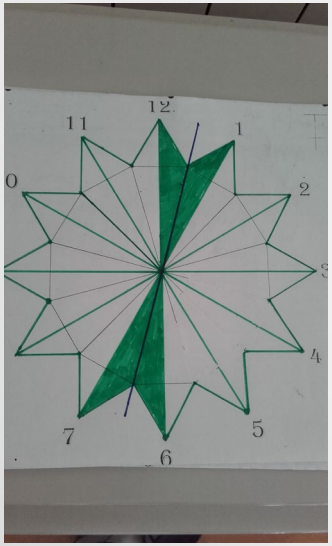


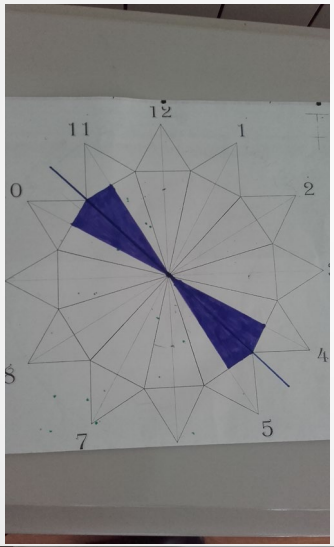


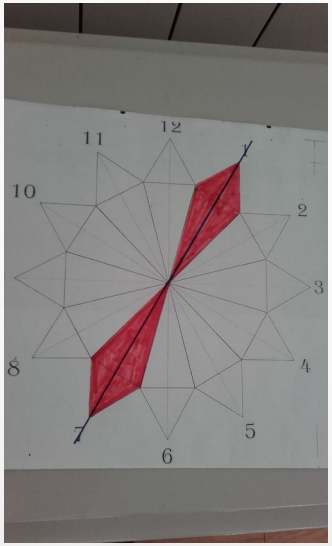


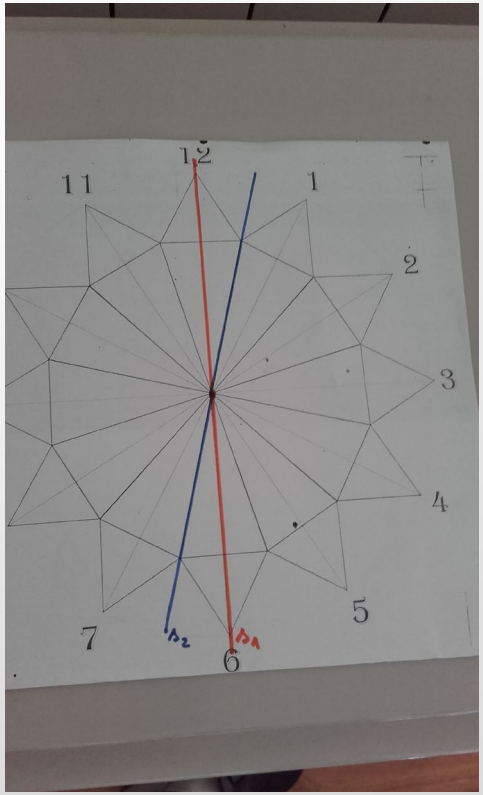


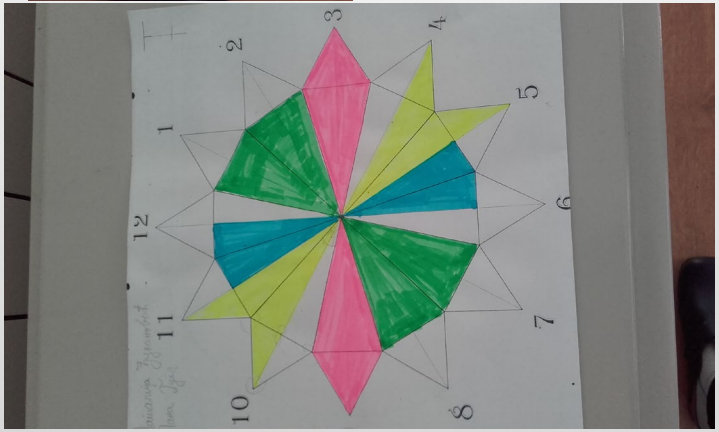
Students' drawings in Math class





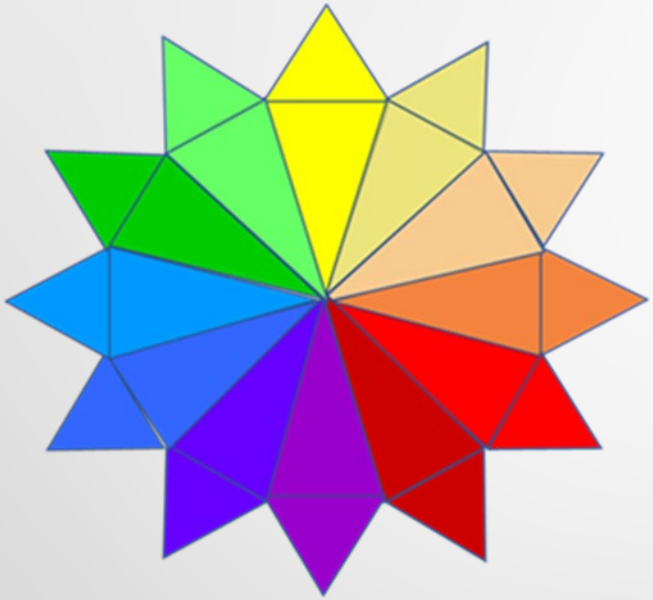






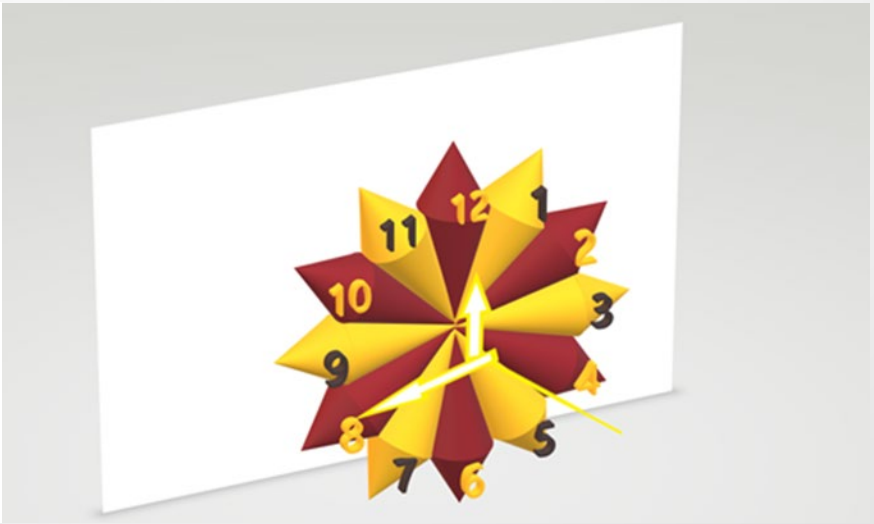
Ostwald Colour Circle

Correlation with Physics and Art



Author: Mihailo Stanojević

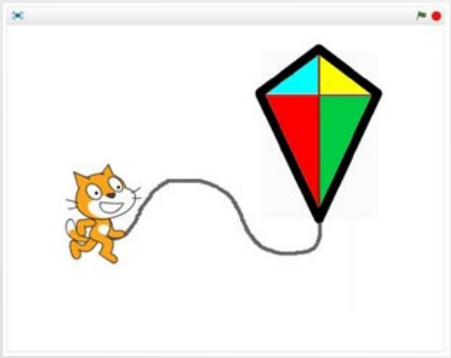
The chosen clock model in Paint 3D computer program

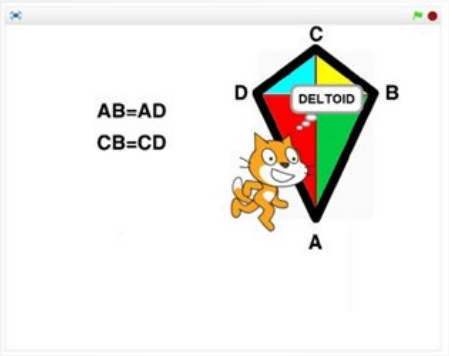


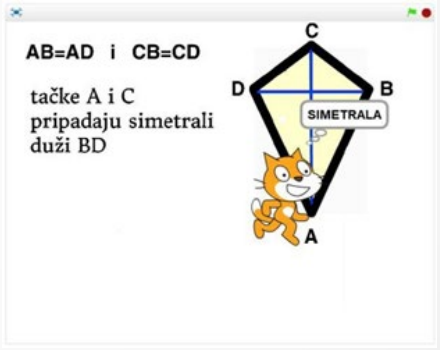
Author – Lazar Kovačević

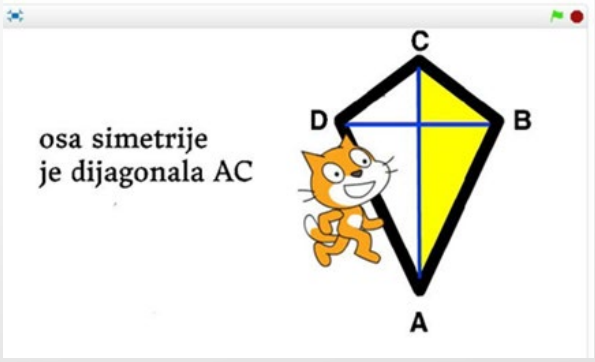
https://youtu.be/yI9nvvckcYk

Deltoid (kite) in Scratch computer program





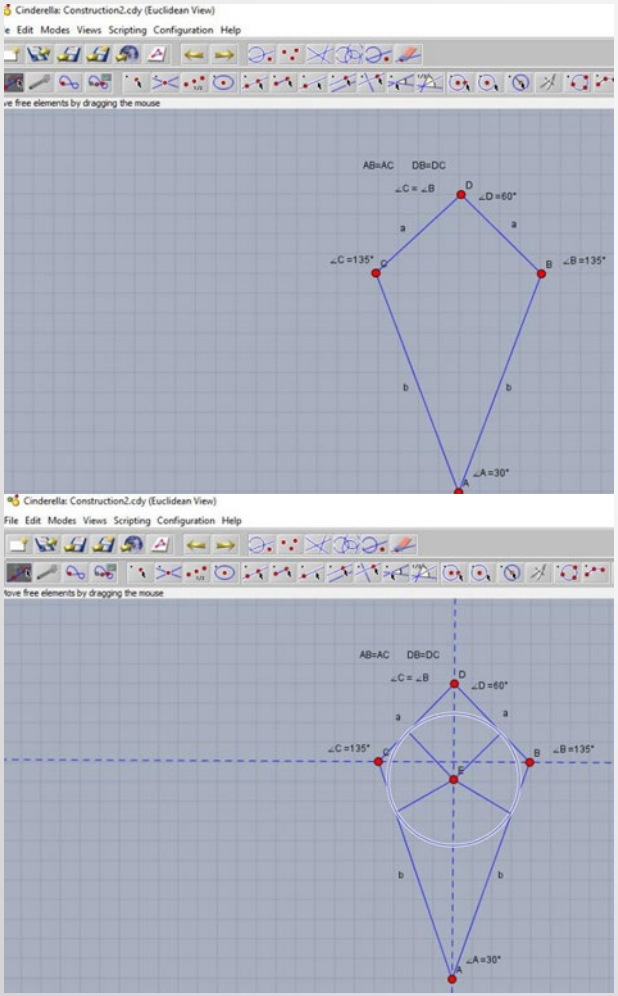


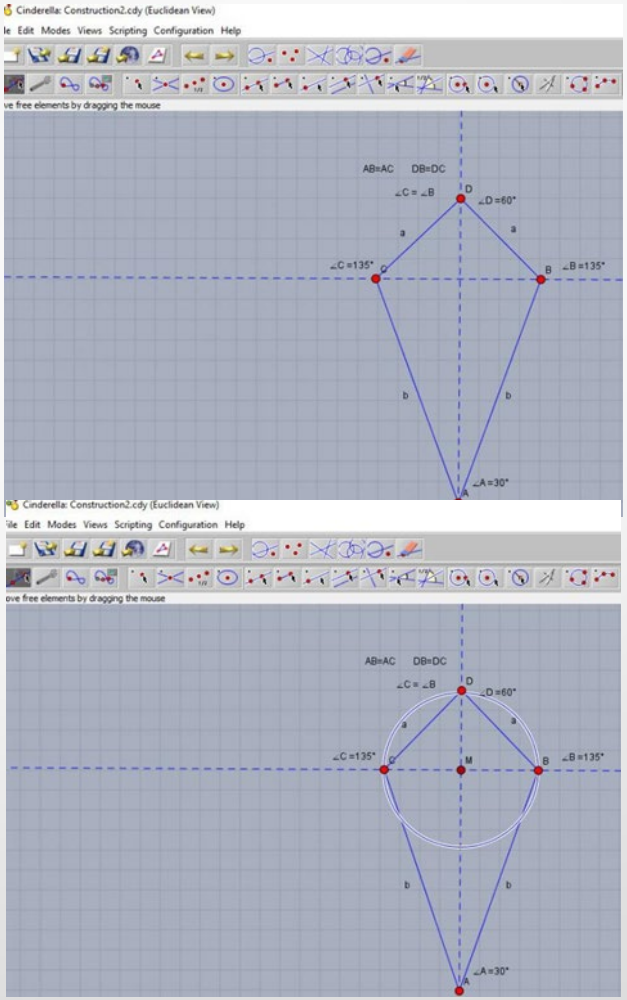


Author – Lazar Kovačević

https://youtu.be/zyTrHS7qmcQ

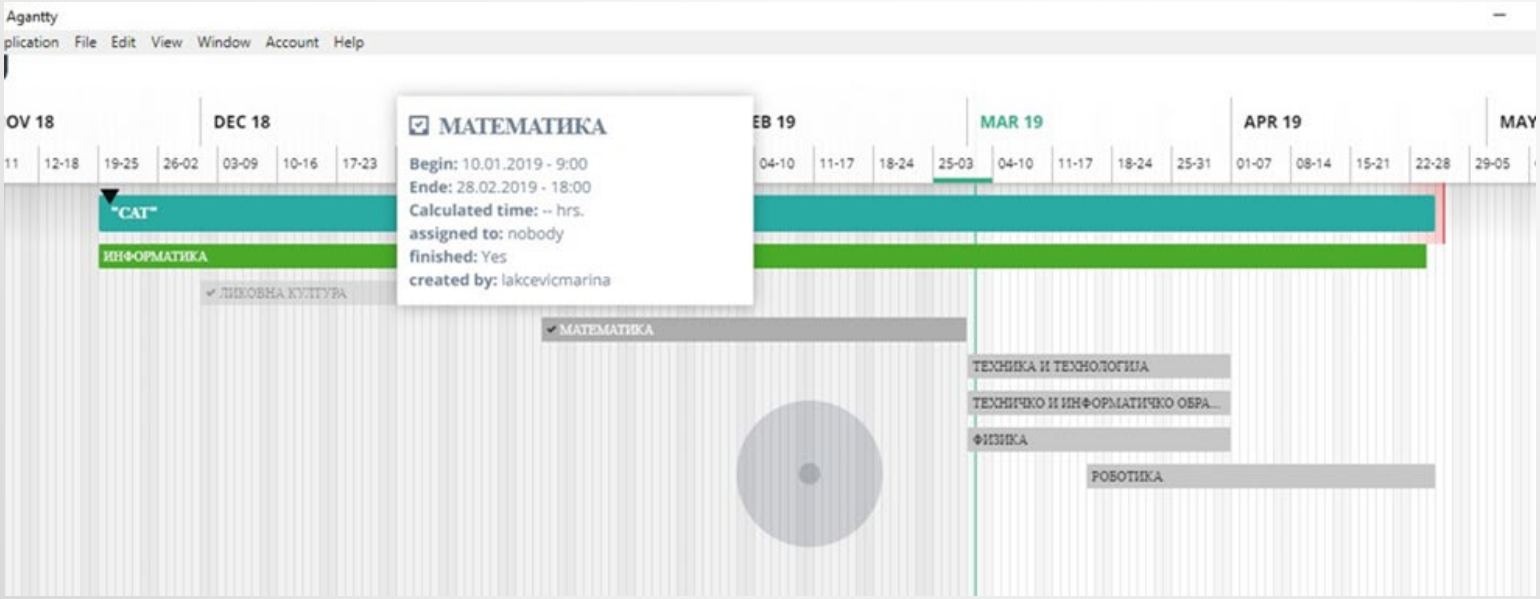
Deltoid (kite) in Cinderella computer program





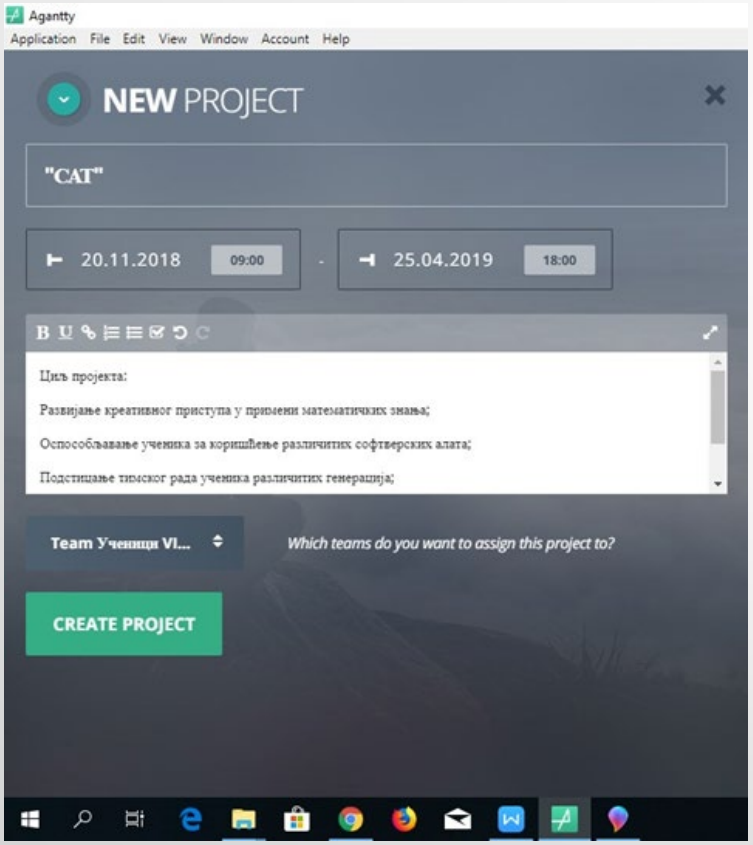
Author – Konstantin Ljepava

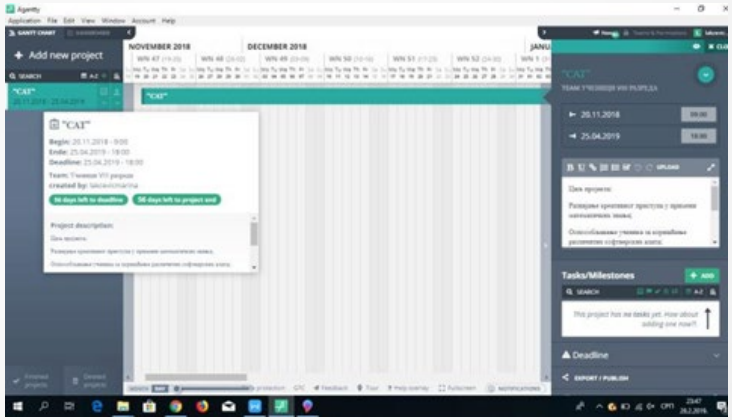
Project Organization using Project Management Tool Agantty

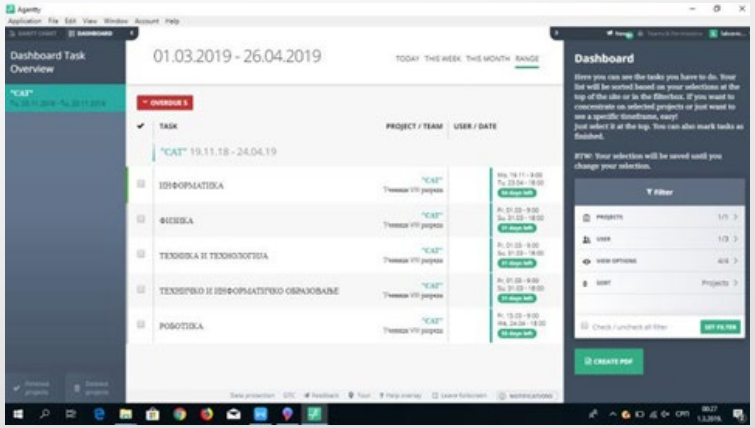


Authors – Uglješa Kaplarević, Lena Carić, Petar Deheljan, Luka Vuksanović

Porject Organization using Project Management Tool Agantty



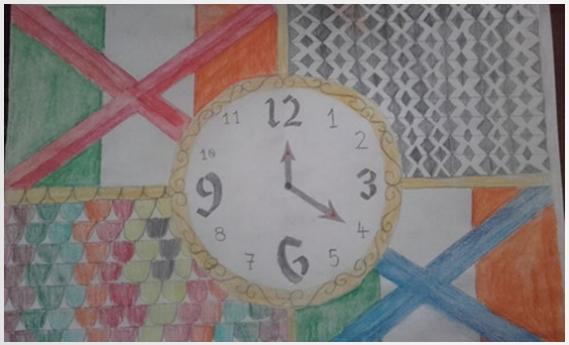




Authors – Uglješa Kaplarević, Lena Carić, Petar Deheljan, Luka Vuksanović

Art Class

Theme: Arabesque



Theme: Science fiction

What needs to be done:

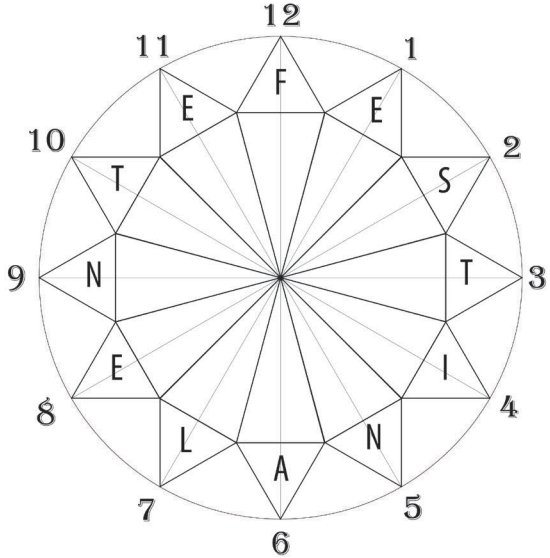
For semifinal:

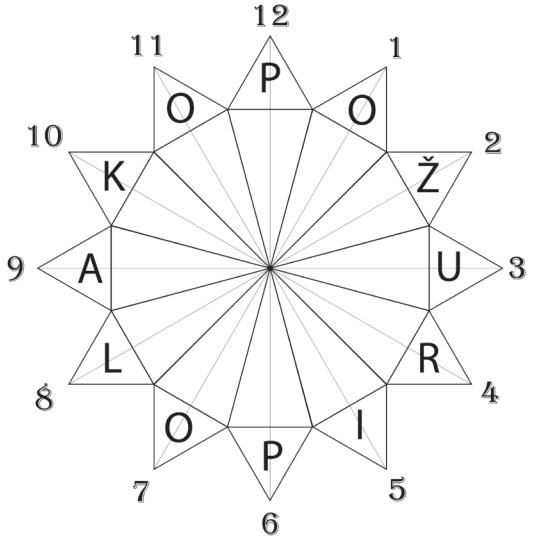
- To make a clock dimensions 50x50 which lights up at a certain time;
- To make an exhibition of all the drawings for the project;
- To complete the evaluation;
- To make a presentation in Sway;

For final:

- To edit a film showing the making of the project;
- To print out a catalogue with all the tasks we have created and solved.

OUR MOTTO
MAKE HASTE SLOWLY
FESTINA LENTE





Presentation Author: Mila Urošević,
Translator: Danijela Bojanić - professor of English Language and Literature, students: Hana Amanović, Nikola Manojlović, Uroš Nikoletić, Nemanja Ignjatović