

Colégiul Național Emil Racovița de Cluj (Romania)



50 students supervised by Ariana-Stanca Văcărețu, Alexandrina Cruceru, Valentina Vasilescu, Adrian Magdaș, Vasile Andrea, Felicia Marincaș, Ioana Nendrean, Anca Lăpuștea and followed by Adela Lupescu (Universitatea Babeș – Bolyai, Cluj-Napoca)

High School Altitude Briançon (France)



51 students supervised by Hubert Proal Mickaël Lissonde Pierre Granouillet, William Faux, Noëlle Trovato and Stephan Colas and followed by Camille Petit (University of Fribourg - Switzerland) and Yves Papegay (INRIA Sophia Antipolis - France)

Common scientific communications



Mathematical understanding through different languages

Volunteer students from both high schools are working on topics proposed by researchers in mathematics. They exchange their ideas in seminars, they present their results during the conference and prepare their work for publication. This is also an opportunity for young people to meet and talk with researchers and enhance their work in various scientific events.

The collage includes a line graph with two oscillating lines, one labeled 'Nombre de voitures sur la route D' and the other 'Nombre de voitures sur la route C'. Below the graph are two photographs: one of a student sitting at a desk with a laptop, and another of a student standing next to a poster. The poster contains mathematical text and formulas, including $A = 20000$, $B = 10000$, $C = 5000$, $D = 2500$, $E = 1250$, $F = 625$, $G = 312.5$, $H = 156.25$, $I = 78.125$, $J = 39.0625$, $K = 19.53125$, $L = 9.765625$, $M = 4.8828125$, $N = 2.44140625$, $O = 1.220703125$, $P = 0.6103515625$, $Q = 0.30517578125$, $R = 0.152587890625$, $S = 0.0762939453125$, $T = 0.03814697265625$, $U = 0.019073486328125$, $V = 0.0095367431640625$, $W = 0.00476837158203125$, $X = 0.002384185791015625$, $Y = 0.0011920928955078125$, $Z = 0.00059604644775390625$, $a = 0.000298023223876953125$, $b = 0.0001490116119384765625$, $c = 0.00007450580596923828125$, $d = 0.000037252902984619140625$, $e = 0.0000186264514923095703125$, $f = 0.00000931322574615478515625$, $g = 0.000004656612873077392578125$, $h = 0.0000023283064365386962890625$, $i = 0.00000116415321826934814453125$, $j = 0.000000582076609134674072265625$, $k = 0.0000002910383045673370361328125$, $l = 0.00000014551915228366851806640625$, $m = 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Learning mathematics and languages through research and cooperation:



research work on common issues



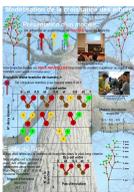
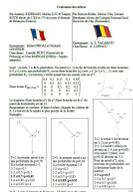
exchange of ideas, methods, results ...



meetings between high schools



joint presentations at conferences or other scientific events

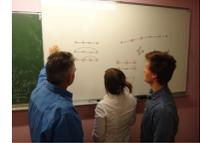
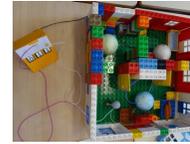


the drafting of common items

List of subjects 2015-2016

- Localization

How to arrange the beams to know at any time where is a person in a house?

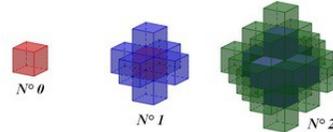


- Supervision of rooms

We have to place sensors in a building knowing that a sensor reacts if a person is in the same room as the sensor or in the nearby room. The sensors' activations must allow to localize exactly in which room is the intruder..

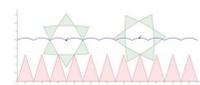
- Growth of crystals

We model the growth of a crystal in the following way: what can you say about the structure after several evolutions.



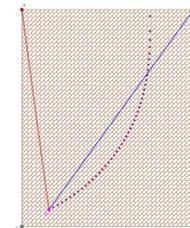
- The bike's wheel

We want to make a bike's wheel such that it can roll on a sawtooth-shaped ground, its axis remaining at the same height.



- Controlling a pod

We put an engine at both ends of the rope. How to operate engines so that the pod describes a segment.



- Poincaré's disk

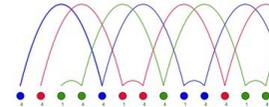


Inside a disk, we define straight lines as either diameters, or circle arcs which are perpendicular to the edge of the disk.

What does remain of the common results of geometry.

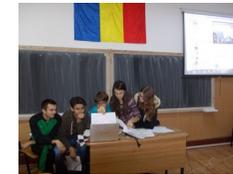
- Juggle

441 means that the first ball spends a duration of 4 in the air, the second one as well and the last one only 1. We then repeat the pattern. Let's imagine other examples with three balls and with less balls.



- Smile, you're being filmed!

Can we always find an orientation for a set of n cameras to monitor the entire plan?



- Decimal clock

The decimal time was adopted by decree in 1793. The day is divided into 10 hours of 100 minutes of 100 seconds. Logical and practical! How to make such a clock?



- Searching for convex polygons

Can we always find a convex polygon inside any polygon?

