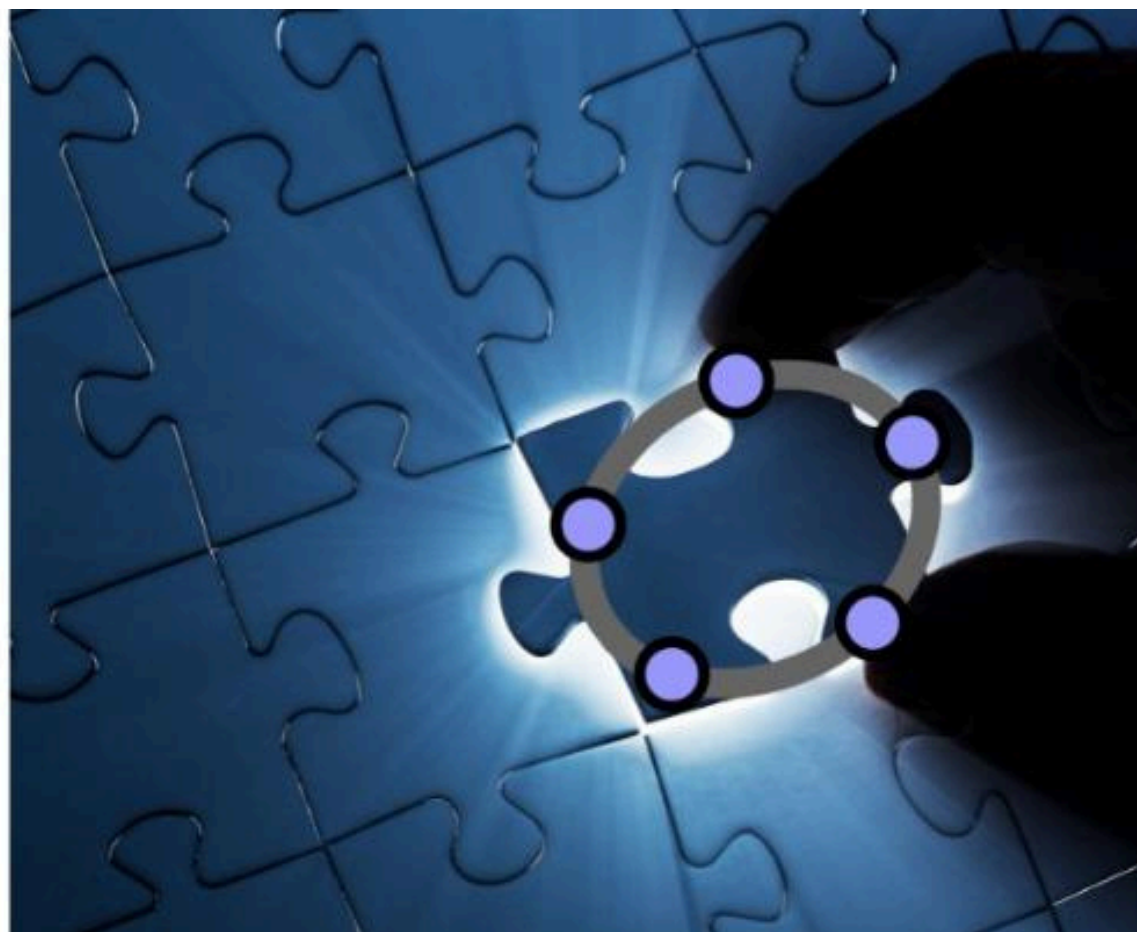


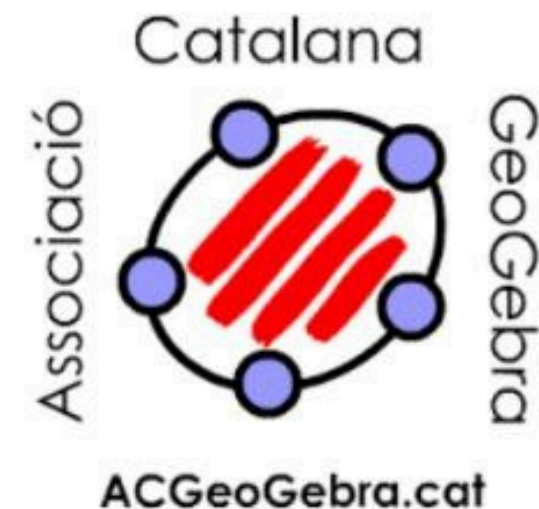


XVII Jornada de l'ACG

22 de febrer de 2025

GeoGebra,

la peça que et falta a l'aula.



Transforma la teva aula amb Thinking
Classrooms i GeoGebra

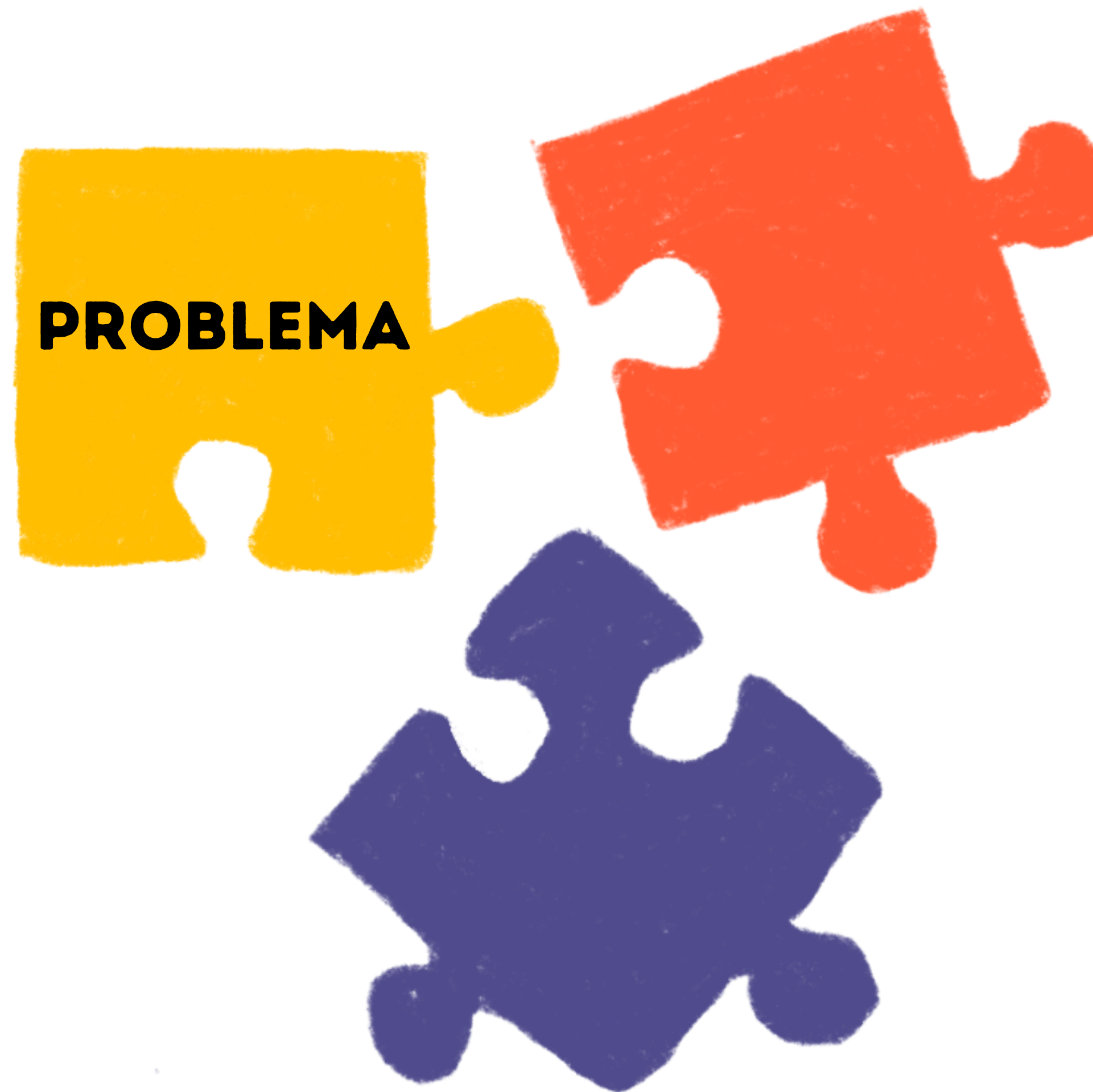
Carles Granell



cgranel4@xtec.cat



@carlesgranell4

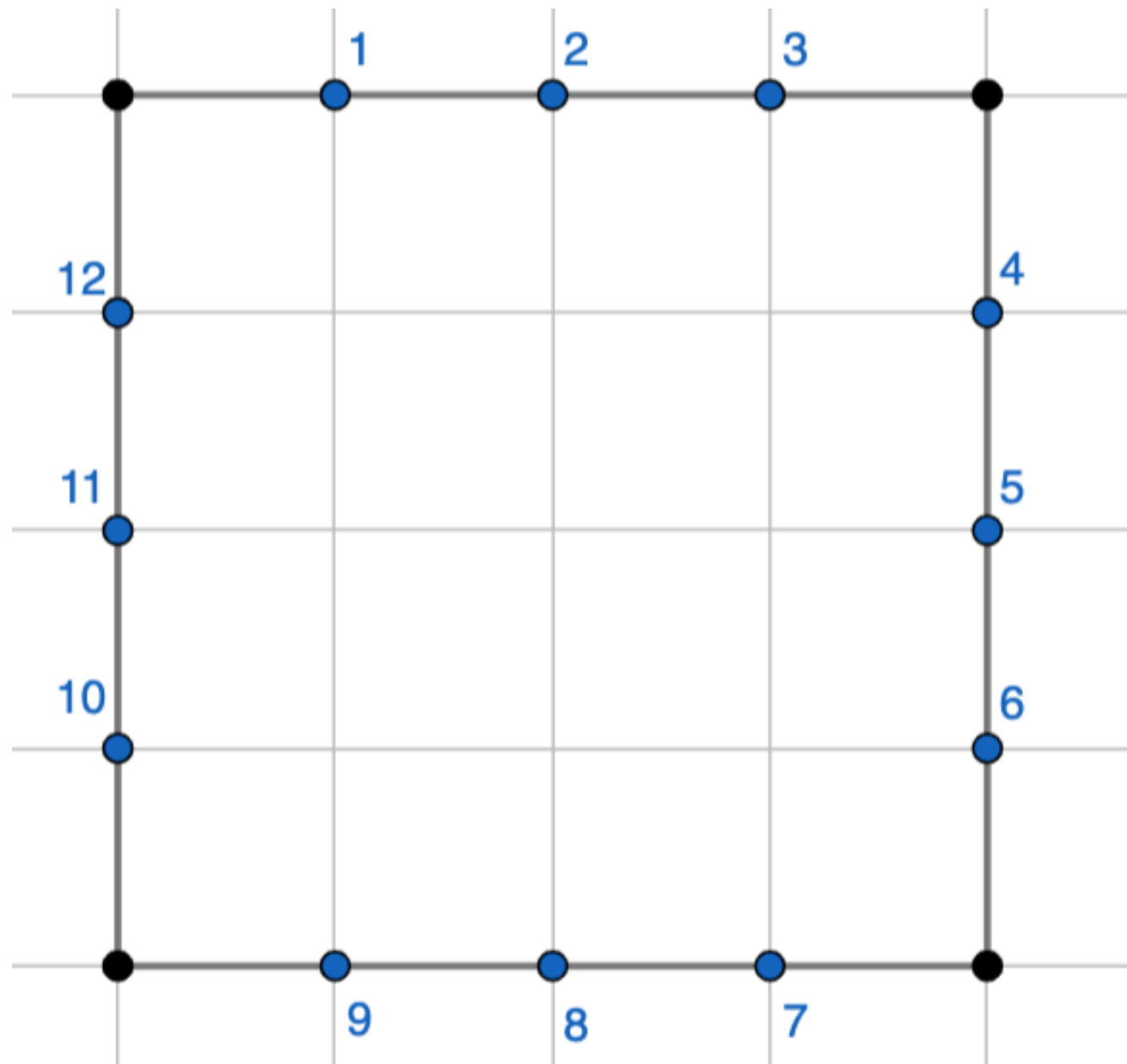


VITRALLS DE COLORS



Daniel Finkel's Stained Glass Window Problem (Wordplay, The New York Times, 2014) a <https://archive.nytimes.com/wordplay.blogs.nytimes.com/2014/01/06/finkel-2/>

VITRALLS DE COLORS

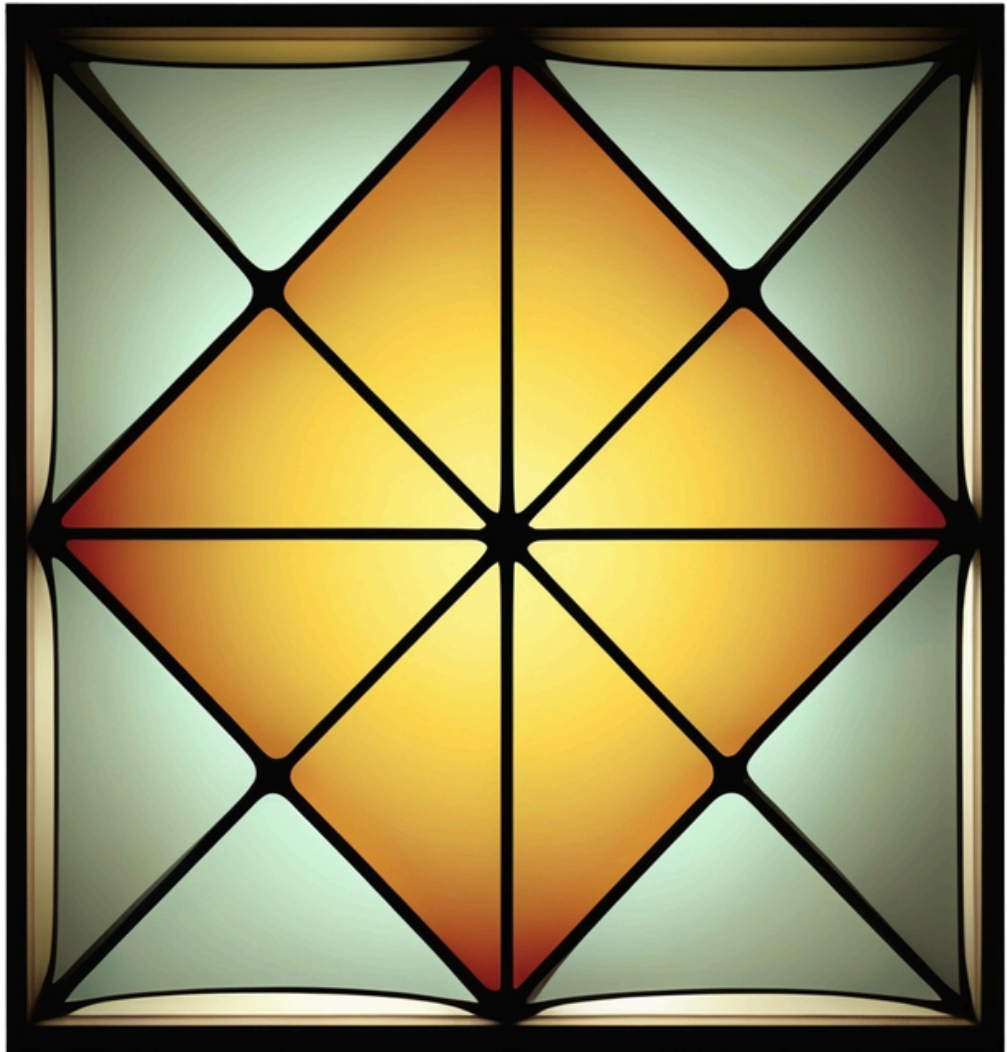
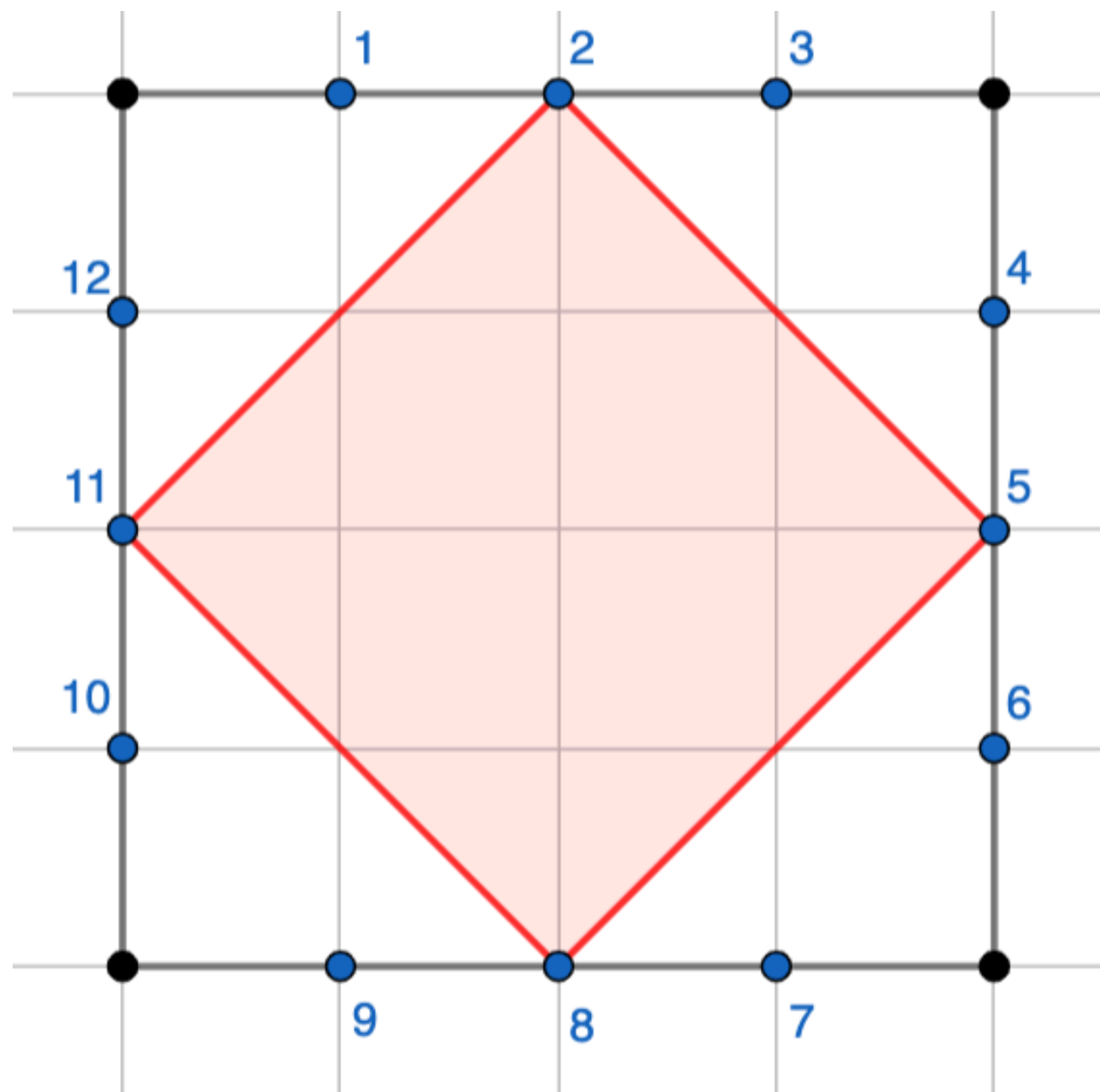


Per a cada finestra hem de connectar **un punt de cada costat del quadrat** per formar un quadrilàter.

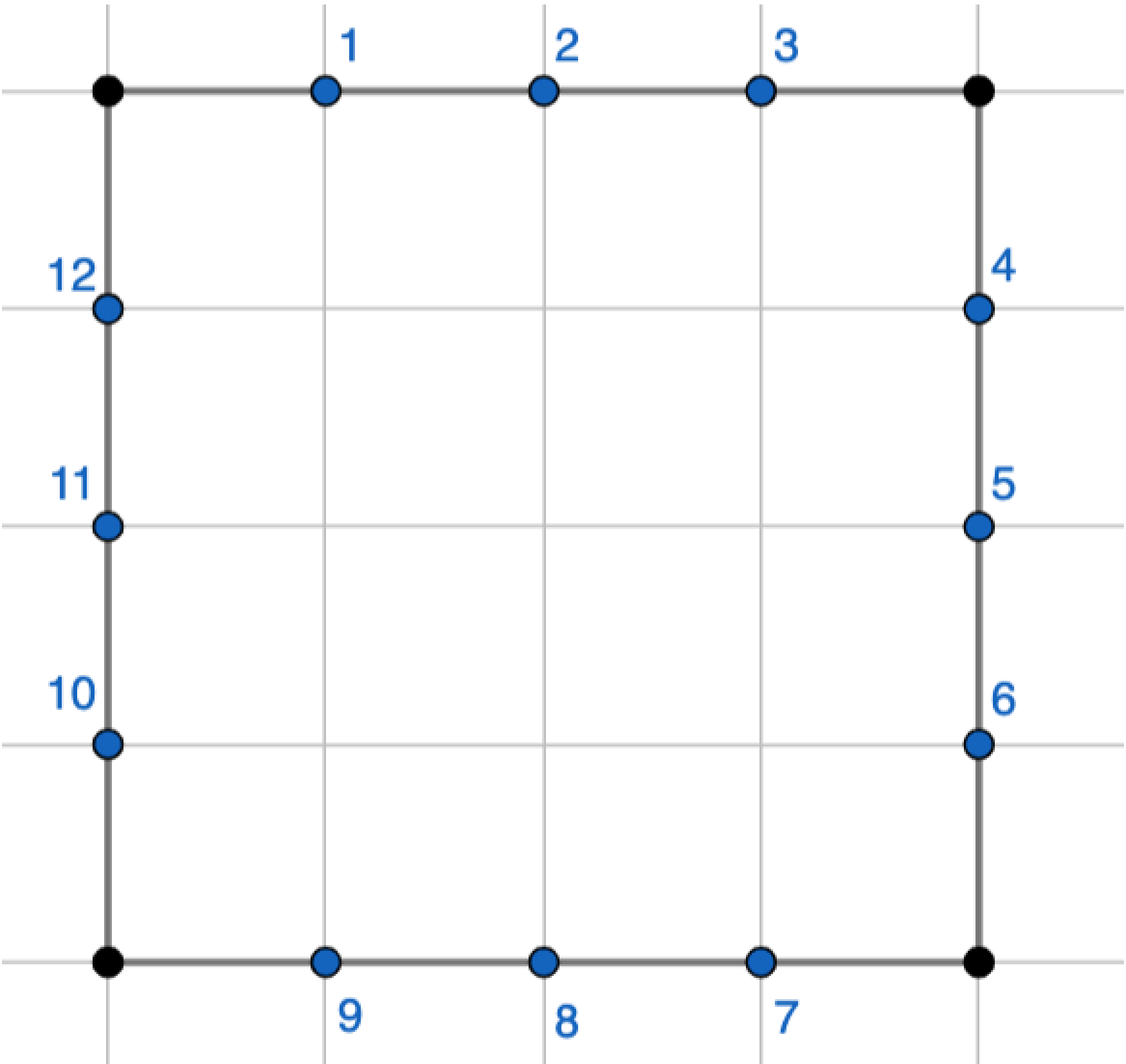
La figura creada ha de tenir exactament **la meitat de la superfície del quadrat**.

Què passaria si unim els punts 2, 5, 8 i 11?

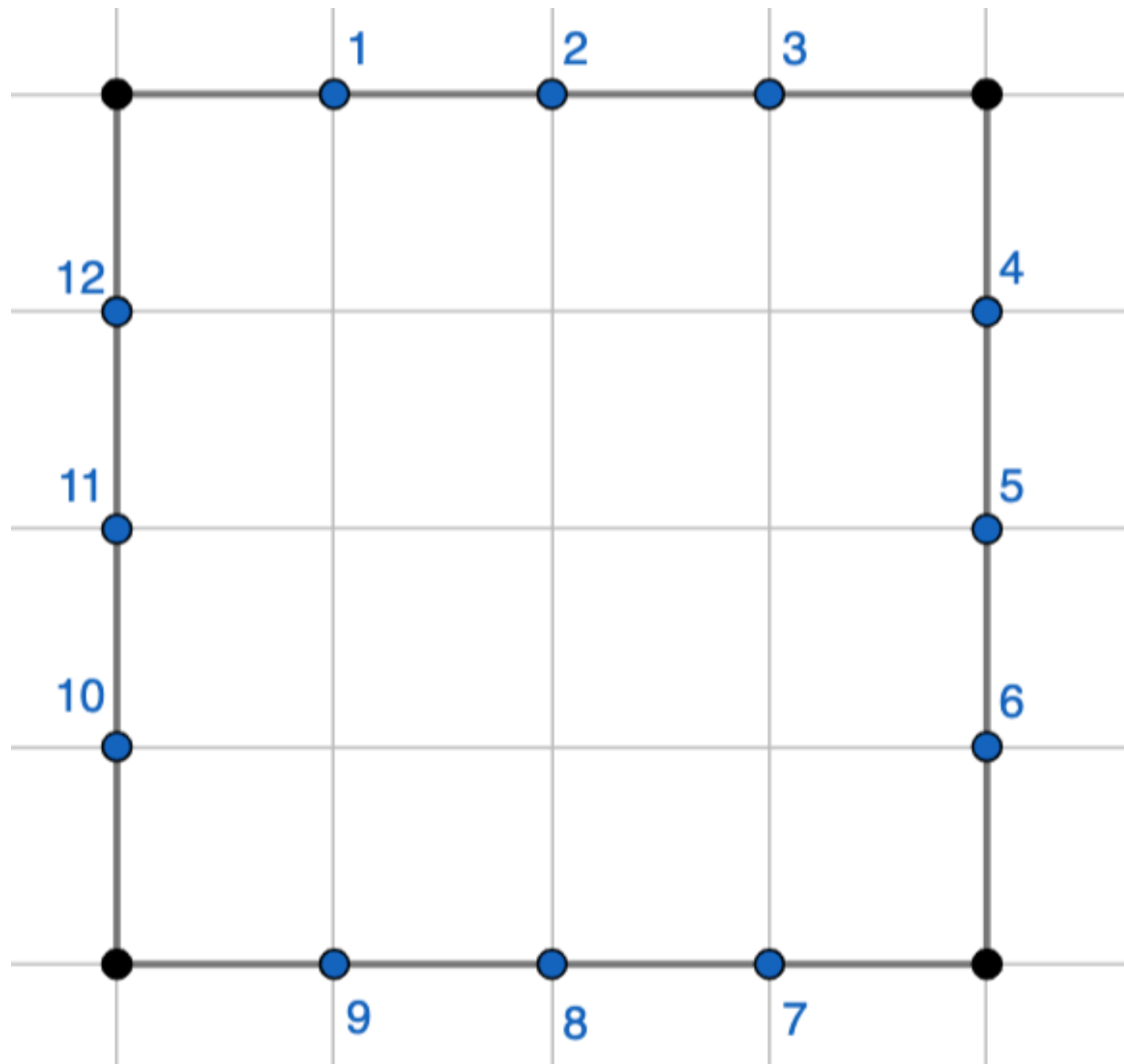
VITRALLS DE COLORS



VITRALLS DE COLORS



VITRALLS DE COLORS



Creieu que hi haurà altres maneres d'unir un punt de cada costat de la finestra per obtenir un vitrall que tingui la mateixa àrea?

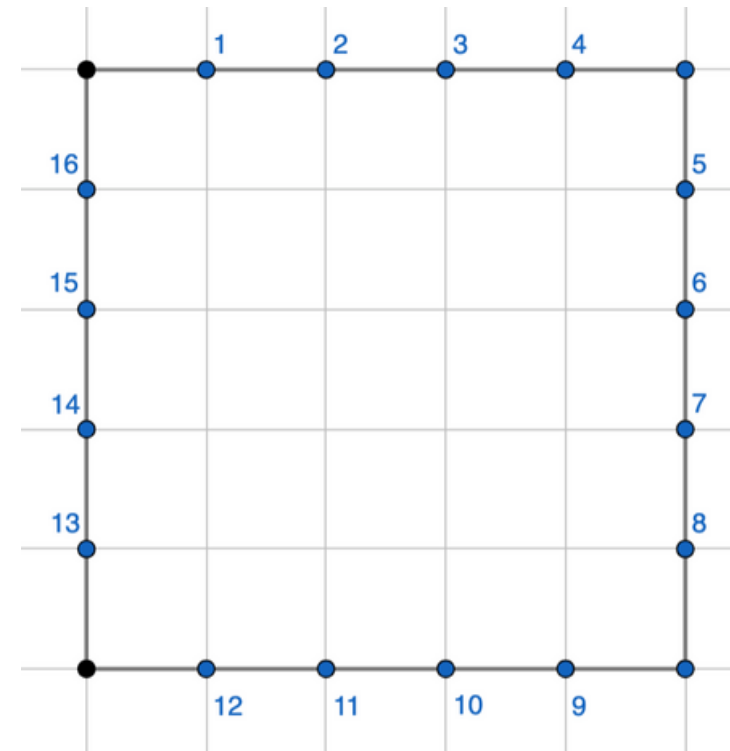
Si és possible, quants se'n podrien obtenir?

<https://www.geogebra.org/m/qwhgpmrk>

<https://www.geogebra.org/classroom/zfrpkmnt>

VITRALLS DE COLORS - SEGUIM INVESTIGANT

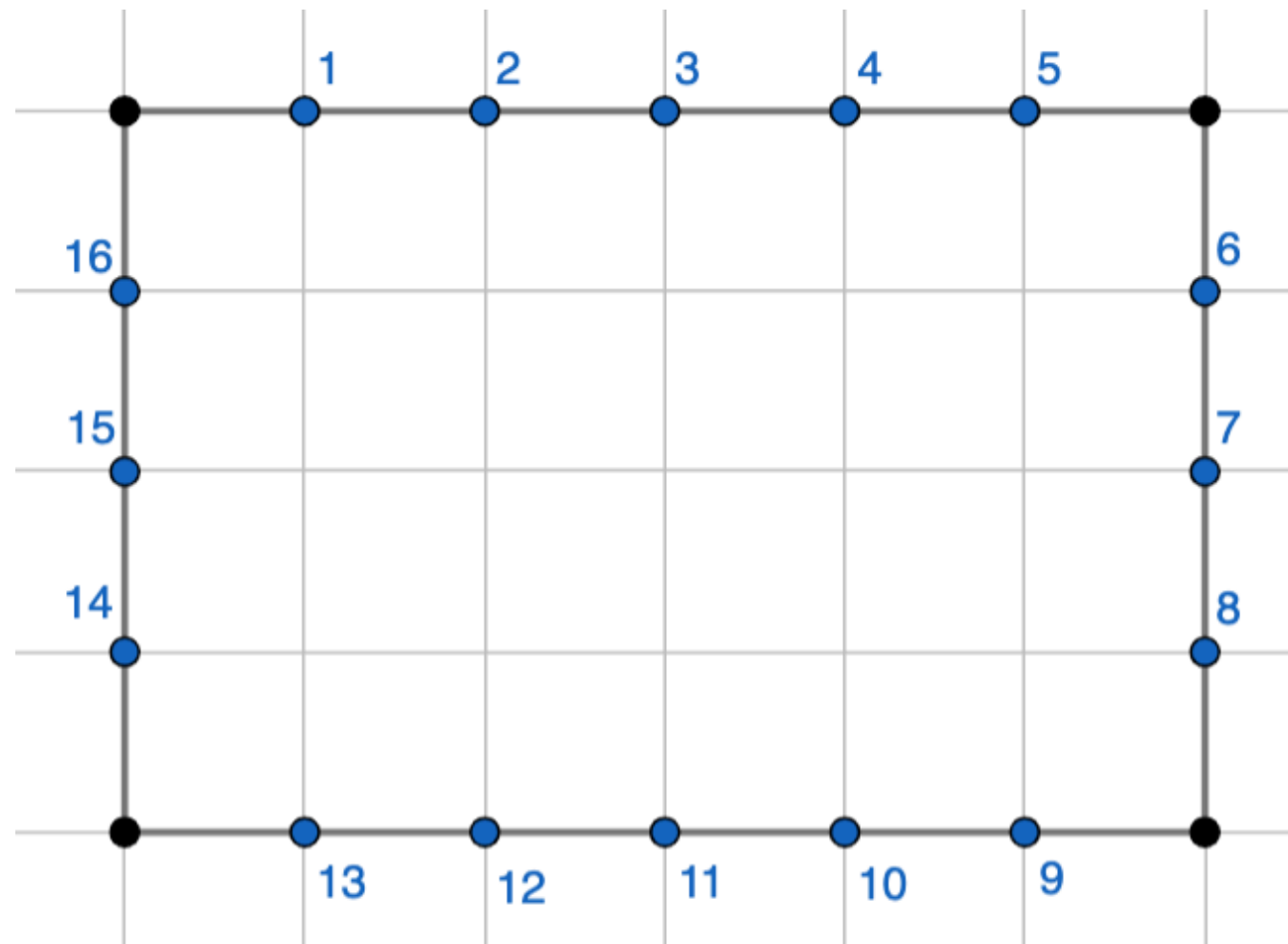
- Si seleccionem aleatòriament un punt de cada costat, quina és la probabilitat d'obtenir un quadrilàter vàlid?
- Què passaria si al costat de cada quadrat hi hagués quatre punts en lloc de tres? I amb 5 punts? I per a qualsevol nombre de punts?



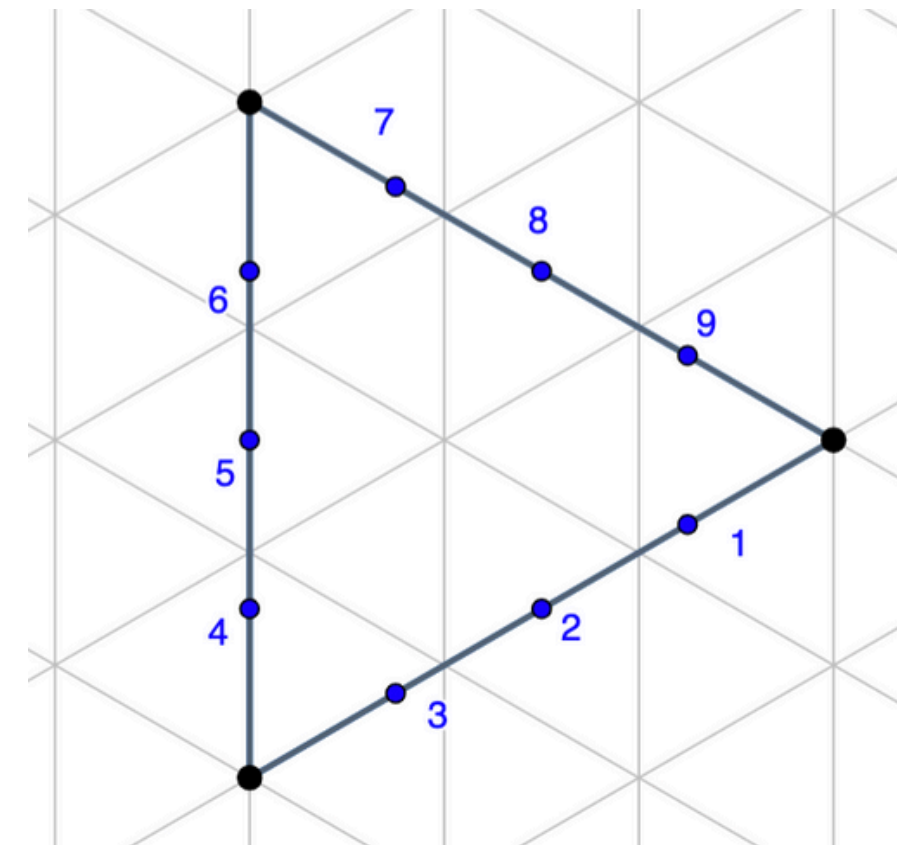
Quadrilateral Bisection (The Stained Glass Window Problem) de Daniel Finkel a
<https://mathforlove.com/lesson/quadrilateral-bisection-the-stained-glass-window-problem/>

VITRALLS DE COLORS - SEGUIM INVESTIGANT

- I si la finestra original fos un rectangle? O qualsevol altre paral·lelogram? Quines coses serien iguals i quines coses canviarien?



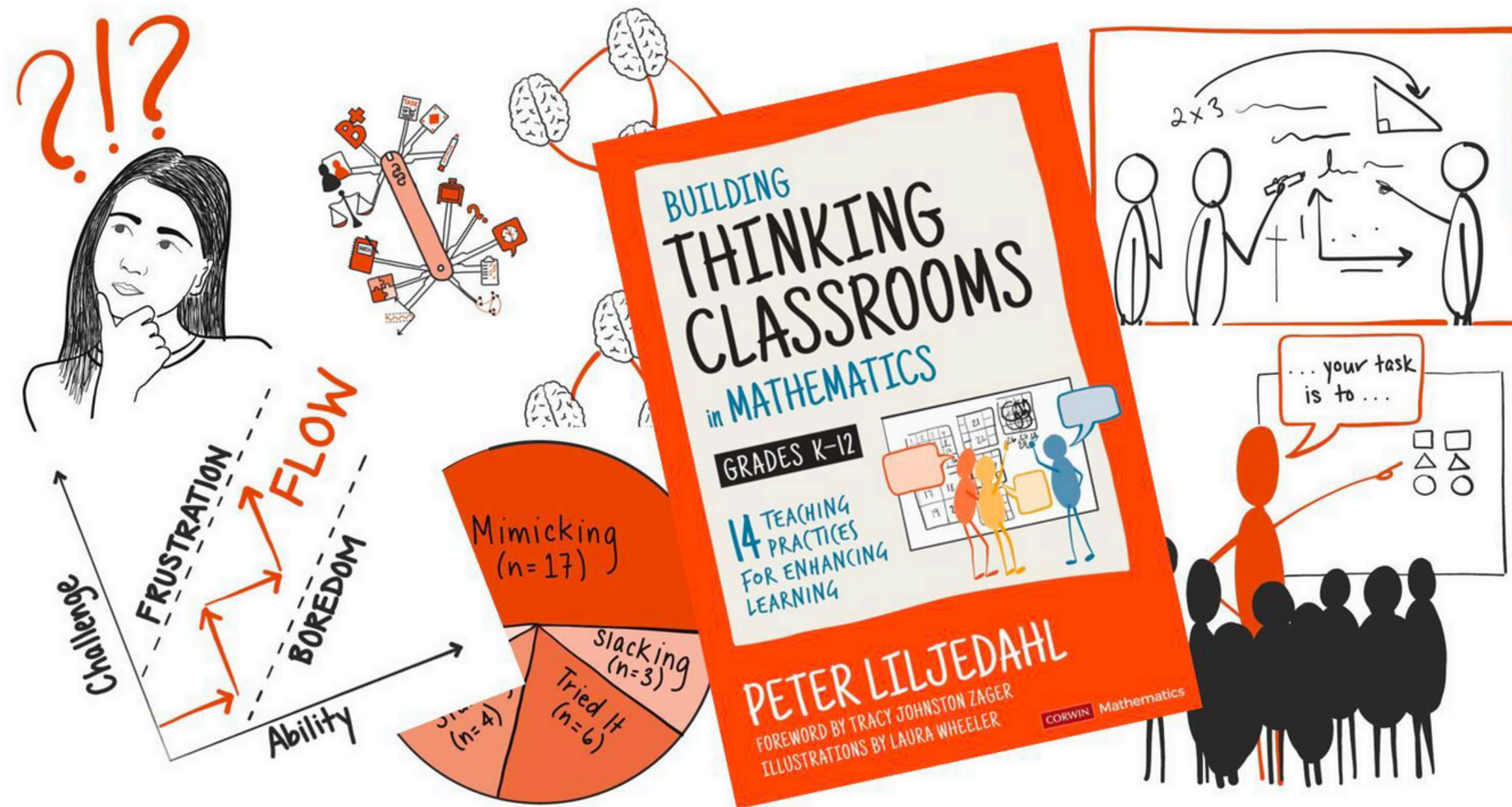
- Què passaria si la finestra fos un triangle equilàter? Si connectem els punts mitjans de cada costat, formem un triangle amb $1/4$ de l'àrea. Quins altres triangles pots obtenir amb la mateixa àrea?





BUILDING THINKING CLASSROOMS

Peter Liljedahl



<https://www.buildingthinkingclassrooms.com>

BUILDING THINKING CLASSROOMS

Peter Liljedahl

BUILDING THINKING CLASSROOMS

Research: @pgliljedahl
SketchNote: @wheeler_laura

① Begin w/ a Problem

Give a problem-solving task

To start:

- Problems should be
 - ☐ engaging
 - ☐ not-curricular
 - ☐ collaborative
 - ↳ promote talking

Later:

- Problems can be curricular
eg textbook problems

② Visibly Random Groups

- ☐ Randomly assigned
eg playing cards
- ☐ Daily & in front of students
- ☐ 2 or 3 students / group
- ☐ Sit & stand together

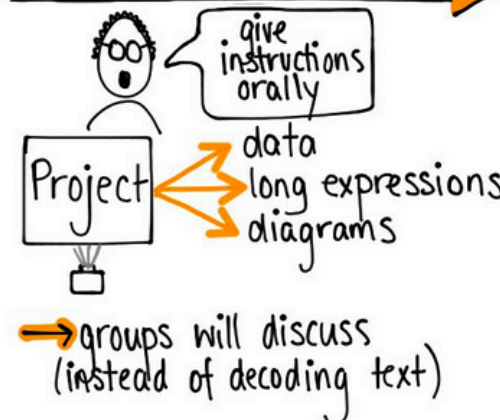
③ Vertical NonPermanent Surfaces

- ☐ Vertical
- ☐ Erasable

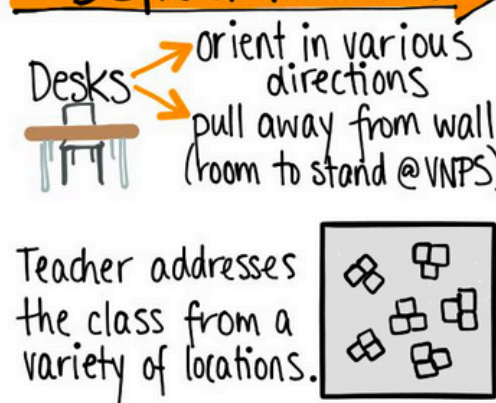


- ☐ 1 marker or chalk per group
↳ promotes discussion

④ Oral Instructions



⑤ Defront the room



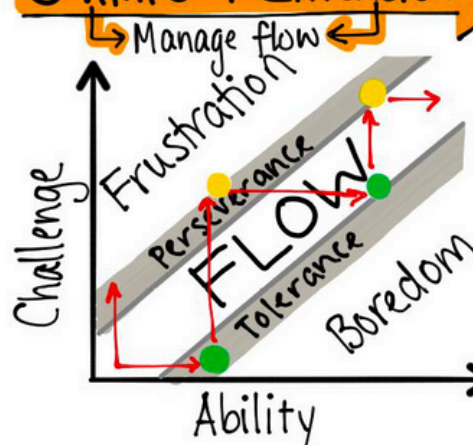
⑥ Answering Questions

- Acknowledge, but don't answer:
- ☒ Proximity questions (b/c teacher is close by)
- ☒ Stop thinking questions
- Answer:
 - ☒ Keep thinking questions
 - ↳ give HINTS not answers

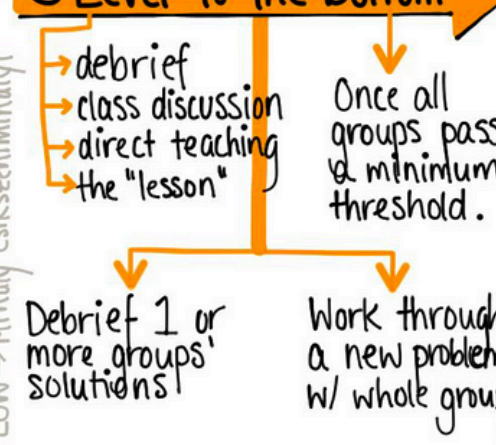
⑦ Build Autonomy

- ☐ Model how groups can visit other groups when they are stuck or done.
- ☐ Hints & extensions come from peers (not just the teacher).
- ↳ Helps manage flow

⑧ Hints & Extensions



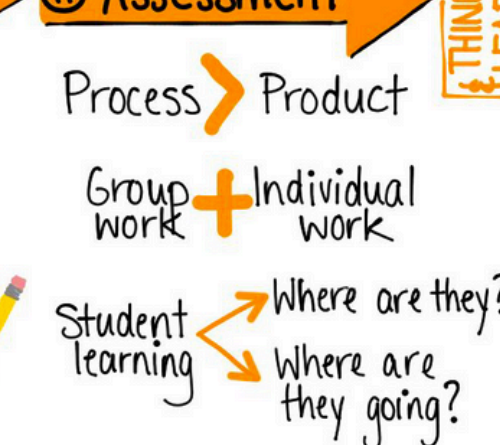
⑨ Level to the Bottom



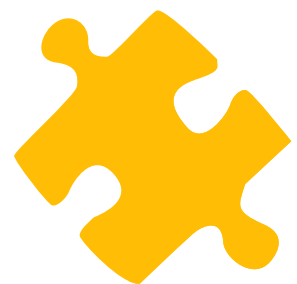
⑩ Student Notes

- Student created:
 - select
 - synthesize
 - reorganize
 ↳ ideas
- Provide time for this after levelling.

⑪ Assessment



THINKING LEARNING



EL PROBLEMA

Tasques riques de llindar baix i sostre alt que fomentin el raonament i la participació de tot l'alumnat.



[Puntmat](#)



[NRICH](#)



[CREAMAT](#)



[Math For Love](#)



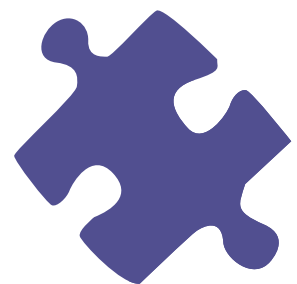
[MathPickle](#)



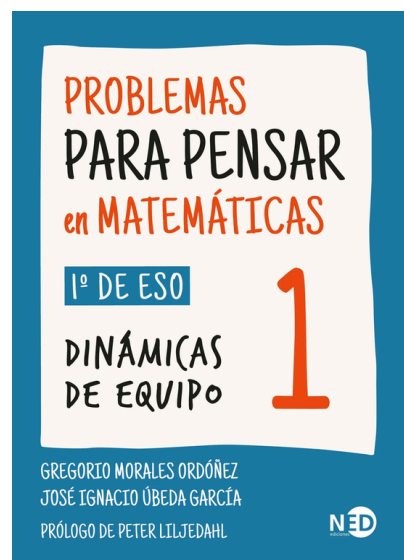
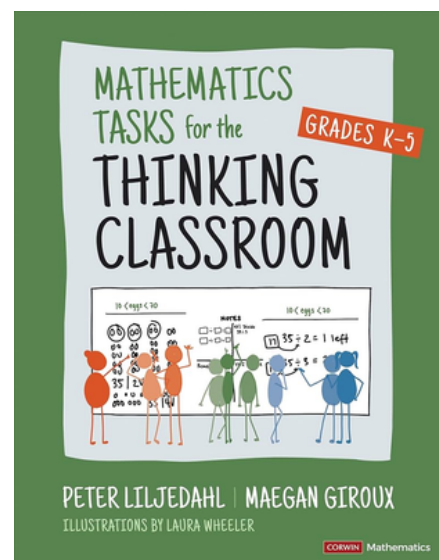
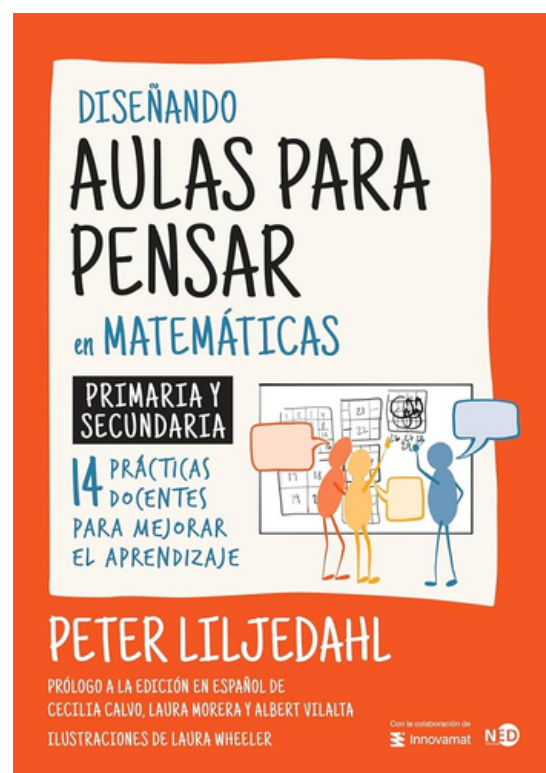
[Recull del Fem Matemàtiques](#)



[Calaix + ie](#)

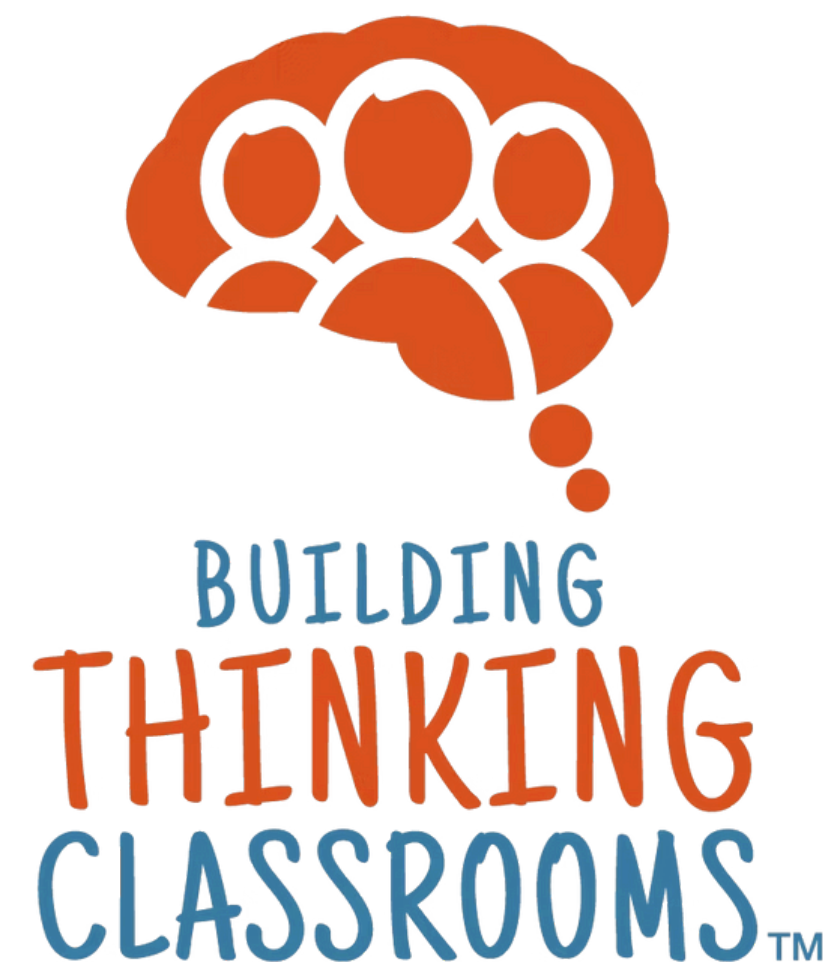


PER SEGUIR-NE APRENENT



AULAS PARA PENSAR

<https://t.me/AulasParaPensar>



<https://www.buildingthinkingclassrooms.com>



LA GESTIÓ D'AULA

Grups de 3 alumnes visiblement aleatoris

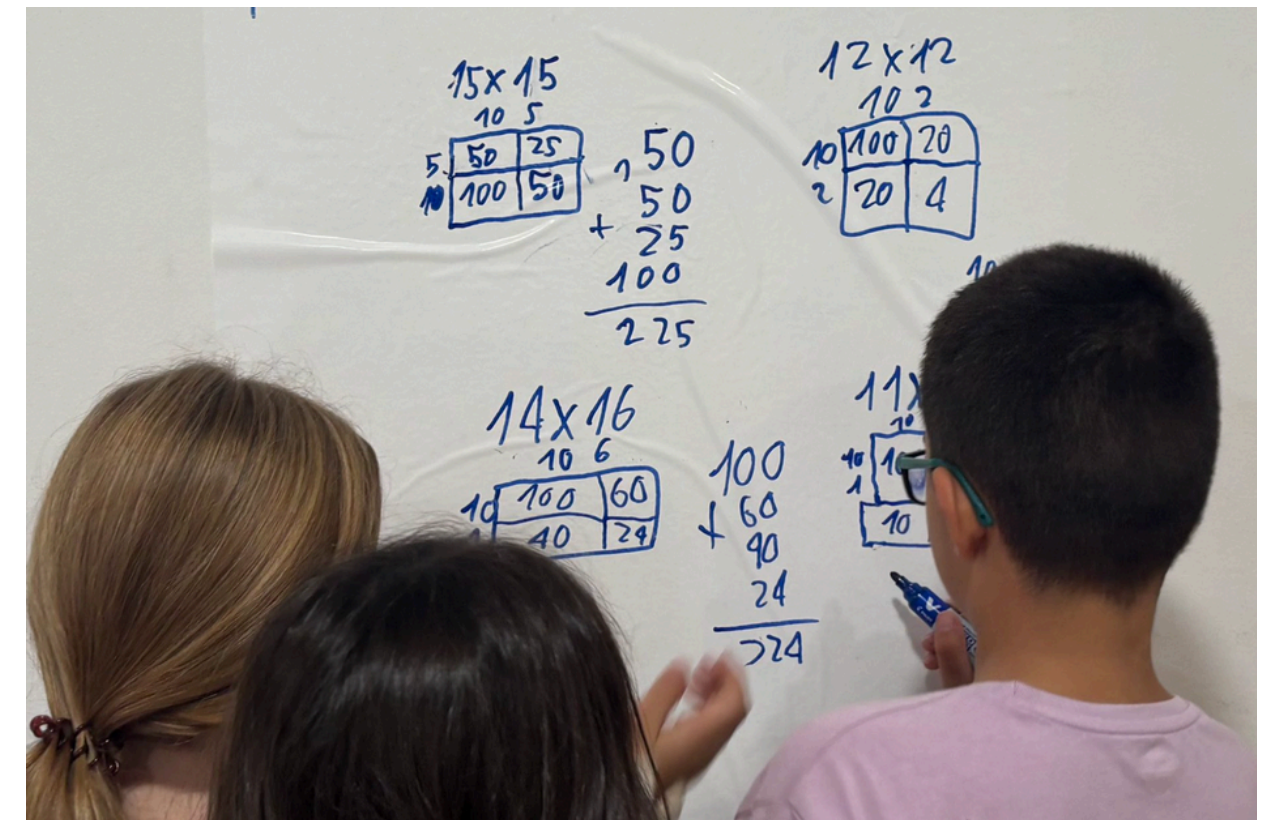
Treball amb pissarres verticals esborrables

Redistribuir la disposició del mobiliari

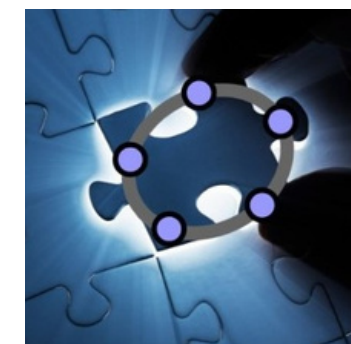
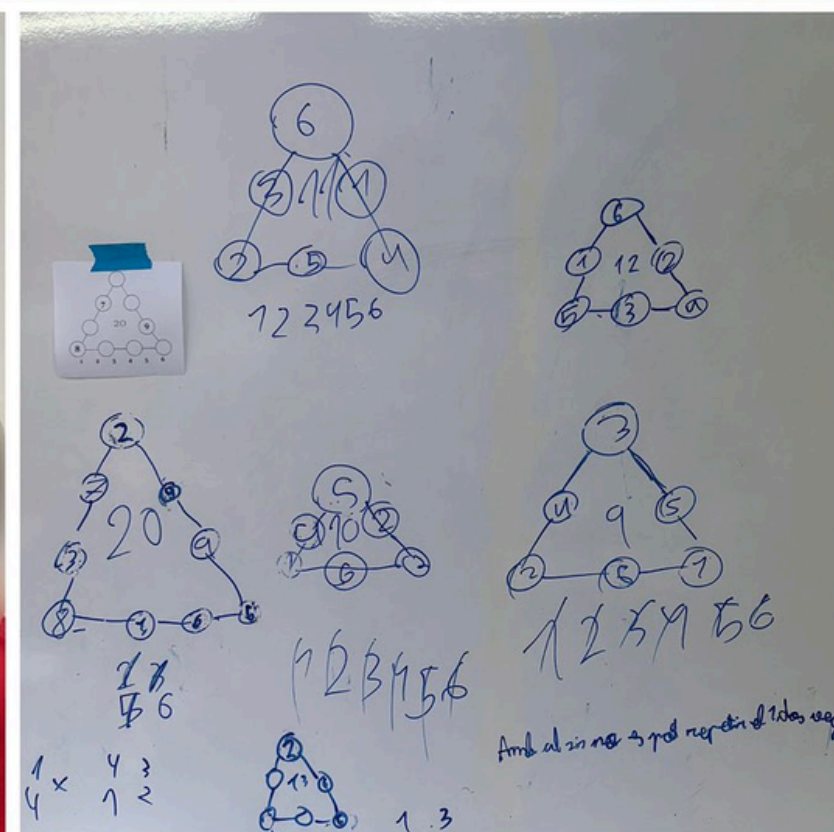
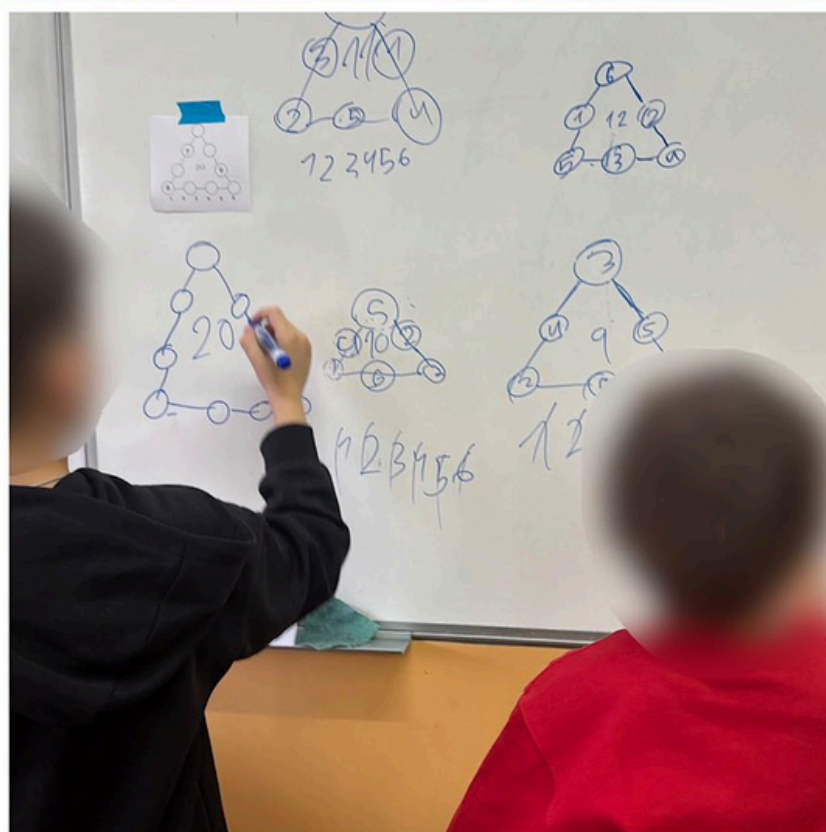
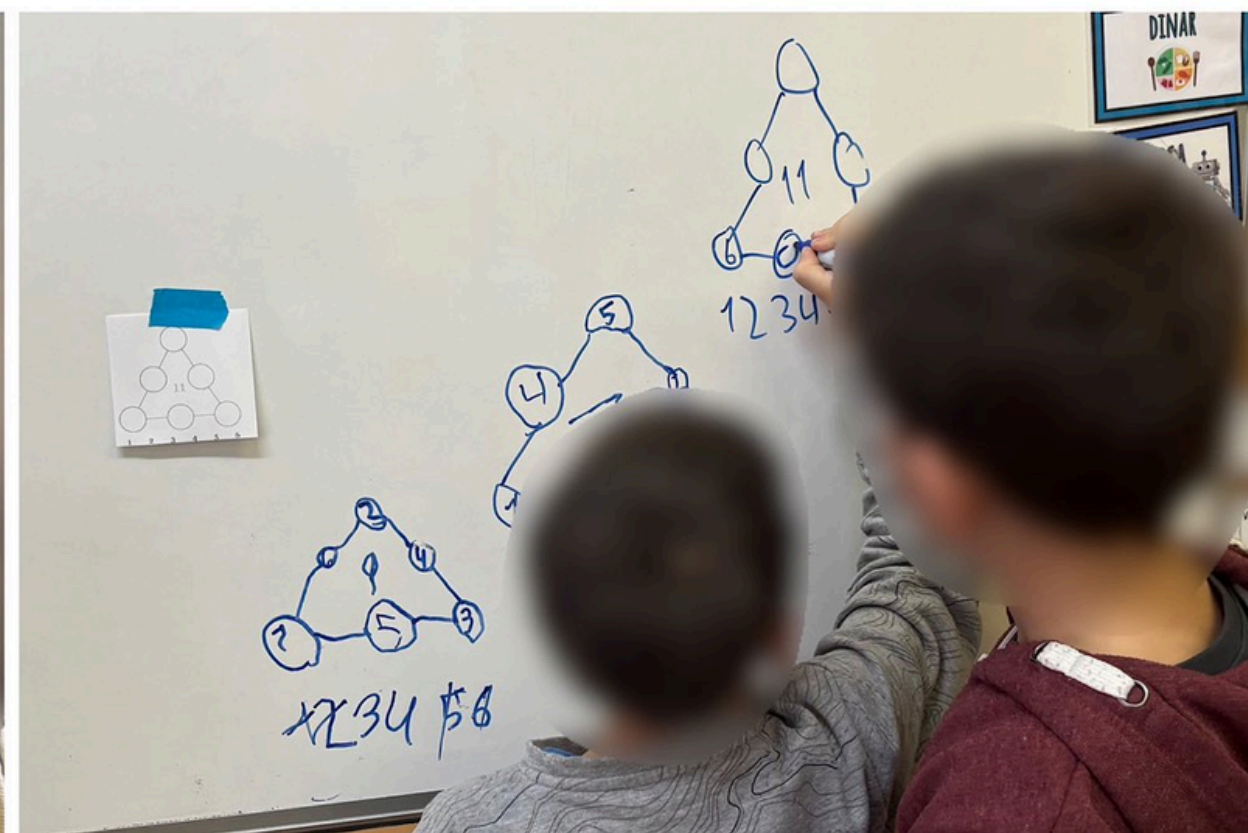
Consolidar aprenentatges amb reflexió individual

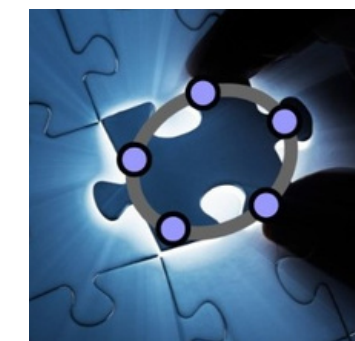
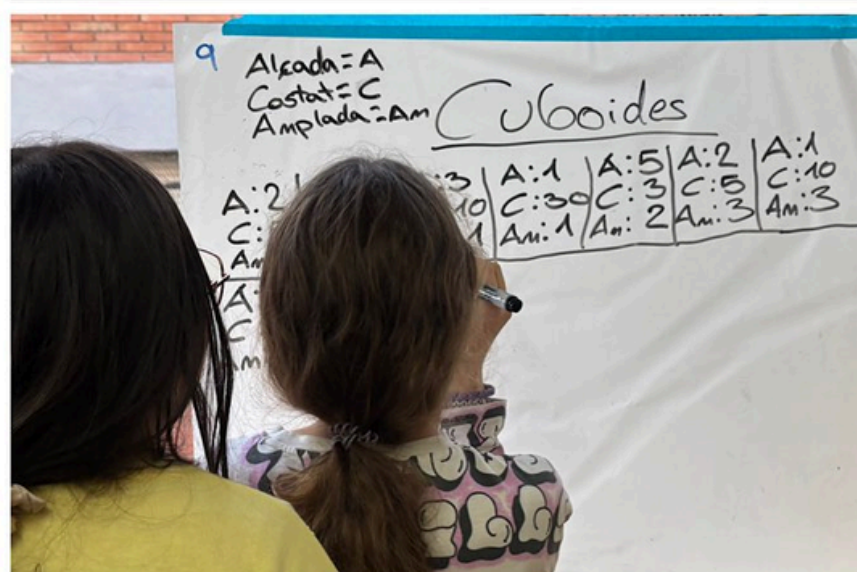
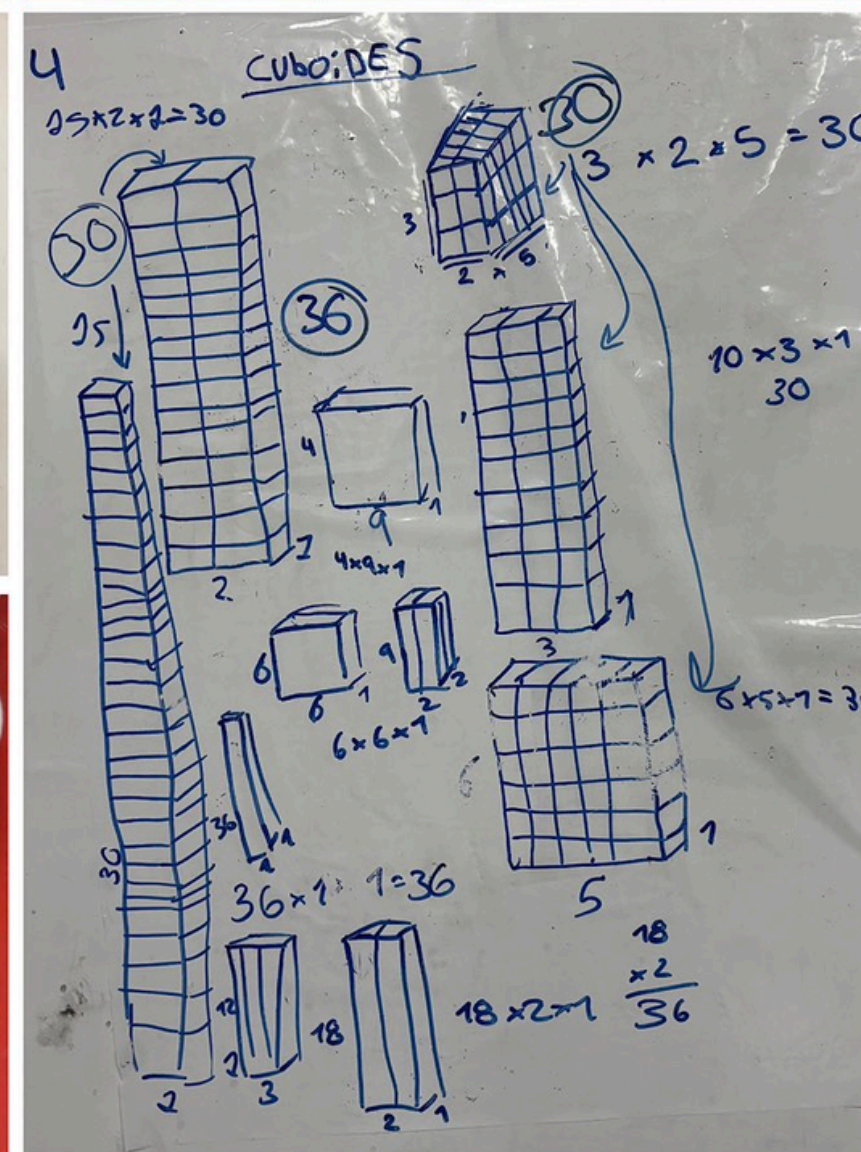
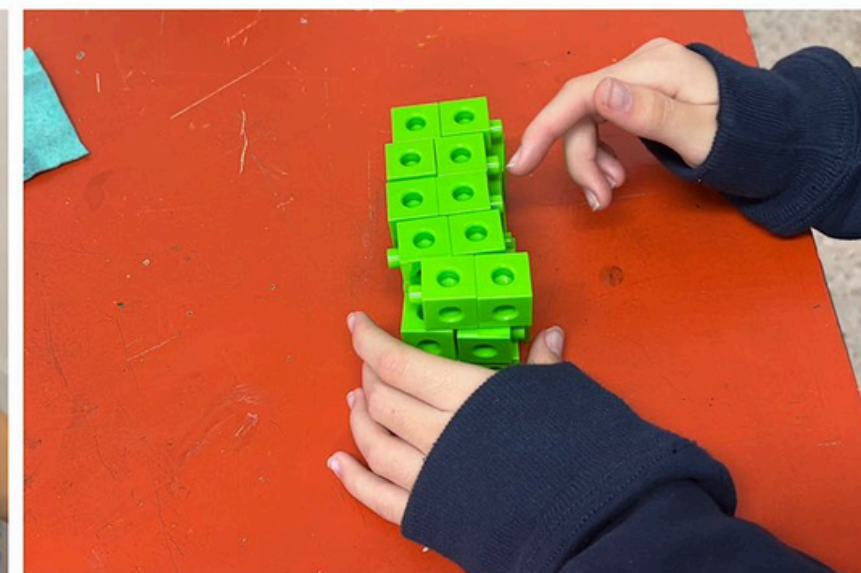
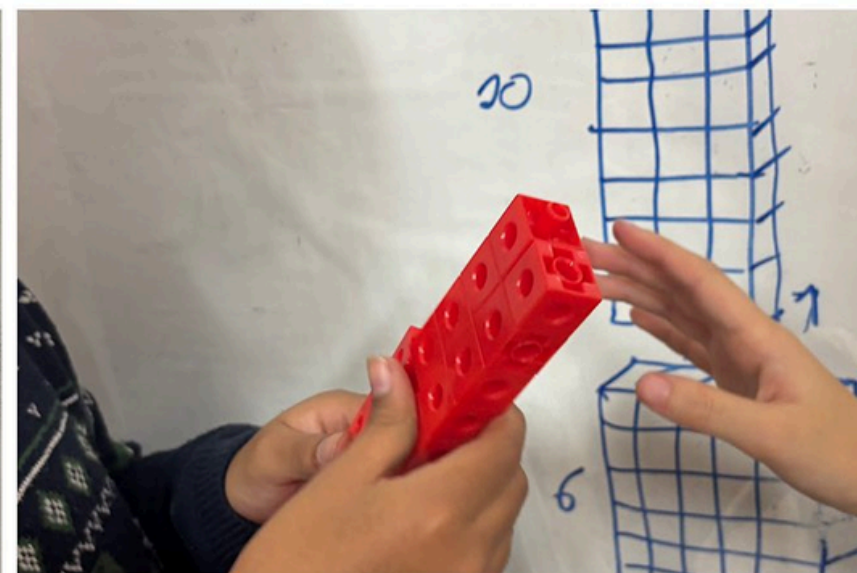
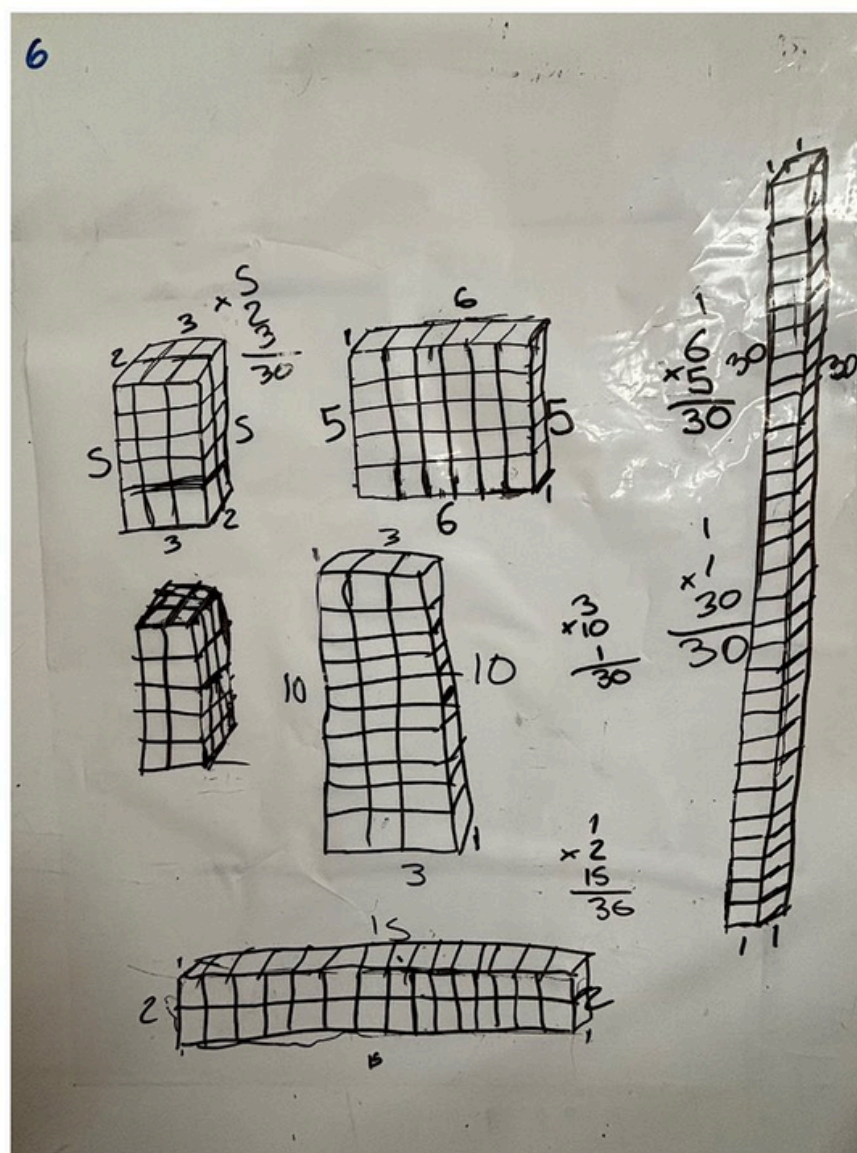
Fomentar la comunicació i representació

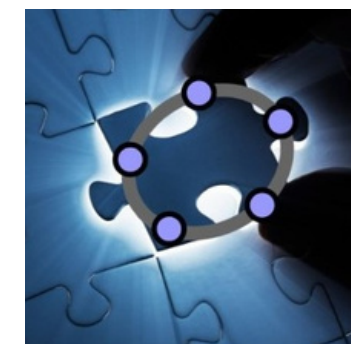
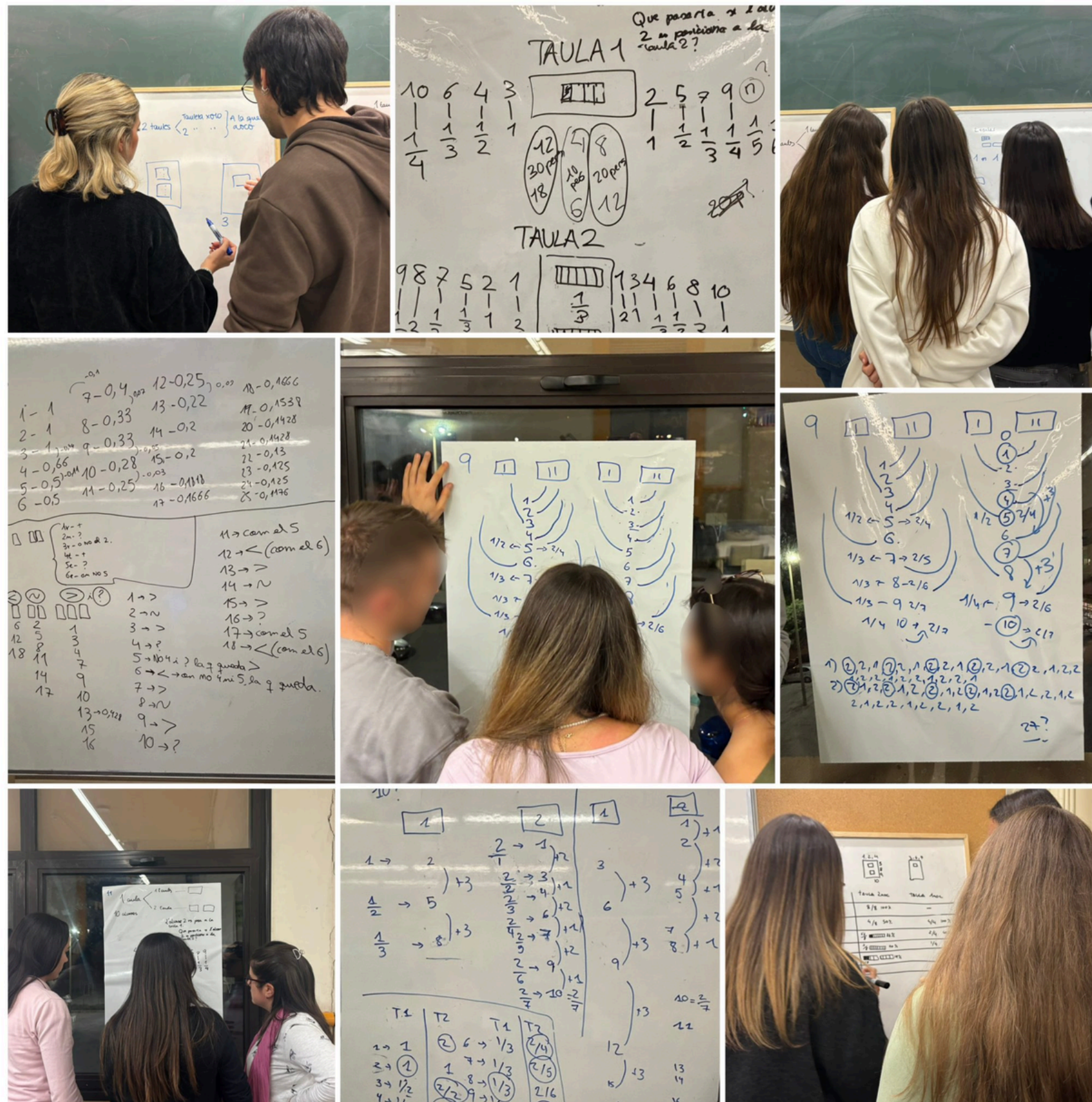
Avaluació formativa i formadora











MOLTES GRÀCIES!

