Cap sur l'école inclusive en Europe

Erasmus+

Pedagogical Sheet

Approaching the Pythagorean theorem with visually impaired pupils

Section of the Module/E

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The Pythagorean theorem is undoubtedly the best-known theorem: all children learn it one day or the other especially in the 3rd grade of secondary school.

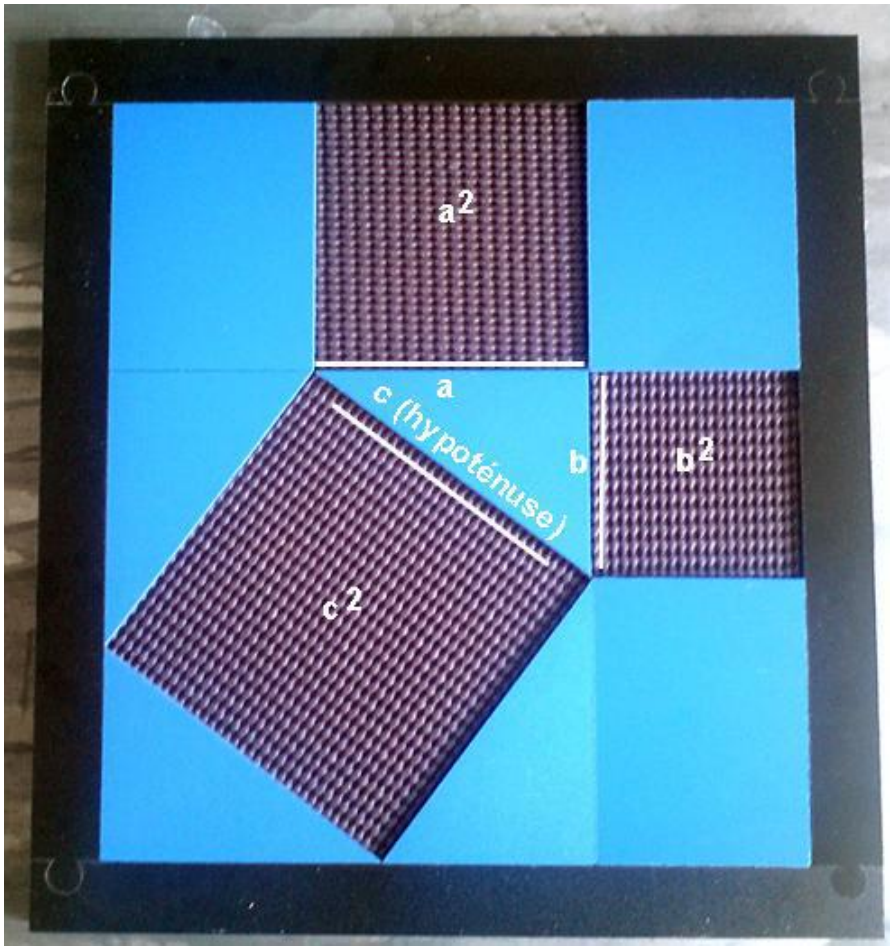
Of course, over the years, it is not uncommon to end by completely forgetting its meaning, and what remains of it is only a kind of song that is sung without understanding it, as in the Franc-Nohain's quatrain: *"Le carré de l'hypoténuse / est égal si je ne m'abuse / à la somme des carrés / construits sur les autres côtés."*(*"The square of the hypotenuse / is equal if I am not mistaken / to the sum of the squares / built on the other sides*.")

This theorem represents perhaps the first mathematical statement that is not obvious and that is hard to believe since it comes as such a surprise.

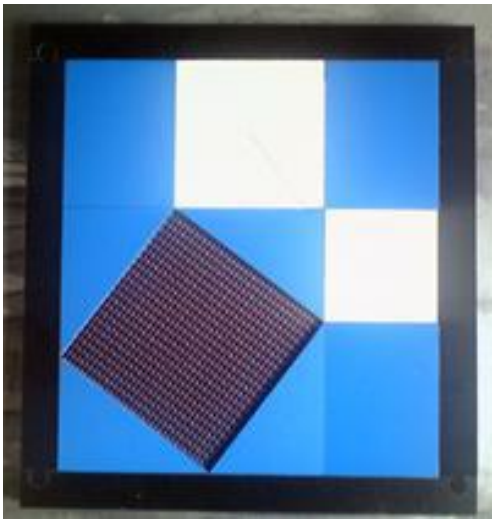
The proposition of this manipulation helps visually impaired pupils to perceive this theorem and to grasp its meaning.

How to use a puzzle made by Jean Meyer:

A puzzle with, in the middle, a right triangle with sides called **a** (small side of the right angle), **b** (large side of the right angle), and **c** (the last side). This triangle is blue and smooth to the touch. The surfaces $\mathbf{a^2}$, $\mathbf{b^2}$ and $\mathbf{c^2}$ are empty, with in the background a tactile material (rubbery waves touch):

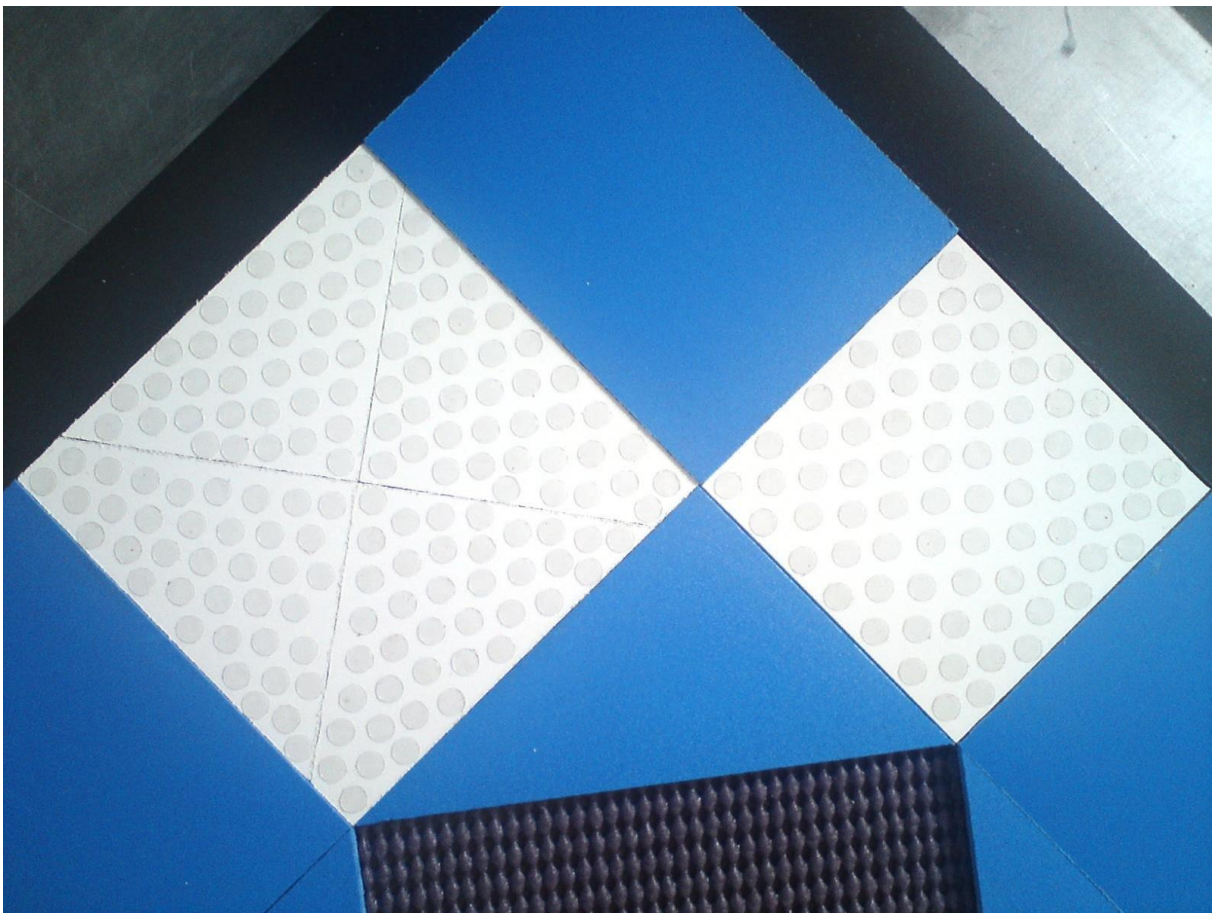


Surfaces $\mathbf{a^2}$ and $\mathbf{b^2}$ are filled with the puzzle pieces:

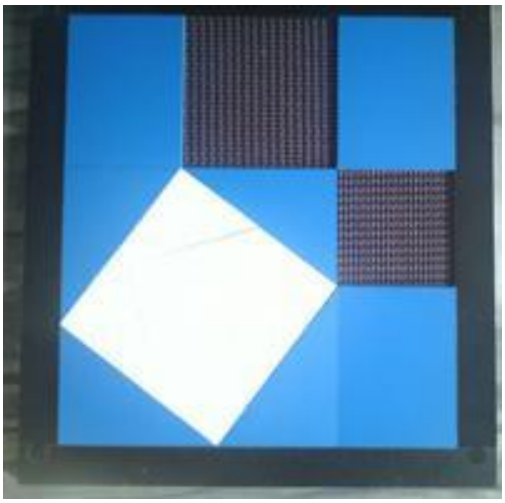


The surfaces of pieces are tactile (bumps touch).

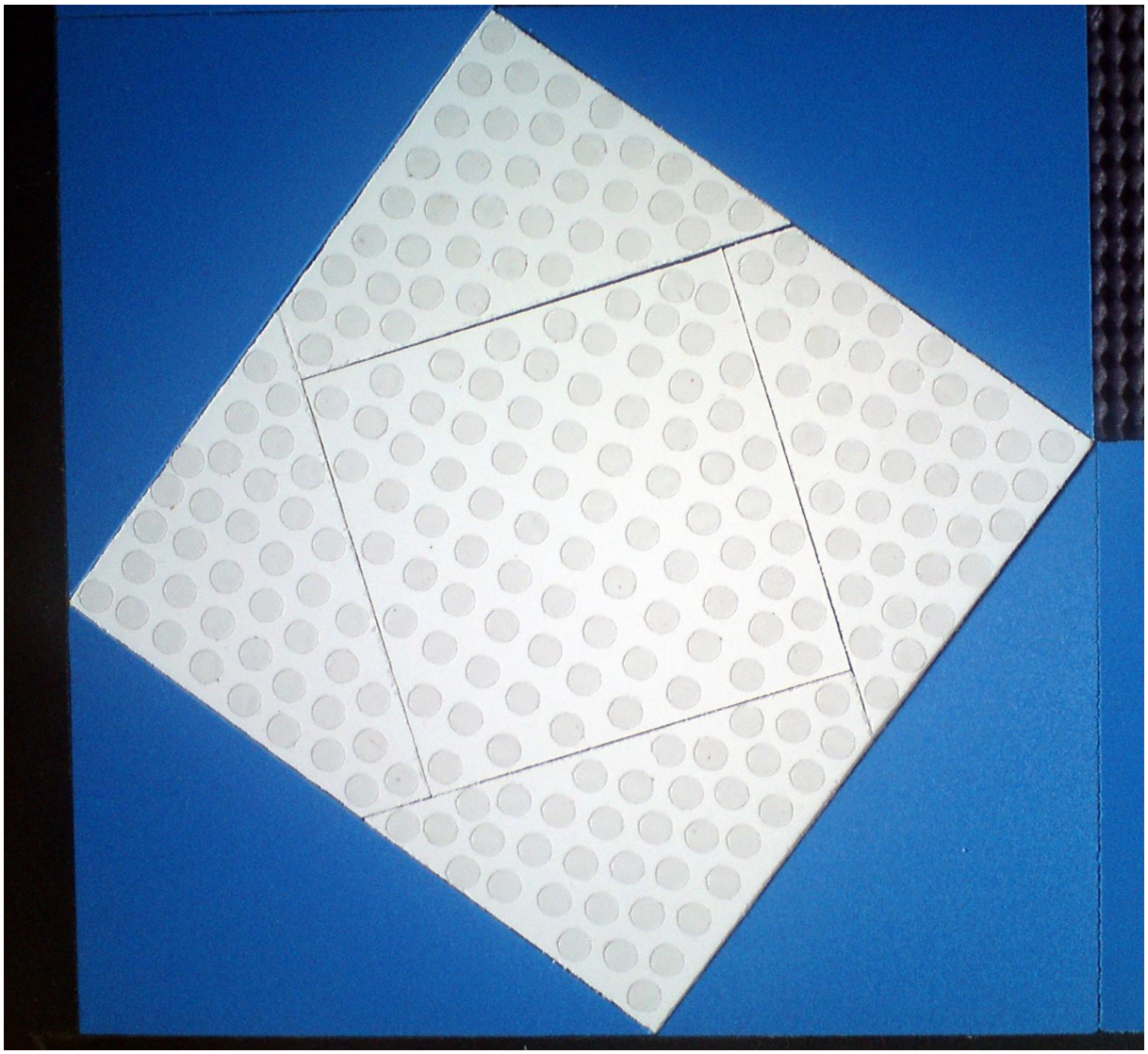
Zoom :



These same parts are removed from surfaces $\mathbf{a^2}$ and $\mathbf{b^2}$ to arrange them differently and fill surface $\mathbf{c^2}$.



Zoom :



All pieces are used, and perfectly cover the surface.

Which verifies that in a right triangle, $\boxed{a^2 + b^2 = c^2}$