THE SIX NAMAS!

Croatia, Greece, Italy, Latvia, Portugal and Turkey are the Six "NAMAs"! They are sisters as well mothers of a child. The child is called "Water unites us!". It is an Erasmus+ KA219 strategic partnership. NAMAs are keeping their child with their left hand. Where does the name "NAMA" come from? "MANA" means "mother" in Greek. Changing the position of the letters in "MANA" here it comes the word "NAMA" which means "the water of the spring"!

"NAMA" is a combined application of Maths, Biology, Chemistry and Arts and Craft and made by foam material. Nick Pexomatis, teacher of Art in our school, made a three dimension design of "NAMA" (fig. 1) on white paper using ferule and pencil (application of Maths, 1st step).

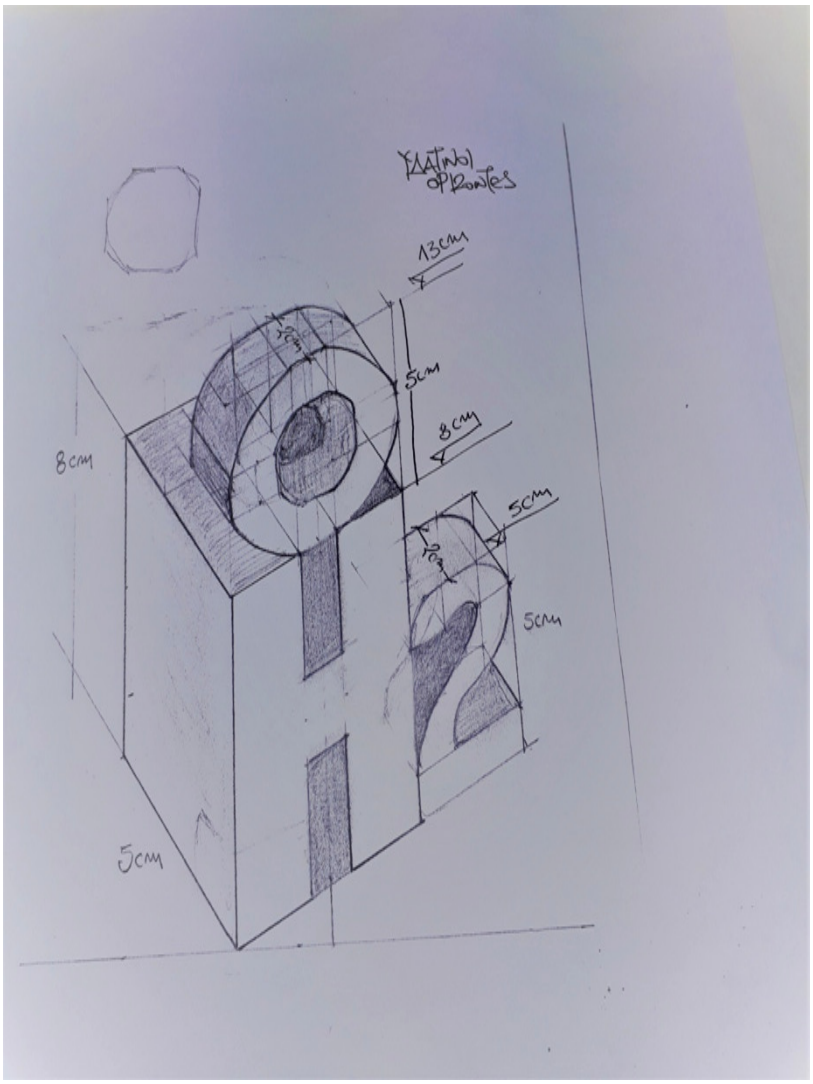
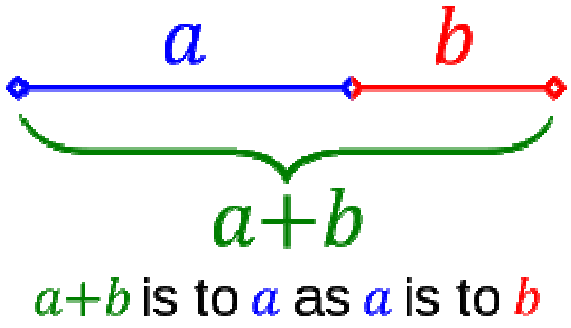


Figure 1. The three dimension design of "NAMA".

Students followed the design and cut the foam material properly, using a lancet, a tool of Anatomy (2nd step). Thereafter they painted "NAMA" with water-based glue (3rd step) and with water-based paint (4th step). Finally, they painted "NAMA" once more with water-based glue (5th step) so as to stabilize the color. The three last steps are applications of Chemistry.

NAMA IS AN APPLICATION OF GOLDEN RATIO!

In mathematics, two quantities are in the golden ratio if their ratio is the same as the ratio of their sum to the larger of the two quantities. The figure below illustrates the geometric relationship:



Expressed algebraically, for quantities a and b with a > b > 0,

$$\frac{a+b}{a} = \frac{a}{b} \stackrel{\text{def}}{=} \varphi,$$

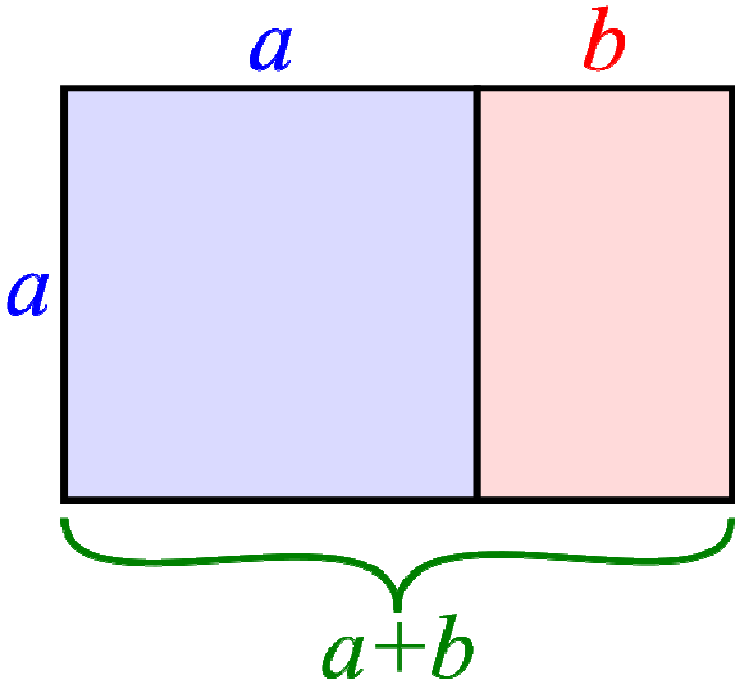
where the Greek letter phi (φ) represents the golden ratio. It is an irrational number with a value of:

$$\varphi = \frac{1+\sqrt{5}}{2} = 1.6180339887\ldots.$$

Some twentieth-century artists and architects, including Le Corbusier and Dali, have proportioned their works to approximate the golden ratio—especially in the form of the golden rectangle, in which the

ratio of the longer side to the shorter is the golden ratio believing this proportion to be aesthetically pleasing.

A **golden rectangle** (in pink) with longer side ***a*** and shorter side ***b***, when placed adjacent to a square with sides of length ***a***, will produce a similar golden rectangle with longer side ***a + b*** and shorter side ***a*** as it is shown in the figure below:



This illustrates the relationship:

$$\frac{a+b}{a} = \frac{a}{b} = \varphi$$

The dimensions of NAMA (a = 8 cm and b = 5 cm, longer side ***a + b*** = 8 + 5 = 13 cm and shorter side ***a*** = 2 + 1 + 2 + 3 = 8 cm, fig. 2) are mostly closed in the **golden ratio**:

$$\frac{8+5}{8} \sim \frac{8}{5} \sim \varphi \sim 1.6$$

Therefore our NAMAs are characterized by harmony!

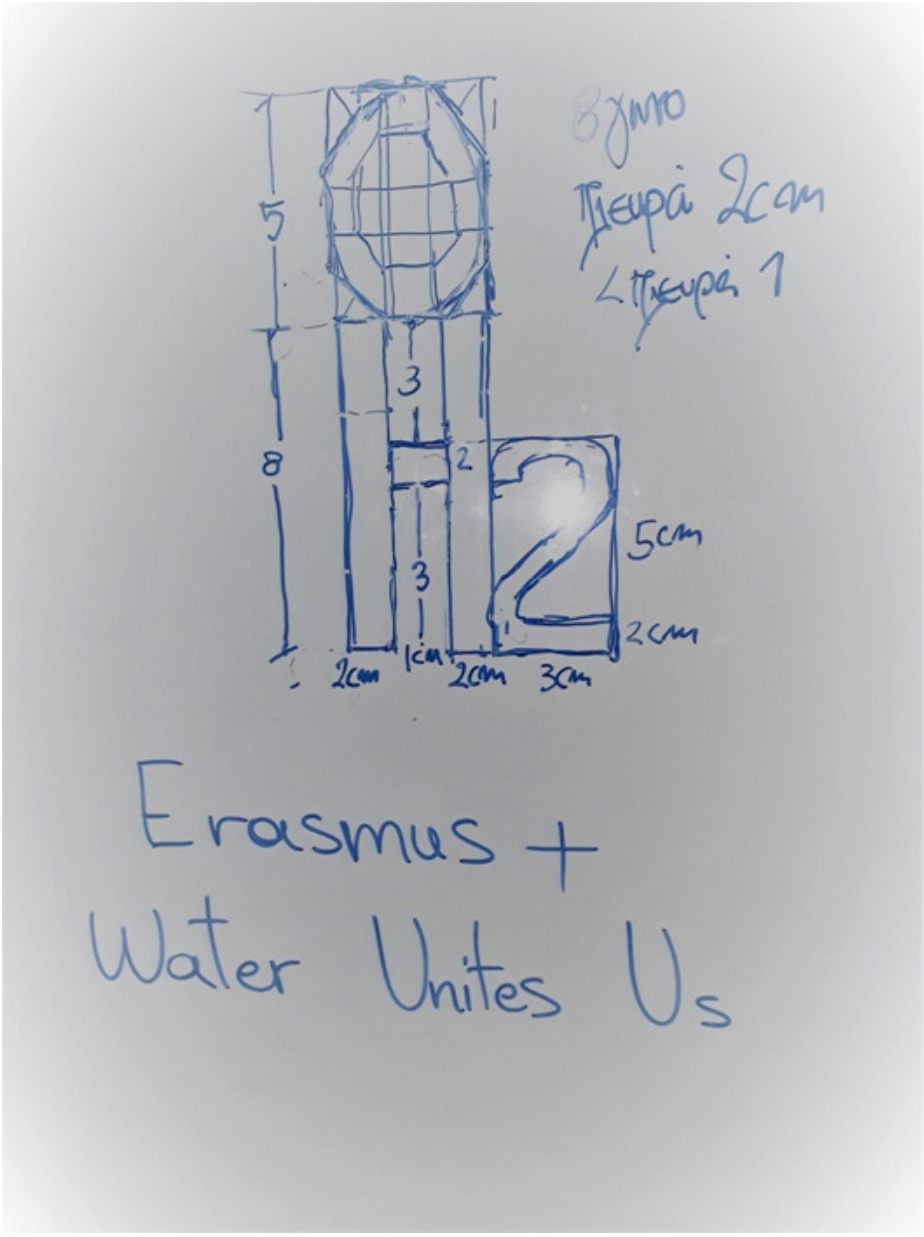


Figure 2. Dimensions of Nama (a = 8 cm and b = 5 cm).

It was a team work of a group of students of class A of the 1st General Lyceum of Argostoli, Maria Vandorou, Koralia Vasilia, Evi Gontika, Chrysa Destouni, Cristi Kounadi, Naja Tsamopoulou and Artemis Staveri (girls) and Gerasimos Avgerinos and George Papageorgopoulos (boys). Spyridon Kavvadias (Dr Biologist and project coordinator) had the responsibility of the whole procedure in December 2017.