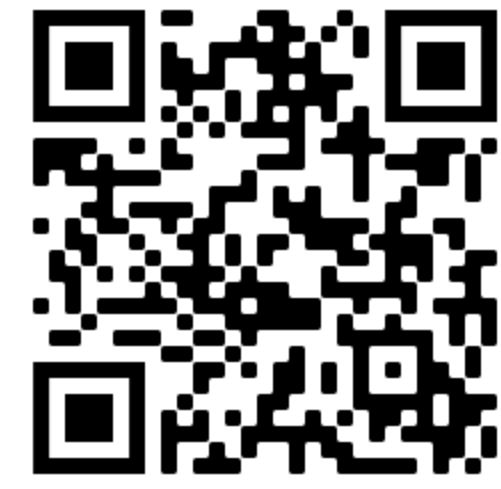


# GEOMETRICIAN'S VIEWS

## TOPIC: ORIGAMI

### Mathematical View



Mathematical ground of origami enables solutions for equations such as quadratic, cubic and quartic equations with rational coefficients, but also the doubling cube problem or trisecting an angle got its solution through origami. Constructing cube roots are also possible due to origami axioms. Doubling cube problem is also known as Delian problem. It is based on calculating the volume of geometric solids. A unit cube doubling depends upon line segment construction of line segment of length which is impossible to solve within the constraints of Euclidian geometry. The solution based on origami was found in 1986 by Peter Messer.

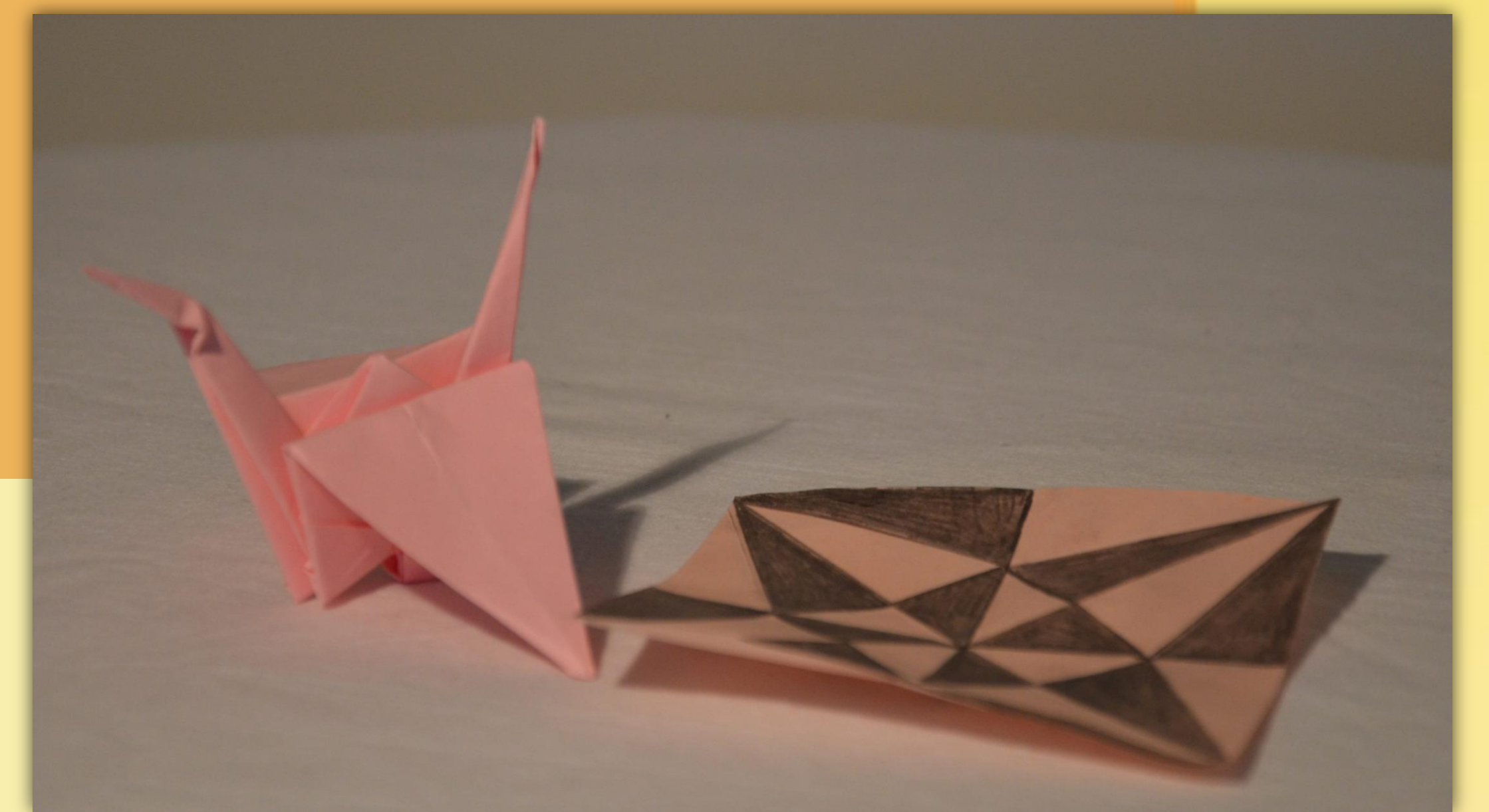
Researcher  
Miroslav Novta



### Artistic View

Students explore Bauhaus style-movement which made a great influence on the art and architecture of the 20th century. Bauhaus movement is also famous for introducing origami in the process of learning and teaching. Since origami and mathematics are related, it can be explored in the light of the Bauhaus movement.

Artist  
Renata Zorić



### Common View



Students in this lesson learn about European cultural heritage. Also, they get acquainted with the new ideas in science that connect mathematics, origami and art. What is very important, that students through these activities learn about advanced mathematical concepts, such as for example hyperbolic paraboloid. By mathematical definition a hyperbolic paraboloid is an infinite surface in three dimensions with hyperbolic and parabolic cross-sections. A couple of ways to parameterize

A hyperbolic paraboloid shape is called less formally as a hyper or more formally as a partial hyperbolic paraboloid, cut from the full infinite surface. The term hyper was invented by the architect Heinrich Engel in his 1967 book *Structure Systems*. Hybers that can be joined together at their edges can make interesting sculptures and make them interesting for everyday application, especially in architecture. One example of hyper application is the roof of the Girls' Grammar School in London designed by Chamberlin, Powell, and Bonn which is what we call a "5-hat" with five hyperbolic paraboloids spread apart slightly.

**"Origami is the art of folding uncut sheets of paper into decorative objects such as birds or animals."**

Robert Lang



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