TEMPLATE for the TEACHERS

★ **Name of the project:**
Dancing Euclidean Geometry

★ **Subjects covered from STEAM areas:**
Mathematics, geometry, Euclidean geometry, dance

★ **Target group (age range and size of the group)**
13-16, individual work, whole class

★ **Duration of the activity:**
90 Minutes, two lessons

★ **Keywords:**
Geometry, mathematics, dance, Euclid

★ **Key sentence describing context of the activity, followed by short description (200 words):**
Students present Euclidean geometry content like axioms or theorems by dance. Each representation should be followed up by video and short description that combine mathematics and artistic expression.

★ **Description of the activity environment, including the list of materials and tools needed:**
Students need to be familiar with the Euclidean geometry content, such as axioms, definitions, theorems, and proofs. Students need to make videos and edit them.

★ **Step by step, detailed description of the activity, including teaching and learning strategies.**
The workshop has three parts. The first part is dedicated to revising Euclidean geometry. Students revise axioms, theorems, and proofs about basics of the geometry. The second part is dedicated to analyzing the possibilities of how to connect dance elements and Euclidian geometry, while the third part is dedicated to creating videos that describe some of the Euclidian geometry properties by dance. The flow of the task follows these steps: starting from the basis of the mathematical content, elaborating more sophisticated concepts, and exploring them in the field of dance and body movement, supporting creative expression of the abstract mathematical ideas. Each task would be conducted by detailed observations to shape the ideas and make result acceptable and appealing to the public, in our case that would represent public. Questions that will be suggested to the students during the task creations should help them to finish their task successfully. Those questions would be the following: What is the main idea and how to represent it, what would be the clear mathematical explanation of the mathematical content to people who are not into mathematics? What to highlight in the task? What would be creative and innovative?

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★ **Learning objectives/competencies:**

The workshop promotes connections between different approaches of learning, where one topic is examined from two perspectives: dance and mathematics. We have chosen dance as an illustration how artistic elements can be used to learn Euclidian geometry in innovative way. Students would explore Euclidean geometry content such as point, line and plane. They would be encouraged to make more connections between geometry and movement. Once students revise through the knowledge of the basic notions and the concept and how they could be represented in the world of dance, they would move on to more advanced concepts such as triangles and theorems related to triangles. The students are supported to think about those concepts in the sense of the dance movements combination and their feelings regarding them.

In Figure 1 we can see the movements presented in the students' videos that connect Euclidean geometry and movements.

Figure 1. Students present Euclidean geometry content trough dance movement

★ **Evaluation/Assessment guidelines**
Evaluation can be done through peer discussion. Students present their dance in videos and together with teacher and other students they discuss and analyze connection mathematics and geometry represented by movement and dance.

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★ **Lessons learned:**
We have chosen dance as an illustration of how artistic elements can be
used to learn Euclidian geometry in innovative way. Since very innovative
and unusual, this approach could face many challenges and limits. But on the other
Hand, prejudice about mathematics which inhibit the meaningful learning could be
overcome with the creative and artistic expression of the students.

★ **Additional information/Links:**

https://web.archive.org/web/20181123140419/http://gonzolabs.org/dance/

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