Report on Implementations of Learning and Creativity Plans of the STEAME Program in summer Schools.

During the period of July 2021, at the Hotel "RODON" in Agros a summer school organized by the Cyprus Mathematical Society, took place. In the summer school, elementary, middle school and high school students participated for a week attending Mathematics classes and participating in various other activities.

Within the framework of this school, learning and creativity plans of the European project "STEAME" were implemented with groups of elementary and high school children.

Specifically, the plans "A glass of hot chocolate" were implemented (with the modification, due to the summer, to "A glass of cold chocolate"), "An education museum in our city" and "The colonization of Mars".

The first application took place on 7 and 8 July 2021 in a group of 75 middle school children with the theme "The colonization of Mars". The second action took place on July 15 with 72 middle school children and the theme was "An education museum in our city" and the third on July 16 with 68 elementary school children and the theme was "A glass of cold chocolate". Finally, on July 22 and 23, the fourth application took place with 40 middle school students and the theme was "The colonization of Mars".

Through the implementation of the learning and creativity plan "A glass of cold chocolate" the children should organize a charity bazaar for their school on a theme of their choice. The students had to discover which glass (material) keeps the chocolate cold for the longest time, study the cost of preparing a glass of cold chocolate and compare it with the selling prices of the corresponding drink from the cafes. At the same time, each group had to create an advertising poster for its bazaar and craft the glasses, according to the theme they had chosen.

The project "An educational museum in our city" raised the issue of security in a museum consisting of convex and concave polygons. Children had to identify the smallest number of cameras needed to monitor each point in the museum, verify their findings using simple LED circuits and do market research on the cost of purchasing and installing the cameras. Finally, they had to use binary code to write their own message at the entrance to the museum. Students learned about convex and concave polygons and the straight propagation of light, learned to build a simple electrical circuit and to build with a scale. They also learned to convert numbers from the decimal system to binary and vice versa.

Through the learning and creativity project "The colonization of Mars" the children had to answer various questions about the possibility of colonization of the planet Mars by the human species. Such questions were: Why we would need to leave Earth? Why would we choose Mars as a new place to live? How would we leave Earth? How would we land safely on Mars? What would we need there to survive (facilities, buildings, materials)? The children studied the questions and through activities and constructions, they tried to answer them. Specifically, the children made a poster about why the human species should leave Earth at some point and why to choose Mars,

built a model of a rocket and a parachute and studied their motions, made a model of a space base on Mars and they also studied ways of securing the necessary materials and conditions for life (water, oxygen, energy, food). Through their work, the children were introduced to the concepts and laws of Physics (principle of conservation of momentum, air resistance, final velocity, energy conversions), studied chemical processes for the production of oxygen and water from materials found on Mars, explored by biological side of how it would be possible to grow plants on Mars and in Mathematics they located the nets of various normal solids and constructed these solids using an appropriate scale. They also dealt with the binary number writing system by creating their own message in a binary system. They also designed the emblem of the space base they built. Finally, each group had to present to the plenary the model they had made and answer the questions that had been initially asked.

In all cases of implementation of the learning and creativity plans, the children were enthusiastically involved in the activities and worked in their teams creatively.

Some picture of the implementations: