In 2014 efforts on teaching robotics for children at public elementary school started in the city of Mogi das Cruzes, São Paulo (Brasil). With this initiative, students of some elementary school were presented to technology and science and this work shows some of the results in two of these schools.

This work aims to show the positive impacts of involving children and teenagers in topics involving Science, Technology, Engineering and Mathematics (STEM) and having as a background the applicability of their projects in space projects.

**INTRODUCTION**

**THE START**

In 2015 at Jair Rocha Batalha Elementary school, that attends children from 6 to 11 years old, robotics were applied as an optional course at the school and students were grouped and incentivated to develop small rovers to play sumo with robots. With this classes students were incentivated to work with prototypes, programming language and engineering concepts. Also they were introduced to work in groups, learning to think in a "system way".

**PROTOTYPES & COMPETITIONS**

At Jair Rocha Batalha students were incentivized to present in local science fair the results of their projects and also to take part of local competition. The competition purpose was to develop a sumo robot with a defined dimension and mass and with autonomy. In 2017 the students from the school won the first and second prize in the Municipal Robotics Olimpic.

**THE CUBE DESIGN COMPETITION**

The postgraduate students from the National Institute of Space Research (INPE - Instituto Nacional de Pesquisas Espaciais) created in 2018 the Cube Design ([site](https://www.cubedesign.net.br)). A competition to motivate graduation students do develop a CubeSat and high schoolers to challenge themselves to develop a space artifact.

In 2019 some students from CEMPRE Benedito were selected to participate of the 2nd CubeDesign. The mission for the schoolers was to develop a mockup (structure) to accommodate a payload, within a certain dimension and a certain budget. This mockup was launched from a height of 6 m and during the falling and landing, the payload measured the impact when touching the ground. The mockup was scored according to its mass, volume, final cost (lower cost, higher score), project planning and performance during launching and landing (lower impact, higher score).

In this competition, CEMPRE Benedito Ferreira Lopes was the only public elementary school, and they were granted with the 3rd place in their category.

**CONCLUSION**

The introduction of STEAM using real projects, in space context, within children and teenagers had a good feedback, and two perspectives can be seen:

- For students, this new entire world was so amazing that they are motivated to study more, to know more to develop new robots, new products in engineering.
- The purpose of implementing STEAM was achieved once it was possible to identify natural skills in system thinking and problems solving and challenge students to do more.