

Young Engineers - Bricks Challenge

- **Target Audience: 1st - 3rd Grade**
- **Up to 16 children per group.**
- **Course Duration: 75 minutes**

The overall course objective is to impart theoretical and applied knowledge in the fields of Science, Technology, Mechanical Engineering, and Mathematics (STEM) by using LEGO® technic and other exciting tools.

The main goal of the course is to illustrate content through stories and demonstrations. Our students will learn mathematics and physical principles through intuitive study, develop their independent learning and improve their building skills. The course will provide mathematical integration between physical laws and the simple calculations to support them. The laws and mathematics are both illustrated through the construction of exciting LEGO® models.

Once the concepts have been demonstrated students enjoy hands on building the LEGO® models which provides experiential learning and reinforces the lessons topic. To carry out the building process, students receive a tailor-made kit developed by Young Engineers.

Course Structure:

15 minutes: Explanation of the model and introduction of lesson content.

40 minutes: Model building.

10 minutes: Playing and improvements.

10 minutes: Model dismantling, kit arrangement and lesson summary.

Program Objectives:

- Acquire theoretical knowledge in the fields of Science, Technology, Engineering, and Mathematics through experimental games.
- Integrate theoretical material and scientific principles into a LEGO® based project.
 - Develop creative and inventive thinking among the students.
 - Develop the students' motor skills and spatial vision.
 - Develop skills for cooperative team work.



Main Topics:

- **Basic and Complex Mathematical Operations:** The integration between planning and building the model involves the calculation of energy transformations which enables the teaching of mathematical topics such as addition, subtraction and exponentiation.
- **Introducing Philosophers and Theoreticians:** Archimedes, Newton, Da Vinci and many more.
- **Physical Forces and Laws:** Centrifugal force, centripetal force, force of inertia, kinetic energy, potential energy, law of action-reaction, lift force, torque, leverage points, load distribution, force conservation, angular momentum and more.

Program Objectives:

- Develop time planning and management skills.
- Encourage independent creative and inventive thinking.
- Develop the ability to analyze engineering processes.
- Broaden knowledge of physical laws and various natural phenomena.
- Improve spatial vision.
- Develop a sense of self-efficacy.
- Develop interpersonal communication skills.

Exciting Theme Models:

- Amusement park rides.
- Aircraft.
- Various means of transportation.
- Cranes.
- Elevators.
- Modern machines.

