

# An introduction to Robotics with LEGO® Mindstorms (III)

## The FLL (FIRST LEGO League)

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The educational use of LEGO® is an area many don't know about. In addition to the products aimed at the commercial market, LEGO has developed a product line aimed at the educational market for the full range of ages, from pre-school to secondary education.

On the other hand, LEGO, together with FIRST, promotes one of the most widespread science and technology projects for young people: The LEGO FIRST League.

### What is FLL?

The FIRST LEGO League (FLL) is an international program sponsored by LEGO and FIRST, directed at boys and girls between 9 and 16 (9-14 in the USA and Canada) which combines investigation with a series of robotics challenges in an atmosphere of healthy competition.

FIRST doesn't refer to a number, but rather it is the acronym of "For Inspiration and Recognition of Science and Technology". It is an organization that aims to promote interest in science and technology. In addition to promoting the FLL, it organizes other robotics competitions in the USA and Canada for different age groups starting with 6-year-olds.

### A bit of background

LEGO MINDSTORMS was born in 1998 and in the same year the first FLL trial took place. From 2001 onward this project started to extend outside of the USA and Canada.

The FLL has been celebrated in Spain since in 2006 the Scientia foundation took charge of its organisation and it has grown year by year ever since. This year there are 9 locations for the classification rounds that will lead to the finals in Barcelona.

The challenges that are prepared every year are related to global problems, emerging technologies...

In 2008 the challenge was related to the environment and 13,705 teams from 42 different countries took part, with a total of 137,000 participating children and teenagers and 500,000 volunteers.

### The teams

Most teams are organised in secondary schools, although there are also teams that are promoted by different associations or groups of friends. A team consists of a maximum of 10 players who with the help of a coach, work together to face the challenge and find solution using their creativity and logical thinking.

The teams may get help from mentors who provide the team with voluntary support in matters related to technical, scientific or even design issues that will identify the team.

### The challenge

The starting point for the FLL is a challenge which is presented to the participating teams in September.

Although at first glance the FLL may seem simply a robotics competition it is much more than that. The challenge isn't restricted to the robots – which are probably the element that generates more motivation. The teams need to investigate and present a scientific project related to the central theme. In addition to the technical and scientific part, the FLL also has a code of conduct which sums up the spirit of the competition:

- **We are a team.**
- **We do the work to find solutions with guidance from our coaches and mentors.**
- **We honor the spirit of friendly competition.**
- **What we discover is more important than what we win.**
- **We share our experiences with others.**
- **We display Gracious Professionalism in everything we do.**



### - We have fun.

All of this is reflected in the competition itself in which much more is evaluated than just the effectiveness of a robot in passing a challenge.

### How the competition takes place

After a minimum of 8 weeks of teamwork it is time for the first classification round. The teams arrive at the location of the competition with their robot, computer and spare elements in addition to a good dose of nerves. For many teams this is the first time and they have a lot to learn.

The teams have a reserved area at their disposal where they can do make their last trials and adjustments. From the moment the competition

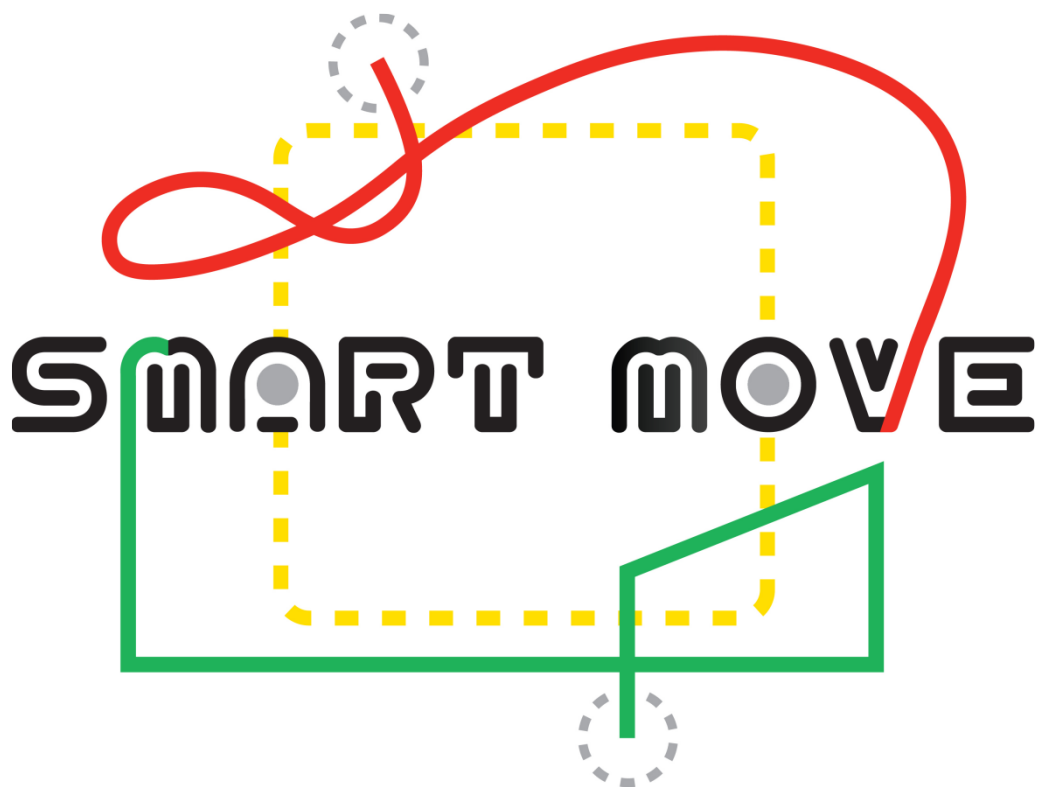
starts a strict time table marks the steps of the teams between presentations and the robotics competition.

### The missions

The teams need to carry out several missions with their robots. After three rounds the 8 teams with the best scores pass on to the next phase in which they will compete to reach the finals.

### Technical presentation

Each team explains to the jury how they have solved the technical challenges they have encountered while building their robot. In this presentation the applied solutions, the methodology used to solve these challenges, creativity and the organisation of the team work are evaluated.



### The scientific project

The teams present their projects which detail proposals for solving real life problems related to the central subject of the year. This presentation may be done using a slide show, a theatre play, a song...

### Recognition

Who wins? First off, all teams win although not every team receives the same level of recognition. In the classification round, there are 8 teams that receive a special recognition and no team can win in two different categories (the first four are related to technical matters whereas the rest are related to team work):

- Champions Award
- Project Award
- Robot Performance Award
- Robot Design Award
- Teamwork Award
- Rising Star Award
- Team Spirit Award
- Adult Coach/Mentor Award

At the finals in Barcelona there is an additional prize: the overall winner of FLL Spain. To award this prize, the robotics competition, the scientific project, team work and robot design work are all taken into account.

### 2009 Challenge: Smart Move

The challenge for 2009 is related to efficient transport. The teams need to propose solutions for current problems related to transport as well as design and program a robot that is capable of dealing with this year's missions.

The competition rules establish a framework that tries to make teams participate in equal conditions. One of the rules is related to the materials that may be used: unmodified LEGO® parts. There is a limit to the number of sensors and motors that can be used and the software needs to be either NXT-G or RoboLab.

On the Spanish FLL website you can find more information about this year's missions as well as the locations and dates for the classification rounds.

FLL España: [http:// www.firstlegoleague.es/](http://www.firstlegoleague.es/)

FLL: <http://www.usfirst.org/firstlegoleague/> ■



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