

An introduction to Robotics with LEGO® MINDSTORMS (IX)

A Guide for Following the FLL

Text and pictures by Koldo Olaskoaga (collaborator of FLL Euskadi)

As every year, in September the new challenge for the **FIRST LEGO League** was presented, a league in which teams from over 60 countries develop their projects. This year the theme is **FoodFactor** or how to avoid food contamination so food doesn't become dangerous. But, do you know what the FLL is? The best way to find out is to see it for yourself, but first you should know what the objectives and character of the competition is because it is not a classical competition.



A science, technology and innovation program.

The FLL is a program to promote science and technology accompanied by an important component of innovation. It was started by FIRST (a foundation that promotes the recognition of science and technology) and LEGO® 13 years ago in the USA and Canada and has grown over the years to reach over 60 countries in this edition.

Yes, but how do FIRST and LEGO generate a motivating context to get boys, girls and teenagers who up until then thought that science and technology were for others motivated to learn and see a future there? Every year the international FLL organisation chooses a theme of global importance, that is, that affects all of us independent of what country you live in. Around that theme two basic lines of work are established, a scientific project and the design of a robot, to which is added the element that brings it all together, the FLL values.

The values

The FLL values are at the core of the competition and must be understood and interiorised by the teams, trainers, schools, families... and must pervade all activity in the FLL.

- 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!

The scientific project

The teams must identify and select a problem in their environment that is related to the central theme. Starting from there they must study it and look for solutions that allow us to deal with it. The idea is to present innovative solutions which in some cases have attracted interest from universities and companies to study their viability.

The competition on the table.

This is probably the part that arouses more interest. All teams must compete on the same competition table, with a common set of rules that establishes the limits of what can be done to solve the proposed missions.

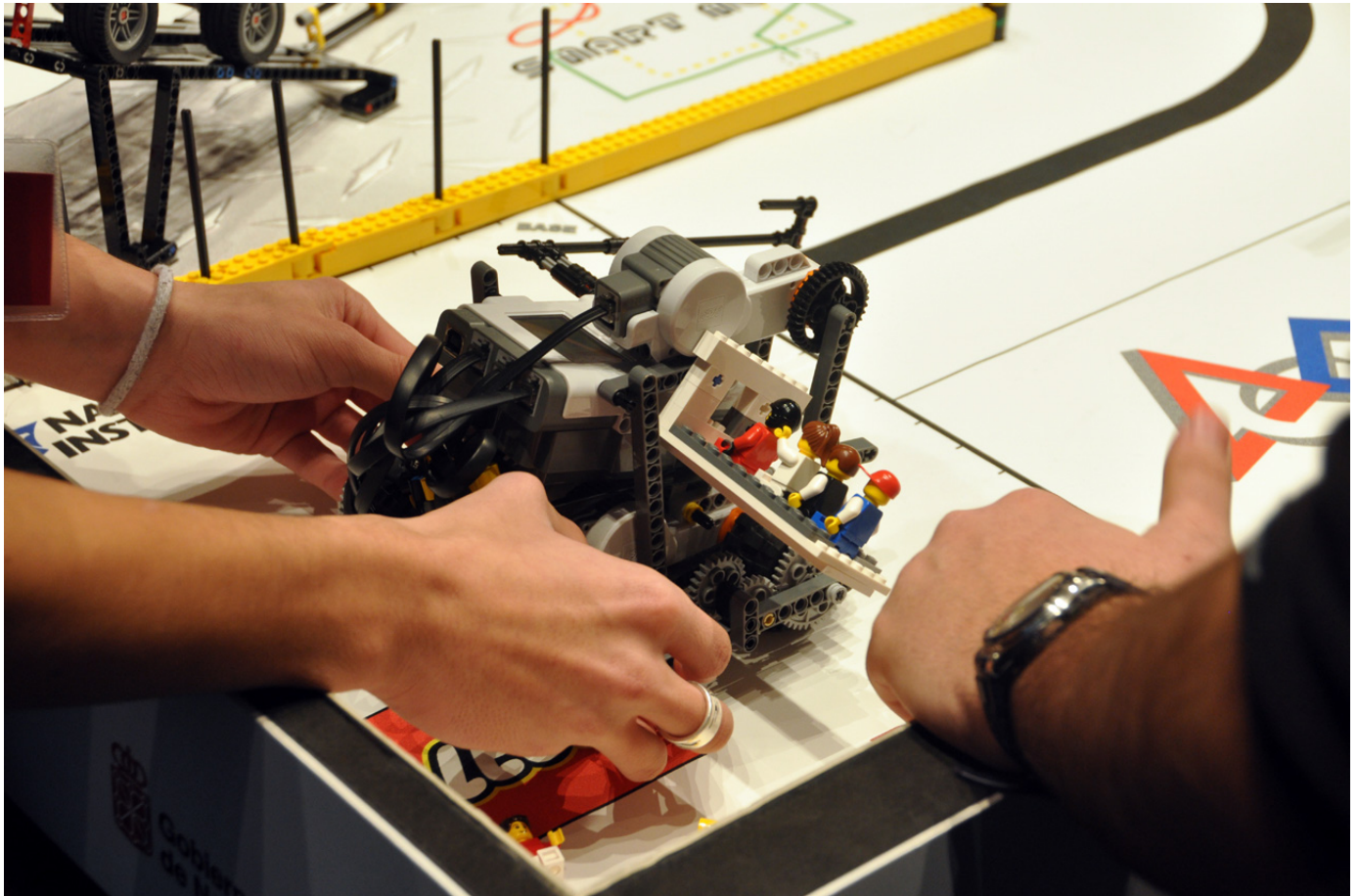
The teams have two and a half minutes to carry out as many missions as they can, using a completely autonomous robot. There is an area called the Base in which the teams can make modifications to the robot, prepare it for missions, start programs... but if they touch their robot outside that base they are penalised.

The missions are designed around the central theme of the challenge, so this year there are elements like bacteria and viruses, a refrigerated truck, thermometers, food etc. on the table. From year to year there are some changes in the set-up of the table, and just like last year there was a mission that necessitated the use of a colour or light sensor, this year the table has been designed to make it practically impossible to (I don't want to say completely impossible) to get the maximum score. In this way teams that used to get the maximum score in less than two and a half minutes will have to think a lot more and there will be fewer draws.

During the three rounds of the tournament, the teams show the result of their work designing and programming their robot. The two teams with the best score (in any of the three rounds) go on to the final round in which the champion will be proclaimed.

Designing the robot

The robot may be more or less efficient, but more important than that is the design process and how original the ideas that were developed are. The team presents and defends the design process and the decisions that were made both in constructing and programming the robot before the jury.



The presentation

Both for the presentation of the scientific project and the robot design, teams have 5 minutes to present their proposals to the jury, after which the jury will ask any further questions it deems necessary for their evaluation. Presentations can be done in a traditional way or in any way the team wishes: as a theatre representation, a song... The jury will evaluate original presentations positively.

In the case of the values, the jury will interview the teams and may propose a test in which the participants need to demonstrate their capacity for teamwork. This is something that was already part of international competitions and that now will be incorporated into all other tournaments.

How are the different aspects evaluated?

The competition on the table is evaluated based on the missions that have been accomplished, although it should be mentioned that what is taken into account is the situation at the end of the two and a half minutes. What does that mean? Each team may complete a mission and ruin it afterwards before time is up, in which case the mission doesn't count. Also, if a mission is resolved in a way that contradicts the rules, no score is obtained.

For the evaluation of the presentations and values of the FLL the jury uses evaluation sheets which were at the team's disposition when the challenge was published. In this way all teams know the criteria that will be used to evaluate their work. Based on these evaluation sheets teams obtain a score for each part of the challenge

The Awards

Although the important thing in a program like this that promotes science and technology, there is an opportunity to participate with young people from different backgrounds... and also in this aspects teams that make a difference are recognised.

One of the novelties this year is that in order to win any of the awards, teams need to demonstrate that their activity is based on the FLL values which influences the possibility of getting to the table finals.

I will not expand on all the awards that can be won as the number of awards depends on the number of teams in each stage of the FLL competition so I will only mention the main ones. Each part of the tournament has its own award: robot design, scientific project, FLL values and best score on the table. In addition to these there is the tournament champion which is the most complete team considering the points obtained in all four categories,

The awards are mutually excluding, so no team can win more than one award, except the team that wins in the table competition.

Teams that do not win any award also have their moment of glory since all the boys and girls who participate receive a commemorative medal.

The International Phase

After the local tournaments there is a national one and from there an international tournament. The world festival



is celebrated in St. Louis (USA) and in it all the teams that obtained the best results in the national tournaments will participate. In addition to this final there are the opens that are celebrated each year in California, Florida and Germany.

The Global Innovation Award

Last year the FLL Global Innovation Award was created, allowing teams the opportunity to work together with Experts in product development and marketing to convert their ideas into a real product. The projects that were presented for this award must be original and pass a pre-patent procedure.

The volunteers

Although I have left this for the end, one of the most important assets of the FLL is the volunteers. Without them it would be impossible to celebrate the FLL. Judges, referees, the people

who accompany the teams during the tournament as well as all the other volunteers that offer their time for the FLL, convinced that the FLL is necessary to stimulate an interest in science technology and innovation among young people.

More information at...

- FLL international: from this website you can access all national FLL organisations: <http://www.firstlegoleague.org/>
- FLL Spain: <http://www.firstlegoleague.es/>
- FLL Euskadi: <http://fileuskadi.com/>
- International Innovation Award: <http://fllinnovationaward.firstlegoleague.org/>

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