

# HANDS-ON LEARNING WITH LEGO

**Dru Watts** shares her love of LEGO® robotics and how she implemented the *FIRST*® LEGO League

**A**round eight years ago, a lower-secondary student mentioned in computing class that he had just got a programmable LEGO set. With a school open evening coming up, I encouraged him to bring it to the computing department so that we could see what it could do. We were impressed and ordered a LEGO MINDSTORMS® set for our computing club, which proved very popular. We then found out we could enter a competition to compete internationally with our LEGO robots — and so our *FIRST* LEGO League team was born!

The *FIRST* LEGO League is an annual STEM competition that runs worldwide for students aged 4 to 16. There are three



## DRU WATTS

Dru is a computer science teacher from Suffolk in the UK. She is a Google Certified Innovator, Trainer, and Educator, and an RPi Certified Educator. She has a particular interest in getting girls and other underrepresented groups interested in computing (@DruWatts, @TeamBergholt).

divisions: Discover for ages 4 to 6, Explore for ages 6 to 9, and Challenge for ages 9 to 16. Each year, the competition has a different theme, from cities, to water, to animals. As well as building a robot, there is an innovation project to complete, challenging students to solve a real-world problem based on the competition's theme. For example, our team has previously created an online game for saving water. Competitors are judged on their team's core values and robot design skills. There are awards at a regional, national, and international level for these individual sections, as well as overall tournament champions.

## How it works

Our team is a voluntary after-school club, usually meeting twice a week. During competition time, students spend every extra minute working on their robot and projects. In the off season, we still meet regularly to practise, sort equipment, and take part in other activities and competitions.

There is usually a high demand to join, so when we have been oversubscribed, we have created additional training teams that enter other robotics competitions before a place in the *FIRST* LEGO League team is available.

There are various ways to organise a team, such as by year group, by gender, or by school class. Our team has evolved over the years, and it is now a mixed-gender group of students from different year groups. This makes it unique among our school clubs, and students say this is one of the things they love best about being in the team — they even socialise outside of the league, something they said they would never have done otherwise! Another benefit

## WHAT OUR ALUMNI SAY: HARRIET

Harriet joined Dru's team when she was aged twelve and is now a computer science undergraduate at the University of Southampton, UK.



### Why did you join the club?

I joined the club because I'd previously enjoyed experimenting with coding games in Scratch, and thought this seemed like something else I could do where you could actually see the results of your coding in real life, in the form of a robot.

### What did you enjoy about the club?

I really enjoyed the camaraderie of being in a team: going to competitions together and all being really excited to test our robot against the other teams, and having a good time whether we did or didn't do so well!

of having a mixture of year groups is that we're never starting the club from scratch: new team members are always introduced and trained by existing team members when the oldest finish secondary school — so the team virtually runs itself now!

## The benefits of taking part

Students benefit from taking part in the competition in several ways. The league is unique in the way it encourages students to get involved in every aspect of a project, rather than requiring them to have a specific role. All participants



■ Students Harry and Annika with team alumni and mentor Morgan Levison

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need to code, engineer, present to judges, and be gracious with other teams when competing — sometimes all at the same time — and our students have really risen to these demands when under pressure. You get to see your students flourish, and to observe the quietest students finding their voice and confidently talking about the ideas and passions that they have discovered and created.

I am passionate about getting girls into computing, and the *FIRST* LEGO League is a great way to do this. The club has definitely been the most popular club for girls in our school, and I think the variety of events within the competition, as well as the teamwork and social elements, really appeal.

We have also taken part in research investigating the impact of the *FIRST* LEGO League programme. This research found

that in our school, 100 percent of our team felt that they had improved their STEM skills and knowledge, compared to 77 percent of non-team members. Furthermore, 100 percent of our team reported that they felt they had learnt more about STEM careers, compared to 53 percent of non-team members. This is certainly reflected around the team’s HQ in school at competition time. As a school governor once said, “Computing is **the** place to be.”

**How you can get involved**

You can register to attend a regional tournament, or ask for a class pack so you can run your own tournament in school. If you would like to find out more about any of the *FIRST* LEGO League divisions or sign up for the next season, you can visit [helloworld.cc/legoleague](http://helloworld.cc/legoleague). (IHW)

WHAT OUR ALUMNI SAY: CHARLOTTE

Charlotte also joined the team aged twelve, and is now in the second year of her maths degree at the University of Warwick, UK.



**Has taking part influenced your career choices or given you skills you still use?**

The club helped me realise that working with technology can be fun. The problem-solving in the competitions probably helped me realise that I enjoy logical thinking, leading to me taking mostly STEM A level subjects and then deciding to study a STEM degree subject.

**Would you recommend that other schools start a team?**

Yes, because it helps get people interested in STEM, which we need for the future. I also really enjoyed everything about it and being part of the team.