SHAPA BLOG about F1 in Schools

1.137 seconds - the time our F1 in Schools car took to complete the 20m track at Regionals.

Alongside my A-levels, I'm competing in F1 in Schools competition as part of the team Ginetta Racing EDU.
F1 in Schools is a competition where teams of students design and manufacture a miniature F1 car to race down a 20m track. The car must comply with the technical regulations, and be financed by the teams sponsorship money. One of the main events of the competition is racing the car, however there are also portfolios to create, presentations to write, as well as running our own social media and website.

I'm the manufacturing engineer for the team, which means it's my role to manufacture the cars and the pit display. Sounds simple, but I can assure you it's not.
To begin with, I discuss the car designs with James (the design engineer) to make them manufacturable, due to all the different constraints and tolerances - something which his amazingly aerodynamic designs often don't factor in! Then I take these designs, and by using CAM software, turn them into the coding used by the CNC router (to cut the main body) or by the 3D printer (to build the other components).

I set myself the aim of creating the most efficient manufacturing method possible, in terms of both time and reducing the amount of post-manufacturing required. One of the ways I did this, was by 3D printing the front wings in 2 seperate halves, so less support structure was required and to CNC route the design in 2 axis, instead of 4, as well as selecting the right method so it used a shorter routing path. A main skill I've developed through F1 in Schools so far was to learn to work to deadlines and manage my time effectively, as well as getting the other members of the team to help with manufacturing tasks.

I'd say that I faced 2 main challenges through manufacturing lots of f1 cars. The first was acknowledging that nothing ever works right first time, and the second was creating a jig that would effectively hold the model block as it was being manufactured. Overall, we 3D printed 6 jigs, of 5 different designs. The final jig design has evolved so much from the first, and uses 4 pieces in an interlocking system with many screw holes, so it can easily and effectively clamp the model block to the router bed. F1 in Schools has definitely advanced my knowledge about 3D printing, and all the different settings, as well as learning how to work CAM software and run the CNC router.

A vital part of the competition, is the research or testing and development. Early Sunday morning, we completed this by testing out a few different car designs on our make-shift track along the school's sports hall. We used these times along with our CFD testing to find out what works, what doesn't and the key areas we may need to develop. Here is a quick clip of highlights from our first testing day - https://www.youtube.com/watch?v=TepRtdwHcVc

After completing a second day, (photos can be seen on our instagram page https://www.instagram.com/ginettaracing_edu/), we decided on our final regional car design. From 21 overall different designs, down to 6 for this testing day, to one final car design, regionals was getting closer! This design was consistently faster than the others, averaging at 1.074 seconds (as it was 5 grams underweight).
The next two weeks before regionals were spent manufacturing this design very carefully and accurately to create our regional race car.

Before regionals, we presented to SHAPA's general meeting, as part of their Return on Investment, along with many other displays of SHAPA's logo across our team. It was a great experience for all of us, something that we can reflect back on in the future as it was the first time that all of us had been involved in an e-business conference. It also helped with the 5 minute presentation we gave at regionals, as it developed our confidence and communication skills. At the moment, we are trying to arrange giving a presentation to a large group of younger children in order to promote STEM activities.

Friday the 2nd of March, and the day was finally here. After setting up our pit display and handing the cars in for scrutineering, we had an introduction to F1 in Schools, and were shown how far it can take us - very far is definitely the answer. We then had our Enterprise judging, followed by a quick lunch, before it was time for the presentation and racing. We were challenged by some tough questions from the judges in the presentation, however we came together as a team to offer some well-thought answers after some on-the-spot quick thinking.

Race time had finally arrived. Jamie released the first car, completing the track in a time of 1.322 seconds. Followed by James, with an equally quick reaction and car time. Once all 4 races had been done, I finally relaxed, only the design and engineering judging to go. What was meant to be a 15 minute judging session soon turned into a 30 minute chat about our engineering process, as we had so much to speak about. From this we got a very positive impression from the judges, who especially loved the number of jigs we'd created. All we had left of a busy day was the awards ceremony. Our team name came up on the screen, not once, not twice, but three times. We'd won the awards for fastest car (1.137 - fastest of all UK regionals up to that point), best engineered car, and team sponsorship and marketing award. I suppose the moment we found out we'd become Yorkshire and the Humber champions, can't really be explained in words, so the end of this clip explains the moment perfectly. https://www.youtube.com/watch?v=51wc-wYMirk - We were delighted, but we saw another long hard-working path ahead of us. It was time to plan for Nationals…..

From a few sketches and one team meeting while watching a cricket match, to Yorkshire and the Humber champions, we'd all come a very long way, both as a team and individually. Highlights from regionals can be found on our video https://www.youtube.com/watch?v=Aessl7twJbY which captured the tense competition perfectly!

Our aim now is to repeat this at Nationals, and become National Champions. At the moment, we're all busy preparing - the car design has been refined, the pit display redesigned, and the presentation is being rewritten. The competition we'll meet at Nationals will be tough, so we're working as hard as we can to beat it, hopefully we'll see you at the World Finals in Singapore!

F1 in Schools has literally changed my life. It's enhanced my engineering skills, developed my CAD/CAM knowledge, but mainly been a great experience. Teamwork, leadership, hard-work, negotiation, time management and confidence are just a few of the skills I've developed. F1 in Schools has already taken me so far, let's hope it will take me and the team even further. However, none of this wouldn't have happened if it hadn't have been from the support from our sponsors - SHAPA, Minster Engineering, The Shepherd Group, Inchcape, and of course Ginetta - from the school, and Mr Cooper for running the competition, and staying late on numerous occasions and teaching us so many vital things, that we, as a team, will never forget.

If anyone read's through this blog post, and enjoys it, I'd very much like to hear! Definitely get in touch if you'd be interested in discussing anything. And even better if you've got some tips or advice for the team (everything is greatly appreciated), or if you just have general questions. I'm on LinkedIn as Georgina Edwards, or on twitter as @GEdwards1105 - I can send you my email from there!

But before you go, check out Ginetta Racing EDU website (www.ginettaracing.education/) and give us a follow on Twitter, Instagram and Facebook.

First stop - Regionals
Next stop - Nationals, and let's work hard so it doesn't stop there!