



Course Overview:

The F1 in Schools STEM Challenge provides an exciting and engaging experience for students through the captivating appeal of Formula 1. Through the challenge, teams of students use Computer Aided Design (CAD) to design, analyse, manufacture, test and race model F1 cars manufactured from a block of foam. The cars race on a 20m track powered by CO2 canisters and reach speeds of up to 80km/h.

The program allows students to learn about physics, aerodynamics, design processes, manufacturing, marketing, graphics, sponsorship, teamwork, communication, media, careers, and finance and to bring all of these together practically and creatively to compete with their peers.

F1 in Schools is operational in 13,000 schools in 51 countries around the world. Students start off competing with their peers at school and can take the journey of discovery across the globe. The program allows students to develop and bring together a range of STEM concepts and apply them to a practical, wide-ranging project.

WeLearn Mastery Competencies:

Ideation

I can comprehend, synthesize, analyze and evaluate complex information, and develop new and innovative concepts and ideas.

Project Management

I can successfully develop, manage, and implement a project plan including goals, milestones, persons responsible, and interdependencies.

Collaborative Team Spirit

I can think interdependently, and work with others towards team goals.

Sponsorship Raising

I can develop a sponsorship prospectus with various tiered benefits for sponsors, and successfully liaise with businesses to generate funds.

Iteration

I can incrementally refine, evolve and improve a design based on analysis of data and feedback.

Writing Composition

I can implement an ongoing writing process that includes planning, drafting, revising, editing, and publishing using ideas, organization, voice, sentence fluency, grammar, and word choice. For a multitude of purposes and audiences.

Engineering Design

I can design a structural or mechanical object which meets specific requirements and/or provides a solution to a defined problem.

Public Speaking

I can speak in front of large audiences with confidence, in an engaging and convincing manner using appropriate language, tone, body language and gestures

Module Outlines:

Build your Team!

- Learners will learn how to develop a team, and decide which team role is most suitable for them for them to take in the F1 project.
- Learners will understand what constitutes effective teamwork and develop a team contract.
- Learners will learn about time management and how to develop a project plan.
- Learners will learn about color theory, color mixing, the meaning of colors, and the art of color symbolism.
- Learners will learn about the importance of team identity.
- Learners will develop their team colors, identity and logo.
- Learners will become proficient in managing a project including timelines, milestones, goals and dependencies.

Fund your Team!

- Learners will begin by learning about the costs of the F1 team by identifying each component that F1 teams spend money on.
- Learners will be given an overview of what a sponsor is, the various kinds of sponsors, and how Formula One teams earn money by securing sponsors.
- Learners will distinguish between various sponsors of the F1 teams by examining the various F1 team uniforms.
- Learners will compile a list of potential sponsors for their own Formula One teams and obtain their contact details so they can get in touch with them.
- Learners will then sketch out their designs for the team uniform, add the WeLearn and F1 logos, and leave space for their sponsor logos.

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- Learners will research different marketing channels for their Formula One teams and develop the most effective channels/website to promote their teams and bring sponsors' brands to the public.
- Learners will determine the total amount of money needed for their teams by making a budget and listing down all the expenses.
- Learners will create different sponsorship packages that will aid in obtaining funding through tiers.
- Learners will create sponsorship prospectuses, which they send to sponsors via their preferred channels by compiling all of their materials.
- Learners will get to prepare their sponsorship pitch with their team in order to present it to potential sponsors.
- Learners will be able to create the team's uniforms and finish all of the tasks for which they requested funding.

Design!

- Learners will study aerodynamic forces and understand how those forces affect the motion of a moving object.
- Learners will explore the aerodynamic components in an F1 car design.
- Learners will cut and build an F1 car's chassis out of cardboard.
- Learners will use Silhouette studio to cut and design an F1 car body for their team.
- Learners will develop car designs using Fusion 360 (middle and secondary)
- Learners will utilize software to interact with a CNC to manufacture their

Test and Analyse!

- The learners look at the designs they made with Silhouette in the designing process.
- The learners will also learn about measurements and how to apply it to their designs.
- The learners then test the "running gear" (wheels and axels) to see if there are any possible obstructions that would cause their car to run slowly. We look at different ways to fix that and apply it to their cars.
- The learners then look at the basics of aerodynamics through video and discussion. Discuss biomimicry and how it could help their designs.
- Learners build (cut out) their newly designed cars and carefully assemble their cars.
- After the assembly of their cars, we then look at videos on how a wind/smoke tunnel works and discuss what the learners understand or learned.
- The learners will then have time to design and build a wind/smoke tunnel to test the aerodynamics of their cars and what it means when we talk about the basic forces that act on moving objects.
- During this process we will test, look at the results and then fix(redesign) or add to their cars.
- The learners will also learn about build stability, and how it affects their cars when force is applied, the learners will then also look at other more stable materials that the Primary can use

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and apply to their designs. Discuss and make team decisions on what materials they would like to add.

- After each step above we will Test and analyze.
- All the steps above will help them work on the engineering portfolio and keep record of their progress throughout this phase of the formula one schools program.

Create a Portfolio!

- Learners will be introduced with the word, "Portfolio", which consists of two main activities: verbal presentation and Pit display.
- Learners will start with Pit display with the future boards to display their journey of 12 weeks in F1 in Schools in various aspects: teamwork, sponsorship, marketing, building and making the racing car.
- Learners should decorate their pit display according to their team colors as to represent their team identity.
- Learners will move to the verbal presentation to tell their journey of F1 in schools to the audience. The highlight of this part is they will be wearing team uniform and cap to represent their team identity to the judges.

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