



STEM Racing Competition – Overview for New Teachers

1. Who Can Take Part?

Each team consists of **3–6 pupils**. Schools can enter a maximum of 5 teams.

The competition is divided into **three classes**:

- **Entry Class** – for beginners and first-time teams, 11 to 14 years old
- **Development Class** – for teams with some prior experience or older pupils, 11 to 19 years old
- **Professional Class** – for more advanced teams, aged 11 to 19 years old

2. What Do Teams Need to Do?

Teams work together to:

- Develop a **team identity** (name, logo, branding, etc.)
- Research **race car design** and **aerodynamics**
- **Design and manufacture** the fastest possible model car while following the official **Technical Regulations** for their class, provided by STEM Racing.

Their journey is documented in:

- **Portfolios** showcasing their design process
- A **Pit Display** that is presented at the **Regional Event**

During the event, teams will:

- Submit their cars to be checked against the technical regulations (Scrutineering)
- Race their cars - Each car races twice with the track time and driver reaction times contributing to an overall score.
- Submit their portfolio(s) for review by the judges.
- Deliver a verbal presentation.

Full details on judging rubrics, portfolio requirements, and scoring can be found the **Competition** and **Technical Regulation** documents for each class and do vary by class.

3. How Do Teams Design and Manufacture Their Car?

Each team begins with:

- A downloadable **“no-go zone”** file from STEM Racing
- A **model block** that defines the maximum and minimum dimensions of the car

The **Technical Regulations** set limits for key features such as front and rear wings, side pods and overall body shape.

Most teams use **Autodesk Fusion 360** to design their cars in CAD. The digital model is then used to machine the car body:

- Schools with a **CNC milling machine** can produce their own cars
- Alternatively, **EESW offers a milling service for £75 per car**

Teams can also choose to 3D print their car or elements of it, depending on their class.

4. What Support Is Available?

All competition rules, regulations and scoring rubrics are available to download from the STEM racing website so your team know exactly what the judges are looking for come race day.

We offer an **in-school CAD workshop**, *Fusion First Lap*, to help teams new to the competition to get to grips with the process of designing a car. This session is currently only available remotely to schools in North Wales. This workshop is charged at **£175 per team**, quotes can be provided upon request if you require support for more than one team. Availability is limited and allocated on a first-come-first-served basis.

5. How Much Does It Cost?

- **Registration:** Entry Class £50 per team, Development and Professional Class £100 per team. Discounts available for returning teams.
- **Car machining (Provided by EESW):** £75 per car
- **Duplicate car machining (EESW):** £50 per car

Other approved machining providers are listed on the **STEM Racing website**. Schools can purchase an approved model block to machine their own car from STEM Racing or EESW for approximately £20 per car.

Schools can also access **free educational licenses for Autodesk Fusion 360** if they don't already have the software.

As part of the competition, teams are encouraged to **secure sponsorships** to help cover entry fees or additional materials depending on the class (e.g. uniforms, enhanced components such as wheel bearings, etc.). These extras are optional but can contribute to higher performance and presentation scores.

6. What Are the Timescales?

- **Registration:** Open now – teams can start at any time.
- **Design submission (for EESW machining):** Usually **mid-December** (final date to be confirmed).
 - This ensures car bodies are returned to teams by **early January** for assembly, painting, and final preparation.
- **Regional Competitions:**
Dates and venues are TBC – Typically one event in North Wales, one in South Wales in the Spring term.
- **National Finals:** Regional winners of the Development and Professional classes are invited to the **UK National Finals**, usually held a month or so later.