

4x4 In Schools Technology Challenge – Competition Preparation Training

Introduction

The Land Rover 4x4 in Schools Technology Challenge requires students to build a radio controlled four-wheel drive (4x4) vehicle to the specifications provided by the International Rules Committee. It must successfully navigate and complete obstacles on an off-road test track which is just as demanding as a real off-road situation. The vehicle must emulate the capabilities of a full size 4x4 vehicle.

The National Champions from each country are then invited to compete at the Land Rover 4x4 in Schools World Finals!

About the Competition

1. Teams

Each team must consist of a minimum of three and maximum of six young people between 13 and 19 years of age. The team may all be of the same age group or consist of a mixture of different ages. Educational organisations may coordinate teams with students from across different year groups. Teams of more than six will not be allowed to enter the competition. Teams must follow a safe working practice at all times during their vehicle build process.

2. How to Enter

Register for the Entry Class Competition and undergo training before competing in the 2017 4x4 in Schools National Finals (Singapore). Entry Class teams will move up to Development/ Professional Class after 1 year of training and experience.

3. Entry Class

Purchase a Land Rover 4x4 in Schools starter kit containing a remote controlled vehicle. Other remote controlled vehicle models are available but may not be suitable for the competition. The starter kit also includes a vehicle battery and battery charger. This vehicle can be entered into the challenge, however, Entry Class teams must manufacture their own vehicle body according to specific dimensions in line with the rules and regulations of the competition. The team must also have an in-depth knowledge and understanding of the vehicle's suspension, drive train, chassis and wheels.

Teams can alter/modify the vehicle body, vehicle chassis and all vehicle electrics themselves. This is on top of either manufacturing or purchasing and modifying other elements of the vehicle such as the drive train, suspension, steering and wheels.

4. Aims

The ambition of the project is to raise awareness, interest and enthusiasm in engineering through the practical application of Design & Technology, Mathematics and Science.

The engineering industry requires creative, multi-disciplined individuals who are capable of problem solving through individual tasks and working in motivated teams. This project replicates a 'real-life' work situation where specialists come together to share intellectual and practical ideals to resolve a complex problem. The challenge is an excellent opportunity

for students to work in design teams to gain an awareness and understanding of project management and other key skills.

5. Objectives

- To provide participants with a platform and opportunity to experience operations of 4x4 manufacturing companies.
- Provides an experience where students can develop and embed knowledge and skills which may be later required in further education or their chosen career.
- Is motivating, exciting, challenging and fun for both the students and adults involved.
- Provides young people with the opportunity to work as part of a team or independently to develop problem solving skills and techniques.
- Provides an opportunity for students to learn and develop through participation in a hands-on practical experience.
- Enables young people to gain an understanding and awareness of what engineering involves, encouraging them to actively think about a career within STEM.
- Integrates subject knowledge from key areas of the curriculum with the wider agenda of work-related learning, enterprise, key skills and personal development.
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Competition Training Outline – Entry Class

1. Introduction

- History and facts about Land Rover
- Introduction to the Science/ Engineering of Land Rover
- Introduction to 4x4 in Schools Technology Challenge programme and competition
- Introduction of each member and their team roles
- Viewing of past 4x4 in Schools Technology Challenge competition resources

2. Team Identity:

- Understanding about Logo, Team Identity, Branding
- Designing and choosing Team Logo, Team Name, and Colours
- Presentation to the class (Verbal Presentation skills)
- Creation of Presentation Board

3. Car Design:

- Introduction to the use of Autodesk – Fusion 360
- Simple Model creation
- Creation of the 4x4 Body Shell
- Design of the car body and mechanical parts (optional) of the car structure

4. Car Manufacture:

Designing of car body shell via recycle materials + Assembly

- Each student to receive recycled materials for car body creation
- Students cut, fold and staple the basic car structure
- Design of the car body shell using recycled materials and assembly of the car

Colouring

- Each group to decide on colours for Team Colours
- Each student to design and paint own car body

5. Track Element Setup

- Understanding different Track Elements and the effect on the vehicles of the Competition
- Understanding the Rules and Regulation
- Creating obstacle course using 6 Track elements
- Trial Practices

6. Competition among teams

- Setting up of the Obstacle using different Track Elements
- Trial Practices
- Competition - navigate vehicles across the obstacle