FIRST TECH CHALLENGE
UK & IRELAND

Challenge accepted!

Your *FIRST* Tech Challenge UK onboarding guide

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UK & IRELAND

Welcome to the *FIRST* Tech Challenge UK community!

***FIRST* things *FIRST*. Thanks for getting involved! You're about to start an exciting journey with *FIRST* Tech Challenge UK.**

Over the coming season, you'll build robots, solve challenges and discover what's possible when you work together.

In this guide, you'll be introduced to the different areas of the challenge, with QR codes to resources where you can learn more, including those on our resource platform, Makerspace. Our onboarding course on Makerspace is complementary to this resource and will help you test your knowledge as a facilitator.

The challenge is about more than robots. It's about celebrating the wins, learning from your setbacks and sharing your journey with your community. Lean on them for support – guidance is key to your success.

Take a deep breath, dive in, and enjoy the ride – the view from the top is worth it!

Your biggest cheerleaders,
***FIRST* UK HQ**

Your journey starts here

FIRST Tech Challenge UK is an educational robotics programme that empowers young people aged 12-18 with the technical knowledge and soft skills to thrive in STEM and beyond. Teams work like real industry groups, often supported by a mentor, to design, build and program a robot to compete at progressive events.

Key milestones

- **Kick-off: September**
- **Scrimmages: November-December**
- **Qualifying Tournaments: February-March**
- **UK Champs: April-May**

In-season support

Maker space

Your educational platform, with content to support your team at all confidence levels, which is being mapped to the Universal Skills Framework 2.0.

More Than Robots™ CHAMPION ORG

Experienced schools, colleges or organisations that act as regional hubs for local teams in *FIRST* Tech Challenge UK. They provide technical support to teams, champion STEM in their local communities and sometimes host events.

FIRST® TECH CHALLENGE UK & IRELAND

You'll be matched with a HQ Hub Coordinator who's an expert in your area. We're here to support you and cheer you on.

Welcome to the community

A global movement

***FIRST* – For Inspiration and Recognition of Science and Technology** – is a global movement established in 1989 that engages hundreds of thousands of young people, supported by a huge network of mentors and volunteers. They are the organisation behind the challenge globally.

We're *FIRST* UK, the charity behind
***FIRST* Tech Challenge UK**

Since we brought the challenge to the UK in 2018, we've been on a mission to make STEM less intimidating, more diverse and inclusive.

FIRST Tech Challenge values

More Than Robots: What our young people learn in the programme goes beyond building and coding robots. They gain confidence and creativity, collaborate with others, find their own paths in STEM and are inspired to tackle the world's greatest challenges.

Inclusivity: Respecting each other, embracing our differences, and demonstrating that there is a place for everyone in STEM.

Coopertition: Competing while assisting and enabling others to succeed wherever possible. It's a healthy balance between competition and collaboration.

Gracious Professionalism: A way of doing things that encourages high-quality work, emphasises the value of others, and respects individuals and the community. Gracious Professionalism is not clearly defined for a reason. It can and should mean different things to everyone.

Some real-life examples of Gracious Professionalism include...

- Teams lending others valuable parts at competitions, where they will later face them as competitors
- Teams giving each other advice so they can be stronger competitors
- Teams collaborating on outreach to maximise their impact together
- Teams being strong competitors and treating others with respect and kindness

Areas of the challenge

Head to Makerspace

Building and design

Your robot is at the heart of *FIRST* Tech Challenge UK. It's your tool for competing and is a reflection of your problem-solving and design thinking skills.

Skills focus:
- Adapting
- Creativity
- Problem-solving
- Teamwork

Top tip!
Start simple. Have a go at building the starter bot as an introduction, then design and build your own unique robot. Iterate throughout the season, learn from your mistakes, and stay safe when using new tools and equipment.

Explore building and design on Makerspace

Programming

Programming turns your hardware into a moving robot. In both autonomous and driver-controlled modes, your code shapes your robot's performance, so keep testing, debugging and improving it! Use either Blocks or OnBot Java to code your creations.

Skills focus:
- Adapting
- Creativity
- Problem-solving
- Teamwork

Top tip!
Coding challenges persistence! Don't just copy code you can find; understand the basic commands and concepts behind them to apply your knowledge.

Learn about programming on Makerspace

Strategy and scouting

Every game needs a strategy. Look for ways to score points, play to your robot's strengths and adapt to work best with your alliance partner to outscore your opponents – even with a basic bot.

Skills focus:
- Creativity
- Planning
- Leadership
- Speaking

Top tip!
Balance ambition with reliability when developing a strategy.

Explore strategy resources on Makerspace

Areas of the challenge

Head to Makerspace

Outreach

Your team is a community leader. Use outreach to build awareness of STEM and *FIRST*, connect with industry and give back in ways that matter to your team.

Skills focus:
- Creativity
- Teamwork
- Planning
- Speaking

Top tip!
Explore valuable connections you already have. Call on those around you to share your story and inspire support.

Easy win!
Create a team social media account or share your team's journey in an assembly.

Learn about outreach on Makerspace

Fundraising and sponsorship

The challenge gives you real-world experience, including budgeting and business skills. Learn how to secure funding and manage your team resources for long-term success.

Skills focus:
- Planning
- Speaking
- Adapting
- Creativity

Top tip!
Fundraise throughout the season to build a budget for extra materials, travel, team merch and even next season's commitment fee.

Easy win!
Set up a crowdfunding page to share with local businesses.

Explore fundraising and sponsorship on Makerspace

Post-event reflection

The whole season is a learning opportunity – not just the event finale! Reflect as a team to identify what worked, what needs improvement, and how to become stronger.

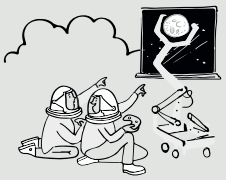
Skills focus:
- Adapting
- Planning
- Teamwork
- Leadership

Top tip!
Celebrate your individual and team wins throughout the season. Let every team member pick one thing they commit to improving.

Find out more about events on Makerspace

Know your lingo!

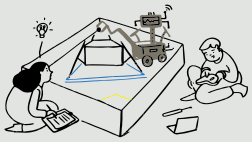
Competition Manual:
The rule book, which is updated each season in line with the new game.



Game reveal:
This is when the new season's game is shared at the start of September each year. A video about the game is uploaded to *FIRST* Inspires' YouTube and the new Competition Manual is added to their website.

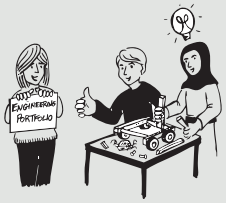
Alliance:
A temporary grouping of teams that work together during a match to score points. They collaborate on strategy, robot roles and scoring to maximise their combined performance. Alliances are named as red or blue during matches.

Scoring element:
An object used in the season's game to earn points when manipulated by the robot.



Game field:
The official playing area where matches take place. The equipment on top of the field changes each year with the game.

Drive team:
A group of team members who operate the robot and manage strategy during a match. Only drive team members are allowed by the fields during matches. There are two drivers, a coach and a human player.

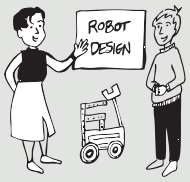


Engineering Portfolio:
Your team's record of progress throughout the season when building your robot, developing code, conducting outreach and fundraising. Judges will look at your portfolio, alongside your presentation, to put you forward for awards at events.

Global number:
Your team's unique 5-digit number, assigned during registration, which identifies you in the global system.

Pit:
Your team's base at events to wait between matches, make robot repairs and keep your belongings.

Team Lead:
The adult who guides and supports the team throughout the season. They push their team towards their goals without doing it for them.



Game Changer:
A volunteer who has a specific role at an event or supports throughout the season through mentorship. They wear blue T-shirts at our events.

Understanding the game

All *FIRST* Tech Challenge teams around the world play the same game each season.

Each season, all three *FIRST* programmes share a universal game theme – it might explore archaeology, the arts or the ocean. The full game is revealed in early September, with teasers dropped beforehand, so have fun guessing what it is!

No matter the game, your kit is reusable each season and many teams even reuse their drivetrains.

Gameplay

Each game is 2.5 minutes

Your team

Building your team

What does your team need?

- Laptop or computer
- Robotics kit
- Season-specific scoring elements
- Safety goggles

Explore your kit contents!

Who's in it?

- Maximum of 15 members
- Aged 12-18

Top tip!
When recruiting team members, you may want to focus on people with particular skills or subject knowledge to strengthen your team.

We recommend having a range of age groups, while being cautious with exam years.

Championing inclusion

Supporting underserved and underrepresented young people to thrive in STEM.

The challenge works best when everyone feels they belong. Diverse, inclusive teams bring rich ideas, ooze ambition and support their peers to venture beyond their comfort zones.

Use this guidance to build a diverse team, foster inclusion and adapt, so every young person can thrive.

Targeted recruitment

Identify which groups of young people will benefit most from the provision. At least 50% of your team must include these priority groups:

- Identify as girls or non-binary
- Underrepresented groups
- Neurodiverse or have special educational needs
- First in their family to go to university
- Risk of NEET, low attendance, low engagement or attainment
- Undeveloped interest in STEM subjects

Recruitment strategies

- Reach out via social groups, pastoral staff or teacher recommendations
- Run taster sessions, assemblies or clubs to spark interest
- Drum up interest with posters, flyers and newsletters
- Keep sign-up simple and encourage peer-to-peer recruitment
- Speak with parents to secure support and address potential barriers
- Emphasise creativity, teamwork and fun rather than just “building robots”

Engagement and belonging

A safe, supportive environment helps young people thrive. Consider these approaches:

- Co-create a team name, logo and core values to build a sense of identity
- Use varied workspaces that encourage collaboration and independence
- Run team-building games and activities to build camaraderie
- Define roles and subteams with equal value
- Explore outreach themes relevant to your community
- Celebrate team and individual progress and contributions through feedback or awards

Inclusive teamwork

All young people bring different strengths – vary tasks so everyone can contribute meaningfully.

- Offer the choice to participate in different areas of the challenge
- Rotate roles early in the season, so members can explore what they enjoy
- Pair less experienced members with confident peers to build skills together
- Break complex tasks into smaller, clearer steps
- Use visual guides, diagrams or physical examples alongside written instructions
- Allow flexible contributions (eg, CAD design at home on free software if attendance is tricky)
- Adjust tools, equipment and spaces to suit different needs

Continued development

- Identify development pathways for each team member and track their participation
- Offer leadership roles and rotate responsibilities throughout the season
- Involve subject specialists, staff or industry mentors
- Visit STEM employers or arrange video calls to demystify what it's like to work in STEM

Your role in inclusion

- Set the tone – kindness and respect are non-negotiable
- Model patience and celebrate all contributions equally
- Make it safe to ask questions or admit mistakes

Team roles

There is no set way to develop your team's structure, titles or decision-making processes. Each team member will have their own strengths, weaknesses and aspirations, which should be considered when deciding team roles. Depending on the size of your team, some members may be able to take on multiple roles.

You may have…

- Co-captains or a Project Manager
- Separate build, programming, design and outreach leads
- Subteams to focus on specific tasks or activities
- A rotating leadership system

Roles to consider…

Team Captain / Project Manager

Oversees the team, leading discussions, setting deadlines, helping where needed and making sure everyone in the team has a role to play

Robot Engineer

Building the robot and overcoming problems along the way, while collaborating with the code team to understand what's possible

Software Engineer

Working on the robot's code, collaborating with the build team to understand how they can bring the design to life

Strategy Officer

Decides on the best strategy for the robot using a thorough game analysis

Communications Officer

Growing the team's online presence, highlighting achievements and building a strong team brand

Outreach Officer

Organising ways to promote STEM and the values of *FIRST* with the community

Financial Officer

Keeps track of the team's budget and may also help coordinate sponsorship and fundraising events

Data Officer

Helps keep the team's portfolio up-to-date throughout the season, coordinating the team to update their sections

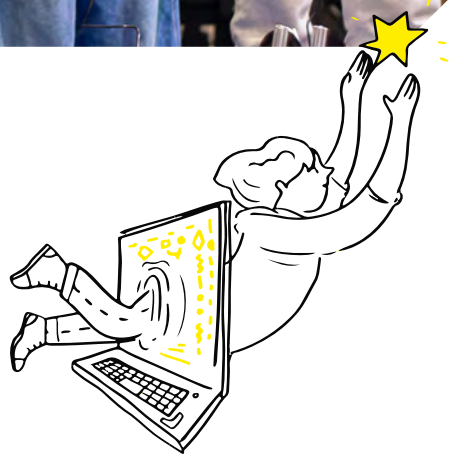
Inventory Manager

Keeping track of the team's kit, understanding what's missing and what needs ordering to meet the team's needs

Top tip!

Having clearly defined roles and responsibilities is something judges look for in your Engineering Portfolio. You may want to create a visual role map to demonstrate the bigger picture to everyone's individual roles.

The drive team



You'll also need to decide who is on your drive team. This is the group of people who operate the robot and manage the strategy during a match, but they should have other roles during the development phase, too. There are up to four people in the drive team:

Driver

Your team can have up to two drivers who operate the robot during TeleOp. One typically controls movement and navigation, while the other often controls the robot's mechanisms, like arms and intakes.

Coach

A non-driving team member who provides strategic guidance during the match. They communicate with the drivers, monitor time remaining and focus their team on strategic goals.

Human player (if allowed in game rules)

A team member who interacts with game elements on the field as outlined by that season's game. Their actions are limited and vary each year.

Your first steps

Your *FIRST* four weeks

Week 1 Kick-off and team spirit

Goals: Understand the challenge, get excited, and start bonding as a team

- Watch the Game Reveal together. What looks tricky?
- Read the Competition Manual's sections on scoring, rules and penalties as a group. Split it into sections, so everyone has a part to explain back to the team
- Start team introductions and complete some icebreakers or team-building activities
- Begin assigning "interest areas" rather than fixed roles – "I want to try coding" or "I like making presentations"
- Start a branding brainstorm for a team name, colours and mascot

Top tip!
Lock in a fixed weekly meeting time/ place for the season.

Week 2 Game analysis & early roles

Goals: Build an understanding of the game, explore roles and prepare to build

- Analyse scoring tasks in mini groups and brainstorm robot functions to achieve them
- Introduce team roles and let members shadow each other
- Finalise your branding decisions and sketch a logo
- Set up social media with your Team Lead's approval
- Begin light build prep – unbox the starter kit and check all parts are present

Top tip!
Create a shared folder for all documents on Google Drive, OneDrive or similar.

Week 3 Strategy & early build steps

Goals: Create a game plan, start building and explore outreach ideas

- Decide on a "first season" strategy – don't try to do everything! Choose one or two scoring tasks to master first
- Assign primary roles with the option to swap later
- Run skill sessions: tool safety, basic programming, graphic design
- Build a basic chassis frame from the starter kit – expect it to evolve!
- Brainstorm possible events or assemblies and local clubs to talk to about the challenge

Top tip!
If you don't know how to do something – ask! Teams often share tips online and at scrimmages.

Week 4 Team identity & foundation skills

Goals: Cement your identity, practice the basics and launch outreach

- Finalise logo and design early merch like hoodies, banners and stickers
- Test drive your drivetrain – even basic forwards/backwards motion counts
- Document everything – photos, decisions and sketches for your Engineering Portfolio
- Do your first outreach action – post an intro on your social media or present at a club
- Reflect and plan ahead for weeks 5–8: What worked? What confused you? What do you need to learn/build to get to a functional starter bot?

Top tip!
Even if the robot isn't perfect, practice driving early – driver skill can win matches.

Remember! Iteration is normal: **Test** >> **Tweak** >> **Test again**

Document it all as you go!

Team Lead tips

Being a Team Lead is about guiding, not doing. Your role is to keep the team safe, motivated and moving forward, while letting the team own their robot and season.

Support from a distance

- **Ask, don't fix** – "What do you think is causing that?" or "What could you try next?"
- **Give them time** – let problem-solving run its course, even if it's slower than your way
- **Celebrate progress**, not just results – a failed test can be a huge learning win
- **Enable initiative** – create a cheat sheet of deadlines, key resources and support contacts for both yourself and the team

Manage your time

- **First month:** 1-2 sessions per week (1-2 hours), plus light admin (emails, parts, organisation updates)
- **Competition season:** Expect extra build/testing sessions

Your presence is important, but you don't have to attend every sub-team meeting if they can work independently.

Get the best out of your team

- **Spot strengths** and encourage everyone to try different roles before settling
- **Keep communication open** – start each session with a plan and end with "What's next?"
- **Make space for all voices** – quieter young people often have brilliant ideas waiting to be heard

Secure SLT sign-off for trips

Senior leadership teams love seeing clear benefits for their young people. When requesting permission for competitions or outreach:

- Highlight the **STEM skills, teamwork and problem-solving**
- Link to **organisational goals,** such as raising aspirations or fostering inclusion in STEM
- Provide all **key details early,** including date, location, cost, risk assessment and staffing
- Share **updates and photos** from events to showcase involvement

Remember!

Your biggest impact comes from creating the conditions for young people to succeed – not doing it for them.

Awards and your Engineering Portfolio

Take me to the portfolios and awards course!

The awards

The judged awards recognise more than match results. They celebrate the engineering, creativity, teamwork, and community impact your group brings to the season.

There are also awards for your robot's performance in the game.

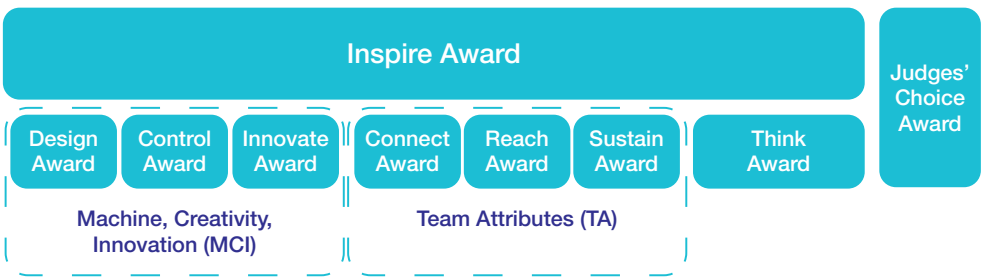
The judged awards are grouped by:

Inspire Award
The big one! This one recognises teams that shine in every area.

Machine, Creativity & Innovation (MCI)
Awards that recognise brilliant robot design, clever engineering, smart programming, and creative control systems.

Team Attributes (TA)
Awards that celebrate the people side of the challenge with a focus on outreach, sustainability, and making a difference in your community.

Other awards
Special stand-alone awards such as Think and Judges' Choice.



Judges may consider your team for several awards, but at an event, you can only win or be a runner-up for one judged award.

Inspire Award

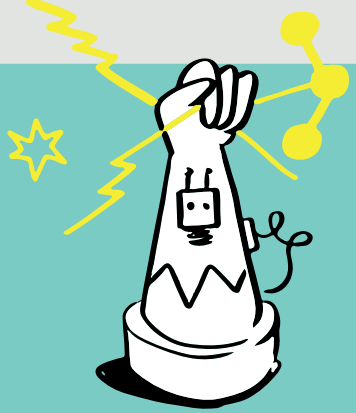
The Inspire Award recognises teams that are strong ambassadors for *FIRST* and its values, are inspirational role models to others, and are top contenders across multiple judged awards.

Team Attributes (TA) Awards

Connect Award
Recognises teams that have built strong connections with their local STEM community to learn and grow.

Reach Award
Celebrates a team that has introduced and recruited new people into *FIRST*. Through their efforts, they have sparked others to embrace the *FIRST* culture.

Sustain Award
Recognises a team that plans for long-term success, considering how to secure the future of their team and the challenge.



Machine, Creativity and Innovation (MCI) Awards

Design Award
Celebrates designs that balance a robot's form, function and aesthetics with reliable game performance.

Control Award
Celebrates teams that innovatively use sensors and software to improve robot functionality during gameplay.

Innovate Award sponsored by RTX
Recognises creative and original robot design solutions to bring ideas to life.

Other awards

Think Award
This award goes to the team that best documents its journey throughout the season.

Judges' Choice Award
The judges give this award to a team they feel deserves recognition for their unique efforts, performance or dynamics, but doesn't fit into any of the other award categories. It is not given at every event.

Teams should refer to the awards criteria in the Competition Manual, as it is what the judges will assess them against.

Your Engineering Portfolio

The judged awards recognise more than match results. They celebrate the engineering, creativity, teamwork, and community impact your group brings to the season.

What to include

- Robot design and game strategy
- Outreach, fundraising and mentorship activities
- Team profiles – who did what and how you worked together
- Diagrams, tables and drawings to explain your ideas and reasoning
- Honest reflections on challenges and where to improve

How to create it

- **Document as you go:** keep a weekly log for everyone to update at the end of each session. Pull from it when creating your portfolio
- **Plan your sections early:** knowing what you want to include will guide your work across the season
- **Add depth:** explain decisions and lessons learned, not just outcomes
- **Highlight awards criteria:** use headings, short sections and clear examples, so judges can quickly connect your work to the award criteria

Top tips!

Your engineering portfolio is a story, not a fact file. Show your journey and learning process.

Quality matters more than quantity – focus on what's important.

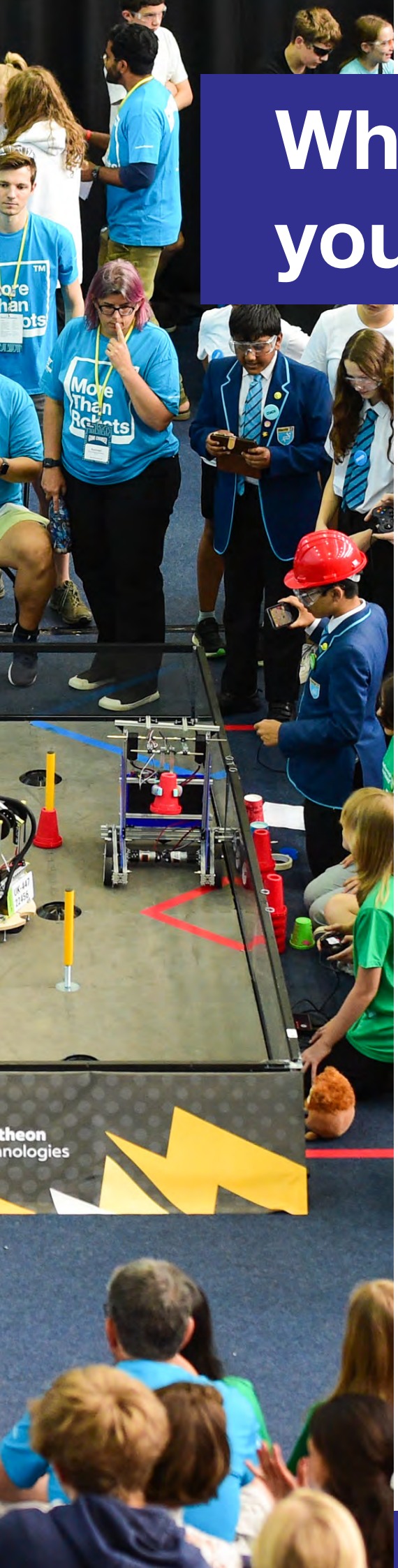
Look at example portfolios on Makerspace for inspiration.

Your Engineering Portfolio must be in a PDF format.

There are specific rules on how your Engineering Portfolio must be laid out in the Competition Manual.

Read the rules!

Your events



What to expect at your Scrimmage

What?

A scrimmage is a day for teams to collaborate, network and share ideas. We recommend all teams attend their scrimmage, no matter what stage they're at in the build, to get support from their community. Some teams arrive with a box of parts and leave with a working drivetrain!

Where?

Usually hosted by your Champion Organisation

When?

November – December

Some Champion Organisations may choose to host additional scrimmages in the lead-up to events.

Who?

You'll be joined by other local teams, both new and experienced, as well as your Champion Organisation Ambassador.

Why?

Make new friends, share ideas, attend optional workshops, get help and troubleshoot together. You'll also get a chance to test your robot on the game field, or even take part in a practice match.

What to expect at your Qualifying Tournament

What?
Your Qualifying Tournament is your first competition, and is where you can earn a spot for progression opportunities, including our UK Championship.

Where?
Often at your local Champion Organisation

When?
February – March

Who?
You'll be joined by around 12-16 other teams, both new and experienced.

The schedule at a qualifying tournament is much more structured than a scrimmage, with people there to guide you through the day.

Top tip!
Complete your own robot and field inspections before competition day to alleviate any on-the-day stress.

Why?

Check in and head to your **pit**

Complete your robot and field inspections, and judges presentation

In your **judging session**, you will present and answer questions from the judges.

Your **robot inspection** checks that you've built your robot in line with the rules

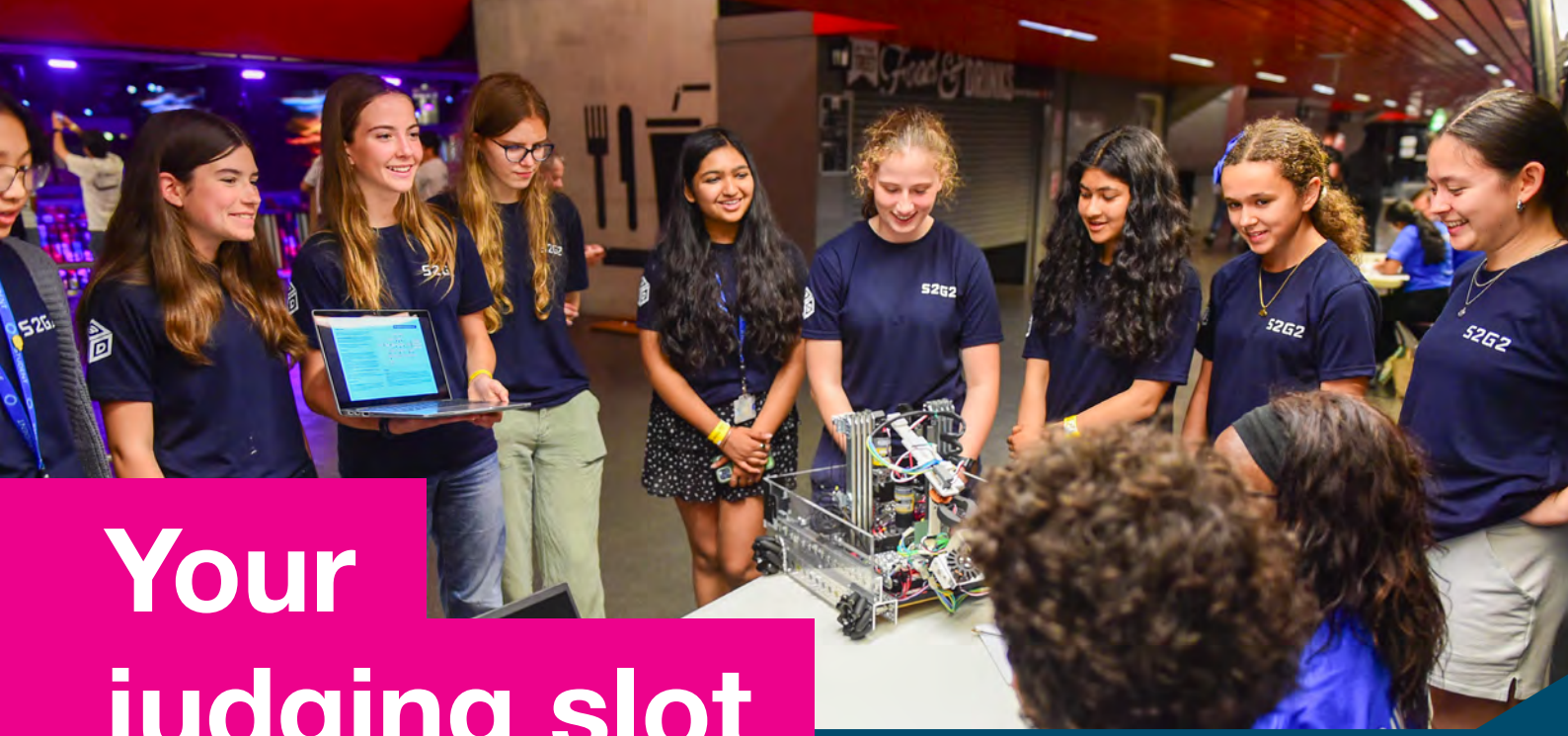
Your **field inspection** checks that your robot is safe to compete

Qualification match: Once all teams have passed inspections and judging, you'll play at least five matches to set the rankings. Alliances are assigned by computer, so a partner in one match could be your opponent in the next.

Alliance selection: The top-ranked teams from qualification matches select their alliance partners for the elimination matches.

Elimination match: These matches take place after alliance selection and determine the winning and finalist alliances.

Award ceremony: We announce the judged award winners and top-performing teams, including those advancing to the UK Championship.



Your judging slot

At your qualifier, you'll have a judging slot with a panel of 2-3 industry judges. It's a good idea for your whole team to attend, as this is what the judges will use to put you forward for awards.

How does it work?

- 5-minute uninterrupted presentation
- 5-minute Q&A session
- The judges may find you later to ask more questions

Your presentation

This is your chance to showcase your season highlights and team dynamic.

- The judges will have time to look at your portfolio later, so avoid just repeating what it says
- Make sure everyone who wants to speak has the chance to share, even if it's only to introduce themselves and their role
- Give the judges a well-rounded picture of your journey and achievements
- Talk about the challenges you faced and how you solved them
- Practise your presentation to time
- Feel free to use cue cards or a guiding script
- Reference the content in your Engineering Portfolio
- Bring your robot, props and any team mascots

Top tips!

Be professional, practice and show the judges what makes your team unique.

Awards focus!

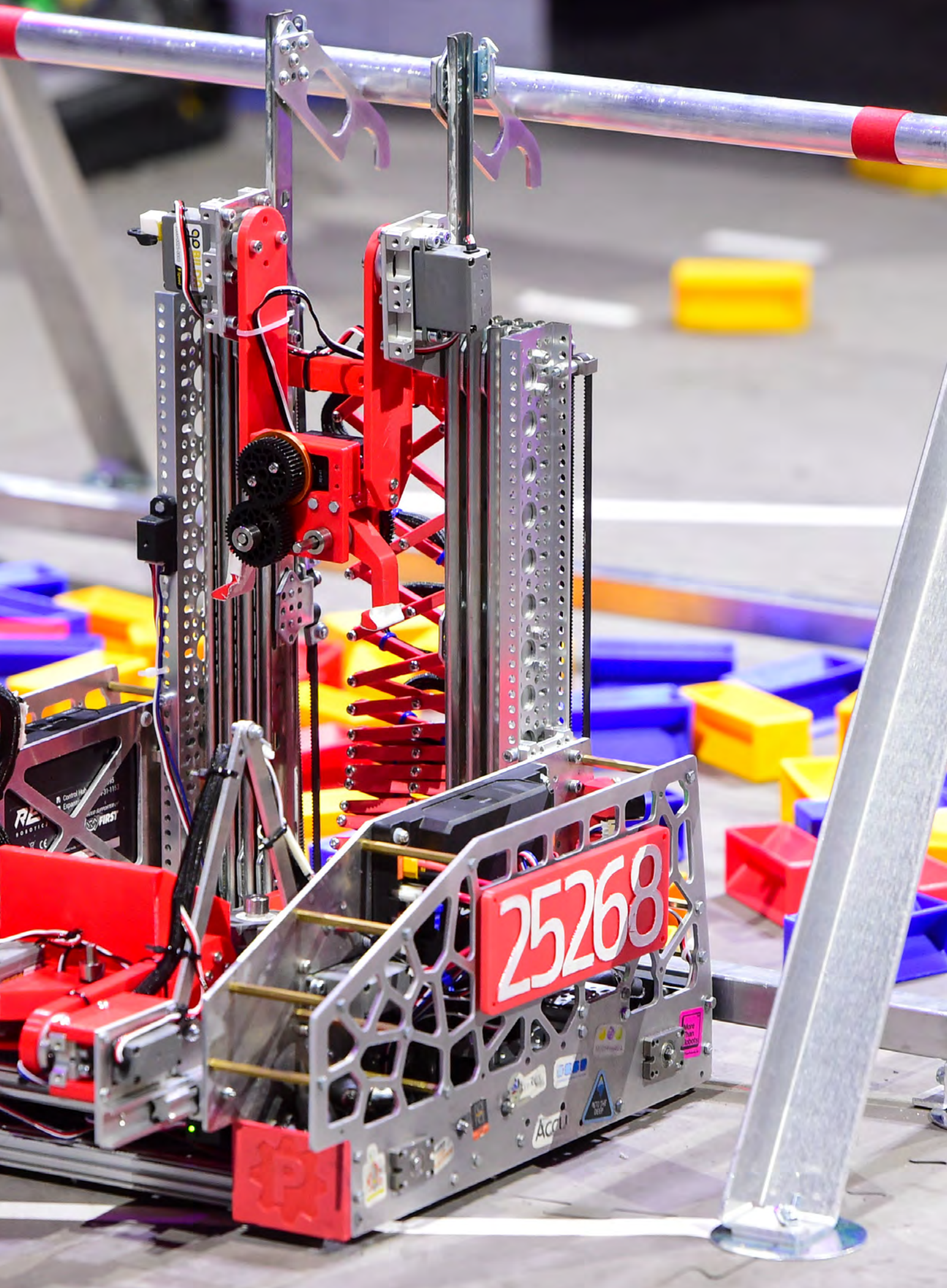
Tailor your presentation so that the judges mentally tick off each criterion point.

The Q&A

After your presentation, the judges will ask you some questions about your experience.

They may ask you to expand on a certain topic or lesson learned. Make sure you know who to direct particular questions to and avoid speaking over each other. For example, a coding question is best answered by your software engineer.

You can find some example questions to practice with on Makerspace!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Event checklist

Qualifying Tournaments are your chance to compete for industry-judged awards, showcase your achievements and earn a spot at the UK Championship. Make sure you're prepared with this checklist.

Must-haves:

- [ ] Fully-built robot
- [ ] Driver hub loaded with code
- [ ] Driver hub charger
- [ ] Laptop to make coding changes
- [ ] 2x gamepads
- [ ] Robot battery and charger
- [ ] Spare kit and tools to make repairs
- [ ] 2x printed robot number plates in red
- [ ] 2x printed robot number plates in blue
- [ ] 5-minute presentation for your judging session
- [ ] Pen
- [ ] Lunch and a refillable water bottle
- [ ] Photo permissions for team members

Nice-to-haves:

- [ ] Team merch (T-shirts and accessories)
- [ ] Pit decorations
- [ ] Zip ties
- [ ] Tape
- [ ] Paper
- [ ] Pliers
- [ ] Giveaways (keyrings, badges, etc)
- [ ] Spare robot batteries

If you can, we recommend that you bring your full kit box and tools.

If you qualify for champs, you'll need to bring the same items, but keep an eye out for any event-specific information from HQ.

Your support network

Want more resources?

Scan the QR code to explore our full resource hub, with links to guides, tutorials and tools for every part of the programme.

Need extra parts?

You'll also find information on sourcing parts.

Just remember:

- Parts from different suppliers might not fit together perfectly
- Always double-check the rules on which parts are allowed
- You can even design and 3D print your own custom parts

Get in touch!

Here to cheer you on! Your port of call for tech guidance and support:

Make a note of your champion org:

Ambassador(s):

Want more info?

Head to Makerspace and explore the onboarding or topic-specific courses!

Contact HQ

teams@firstuk.org

Make a note of your HQ Hub Coordinator:

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