

**FIRST
LEGO
LEAGUE**

CHALLENGE

ENGINEERING NOTEBOOK



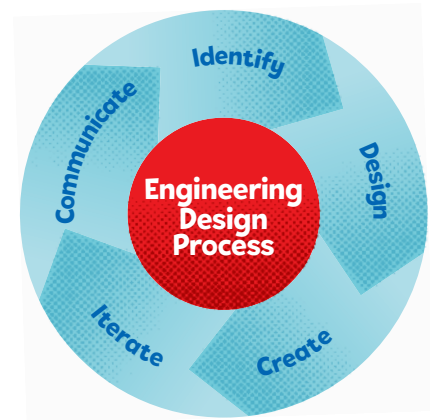
UNEARTHED™



Welcome!

Use the sessions in this *Engineering Notebook* as a guide for your team's journey through the *FIRST® AGE™* presented by Qualcomm season and UNEARTHED™ challenge.

Use the *FIRST Core Values* and the **engineering design process** throughout your team journey. Have lots of fun as you develop new skills and work together! This notebook is a great resource to share at your judging event, but it isn't required to do. Check out careers related to the season theme at the end of this notebook.



FIRST® Core Values



Teamwork

We are stronger when we work together.



Inclusion

We respect each other and embrace our differences.



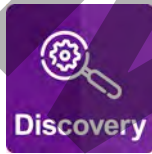
Impact

We apply what we learn to improve our world.



Fun

We enjoy and celebrate what we do!



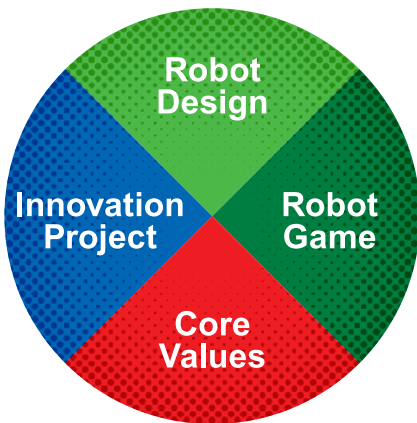
Discovery

We explore new skills and ideas.



Innovation

We use creativity and persistence to solve problems.



Each of the four equally weighted parts of *FIRST® LEGO® League Challenge* accounts for 25% of your total performance at your event.

At the event, your team will present your robot design and innovation project work to the judges during the judging session, and your robot performance will be evaluated at the robot game. Core Values are evaluated in all parts of your work, and you will receive scores from the judges and referees for how you apply them.

We express our Core Values through *Gracious Professionalism®* and *Coopertition®*, and this will be evaluated during robot game matches.

Gracious Professionalism is a way of doing things that encourages high-quality work, emphasizes the value of others, and respects individuals and the community.

Coopertition shows that learning is more important than winning. Teams can help others even as they compete.

Team Roles

Here are sample roles your team can use during the sessions. Everyone on the team should experience each role throughout their *FIRST*® LEGO® League

Challenge experience. The goal is to build your team to be confident and capable in all aspects of *FIRST* LEGO League Challenge.

Team Captain

Shares team progress with facilitator. Ensures session tasks are completed.

Creative Designer

Creates innovative designs for solutions to be discussed with the team.

Researcher

Investigates ideas and finds relevant research from different sources to inform the team's decision-making.

Communicator

Concentrates on how to communicate the team's work. Writes scripts and prepares presentations.

Project Manager

Focuses on time management and preparing for the event.



Material Manager

Gathers and returns materials needed for the session.

Builder

Assembles the LEGO mission models following the building instructions and builds your robot.

Mission Strategist

Analyzes the *Robot Game Rulebook* and leads team strategy discussions on which missions to attempt.

Coder

Operates the device and creates the programs in the app.

→ Introduction

- ☐ Get to know your team members and select your team name.
- ☐ Watch the season videos and read pages 3-9 to learn how *FIRST*® LEGO® League Challenge works and about the UNEARTHED™ robot game and innovation project.

→ Tasks

- ☐ Learn more about the season theme by building the robot game mission models.
- ☐ Place each model where it belongs on the Challenge mat. Read page 7 of the *Robot Game Rulebook* to learn how to set up the table.
- ☐ Explore how the models work. Connect them to the Project Sparks on page 6.
- ☐ Use the space on this page to write notes about the mission models or to answer the reflection questions.

→ Share

- ☐ Discuss the reflection questions.
- ☐ Get together at the mat. Talk about how the mission models connect to the UNEARTHED theme.
- ☐ Clean up your space.

→ Reflection Questions

- What ideas does your team have after reading about the innovation project?
- How do the mission models relate to the Challenge story or Project Sparks?
- Which mission models look interesting to you?

Session 1

Record information about your team here.

Our notes:

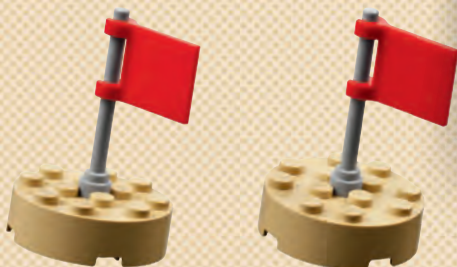
Tips

- Use the checkboxes to mark when you are finished with a task.
- During each meeting, record what you have learned and what you want to improve.

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The *Robot Game Rulebook* is a great resource to use throughout the season.



Prepare for Your Event

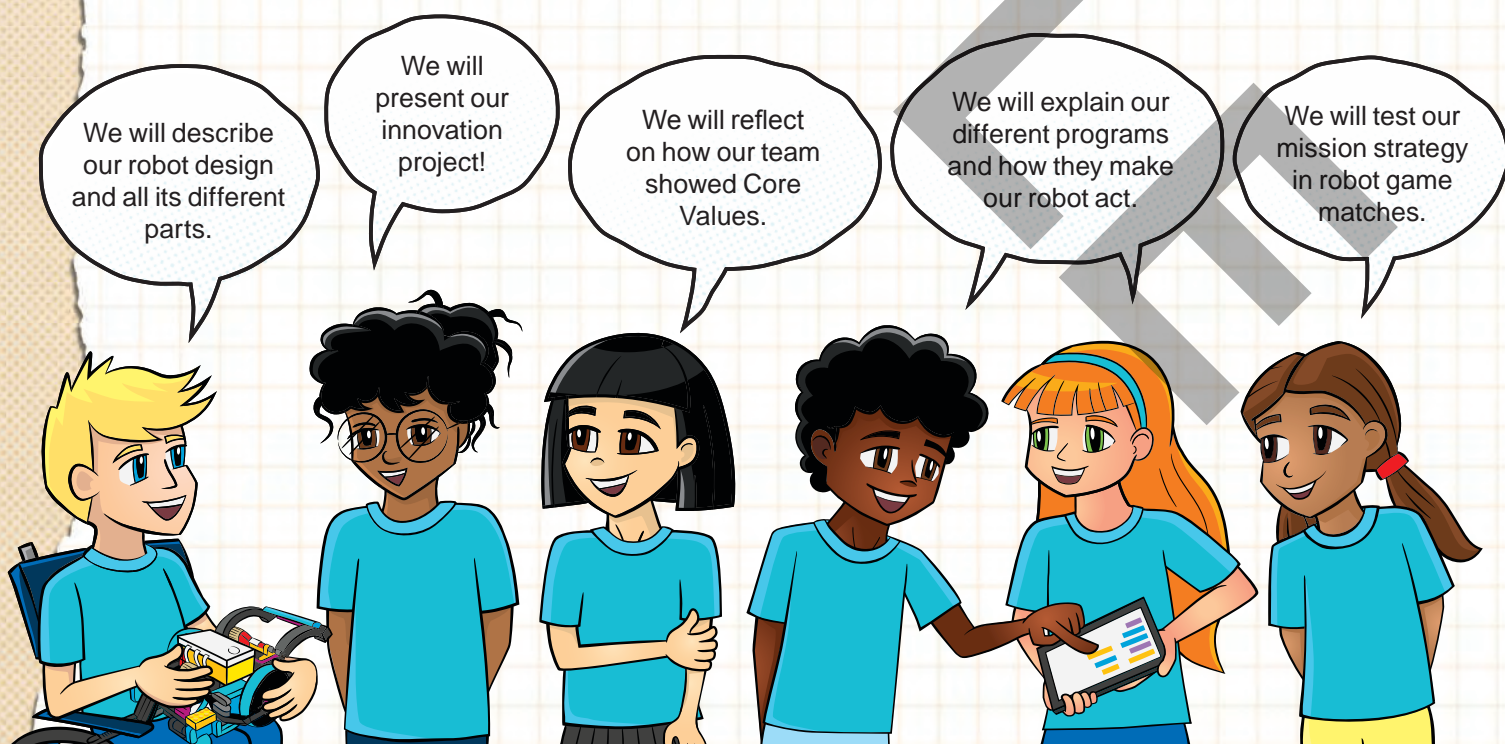
- ☐ **Make a packing list.** You'll at least need your robot and attachments, device with your programs, chargers, project and judging materials (poster, model, or visuals), and any team notes.
- ☐ **Practice and plan the day.** Review the event schedule and practice your innovation project and robot design presentations. Decide who will present each part during judging and confirm who will do what at the robot game.
- ☐ **Think about your innovation project.** Can you describe the problem you chose and how it connects to the season theme? How did you share your solution and iterate based on feedback? What is innovative about your solution and how could it help others?
- ☐ **Think about your robot design and mission strategy.** Which missions did your team attempt to solve and what resources helped you learn how to build and code your robot? How will you describe what each member of your team contributed and the improvements you made along the way?
- ☐ **Reflect on the Core Values your team has used.** Think back on your season and be ready to share how your team worked together, overcame challenges, and what you learned from your journey.

Tips for a Great Event Day

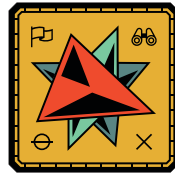
- Stay organized by knowing your schedule and where you need to be. Arrive on time, keep track of your materials, and be ready for your judging session and robot game matches.
- Support your teammates and communicate clearly. Encourage each other, solve problems together, and remember that teamwork is one of your biggest strengths.
- Be flexible and stay positive. Not everything may go as planned, but how you respond to challenges shows your *Gracious Professionalism*®.
- Most importantly, have fun and celebrate your hard work! Take pride in what you've accomplished this season and enjoy the experience of sharing it with others.



Watch this video to prepare for your event.



Team Journey



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