

**FIRST  
LEGO  
LEAGUE**

**CHALLENGE**

# ENGINEERING NOTEBOOK

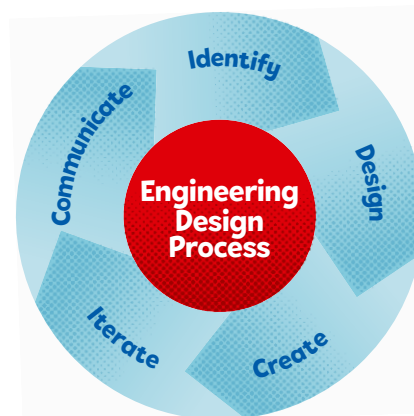


# Welcome!

Use the sessions in this *Engineering Notebook* as a guide for your team's journey through the *FIRST*<sup>®</sup> DIVE<sup>SM</sup> presented by Qualcomm season and SUBMERGED<sup>SM</sup> challenge.

Use the **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. Check out careers related to the season theme at the end of this notebook.



## FIRST<sup>®</sup> Core Values



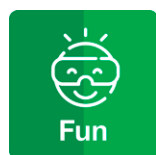
We are stronger when we work together.



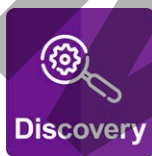
We respect each other and embrace our differences.



We apply what we learn to improve our world.



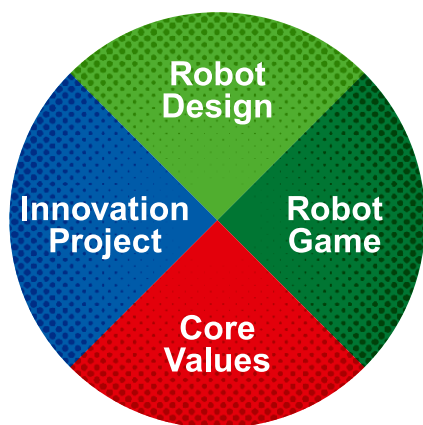
We enjoy and celebrate what we do!



We explore new skills and ideas.



We use creativity and persistence to solve problems.



Each of these four equally weighted parts of *FIRST*<sup>®</sup> LEGO<sup>®</sup> League Challenge accounts for 25% of your total performance at your event.

Core Values should be demonstrated at the event, where you will showcase your team's amazing work on robot design and the innovation project. These three parts will be evaluated during the judging session. Your robot's performance will be evaluated during the robot game.

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

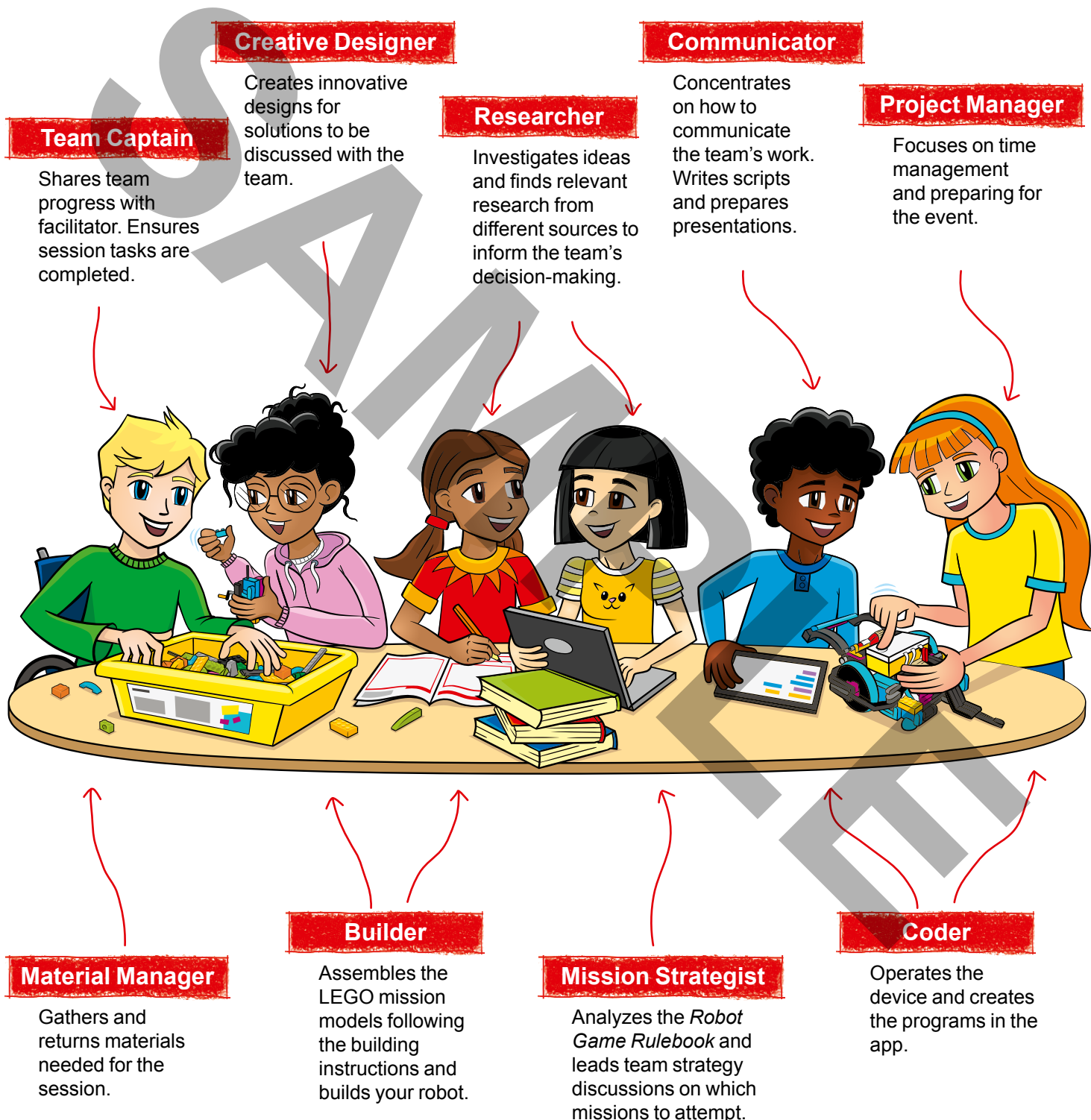
**Gracious Professionalism** is a way of doing things that encourages high-quality work, emphasizes the value of others, and respects individuals and the community.

**Coopertition** is showing 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.



# Session 1 Get Started

## → Introduction

- Watch the season videos and read [pages 3-11](#) to learn how *FIRST*® LEGO® League Challenge works and about the SUBMERGED<sup>SM</sup> robot game and innovation project.
- Get to know your team members and select your team name.

## → Tasks

- Dive in to the season theme by building the robot game mission models.
- Place each model where it belongs on the mat. Refer to the field setup section of the *Robot Game Rulebook*.
- Explore how the models work and how they might connect to the Project Sparks on [page 7](#).

## → Share

- Get together at the mat.
- Show how the mission models connect to the SUBMERGED<sup>SM</sup> theme.
- Discuss the reflection questions.
- Clean up your space.

## → Reflection Questions

- Which mission models look the most interesting to you?
- How do the models relate to the Challenge story or Project Sparks?
- What resources will you use to learn more about the season theme?



What are the four parts of *FIRST* LEGO League Challenge?

Our Notes:

Record your ideas during each team meeting!



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

# Prepare for Your Event

- Make a list of what you need to bring to your event. Read over the event day schedule.**
- Think about your team.**  
How will each person on the team participate in the live presentations and at the robot game?
- Reflect on the Core Values your team has used.**  
How did you make sure every team member was involved and could share their ideas? What did your team learn from working together on your project and robot this season? Can you provide examples of how your team using Core Values and demonstrating *Gracious Professionalism*®?
- Think about all the work you've done on the innovation project.**  
Can you describe the problem you chose and how it connects to the season theme? Can you describe

the steps your team took to create, share, and iterate on your project solution? What is innovative about your solution and how could it help others?

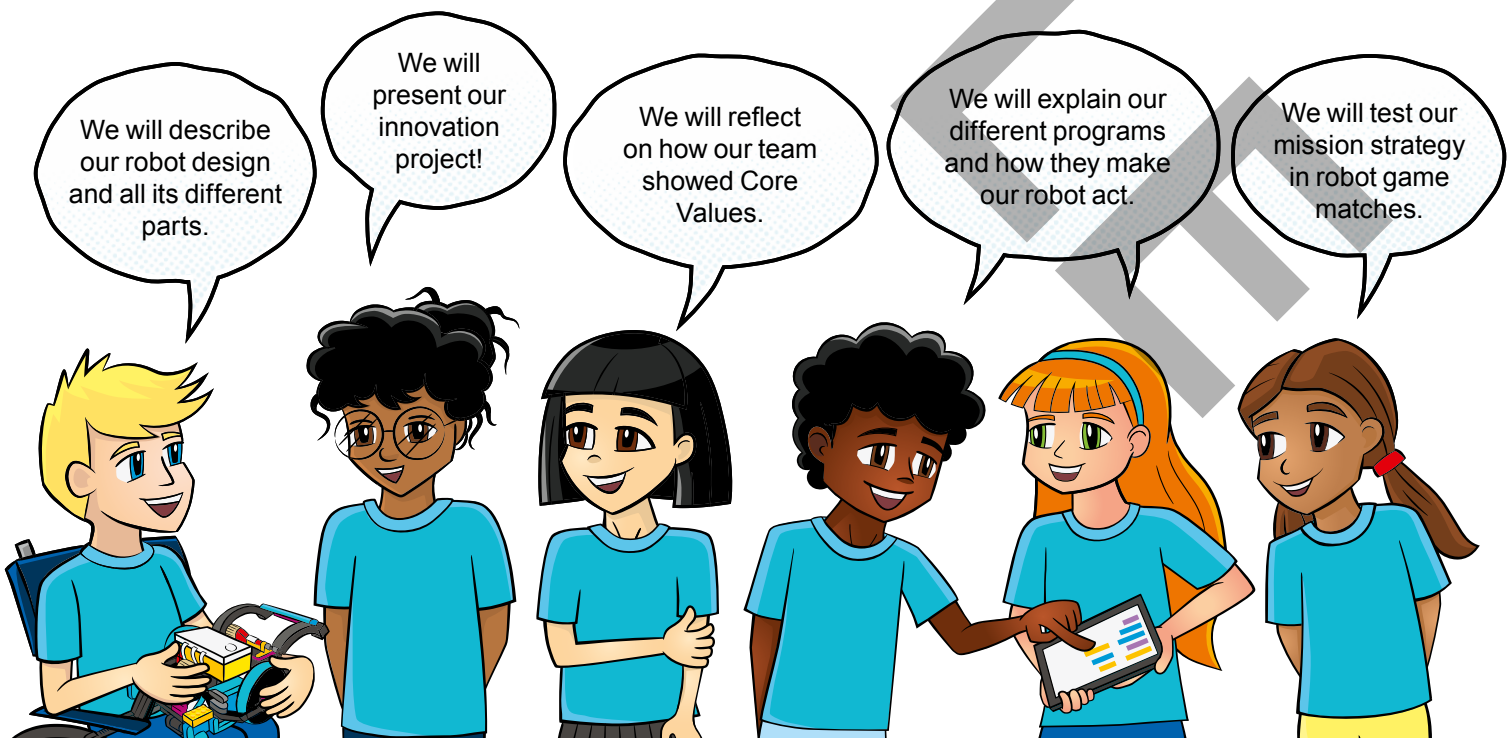
- Talk about the programs and attachments you've created for your robot.**  
How do your programs match your mission strategy? How do your programs make your robot act?
- Think about your robot design.**  
Which missions did your team attempt to solve and why? What resources helped your team learn how to build and code your robot? How will you describe your team's testing plan and what improvements you made along the way?

## What to Expect at Your Event

- Your team should have fun and show team spirit and enthusiasm at the event. Be sure to display Core Values in everything you do.
- Your whole team will meet with the judges in a single judging session to share your team's journey throughout the season. Think about what you have achieved and what challenges you have faced and overcome.
- You will be able to test your mission strategy by competing in matches at the robot game. You will have several chances to compete, but only your highest score counts.



Watch this video to prepare for your event.



# Team Journey



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