FIRST LEGO LEAGUE CHALLENGE

TEAM MEETING GUIDE

MASTER PIECE℠

FIRST

LEGO education

Introduction to *FIRST*® LEGO® League Challenge

Friendly competition is at the heart of *FIRST*® LEGO® League Challenge, as teams of up to 10 children engage in research, problem-solving, coding, and engineering as they build and code a LEGO® robot that navigates the missions of the robot game. Teams also participate in an innovation project to identify and solve a relevant real-world problem.

FIRST LEGO League Challenge is one of three divisions by age group of the *FIRST* LEGO League program. This program inspires young people to experiment and grow their confidence, critical thinking, and design skills through hands-on learning. *FIRST* LEGO League was created through an alliance between *FIRST*® and LEGO® Education.

FIRST LEGO LEAGUE

FIRST LEGO LEAGUE DISCOVER | FIRST LEGO LEAGUE EXPLORE | FIRST LEGO LEAGUE CHALLENGE

FIRST® IN SHOW℠ Presented by Qualcomm and MASTERPIECE℠

Welcome to the *FIRST*® IN SHOW℠ season presented by Qualcomm. This year's *FIRST* LEGO League challenge is called MASTERPIECE℠. Children will learn about how we share our own hobbies and interests while learning about experts in museums, theaters, and other creative fields.

People who work in the arts can teach us a lot about how to communicate, how to engage, and how to entertain an audience of any size. The team will use critical thinking and innovation to inspire others to learn and be entertained!

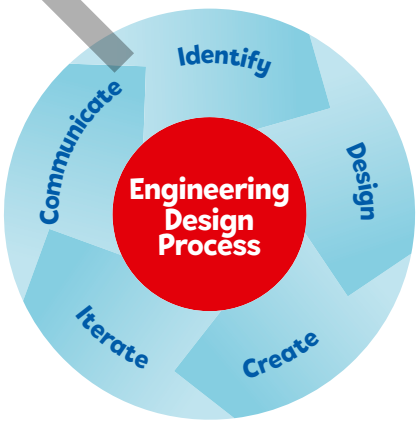
FIRST IN SHOW℠ PRESENTED BY Qualcomm

MASTER PIECE℠

Program Outcomes

The team will:

- Use and apply the *FIRST* Core Values and engineering design process to develop robot and innovation project solutions.
- Identify and research a problem related to the season theme and then design and create an innovation project solution.
- Identify a mission strategy and design, create, and code a robot to complete missions.
- Test, iterate, and improve their robot design and innovation project.
- Communicate their robot design and innovation project and demonstrate their robot in the robot game.



Overview

How to Use This Guide

The sessions provide a guided experience for the *FIRST*® LEGO® League Challenge. The sessions are designed to be flexible so that teams of varying experiences can use the materials. Your role is to facilitate and guide the team during the sessions to complete the team tasks. The tips within this guide are just suggestions. Remember to do whatever is best for you and your implementation.

FIRST® Core Values

The *FIRST*® Core Values are the cornerstones of the program. *Gracious Professionalism*® is a way of doing things that encourages high-quality work, emphasizes the value of others, and respects individuals and the community. The team's Core Values and *Gracious Professionalism* are evaluated during robot game matches and during the judging session at the tournament. The team demonstrates *Coopertition*® by showing that learning is more important than winning and that they can help others even as they compete.

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.

What Does the Team Need?

LEGO® Education SPIKE™ Prime Set

Core set

Expansion set

Note: *Other LEGO® Education sets such as MINDSTORMS® and Robot Inventor are also allowed.*

Electronic Devices

Each team will need two compatible devices such as a laptop, tablet, or computer. Prior to starting Session 1, you need to download the appropriate software (LEGO® Education SPIKE™ Prime or other compatible software) on to the device.

Mission Model Building Instructions

MASTERPIECE℠ Challenge Set

This challenge set comes in a box that contains the mission models, challenge mat, and some miscellaneous pieces. The team should build the models very carefully using the building instructions. The miscellaneous items include 3M™ Dual Lock™ Reclosable Fasteners, coach pins, and season tiles for the team members.

Challenge Mat and Table

Set up a table with the challenge mat in your classroom or meeting space. Even if you cannot build the whole table, building just the four walls will be useful. It is also possible to use the mat on the floor.

Sessions at a Glance

Every session starts with an Introduction and ends with a Share activity. Details for these activities are given in the session pages that follow, along with notes and tips to help you run the session.

	Introduction (10-15 minutes)	Team Tasks (100-120 minutes)		Share (10-15 minutes)
Session 1 Museum Curator	Introduction to Challenge	Tutorial Activities	Museum Curator	Share
Session 2 Visual Effects Director	Goals and Processes	Training Camp 1: Driving Around	Visual Effects Director	Share
Session 3 Stage Manager	Team Design	Training Camp 2: Playing with Objects	Stage Manager	Share
Session 4 Sound Engineer	Discovery Examples	Training Camp 3: Reacting to Lines	Sound Engineer	Share
Session 5 Investigate Ideas	Teamwork Examples	Guided Mission	Identify Project	Share
Session 6 Identify Solutions	Innovation Project Build	Pseudocode and Mission Strategy	Plan Innovation Project Solution	Share
Session 7 Create Solutions	*Gracious Professionalism*® Examples	Solve Missions	Develop Project Solution	Share
Session 8 Continue Creating	*Coopertition*® Examples	Solve Missions	Evaluate and Test Project Solution	Share
Session 9 Solution Planning	Innovation Examples	Iterate and Improve Robot Solution	Iterate and Improve Project Solution	Share
Session 10 Iterate Solutions	Impact Examples	Iterate and Improve Robot Solution	Plan Project Presentation	Share
Session 11 Presentation Planning	Inclusion Examples	Plan Robot Design Explanation	Practice Project Presentation	Share
Session 12 Communicate Solutions	Fun Examples	Practice Robot Game Matches	Practice Full Presentation	Share

Pre-Session Checkpoint

Please read the student *Engineering Notebook*, *Robot Game Rulebook*, and this *Team Meeting Guide* before starting the sessions.

The guides are full of very useful information to guide you through this experience. Use this checkpoint to help you get started and guide you toward success.

Helpful Resources

- ☐ Explore the *FIRST*® Core Values. These are the essential foundation for your team.
- ☐ Watch the season videos on the *FIRST*® LEGO® League YouTube channel.
- ☐ Unpack the robot set and sort the LEGO elements into the trays.
- ☐ Have the team look over the judging rubrics to see the evaluation criteria for their robot and innovation project solutions.
- ☐ Make sure the controller is charged and all updates are completed.
- ☐ Ensure you have at least two devices with Internet access and the appropriate LEGO® Education app installed per team.
- ☐ Scan the QR code for additional support resources and links.

Sessions 1-4 Tips

CORE VALUES

Have the team set goals for what they want to accomplish together, and have individual team members set their personal goals.

ROBOT DESIGN

If the team is new to using their LEGO Education robot set, take some time to get them acquainted with the set. Have the team complete the Getting Started activities.

INNOVATION PROJECT

Sessions 1-4 provide four different Project Sparks that provide example problems and solutions to the innovation project.

ROBOT GAME

Have a location to place the mat and models after each session if they have to be stored.

Session 1

Outcomes

The team will:

- Learn how to connect and use the sensors and motors.
- Make connections from the mission models to the museum curator Project Spark ideas.

Season Videos

1. Have the team watch the season videos on the *FIRST*® LEGO® League YouTube channel and read pages 3-9 in their *Engineering Notebooks*.
2. Two devices are suggested, one for the robot and one for project work. Additional devices for the mission model building are useful.
3. Activities in the sessions use the LEGO Education SPIKE™ Prime app.
4. Make sure the controller and device are plugged in and charging at the end of the session.
5. Robot Game Connection: Have the team think about how a sensor could be helpful to get the robot to stop in the right place to engage with a mission model on the mat.

Estimated times are provided for each part of the session.

1. **Introduction** *(10-15 minutes)*
   - ☐ Watch the season videos and read pages 3-9 on how *FIRST*® LEGO® League Challenge works and the MASTERPIECE℠ challenge.
2. **Tasks** *(50-60 minutes)*
   - ☐ Open the SPIKE™ Prime app. Click the Start button.
3. **Tutorial Activities: 1-6**
   - ☐ Check out the *Robot Game Rulebook* for mission details.
4. **Reflection Questions**
   - How could stopping a motor help you solve a mission with your robot?
   - What do you know about your teammates' interests and hobbies?
   - What are resources that can help you learn more?

Session 1

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

Every session has an Introduction prompt and space to document the team's responses.

Our Notes:

Open space is provided in each session for the team to collaboratively capture their thoughts, ideas, diagrams, and notes.

Some sessions will have helpful tips for the team.

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

10 Engineering Notebook | Sessions

Understanding Judging

Judging Session Flowchart

Teams should demonstrate Core Values in everything they do. The judges are excited to see how they show **teamwork**, **discovery**, **inclusion**, **innovation**, **impact**, and **fun** as they present their Innovation Project and Robot Design work.

This is the team's time to shine, so try to settle their nerves and encourage them. Please make sure they don't leave anything in the judging room, including any documentation, when they leave.

TEAM ENTERS

1	**Team Welcome** Introductory conversation takes place as the team sets up any materials they have brought.	2 minutes
2	**Innovation Project** **Live Presentation**	5 minutes
3	**Innovation Project** **Question and Answer**	5 minutes
4	**Robot Design** **Explanation**	5 minutes
5	**Robot Design** **Question and Answer**	5 minutes
6	**Core Values** **Question and Answer**	3 minutes
7	**Feedback** Judges provide verbal feedback to the team.	5 minutes

TEAM LEAVES

8	**Judges discuss the team and complete the rubrics together.**	10 minutes
	Judges submit the rubrics once they are complete, before next team enters.	

1. During setup, the judges will ask questions to find out about the team and what experience they have in the program.
2. The team can present their innovation project uninterrupted by the judges.
3. Judges use the rubric to find out more about the innovation project solution and anything the team did not make clear during their presentation.
4. Judges listen as the team explains how they worked on the robot and demonstrate their understanding of their programs.
5. Judges use the rubric to find out the depth of the team's understanding of the robotics and coding.
6. The Core Values are evaluated throughout the judging session, but this reflection section is for the judges to ask additional questions.
7. To inspire the teams, the judges give immediate verbal feedback on what the team did well but also on where further work would improve their performance.
8. After the team leaves, the judges work together to complete and submit the rubrics.

If there is too much information for the team to cover in detail, visual aids can be very useful references. Make sure the team practices how they will use them in the judging session.

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