Introduction

Welcome to FIRST® LEGO® League Explore!

In FIRST® LEGO® League Explore, teams focus on the fundamentals of engineering as they explore real-world problems, learn to design and code, and create unique solutions made with LEGO® bricks and powered by LEGO® Education SPIKE™ Essential or WeDo 2.0. FIRST LEGO League Explore 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® ENERGIZE℠ presented by Qualcomm and SUPERPOWERED℠

Welcome to the FIRST® ENERGIZE℠ season presented by Qualcomm. This year’s FIRST LEGO League challenge is called SUPERPOWERED℠. Children will learn about different types of energy sources, storage, distribution methods, and ways in which energy is consumed.

During each session, they will experience the engineering design process. There is no set order for this process, and they may go through each part several times in a single session. This means that during a session, children will be exploring the theme and ideas, creating solutions, testing them, iterating and changing them, and then sharing what they’ve learned with others.

Working in Teams

Children work together in teams of up to six members using pieces from the LEGO Education SPIKE™ Essential or WeDo 2.0 set, and an Explore set. They will collaborate and communicate to build, learn, and play together.

Children should be encouraged in every session to work with their teammates, listen to each other, take turns, and share ideas and pieces.
Playful Learning in Action

**FIRST® Core Values**

The **FIRST®** Core Values are the cornerstones of the program. They are among the fundamental elements of **FIRST® LEGO®** League. By embracing the Core Values, children use discovery and exploration of the theme in each session and learn that helping one another is the foundation of teamwork. It is important that the children have fun. The more playful the sessions are, the more motivated the children will be.

- **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.

**Team Roles**

Here are sample team roles to use during the sessions. Everyone could experience each role multiple times throughout their **FIRST** LEGO League Explore experience. Using roles helps the team function more efficiently and ensures that everyone on the team is engaged. Some roles, like the builder and coder, could be filled by multiple children during a session when the experience is designed for a pair of children.

- **Reporter**
  - Captures the team’s journey by taking pictures or video. This media can be used for the team poster.

- **Builder**
  - Assembles the LEGO builds following the building instructions.

- **LEGO Element Finder**
  - Locates the specific LEGO elements needed for each build step.

- **Team Captain**
  - Shares team progress with facilitator. Ensures session tasks are completed.

- **Adult Facilitator**
  - Guides the team through the sessions and their learning to achieve session outcomes.

- **Coder**
  - Operates the device and creates the programs in the app.

- **Material Manager**
  - Gathers materials needed for session and returns materials at end of session.
What Does the Team Need?

LEGO® Education Set

- LEGO® Education SPIKE™ Essential Set

OR

LEGO® Education WeDo 2.0 Set

Electronic Device

Your team will need a compatible Bluetooth-enabled device like a laptop, tablet, or computer. Scan the QR code to view system requirements and download software.

Team Poster Supplies

Each team will need a large poster board and various art supplies and materials in Sessions 10-11.

SUPERPOWERED™ Explore Set

Each team will get one SUPERPOWERED™ Explore Set. Leave the LEGO® elements in their plastic bags until the sessions in which they are needed.

Three printed books contain the building instructions for the Explore model.

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Tips

- The prototyping pieces and baseplates are used throughout the sessions to build solutions to the design challenges.
### Session Layout

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.

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**Celebrate at a Festival!**
Session 1

Introduction (10 minutes)

Let’s Discover
• Read the definition for discovery to the team. (see page 5)
• Talk about what discovery is. Have the team provide examples of this Core Value.

Session Tips
1. Check out the Multimedia Resources for more resources you can use with your team.
2. You will find various sessions reference different energy jobs. These jobs are listed on the Career Connections pages in the Engineering Notebook.
3. Writing and drawing space is provided throughout the notebook for each child to capture their thoughts and ideas.

Guiding Questions
• How does energy get to where we need it?
• From where do you get energy?
• What jobs are linked to energy?

Activity 1 Tasks (15-20 minutes)
1. Explore the energy theme.
2. Talk about how you get and use energy.
3. Think about how you use energy daily.
4. Draw a picture of one way you use energy in your home every day.
5. Think about what different energy jobs people have.
6. Draw a person doing an energy job.

Outcomes
• The team will use discovery to explore the SUPERPOWEREDSM theme and explain what is an energy journey.
• The team will identify different energy examples on the mat.

Extention
• Research new innovations and emerging technologies in the energy field.
• Explore different jobs and careers related to energy.

See pages 30-31 for more details on jobs!
**Outcomes**
- The team will reflect on their SUPERPOWERED℠ experience.
- The team will create a plan for what to share at their final event.

**Introduction (10 minutes)**

**Impact Build**
- Have the team provide examples of how they have had an **impact** throughout the sessions.
- Have the team create a build from the prototyping pieces representing this Core Value or examples of how the team has had an **impact**.

**Guiding Questions**
- Can you explain the code you created for your motorized part?
- How does your team model relate to the SUPERPOWERED theme?
- Can you share about your team’s journey?

**Tasks (40 minutes)**
1. Gather your completed team model and team poster.
2. Talk about what your team would like to share at your event!
3. Complete the next page to prepare for your event.
4. Look over the reviewing sheet with your coach.
5. Practice your presentation.
6. Communicate what you have learned with others.

**Session Tips**
1. Go over the reviewing sheet and reviewing questions with your team.
2. Ask the team the reviewing questions and practice the responses they would give the reviewers.
3. If you are not attending an official festival, you can still run your own festival or have an informal sharing event.

**Sample Festival Setup**

**Extension**
- Present your presentation to another team, class, or group of adults.
- Ask for feedback to make improvements before your final event.

**DEMO**

**DEMO**
Prepare for Event

Consider what you will share at the event.

• Can you describe your team model?
  • How did you use your mat to create your model?
  • Explain the problems you solved about your community’s energy journey.

• What part of your team model is motorized?
  • How did you code your motorized part?

• What did you learn about the challenge?
  • How did you use Core Values?

• What did you include in your team poster?
  • How does the poster show your team journey?

Share (10 minutes)

Have the team:
• Practice their team poster presentation.
• Practice their team model presentation.

Guiding Questions
• How will you present your poster and model at the event?
• How do we show Core Values?
• What does your team need for the event?

Session Tips
4 Every question on this page doesn’t need to be answered. They are just to help your team feel ready for the event.
5 You could have the team practice their presentation by presenting to others before their event.
6 Your team could register for an Explore festival or you can run your own festival.

Cleanup
• Make sure the team model and team poster are stored and ready to be transported to the event.
• Check that you have the device, charging cord, and fully charged battery for the event.