FIRST LEGO LEAGUE CHALLENGE

CLASS PACK GUIDE

FIRST

LEGO education

FIRST® LEGO® League
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Welcome to the Program

Welcome to *FIRST*® and the *FIRST*® LEGO® League program. *FIRST* LEGO League captures children's curiosity and directs it toward discovering the wonders of science and technology. The program was created through a partnership between *FIRST* (For Inspiration and Recognition of Science and Technology) and LEGO® Education. *FIRST* LEGO League has three divisions: Discover, Explore, and Challenge. Your students will take part in the Challenge Class Pack!

Thank you for participating in this innovative STEM program for students. Your students join a global community across more than 110 countries. Its impact is profound and leads to a further progression of STEM exploration, skills, and experiences even after students complete the program.

The Class Pack provides schools with the tools to implement *FIRST* LEGO League Challenge in daily classroom lessons or as a structured after-school program. As the teacher, your role is to facilitate learning for your students and organize your implementation of the program. The guide is designed to help you do this.

This guide also contains information on how students can share their experiences and what they have learned throughout their journey – from highlighting your students' hard work in a classroom showcase to putting on your own school or organization-based *FIRST* LEGO League Challenge event.

The Class Pack Videos show you how to implement the program in the school environment.

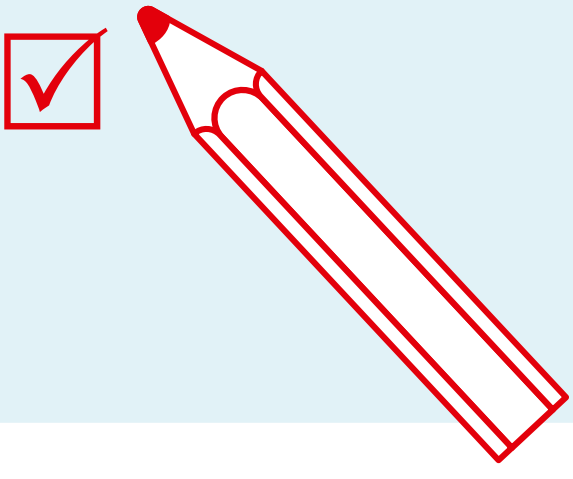
Getting Started Checklist

Thank you to all the teachers and youth leaders who will be delivering the *FIRST*® LEGO® League Challenge Class Pack to your students.

Please read the *Engineering Notebook* and *Robot Game Rulebook* (these guidebooks are given to the students) and the *Team Meeting Guide*. They are full of very useful information to guide you through the program. After completing the 12 sessions, your students will be prepared to participate in a tournament that celebrates the magnificent achievements made by the teams.

We've created a checklist to guide you toward success. Use this to help you get started.

- ☐ Ensure you have received all materials needed to run the program. See page 6 for list.
- ☐ Identify the space where you will implement the program and store materials. Think about the robot sets and any assembled models that may need to stay together.
- ☐ Think about the size of the event you want to have. Your tournament could be in your classroom or be a bigger event for the whole school.
- ☐ Create an implementation plan and timeline for how you will use the program. See pages 7-10 for implementation tips.
- ☐ Determine who will be participating in the program. Is it your entire class? Will the same materials need to be shared by different classes or other teachers?
- ☐ Encourage family and home engagement.
- ☐ Determine how you will place the class into teams. The recommended team size is no more than 6 students.



Material Needs

Look over the following list for what materials and space you will need in your classroom. It is recommended that students work in teams of six. Each team will need space to design, build, and program their robot. They will need space to have brainstorming sessions, research, draw diagrams and participate in teamwork activities. Access to electronic devices and the Internet are important for each team to have for a successful program implementation.

For each student:

- 1 *Engineering Notebook**

For each team (within class):

- LEGO® Education SPIKE™ Prime Core and Expansion Sets (or compatible older sets)
- 2 electronic devices
- Supplies to create the Innovation Project and poster board (recommended)*

For each class:

- 2 Challenge Sets
- 4 *Robot Game Rulebooks*

Classroom space:

- 2 tables (recommended) or space on the floor for two Challenge mats with assembled models
  - **OR** 1-2 *FIRST*® LEGO League Practice Tables (4' x 8') – OPTIONAL
- Small workstations/tables for each team (enough space for robot building, computers, assembled models, and project work)
- Portable or permanent storage
- Internet access
- Electrical support

*Items with an asterisk are consumable each time a team goes through this experience.

Storage and Material Management

Before you get started with the *FIRST*® LEGO® League Challenge content, you might want to play a game where the teams identify pieces in their robot sets. It is recommended that students organize their robot sets to help in taking ownership of materials. This would allow you to start processes and procedures for keeping the sets organized.

After you have gathered or purchased all the materials your students will need, you could use plastic storage tubs or other containers to create a kit for each team in your class. You could store the *Engineering Notebooks* and robot sets inside the kit for each team, ensuring that each team is responsible for their materials and they won't get mixed up with others in the classroom.

Alternatively, you could assign and label each robot set with the team name and/or number so the students know what materials to grab each time. Be sure to check the battery levels of your hardware devices and charge them as needed between sessions.

Designate a safe area for the robot sets, computers, Mission Models/table, and materials that students have been working on so they remain safe between class days/periods.

POSSIBLE STORAGE SOLUTIONS

Classroom Implementation

Flexible Implementation

First and foremost, use your professional judgment to augment this program to meet the needs of your students, class space, class timing, and additional curricular requirements. Set student expectations for participation in the program based on the student growth mindset of holistic and STEM skills.

Working in Teams

The sessions in the guidebooks have guided tasks for each student team. Here are the reasons behind this design:

- It ensures an equitable experience for every student in all aspects of the program.
- It provides additional opportunity for collaboration and communication.
- Small groups promote deeper learning of content and build holistic skills to share out learning with other team members.
- Fewer materials are needed, and they can be used by more students.
- Having smaller groups allows for students to get hands-on time with building, coding, and exploration.

How to Run Differentiated Groups

- Physically split the space to facilitate working in small groups.
- Establish norms for movement and talking in small groups.
- Be comfortable with talking and movement within groups.
- Orient students to daily goals for learning using the student outcomes for each session listed in the *Team Meeting Guide*.
- Have individual check-ins with each team at the start of class.
- Determine the length of time for daily tasks ahead of class and share with students.
- End each class with whole group sharing using the guiding questions outlined in the *Team Meeting Guide* as inspiration.

You will need to adjust how each session is completed by your students if your designated class time to complete each session is different than the allotted 120 minutes per session outlined in the guides. The length this program will take to complete will depend on time within the day you have available to do *FIRST*® LEGO® League Challenge and how often you will teach this program (daily, weekly, etc.).

Following is a daily lesson planning example for how to adjust the session content to meet a different class time frame. This example is from Session 1 and uses a 50-minute class time.

Day 1 (Session 1)

Time	Activity	Teacher Notes
10 minutes	Introduction Tasks	Review the *Team Meeting Guide*. Pull up season video on YouTube.
30 minutes	Complete robot tasks on first page of session.	The introductory pages in the *Engineering Notebook* are important. Provide PDFs of the building instructions to teams.
5 minutes	Reflection Time	Look over the Reflection Questions on the first page of the session in the *Engineering Notebook*.
5 minutes	Clean Up	Store any relevant LEGO® pieces for the robot in a plastic bag.

Day 2 (Session 1)

Time	Activity	Teacher Notes
5 minutes	Check in with teams.	Review Session outcomes in the *Team Meeting Guide*.
35 minutes	Complete project tasks on second page of session.	The *Robot Game Rulebook* is a great resource to also use. It is recommended that the mats are set up on tables in the classroom.
5 minutes	Reflection Time	Look over the Reflection Questions on the second page of the session in the *Engineering Notebook*.
5 minutes	Clean Up	If models aren't finished, show teams where to place them.

If your school or district is running as a cohort using reusable materials, collaborate with other teachers who will run the program on daily lesson planning and timing.

Classroom Management

Teacher Role

The role of the teacher in a *FIRST*® Class Pack environment is more of a facilitator. Your teaching style should include a focus on developing holistic skills, building STEM confidence, embracing challenging activities and using play, discovery, and exploration.

Important things to consider when using the facilitator mindset is to:

- Reinforce *FIRST* Core Values.
- Ask guiding questions to get students thinking.
- Be comfortable with not having all the answers.
- Let students learn for themselves through problem-solving.
- Create opportunities for students to have ownership of the learning process and outcomes.
- Reflect on student and team goals and how they are working to achieve them.
- Guide students to the resources to help them achieve their goals.
- Celebrate mistakes and see learning opportunities.

Student Growth Mindset

As you guide students through their experience, having the right mindset is important. Creating student ownership of learning can assist with this. Ownership can be achieved by allowing students to focus on the skills they are developing and what they want to achieve and to use their problem-solving skills.

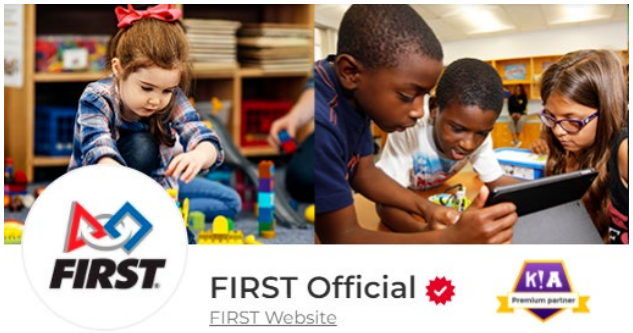
There are no right or wrong solutions, just different ways of solving problems. There is plenty of opportunity for students to enjoy their successes and learn from their mistakes.

As a teacher, if you can establish perseverance and resilience as traits to celebrate and be grateful for, students will be more likely to strive for them. Students need to be challenged just enough that it stretches their minds and creativity without overwhelming them.

Promote inquiry by using open-ended questions that lead to more student discovery and investigation. Use the *FIRST Inspires Inquiry Poster* as a resource for inquiry questions you can use with your students. You can access this poster in the *Class Pack Resources* module in Thinkscape.

FIRST® LEGO® League Challenge Resources

FIRST® has created many resources to help with the implementation of *FIRST*® LEGO® League Challenge in the classroom. These support resources provide different activities and platforms that you can use to engage with your students and extend their STEM learning.



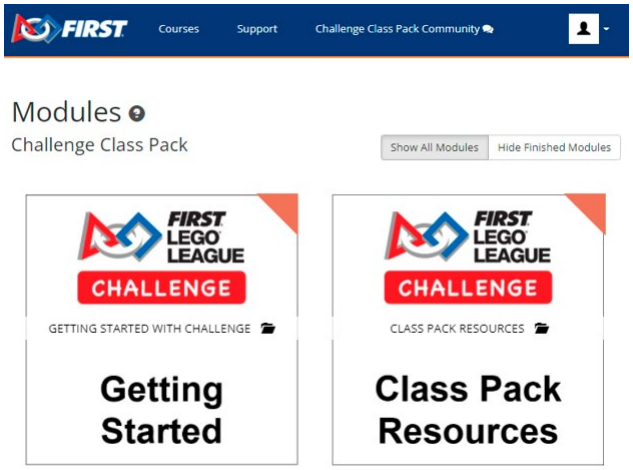
Kahoot! Series

The *FIRST* LEGO League Challenge Kahoot! series covers topics such as *FIRST* Core Values, Engineering Design Process, Innovation Project, Robot, and more. These Kahoot! activities are a great way to engage the students in a fun way and introduce them to what *FIRST* LEGO League Challenge is and its main components. Be sure to subscribe to the *FIRST* community on the Kahoot! page to stay tuned for updates.

STEM Activities

Explore the *FIRST* LEGO League Challenge STEM learning series. You can use these activities to engage students in STEM learning, skill building, and FUN! Lessons cover topics such as coding, engineering, design, Core Values, and more. These activities are easy to implement with limited resources and can either stand alone or work as a great supplement to a *FIRST* Class Pack experience.

Google Drive



Thinkscape Course

FIRST LEGO League Challenge has a digital course available through Thinkscape. This course includes various modules that provide information on how to get started with Challenge and how to implement a Challenge Class Pack.

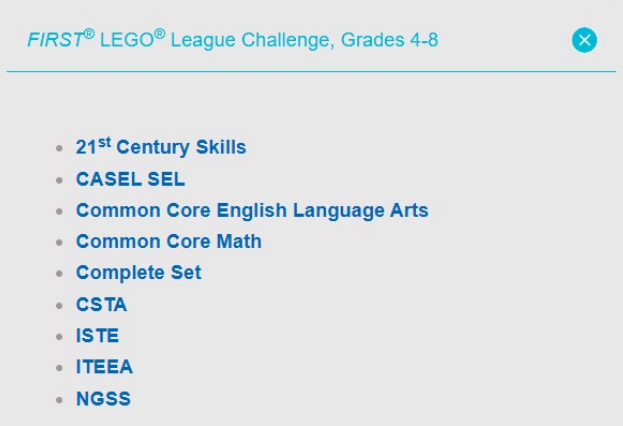
Also, a Season Resources module will be available at season launch in August. The Season Resources module will contain digital versions of the guidebooks, translated versions of the guidebooks, and a multitude of support resources including Session Slides and Multimedia Resources.

FIRST® Education Resources

FIRST® Education supports educators by providing additional educator content and resources. Below is a list of the some of the educator resources available.

Scope and Sequences

FIRST Education has created various scope and sequences to provide options for implementation in the classroom. Detailed documents for each of the scope and sequence options can be found on the *FIRST* Education website.



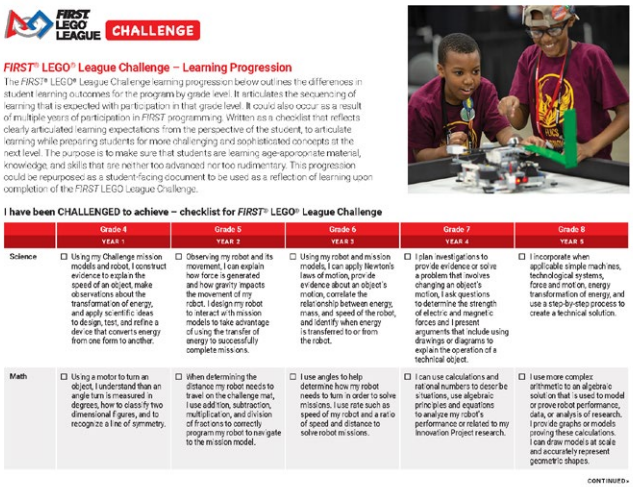
Standards Alignments

FIRST Education has completed an external analysis and mapping of all its programs to national educational standards. Custom alignments have also been completed for various specific states and countries.

Contact *FIRST*education@firstinspires.org to see if alignments are available for your state or location. If such alignments aren't available, you can request customized standards mapping.

Skills Progression

FIRST has created a learning progression of skills used in *FIRST*® LEGO® League Challenge and their correlation to various subject areas. The document allows teachers to see how *FIRST* LEGO League Challenge can be used across different grades to develop skills.



FIRST LEGO League CHALLENGE

FIRST® LEGO® League Challenge – Learning Progression

The *FIRST*® LEGO® League Challenge learning progression below outlines the differences in student learning outcomes for the program by grade level. It articulates the sequencing of learning that is expected with participation in that grade level. It could also occur as a result of multiple years of participation in *FIRST* programming. Written as a checklist that reflects clearly articulated learning expectations from the perspective of the student, to articulate learning while preparing students for more challenging and sophisticated concepts at the next level. The purpose is to make sure that students are learning age-appropriate material, knowledge, and skills that are neither too advanced nor too rudimentary. This progression could be repurposed as a student-facing document to be used as a reflection of learning upon completion of the *FIRST* LEGO League Challenge.

I have been CHALLENGED to achieve – checklist for *FIRST*® LEGO® League Challenge

	Grade 4 YEAR 1	Grade 5 YEAR 2	Grade 6 YEAR 3	Grade 7 YEAR 4	Grade 8 YEAR 5
Science	☐ Using my Challenge mission models and robot, I construct evidence to explain the speed of an object, make observations about the transformation of energy, and apply scientific ideas to design, test, and refine a device that converts energy from one form to another.	☐ Observing my robot and its movement, I can explain how force is generated and how gravity impacts the movement of my robot. I design my robot to interact with mission models to take advantage of using the transfer of energy to successfully complete missions.	☐ Using my robot and mission models, I can apply Newton's laws of motion, provide evidence about an object's motion, correlate the relationship between energy, mass, and speed of the robot, and identify when energy is transferred to or from the robot.	☐ I plan investigations to provide evidence or solve a problem that involves changing an object's motion, I ask questions to determine the strength of electric and magnetic forces and I present arguments that include using drawings or diagrams to explain the operation of a technical object.	☐ I incorporate when applicable simple machines, technological systems, force and motion, energy transformation of energy, and use a step-by-step process to create a technical solution.
Math	☐ Using a motor to turn an object, I understand than an angle turn is measured in degrees, how to classify two dimensional figures, and to recognize a line of symmetry.	☐ When determining the distance my robot needs to travel on the challenge mat, I use addition, subtraction, multiplication, and division of fractions to correctly program my robot to navigate to the mission model.	☐ I use angles to help determine how my robot needs to turn in order to solve missions, I use rate such as speed of my robot and a ratio of speed and distance to solve robot missions.	☐ I can use calculations and rational numbers to describe situations, use algebraic principles and equations to analyse my robot's performance or related to my Innovation Project research.	☐ I use more complex arithmetic to an algebraic solution that is used to model or prove robot performance, data, or analysis of research. I provide graphs or models proving these calculations. I can draw models at scale and accurately represent geometric shapes.

CONTINUED »

Assessment Resources

Formative Assessments

You can keep track of how your students are progressing against the outcomes for each of the 12 sessions using this formative assessment sheet. Place the session outcomes into the formative assessment templates.

Summative Assessments

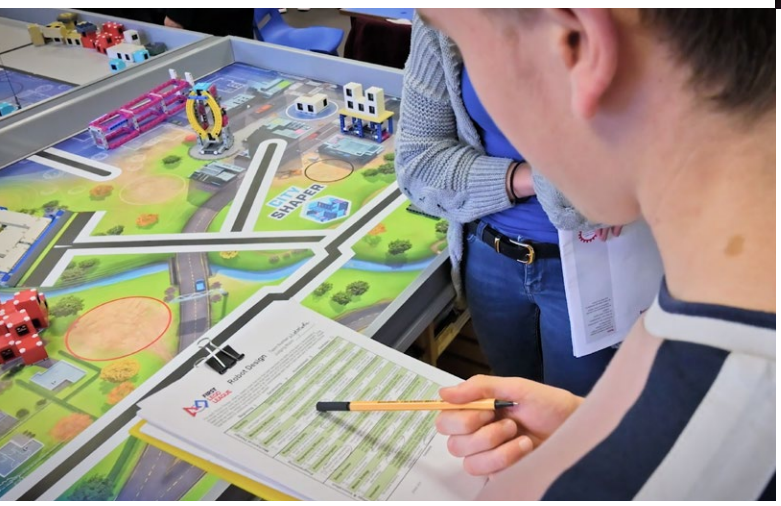
There are multiple summative assessments within the program. The culminating event or showcase serves as a capstone of the students' achievements and participation in the program. Evidence of learning includes the rubric, final event, final presentations, robot game score sheet, and final products: robot and innovation project.

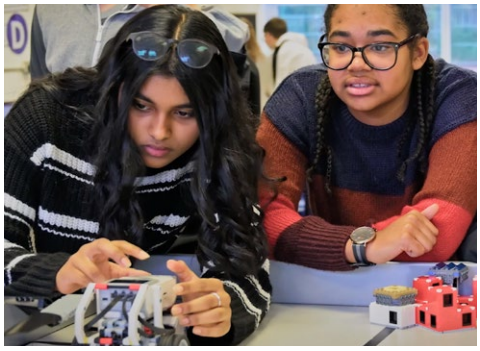
Engineering Notebooks

The *Engineering Notebook* serves as a proof of learning and is a great resource for student teams to document the process they went through to create their robot and project solution. Encourage them to document how they demonstrate Core Values throughout their experience.

Public Celebration

During the tournament, student teams will get the chance to showcase all the work they have prepared. You will be able to observe and record a summative assessment of how they have done using the Class Pack judge questions and rubric which can be found in the Challenge *Class Pack Event Guide*.





LEGO® Education Resources

Getting Started

LEGO® Education has additional educator content to help with implementation into classrooms. These resources and other relevant content can be used prior to starting the *FIRST*® LEGO® League Challenge, during the program, or as an extension once the program is complete.

Lesson Plans

This program utilizes the complete solution packages that LEGO Education has available. The robotics sets purchased for use with the *FIRST* LEGO League Challenge also include additional lesson plans and resources available through the LEGO Learning System and the LEGO Education website.

Software Downloads

Download and install all the software and student apps needed to successfully integrate robotics into your classroom.

LEGO Education Community

LEGO Education has created a community page for educators to support and learn from one another, find inspiration, and to connect with their peers.

Professional Development Resources

FIRST® Certified Professional Development

FIRST® offers an immersive learning experience for teachers that will help them acquire or strengthen their facilitation skills for project-based learning and building holistic skills.

FIRST Certified Professional Development is available in both remote and in-person formats. We hold regional sessions at various locations as well as custom sessions for school districts.

FIRST LEGO LEAGUE DISCOVER	FIRST LEGO LEAGUE EXPLORE	FIRST LEGO LEAGUE CHALLENGE
Grades PreK-1	Grades 2-4	Grades 4-8
6 hours	12 hours	14 hours

Additional Training Opportunities

As part of our commitment to creating a diverse, inclusive, and equitable community for all our participants, *FIRST* has trainings on how you can inspire the youth voice, create a sense of belonging, and more.

Equity, Diversity, and Inclusion Training

Your local *FIRST* Program Delivery Partner might offer *FIRST* training in your area. For information on local training and workshops, you can contact your Program Delivery Partner.

Find Your Partner

LEGO® Education offers a personalized learning program that inspires teachers to learn, practice, and master competencies that support playful, hands-on STEAM learning with maximum impact on student outcomes.

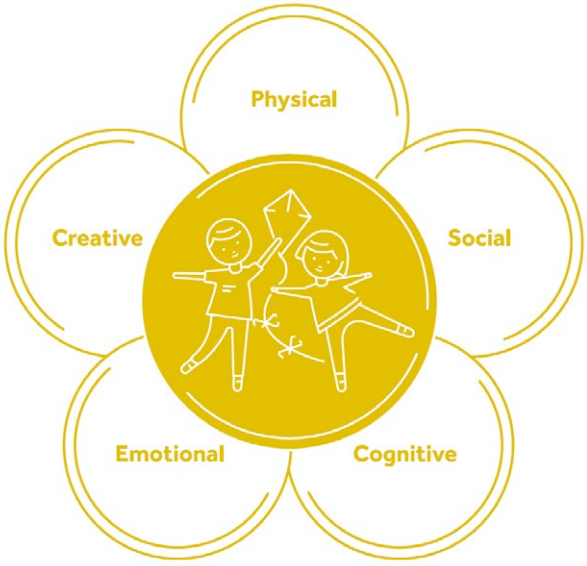
LEGO Education Training

FIRST® LEGO® League Education Philosophy

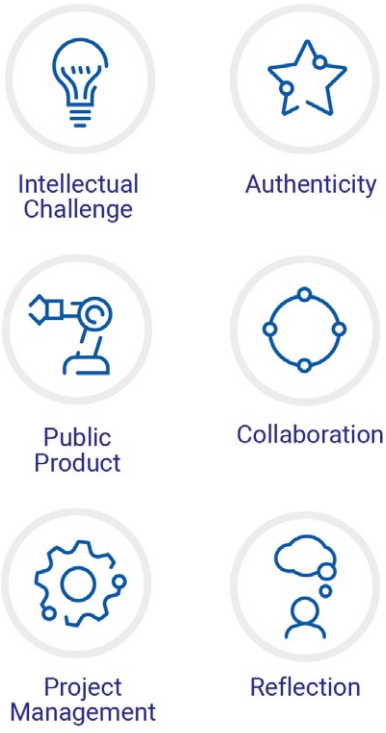
FIRST® LEGO® League is a program created through a partnership between *FIRST* and LEGO® Education and is infused with the educational philosophies of both organizations. All three divisions of *FIRST* LEGO League: Discover, Explore, and Challenge, follow these philosophies.

Learning through Play

This program encourages schools to incorporate play into the learning process throughout all grades. Play has positive impacts on holistic skill development. The guided materials are designed to increase confidence in STEM for both students and teachers. Content is designed with the idea that the teacher does not know all the answers. The materials provided don't give the exact answers but provide guidance and tips to the teacher on how to support their students. It is for the students to determine the way forward in solving the problem through play, discovery, and exploration.



Five Skills for Holistic Development



Use the *Engineering Design Process* Poster and *Project-Based Learning Mindset* Poster as resources in your classroom for your students. You can access these posters in the *Class Pack Resources* module in Thinkscape.

Project-Based Learning

FIRST LEGO League is a project-based learning program that creates meaningful, authentic learning opportunities for the students. Students gain knowledge and skills by working toward goals through the investigation of solutions and complex problem-solving.

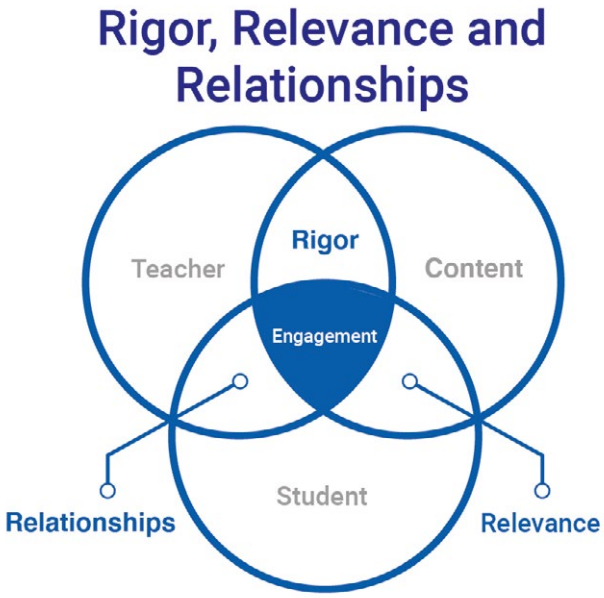
Key project-based learning elements include:

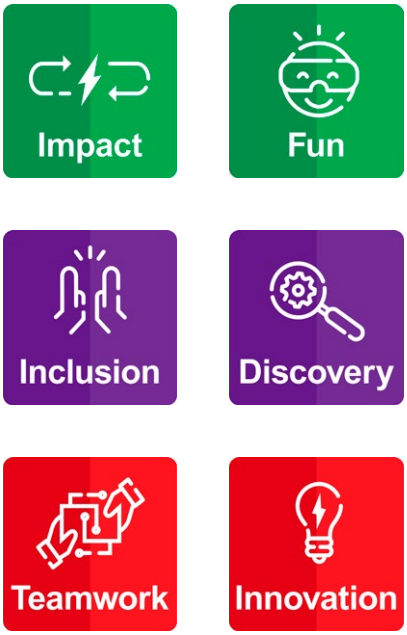
- **Intellectual Challenge**: To start the engineering design process, this program begins with a challenge to solve.
- **Authenticity**: This program features age-appropriate real-world contexts and includes career awareness.
- **Public Product**: Teams present public products as a showcase of work to a public audience.
- **Collaboration**: Teams work together to brainstorm and develop design ideas then make decisions to create public products.
- **Project Management**: Scaffolded through the engineering design process and teams hone these skills throughout their experience.
- **Reflection**: Reflecting on an experience is a key tool that is incorporated after achieving a learning outcome.

Rigor, Relevance, and Relationships

Through the data of our longitudinal study, it has been proven that experiencing just one year of *FIRST*® LEGO® League has an impact on STEM outcomes for students. These outcomes are manifested by this program's rigorous and relevant content that incorporates relationships within a team and the larger community.

- **Rigor**: The teacher is the facilitator of a student-led, engaging experience involving activities related to robotics, coding, engineering, research, and innovative design.
- **Relevance**: Students acquire technology literacy by experiencing authentic activities with ties to careers that build technical and holistic skills through real-world problem-solving.
- **Relationships**: This program engages students to foster pathways to careers with the mission of building a better society and activating students to action in their communities.





Core Values

The *FIRST*® Core Values and ethos are the foundation of the program. For the *FIRST* Core Values to have effect, they must be known and practiced. The Core Values should be woven into all activities, projects, assessments and reflection tools to infuse them into the student learning. The Core Values are used within every step of the engineering design process as teams develop their solutions.

Gracious Professionalism® and *Coopertition*® are part of the ethos of *FIRST*. *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 displaying unqualified kindness and respect in the face of fierce competition.

The *Core Values* Poster is a great tool to place in your classroom as a reference for your students. You can find this poster in Thinkscape.

To read more about the LEGO® Education Philosophy, scan the QR code.

Running Your Tournament

Purpose: The school tournament is the culmination and celebration of the teams' work throughout the program.

Check out the Class Pack Tournament video to see how the event can be implemented in the classroom.

PREPARATION (60 minutes before event)

Teacher:

- Set up the space.
- Set up two competition fields for the robot games. Ideally, these will fit on official tables with walls, but it will also work on ordinary school tables or on the ground (with home areas taped off).
  - Two teams play at the same time, and there is one mission that crosses over both competition fields.
- Allocate each team an area with a table where they will sit and work during the tournament. They are encouraged to watch the robot games and interact with the other teams.

Teacher/Referee:

- Read the *Robot Game Rulebook* to check the field setup, missions, and rules. Photocopy enough score sheets for use.
- Print/photocopy the score sheet found at the back of the *Robot Game Rulebook*. You will need three copies per team.

Teacher/Judge:

- Decide where the teams will present their work and whether this will be to the whole class or just to the teacher and/or volunteer judge(s).
- Print/photocopy the Class Pack Rubric. You will need one copy per team.
- Look at the formative assessment the teacher has recorded to understand the progress each team has made since the beginning of the program.
- If you have volunteers to help you, the judges should be familiar with the Class Pack Rubric and Judge Questions. Referees should be familiar with the *Robot Game Rulebook* and Robot Game score sheets.

Scaling up from the Classroom

- If you have more than five teams, you can scale up the size of your tournament and use a bigger room.
- If you have additional competition fields, you can set them up as practice tables.
- The teams could do their presentations to judges in a separate room.
- You could provide access to electricity, such as a power strip, so teams can plug in their devices and charge their robots between rounds.
- If there is sufficient capacity, invite parents or other classes so teams can share the excitement with them.
- You could hold this event as a STEM night and invite the whole school and parents.

TASK 1: INTRODUCTION (10 minutes)

Teacher:

- Welcome the teams and share the schedule.
- Emphasize that the objective of the session is to allow teams to showcase their work. Remind them that the Core Values are an integral part of all they do.
- Show the *FIRST*® LEGO® League Teamwork Makes the Dream Work video. Encourage a FUN atmosphere.

TASK 2: PRESENTATIONS (60 minutes)

Teacher:

- Give 6-8 minutes for each team to present their Innovation Project and Robot Design and how they applied their Core Values to their work.
- Allow 3-4 minutes for each team to answer questions from the teacher/judge or other students.

Teacher/Judge:

- Fill out the rubric to record each team's achievement.
- This will add to the formative assessment the teacher has observed through the 12 sessions.

TASK 3: ROBOT GAME MATCHES (60 minutes)

Teacher:

- Two teams compete at the same time. The matches last 2.5 minutes, and the scoring and resetting takes another 3-5 minutes depending on how practiced the referee is.
- If possible, allow time for each team to have one practice round before their official matches begin.
- Hold as many rounds as time allows.
- Only the highest score the team achieves is counted in the final ranking for the Robot Game.

Teacher/Referee:

- Use the score sheet found in the back of the *Robot Game Rulebook* to record points for each match.
- Remember to record a *Gracious Professionalism*® score for each match on the score sheet. This will feed into the team's Core Values score.
- Keep track of the scores in a simple spreadsheet.
- Reset the game table as needed between 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. It is how we express our Core Values in *FIRST* LEGO League.

TASK 4: CLEANUP AND AWARD DELIBERATION (20 minutes)

Teacher:

- Organize teams to clean up the classroom and put away their materials.

Teacher/Judge/Referee:

- Decide which team wins the School Champion's award using observations from the tournament, performance levels on rubrics, and formative assessment to decide which team was the best all-around performers. They need to be strong in all four categories (Innovation Project, Core Values, Robot Design, and Robot Performance), but they might not be the team that wins the Robot Game.
- Each team can win an award. The teacher chooses from the list of optional awards.

TASK 5: CELEBRATION (10 minutes)

Teacher:

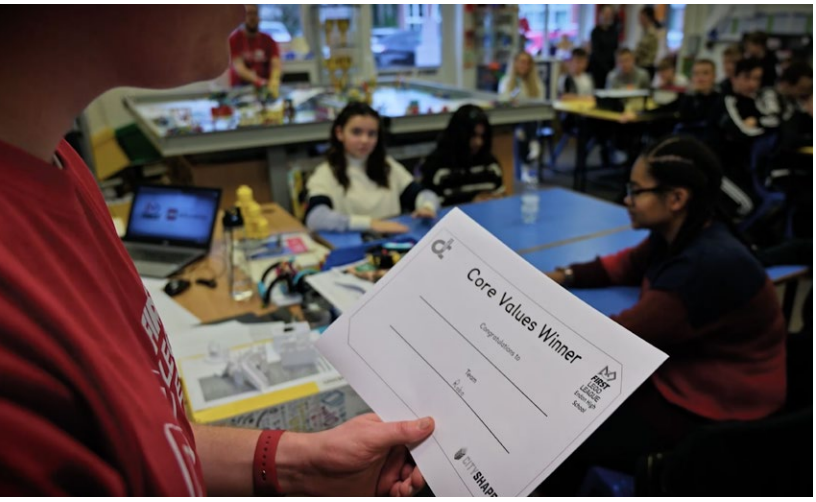
- Address the whole class and celebrate each team's achievements!
- Create a FUN atmosphere – you could repeat the *FIRST*® LEGO® League song.
- Give award(s) to the teams.

WHAT'S NEXT?

- You might already know if your School Champion team will be progressing to a qualifying event. They should continue to meet to prepare.
- Contact your program delivery partner for details on how to get team(s) registered for a qualifying event!
- Keep using your robot sets in your lessons. There are plenty of activities available from LEGO® Education.

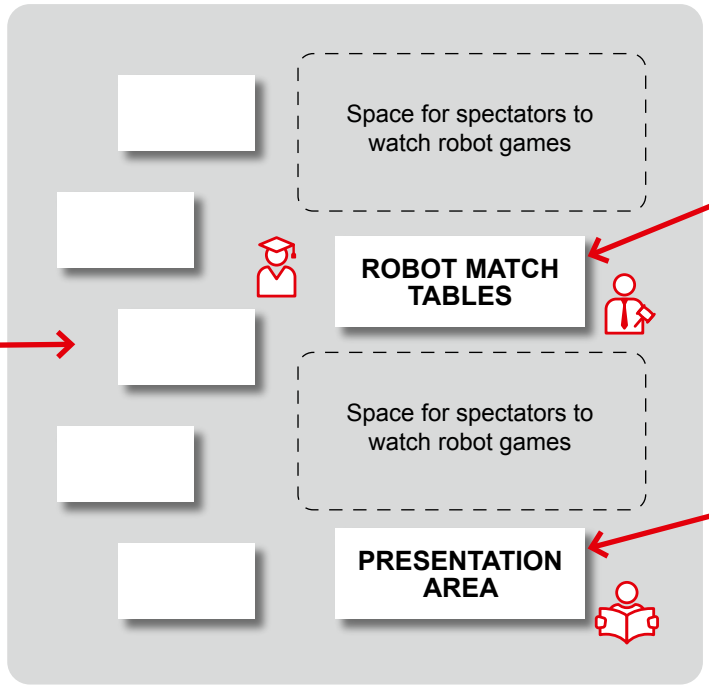
Celebration Tips

- You can print a certificate for each child. You can also give a small prize like a medal.
- Give every team an award or just give one to the overall School Champion. It depends on how many teams you have.
- A fun way to recognize teams is a high-five line involving all the teams.



Tournament Setup

Layout of Your Space



Team area with tables where teams sit and set up their materials.

Robot match area with two competition fields set up.

A space where teams present their work on the Innovation Project and Robot Design. This could be at the front of the classroom, to one side, or in a separate room.

Time

- When: During lessons in the school day, during an assembly, or after school.
- Timing: 2-3 hours depending on number of teams competing. This could be split over two different lessons.

Space

- The tournament space could be a classroom, school hall, or other large room.
- A private space for the teacher and volunteers to deliberate the awards could be helpful.

Staff

- 1 teacher can run this event.
- 2-3 volunteers would be useful if they are available. These could be teachers, school staff, older students, parents, or guardians.

- The teacher/referee needs to have a good understanding of the robot game missions, rules, and score sheet. These can all be found in the *Robot Game Rulebook*.

- The teacher/judge needs a simple understanding of the program and the Class Pack rubric.

Sample Tournament Schedule

Detailed Schedule

9:00-9:10	Introduction
9:10-9:15	Transition
9:15-10:15	Presentations
9:15-9:27	Team 1
9:27-9:39	Team 2
9:39-9:51	Team 3
9:51-10:03	Team 4
10:03-10:15	Team 5
10:15-10:30	Break
10:30-11:30	Robot Game Matches
10:30-10:37	Teams 1 and 2
10:37-10:44	Teams 3 and 4
10:44-10:51	Teams 5 and 1
10:51-10:58	Teams 2 and 3
10:58-11:05	Teams 4 and 5
11:05-11:12	Teams 1 and 2
11:12-11:19	Teams 3 and 4
11:19-11:26	Team 5
11:30-11:50	Cleanup and Deliberation
11:50-12:00	Celebration

All times are flexible and can be changed to suit your school schedule.

The **introduction** and **presentations** can be shortened to fit into the first lesson.

The tournament can be delivered across multiple class periods, after school, or on the weekend.

The **Robot Game matches** and the **celebration** can be shortened to fit into the second lesson.

Timings might differ from qualifying events, but teams will be given one judging session to present their work on the Innovation Project and Robot Design. Their Core Values and *Gracious Professionalism*® are evaluated throughout the presentation and during their robot game matches.

Schedule Tips

- The sample schedule is for five teams. You will need to adjust the schedule to fit the number of teams competing.
- Avoid scheduling teams back-to-back for robot game matches.

Allocating the Awards

The teams will showcase their work in the four separate areas of *FIRST*® LEGO® League Challenge. This is recorded as follows:

Robot Performance – the team's highest robot game score during a match

Robot Design – performance levels on the Robot Design criteria on the rubric

Innovation Project – performance levels on the Innovation Project criteria on the rubric

Core Values – performance levels on the Core Values criteria on the rubric, the *Gracious Professionalism*® scores recorded at the Robot Game, and teacher observations during the program

The School Champion's award goes to the team with the best all-around performance across all four areas, but they might not be the team that wins the Robot Performance. During deliberation, the teacher/referee/judge decides how to allocate the awards.

Teacher/judge uses the following methods for assessment:

- Observations at tournament
- Performance levels from rubrics
- Best robot game score
- Formative assessment

All the teams can win an award from the following list:

Main Awards

School Champion's Award – the top team overall across Innovation Project, Core Values, Robot Design, and Robot Performance

Innovation Project Award – team that made a special effort in their Innovation Project

Core Values Award – team that consistently displayed the best Core Values

Robot Design Award – team that made a special effort in their Robot Design

Robot Performance Award – team with highest score in the Robot Game

Optional Awards

Engineering Excellence Award – team with efficiently designed robot and project solutions

Breakthrough Award – team that made major progress in their confidence and capabilities in all aspects of program

Motivate Award – team that demonstrated team building, team spirit, and enthusiasm

Note: Teams should win only one award, unless the School Champion also win the Robot Performance award.

Types of Events

Concept	School Tournament	Qualifying Tournament
Rubric	Class Pack rubric	Event rubrics
Robot Game	Identical at both event types	
Judging	• Each of the four *FIRST*® LEGO® League Challenge areas have equal weighting. • Teams will present their Innovation Project and Robot Design solutions and how they applied Core Values throughout their experience as time allows. (Timings will vary.) • The teacher will use the Class Pack Rubric, which has categories for the Innovation Project, Robot Design, and Core Values. • The teacher/judge will ask questions based on the Class Pack Rubric. • The judging session is approximately 10-12 minutes.	• Each of the four *FIRST* LEGO League Challenge areas have equal weighting. • There is a single judging session (approximately 30 minutes). • Teams will present their Innovation Project and Robot Design solutions and how they applied the Core Values throughout their experience. • Judges will use the event rubrics (Innovation Project, Robot Design, Core Values) to evaluate teams for awards. • *Gracious Professionalism*® evaluated at the Robot Game will feed into the team's Core Values performance. • Judges will ask questions based on the event rubrics.
Awards	**Main Awards**: School Champion's, Innovation Project, Core Values, Robot Design, Robot Performance **Optional Awards**: Engineering Excellence, Breakthrough, Motivate	**Required Awards**: Champion's, Innovation Project, Core Values, Robot Design, Robot Performance, Coach/Mentor **Optional Awards**: Engineering Excellence, Breakthrough, Rising All-Star, Motivate
Qualification	It is possible for school team(s) and/or the school champion to progress to a qualifying event through the purchase of a team registration.	Champion's award winners will advance to the next level in tournament structure.

FIRST LEGO LEAGUE CHALLENGE

Class Pack Rubric

Team #	Team Name

Judges are required to tick one box on each separate line to indicate the level the team has achieved.

Innovation Project

		BEGINNING	DEVELOPING	ACCOMPLISHED	EXCEEDS
IDENTIFY	Team has a clearly defined problem that it is well researched.	☐	☐	☐	☐
DESIGN	Team generated innovative ideas independently before selecting and planning which one to develop.	☐	☐	☐	☐
CREATE	Team developed an original idea or builds on an existing idea with a prototype model/ drawing to represent their solution.	☐	☐	☐	☐
ITERATE	Team shared their ideas, collected feedback and included improvements in their solution.	☐	☐	☐	☐
COMMUNICATE	Team shared a creative and effective presentation of their current solution and its impact on their users.	☐	☐	☐	☐

Robot Design

IDENTIFY	Team had a clearly defined mission strategy and explored building and coding skills they needed.	☐	☐	☐	☐
DESIGN	Team produced innovative designs and a clear workplan, seeking guidance as needed.	☐	☐	☐	☐
CREATE	Team developed an effective robot and code solution matching their mission strategy.	☐	☐	☐	☐
ITERATE	Team repeatedly tested their robot and code to identify areas for improvement and incorporated the findings into their current solution.	☐	☐	☐	☐
COMMUNICATE	Team's explanation of the robot design process was effective and shows how all team members have been involved.	☐	☐	☐	☐

Core Values

DISCOVERY	Team explored new skills and ideas.	☐	☐	☐	☐
INNOVATION	Team used creativity and persistence to solve problems.	☐	☐	☐	☐
IMPACT	Team applied what they learned to improve their world.	☐	☐	☐	☐
INCLUSION	Team demonstrated respect and embraced their differences.	☐	☐	☐	☐
TEAMWORK	Team clearly showed they had worked as a team throughout their journey.	☐	☐	☐	☐
FUN	Teams clearly had fun and celebrated what they have achieved.	☐	☐	☐	☐

Feedback Comments

Great Job:

Think About:

Class Pack Judge Questions

Elicit information to complete your rubric with the following questions or prompts.

The color coding corresponds to your rubric and is as follows:

Blue boxes – Innovation Project	Green boxes – Robot Design	Red boxes – Core Values

Innovation Project

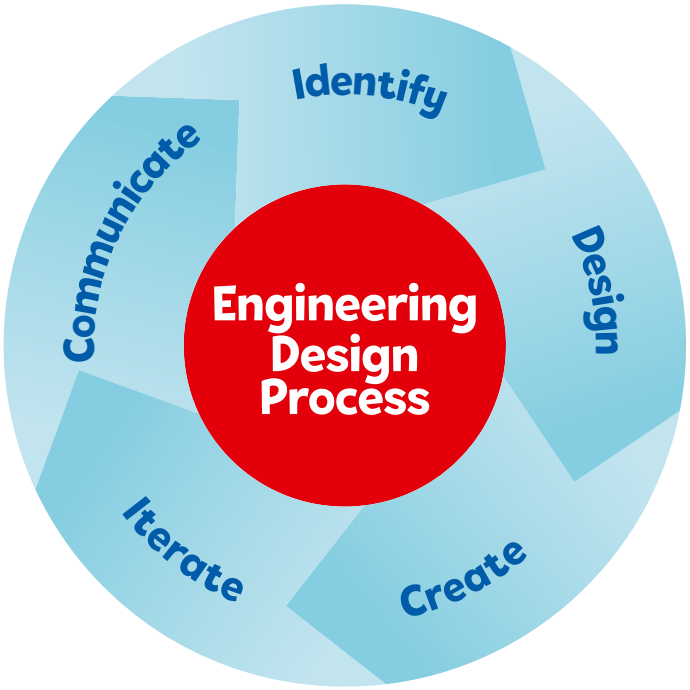
IDENTIFY	Describe the problem that you were trying to solve and the research you did.
DESIGN	Did you have a lot of ideas and what is most innovative thing about the idea you chose?
CREATE	Describe the steps your team took to develop your project solution.
ITERATE	How did your solution improve from the original idea?
COMMUNICATE	How will your solution help others and have an impact on your community?

Robot Design

IDENTIFY	Which missions did you choose and why?
DESIGN	How did you organize building the robot and writing the code?
CREATE	Tell us about how your robot and code work.
ITERATE	Describe one way your robot got better through the season.
COMMUNICATE	Explain the steps your team took to design, build and code your robot.

Core Values

Core Values	Describe the toughest problem you had and how your team solved it.
Many Core Values are also covered in previous questions	Of all the things your team accomplished, what are you most proud of?
	How did you ensure every team member was involved and understood the robot and coding?



FIRST LEGO LEAGUE