



FIRST
LEGO[®]
LEAGUE

EXPLORE

TEAM MEETING GUIDE



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The LEGO Foundation



education™

Introduction 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 WeDo 2.0 and SPIKE™ Essential.

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 STEM learning. FIRST LEGO League was created through an alliance between FIRST® and LEGO® Education.



FIRST
LEGO
LEAGUE
DISCOVER

FIRST
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EXPLORE

FIRST
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CHALLENGE

Welcome to CARGO CONNECT™

Welcome to the FIRST® FORWARD™ season. This year's FIRST LEGO League Explore Challenge is called CARGO CONNECT™. Children will learn about how cargo is transported, sorted, and delivered to its destinations. As more demands are placed on transportation systems, children need to rethink how cargo

is transported from place to place. We have the power to build a path forward and invent the future of transportation. And it starts here, with you.

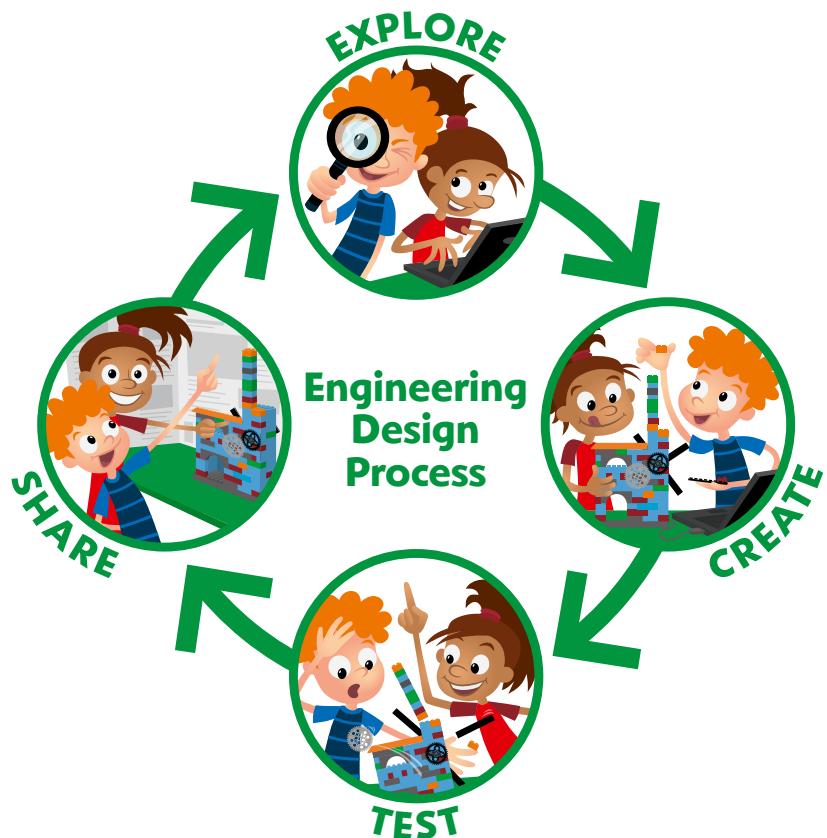
During each session, they will experience the engineering design process. There is no set order for this process, and they may go

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 six using pieces from the LEGO® Education WeDo 2.0 or SPIKE™ Essential set, and a CARGO CONNECT 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.

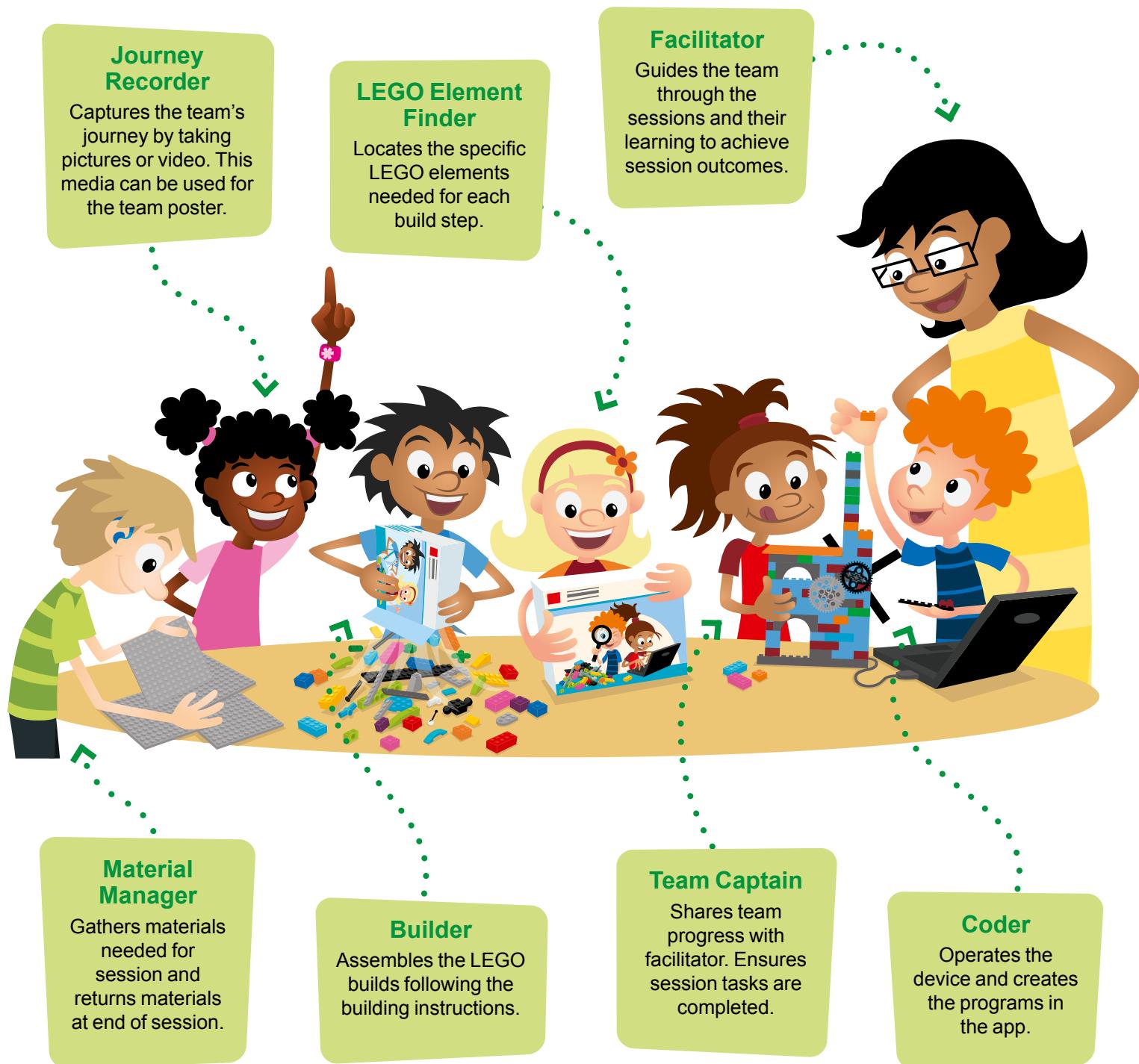


Team Roles

Here are sample team roles to use during the sessions. Everyone on the team 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 will be filled by multiple children during a

session. For example, the builder and coder roles can be duplicated where the experience is designed for a pair of children.



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.



We found we were stronger when we worked together.



We respected each other and embraced our differences.



We used creativity and persistence to solve problems.



We enjoyed and celebrated what we did!



We explored new skills and ideas.



We applied what we learned to improve our world.



What Does the Team Need?

LEGO® Education Set

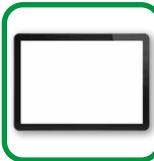


LEGO® Education WeDo 2.0 Set



LEGO® Education SPIKE™ Essential Set

Electronic Device



Your team will need a compatible Bluetooth-enabled device like a laptop, tablet, or computer. To view system requirements and download software, visit legoeducation.com/downloads.

Team Poster Supplies



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

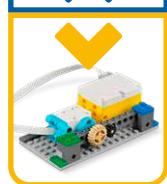
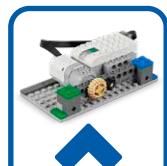


CARGO CONNECT™ Explore Set



Each team will get one CARGO CONNECT™ Explore Set. Leave the LEGO® elements in their plastic bags until the sessions in which they are needed. Two printed books contain the building instructions for the Explore model.

	Truck	Sorting Center	Motor and Hub Build	Prototyping Pieces
Bag	1	2	3	4
Book	1	2	2	-



Tips

- The prototyping pieces are used throughout the sessions to build solutions to the design challenges.
- There are baseplates provided. These can be used for each individual student to create his or her own build ideas or can be combined to create their team model.



General Management Tips

FACILITATOR TIPS

- Determine your timeline. How often will you meet and for how long? How many meetings will you have before your festival?
- Set team guidelines, procedures, and behaviors for your meetings.

MATERIAL MANAGEMENT

- Place any extra or found LEGO® pieces in a cup.
- Have the children who are missing pieces come to the cup to look for them.
- Wait to dismiss your team until you look over their LEGO set.

- The lid of the LEGO set can be used as a tray to keep pieces from rolling away.
- Use plastic bags or containers to store any unfinished builds and their associated pieces or assembled models.
- Designate a storage space for the built models, Explore set, and LEGO container.

- Get into the mindset that the team should be doing most of the work and learning. You are there to facilitate their journey and remove any major obstacles.
- Lead your team through the Introduction and Share activities provided in each session.
- Use the guiding questions in the sessions to provide

- focus and direction on what the team will do.
- Jobs are listed in some sessions that connect to the Career Connections pages in the back of the *Engineering Notebook*. Additional enrichment activities are also provided on these pages.



- The role of the Material Manager is to help in the process of clearing away and storing materials.



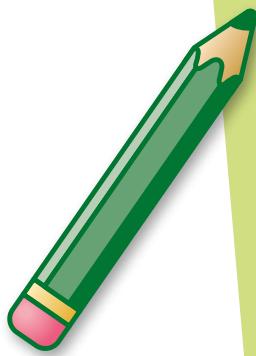
ENGINEERING NOTEBOOK TIPS

- Read the *Engineering Notebook* carefully. Each team member should have one.
 - It contains all the information the team needs, and it guides them through the sessions.

- The tips in this Team Meeting Guide will direct you how to support each session.
- As facilitator, help guide the team members in the performance of their roles during each session.
- The sessions contain individual and team tasks to help the team perform their roles independently.

Pre-Session Checkpoint

Please read the student *Engineering Notebook* and this *Team Meeting Guide* before starting the sessions. They are full of very useful information to guide you through the program.



Use this checkpoint to help you get started and guide you toward success.

- Make sure you have a Bluetooth-enabled device with the WeDo 2.0 or SPIKE™ Essential app installed.
- Unpack the WeDo 2.0 or SPIKE™ Essential set (if not already done) and sort the LEGO® elements into the tray.
- Make sure the hub is fully charged or has batteries in it.
- Familiarize yourself with the contents of the Explore set.

- Explore the *FIRST*® Core Values. These are the essential foundation for your team.
- Watch the *FIRST LEGO League Explore* Season video and other videos on the *FIRST LEGO League* You Tube channel.
- The team could complete the Introduction and some Getting Started activities in the app so that they gain experience in building and coding before starting the sessions.
- Discuss transportation-related vocabulary with the team. Words could include product, package, cargo, efficiency, access, safety, and connections.

Helpful Resources

LEGO® Education Support education.lego.com/en-us/support
Phone: (800) 422-5346

Main Website firstlegoleague.org

General Support Questions flexport@firstinspires.org

Equity, Diversity, & Inclusion Training firstinspires.org/about/diversityinclusion

LEGO Education Teacher Community community.lego.education.com

CARGO CONNECT™ Resources firstlegoleague.org/season

Educator Resources info.firstinspires.org/curriculum

Find additional digital resources here!

Hybrid Learning education.lego.com/en-us/managing-todays-classroom#covid-19-resources
firstinspires.org/covid-19

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.

	Introduction (10 minutes)	Task 1 (20 minutes)	Task 2 (20 minutes)	Wrap Up (10 minutes)
Session 1 Let's Explore	Let's Discover	Explore Theme	Create Truck Designs	Share and Clean-Up
Session 2 Let's Transport	Go Team	Do Coding Lesson 1	Create Forms of Transportation	Share and Clean-Up
Session 3 Let's Sort	Let's Have Fun	Do Coding Lesson 2	Build Sorting Center	Share and Clean-Up
Session 4 Let's Drive	Let's Innovate	Do Coding Lesson 3	Drive Robot to Sorting Center	Share and Clean-Up
Session 5 Let's Motorize	Be Inclusive	Identify Packages	Code Sorting Center	Share and Clean-Up
Session 6 Let's Be Safe	Have An Impact	Transport Across Water	Create Safety Features	Share and Clean-Up
Session 7 Let's Improve	Discovery Build	Build Destinations	Improve Efficiency or Access	Share and Clean-Up
Session 8-9 Build Team Model	Teamwork and Fun Builds	Design Team Model	Create and Code Team Model	Share and Clean-Up
Session 10-11 Make Team Poster	Innovation and Inclusion Builds	Design Poster	Create Poster	Share and Clean-Up
Session 12 Prepare for Event	Impact Build	Prepare for Event	Determine What to Share	Share and Clean-Up

Celebrate at a Festival!

Session 1

Outcomes

- The team will build the truck and create new truck designs.
- The team will use discovery to explore the CARGO CONNECTSM theme and how cargo is transported to different destinations.

Guiding Questions

- How can you load cargo and transport it to different areas?
- How do packages get delivered to your front door?

Session Tips

- 1 The team will need Book 1 and Bag 1 located in the Explore set.
- 2 Most of the tasks in each session should be done together by the team.
- 3 Writing and drawing space is provided in each session for each child to capture their thoughts and ideas.



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.
- Extension: Have everyone draw a picture of an example of **discovery** on the Core Values page in their *Engineering Notebook*.

Session 1

Your team needs: 1



2 Tasks (20 minutes)

- Talk about Ruby and Jacob's questions.
- Use the space below to capture your inventive ideas!
- Follow the building instructions in Book 1 to make the truck.
- Look at the mat and discover how the truck works!



What products
need to be
transported to
and from your
community?



How is cargo
packed and
loaded onto
vehicles?

3

Let's Explore

Share (10 minutes)

Have the team:

- Share what they did in the session.
- Explain how cargo is transported to and from their community.

- Describe their truck designs.
- Demonstrate how their solutions work on the mat.

Let's Explore

Your team needs:



DESIGNS

Draw your designs!

What have you discovered?
Share with your team!

6

Tasks (20 minutes)

- Circle the routes the truck can take on the mat image.
- Draw your design of a truck that transports cargo.
- Label what products are in the cargo the truck transports.
- Share your creation with your team!
- Work as a team to build your amazing truck designs using the LEGO® prototyping pieces (Bag 4).
- Place your built trucks on the mat and show how they work.



Guiding Questions

- What routes do cargo trucks use for transportation?
- Where do you see trucks doing deliveries in your town?

Session Tips

- 4 Give the team the LEGO® prototyping pieces (Bag 4) to create their designs. Do NOT open Bags 2 or 3.
- 5 Place the mat on top of a table or the floor for the team to interact with the mat.
- 6 Max the dog will give session reflection questions for the team.

Cleanup Pointers

- The truck should stay assembled, but everything else should be taken apart.
- Place the prototyping pieces back in the Explore box or in a container labeled "Prototyping Pieces."

Session 2

Outcomes

- The team will build and code the LEGO® robot and then change the program.
- The team will create two forms of transportation.

Guiding Questions

- Can you build a LEGO robot and code a solution?
- How do you change the program so the LEGO robot moves in a different way?

Session Tips

- 1 Walk the team through how to access their appropriate lesson in the app.
- 2 The team will use either the LEGO Education WeDo 2.0 set or the LEGO Education SPIKE Essential set and their associated apps.
- 3 You will find the estimated timing in the lesson for each page's tasks. This is to assist with children's selfregulation.
- 4 If the team is short on time, have them do only the coding lesson and build the robot.

Introduction (10 minutes)

Go Team

- Read the definition for **teamwork** to the team. (see page 5)
- Talk about what **teamwork** is. Have the team provide examples of this Core Value.
- Extension: Have everyone draw a picture of an example of **teamwork** on the Core Values page in their *Engineering Notebook*.

Session 2

Your team needs:



Classroom Projects:
Cooling Fan

FIRST® LEGO® League
Explore Unit:
Lesson 1

Show me your
innovative ideas!

Tasks (20 minutes)

1

- Open the WeDo 2.0 or SPIKE™ Essential app. Find your lesson.
- Can you make the robot go in a different direction? Capture your ideas!
- Explore how to change the existing program based on your ideas.
- Run your new program. See what happens.

3

Challenge

- Can you add a propeller, steering wheel, or boat rudder to the robot?
- Redesign the robot. Play your program.

4

IDEAS

Draw your ideas!

Let's Transport

Share (10 minutes)

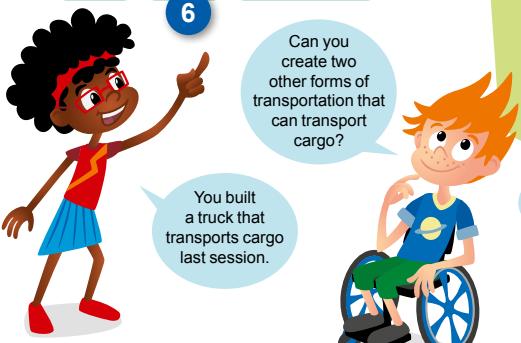
Have the team:

- Share what they did in the session.
- Show the coding skills they learned.
- Explain how they changed the program.



Let's Transport

Your team needs:



DESIGNS

Draw your designs!

Tasks (20 minutes)

- Explore the mat while thinking about Jacob's question.
- Draw a picture of your designs for two forms of transportation.
- Share your brilliant designs with your team!
- Create a design using the prototyping pieces to show your team's solution.
- Show how your creations work on the mat.

7

Reflect as a team on how an engineer creates innovative designs.



Guiding Questions

- Could you design two forms of transportation?
- Where does the cargo fit on your vehicle?

Session Tips

- 5 The team will need the assembled truck.
- 6 Give the team the LEGO prototyping pieces (Bag 4) to create their designs.
- 7 You will find that many of Max's reflection statements connect to jobs listed on the Career Connections pages in the *Engineering Notebook*. This provides real life examples of transportation jobs.

Cleanup Pointers

- The truck should stay assembled, but everything else should be taken apart.
- Check that the pieces from the LEGO® robot are returned to the LEGO set.

Session 3

Outcomes

- The team will build and code the LEGO® robot and then change the program.
- The team will build the sorting center and explore how cargo is sorted.

Guiding Questions

- Can you build a LEGO robot and code a solution?
- How do you change the program so the LEGO robot plays a light or sound?

Session Tips

- 1 The team will learn about and use light and sound blocks.
- 2 Challenges are provided for the team to go further with their robot.
- 3 The *Solution* space can be used to write down the coding steps planned or which coding blocks the team will change.



Introduction (10 minutes)

Let's Have Fun

- Read the definition for **fun** to the team. (see page 5)
- Talk about what **fun** is. Have the team provide examples of this Core Value.
- Extension: Have everyone draw a picture of an example of **fun** on the Core Values page in their *Engineering Notebook*.

Session 3

Your team needs:



Classroom Projects:
Spy Robot

FIRST® LEGO® League
Explore Unit:
Lesson 2

Use teamwork
to solve this
challenge!



Tasks (20 minutes)

- 1 **Tasks**
 - ☐ Open the WeDo 2.0 or SPIKE™ Essential app. Find your lesson.
 - ☐ Can you code the robot to play a different sound or flash a light? Explain your solution.
 - ☐ Change the existing program based on your ideas. Test it out!
- 2 **Challenge**
 - ☐ Can you make the robot flash a different color or move?
 - ☐ Change the robot and play your program.

SOLUTION

3

Draw your solution!

Let's Sort

Share (10 minutes)

Have the team:

- Share what they did in the session.
- Show the coding skills they learned.
- Explain how they changed the program.

- Describe how cargo is loaded and unloaded.
- Demonstrate how the sorting center works.

Let's Sort

Your team needs:



IDEAS

Draw your ideas!

Tasks (20 minutes)

- Follow the building instructions in Book 2 to make the sorting center.
- Place the sorting center on the mat.
- Think of ways to help Ruby and Jacob.
- Try out the sorting center!
- Turn the crank to the right to sort the green cargo to the green bin.
- Turn the crank to the left to sort the blue cargo to the blue bin.
- Brainstorm and share your ideas for how the sorted cargo is loaded for transport to its next destination.

5

Guiding Questions

- How can you make sure cargo is sorted correctly?
- Can you build ways to load and unload cargo?

Session Tips

- 4 The team will need Book 2 and Bag 2 located in the Explore set.
- 5 Connect to telling time by sharing that turning the crank right is clockwise and turning it left is counterclockwise.

Cleanup Pointers

- The sorting center and truck should stay assembled, but everything else should be taken apart.
- Check that the pieces from the LEGO® robot are returned to the LEGO set.

Session 4

Outcomes

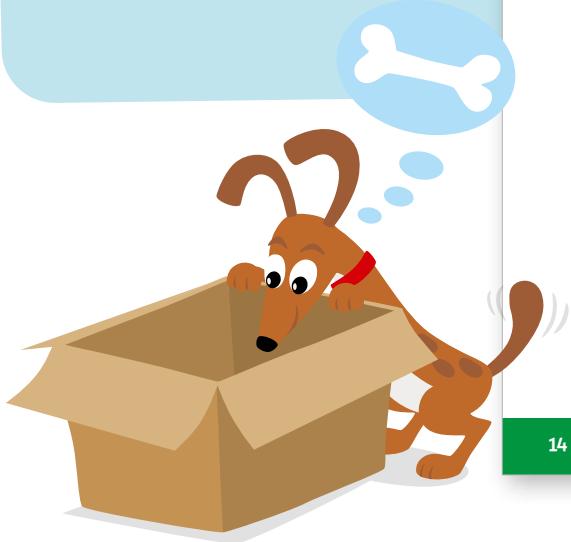
- The team will build and code the LEGO® robot and then change the program.
- The team will create a robot that can transport cargo.

Guiding Questions

- Can you build a LEGO robot and code a solution?
- How do you change the program so the LEGO robot moves differently?

Session Tips

- 1 The team will learn about and use motor blocks.
- 2 The Ideas space can be used to write down the coding steps planned or which coding blocks the team will change.



Introduction (10 minutes)

Let's Innovate

- Read the definition for **innovation** to the team. (see page 5)
- Talk about what **innovation** is. Have the team provide examples of this Core Value.

- Extension: Have everyone draw a picture of an example of **innovation** on the Core Values page in their *Engineering Notebook*.

Session 4

Your team needs:



Classroom Projects:
Milo the Science Rover

FIRST® LEGO® League
Explore Unit:
Lesson 3

Be sure to include
everyone's ideas on
your solutions!



Tasks (20 minutes)

1

- ❑ Launch the WeDo 2.0 or SPIKE™ Essential app. Complete your lesson.
- ❑ Can you program the robot to move backward? Do a turn? Capture your ideas.
- ❑ Change the existing program based on your ideas. Give it a test!

Challenge

- ❑ Can you add a cargo container to the robot?
- ❑ Follow your plan and play your program.

IDEAS

2

Draw your ideas!

Let's Drive

Share (10 minutes)

Have the team:

- Share what they did in the session.
- Show the coding skills they learned.
- Explain how they changed the program.
- Describe how cargo is transported.
- Demonstrate how their robot transports cargo on the mat.

Let's Drive

Your team needs:



How is cargo transported in and out of my town?

What routes are used to get cargo to the sorting center?



Tasks (20 minutes)

- 3 Chat about Ruby and Jacob's questions.
- 4 Brainstorm, brainstorm, brainstorm!
- Place the sorting center on the mat.
- Use the mat to map out your planned path.
- Create your program and run it.
- Place the cargo delivered from the robot into the sorting center.

How does a freight driver know what routes to use when transporting cargo? Talk as a team!

Guiding Questions

- Can you identify routes used for transportation?
- How can you code the robot to transport cargo?

Session Tips

- 3 The team will create their first mobile robot that drives on the mat.
- 4 Make sure the team watches where the robot drives so that it does not fall if placed on a table.

Cleanup Pointers

- The sorting center should stay assembled, but everything else should be taken apart.
- Check that the pieces from the LEGO® robot are returned to the LEGO set.

Session 5

Outcomes

- The team will determine what products are transported in the cargo containers.
- The team will build and code the motor and hub build and then change the program to sort blue cargo.

Guiding Questions

- What products are inside each package?
- How do packages get transported in and out of your community?

Session Tips

- Ask the team what the difference is between products, packages, and cargo. Packages can contain one product (like bananas) or different products. Cargo is made up of many packages.
- Have the team research products that are created or transported throughout their community.

Introduction (10 minutes)

Be Inclusive

- Read the definition for **inclusion** to the team. (see page 5)
- Talk about what **inclusion** is. Have the team provide examples of this Core Value.
- Extension: Have everyone draw a picture of an example of **inclusion** on the Core Values page in their *Engineering Notebook*.

Session 5

Your team needs:



Tasks (20 minutes)

- 1 Read over Ruby and Jacob's questions.
Get thinking!
Write down your ideas in the table.
Explore different areas on the mat where cargo packages are transported.
Choose and list the different starting points and destinations in the table.

Cargo Packages



2

What cargo is transported in and out of your community?
What could be inside each cargo package?

CARGO PACKAGES

Product Inside Cargo Packages				
Starting Point				
Destination				

Let's Motorize

Share (10 minutes)

Have the team:

- Share what they did in the session.
- Explain what products are in the cargo containers.



- Show how they motorized the sorting center.
- Demonstrate how they changed the code to sort the blue cargo.

Let's Motorize

Your team needs:



Talk as a team about how a warehouse worker ensures cargo is sorted correctly.

IDEAS

Draw your ideas!

Tasks (20 minutes)

- Follow the building instructions in Book 2 to make the motor and hub build.
- Connect the motor and hub build to the sorting center.
- Open the WeDo 2.0 or SPIKE™ Essential app.
- Re-create the program provided in Book 2. Try it out!
- How is blue cargo sorted into the blue bin on the sorting center? Brainstorm your ideas.
- Say what you would change in the program in the space below.
- Play your program to sort the blue cargo.



Guiding Questions

- Can you motorize the sorting center?
- How do you change the program so that the blue cargo is sorted?

Session Tips

- The team will need Book 2 and Bag 3 located in the Explore set.
- The team will determine how to change motor direction.
- It would be beneficial to cover how different motor directions turn the sorting mechanism to the right or left.

Cleanup Pointers

- The motorized sorting center should stay assembled, but everything else should be taken apart.
- Check that any unused pieces from the LEGO® set are returned to it.

Session 6

Outcomes

- The team will design ways to safely transport cargo over water.
- The team will add a safety feature to the sorting center.

Guiding Questions

- Could you build ways to transport cargo across water?
- How do you create safer ways to transport cargo?

Session Tips

- 1 Give the team the LEGO® prototyping pieces (Bag 4) to create their designs.
- 2 Provide specific examples of safety features found in your community. This could include cargo unloading zones and railroad crossing guards.

Introduction (10 minutes)

Have an Impact

- Read the definition for **impact** to the team. (see page 5)
- Talk about what **impact** is. Have the team provide examples of this Core Value.
- Extension: Have everyone draw a picture of an example of **impact** on the Core Values page in their *Engineering Notebook*.

Session 6

Your team needs:



1

What safety features are there on the sorting center and the mat?

How is cargo from your community transported safely across the water?



Tasks (20 minutes)

- Start with Ruby and Jacob's questions while looking at the mat.
- Design how you would transport cargo by air and water.
- Show your team your innovative creation!
- Create your team's designs using the prototyping pieces.
- Place your solutions on the mat.
- Show how they will transport cargo safely from the sorting center to the island and icy area.

CREATION

Draw your creation!

Let's Be Safe

Share (10 minutes)

Have the team:

- Share what they did in the session.
- Show how they safely transported cargo across water.

- Point out safety features present on the mat and sorting center.
- Explain how they coded a safety light.



Let's Be Safe

Your team needs:



How would a safety specialist do a safety check on the sorting center? Explore ways as a team!

4



IDEAS

Draw your ideas!

Tasks (20 minutes)

- 3 Start the WeDo 2.0 or SPIKE™ Essential app.
- Can you code the sorting center to have a safety flashing light when sorting? Think of how to create a program.
- Try out your program!

Challenge

- Can you add a different sensor that makes the sorting center safer?
- Change the sorting center. Play your new program.

Guiding Questions

- How do you change the program to flash a blinking light?
- Can you add a sensor to the sorting center and code it?

Session Tips

- 3 The team will apply the coding concept of light blocks learned in Session 3.
- 4 The team can look at the Career Connection page for ideas or research what this job does.

Cleanup Pointers

- The motorized sorting center should stay assembled, but everything else should be taken apart.
- Check that any pieces used from the LEGO® set are returned to it.

Session 7

Outcomes

- The team will design ways to improve access and efficiency.
- The team will improve the efficiency of the sorting process.

Guiding Questions

- How can you sort the cargo more efficiently?
- How can you create better access to the different destinations?

Session Tips

- 1 Give the team the LEGO® prototyping pieces (Bag 4) to create their designs.
- 2 Ask the team to identify places that would be hard to access in their community.



Introduction (10 minutes)

Discovery Build

- Have the team provide examples of how they have used **discovery** throughout the sessions.
- Have the team create a build from the prototyping pieces representing this Core Value or examples of the team using **discovery**.

Session 7

Your team needs:



1

Can you build ways to improve transportation access or efficiency?



2

Can you build the destinations where cargo is being delivered?

Tasks (20 minutes)

- ❑ Imagine how to answer Ruby and Jacob's questions while looking at the mat. Dream big!
- ❑ Using the prototyping pieces, build ways to improve access to the destinations (house icons on mat).
- ❑ Show how you have improved access to each place for cargo deliveries.

Challenge

- ❑ Create a new form of transportation that can access many different areas.



Let's Improve

Share (10 minutes)

Have the team:

- Share what they did in the session.
- Show the destinations they created for cargo deliveries.

- Demonstrate how they improved access to destinations.
- Explain how they improved sorting efficiency.

Let's Improve

Your team needs:



3

Why would a machine operator make adjustments to the sorting center? Discuss as a team!

Tasks (20 minutes)

- Launch the WeDo 2.0 or SPIKE™ Essential app.
- Can you use a sensor to improve the efficiency of the sorting process? Dream up your solution.
- Alter the sorting center to include a sensor.
- Create a new program and try it out on the sorting center.

Challenge

- Can you add a different sensor to improve the sorting process?

4



SOLUTION

Draw your solution!

Guiding Questions

- How can you use a sensor to make the sorting center more efficient?
- Can you improve how the sorting center works with a sensor?

Session Tips

- 3 A machine operator will adjust settings on the control panel to ensure the machine is working efficiently.
- 4 Examples of efficiency include sorting cargo faster, sorting cargo by color, or stopping the sorting process when there is no cargo loaded.

Cleanup Pointers

- The motorized sorting center should stay assembled, but everything else should be taken apart.
- Check that any pieces used from the LEGO® set are returned to it.

Sessions 8 & 9

Outcomes

- The team will draw their team model design and label its required parts.
- The team will create their team model that shows the journey of cargo to their destinations.

Introduction (10 minutes)

Teamwork and Fun Builds

- Have the team provide examples of how they have used **teamwork** (Session 8) and **fun** (Session 9) throughout the sessions.
- Have the team create a build from the prototyping pieces representing this Core Value or examples of the team using **teamwork** and **fun**.

Guiding Questions

- What do you think is the most important part of your team model?
- How will your team model show the transportation journey of cargo?

Session Tips

- 1 The team will need their assembled Explore model and mat.
- 2 Each team member could build a part of the team model using a baseplate.
- 3 The team model can use extra LEGO® bricks, minifigures, baseplates, and other LEGO elements. You may NOT use glue, paint, or art supplies.

Tasks (80 minutes)

- Think about ways to answer the questions.
- Brainstorm ideas for each question.
- Explore the list of required parts on the next page.
- Draw your team model design and label the required parts.
- Make a plan! Create your team model together.

2

Use these two pages to draw your team model design:

3

Sessions 8 & 9

Your team needs:



Can you explain how you improved the transportation of the products?



Can you show the entire journey of products from your community getting to their destinations?



Build Team Model

Share (10 minutes)



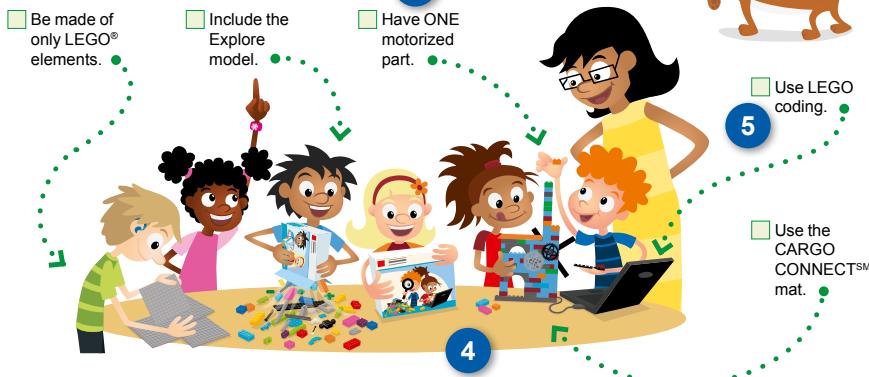
Have the team:

- Share what they did in the session.
- Explain the program and how it motorizes the sorting center.

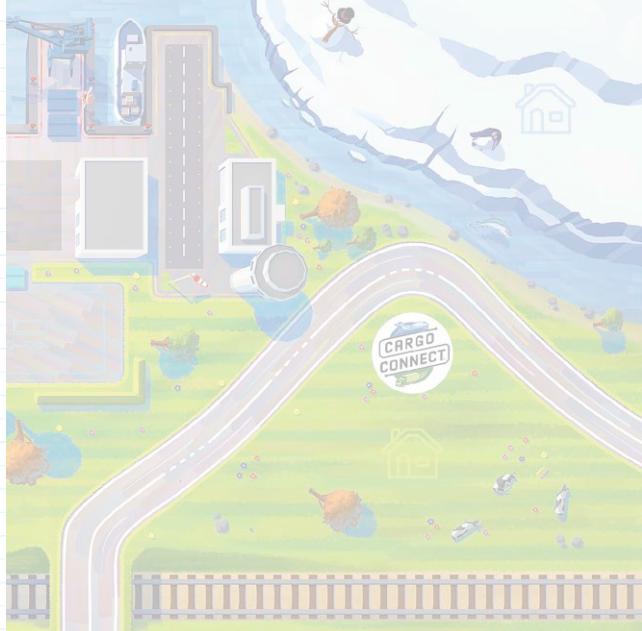
- Review the list of required parts and identify them on the team model.
- Demonstrate how the team model works.

Build Team Model

Requirements



Label the required parts of your team model.



Guiding Questions

- What are the strengths and the weaknesses of your design?
- How can you motorize part of your team model?

Session Tips

- The team model should be able to fit on a table and be easily transportable.
- The team will apply coding concepts throughout the sessions to create their programs.
- The team could reuse the code from Session 5, or they could motorize and code a brand-new part in their model.

Cleanup Pointers

- The team model will remain assembled from this point forward until the event.
- Check that any unused pieces from the LEGO® set are returned to it.

Sessions 10 & 11

Outcomes

- The team will create a plan for what they will include on their team poster.
- The team will design and create their team poster.

Guiding Questions

- What different challenges did you explore?
- What did you create and build?

Session Tips

- 1 You will need to provide a large poster board and various art supplies. A trifold poster board works well.
- 2 The goal is for the team to create the board themselves. You can support them and provide insight.
- 3 The team can look back at the Team Journey and Core Values pages in their *Engineering Notebooks*.



Introduction (10 minutes)

Innovation and Inclusion Builds

- Have the team provide examples of how they have used **innovation** (Session 10) and **inclusion** (Session 11) throughout the sessions.
- Have the team create a build from the prototyping pieces representing this Core Value or examples of the team using **innovation** and **inclusion**.

Sessions 10 & 11

Your team needs:



1
Describe your team journey throughout the sessions.

Make a team poster sharing what you learned about CARGO CONNECTSM!



Team Poster



Make Team Poster

Share (10 minutes)

Have the team:

- Share what they did at the end of each session.
- Show their team poster design.

- Explain their team journey.
- Demonstrate how they will present their team poster.

Make Team Poster

Here's your chance to capture ideas for your team poster.

Sample Topics: Explore, Create, Test, Share, Core Values, Team Journey.

4

5 6

Be creative!
Think about how you
will communicate
your team journey.

An empty rectangular box with a light blue grid pattern, designed to look like lined paper for writing ideas.An empty rectangular box with a light blue grid pattern, designed to look like lined paper for writing ideas.An empty rectangular box with a light blue grid pattern, designed to look like lined paper for writing ideas.An empty rectangular box with a light blue grid pattern, designed to look like lined paper for writing ideas.An empty rectangular box with a light blue grid pattern, designed to look like lined paper for writing ideas.An empty rectangular box with a light blue grid pattern, designed to look like lined paper for writing ideas.

Guiding Questions

- How can you show your team journey on the poster?
- What will you include on your team poster?

Session Tips

- 4 Sample topics for the poster are provided for the students. They can choose to include whatever they want!
- 5 Provide extra scrap paper for the team to draw and write their ideas for their team poster.
- 6 Two boxes would fit on each fold on a trifold poster board.

Cleanup Pointers

- Make sure you have a safe place to store the poster, especially if it needs to lay open to dry.
- You may need extra time at the end of each session to clean up the art supplies.

Session 12

Outcomes

- The team will reflect on their CARGO CONNECTSM experience.
- The team will create a plan for what to share at their final event.

Guiding Questions

- Can you explain the code you created for your motorized part?
- How does your team model relate to the CARGO CONNECT theme?

Session Tips

- 1 Go over the reviewing sheet and reviewing questions (found here: firstlegoleague.org/season) 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.

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**.

Session 12

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.

2

You will be taking part in a FIRST® LEGO® League Explore Festival. Invite your family and friends to your special event!

Share what you have learned and how your team had fun!



3 Typical Event Setup



Prepare for Event

Share (10 minutes)

Have the team:

- Practice their team poster presentation.
- Practice their team model presentation.



Prepare for Event

Consider what you will share at the event.

5

- Can you describe your team model?
- How did you use your mat to create your model?

4

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

Let's celebrate!



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

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



Guiding Questions

- How will you present your poster and model at the event?
- How do we show Core Values?

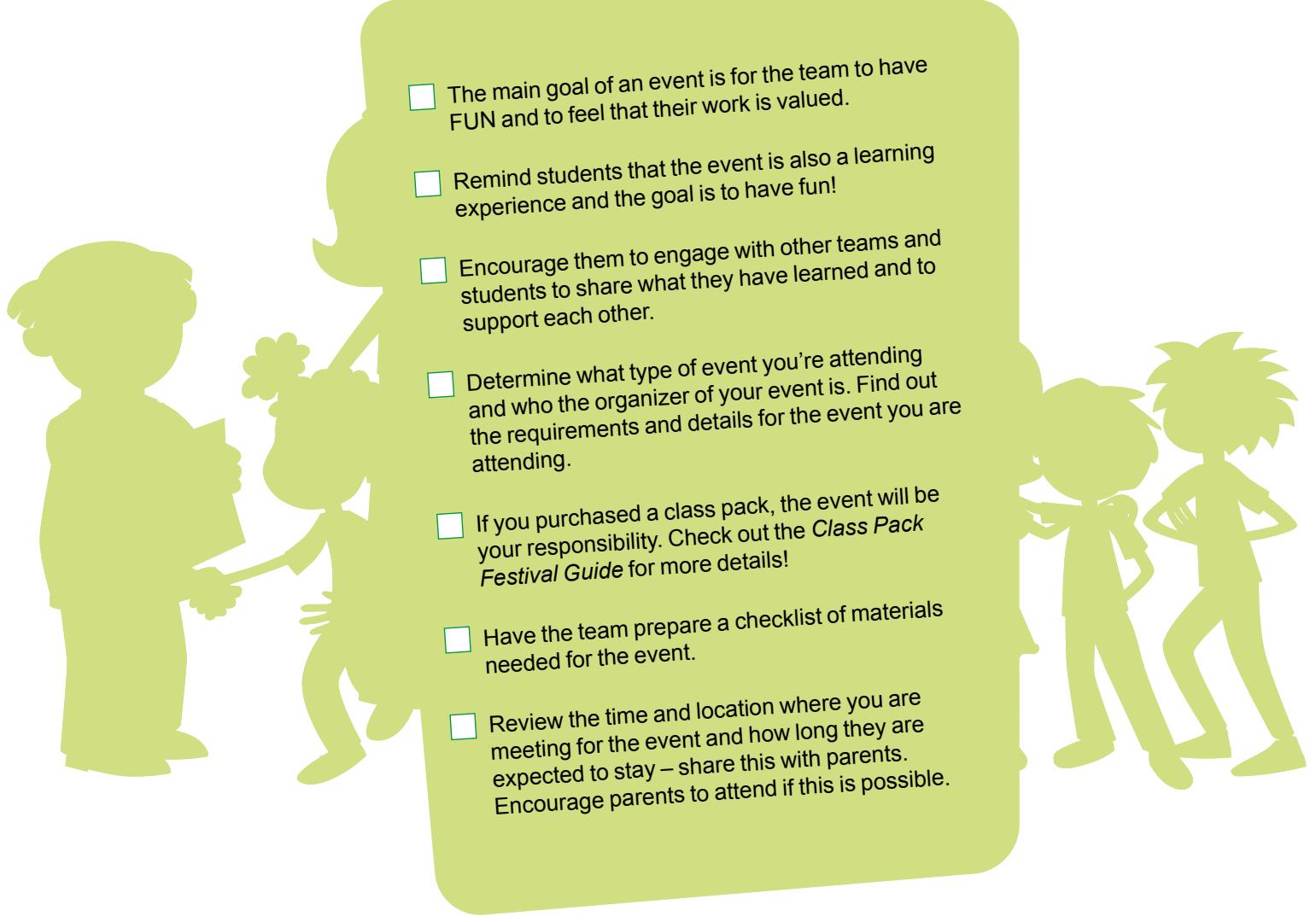
Session Tips

- 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 Provide extra scrap paper for the team to write out what they plan to share at their event.

Cleanup Pointers

- 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.

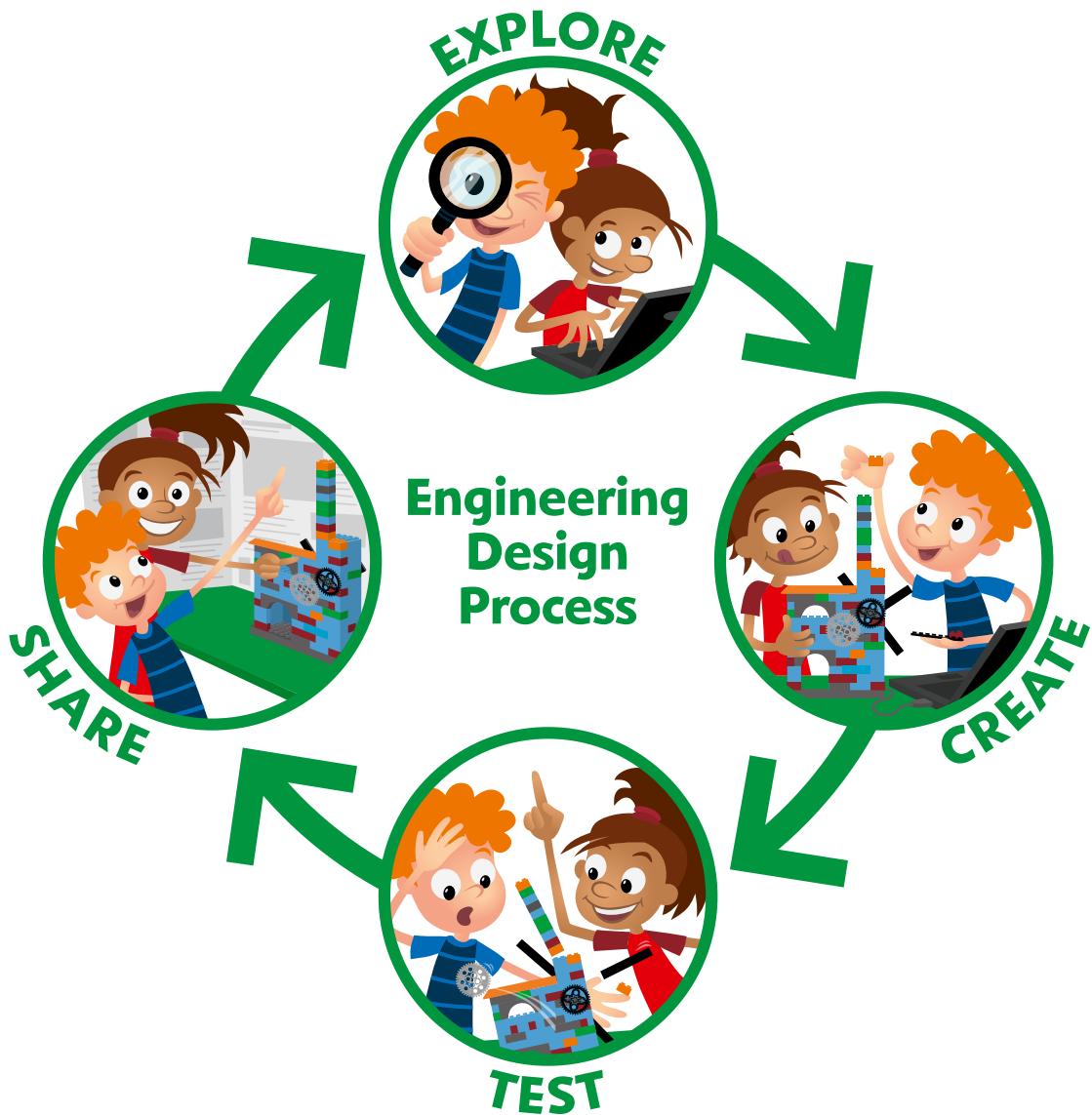
Prepare for Festival!

- 
- The main goal of an event is for the team to have FUN and to feel that their work is valued.
 - Remind students that the event is also a learning experience and the goal is to have fun!
 - Encourage them to engage with other teams and students to share what they have learned and to support each other.
 - Determine what type of event you're attending and who the organizer of your event is. Find out the requirements and details for the event you are attending.
 - If you purchased a class pack, the event will be your responsibility. Check out the *Class Pack Festival Guide* for more details!
 - Have the team prepare a checklist of materials needed for the event.
 - Review the time and location where you are meeting for the event and how long they are expected to stay – share this with parents. Encourage parents to attend if this is possible.

Events Complete and All Done?

Here are some tips for wrapping up after the last event your team will participate in:

- Clean up and take apart the team model. Make sure the WeDo 2.0/SPIKE™ Essentials elements go back to their set.
- Inventory the WeDo2.0/SPIKE™ Essentials set to make sure all the pieces are there.
- Decide what to do with Explore set elements.
- Allow time for the team to reflect on their experience.
- Hold a team celebration!



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