FIRST LEGO LEAGUE JR.

TEAM MEETING GUIDE

DEMO VERSION

FIRST

LEGO education

Table of Contents and Session Summaries

BOOMTOWN BUILD℠

Welcome to Boomtown! Come join our team!

Use your imagination and LEGO® Education WeDo 2.0 to design and program your Boomtown Build.

Keep track of what you learn in your *Engineering Notebook*, and tell about it in a *Show Me* poster.

FIRST® Core Values and the Engineering Design Process

FIRST® Core Values

Throughout your season, use the *FIRST*® Core Values as a guide for your team:

FIRST® Core Values

- **Discovery:** *We explore new skills and ideas.*
- **Innovation:** *We use creativity and persistence to solve problems.*
- **Impact:** *We apply what we learn to improve our world.*
- **Inclusion:** *We respect each other and embrace our differences.*
- **Teamwork:** *We are stronger when we work together.*
- **Fun:** *We enjoy and celebrate what we do!*

One or more of these Core Values are featured in each session of the *Team Meeting Guide*. During or after any session, ask your team members any of the questions below to help them think about how they are using the Core Values.

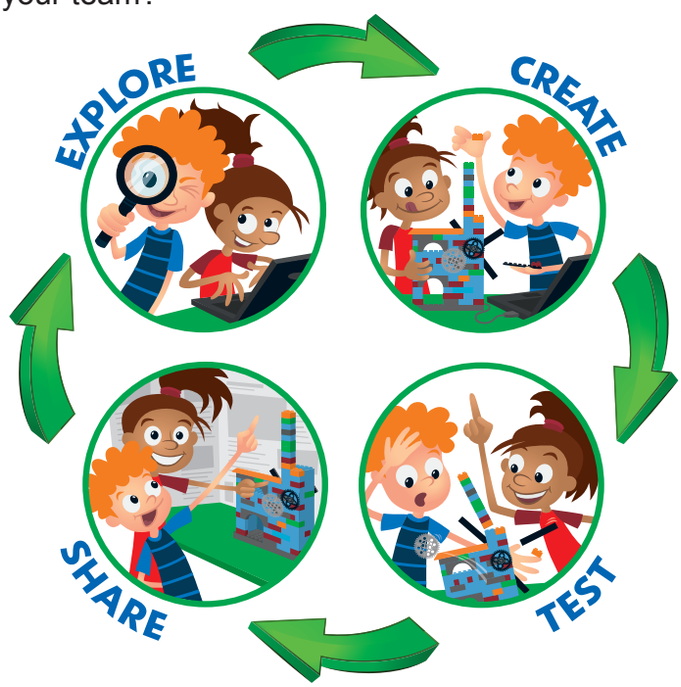
- What new skills and ideas have you learned?
- What problems have you solved? How did you solve them?
- How could you use what you have learned to make the world a better place?
- How do you show respect for everyone on your team?
- How do you work together as a team?
- What do you enjoy most about being on your team?

Engineering Design Process

Your team will use the engineering design process during each session as they work on the BOOMTOWN BUILD℠ Challenge. The four parts of the process are:

- *Explore* a problem.
- *Create* one or more solutions.
- *Test* the solutions.
- *Share* what you learn.

Emphasize to the children that there is no set order for this process. They might go through some or all of the parts multiple times in a single session.



How to Use the *Team Meeting Guide*

There are 12 sessions outlined in the *BOOMTOWN BUILD*[SM] *Team Meeting Guide*. In general, plan for one team meeting lasting about an hour to complete each session. Note that at least two hours are suggested to create and program the Boomtown Build (Sessions 8–9) and to create the *Show Me* poster (Sessions 10–11). Each session is organized as follows:

A.) The **Objectives** outline what the team should accomplish during the session.

B.) The **Materials** list outlines the resources needed for the session. For more information on the materials you will need for your team, see pp. 8–9.

C.) The **Set-Up** section details anything special that you will need to do or prepare prior to the start of the session.

D.) The **Warm Up** is a brief activity to help the children focus and build teamwork skills at the start of the session.

E.) Each session has an **Explore** section that can be read aloud by you and/or the children to build reading comprehension skills and introduce the context of the session.

F.) The **Create** portion of the session includes a step-by-step list of what the team should do during the session. In most sessions, the children will work in small groups on separate tasks. The two groups are **May's Group** and **Marco's Group**. See p. 10 for more information.

G.) Allow at least 10 minutes for the **Share** section, during which the children should share their sketches, ideas, and LEGO® models with one another.

H.) Be sure to allocate at least 5 minutes at the end of each session for the **Cleanup and Look Ahead** section. Children should disassemble and put away the LEGO elements for any models that they will not need anymore. Share the information about the next session to get the children excited about what is coming up.

I.) The **Applause** icon  appears any time that the children should give one another positive encouragement or applause, such as after they share an idea with the group. This helps to reinforce the *FIRST*® Core Values.

J.) The **Tips** offer additional information to help you lead each session as successfully as possible. They include discussion questions, directions for how to access the suggested WeDo 2.0 models within the software/app, **Take It Further** ideas, and more.

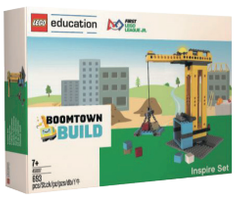
What Materials Do I Need for My Team?

The materials for the 12 sessions outlined in the *BOOMTOWN BUILD℠ Team Meeting Guide* are listed at the start of each session. Below are notes about some of the specialized materials.

BOOMTOWN BUILD℠ Engineering Notebooks

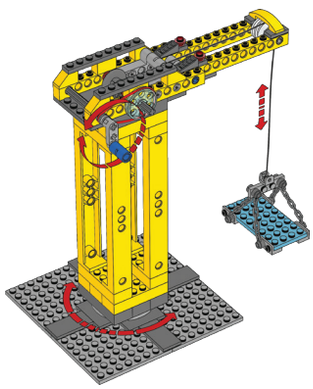
The sessions in the *Engineering Notebook* correspond directly to the sessions in the *Team Meeting Guide*. Provide one *Engineering Notebook* per team member.

BOOMTOWN BUILD Inspire Set and Inspire Model

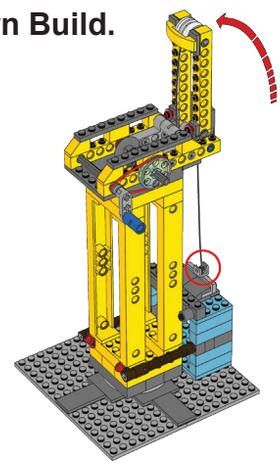


The BOOMTOWN BUILD Inspire Set consists of about 700 LEGO® elements. Note that the bags labeled "1," "2," "3," and "4," contain the elements that the children will need to build the BOOMTOWN BUILD Inspire Model (a LEGO crane/elevator) as part of Sessions 2 and 4, so be sure to set aside these bags until then.

Book 1, Book 2, and Book 3 of the building instructions for the Inspire Model can be found in the Inspire Set box. If you would like to print additional copies or access the online version of the building instructions, a link is available on the "BOOMTOWN BUILD Challenge and Resources" page of the *FIRST*® LEGO® League Jr. Resource Library; see p. 10 for details on how to access this page. **All teams must include one version of the Inspire Model — either the crane or the elevator — as part of their Boomtown Build.**



Crane version of Inspire Model



Elevator version of Inspire Model

LEGO® Education WeDo 2.0

All teams must program and motorize at least one part of their Boomtown Build using LEGO® Education WeDo 2.0. To facilitate this, you must provide your team with a LEGO Education WeDo 2.0 Core Set 45300 and a compatible hardware device (for example, a tablet, laptop, or desktop computer). Prior to the first team meeting, you must download the WeDo 2.0 software or app onto the hardware device. To view system requirements and download the WeDo 2.0 software or app, visit education.lego.com/downloads.

Getting Started with WeDo 2.0

If this is your first time using WeDo 2.0, follow the steps below to prepare everything for your team and to gain important hands-on experience with the software and hardware.

Step 1: Unpack and Get Organized

1. Unpack your WeDo 2.0 set.
2. Stick the labels onto the walls of the sorting tray, and sort all the LEGO elements in the appropriate sections. The lid card shows the recommended placements for the labels and elements.
3. If you will be using more than one WeDo 2.0 set, LEGO Education recommends that you color code or number each set and its corresponding Smarthub to help with group management.
4. Insert batteries into the WeDo 2.0 Smarthub. If you have bought the WeDo 2.0 Add-on Power Pack, remove the battery house from the Smarthub and replace it with the Add-on Power Pack.

Step 2: Download and/or Update the WeDo 2.0 Software

1. Visit education.lego.com/downloads to download and/or update the WeDo 2.0 software or app on your compatible hardware device.

Step 3: Complete a WeDo 2.0 Project

1. Open the WeDo 2.0 software or app, and play the WeDo 2.0 Introduction.
2. Build and program one of the “Getting Started” projects. Completing a WeDo 2.0 project will help you get comfortable with the software and hardware.
3. If time allows, complete one or more of the other “Getting Started” projects, or use the “Light Bulb” icon to access and explore the “Model Library” and “Program Library.”

For additional WeDo 2.0 support, including “Getting Started” guides, FAQs, troubleshooting tips, and more, visit LEGOeducation.com/wedo2quickstart.

What if I am working with more than one team?

That’s great! Note that each team will need its own WeDo 2.0 Core Set and compatible hardware device, Inspire Set, set of *Engineering Notebooks,* and *Show Me* poster materials.

After you have gathered or purchased all the materials that your teams will need, use plastic storage tubs or other containers to create a kit for each team to use during team meetings. Color code or number the kits to help match each kit to a specific team for use throughout the season. Consider storing the *Team Meeting Guides, Engineering Notebooks,* and WeDo 2.0 sets inside the kit for each team. This will ensure that the materials do not get lost between meetings. Be sure to check the battery levels of your hardware devices after every team meeting, and charge them as necessary between sessions.

SESSION 3: Be an Engineer

OBJECTIVES

Team members will:

- Describe how architects and engineers work together to design buildings
- Use LEGO® elements to design a solution to a problem
- Practice the *FIRST*® Core Values, with a focus on **Innovation**

MATERIALS

- *BOOMTOWN BUILD*℠ *Engineering Notebooks*
- LEGO crane (1)
- BOOMTOWN BUILD Inspire Set
- BOOMTOWN BUILD Inspire Model building instructions (Book 3)
- LEGO® Education WeDo 2.0 Core Set, software or app, and compatible hardware device

WARM UP (5 minutes)

- Ask the children to describe an imaginative building where they could have fun (for example, a treehouse playground, an underwater amusement park, or a castle made entirely of food).
- Have the group describe one or more problems that they might need to solve in order to design and construct their imagined building. Then have them brainstorm ways of solving the problems. (2)

EXPLORE (5 minutes)

Architects design buildings. Builders build them. Many other people help along the way.

Engineers design solutions to problems. They work with architects in order to solve problems related to designing buildings. *How strong does a building need to be? What should it be made of? How tall should it be?* (3)

You are an engineer, too! May and Marco need your help to solve a problem. They are at a new building that is being built in Boomtown. It has two floors. May has supplies in crates on the ground. Marco is on the second floor. He needs the supplies. (4) How can you use the LEGO crane to bring the crates to Marco? Work as a team to solve the problem!

TIPS

(1) The LEGO crane is the version of the BOOMTOWN BUILD Inspire Model that the children build in Session 2. See pp. 14–15 for more information.

(2) Encourage the children to suggest imaginative solutions!

(3) **Take It Further**

Ask the children to share stories that include architectural challenges, for example: *Iggy Peck, Architect; The Three Little Pigs* or *The Three Goslings;* and *Aladdin*.

By Andrea Beaty Illustrations © David Roberts

You can find links to a Reader's Theater edition of *Iggy Peck* and additional resources in the Multimedia Connections for this session. See pp. 10–11 for details on how to access them via the "BOOMTOWN BUILD Challenge and Resources" page of the *FIRST*® LEGO® League Jr. Resource Library.

(4) Ask the children to brainstorm what might be in the crates.

CREATE (35 minutes)

- Have the children return to the groups they were in last session — **May's Group** and **Marco's Group**.
- The groups will work together to program a LEGO crane to bring four crates from the ground to the second floor of a two-floor LEGO building.

Marco's Group

- This group will design and create a LEGO model of a two-floor building to represent the building in the **Explore** section.
- Give the group an assortment of LEGO elements from the Inspire Set to build their model. They should use a baseplate for each level of the building. 5
- Encourage the children to work together with **May's Group** as they design the building. For example, they should examine the crane to help them decide how tall to make their building; the second floor should not be so high that the crane cannot reach it. 6
- Have them record their ideas in the **Share** section of the *Engineering Notebook*.

May's Group

- This group will program the LEGO crane to move the crates from the ground to the second floor of the building that **Marco's Group** is making.
- Give the group the LEGO crane and a WeDo 2.0 Core Set.
- Have the children follow the steps on pp. 19–23 in Book 3 of the building instructions to convert the hand-operated crane into a WeDo 2.0-powered crane. Note that the children should not build the elevator attachment yet (as shown on pp. 6–17), as they will do this in Session 4.
- Have the children start a "New Project" within the WeDo 2.0 software or app. Then ask them to use the two program strings shown in the *Engineering Notebook* to make the crane raise and lower its platform. Ask the group to make any changes that could improve how the programs work. For example, they could change the number of seconds that the motor is on and/or combine the program strings into a single program. 7
- Have them record their ideas in the **Share** section of the *Engineering Notebook*.

SHARE (10 minutes)

- Have both groups share their sketches, ideas, and models.

- Ask the team to explain how they used creativity and persistence to transport the crates from the ground to the second floor. What problems did they solve along the way? How did they work together to solve the problems? 8

CLEANUP AND LOOK AHEAD (5 minutes)

- Have **Marco's Group** disassemble their models and put away the LEGO elements.
- The team will need the crane in future sessions. However, **May's Group** should turn it back into the hand-operated version before storing it. They can do this by undoing the steps on pp. 19–23 in Book 3 of the building instructions. Ask them to put away the WeDo 2.0 LEGO elements.
- Tell the team that in the next session they will explore how to make buildings easy for all people to use!

5 See the Multimedia Connections for some example models of two-floor buildings.

6 **Take It Further**

- Have the children create a floor plan for each of the two floors of their model and/or create a third floor.
- Encourage them to use LEGO elements for their floor plans and/or draw their ideas in their *Engineering Notebook.*

7 **Take It Further**

Ask the group to program the crane to do one or more of the following:

1) Make at least two round trips between the ground and the second floor of the building.
2) Make a sound and/or flash a warning light while in motion.
3) Display a message on the screen of the hardware device when the supplies arrive at the second floor.

8 Creative problem-solving is an example of the following *FIRST* Core Value:

Innovation: *We use creativity and persistence to solve problems.*

Let the children know that it is okay if it took them more than one try to deliver the crates successfully to the second floor.