



FIRST
LEGO
LEAGUE

EXPLORE

ENGINEERING NOTEBOOK



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Welcome!

I'm May!

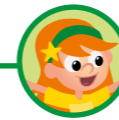


I'm Marco!



We are your guides to PLAYMAKERSSM.
Sometimes, you will work as a team and sometimes in two different groups.
Write down who will be in May's Group and who will be in Marco's Group.

Team Members:



May's Group

1. _____
2. _____
3. _____



Marco's Group

1. _____
2. _____
3. _____

I'm Max!
Come on!
Let's go!



FIRST[®] LEGO[®] League
Global Sponsors



The LEGO Foundation



Team Journey



Explore the Challenge



Learn About Core Values



Create Team Model



Celebrate at an Event



Challenge Story

They noticed there are lots of places where people are not active.

May and Marco don't like to stay still – and that's a good thing!



Moving keeps them both healthy and strong!



May and Marco have great ideas for games and activities, wherever they go.



Can you help them create new, fun ways for everyone to get moving?

Your ideas could help change your community – and even the world!

Core Values

Draw an example of each Core Value!



DISCOVERY

We explore new skills and ideas.

Grid area for drawing an example of Discovery.

INCLUSION

We respect each other and embrace our differences.

Grid area for drawing an example of Inclusion.

INNOVATION

We use creativity and persistence to solve problems.

Grid area for drawing an example of Innovation.

TEAMWORK

We are stronger when we work together.

Grid area for drawing an example of Teamwork.

IMPACT

We apply what we learn to improve our world.

Grid area for drawing an example of Impact.

FUN

We enjoy and celebrate what we do!

Grid area for drawing an example of Fun.

Use the Core Values to guide your team through your journey.

Have lots of FUN as you develop new skills and work together.

Inspiration Toolkit

Can you use these real-life photos from different places as inspiration for what you build?



Session 1 WHOLE TEAM

Getting moving helps your heart get healthy and strong!

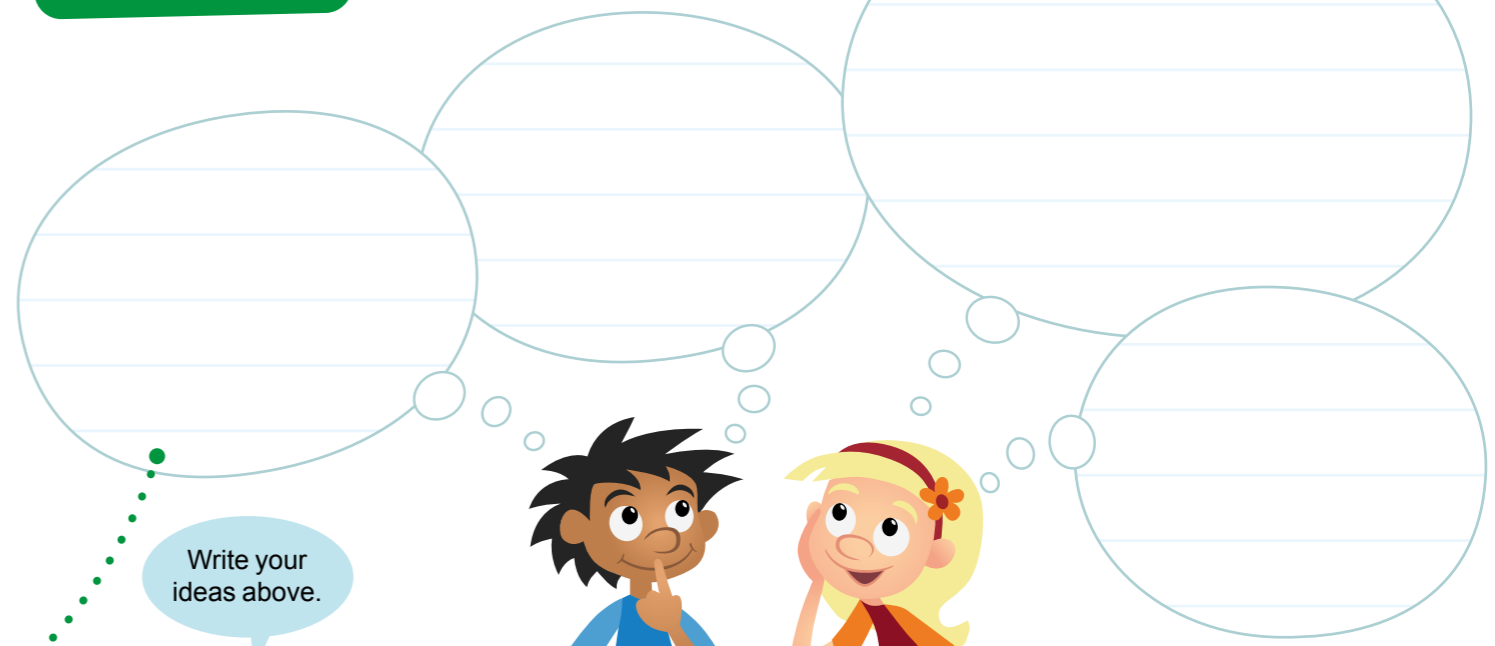


When you get moving, your heart rate goes up.

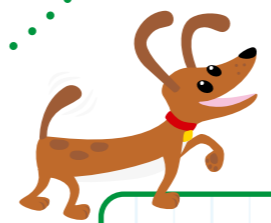


I like to run at the dog park!

Session 1 WHOLE TEAM



Write your ideas above.



Find the prototyping pieces and baseplates from the Explore set.

List different ways you like to play and get your body moving.

Where do you like to play and be active?

What games do you like to play?

Pick your favorite activity and draw a picture of yourself doing it. Show where you are.

Draw how you would build a LEGO® design of this activity.

Build a design of your drawing on your own baseplate.

Share your drawing and what you built with your team.

THIS IS ME:

Draw your design above!



Draw your empty lot designs here:



Draw your park designs here:



Sessions 8 and 9

WHOLE TEAM



Combined Build

Can your team code your combined build?



Motor and Hub Build

Can your team motorize the combined build?



- Find your WeDo 2.0 set and device.**
- Find the WeDo 2.0 app.
 - Use the blocks below to create a code to raise the flag to the top on the heart game.
 - Work as a team to code solutions to these challenges!
1. Raise the flag and then bring it all the way back down.
 2. Add a sound to celebrate when the flag is at the top.

- Find your Explore set and WeDo 2.0 set.**
- Follow the build instructions in Book 2 to make the motor and hub build.
 - Find your combined treadmill and heart game.
 - Connect it with the motor and hub build.
- Work as a team to complete the tasks!

You could use these blocks to create your new code!



Sessions 8 and 9

WHOLE TEAM

- Find your Explore set, combined build, WeDo 2.0 set, and device.**
- Think about the questions.
 - Brainstorm ideas for each question.
 - Look over the list of required parts below.
 - Draw your obstacle course design on pages 20-21. Label all the required parts and the places the course is found.

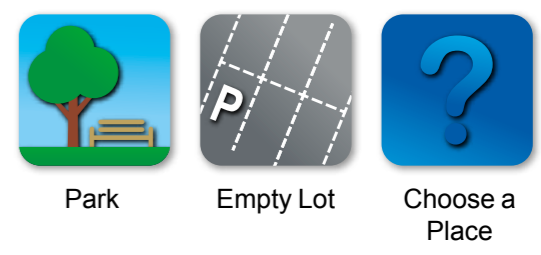
Can you design an obstacle course for us to play on and then build it as your team model?



Can you include fun activities that would raise our heart rates?



Could your obstacle course be built in one of these places or maybe in all of them?



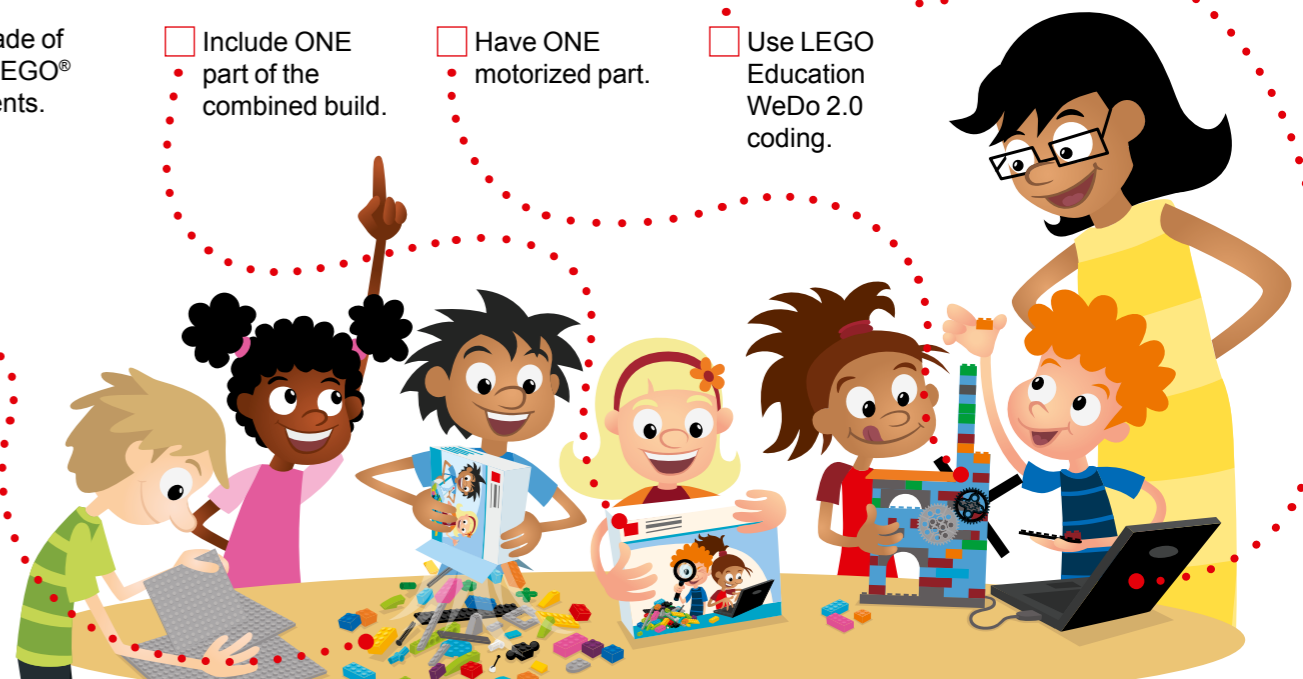
Park Empty Lot Choose a Place

Team Model



Required Parts:

- Be made of only LEGO® elements.
- Include ONE part of the combined build.
- Have ONE motorized part.
- Use LEGO Education WeDo 2.0 coding.



Draw your obstacle course design here:

Use these two pages for your drawing. Label the required parts of your team model.



Park



Empty Lot



Choose a Place

Required Parts checklist:

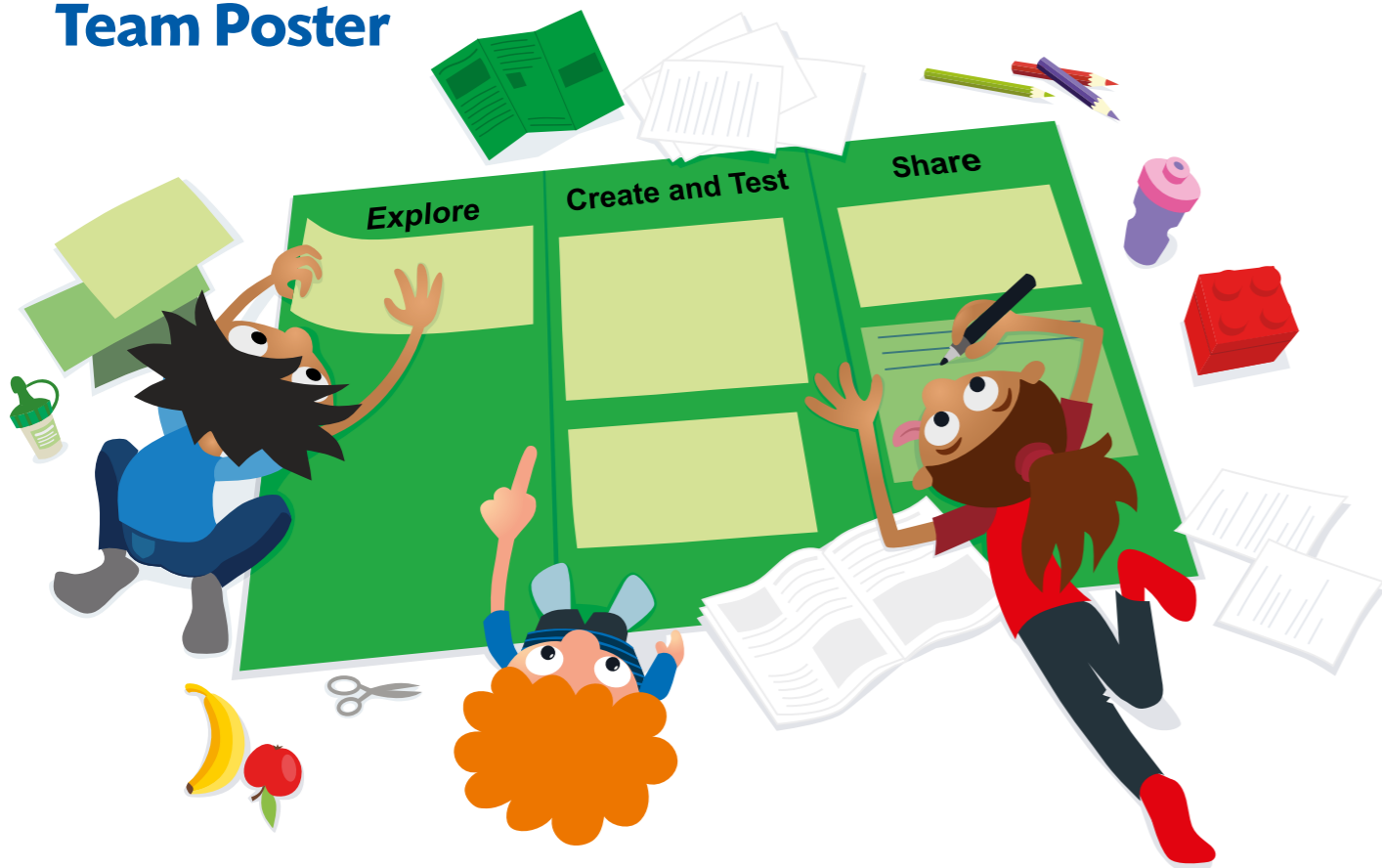
- Be made of only LEGO® elements.
- Include ONE part of the combined build.
- Have ONE motorized part.
- Use LEGO Education WeDo 2.0 coding.

Find your poster board and art supplies.

- Brainstorm what you will put on your poster.
- Use the next page as a draft for your ideas.
- Work together as a team to create your poster.



Team Poster



Write and draw your ideas for your team poster:

Sample Topics:

- Explore
- Create
- Test
- Share
- Core Values
- Team Journey

Check out Core Values page 6 for ideas!



Find your completed team model and team poster.

- Talk about what your team would like to share at your event!
- Complete the next page to prepare for your event.
- Look over the reviewing sheet with your coach.



Typical Event Setup



Record your ideas for sharing at your event:

<ul style="list-style-type: none"> • Can you describe your team model? • Did you include the treadmill, the heart game, or the combined build? 	<ul style="list-style-type: none"> • What did you learn about the challenge? • How did you use Core Values?
<ul style="list-style-type: none"> • What part of your build is motorized? • How did you code your motorized part? 	<ul style="list-style-type: none"> • What did you include in your team poster? • How does it show your team journey?

Let's Celebrate!



Find Your Projects

1. Open the WeDo 2.0 app. The app might be an icon on the main screen or in the Start menu.



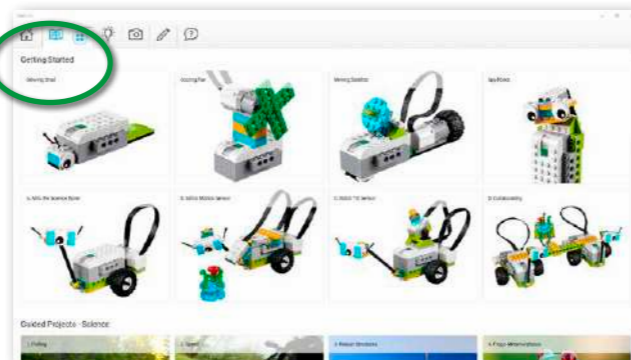
2. Follow the Introduction directions if this is your first time using the app. Otherwise, click the X.



3. Select Classroom Projects from the main page.



4. Choose the appropriate Getting Started project listed in your session.



Programming Block Descriptions

Flow Blocks



Start Block

When used, always place at the beginning of a program string. Press on it to start the program string you have written.



Wait For

Use this block to tell the program to wait for something to happen. It can wait for a set amount of time or for input from a sensor. This block always requires input in order to work properly.



Repeat Block

Use this block to repeat actions. Blocks placed inside the Repeat Block will be looped. This can also be called the Loop Block. The loop can be repeated forever, for a certain amount of time, or until something happens.

Other Blocks and Inputs



Light Block

Lights up the LED on the Smarthub in a specific color. The color can be changed with a numeric input between 0 and 10.



Play Sound

Plays a sound. The sound is chosen from a list available within the software. You can choose a sound using a numeric input. Choose sound number 0 to play a sound that you have recorded yourself.



Bubble

Use the bubble to insert comments into your program. This is not a programming block.



Number Input

Inputs a numeric value to a block.



Text Input

Inputs a text value to a block.

Motor Blocks



Motor This Way Block

Sets the motor to turn the axle in the direction shown and starts the motor. Tap on the block to quickly change the direction of the rotation.



Motor Power Block

Sets the motor power to the specified level and starts the motor. The level can be set with a numeric input from 0 to 10.



Motor On For Block

Starts the motor for a chosen amount of time specified in seconds. The amount of time can be set with a numeric input, using whole or decimal numbers.



Motor Off Block

Stops any movement of the motor.

Sensors Inputs



Any Distance Change

Inputs the Motion Sensor mode "Any Distance Change" to a block.



Distance Sensor Input

Inputs the value detected by the Motion Sensor (from 0 to 10) to a block.



Shake

Inputs the Tilt Sensor mode "Shake" to a block.



Motor Off Block

Stops any movement of the motor.

Career Connections

Jay Flores

Global STEM Ambassador

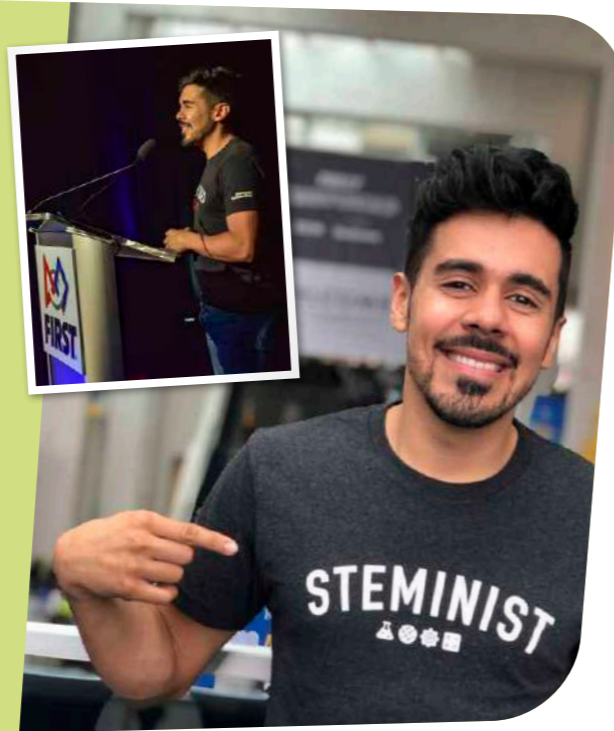
Where I work: Rockwell Automation

My FIRST® connection: I helped design the FIRST Robotics Competition experience and help FIRST create the strategies to reach more kids.

Fun facts about me: I was on two athletic competition TV shows: *Exatlon Estados Unidos on Telemundo* (2019) and *BattleFrog League Championship* on ESPN (2016).

My STEM superhero: FIRST® LEGO® League students who are solving real problems in their community.

Advice to teams: Invent the change you want to see in the world!



Leanne Cushing

Mechanical Engineer

Where I work: Bellwether Coffee

My FIRST® connection: I did FIRST Robotics Competition in high school, and with the help of my mentors, I learned that mechanical design was the one thing I'm good at and love doing.

Fun facts about me: Most of my spare time is dedicated to *Battlebots* and my team, Valkyrie, where we design, build, and compete with our 250 lb robot on Discovery Channel.

My STEM superhero: Bill Nye, for his love of entertaining combined with his love of engineering and teaching. He showed me you could be entertaining, social, and brainy. He fed a lot of my curiosity and taught me so much when I was little.

Advice to teams: Passion isn't perfection. Be your own favorite version of yourself; don't let other people tell you who to be or what you can or cannot do. Don't talk yourself out of trying something new. Worst case, you have a new opinion or story to share.



Javion Mosley

Mechanical Engineering Senior

Where I work: Rockwell Automation

My FIRST connection: Riverside Robotigers 2830 mentor, FIRST alumni

Fun facts about me: I like to travel a lot and experience as many new things as I can. I was also a Rockwell Automation intern in China.

My STEM superhero: Wilbur and Orville Wright. I have an admiration for flight.

Advice to teams: FIRST is a great opportunity to get your first steps in engineering. Treat it as part of your building blocks for your future as the steps you take today will affect your outcome tomorrow.



Pedro Alejandro Yang

Manager

Where I work: LEGO® Education

My FIRST connection: I work in LEGO Education's competition team, and we are a Strategic Partner of FIRST.

Fun facts about me: I played badminton in the 2004 Summer Olympics. My hobby is to cook recipes that famous chefs post on YouTube.

My STEM superhero: Woodie Flowers. Even though he was a STEM advocate, he also acknowledged the human empathy factor for people to succeed, thus inventing what we know today in our FIRST LEGO League community as *Gracious Professionalism*®.

Advice to teams: It's not about winning, but the learnings and friends you make in your journey.



Draw your designs here:



Name:

Team name:



There are lots of places where people are not active.



May and Marco have great ideas for games and activities, wherever they go.



Can you help us create new, fun ways for everyone to get moving?

