

FIRST® LEGO® League Explore WeDo 2.0 Alternative Instructions

Follow these WeDo 2.0 instructions if you have WeDo 2.0 sets as an alternative to the SPIKE Essential set instructions contained within the Engineering Notebook and Team Meeting Guide.

Getting Started

1. Do an inventory check of your WeDo 2.0 set and sort LEGO elements into their appropriate sections according to lid card. Number each set and its corresponding WeDo 2.0 hub to help with classroom management.
2. Insert batteries into the WeDo 2.0 hubs (unless you have the power packs). Make sure to have backup batteries.
3. Download the WeDo 2.0 Software or app at LEGOeducation.com/downloads.
4. Check out the Introduction video and Teacher’s Guide in the app or online. Complete the Getting Started activities to get yourself familiar with the WeDo 2.0 app, coding blocks, and building system.
5. Make sure you have all your Bluetooth-enabled devices have the WeDo 2.0 app installed. Check for updates. Each team of students will need a device, FIRST LEGO League Explore set, and a WeDo 2.0 set.

Tips:

- For easier material management, keep the pieces from the Explore set separate from the WeDo 2.0 set.
- The team could complete the Getting Started activity: Glowing Snail in the app so that they gain experience in building and coding before starting the sessions.

Session Activity Sequence

Activity 1: Cooling Fan (Alternative session activity to replace SPIKE Essential: Explore Lesson 1)

STUDENT INSTRUCTIONS			
<ol style="list-style-type: none"> 1. Explore: Complete the Cooling Fan lesson. 2. Create: How can you make the model go in a different direction? Brainstorm ideas. 3. Test: Modify and test your new program. 4. Share: Show the motor coding skills you learned. Demonstrate how you modified the model and code. <p>Challenge 1: Make the motor turn in both directions and code it to go faster and slower. Challenge 2: Modify the cooling fan model. Can you change the blades? Make the fan taller?</p>			
GUIDING QUESTIONS	TEACHING TIPS	EXTENSION	OUTCOME
<ul style="list-style-type: none"> • Can you build and code the model using motor blocks? • How do you change the program so the model moves in a different way? • Can you code the model to move at a different speed? 	<ul style="list-style-type: none"> • Walk students through how to access the lesson in the app. • If students are new to coding, you could have them complete the getting started tutorials. 	Try these activities in program library: <ul style="list-style-type: none"> • Motor Power • Increase Speed • Stop Motor 	<ul style="list-style-type: none"> • Students will build the Cooling Fan model from the lesson and explore motor coding blocks.

Activity 2: Moving Satellite (Additional activity; expands on SPIKE Essential: Explore Lesson 1)

STUDENT INSTRUCTIONS	
Activity 2: Spy	<ol style="list-style-type: none"> 1. Explore: Complete the Moving Satellite lesson. 2. Create: How can you make the model turn in a different direction for a longer time? Brainstorm ideas. 3. Test: Modify and test your new program. 4. Share: Show the coding skills you learned. Demonstrate how you modified the model and code. <p>Challenge 1: Make the satellite turn clockwise fast then turn counterclockwise slow. Challenge 2: Modify the moving satellite model. Can you change the satellite shape? Make it bigger?</p>

GUIDING QUESTIONS	TEACHING TIPS	EXTENSION	OUTCOME
<ul style="list-style-type: none"> How did you change the design of the moving satellite? What do you want your code to make the build do? 	<ul style="list-style-type: none"> The students will use various motor blocks to code the motor direction and duration. 	Try these activities in program library: <ul style="list-style-type: none"> Motor Direction and Motor Time Screen Joystick 	<ul style="list-style-type: none"> Students will be able to build and program the moving satellite.

Activity 3: Spy Robot *(Alternative session activity to replace SPIKE Essential: Explore Lesson 2)*

STUDENT INSTRUCTIONS			
<ol style="list-style-type: none"> Explore: Complete the Spy Robot lesson. Create: Code the model to play a different sound or flash a light. Brainstorm ideas. Test: Modify and test your new program. Share: Show the light and sound coding skills you learned. Demonstrate how you modified the code. <p>Challenge 1: Code the robot to play a different sound or show a different light.</p> <p>Challenge 2: Code the model's motor to be triggered using a sensor.</p>			
GUIDING QUESTIONS	TEACHING TIPS	EXTENSION	OUTCOME
<ul style="list-style-type: none"> How do you change the program so the model plays a different light? Can you code the model to make a different sound? Can you use a sensor to signal a sound or light? 	<ul style="list-style-type: none"> Students will learn about and use light and sound blocks. There are various sensors in the set that students could use. 	Try these activities in program library: <ul style="list-style-type: none"> Sound Detect Motion Loop 	<ul style="list-style-type: none"> Students will build the Spy Robot model from the lesson and explore light and sound blocks.

Activity 4: Milo the Science Mover *(Alternative session activity to replace SPIKE Essential: Explore Lesson 3)*

STUDENT INSTRUCTIONS			
<ol style="list-style-type: none"> Explore: Complete the Milo the Science Rover lesson. Create: How can you make the rover go a different way? Go forward and stop at a line? Brainstorm ideas. Test: Modify and test your new program. Share: Show how you applied coding skills learned in previous sessions to make a mobile robot. Demonstrate how your robot drives on the mat. <p>Challenge 1: Program your vehicle to push or pull objects to different targets on the mat.</p> <p>Challenge 2: Modify the build so that the rover has four wheels.</p>			
GUIDING QUESTIONS	TEACHING TIPS	EXTENSION	OUTCOME
<ul style="list-style-type: none"> How do you change the program so the LEGO robot moves differently? Can you code the robot to drive around on the mat? 	<ul style="list-style-type: none"> Students will create their first mobile robot that drives on the mat. Students may need to modify the robot or program to account for the mat folds. 	<ul style="list-style-type: none"> Code the robot to drive from one place to another on the mat. 	<ul style="list-style-type: none"> Students will build Milo the Science Rover from the lesson and code the robot to drive.

Activity 5: Motorize Explore Model (Alternative session activity for Motor and Hub build to replace SPIKE Essential instructions)

STUDENT INSTRUCTIONS			
<ol style="list-style-type: none"> Explore: Follow the building instructions in the booklet to make the motor and hub build. Create: Connect the motor and hub build to your Explore model. Create a program to motorize your model. Test: Modify and test your program. Share: Show how you motorized your Explore model. <p>Challenge 1: Can you use light and sound in the motorized Explore model? Challenge 2: Can you add a sensor to the motorized Explore model?</p>			
GUIDING QUESTIONS	TEACHING TIPS	EXTENSION	OUTCOME
<ul style="list-style-type: none"> How can you motorize the Explore model? How can you connect the motor and hub build to the Explore model? 	<ul style="list-style-type: none"> Students will need the build booklet from the Explore set to assemble the motor and hub build. You will have to modify the build instructions in the booklet that are for the SPIKE Essential set to fit the WeDo 2.0 set. 	<ul style="list-style-type: none"> Incorporate the use of a sensor in their model. 	<ul style="list-style-type: none"> Students will build the motor and hub build and motorize the Explore model.

Activity 6: Build & Code Team Model (Alternative instructions to use instead of SPIKE Essential ones)

STUDENT INSTRUCTIONS			
<ol style="list-style-type: none"> Explore: Think about season challenge. Explore the list of required parts for your team model. Create: Brainstorm ideas. Draw your team model design and label the parts. Create your team model and code your Explore model. Test: Modify and test your program. Look over your team model to check that you have all the required parts. Share: Explain the program and how it motorizes your team model. Demonstrate how the team model works. <p>Challenge 1: Can you incorporate multiple moving parts in your team model? Challenge 2: Can you use multiple sensors in your team model?</p>			
GUIDING QUESTIONS	TEACHING TIPS	EXTENSION	OUTCOME
<ul style="list-style-type: none"> How can you motorize part of your team model? How will you design your team model? What is the most important part of your team model? 	<ul style="list-style-type: none"> Students will apply coding concepts from sessions to create their programs. Students should use the entire Explore model in the team model and the mat. 	<ul style="list-style-type: none"> Create a detailed, labeled drawing of the team model and all its parts. 	<ul style="list-style-type: none"> Students will draw their team model design and label its required parts.