



# MODULE 6

CREATING THE PRESENTATION AND REFINING THE ROBOT

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## MODULE OVERVIEW

MODULE NUMBER: 6

DURATION: 2 hours

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## SUMMARY

In this module, the team will begin creating the presentation they will give to the judges at the *FIRST* LEGO League® competition. In addition, they will continue to refine the programming of the robot and fix any errors they have encountered.

### Core Values to Focus on in This Module

- **Inclusion:** *We respect each other and embrace our differences.*



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## OUTCOMES:

Educational standards alignments can be found at

<http://www.firstinspires.org/resource-library/fll/standard-alignment-map>

## MATERIALS

1. *FIRST* LEGO League Challenge Set
2. Whiteboard or other writing surface
3. Pencil/Pens/whiteboard markers
4. Computer or tablet to program the robot
5. Printed Field Research handouts

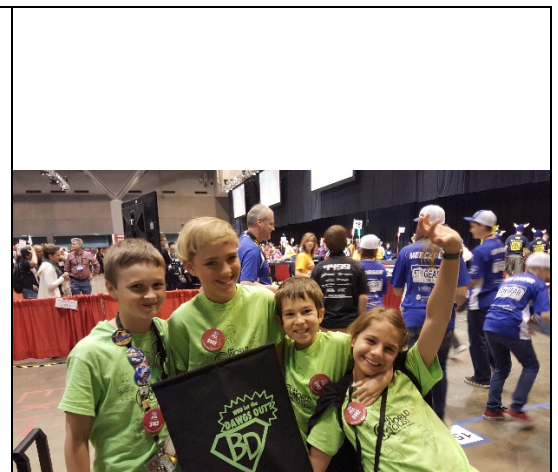


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## Note from An Experienced Coach:

Costumes, props, and models can make the presentation fun and memorable, but be sure they don't detract from clearly stating your problem and solution. Remember, the kids will need to set up the presentation quickly and without any help from you. Once you've created your presentation, begin practicing right away. The more times they practice, the more comfortable they will become. You and another parent or mentor can pretend to be the judges. Invite the students into the room, just like it will be on tournament day, and have the team introduce themselves. Don't forget to time them, and be sure they don't go over the five-minute time limit. Ask the team members questions based on the judging rubric for the remaining five minutes. Afterwards, talk about how it went. Ask them what they did well and what they think they could do better. Were they taking turns answering questions? Did they interrupt and talk over each other? Remember, the judges don't know how hard they've worked all season, and this is their chance to share all that they have accomplished!

Sonya Shaver



# INSPIRATION

SUGGESTED TIME: 15 minutes

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## Teaching and Learning From Others

In this exercise, team members will teach a partner how to do a certain task. This is to help them learn to explain things clearly, as well as learn that everyone has something to learn and something to teach others.

1. Divide the team into pairs.
2. Have each team member choose a task to teach to their partner.



**HINT:**

This could be as simple as brushing their teeth, taking out the trash, or telling a joke.

3. Have the pairs decide which partner will go first.
4. Tell the first partners: "You have two minutes to teach your task to your partner. Go!"
5. Once the two minutes are up, repeat with the other partners.



## Discussion

Ask the team members the following questions:

1. Was it hard to explain something to your teammate?
2. How did you figure out what to tell them?
3. How can we explain our Project to others?



**HINT:**

An additional talking point related to this activity is to show that you can learn something new from everyone and there is always something new to learn.

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# PROJECT

SUGGESTED TIME: 60 minutes

## Create the Presentation

At every *FIRST*® LEGO® League tournament, each team will have 5 minutes to present their Project work to the Judges. You will begin creating the presentation in this module.

1. Look at the Judging rubric and use it to make a list of all the information you will need to include in your presentation.

1. Be able to clearly state your problem.
2. How many sources did you use in your research, and what type?
3. What solutions currently exist?
4. What is your solution, and can you clearly state it?
5. How did you design your solution?
6. How is your solution innovative?
7. Can your solution be implemented?
8. Did you implement your solution? If so, share the results and the impact of your solution.
9. Who did you share your solution with? How would they benefit from it? (We will talk more about this in the next module.)



2. Decide how you want to present your information.
  - Ask the team members to share the ideas they came up with in the last module's Field Research. Do they want to present with a:
    - Skit
    - Song
    - Professional presentation
    - Or other creative approach?



**HINT:**

Some teams split up the five minutes and incorporate different approaches into the presentation.



**HINT:**

Have the team think about how they can stand out from other teams. How can they be creative and effective in getting their message across?



**HINT:**

Think about what is realistic to do in five minutes. That includes setup time and introductions, and the kids must do all of the setup themselves!

3. Start creating the presentation!
  - Begin writing the script. It is helpful to write out everything the team members will say, beginning with introducing the team and team members.
  - Divide the preparation between the team members.
  - Props or costumes can help your team stand out, but make sure they don't interfere with the team's ability to deliver the presentation effectively and efficiently.

- Whatever you haven't finished at the end of the practice, divide the remaining tasks to individual team members for this week's Field Research.
4. Make a list of what materials you will bring into the Project judging room.
- A model or prototype of your invention or solution?
  - A trifold with information about your solution and the impact your solution can have?
  - A handout for the judges? If so, what will be included and who will be responsible for it?



**HINT:**

Make sure the kids can realistically do everything they plan in 5 minutes.



**HINT:**

Using technology in a presentation is risky. Have a backup plan! The judges have a very tight schedule, so they cannot give teams extra time to handle technical difficulties. Your team should be ready to carry on if the technology fails.

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## LEARNING RESOURCES

- *FIRST*® LEGO® League Challenge Guide
  - Judging Rubric
  - *FIRST* LEGO League How-To: Present Your Project  
<https://www.youtube.com/watch?v=hHV8d9sCthA>
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# ROBOT

SUGGESTED TIME: 40 minutes

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## Refine Robot Programming

There are always improvements that can be made when programming a robot. Continue to test your robot and improve any errors, inefficiencies, or inconsistencies in its performance.

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## ROBOT TIPS

### What to do when the robot isn't cooperating

As you move through the season, you are likely to encounter some robot malfunctions and mishaps. That's all part of the learning process! Help your team stay positive through the challenges, and encourage them to use their best problem-solving skills. Remember, your job as a coach is to guide them and ask questions. If you're getting different results every time you run a program, try to identify where the inconsistency is coming from. How do you find it and how do you fix it? Here are some common issues that can cause inconsistencies:

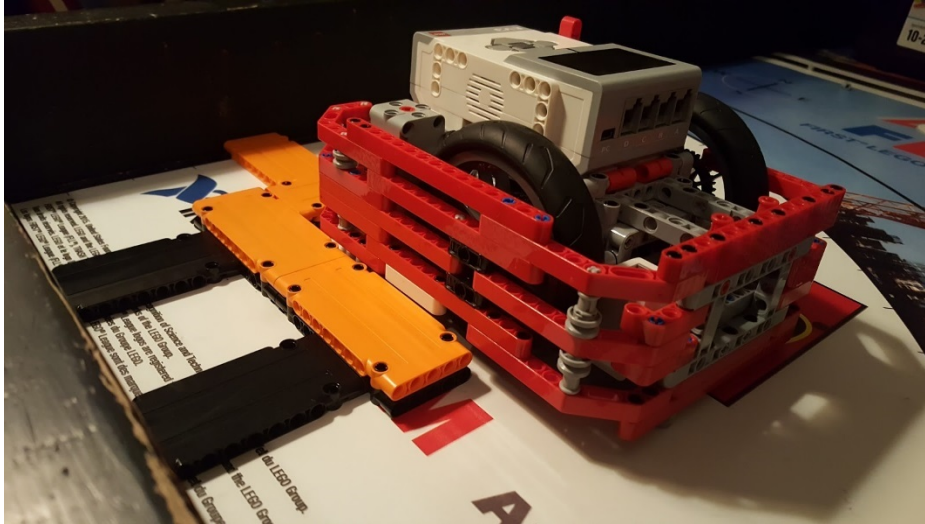


1. **Too much dead reckoning.** Dead reckoning is having the robot move without any external feedback. For example, using move blocks without sensors or other outside help like a wall.

What can you do about it? Use a feature on the table before and after sections that require dead reckoning. For example, you could line up with a wall, follow a line, or use a mission model to provide a reference point for the robot.

2. **Inconsistence alignment when starting from base.** If you aren't starting the robot in the same place every time, you will end up in a different place every time. Even small errors when aligning in base will multiply as the program goes on and can cause inconsistencies.

What can you do about it? Making a "jig" is the best way to align your robot in base. A jig is a guide that helps show you where to place your robot before launching it from base. That way, the robot will start in the same position every time. It will also increase consistency between different operators. *Remember that your jig can only be made from LEGO® parts!*



3. **Battery usage and charge.** Keep in mind that the robot can potentially act differently when operating on a low charge compared to a fully charged battery.

What can you do about it? Charge the robot frequently, during breaks and between practices.

4. **Wheels slipping or robot jerking.** Sometimes the robot will jerk or skid, decreasing your accuracy and reacting differently with each run.

What can you do about it? Check to be sure all of your wheels are making contact with the mat evenly. If your robot is jerking or skidding, try slowing the speed a little just during that section of the program. Experiment with different speeds to find the right balance between saving time and maintaining accuracy.

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## LEARNING RESOURCES

- LEGO.com has links to the EV3 Mindstorm user community, apps for learning programming, and a variety of videos, galleries and games that can provide inspiration.
  - The LEGO MINDSTORMS Education EV3 Software (that you use to program the robot) also has many programming tutorials that will be useful to the team.
  - A comprehensive approach to robot design and programming with lessons categorized as Beginner, Intermediate and Advanced is available at EV3Lessons.com.
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# DEBRIEF

SUGGESTED TIME: 10 mins

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## 1. Check the Timeline

1. Have the team check the timeline they created last practice.
2. If they are on schedule, congratulate them!
3. If they are a little behind, ask them what they can do to catch up.

## 2. Recap

Review what the team accomplished in this module. The team:

1. Planned their Project presentation.
2. Improved the Robot.

## 3. Reflect

Ask the team:

1. How do you feel about presenting in front of people?
2. How can we be more comfortable speaking in public?
3. How do you feel about the progress of the robot?

## 4. Give the students the Field Research for this week.

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# FIELD RESEARCH

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Before the next module, team members should use the attached handout to do the following activities:

## Project

- Write down one person or group who may benefit from hearing about your project.
- Continue working on any presentation tasks you've been given.

## Robot

- Choose one issue your team is having with the robot and write or draw one way it might be fixed.





# Field Research

## Module 6

### Project

1. Write down one person or group who may benefit from hearing about your project.
  
2. Continue working on any presentation tasks you've been given.

### Robot

1. Choose one issue your team is having with the robot and write or draw one way it might be fixed.



# OTHER TASKS & TIPS

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## TASKS

1. If you have any parents that did not register their child in STIMS, make sure you get a paper copy of their Consent & Release form to bring to the tournament.
2. Make sure your team is registered for your local tournament.
3. If you ordered t-shirts or other team paraphernalia, make sure the order will be ready by the tournament date.
4. Make sure to check the Challenge updates every week.

## TIPS

1. Some teams make small trinkets or handouts related to their team's Project or team identity to share with other teams at the tournament. They are absolutely **NOT** required, but can be a fun addition if you have the time and resources.
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# NEXT TIME

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In the next module, the team will share their Project solution with someone who would benefit from it, practice their presentation, and continue to improve the Robot's performance.



Make sure that before you come to the next meeting you have reviewed *Module 7* thoroughly.

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