



Senior League Season Guide

Week 1 – Team Introductions and Intro to Robotics with LEGOs

- **Welcome and Introductions, Ice Breaker** – See who has done the program before, find out what they like about working with Legos, and ask what they would like to get out of the program.
- **Program Overview** – Give kids a brief introduction to Lego Robotics and Track Meet Challenges and how this leads up to our District Meet in April. We are building robots that perform specific tasks! - Some robots are general purpose or perform multiple tasks. We will focus on robots that perform a single task.
- **Caring for our Kit**– We will not operate our robot on a table with any edges – we will pick up and put away all pieces at the end of every session.
- **Terminology Review** – During the season we will work with all kinds of Legos while building our robots. It is important that we use common terms so that we understand each other. Don't ask for that "thing" over there. Ask for the "dark gray 10 lift beam." Review terminology and reinforce correct terms with the team.
- **Set Review** - Open up and share the kit with the team members. You can do this as part of the terminology review. Show them the different elements and give a brief explanation of what each does.
- **Get Hands-On with Gearing** – Gearing is a critical part of building robots for the Track Meet challenges. It is also one of the hardest concepts for many team members to grasp. This exercise encourages team members to get hands-on with gearing. Have your team members take four gears each and line them up in a way so that if they turn the first gear then the last gear will turn. Once they have all done this, ask them to select a different set of gears and have them do it again. Ask them what they found to be the biggest challenge.
- **BUILD!** – Let the team get their hands on the Legos.
 - The following builds are designed to familiarize team members with the EV3 and all sensors and motors. First time teams can build the EV3 Model robot from the EV3 Core Kit. They can follow the instructions for the EV3 Model in the booklet (if available), follow the instructions available online at www.smgearbots.org/coach-resources/, or follow the instructions that are available in the LEGO MINDSTORMS Education EV3 software available on your computer. To access the build instructions on the computer, start the LEGO MINDSTORMS Education EV3 software, select Robot Educator, select Building Instructions, and then begin with Driving Base and follow through to Cuboid.
 - Returning teams may choose to familiarize themselves with building robots by completing the EV3 Model as above or they may build the Simple EV3 Wheelbot model that is posted online at www.smgearbots.org/coach-resources/.

NOTE: The Simple EV3 Wheelbot is the model used in the State Meet Speed Build Event.
- **Close Session** – Discuss plans for next week and clean up

Week 2 – Track Meet Challenge Overview & More Building

NOTE: While you may talk about the Track Meet Challenges in the first few meetings, the Robot Track Meet Association doesn't release the Official 2019 Rules until mid-January. You will receive an email with a link to the Official 2019 Rules when they become available.

- **Welcome** – Recap from first week, how did things go?
- **More Terminology Review** – Check coach resources online for inventory lists for names of specific elements
- **Gears, gears, gears!** – Gears are one of the most critical parts of your team's robot models. Use the Tora no Maki PDF at www.smgearbots.org/coach-resources/ to help explain how gears work. *Look at it first!!*
- **Introduce Track Meet Challenges** – Introduce the Track Meet Challenges found on the Coach Resources page at www.smgearbots.org/coach-resources/. Explain the idea of the Track Meets. Different challenges require different robots. A robot that works for one challenge may not work well for another.
- **Continue Building** – Continue the models if more time is needed.
- **Additional Models** – Experienced teams may have an immediate idea about what to build. To challenge these types of teams more, consider having them build from the LEGO MINDSTORMS Education EV3 software. They could build either the Tank Bot, which is a great base and starting point for the Steeplechase, Slope Climber, and Table Clearing Mission, or the Elephant, which is a good step at learning about Walking robots.
- **Close Session** – Discuss plans for next week and clean up

Week 3 – More about Track Meet Challenges

- **Welcome** – Recap
- **Review Track Meet Challenges & Think About Robots** - Have your team look through the challenges and encourage your team to think about the robots they might like to build. Which robots seem the easiest? Which might be harder? Which might require extra elements?
NOTE: The Bridge Building and Speed Build challenges are not a part of this year's District Meet.
- **What to Build** - Have the team members think about what to build as a team. Next week they will bring their ideas back and vote on the robots to build.
- **BUILD!** - Continue building the EV3 Model, the Simple EV3 Wheelbot, or one of the other robots if needed to reinforce robotic concepts.
 - **Research** – Look at what others have done. A nice place to start is www.drgraeme.org/catalog.html
Alternately, some sections of the Robot Track Meet Association Rules have pointers for teams to look at as a starting point for research. Encourage your teams to look into these or look up other types of LEGO models at home and bring information back to share.
Additional Resources may be found on the LEGO Education Website
 - <https://education.lego.com/en-us/support/mindstorms-ev3>
 - <https://education.lego.com/en-us/resources/robot%20educator>
 - <https://education.lego.com/en-us/support/mindstorms-ev3/building-instructions>
- **Close Session** – Discuss plans for next week and clean up

Week 4 – Now we Vote! – Robot Selection and Building

- **Welcome** - Recap
- **Discuss Challenges** - Each robot has different requirements. Have the team look up the robots they are interested in working on and investigate the requirements. Have the teams discuss what they have researched. What did they find exciting? What looked to be a tremendous challenge?
- **Robot Selection** - Have team vote on top 3 robots. Give them slips of paper to write down their choices, then tally the votes. This will give a list of the top contenders, then have a second or third round of votes from the finalists to identify the top robot. Consider holding Ranked Choice Voting. Second choice is a great fall back if the first choice proves too complex or is finished early.
- **Team Name and Color** – The team will need to come up with a name and color for the District Meet. Have them come up with fun names and color ideas. Keep an eye out for the email requesting this info.
- **BUILD!** - Have the team read up on the selected robot, make a plan, work up a design, and start building!
- **Close Session** – Discuss plans for next week and clean up

Week 5 through 11 – Robot Building and Testing

- **Research** – Teams should spend time outside of the sessions each week researching about their robot topics. Links with relevant information can be found online at www.smgearbots.org/coach-resources/ as well as in the Maine State Robotic Track Meet rules.
- **Well, that didn't work, did it?** – If the team launched into building last week then they quickly found out what it was like to spin their wheels! This was because they didn't have a good PLAN! Help them get back on course, of course!
- **Plan, Design, Build, Test, & Iterate, OR Continue Building and Testing Your Robots** – Talk with your team about how they need to
 1. Research,
 2. Plan,
 3. Design,
 4. Build,
 5. Test, and
 6. Iterate or DO IT AGAIN!

Each robot has specific requirements. Teams may need to make multiple iterations on a single robot in order to have it perform to the level they feel comfortable with for the District Meet. Encourage teams to design, build, and test their robots. Then they can do it again and again!

- **BUILD! Additional Robots** – Teams may have time in the season to build more than one robot. Encourage them to consider which additional robots that they might build. They may need to build one of the challenge surfaces to test their robots, or alternately they can join in on one of the robot try out days in Windham or Saco. Keep an eye out for announcements for the try out days and times.
- **Try-Outs** – Have the team participate in a try-out day in Windham or Saco. Look for emails announcing dates and times.

District Meet, April 6, 2019 – Robot Track Meet Challenges

- **Join the Fun and Compete** – Have your team bring their robot to compete at the District Meet on April 6. Teams have a last chance to test robots and make final adjustments the morning of the meet.

Regional Meet, Early May, 2019 – Robot Track Meet Challenges

- **First place teams from the District Meet go to the Regional Meet** – Show your support and watch your friends compete at the State Regional Meet. Select second or third place teams may be able to go.