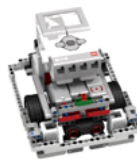


# FLL ROBOT BUILD GUIDE

By Droids Robotics, 2015

Building a good competition robot involves a lot of considerations. We often get asked if Droid Bot would make a good FLL robot. Droid Bot was designed with three purposes: 1) To use only the elements in the EV3 Core Kit, 2) Build a robot that could be used to complete any of the lessons on [EV3Lessons.com](http://EV3Lessons.com), and 3) Have elements of solid building that students could learn from and adapt for their own designs.

Droid Bot was **not** built for any year of FLL or to complete any particular mission, but it has elements worth checking out. Take features you like about Droid Bot and build your own.



## Droid Bot 2.0 Features:

- Good weight distribution
- A strong outer wall to support the wheels
- Color sensors that are shielded and a good distance apart from each other (for line squaring), set in front of the wheels
- A compact design that lets you add more later
- Small wheels for wall riding
- SNAP attachments that go on & off quickly

To build a robot for a competition, start by asking yourself the questions below and consider the pros and cons of each option.

	Factors to Consider
<b>What type of wheels should we use?</b>	<ul style="list-style-type: none"> <li>• Tall wheels can add height, but give you speed. EV3 motors can be installed upside down to reduce the height.</li> <li>• Small wheels can give you more precision, but are slower.</li> <li>• Firmer tires won't become out of shape or come off the rims.</li> <li>• Back wheels/skids need to be able to move in many directions and be at the same height as the front wheels.</li> <li>• If the robot has to go over obstacles you might have to pick different tires or even treads. (e.g. Nature's Fury)</li> </ul>
<b>How tall can the robot be?</b>	<ul style="list-style-type: none"> <li>• Other than base height restrictions, the taller the robot, the more imbalanced it might get.</li> </ul>
<b>How wide can the robot be?</b>	<ul style="list-style-type: none"> <li>• The width of the robot depends on base, your attachments, as well as how much space there is on the competition field (space to navigate between missions and walls)</li> </ul>
<b>What are the consequences of an imbalanced robot?</b>	<ul style="list-style-type: none"> <li>• The robot should not be weighted to any one side</li> <li>• If it does, your moves will be unreliable, the tires may skid, the robot may veer</li> <li>• Once you add the weight of the attachments, this may worsen.</li> </ul>
<b>Where should we place sensors?</b>	<ul style="list-style-type: none"> <li>• Color sensors need to be a good distance from the drive wheels to line follow. Sometimes placing them too close to the wheel causes problems with the line follower.</li> <li>• The gyro can be placed anywhere (but must face right side up/upside down to be used to measure turns) (ie. not pointing up or sideways)</li> <li>• The other sensors need to be placed where they are most useful - on the side of the robot where you will use them the most.</li> </ul>
<b>What is the best spot for an additional motor?</b>	<ul style="list-style-type: none"> <li>• If you are using the EV3, you can use 2 additional motors (of any type). You need to decide if you like the Medium or Large Motor.</li> <li>• Where you place them depends on the attachments you build and if you are willing to add gears to your attachment (like SNAP)</li> </ul>
<b>What else should we add to the robot?</b>	<ul style="list-style-type: none"> <li>• Planning to ride on walls? Consider adding small wheels in the corner of your robot.</li> </ul>