





(30 pts) Approx. 3 days

The first part of this unit involves doing some reading and research about how FTC robots come together, and then working with a team to build a very simple, drivable robot. Great robots need three things in order to be successful: (1) a sturdy and reliable frame, (2) properly connected wiring and electronics, and (3) a good program. In this first part of the unit, we want to get those essential elements working together before we start trying to make super complicated robots.

1. Start by watching the introductory videos on our website, *Robot Overview*, *Frame Tutorial*, *Gears & Chains*, *Rigid Frames*, and *Good Wheel Bases*. Take at least a full page of notes on these topics. Together, they'll give you a good sense of some of the important things to keep in mind as you design and build your first robot frame.
2. Once you've been assigned a team, work with your team to brainstorm ideas for what your basic frame could look like. Your first simple robot needs to be smaller than 18" x 18", must hold all the needed electronic components, and must have exactly 4 wheels and 2 motors. Brainstorm with your team and record your brainstorming in your notebooks.
3. Once you and your team have agreed on a design together, start building! Put together your robot carefully, and make sure to use the proper screws and bolts for each connection.
4. When your frame is built, take some time to watch the *Basic Electronics Tutorial*, and to review the "Wiring Diagram" image. Take good notes, and make sure you include a drawing of the wiring diagram. The wiring of your robot is essential to your robot working well.
5. Finally, get a set of the robot electronics from Mr. Benshoof. Take an inventory of what you are given to make sure that you can keep track of all your pieces.
6. Attach all your electronics to your robot.
7. Double check for the following common wiring mistakes:
 - a. None of the ports are blocked on any electronic piece
 - b. The battery has a stable place to be secured to your robot (It won't fall off)
 - c. The Robot Controller phone has a stable place to be secured to your robot (it won't fall off)
 - d. You can easily access the screen of the Robot Controller phone while it is on the robot

Part 1: Tasks	5 points	4-3 points	2-1-0 points
 Frame Notes	+ You took a full page of notes on the construction of FTC robots + Your notes include some brainstorms for frame design	- Your notes are less than a full page - Your notes do not include brainstormed ideas	- Very brief or no notes in your engineering notebook
	15-13 points	12-9 points	8-0 points
 Build a Basic Frame	+ You worked with your team to build a simple frame with 4 wheels and 2 motors	- Your robot is not complete or does not have 4 wheels and 2 motors	- Your robot is barely started
	5 points	4-3 points	2-1-0 points
 Electronics Notes	+ You took a full page of notes on the wiring of FTC robots + Your notes include a wiring diagram for the robot	- Your notes are less than a full page - Your notes do not include a wiring diagram	- Very brief or no notes in your engineering notebook
 Attach Electronics Components	+ Your robot contains the needed electronics + Electronics are attached in the right order	- Your robot is missing some essential electronics - Your wiring is out of order	- Your robot is not wired at all

