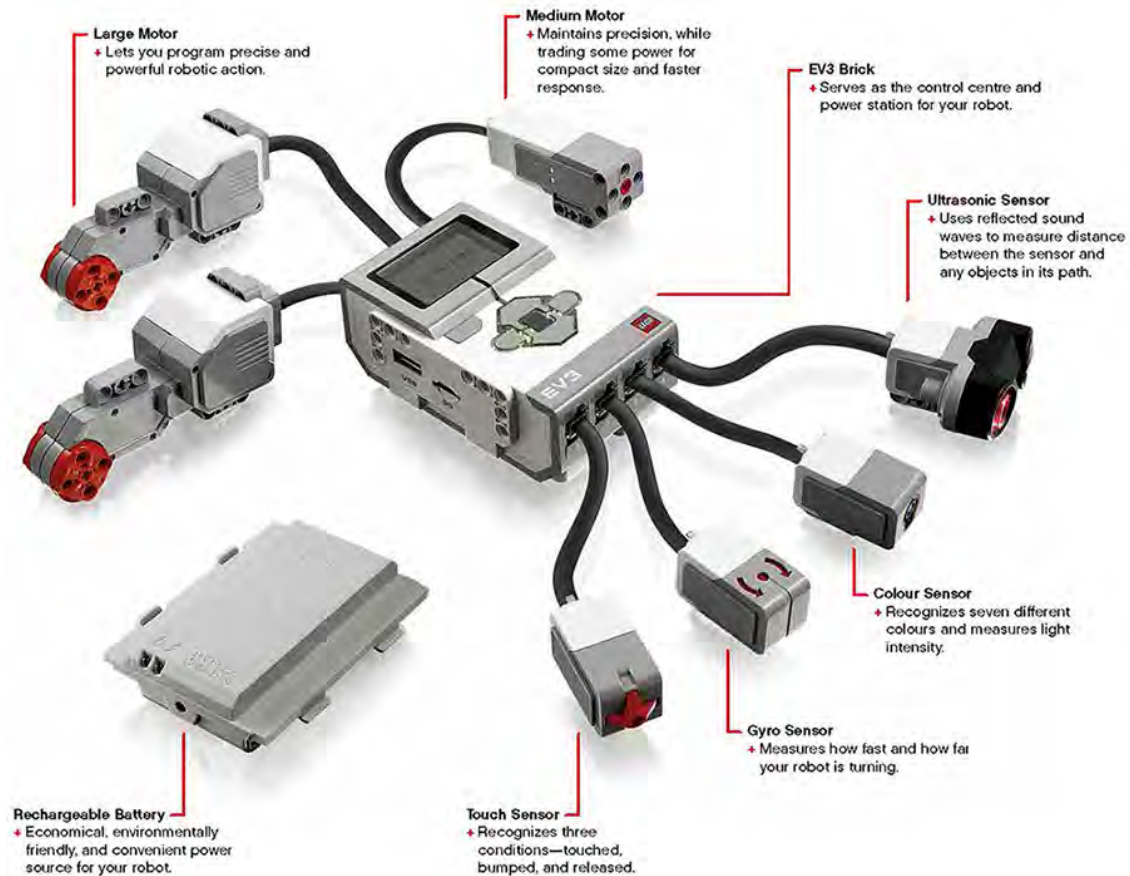# Lego Mindstorms EV3

Lego Mindstorms EV3 is for you, and if your child finds you playing with it you may have to share. Lego has certainly come a long way from the small multi-colored brick sets. The Lego Mindstorms Education EV3 Core Set costs $412 at the Lego Store (https://www.lego.com/en-us/mindstorms). What makes this exciting is the EV3 Brick and sensors.

The User Guide https://education.lego.com/en-us/support/mindstorms-ev3/user-guides available in several languages, lists device specifications showing just how sophisticated this "Toy" is.

EV3 Brick
- LINUX OS
- 300 MHz ARM chip set
- 16MB flash memory, 64 MB RAM memory
- USB port, mini-USB port. SD card port

Large Motor
- 160 rpm max, running torque 20 Ncm, stall torque 40 Ncm
- 1 degree rotational resolution for precise control

Light Sensor
- color sensor – recognizes 7 colors
- reflected light intensity, ambient light intensity

Gyro Sensor
- spin rate 440 rpm
- +/- 3 degree turn resolution

Note that the Brick has LINUX OS installed. You can set up a dual-boot configuration by installing a 2nd OS on a SD card. Several IDEs are available to allow coding the robot in Java, Python, Ruby, Swift, C, C++, SCRATCH, and others. A good starting point if you want to go down this path is
http://www.ev3dev.org/docs/programming-languages/

I spent about 10 hours looking at these alternative options. Unless you have several years of code writing experience in one of these languages, Lego's EV3 Programming IDE is best. My objective for Rheannon (and, kids that code) is to present programming concepts and not get bogged down with a particular language, which will be obsolete when they enter the workforce in 10-20 years. Lego's EV3 IDE runs within LabVIEW on a desktop computer and is also available for tablets. The download link is
https://www.lego.com/en-us/mindstorms/downloads

Now I had to make a second decision. What robot should I build? I got way ahead of my capabilities and started with Gyro Girl (well, actually named Gyro Boy, do a Google search). This uses the gyro sensor to build a robot that balances and moves on 2 wheels like the Segway. I then throttled back my enthusiasm, and decided to start off small. I didn't want to be like one of those analysts that posts on the Yahoo user group, "I'm new to LS-Dyna, why does my metal forming simulation error terminate? The error message says negative volume. Do you think it will run if I use ALE?"

Therefore, I decided to build a "getting started" robot. It has 2 drive wheels using the large motors and a single rear wheel for support. All 4 sensors that come with the core kit are installed. This provides a platform to experiment with as I write code to activate the various sensors to direct the robot to perform various tasks. I will report on my experience next week.