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# **Mindstorm Documentation**

***Release 0.1***

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## ABOUT THIS WEB PAGE

This Web page contains some resources for the 2015 Lego Mindstorm FLL used by the Lakeview Lions.

The contents of this page is available in different formats. This includes

- [HTML](#) (this page)
- PDF
- epub

The contents of this page is maintained on [github.com](#). Please send suggestions for improvements to [<laszewski@gmail.com>](mailto:laszewski@gmail.com).



## FIRST LEGO LEAGUE

This years FLL is all about trash. There are a number of Web pages dedicated to this effort. This includes:

- [First Lego League](#)
- [Team resources](#)

Videos:

- [Introduction Video](#)
- [Project Video](#)
- [Robot Challenge](#)

Building Instructions:

Included is a set of buliding instructions for the FLL Trash chalange:





## TRASH CHALLENGE LINKS

- [IU Sustainability programs](#)
- [EPA summary on waste generation in the U.S.](#)



## ROBOT

There are many cool designs for robots that we need to explore to master the FLL challenges. One such Robot that seems to be very useful is a robot called Sirius. The Building instructions are available as

- HTML Instructions
- LXF File
- Video

The person that designed this robot has a Youtube Channel:

- [https://www.youtube.com/channel/UCuXq-jiU0ANeBcF\\_Tvq1D7g](https://www.youtube.com/channel/UCuXq-jiU0ANeBcF_Tvq1D7g)

Attachments are also Available

- Doggear: (Video) <<https://www.youtube.com/watch?v=NZbt3tnySyI>>
- Wormgear (Video) <[https://www.youtube.com/watch?v=TQ9hQ\\_ZXwmM](https://www.youtube.com/watch?v=TQ9hQ_ZXwmM)>

Possible useful ideas to build attachments include:

- Forklift Attachment 1 (Video) <<https://www.youtube.com/watch?v=7hVOOGAGsKY>>
- Forklift Attachment 2 (Video) <<https://www.youtube.com/watch?v=5XwFTzPuSJs>>



## SOFTWARE

### 5.1 LDD

A free lego design program allowing you to build and view 3D lego instructions on your MAC, PC, or ipad is available at

- <http://ldd.lego.com/>

We recommend that you download this program so you can view the LXF instructions conveniently. Once you start the program, you have different views, one of them is the build view that allows you to see a step by step guide on how to build the robot. The computer instructions are superior in contrast to the paper printed instructions.

We found however that the instructions may be different on different computers. We suggest that you find an easy to follow set. In order to provide one such set for a robot such as sirius, we have included them in html format in another section of this document.

### 5.2 Free Lego Programming software

The free Lego software that runs the robot can be found on the lego site:

- <http://www.lego.com/en-us/mindstorms/downloads/download-software>

You can download the software for free on your PC or Mac and explore how the basics of programming work. This program provides an easy to use drag and drop visual programming graphical user interface.

The software does unfortunately not run on iPads or tablets. However there seems to be an educational version that may be able to do that. However the version costs \$99. Due to the small screen size of tablets this may not be that useful. If you have experience with it, please let us know.

### 5.3 Simulator (Under investigation)

There are two lego simulators available that allow the use of a simulator to learn how to program.

- TODO: put link here
- TODO: put link here

Either of them cost \$50 and do not require the robot set. That means you can simulate a robot and its behavior on the computer. We do not have any experience in using them, so if you have experience with them send me a mail.



## MINDSTORM SETS

There are two lego robot mindstorm sets available they are

- [Home Eddition:](#)
- [Educational Edition:](#)

The differences between the sets are explained [here](#) and [here](#)

In summary the education set includes:

- [Rechargeable battery pack and charger](#) (normally \$60 and \$25)
- [Gyroscope](#) (\$30)
- [Ultrasonic distance sensor](#) (\$30)

The education set does not include:

- [Infrared Sensor](#) (\$30)
- [Infrared Remote](#) (\$30)
- Software

Software may be additional \$99 but you can also use the free software. We are not yet sure about the programability of the Gyro sensor.

We list some additional useful links:

- [Lego Mindstorm educational store](#)

EV3 search from lego site:

- <http://search-en.lego.com/?q=ev3>

NXT search from lego site:

- <http://search-en.lego.com/?cc=US&lang=2057&q=nxt>





## ADDITIONAL INSTRUCTIONS

- BI 3006/48 - 31313 - Download size: 11.55 Mb

### Extra Building Instructions

- <http://www.lego.com/en-us/mindstorms/build-a-robot> (see bellow, 5 instructions)
- <http://www.lego.com/en-us/mindstorms/build-a-robot/rac3-truck> (see bellow 12 instructions)
- EV3RSTORM - Download size: 51.81 Mb
- GRIPP3R - Download size: 51.35 Mb
- R3PTAR - Download size: 38.96 Mb
- TRACK3R - Download size: 29.49 Mb
- SPIK3R - Download size: 38.5 Mb
- BANNER PRINT3R - Download size: 15.03 Mb
- BOBB3E - Download size: 13.19 Mb
- DINOREX - Download size: 31.21 Mb
- EL3CTRIC GUITAR - Download size: 12.71 Mb
- EV3 GAME - Download size: 8.78 Mb
- EV3D4 - Download size: 17.09 Mb
- EV3MEG - Download size: 12.17 Mb
- KRAZ3 - Download size: 19.75 Mb
- MR B3AM - Download size: 14.76 Mb
- RAC3 TRUCK - Download size: 14.99 Mb
- ROBODOZ3R - Download size: 16.01 Mb
- WACK3M - Download size: 18.17 Mb