



FIRST® LEGO® League **Links & Resources**

LEARNING

EV3 Lessons

<http://ev3lessons.com/>

Excellent resources for both NXT and EV3, as well as information about FLL competitions, judging, etc. There are a number of robot designs, too. All resources on the site are free.

FLL Tutorials

<http://flltutorials.com/>

This is a companion site to the EV3 Lessons site (above). It has robot designs and programming lessons, as well as information about the FLL program, running a team and participating at an FLL competition. In particular, you may want to check out the worksheets created each season: <http://flltutorials.com/Worksheets.html>.

Dr. Graeme

<http://drgraeme.net/>

<http://www.docgraeme.com/>

<https://drgraemetutor.com/>

<https://drgrae.me/>

<http://www.drgraeme.org/>

Dr. Graeme Faulkner is well-known in the LEGO community and, as you can tell from the numerous websites above, has produced many tutorials/e-books/etc.

Anton's MINDSTORMS Hacks

<https://www.antonsmindstorms.com/>

Not focused on FLL, per se, but lots of cool tips and tricks related to the LEGO MINDSTORMS hardware and software. There is a corresponding YouTube channel with videos:

<https://www.youtube.com/channel/UCoNL918PAT8zu2i0OQA4-Cg>.

TechBrick

<https://techbrick.com/>

TechBrick posts a number of worksheets and other tools each season to help with planning, strategizing and creating code.

Carnegie Mellow Robotics Academy — LEGO® EV3: Introduction to Programming

http://education.rec.ri.cmu.edu/previews/ev3_products/ev3_curriculum/

The online version of the curriculum is free. Additionally, you can download the Teacher's Guide as a PDF file:

<http://education.rec.ri.cmu.edu/wp-content/uploads/2015/03/EV3-teachers-guideWEB.pdf>

LEGO® Engineering

<http://www.legoengineering.com/>

Lots of resources, including lessons, worksheets, etc.; some resources require a login (registration) and confirmation of an education (.edu) email, but no fee.

FLL Casts

<http://fllcasts.com/>

Lots of resources, but best videos and instructions require subscription; there are still a number of free resources, especially reference material.

Texas Tech University — LEGO® MINDSTORMS Education EV3

<http://www.depts.ttu.edu/coe/stem/gear/ev3/>

A little dated, but another resource for basic EV3 lessons.

TECHNICAL

LEGO® MINDSTORMS EV3 Brick 101: A Complete Overview

[article on Fun Code for Kids]

<https://www.funcodeforkids.com/lego-mindstorms-ev3-brick-101-a-complete-overview/>

Great summary of the brick, its features, its specifications, its ports, etc.

Philo

<http://www.philohome.com/>

Detailed technical information about LEGO parts, including a motor performance comparison:

<http://www.philohome.com/motors/motorcomp.htm>.

PARTS

LEGO® Pick A Brick

<https://shop.lego.com/en-US/page/static/pick-a-brick>

This is the official LEGO parts shop. It's a good place to start if you need a specific part. If the part is older (i.e., no longer produced), you may need to use one of the part resellers listed below.

LEGO® Education Shop

<https://education.lego.com/en-us/shop>

Beyond the main (retail) shop (<https://shop.lego.com/en-US/>), you may want to check out the Education shop for some parts which are considered “education-specific” by LEGO. As an example, the Pneumatics Add-on Set (Part # 9641) can only be found here within the LEGO website/store(s).

Brick Link

<https://www.bricklink.com/>

An excellent and exhaustive marketplace for LEGO pieces. Note that the site itself does not sell pieces; it is simply a marketplace for third-party vendors.

Brick Owl

<https://www.brickowl.com/>

Another comprehensive marketplace for LEGO pieces. Note that the site itself does not sell pieces; it is simply a marketplace for third-party vendors.

Brickset

<https://brickset.com/>

A great database for finding/identifying pieces.

COLLABORATION

FIRST® LEGO® League Share and Learn Public Group (Facebook)

<https://www.facebook.com/groups/FLLShareandLearn>

Popular forum for teams to collaborate, ask questions and share ideas.

BOOKS

Winning Design!: LEGO® MINDSTORMS EV3 Design Patterns for Fun and Competition (2nd Edition) by James Jeffrey Trobaugh

<https://smile.amazon.com/dp/1484221044/>

The 1st edition of this book (Winning Design!: LEGO MINDSTORMS NXT Design Patterns for Fun and Competition) for the older NXT system is fantastic, and this update for the EV3 should be equally helpful. The original covered all facets — not only the technical aspects of building and programming, but also game strategy and explaining your design to the Judges. It is an excellent place for a new coach to start, while offering ways for veteran coaches to take it to the next level.

The LEGO® MINDSTORMS EV3 Discovery Book: A Beginner's Guide to Building and Programming Robots (1st Edition) by Laurens Valk

<https://smile.amazon.com/dp/1593275323/>

This is a good starting point for those trying to learn how to build and program EV3 robots. It has many colorful pictures and clear examples of program codes.

The Art of LEGO® MINDSTORMS EV3 Programming (1st Edition) by Terry Griffin

<https://smile.amazon.com/dp/1593275684/>

Another book that provides examples of program code. It also has colorful and clear examples, making it is easy to read and follow.

Programming LEGO® EV3 My Blocks: Teaching Concepts and Preparing for FLL® Competition (1st Edition) by Gene Harding

<https://smile.amazon.com/dp/1484234375/>

A little denser than the books above, but it continues down the path of learning how to program with a focus on My Blocks (subroutines you can custom create in the MINDSTORMS software). On the plus side, it has an FLL perspective, as opposed to just generic information.

Your guide to Excel in FIRST® LEGO® League: Robot Architecture, Design, Programming and Game Strategies by Sanjeev Dwivedi and Rajeev Dwivedi

<https://smile.amazon.com/dp/1975760751/>

This book definitely is denser than the ones above; however, it is focused on FLL and contains many interesting insights, especially in regard to how a robot moves/drives/navigates.

The LEGO® MINDSTORMS EV3 Idea Book: 181 Simple Machines and Clever Contraptions (1st Edition) by Yoshihito Isogawa

<https://smile.amazon.com/dp/1593276001/>

This book has nothing to do with FLL; however, it provides wonderful insights and ideas about mechanical design for your robot. It is especially helpful in designing non-motorized (think: rubber bands, etc.) subsystems for your robot.

MISCELLANEOUS

FIRST® Fundraising Toolkit

<https://www.firstinspires.org/resource-library/fundraising-toolkit>

While targeted at FTC and FRC teams (that have greater fundraising needs), this is a good resource for FLL and FLL Jr teams, too.

LEGO® Parts Organization and Inventory Storage for LEGO® MINDSTORMS EV3 Education Kit for *FIRST*® LEGO® League by Timothy Ewers

<https://drive.google.com/drive/folders/1xqDN2RW2u6gv1cf6Xbcn-kp0Z14L2vds>

Timothy Ewers, a professor at the University of Idaho, created a system for storing the contents of the EV3 kit (the “core” kit and the “expansion” set) received by FLL teams. It is extraordinarily helpful to both new and veteran teams, and it is highly recommended.

Clip for LEGO® Education Boxes

<https://www.thingiverse.com/thing:2153729>

If you worry about the lid on your LEGO Education boxes (for both NXT and EV3 kits) popping off in transit and spilling your precious LEGO pieces, this is a 3-D printable clip to secure the lid.