

THE EVOLUTION OF A REVOLUTION

The launch of LEGO® MINDSTORMS® Education in 1998 fundamentally changed the world of popular and educational robotics. Teachers everywhere experienced how the power of hands-on robotics technology helped to engage and motivate students across a wide range of science, technology, engineering, and mathematics subjects. Millions of students and three generations of technology later, LEGO Education continues to lead the way in educational robotics, with the LEGO MINDSTORMS Education EV3 to inspire a whole new generation of students worldwide.



DID YOU DID YOU KNOW...

The unique LEGO Education teaching methodology is based on Swiss developmental psychologist Jean Piaget's constructivist learning theory?

8

LEARNING

Powered by LEGO® MINDSTORMS® Education

Ignite student engagement and energize learning through real-life problem solving. Engage your students in computer science, science, technology, engineering, and mathematics. Boost learning and help all your students reach their curriculum targets. With the LEGO® MINDSTORMS® Education hands-on, minds-on approach, the only challenge you'll have is getting your students to leave the classroom after class!

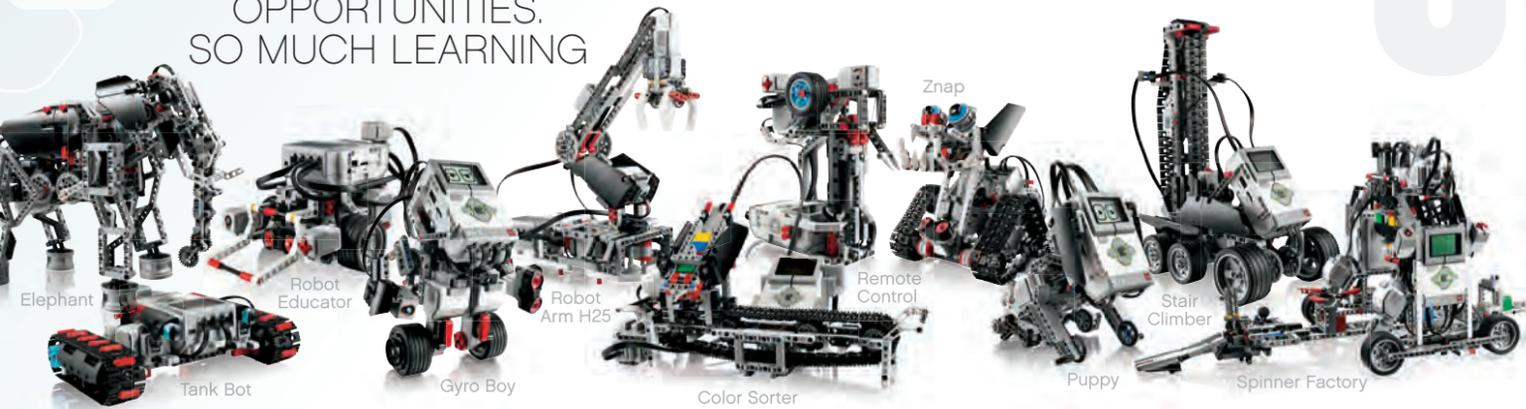
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SO MANY OPPORTUNITIES. SO MUCH LEARNING



RO-BOTICA

ROBOTICA EDUCATIVA & PERSONAL

www.ro-botica.com

FOR MORE INFORMATION VISIT

LEGOeducation.com/MINDSTORMS

COMPUTER SCIENCE • SCIENCE • TECHNOLOGY • ENGINEERING • MATH

LEGOeducation.com

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EVERYTHING YOU NEED TO ACHIEVE YOUR TEACHING GOALS ...

BASED ON EASY-TO-USE ROBOTICS TECHNOLOGY, THE ENGAGING LEGO® MINDSTORMS® EDUCATION EV3 PLATFORM PROVIDES AN INSPIRING FULL TEACHING SOLUTION.

SOFT & HARDWARE

INSPIRATIONAL HARDWARE

Core set based on robotics technology for great learning via hands-on building experience.

- Intelligent EV3 brick
- Three motors
- Five sensors
- Plenty of LEGO Technic elements for sturdy building
- Durable, safe, and very versatile



INTUITIVE SOFTWARE

Programming and data logging made easy through software optimized for the classroom.

- Easy to learn, use, and understand
- Simple drag-and-drop programming
- Extensive data logging for science experiments
- Comprehensive user guide and 48 step-by-step tutorials



... JUST ADD STUDENTS

DID YOU KNOW ...

... that Coventry University, UK, uses LEGO MINDSTORMS Education to help teach Computer Architecture, Pythagorean Theorem, and Trigonometry?

KEY LEARNING VALUES

- Brainstorm to find creative alternative solutions
- Develop solutions, select, build, test, and evaluate
- Learn to communicate, share ideas, and work together
- Hands-on experience with sensors, motors, and intelligent EV3 brick



AS JEAN PIAGET SAID... TO UNDERSTAND IS TO INVENT

In his seminal work "Mindstorms: Children, Computers, and Powerful Ideas," Piaget adherent Seymour Papert states that children can learn to use technology in such a way that it changes how they learn about everything else. This means that students not only engage with and retain knowledge about subjects in which they excel, but – crucially – also in those subjects that they previously would have seen as difficult or abstract.

CURRICULUM & TOOLS

CURRICULUM-RELEVANT TEACHING MATERIAL

Engaging content that meets your national standards.

- Suitable for teaching one week, one semester, or several years
- Meets computer science, science, technology, engineering, and mathematics standards
- Includes suggested lesson plans
- No prior robotics or LEGO knowledge needed



CONTENT EDITOR FOR ACHIEVING MORE!

The Content Editor integrated into the software makes it easy for you to edit all content – or to create your own.

- Customize all curriculum material
- Meet your specific teaching requirements
- Edit or create content for differentiated teaching
- Be inspired by others



DIGITAL WORKBOOKS FOR STUDENTS!

Your students capture their work directly inside the content, creating their own digital workbook.

- An integrated digital learning experience
- One place for all student information, guidance, and support
- Students can add text, images, web links, video and audio files
- Makes assessment and sharing easy



TRAINING & SUPPORT

PROFESSIONAL DEVELOPMENT

Full-course program tailored toward your specific needs.

- Dedicated to help you succeed
- Focused on classroom implementation
- Developed by teachers for teachers
- Conducted by certified trainers



COMPREHENSIVE SUPPORT AND INSPIRATION

Because you can never know enough.

- Software and content:
- Getting started section
 - Lesson plans
 - Teacher notes and guides
 - Solution examples
 - Tips and Tricks

- Online:
- Network with other teachers
 - Share content, view content
 - FAQs and software updates
 - Tips, tricks, and inspiration



COMPETITIONS

ROBOTICS COMPETITIONS

Take your students to the next level through engaging, real-world challenges.

- Boost student interest in science and technology
- Powers 21st century learning skills
- Learn, collaborate, and share the excitement
- Build life skills and self-confidence
- You can tell who has participated



**YOU DID NOT
YOU KNOW ...**
... that LEGO® MINDSTORMS® Education is used from upper primary school and all the way through-out university?

WHATEVER YOU WANT TO TEACH ...

“IF WE CAN TEACH SIMPLE BASIC TROUBLESHOOTING AND PROBLEM-SOLVING ABILITY TO OUR STUDENTS THROUGH THE USE OF ROBOTICS, THEY DON'T HAVE TO GROW UP TO BE ROBOTICS EXPERTS, THEY DON'T EVEN HAVE TO BE IN THE FIELD OF SCIENCE, TECHNOLOGY, ENGINEERING, AND MATH. PROBLEM SOLVING IS A UNIVERSAL SKILL.”

*Timothy Burns,
St. Luke School, USA*



COMPUTER SCIENCE

Programming for real. Intuitive, simple icon-based programming language and tools that encourage solutions design using algorithmic problem solving.

Example: Define an algorithm to measure and control behavior and process.



SCIENCE

Learning by doing. Support classroom teaching by using LEGOMINDSTORMS Education to collect real-time data to verify a hypothesis.

Example: Carry out experiments designed to determine melting points – collect data samples with the temperature sensor and track and plot the results using the intuitive graphing environment.



TECHNOLOGY

Actively engage students. Explore real-life application of technology to make analogies, identify relationships, predict outcome, analyze data, and draw conclusions.

Example: Explore design and functionality by building and programming the LEGO MINDSTORMS Education EV3 to carry out controlled actions.



ENGINEERING

From idea to working prototype. Engage your students in practical, open-ended Engineering challenges and open-ended problem solving.

Example: Carry out a design process, from brief through testing and analysis to creating functional prototypes that can be easily modified to achieve design goals.



MATHEMATICS

Bringing numbers alive. LEGO MINDSTORMS EV3 is an ideal way to explore mathematical problems for real, making abstract concepts tangible and concrete.

Example: Calculate the wheel circumference of your robot. Then program the robot to move a specific distance using the rotation sensor feedback multiplied by the circumference.

... WE'VE INCLUDED ALL THE HARDWARE YOU NEED!

CORE SET

BUILD, PROGRAM, AND LEARN USING REAL-LIFE ROBOTICS TECHNOLOGY

At the heart of the LEGO MINDSTORMS Education Core Set is the EV3 brick, the programmable intelligent brick that controls motors and sensors, as well as providing wireless communication. (Wi-Fi and Bluetooth)

FEATURES INCLUDE

- Sturdy storage box and sorting tray for easy classroom management
- Building instructions
- Three motors and five sensors
- Rechargeable battery
- Large collection of carefully selected LEGO elements.



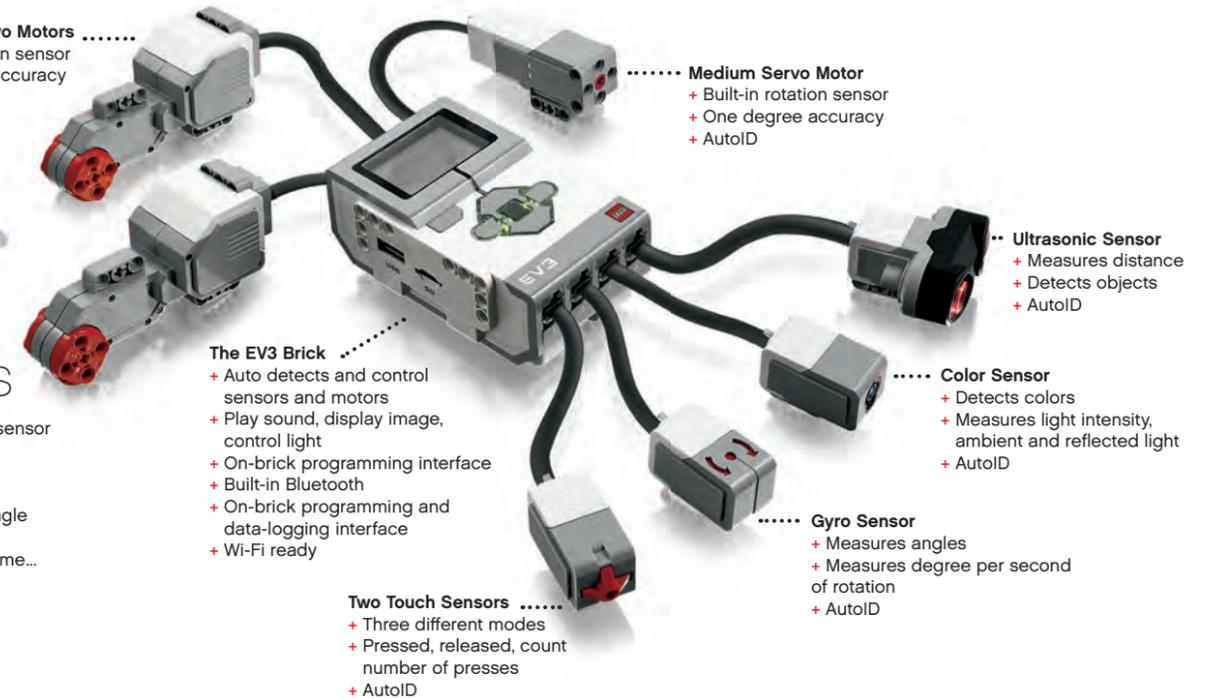
Two Large Servo Motors

- + Built-in rotation sensor
- + One degree accuracy
- + AutoID



EXTRAS

- + Temperature sensor
- + IR sensor
- + IR beacon
- + Wi-Fi dongle
- + Bluetooth dongle
- + Transformer
- And more to come...



Medium Servo Motor

- + Built-in rotation sensor
- + One degree accuracy
- + AutoID

Ultrasonic Sensor

- + Measures distance
- + Detects objects
- + AutoID

Color Sensor

- + Detects colors
- + Measures light intensity, ambient and reflected light
- + AutoID

Gyro Sensor

- + Measures angles
- + Measures degree per second of rotation
- + AutoID

Two Touch Sensors

- + Three different modes
- + Pressed, released, count number of presses
- + AutoID

The EV3 Brick

- + Auto detects and control sensors and motors
- + Play sound, display image, control light
- + On-brick programming interface
- + Built-in Bluetooth
- + On-brick programming and data-logging interface
- + Wi-Fi ready



EXPANSION SET

BUILD BIGGER MODELS WITH MORE FUNCTIONS

Take your robot builds to the next level with a wide range of elements that allow you to build and program LEGO MINDSTORMS Education models with even more functions than ever before. Building instructions for several models available. See more at LEGOeducation.com/MINDSTORMS



BACKWARDS COMPATIBILITY

LEGO MINDSTORMS Education EV3 uses the same LEGO Technic elements and RJ12 connector cables as the LEGO MINDSTORMS Education NXT, so all your existing sensors, motors, and building elements will work with the new EV3 platform – you can even program your NXT brick using the new EV3 software!*



EVERYTHING YOU NEED ... JUST STEP INSIDE



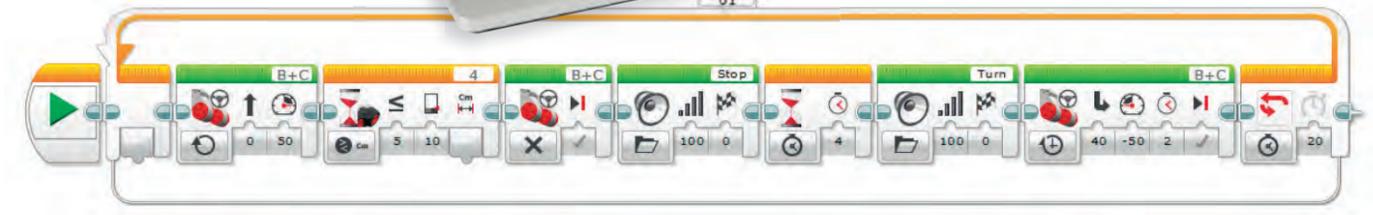
INTUITIVE ICON-BASED PROGRAMMING

FULL OF CHALLENGING POSSIBILITIES



The LEGO MINDSTORMS Education EV3 software is based on LabVIEW, the industry-leading graphical programming language used by scientists and engineers worldwide. Our software is optimized for classroom usage and follows the very latest developments in intuitive software design, which results in an extremely user-friendly interface.

- Easy to learn, use and understand
- Intuitive drag-and-drop programming
- From simple to complex programs
- Comprehensive teacher guide



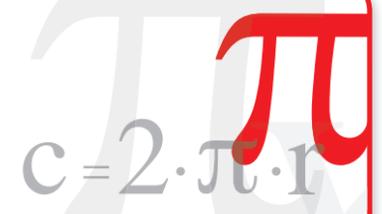
WELCOME TO THE LOBBY

THE INSPIRING ENTRY POINT, GIVING YOU EASY ACCESS TO CONTENT, PROGRAMMING, DATA LOGGING, DIGITAL WORKBOOKS – EVERYTHING.

Just enter the LEGO® MINDSTORMS® Education Lobby to find everything you need to achieve your teaching goals. It's designed to make it easy for you and your students to access, organize and preview content. The Lobby also makes it easy to locate and work with the software – and everything that you do, add, or change is stored, ready for your next visit!



UP AND RUNNING IN LESS THAN 45 MINUTES



FOLLOW THE ROBOT EDUCATOR AND YOU'LL BE ABLE TO CREATE, PROGRAM, AND RUN A ROBOT IN JUST ONE CLASSROOM LESSON.

Robot Educator is the name of both the basic robot and the tutorials you will find in the software.

The Robot Educator is a very simple, very quick-to-build robot that students will have in their hands, ready to learn the basics of robotics. It is the robot that introduces the student to the world of robotics.

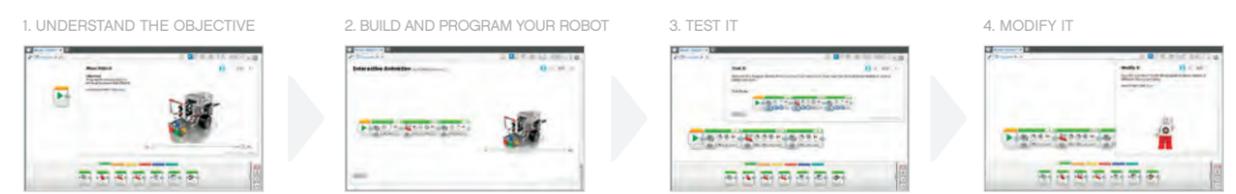
The Robot Educator learning tool is designed to take you and your

student's through the essentials of programming, data logging, and hardware. It does so in a structured and engaging way, ensuring that everyone is constructing, programming, and experimenting within a minimum of time.

With the Robot Educator, the students will learn "how to robot," and then use their "robot to learn."

TUTORIAL FLOW

48 step-by-step tutorials • An essential guide to the programming language and hardware functionalities
Up and running in one classroom session • One robot with endless learning opportunities

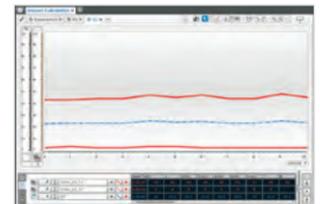


DATA LOGGING

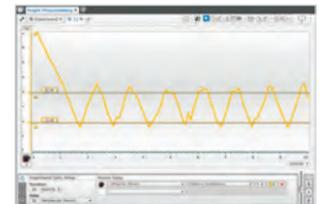
POWERFUL SCIENCE TOOL FOR SCIENTIFIC INQUIRY-PREDICT, COLLECT, ANALYZE, AND CALCULATE DATA AND CARRY OUT EXPERIMENTS.



- DATA LOGGING**
- Predict, collect, and analyze
 - Log data and view live graphs
 - Basic and advanced analysis tools
 - Easily export data to spreadsheets



- DATASET CALCULATION**
- Unique calculator interface
 - Three dataset average
 - From one value to another
 - From rotational counts via speed to acceleration



- GRAPH PROGRAMMING**
- Execute actions based on data readings
 - Unique new LEGO feature
 - Makes science experiments come alive
 - Increase student understanding of graphs/data



AS CLOSE AS IT GETS TO REAL LIFE

Your students are using the same software used by scientists and engineers worldwide – imagine middle school science today – rocket science tomorrow.

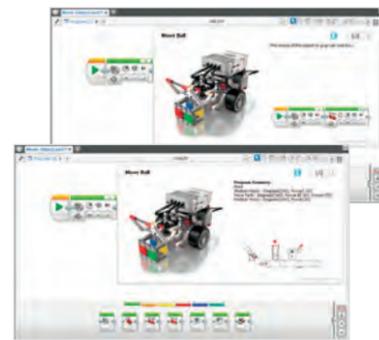


FOR ALL - SEAMLESS CURRICULUM INTEGRATION

DIGITAL CONTENT AND SOFTWARE SEAMLESSLY INTEGRATED INTO ONE WORKSPACE. NO NEED TO SWITCH BETWEEN COMPUTER SCREENS AND BOOKS TO FOLLOW OR WORK ON ASSIGNMENTS, MAKING SURE CONTENT IS IN FOCUS AND THAT STUDENT FOCUS IS ON THE SCREEN. JUST CLICK THE TEACHER ICON AND YOU HAVE FULL TEACHER NOTES AS PART OF THE CONTENT.

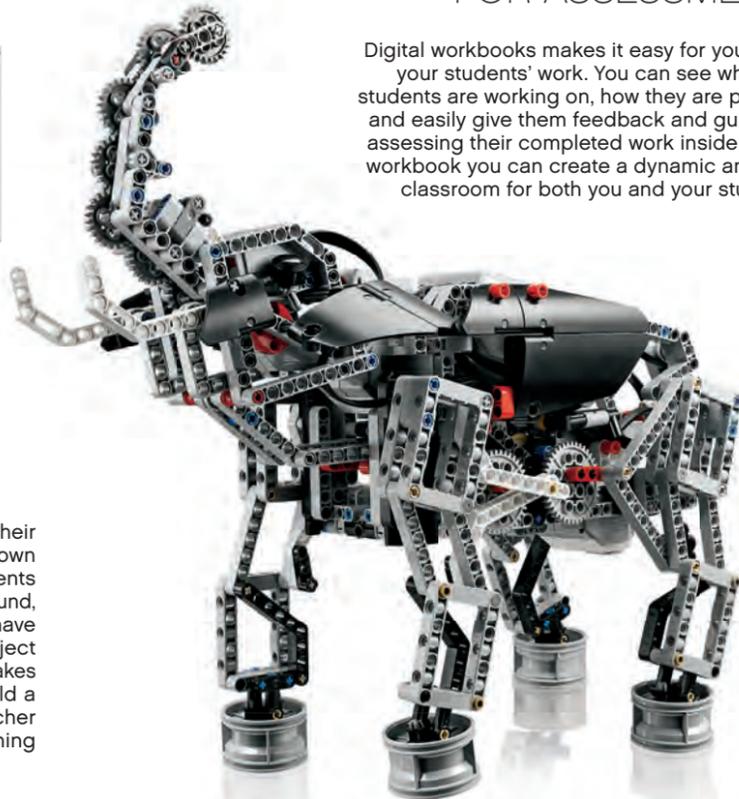
FOR YOU - CONTENT EDITOR

All of our content is fully editable. The Content Editor tool allows you, the teacher, to easily edit our content, adapt and customize it – or simply create your own. You can create activities and tasks targeted directly at your students' needs – offering your class the level of differentiated teaching you want it to have. Feel free to customize by changing text, images, videos, sound, and deleting or adding pages. You decide.



FOR ASSESSMENT

Digital workbooks makes it easy for you to assess your students' work. You can see what your students are working on, how they are progressing, and easily give them feedback and guidance. By assessing their completed work inside the digital workbook you can create a dynamic and creative classroom for both you and your students.



FOR YOUR STUDENTS - DIGITAL WORKBOOKS

The Content Editor lets your students capture their work directly inside the content, creating their own digital workbook! Students write their assignments directly in the workbook by adding text, images, sound, video, etc, making it their personal project. They have plenty of opportunities to create inspiring project reports and document their work. The workbook makes it easy for students to present their work, to build a portfolio of projects, and to share it with the teacher for assessment. A truly integrated digital learning experience.

DESIGN ENGINEERING PROJECTS

DO YOU KNOW HOW MANY OF TOMORROW'S SCIENTISTS AND ENGINEERS ARE IN YOUR CLASSROOM?

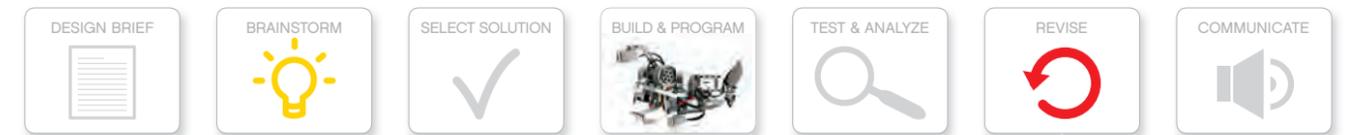
Let your students work with open-ended problem-solving activities, in a context that makes it fun and engaging to learn and use Science, Technology, Engineering, and Mathematics. The Design Engineering Projects science and mathematics concepts with soft skills, such as creative thinking, problem solving, teamwork and communication skills, boosting 21st century learning skills.

All projects follow a design engineering

process as used by engineers in various industries. The design engineering process provides a structured flow throughout the activities

Students are guided through the process, beginning with a design brief that explains the challenge. Videos of robots in action are used to make real-life connections. The students build, program, test and revise, and finally, they communicate their solution in the final project, which can be shared and

presented. Throughout the process, students gain and use knowledge of science, technology, and mathematics as they engineer a solution. Students capture their work as they move along in the built-in digital workbook, making it easy for you to follow their progress and to assess their work.



MAKE IT MOVE

Students are challenged to design, build, and program robots that move using motors with rotation sensors. In five projects students apply mathematics and science knowledge to create robots that measure distance, measure speed, move without using wheels, maximize power to move up an incline, and move and turn to create regular polygons. Students will also apply their knowledge of simple and complex machines and use ratios to describe proportional relationships.

MAKE IT SMARTER

Students are challenged to add sensors to their robots to control behavior and to measure, graph, and analyze sensor data. In five projects, students develop robots that use sensors to measure ambient and reflected light, distinguish specific colors, measure distance from an object, recognize a touch sensor state (pressed or not pressed or pressed and released), and measure angular displacement or rate of change.

MAKE A SYSTEM

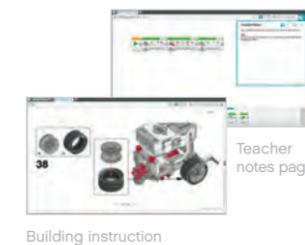
Students are challenged to design, build, and program robotics systems built from subsystems. In five projects, students develop systems that move a ball, pick up and place objects, simulate manufacturing, sort colors, and communicate their location. Students test their system, gather data, and use that evidence to engineer system optimizations and improvements.

COMING SOON

JOIN US IN SPACE

NASA is currently developing three cross-curricular, exciting, real-life challenges that students will be invited to solve in the next curriculum pack!

- YOUR CHANCE TO
HELP NASA REACH
NEW HEIGHTS!



Building instruction



Sample program solution for teacher

TEACHING RESOURCES

ALL THE SUPPORT YOU NEED FOR A SAFE, YET FLEXIBLE, ROUTE THROUGH THE CURRICULUM PACK, INCLUDING:

- Extensive teacher notes
- Tips, tricks, and ideas for further activities
- Full solution examples with explanations
- Videos of solution models
- Easy-to-follow building instructions
- Programming examples
- Digital student worksheets



ALL THE TRAINING AND SUPPORT YOU NEED ... ALL JUST A CLICK AWAY

LEGO® EDUCATION ACADEMY WORKSHOPS
Learn to use LEGO® MINDSTORMS® Education for teaching your subject. The training introduces you to the entire LEGO MINDSTORMS Education EV3 solution – matched to your needs and requirements – ensuring your success in the classroom.

- All courses cover:
- Hands-on lessons to take back to school
 - Hardware and software overview
 - Curriculum coverage in an exciting way
 - Lesson planning
 - Classroom management
 - Customizable activities
 - 21st Century Learning
- All courses are conducted by certified trainers

PROFESSIONAL SOCIAL MEDIA
Join our Teacher-to-Teacher Forum and work together with your peers to create and share ideas online – visit LEGOeducation.com/MINDSTORMS

SUPPORTING YOU WORLDWIDE
Visit LEGOeducation.com/MINDSTORMS for comprehensive online support, FAQ, and software updates or talk to your local LEGO MINDSTORMS Education partner.

CHALLENGE YOUR STUDENTS

TO BECOME TOMORROW'S INNOVATORS

Get your students thinking like real scientists and engineers! Enter them in the LEGO Education-supported FIRST® LEGO League and World Robot Olympiad – and watch as they gain invaluable knowledge, life skills, and increased self-confidence!

FIRST® LEGO LEAGUE – SPORT FOR THE MIND™
FIRST LEGO League (FLL®) is enquiry-based, cross-curricular learning at its best! Every year, more than 200,000 children in 70 countries compete in FLL.

Find out how you can successfully challenge your students to take part at firstLEGOleague.org.

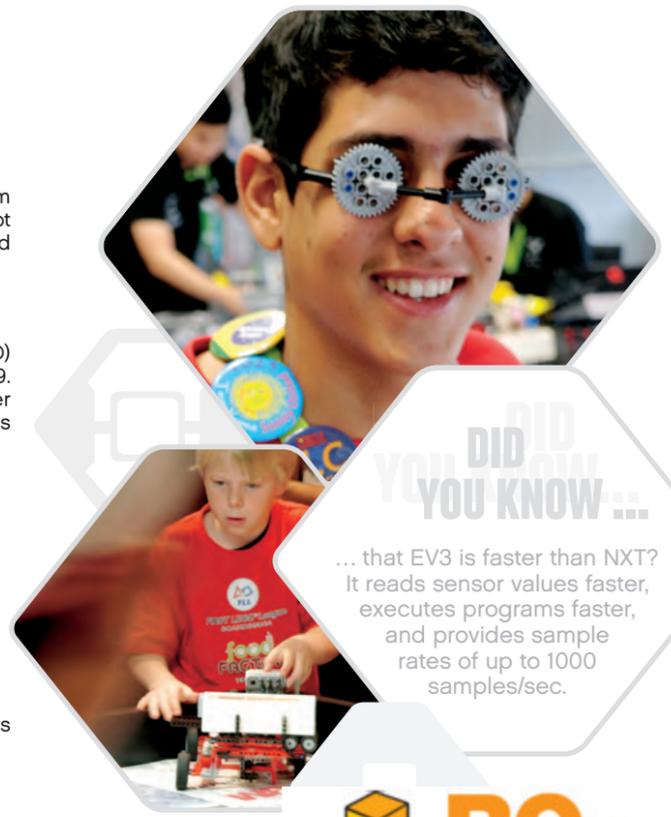


*Ages 10-16/9 -14 in USA/CAN. FIRST® is a registered trademark of the United States Foundation for Inspiration and Recognition of Science and Technology. FIRST LEGO League, FLL and the FLL logo are jointly held trademarks of FIRST and the LEGO Group.

WORLD ROBOT OLYMPIAD
The World Robot Olympiad (WRO) is targeted at children aged 9 – 19. Taking place in 40+ countries, over 50,000 students compete across three exciting categories:

- Regular – Design and programming solving challenging, fun tasks
- Open – Create theme-based solutions
- WRO GEN II Football – Compete in an action-packed robot football tournament

Find out how to get your students involved at wrobo.org.



DID YOU KNOW ...
... that EV3 is faster than NXT? It reads sensor values faster, executes programs faster, and provides sample rates of up to 1000 samples/sec.



STRONG ECOSYSTEM INCLUDED

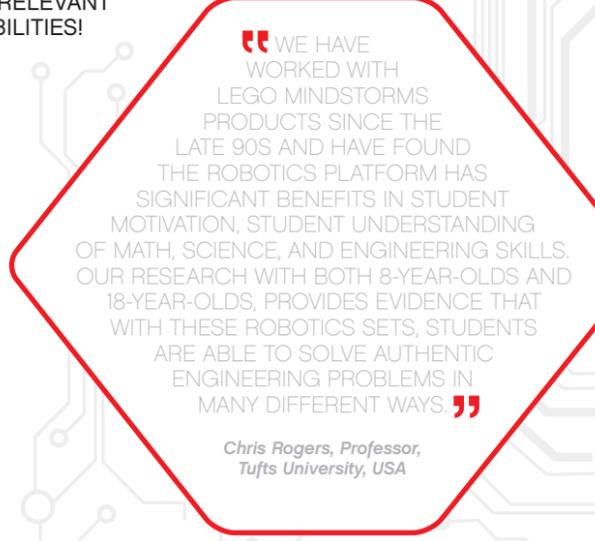
LEGO MINDSTORMS EDUCATION IS SURROUNDED BY A STRONG ECOSYSTEM ENSURING RELEVANT PRODUCTS AND EVEN MORE POSSIBILITIES!

DEVELOPING WITH TEACHERS FOR TEACHERS

LEGO Education works closely with lead users, teachers, and educational experts worldwide to ensure that LEGO MINDSTORMS Education is always relevant and useful inside the classroom.

MORE TEACHING OPPORTUNITIES!

Looking for different sensors for your experiments, like an accelerometer, PH sensor, or...? Looking for other programming languages, like Labview, RobotC, Java, or ...? Check out our website and see how the ecosystem can help you reach your teaching goals.



“ WE HAVE WORKED WITH LEGO MINDSTORMS PRODUCTS SINCE THE LATE 90S AND HAVE FOUND THE ROBOTICS PLATFORM HAS SIGNIFICANT BENEFITS IN STUDENT MOTIVATION, STUDENT UNDERSTANDING OF MATH, SCIENCE, AND ENGINEERING SKILLS. OUR RESEARCH WITH BOTH 8-YEAR-OLDS AND 18-YEAR-OLDS, PROVIDES EVIDENCE THAT WITH THESE ROBOTICS SETS, STUDENTS ARE ABLE TO SOLVE AUTHENTIC ENGINEERING PROBLEMS IN MANY DIFFERENT WAYS. ”

Chris Rogers, Professor, Tufts University, USA

TAKE UP THE OPEN SOURCE CHALLENGE

Design your own sensors or make your own software interface! LEGO MINDSTORMS Education is open source – download our free open source developer kits for hardware, software, Linux, BT, and Wi-Fi at LEGOeducation.com/MINDSTORMS

CLASSROOM SET

HERE YOU CAN SEE AN OVERVIEW OF THE LEGO MINDSTORMS EDUCATION ELEMENTS FOR A FULL CLASSROOM SOLUTION FOR 24 STUDENTS.

24 STUDENTS:

12 x 45544 Core Set 6 x 45560 Expansion Set	1 x 2000046 Software site license	1 x 2005544 Design engineering curriculum pack	12 x 8887 Transformer
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