2008

Classroom Solutions for Schools

LEGO education

LEGO® Education

LEGO® Education provides learning solutions for children aged 1½ and up – all the way to university level. Our classroom solutions are based on a hands-on learning approach that actively involves students in their own learning process, making learning fun and an adventure.

Learning by making

More than 25 years of experience has taught us the effectiveness of learning by actually making something. Learning by making is based on the notion that construction facilitates a naturally positive learning experience. When children actively construct something with their own hands, it helps them to build knowledge and understanding.

More than just bricks!

Our solutions are much more than just bricks! We offer activity packs, teacher guides, worksheets, programming tools, etc. designed to cover a wide range of curriculum targets. Our sets are delivered in sturdy, stackable plastic storage boxes, with sorting trays for LEGO® elements. The boxes are also ideal for sliding into shelving solutions and have transparent lids.

School Assortment

The LEGO Education school portfolio provides classroom solutions that help teachers cover science, technology, engineering and maths curricula in a hands-on, experimental way. All solutions are designed to enable students to behave as young scientists and engineers, by allowing them to observe, predict, test, measure and record their experiences with their peers.

The assortment is divided into two main categories; Science and Technology solutions, and Robotics. The icons underneath each product illustrate what is included in the product.

Inspiration Cards | Storage Solution | Piece Count

Engaging activities that will inspire your students

LEGO Education develops hands-on, curricular-relevant and fun activities that empower students to enter a dynamic learning process. Instead of simply memorizing the achievements of others, students are presented with challenges that encourage them to use their imagination, try out their problem-solving skills and cooperate with others. Activities are designed to support a learning process which consists of four phases: Connect, Construct, Contemplate, and Continue.

Contemplate

An important aspect of the learning process is the Contemplate phase. This involves children taking time to think about what they have seen or constructed, and thereby deepening their understanding of what they have just achieved or experienced. Students discuss the project at hand, reflect on and adapt their ideas, and teachers can encourage this process by asking questions.

Continue

Finally, the Continue phase builds on the natural urge to want to know more. Extension ideas are provided that encourage students to change or add features to their models. Doing so will lead them to a new Connect phase, thus allowing them to enter a positive learning spiral, in which they take on increasingly difficult challenges.

Activity examples at LEGOeducation.com

Visit the Activity Bank on the LEGO Education website to download free examples of activities developed for our school portfolio.

Connect

A key aspect of learning by making is the fact that children learn best when they can either relate new experiences to their existing knowledge bank or are exposed to an idea so compelling that it inspires them to learn more about it. The Connect phase provides a short, engaging story, introducing a problem or a challenge that students must solve.

Construct

The Construct phase is all about building things in the real world and students piecing knowledge and understanding together. They are given particular assignments encouraging them to plan and then build their own solutions to the problem or challenge presented in the Connect phase, perhaps even ending up with their own software program.

Invent, Investigate and Discover

Primary and middle school solutions from LEGO® Education allow children to explore problems and invent their own solutions, while also covering important areas of the science and technology curriculum. Using the brick sets and activity packs students experiment with forces and motion, working with wheels and axles, levers and pulleys. They explore magnetism, friction, gravity and speed. They investigate ways to generate, store and use energy, and work with motorized and wind power. And they observe, predict, measure and record their experiences with their peers.

5+
9656
Early Simple Machines Set

The Early Machines Set is ideal for introducing youngsters to mechanical principles such as gears, levers, pulleys, wheels and axles, as well as investigating energy, buoyancy and balance. The set includes inspirational inbox cards for building eight different models such as the Measuring Car and the Spinning Top. Exclusive for this set is a plastic punch-out sheet with eyes, sails, scales and wings.

5+
9660
Early Structures Set

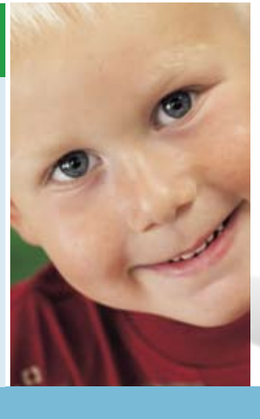
A big set containing 107 elements, including pulley wheels, movable hooks on strings and axles, and designed from the ground up to help children learn all about structures such as towers, walls and bridges. Lots of extras, including activity cards. Ideally, one set per 4 students.

8+
9618
Structures Set

A progressive introduction to the principles of stable and movable structures – and how to test these for weaknesses. By investigating bridges and towers, students learn about structure, function, strength, stability, forces and loads. The set contains additional unique elements, 20 challenges to solve, building instructions and assessment ideas. Ideally, one set per 4 students.

8+
2009618
Activity Pack for Structures Set

Specially designed to support 9618 Structures, these teacher's notes and worksheets include an introduction, curriculum references, pre- and post-assessment tests, a scope and sequence chart, a problem-solving summary and 11 copy master worksheets.



5+
2009656
Activity Pack for Early Simple Machines Set

Designed for the 9656 Early Simple Machines Set, this activity pack includes eight engaging 45-minute lessons, each with extension activities of up to 20 minutes, and four additional open-ended problem-solving activities. The activities are designed to allow youngsters to explore, investigate and solve tasks related to mechanical principles as well as learn about energy, balance, buoyancy, and much more.

Colours of and decorative designs on elements may vary.

8+
9684
Renewable Energy Set

Embracing a wide range of elements – including a solar panel, a capacitor and two motors – this set helps students investigate the concepts of energy, energy sources, electricity and the environment by building models. Contains building instructions for constructing windmill, water mill or solar-powered Ferris wheel and several supplementary models.

8+
2009684
Activity Pack for Renewable Energy Set

Designed for use with 9684 Renewable Energy Set, the 49 activities in this pack help students to explore, investigate and solve problems pertaining to renewable energy. The activities are divided into two levels, which can be taught either sequentially or individually.

8+
9632
Science & Technology Base Set

Let your youngsters invent and investigate like young scientists. There are instructions for 12 different models to build. Students use the models to predict, observe, measure and record events, experiencing forces, motion, energy and magnetism first hand. Use the set with the LEGO Education activity pack and give your youngsters more than 30 hands-on science and technology lessons, including extra problem solving tasks and building ideas.

8+
9628
Power Add-On Set

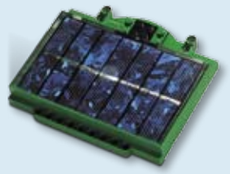
A superb add-on set to the 9632 Science & Technology Base Set. Using the battery box, the motor brings the models to life. The motor can be turned on/off either clockwise or counter-clockwise, and its direction of rotation can be changed. Combine the 9632 Base Set and the 2009628 Activity Pack to carry out 4 new lesson plans, build 4 new models and solve 2 additional problem-solving tasks

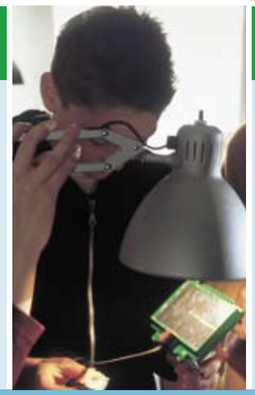
8+
2009632
Activity Pack for Science & Technology Base Set

This exciting activity pack is designed for the 9632 Science & Technology Base Set and includes 12 45-minute lessons, each with extension activities of up to 20-minutes. Activities are introduced with an entertaining animation, presenting a problem that the children must solve. Also in the pack are 4 open-ended problem-solving activities; a guide to principles of gears, levers, pulleys and wheels & axles and a full glossary of terms.

8+
9912
Solar Panel

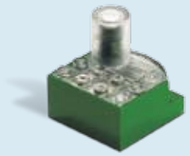
The LEGO® Solar panel provides sufficient power to operate LEGO motors. It delivers: 3V, 200mA in full sunlight outdoors; 3V, 100mA indoors with full sun outdoors; 2.5V, 8mA with light from a 60W incandescent bulb positioned 25cm from the solar panel (2000 lux); and 2.5V, 40mA with light from a 60W incandescent bulb positioned 8cm from the panel (10,000 lux).





8+
9916
Capacitor

Using a LEGO® solar panel or a LEGO motor as generator, the capacitor can be charged and discharged just like a rechargeable battery. The capacitor can be used for powering a LEGO motor. When the capacitor is fully charged, operating voltage is normally 2.5V. A red diode lights flashes when fully charged. The capacitor is protected against reverse polarity.



8+
2009628
Activity Pack for Power Add-On Set

Investigate speed and power, discover how components work together, and much more by combining the 9632 Base Set and 9628 Power Add-on Set. Combine them to carry out exciting science and technology activities. This activity pack includes 4 new lesson plans with animated story-starters, 4 new models to build and an additional 2 problem-solving tasks.

8+
9610
Gears – Mini Set

This set provides a perfect hands-on introduction to gears and the mechanics of gearing. Includes step-by-step guide to building a merry-go-round and windmill, as well as material for up to 10 lessons. Ideally, one set per 2 students.

8+
2009620
Teacher's Guide for Gears

Specially designed to complement 9610 Gears – Mini Set, this 20-page guide includes an introduction for the teacher, illustrated explanations to the principles of gears, "how-to" pages, problem-solving activities, extra activity ideas, and copy masters.

8+
9612
Levers – Mini Set

A set designed to help the whole class learn all about simple levers by building appealing models. With its assorted beams, bushings, a weight element and building instructions, this set provides everything needed for countless open-ended classroom activities. Ideally, one set per 2 students.

8+
2009622
Teacher's Guide for Levers

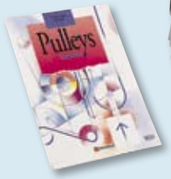
Specially designed to complement 9612 Levers – Mini Set, this 20-page guide includes an introduction for the teacher, illustrated explanations of the principles of levers, problem-solving activities, "how to" pages, extra activity ideas and copy masters.

8+
9614
Pulleys – Mini Set

Aimed at giving students an insight into the power of the pulley, this set helps children study the effects of changing the direction of rotation and increasing force and speed. Includes assorted pulleys, wheels, axles, belts, beams and building instructions. Ideally, one set per 2 students

8+
2009624
Teacher's Guide for Pulleys

Specially designed to complement 9614 Pulleys – Mini Set, this 20-page guide includes an introduction for the teacher, illustrated explanations to the principles of pulleys, "how to" pages, problem-solving activities, extra activity ideas and copy masters.



8+
9616
Wheels and Axles – Mini Set

This set of wheels, axles and rollers helps students gain a deeper understanding of the concepts of movement and speed. Also includes beams, figures and building instructions for a variety of classroom activities. Ideally, one set per 2 students.

8+
2009626
Teacher's Guide for Wheels & Axles

Specially designed to complement the 9616 Wheels & Axles – Mini Set, this 20-page guide includes an introduction for the teacher, illustrated explanations to the principles of wheels and axles, "how to" pages, problem-solving activities, extra activity ideas and copy masters.

LEGO MINDSTORMS education

The NXT Generation

LEGO® MINDSTORMS® Education is the latest in educational robotics, enabling students to discover science, technology, engineering and maths in a fun, engaging, and hands-on way. Combine the sturdy LEGO Technic building set with user-friendly software and progressive curriculum activities, and teach students from 8 years to design, program and control robots that carry out life-like automated tasks. At the same time as grasping important curriculum skills, students learn to work with others to come up with new ideas and solve problems.

LEGO MINDSTORMS Education covers the following curriculum areas:

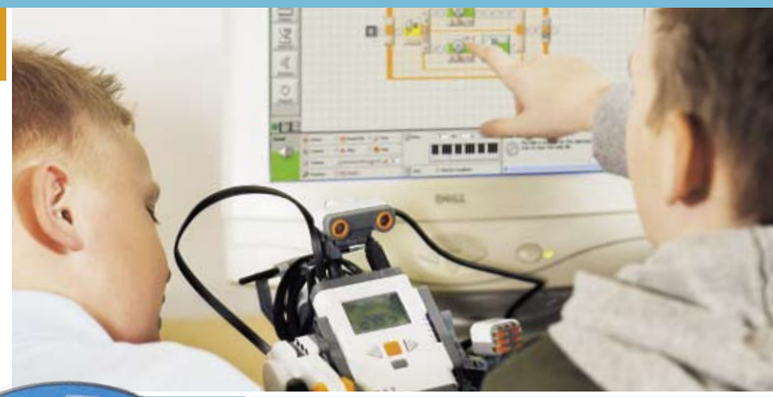
- **Science:** investigating energy, forces and speed
- **Technology:** programming and controlling input and outputdevices, using wireless communication
- **Engineering:** developing solutions, selecting, building, testing and evaluating
- **Maths:** measuring, using coordinate systems, conversion and applied math

8+
9797
LEGO® MINDSTORMS® Education Base Set

No matter how you wish to work with MINDSTORMS Education, this is where you start. The set enables groups of 2-3 students to build and program real-life robotic solutions. Includes the programmable NXT Brick, 3 interactive servo motors, a range of sensors, including ultrasonic and sound, a rechargeable battery, connecting cables and enough LEGO® bricks to build one model at a time. The set includes building instructions. Software is sold separately, see 2000077. Transformer is also sold separately, see 9833.

8+
2000077
LEGO® MINDSTORMS® Education NXT Software

A powerful, easy-to-use software designed to work with the NXT brick. The software, powered by LabVIEW™, is icon based and incorporates a Robot Educator step-by-step guide to programming, from beginner to advanced levels. The software is also capable of programming the NXT brick to work with former MINDSTORMS sensors and motors, with the help of converter cables. The software pack includes a digital user manual.



8+
2000078
NXT Site Licence Agreement

The site license agreement allows LEGO MINDSTORMS Education NXT software to be used on any compatible computer at the purchasing institution. Is necessary when installing the software on more than one computer. Requires pre-purchase of 2000077 MINDSTORMS Education NXT Software.

8+
9648
Education Resource Set

A wide variety of additional building elements that help bring life to MINDSTORMS Education robots as well as to the range of LEGO Education Science & Technology sets. Plenty of extra standard elements such as beams, axles and connectors and special elements such as a crane hook and tread wheels. An ideal supplement to 9797 for robotics competitions.

11+
2009787
Robotics Engineering Volume 1: Introduction to Mobile Robotics

Getting started in the classroom – this two-CD set provides 45 hours of tuition divided up in 6 main projects, 6 investigations, 3 anytime projects and 3 end-of-project activities. Developed by Carnegie Mellon University's Robotics Academy, it is a comprehensive step-by-step guide to robotics engineering. Includes presentations, video clips, worksheets and extensive teacher introduction materials. Activities can be extended to include guided research projects, see 2009788.

11+
2009797
Introduction to Robotics

Getting started in the classroom - this CD provides up to 24 hours of tuition divided up in 6 main projects and 3 end-of-project activities. Developed by Carnegie Mellon University's Robotics Academy, it is an easy to use step-by-step guide to robotics engineering using the MINDSTORMS Education hardware and software. Includes presentations and video clips, worksheets and teacher introduction materials. Teaching robotics can be extended to include theme-based projects, see 2009798.

11+
2009788
Robotics Engineering Volume 2: Guided Research

This activity pack provides 3 comprehensive research projects of up to 60 hours tuition in total. Developed by Carnegie Mellon University's Robotics Academy, projects are based on real-life themes: Automated Mining, Sentry Guard Dog, and Automated Tree Measuring following an authentic Engineering guided research approach. Includes advanced programming support. 2009788 is the next natural step for students who have completed the Introduction to Mobile Robotics, 2009787.

11+
2009798
Robotics Projects: Themes

This CD provides 3 theme-based projects of up to 24 hours tuition in total. Developed by Carnegie Mellon University's Robotics Academy, the projects are based on the following real-life themes: Automated Mining, Sentry Guard Dog, and Automated Tree Measuring. Students work independently, using a variety of sources to expand their knowledge in order to design, build and program effective solutions. Includes advanced programming support. 2009798 is the next natural step for students who have completed the Introduction to Robotics, 2009797.

14+
2000081
ROBOT C Software Single License

ROBOT C provides an alternative text-based programming language to the NXT-G graphics-based tools that are currently available. Designed by the Carnegie Mellon Robotics Academy, ROBOT C can be used with both the NXT and the RCX systems. This makes it the option to consider for classrooms that are looking for a uniform programming environment for both platforms.

14+
2000082
ROBOT C Software Classroom License

ROBOT C provides an alternative text-based programming language to the NXT-G graphics-based tools that are currently available. Designed by the Carnegie Mellon Robotics Academy, ROBOT C can be used with both the NXT and the RCX systems. This makes it the option to consider for classrooms that are looking for a uniform programming environment for both platforms. Classroom license allows for software installation on 12 computers.

14+
2009781
Teaching ROBOT C for LEGO® MINDSTORMS®

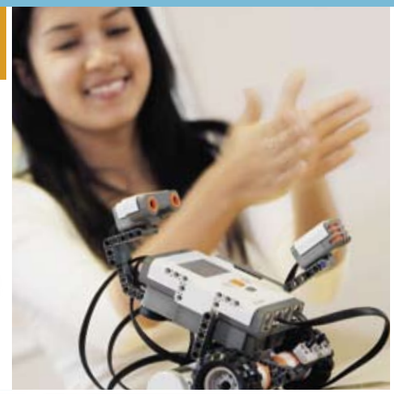
This exciting activity pack includes more than 40 lessons for teaching text-based programming relating to engineering challenges for both the NXT and RCX platforms. Providing video-based instruction, the lessons cover the following topics: Movement, Sensing, Variables, Programming, Systems, and Advanced. Includes a set-up guide with software downloads, step-by-step instructions, and troubleshooting information. Requires use of the ROBOTC Software developed by Carnegie Mellon University.

8+
9841
Intelligent NXT Brick

Programmable 32-bit brick, including Bluetooth™ wireless communication and USB port. Programmable dot matrix display. 4 input, 3 output ports. 6 wire digital platform. 8KHz loud speaker. It is possible to use a number of simple predefined commands directly on the brick. More advanced programming requires software pack 2000077. Requires 6 AA batteries or the 9798 Rechargeable Battery.

8+
9842
Interactive Servo Motor

Servo Motor with in-built rotation sensor that measures speed and distance and reports back to the NXT. This allows for motor control within one degree of accuracy. Several motors can be aligned to drive at the same speed. You will need a connector cable, which is included in the 9797 Base Set.



8+
9843
Touch Sensor

Using the NXT brick, the touch sensor detects pressure – i.e. when the button is pressed or released. The sensor is also able to count single press and multiple presses. A LEGO cross axle can be attached to the sensor button. You will need a connector cable, which is included in the 9797 Base Set.

8+
9844
Light Sensor

Using the NXT brick, the light sensor is able to sense light or dark as well as light intensity in a room. It is also able to measure light intensity in colours (grey scale sorting). You will need a connector cable, which is included in the 9797 Base Set.

Classroom Solution 1:

For a classroom of 24 students you will need:

8 MINDSTORMS® Education Base Sets (9797)
8 Transformers (9833) for the rechargeable batteries
1 MINDSTORMS Education NXT Software pack (2000077)
1 NXT site license for 2000077 (2000078)

Additional materials:

3 Education Resource Sets (9648)
1 Introduction to Robotics Activity Pack (2009797)
8 Bluetooth® Dongles (9847)

Classroom Solution 2:

For a group of 2-3 students you will need:

1 MINDSTORMS Education Base Set (9797)
1 Transformer (9833) for the rechargeable battery
1 MINDSTORMS Education NXT software pack (2000077)

Additional materials:

1 Education Resource Set (9648)
1 Introduction to Robotics Activity Pack (2009797)
1 Bluetooth® Dongle (9847)

8+
9833
Transformer (9V)

9 Volt transformer for the RCX and the NXT Rechargeable Battery. Available for UK, JPN, CH/EUR, AUS and US/CA.

8+
9798
Rechargeable Battery

Lithium battery with A/C plug. Designed for use with the 9841 NXT brick as alternative to normal AA batteries. Capacity: 1400 mAh. Estimated recharge time 4-5 hours. Transformer available, see 9833.

8+
9845
Sound Sensor

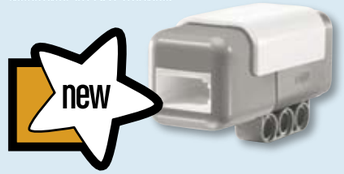
Using the NXT brick, the sound sensor is able to measure noise levels in DB and DBA. It can also recognize sound patterns and identify tone differences. You will need a connector cable, which is included in the 9797 Base Set.

8+
9846
Ultrasonic Sensor

Using the NXT brick, the ultrasonic sensor is able to detect an object and measure its proximity in inches and centimeters. You will need a connector cable, which is included in the 9797 Base Set.

8+
9799
Vernier NXT Sensor Adaptor

The Vernier NXT Sensor Adaptor allows you to integrate Vernier sensors with the Intelligent NXT brick and the NXT Software. This enables you to carry out an even wider variety of science experiments and data collection with your students. Embedded in a LEGO® NXT sensor housing, the adaptor is very easy to assemble on NXT models.



8+
9847
USB Bluetooth™ Dongle

The Abe USB Bluetooth adapter enables wireless communication between your PC or Mac and the NXT device. The Abe USB Bluetooth adapter is supported by Microsoft Windows XP (with Service Pack 2) and Apple MacOS X (10.3.9 and 10.4).

LEGO® MINDSTORMS® For Schools

LEGO® Education continues to support existing users of the MINDSTORMS® for Schools and ROBOLAB™ platform until the end of 2009. See the complete range of brick sets, software and activity packs available here.

Visit www.LEGOengineering.com

Visit the new community website: a meeting place for experienced MINDSTORMS teachers and newcomers to educational robotics, developed for LEGO Education by Tufts University's Center for Engineering Educational Outreach, CEEO: LEGOengineering.com is your gateway to a global network of teachers, expert advice and a wealth of good ideas.

8+
2000069
ROBOLAB™ 2.9 Software

This latest upgrade to the ROBOLAB software platform allows users to communicate with both MINDSTORMS platforms, using the RCX or the NXT bricks. It is developed to aide existing ROBOLAB users migrate step-by-step from the RCX to the NXT platform. The software capability is equal to the 2.5.4 version of the software, with new features such as faster firmware and floating point math. The software pack includes PDF user manuals and resource materials. This software does not support Bluetooth™ communication to the NXT brick.

8+
2000096
ROBOLAB™ 2.9 Upgrade Site Licence Agreement

The upgrade site license agreement allows ROBOLAB 2.9 software to be used on any compatible computer at the purchasing institution. Is necessary when installing the software on more than one computer. Requires pre-purchase of 2000069 ROBOLAB 2.9 Software.

8+
2009786
The Good Life Activity Pack

The Good Life Activity Pack is a collection of activities for use in upper-primary classes. To complete the activities, students build robots from the Robo Technology Set. They program the robots to perform specific tasks, and they identify examples of similar technology used in real life. The activity pack includes video clips and downloadable activities on 2 CD-ROMs.

you will need

- 9786
- 2000069
- 2000096

8+
9786
Robo Technology Set

The perfect starting point for curriculum-based activities using the RCX programmable brick. Comes in a storage box that provides an easy overview of the individual parts, and includes a separate storage box for the built model and a small test pad for training. Contains RCX, transmitter, light sensor, 2 touch sensors, lamp, 2 motors and other elements. Ideally, one set per 2 students

9+
9709
RCX Programmable LEGO® Brick

The revolutionary programmable LEGO brick that serves as the brain of the LEGO MINDSTORMS for Schools sets. The brick is included in the main Robo Technology and Team Challenge Sets.

7+
5225
9V Motor with Gear Reduction

Using the battery box, the motor can turn on clockwise/off, turn on counter-clockwise/off, and change direction of rotation. Using the RCX brick and ROBOLAB software, it can turn on clockwise/off, turn on counter-clockwise/off, change direction of rotation, and change speed of rotation. The motor turns 360rpm.

8+
2009789
The Alien Encounter Activity Pack

A collection of activities that integrate math and technology with science, helping students learn to use equipment for measuring distance and time. To complete the activities, students build robots from the Robo Technology Set. They program the robots to perform specific tasks, and they identify examples of similar technology used in real life. The activity pack includes video clips and activities on 2 CD-ROMs.

you will need

- 9786
- 2000069
- 2000096

11+
9794
Team Challenge Set

Enables groups of 4-5 students to simulate real-life robotics and find solutions to challenges. Constraints on time and materials are set as part of a step-by-step guide to preparing for competitions between teams. Includes the programmable RCX Brick and serial infrared tower, building instructions, a range of sensors, motors and wires to build one model at a time.

7+
9911
9V Touch Sensor and Leads

The touch sensor is a non-powered digital switch, and the pack includes 2 leads. Using the RCX brick and ROBOLAB software, it can detect when the button is pressed and released, count a single press, and count multiple presses.

7+
9758
9V Light Sensor

The light sensor is a powered analog sensor. Using the RCX brick and ROBOLAB software, it can differentiate between light and dark, count, work as an electric eye, sort colors (grayscale sorting), and measure from 0.6 to 760 lux.

7+
9891
9V Angle Sensor

The angle sensor is a digital sensor. Using the RCX brick and ROBOLAB software it can measure direction of rotation, number of rotations, angular velocity, and angles. The angle sensor has 16 positions per revolution and can rotate 360° at maximum 500 rpm.

8+
2000067
Robotics Projects

Designed to introduce students to programming, logical thinking, teamwork, project-based learning and computer-related communication skills. The 8 main activity topics provide approx. 18 45-minute lessons on training missions, data logging with Investigator and programming using containers, subroutines and timers. Comes in a binder including black-and-white student copy masters and full-colour teacher's notes. Also includes a CD-ROM showing video clips of various kinds of robotic behavior.

you will need

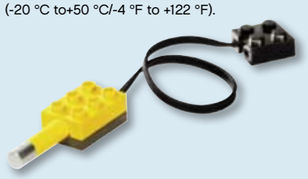
- 9786
- 2000069
- 2000096

8+
9649
Technology Resource Set

A technically oriented set containing more traditional black and gray elements. An excellent resource for problem-solving and cross-curricular work on technology topics. The perfect supplement to existing MINDSTORMS for Schools sets.

8+
9889
9V Temperature Sensor

The temperature sensor is a non-powered analog sensor. Using the RCX brick and ROBOLAB software, it can be calibrated to measure in Celsius and Fahrenheit (-20 °C to+50 °C/-4 °F to +122 °F).



8+
9783
Infrared Transmitter (USB)

The infrared transmitter connects to the computer, establishing the wireless link between the computer and the RCX programmable LEGO brick. Includes USB cable.

12+
9713
Infrared Transmitter (Serial)

The infrared transmitter connects to the computer, establishing the wireless link between the computer and the RCX programmable LEGO brick. Serial cable included.

LEGOeducation.com

LEGO education