



<b>Index</b>	<b>Page</b>
1. Why choose LEGO MINDSTORMS Education NXT?	2
2. Getting started with NXT	3
a. Hardware	
b. Software	
c. Educational Content	
3. Bridging the RCX generation to the NXT	4
4. RCX and NXT Comparison Chart	5
5. NXT: Meet the Sensors	6
6. NXT: Education Extras	8
7. System requirements for LEGO Education Software	9
a. NXT software v1.0	
b. ROBOLAB software v2.9	
8. LEGO MINDSTORMS Education: Product Assortment	10
a. Hardware	
b. Software	
c. Educational Content	
9. Frequently Asked Questions	16

## 1. Why choose LEGO® MINDSTORMS® Education NXT?

LEGO MINDSTORMS Education (LME) is designed specifically for teachers and other adults working with groups of children aged 8 and up, combining a versatile LEGO building set, user-friendly software and progressive educational activities.

LME provides a cost effective, motivating and highly enjoyable solution to cover local curriculum areas in science, engineering, control, design and technology. The software used is based on industry standard programming language that is effective to learn due to its icon based origins.

By building and programming smart robots in a natural, step-by-step learning process, students put their knowledge into practice – and are challenged to come up with new ideas themselves.

### What makes LME unique?

- \* A complete learning solution
  - Progressive hands-on learning platform
  - A modular teaching system – flexible to cover all educational needs, the schemes of work provide easy accessible teaching activities that ensure curriculum relevance when teaching robotics in the classroom.
  - Programming guide: 39 tutorials with step by step building instructions, the integrated Robot Educators in the software and digital schemes of work allow for independent and interactive learning
  - Easy classroom management with rechargeable battery and handy storage solution.
- \* Cutting edge technology
- \* Great for extended activities, out of school clubs and Robotic competitions

### Don't just take our word for it!

"MINDSTORMS Education is unique because it allows me to teach science and technology in a very rewarding way. It allows children to investigate, plan, test and implement their ideas. You see them enjoying themselves, getting results that they are happy with and answering problems you have set them."  
*Simon Williams, Science and IT teacher.*

"Children love to try things out to see what happens. With MINDSTORMS Education, teachers can turn this natural curiosity into concrete learning. And by giving children the tools to test if what they've learned is really true"  
*Louise Erratt, Teaching co-ordinator.*

"LEGO MINDSTORMS Education fits all ages and all learning types. By working with MINDSTORMS Education, students can experience that they actually have a greater talent for science and engineering than they expect"  
*Corey Schmidek, Science and maths teacher.*

## 2. Getting Started with NXT

Thinking of bringing LEGO® MINDSTORMS® Education NXT to your classroom? It's easy to get started. Only three components are needed:

### a. Hardware

The MINDSTORMS Education NXT Base Set serves as the centre point of the NXT robotics system. It contains the NXT intelligent brick, four different sensors (five sensors total - two touch sensors are included), three motors, and hundreds of TECHNIC building elements. Unique to the MINDSTORMS Education NXT set are a rechargeable battery system, an extra touch sensor, lamp bricks, and three converter cables so existing LEGO robotics sensors and motors can be used with the NXT brick. *One set per two-three students is recommended.*

### b. Software

The new Education NXT software is highly intuitive and easy for students to master. Like its predecessor ROBOLAB™, the NXT software is icon-based, so students drag and drop icons into a line to create a program. The MINDSTORMS Education NXT software includes Robot Educator, a series of interactive tutorials that help teachers and students get started. *The software will be available as both a single copy and a site license for an entire school.*

### c. Educational Content

The MINDSTORMS Education NXT educational content features themed projects that apply science and technology concepts via robotics. *The educational content will be CD-based.*



### 3. Bridging the RCX generation to the NXT

#### ROBOLAB™ 2.9

Everyone's excited about the new LEGO® MINDSTORMS® NXT system. But what if you've invested years of your life in ROBOLAB™ and the RCX?

No worries. LEGO Education, in collaboration with Tufts University's Centre for Engineering and Educational Outreach (CEEEO) and National Instruments, will release one last version of ROBOLAB, designed specifically to support RCX users and ease the transition to NXT. Users can upgrade to ROBOLAB 2.9 software, allowing you to program both the RCX and the NXT (via USB).

In addition to providing compatibility with both the RCX and NXT, ROBOLAB 2.9 features new firmware to allow users faster processing, more motor speeds, floating point math, improved debugging and programming functions and more.

Meanwhile, ROBOLAB users who are ready to get started with the NXT technology will be able to work in a familiar environment to create programs for the NXT brick - from basic Pilot to high end Inventor, and data logging programs.

Users will be able to build up their educational robotics resources by investing in the new LEGO MINDSTORMS Education hardware, which includes converter cables for the existing sensors and motor, and use it with their existing sets.

LEGO Education and the CEEEO have teamed up to launch a new teacher-to-teacher website dedicated to teaching science and engineering with LEGO bricks. The site will offer comprehensive online support and advice for LEGO MINDSTORMS, from how to use the new features to how to combine the existing platform with the new in the classroom. Features of the new MINDSTORMS Education NXT software platform will also be presented on the site, including the integrated Robot Educator, which is a fully animated guide to all programming features.

LEGO Education will continue to assist users of the current platform with inspiration and technical support until the end of 2009. The portfolio of hardware, software and curriculum activity packs, designed for students from 8 years up, will still be available, as will local support from educational suppliers.

## 4. Comparison chart: Existing (RCX) system v New (NXT) system

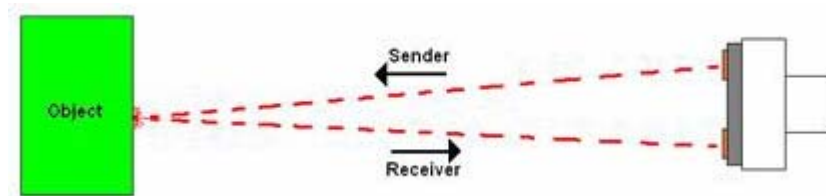
	Existing RCX System	New NXT System
<b>Intelligent Brick</b>	RCX	NXT
	8 bit	32 bit
	3 input, 3 output	4 input, 3 output
	Requires 6 AA Batteries	Rechargeable battery included
<b>Sensors</b>	Touch	Touch
	Light	Light
	Rotation*	Rotation (built into motors)
	Temperature*	Ultrasonic Sound
<b>Motors</b>	9v Gear Reduction	Servo w/ built-in rotation sensor
	2 in each set	3 in each set
<b>Software</b>	ROBOLAB	NXT Programming Software
	Mac/PC	Mac/PC
	Tutorials	Tutorials
	Site License	Site License
	Icon-based	Icon-based
<b>Downloading</b>	3 Levels, 430 icons	2 Pallets, 41 icons More software launching in 2008
	New Update: ROBOLAB 2.9	
	USB	BlueTooth
<b>Sets</b>	Serial	USB
	Team Challenge: 828 elements	LME Base Set: 431 elements
<b>Educational Content</b>	RoboTechnology: 215 elements	Resource Set: 672 elements
	Various activity packs	8 Week Course
		Introduction to Robotics CD Set
<b>FLL Compliant</b>	Yes	12 Week Course
		Robotics Research Projects CD Set

\*Sold separately from the Team Challenge and RoboTechnology Sets. All other sensors listed for both systems are included in the sets

## 5. NXT: Meet the Sensors

### Ultrasonic Sensor

The ultrasonic sensor is an exciting new addition to LEGO robotics. It uses ultrasonic measurements to "see" its surroundings. The sensor works by sending out a signal and then waiting for that signal to return. While the sensor is waiting for the signal to return, it keeps track of the time elapsed. The time between sending out that signal and receiving it back is in true proportion to the distance of the object being detected. So, the longer it takes for the sensor to detect the signal returning, the farther away the object is.



The best rebound of the signal will come from objects which are directly in front of the sensor. It will also be able to measure distances to objects which are placed to either side of the sensor, but not as well.

### Sound Sensor

The sound sensor included in the new MINDSTORMS Education NXT base set is a sophisticated sensor that allows you to use a new stimulus for directing a robot's actions.

The sensor measures dB and dBA, meaning it can tell if a command is given in a normal "inside" voice and one given in a loud "outside" voice. Or you could program the robot to perform a given task one way if a single person gives a command, and to perform differently if lots of people give it the same command simultaneously.

The sound sensor also recognizes sound pattern recognition. One clap, for instance, could be programmed to command a certain behaviour, but two claps could be programmed to do a behaviour that is much different.

In addition to sound pattern recognition, the sensor also features tone recognition. A high pitch would command a different action than a low pitch. Think of the possibilities – you could write a program that performs in tandem with a musical performance, and applause could then trigger an encore performance!



## Light Sensor

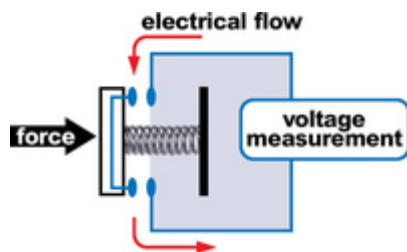
The new light sensor is an improvement on the existing light sensor that is included in the existing MINDSTORMS for Schools set. It is a much more sensitive sensor, allowing more precision in light measurement along a scale of 0 (no light) to 100 (very bright). It is also possible to turn off the infrared light source that is located below the sensor, so that the sensor only measures the ambient light from its surroundings. Just like the touch sensor, the look and feel of the sensor has been updated to support the TECHNIC-based building system and to match the NXT brick.



## Touch Sensor

The touch sensor that will be included in the new MINDSTORMS Education NXT base set is very similar to the touch sensor that is included in the existing MINDSTORMS for Schools set. The look and feel of the sensor has been updated to support the TECHNIC-based building system and to match the NXT brick.

The new touch sensor does have a hole for an axel in the push-button, giving users more options for incorporating the touch sensor into their designs.



Both the new and the existing touch sensors are very basic sensors - they can only be on (allowing the electrical flow to move unimpeded) or off (interrupting the electrical flow). You can see how the electrical flow is allowed or interrupted in the simple diagram on the right. A robot can initiate an action or reaction when it senses a change in voltage due to the electrical flow starting or stopping.

## Rotation Sensor

Unlike the existing MINDSTORMS for Schools, the MINDSTORMS Education NXT does not have a stand-alone rotation sensor. In the NXT system, a rotation sensor is built-in each of the three servo motors, and the LCD display on the NXT brick shows the number of rotations as they are counted. These built-in sensors should provide an easier-to-use, more accurate count of rotation than the existing rotation sensor used with the RCX brick. Some projects may still need a rotation sensor that is not connected to the motors, however. In these cases, the converter cable that is provided with the NXT for Education base set is just the solution, as it will allow existing sensors to be connected to the NXT brick.

## 6. NXT Education Extras

### Rechargeable Battery

Lots of people are wondering about the differences between the MINDSTORMS NXT that will be available from various retailers and the MINDSTORMS Education NXT that LEGO Education will be selling. There are quite a few differences, actually. The MINDSTORMS Education NXT offers lots of extra features that will provide increased value in any learning environment.

One of these Education Extras is the rechargeable battery. The 1400 mAh lithium battery more than replaces AA batteries that run down quickly and cost so much to replace – it has a minimum capacity of 60% of 6 AA batteries (although you can still use AA batteries in a pinch). It doesn't take long to recharge, either. Only 4 hours are required to charge the battery from zero to full. And, since it's a lithium battery, you can partially charge it or leave it charging overnight without having to worry about any negative effects. There's also an A/C plug in the battery to allow the NXT brick to run from a direct power supply when needed.

**The rechargeable battery will only come with the MINDSTORMS Education NXT, and will be available individually from your local dealer.**

### Converter Cables



Another extra provided in the LEGO MINDSTORMS Education NXT is the converter cable. The converter cable allows you to connect existing RCX-compatible sensors and motors to the NXT brick. This will come in handy for many users who wish to continue using their considerable collection of existing sensors. It will also make it possible to use the existing LEGO temperature sensor in conjunction with the NXT. Since the NXT set does not include a temperature sensor at this time, this will greatly benefit those who rely on that sensor for specific projects.

Some people have asked about using the converter cable to connect the RCX and the NXT. Although you could physically connect them, nothing will come of it. Just as it wasn't possible to have two RCX bricks communicate through a connecting cable, the NXT brick won't be able to communicate with the RCX through the converter cable.

People have also asked if it's possible to use the converter cables to connect new sensors to the RCX brick. This is partly possible. Using the converter cable to connect the new touch and light sensors will work, as the RCX is familiar with touch and light sensors anyway. It isn't feasible to connect the sound or ultrasonic sensors, however, due to software limitations. The ROBOLAB software used by the RCX can't communicate with the new sensors.

Here's the quick version of everything just said:

NXT Brick + All NXT Sensors	= Works
NXT Brick + All RCX Sensors	= Works
RCX Brick + NXT light and touch Sensors	= Works
RCX Brick + NXT Brick	= Doesn't work
RCX Brick + NXT sound and ultrasonic Sensors	= Doesn't work





## 7. System Requirements for LEGO Education Software

### LEGO MINDSTORMS Education NXT Software v1.0 minimum system requirements:

#### General

256MB of Ram minimum (512 MB recommended)  
Up to 300MB of available hard-disk space  
XGA display (1024 x 768)  
1 available USP port  
CD-ROM drive  
Compatible Bluetooth adapter (optional)<sup>1</sup>

#### Microsoft Windows

Windows XP Professional or Home Edition with Service Pack 2  
Intel® Pentium® processor or compatible, 800 MHz minimum  
(1.5 GHz or better recommended)

#### Apple Macintosh

Apple MacOS X v. 10.3.9 or 10.4  
PowerPC® G3, G4, G5 processor, 600 MHz minimum<sup>2</sup>  
1.3 GHz or better recommended)

### ROBOLAB Software v2.9 minimum system requirements:

ROBOLAB 2.9 is fully supported on Win 2000 and newer platforms; however NXT support will be restricted to Win XP (SP2). Macintosh users of OS9 must continue to use ROBOLAB 2.54 or older.

#### **When using software with the RCX:**

#### Microsoft Windows

133 MHz PC (166 MHz recommended)  
Windows 2000 operating system or later  
Minimum of 250 MB free hard drive space  
One serial or USB port  
256 MB RAM

#### Apple Macintosh

166 MHz Mac processor  
OS X operating system or later  
Minimum of 300 MB free hard drive space  
One USB port  
RAM for OSX - 128 MB (192 MB recommended)

#### **When using software with the NXT:**

Same as LEGO MINDSTORMS Education NXT Software v1.0 minimum system requirements (will not support Bluetooth)

<sup>1</sup> Supported Bluetooth software are Widcomm® Bluetooth for Windows newer than v. 1.4.2.10 SP5 and the Bluetooth stacks included in Microsoft Windows XP with Service Pack 2 / Apple MacOS X 10.3.9 and 10.4.

<sup>2</sup> The LEGO MINDSTORMS NXT Software is currently available for Intel-based Macintosh systems using Rosetta emulation. A universal update which will run native on Mactel systems will be available as soon as possible. While LEGO MINDSTORMS NXT Software is using the Rosetta emulator Bluetooth functionality will not be available.

## 8. LEGO MINDSTORMS Education NXT: Product Assortment

Product Code.	Product item
9797	LME Base Set
9833	Transformer
9648	Education Resource Set
9798	Rechargeable Battery
9841	NXT Intelligent Brick
9842	Interactive Servo Motor
9843	Touch Sensor
9844	Light Sensor
9845	Sound Sensor
9846	Ultrasonic Sensor
9847	Bluetooth Dongle
2000077	LME NXT Software (single license)
2000078*	LME NXT Site License
2000069**	ROBOLAB 2.9 Upgrade Software (single license)
2000096**	ROBOLAB 2.9 Upgrade Site License
2009797	Introduction to Robotics
2009798	Robotics Research Projects

\* Site License is compulsory when software is installed on more than one computer

\*\*Products require prior purchase of older ROBOLAB single/site license product

## Hardware

### LEGO® MINDSTORMS® Education Base Set

**Product Code:** 9797

**Number of Elements:** 431

**Brick Type:** LEGO Technic

**Age:** 8+

#### **Description:**

The latest generation of LEGO Education robotics is all here in this set! This essential core set serves as the base for endless NXT robotic creations. The set includes 431 elements, many of which are exclusive to the education version of the NXT system:



#### **Unique Features for Education:**

- Rechargeable lithium battery
- Extra touch sensor
- 3 lamps
- 3 converter cables (for using existing sensors and motors with the NXT brick)
- Plastic storage bin with sorting trays

#### **Also included in the set:**

- NXT intelligent brick
- 3 servo motors
- 1 each: light sensor, sound sensor, ultrasonic sensor
- 2 touch sensors
- 3 rotation sensors built into the motors
- 7 connector cables
- USB wire
- Hundreds of TECHNIC building elements

Software sold separately in the form of single and site licenses.

## Transformer

**Product Code:** 9833

#### **Description:**

Allows the NXT to operate from a main power supply rather than from batteries. We recommend purchasing one per NXT.



## Bluetooth Dongle

**Product Code:** 9847

#### **Description:**

A USB device that enables wireless Bluetooth™ communication via your PC.



## Education Resource Set

**Product Code:** 9648  
**Number of Elements:** 672  
**Brick Type:** LEGO Technic and LEGO System  
**Age:** 8+

### Description:

This versatile set includes 672 TECHNIC building elements. The set was specifically designed to complement the LEGO MINDSTORMS Education Base Set and is an ideal supplement to it for robotics competitions. Use the Resource Set to build bigger and more complex robots, and complete more challenging engineering projects. The set comes complete with a plastic storage bin and sorting trays.



## Rechargeable Battery

**Product Code:** 9798

### Description:

This rechargeable lithium battery is designed for use with the NXT Intelligent Brick. The battery features 1400 mAh of power and an A/C plug for direct power supply. The battery will charge from 0 to full in a maximum of four hours. Use the Transformer to charge the battery (sold separately, see 9833).



## Intelligent NXT Brick

**Product Code:** 9841  
**Brick Type:** LEGO Technic  
**Age:** 8+

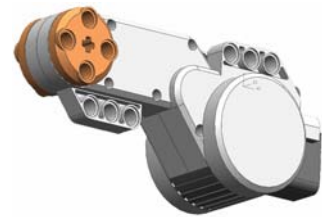
### Description:

- 32-bit ARM7 microprocessor
- 256 Kbytes FLASH, 64 Kbytes RAM
- Unlimited programming slots
- Bluetooth wireless communication (will communicate wireless with the computer, other NXT bricks, a mobile phone and a PDA)
- USB 2.0 port (slave only)
- 4 input ports, 6 wire digital platform
- 3 output ports, 6 wire digital platform
- Programmable Dot Matrix Display 60 x 100 pixels
- Loudspeaker – 8 KHz sound quality
- The many LEGO Technic holes allow for easy and fast building



## Interactive Servo Motor

**Product Code:** 9842  
**Brick Type:** LEGO Technic  
**Age:** 8+



### **Description:**

With an in-built rotation sensor which measures exact speed and distance and reports back to the NXT. LEGO Technic holes for fast and easy building. Allows for precise motor control, the motors will align the speed when your robot moves and it has a 1 degree step control. You will need a connector cable, which is included in the 9797 Base Set.

## NXT Touch Sensor

**Product Code:** 9843  
**Brick Type:** LEGO Technic  
**Age:** 8+



### **Description:**

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

## NXT Light Sensor

**Product Code:** 9844  
**Brick Type:** LEGO Technic  
**Age:** 8+



### **Description:**

The light sensor is able to sense light or dark as well as light intensity. 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.

## NXT Sound Sensor

**Product Code:** 9845  
**Brick Type:** LEGO Technic  
**Age:** 8+



### **Description:**

Measures DB and DBA. Has sound pattern and tone recognition. You will need a connector cable, which is included in the 9797 Base Set.

## NXT Ultrasonic Sensor

**Product Code:** 9846  
**Brick Type:** LEGO Technic  
**Age:** 8+



**Description:** Senses distance and recognises objects and movement. You will need a connector cable, which is included in the 9797 Base Set.



## Software

### LEGO® MINDSTORMS® Education NXT Software

**Product Code:** 2000077

**Age:** 8+

#### **Description:**

A powerful, easy-to-use software designed to work with the NXT brick. Powered by LabVIEW™, it's icon-based, so students will be programming in a snap. The software features two programming pallets, easy and advanced. Also featured is Robot Educator, a series of 39 animated tutorials to help students (and teachers!) learn how to effectively build and program a fully-functioning robot. Robot Educator can be used as a teaching tool, and is indexed and searchable. The software is Mac OS X and Windows XP compatible. The software is also capable of programming the NXT brick to work with former MINDSTORMS sensors and motors, with the help of converter cables.

**Product Code:** 2000078 (Site Licence)

Site Licence is compulsory when software is installed on more than one computer.

#### **Unique features for Education:**

- Icon based, user friendly programming tool
- Progressive platform for students from primary school to university level
- Integrated Robot Educator designed as a tool for teaching, or self-tuition.

### ROBOLAB™ 2.9 Software and User Guide

**Product Code:** 2000069

**Age:** 8+

#### **Description:**

This last version of ROBOLAB is designed to support RCX users and ease the transition to the NXT system. This upgrade enables you to program the NXT brick with ROBOLAB. In addition, ROBOLAB 2.9 features new firmware to allow users faster processing, more motor speeds, floating point math, improved debugging and programming functions and more. ROBOLAB users ready to get started with the NXT technology will be able to work in a familiar environment to create programs for the NXT brick - from basic Pilot to high end Inventor, and data logging programs. Users can therefore continue to build up their educational robotics resources by investing in the new LEGO MINDSTORMS Education hardware while continuing to use a familiar programming environment. This software does not support Bluetooth™ communication.

**Product Code:** 2000096 (Site Licence)

Site Licence is compulsory when software is installed on more than one computer.

## Educational Content

### Introduction to Robotics

**Product Code:** 2009797

**Age:** 8+

**Description:**

This introductory CD provides 8 weeks of robotics instruction, and serves as an exhaustive introduction to the LEGO MINDSTORMS Education NXT system and all concepts associated with mobile robotics. Students will progress through activities designed to teach programming, behaviours, systems, control, sensors, feedback, and more. Along the way, they will address key technology and science concepts. This CD set provides great interactive instruction complete with video tutorials, building instructions, programming assistance, and teacher's materials! Developed at Carnegie Mellon University.

### Robotics Research Projects

**Product Code:** 2009798

**Age:** 8+

**Description:**

This more advanced CD provides 12 weeks of guided research and applied engineering robotics projects. When used after students complete the 2009797 Introduction to Robotics CD, teachers have a full 20-week robotics course. The Research Projects CD focuses on applied inquiry, motivated design, communications technology, scanning, mapping, and more. Using the Engineering Design Inquiry process, the activities on this CD cover science, technology, engineering and maths topics. This CD set provides great interactive instruction complete with video tutorials, building instructions, programming assistance, and teacher's materials! Developed at Carnegie Mellon University.

## 9. Frequently Asked Questions

Will the existing LEGO Education robotics system still be available?

Yes. LEGO Education continues to provide sets, software, technical support and services for LEGO MINDSTORMS for Schools and the ROBOLAB programming software. Exclusive to schools will be accessories that allow them to use parts of their old kits with the new. And Tufts University's Center for Engineering and Educational Outreach will play a key role in providing professional support and advice for new and existing users.

What new and/or updated hardware options are available with MINDSTORMS Education NXT?

The new base set for MINDSTORMS Education NXT includes a new intelligent brick, two new sensors (sound and ultrasonic), new interactive servo motors with built-in rotation sensors, and updated light and touch sensors. The set has over 400 elements.

What are the features of the NXT intelligent brick?

The brick features a 32-bit microprocessor, a larger display, 4 input ports, 3 output ports, a real sound speaker, and is USB 2.0 and Bluetooth® compatible. It also includes a rechargeable lithium battery system with an AC plug.

Are there new sensors in MINDSTORMS Education NXT?

Yes. The new ultrasonic sensor acts as the eyes of the robot, measuring distance and detecting movement and objects. The sound sensor can react to sound commands and patterns and recognize tones. The rotation sensor has been incorporated into the servo motors. The touch and light sensors have also been updated.

Is the building system different from previous LEGO Education robotics systems?

Yes. MINDSTORMS Education NXT primarily uses TECHNIC beams and connectors instead of traditional LEGO stud-based SYSTEM building elements. The TECHNIC system has many advantages. TECHNIC robots can be built quicker, and are sturdier than robots built with SYSTEM bricks. They also allow for more functionality and movement capabilities. However, many SYSTEM bricks are included in the new MINDSTORMS Education NXT set, and SYSTEM bricks can be used in many aspects of robot building within the new system.

What is Bluetooth®?

Bluetooth is a short-range radio technology that facilitates communication between wireless devices such as cell phones, PDAs, handheld computers, and wireless-enabled laptops and desktops. Bluetooth communication does not require line-of-sight between the communicating devices.





### What can Bluetooth in the NXT brick be used for?

Bluetooth enables the NXT brick to communicate wirelessly to all devices with Bluetooth capabilities. Exclusive to the MINDSTORMS Education NXT software, Bluetooth also enables the computer to communicate to several NXT devices at the same time.

### What is the new MINDSTORMS Education NXT software like?

The new software is icon-based, like its predecessor ROBOLAB™. This means that students drag and drop icons to “build” programs. It is intuitive and very user-friendly, and is Mac and PC compatible.

### How can students learn how to use the software?

The MINDSTORMS Education NXT software includes Robot Educator. Robot Educator is a series of approximately 39 tutorials that take users step-by-step through all areas of the software. Built-in progression makes it possible for teachers to focus on selected areas and functions that match student capabilities and curriculum needs.

### Will the FLL Challenge change because of the new MINDSTORMS Education NXT?

FLL anticipates no game-related advantage or disadvantage to using either the new or the existing technology in the 2006 FLL Challenge. The 2006 FLL Challenge will be designed to support both the existing and new MINDSTORMS Education NXT technology. FLL is in the process of evaluating a migration plan to introduce the new technology into FLL Challenges in future years.

### Do I have to purchase the new MINDSTORMS Education NXT set to participate in FLL?

No. When FLL registration opens in May, 2006 teams will have the option of purchasing either the existing or the new Robot Set. Of course, veteran teams may continue to use the set they already own. The 2006 FLL Challenge will be designed to support both the existing and new MINDSTORMS Education NXT technology.

### If I opt for the new set when I register for FLL, will I receive the product before September?

No. The new product is not available for shipment until September 2006 (depending on local market launches). Teams will have the option to purchase the existing technology, which will ship when registration orders begin filling in June.