

## How do I choose the right software program for my classroom?

**NXT-G** is essentially a simplified version of LabVIEW customized for use with LEGO® MINDSTORMS®. As such, it is a great tool to introduce middle school students to programming and to teach them logical thinking and basic algorithms.

**LabVIEW for LEGO® MINDSTORMS®** is a more sophisticated and advanced software environment for programming the NXT, developed for high school students to use with the LEGO® Education robotics platform in classrooms or after-school robotics competitions. The software builds on the core functionality and capabilities of NXT-G and adds unique features including:

- NXT Robot Project to incorporate lesson plan content and share student results
- NXT Schematic Editor to visually configure and test motor and sensor connections
- NXT Remote Control Editor to visually configure and control the NXT using a joystick or the keyboard
- New and improved NXT tools:
  - Data Viewer - datalogging and analysis
  - Sensor Viewer - view live sensor data
  - Remote Display - display NXT screen and buttons on the monitor
  - Piano Player - play sounds and songs on the NXT
  - Picture Editor - create images to display on the NXT
  - NXT Terminal - manage programs and memory on the NXT

This software option is ideal for teachers who just want to teach robotics with the LEGO Education platform and don't need the full feature set offered in LabVIEW for Education. LabVIEW for LEGO® MINDSTORMS® is offered at a lower price-point than LabVIEW for Education, however it does not provide built-in support for data acquisition equipment such as Vernier SensorDAQ and NI myDAQ.

**LabVIEW for Education** is a full-feature version of LabVIEW and the most advanced programming option available for high school classrooms. The software works with LEGO® MINDSTORMS®, too, and offers functionality for advanced robot control, plus tools for acquiring, analyzing and presenting data using widely available classroom lab instruments. LabVIEW for Education 2010 (releasing June 2011) will include all of the features available in LabVIEW for LEGO® MINDSTORMS®, plus provide a complete upgrade on the features from LabVIEW Education Edition 2009 and add new modules and functionality, including:

- LabVIEW Vernier Toolkit for SensorDAQ, LabQuest, and LabQuest Mini
- 8 myDAQ Software Instruments
  - Digital Multimeter
  - Oscilloscope
  - Function Generator
  - Bode Analyzer
  - Dynamic Signal Analyzer
  - Arbitrary Waveform Generator
  - Digital Reader
  - Digital Writer
- Fischertechnik Toolkit
- NI Vision Builder
- NI Vision Development Module

## Product Comparison Chart

User Interface	MINDSTORMS NXT-G	LabVIEW for LEGO MINDSTORMS	LabVIEW for Education
Age group	<13	>14	>14
Simple configuration	X	X	X
Schematic (testing)		X	X
Single Window environment	X		
Multi-Window Environment		X	X
Robot Project (file collection)		X	X
Uses Industry standard LabVIEW programming		X	X
Advanced Math and Science Libraries		X	X
Front Panel User Interface Design		X	X
Visual Debugging		X	X
Autonomous mode	X	X	X
Tethered mode		X	X
Bluetooth mode	X	X	X
Debugging mode		X	X
File handling on NXT (transfer; erasing; defragmentation)	limited	X	X
Clean up diagram		X	X
<b>Compiler Support</b>			
If statements	limited	X	X
While Loops	X	X	X
For Loops		X	X
Simple Math	X	X	X
Formula Node		X	X
Subroutines	X	X	X
Sequences		X	X
Flags/Variables for asych communication	limited	X	X
Centered Text on Display		X	X
Arrays		X	X
Floating point math		X	X
Access to native functions		X	X
Generic sensor configuration		X	X
Data manipulation		X	X
Local variables		X	X
Data type conversion		X	X
File handling		X	X
<b>Applications</b>			
RIC Editor		X	X
Sound Editor	X		
Piano Player	X	X	X
Remote Control		X	X
Data Viewer		X	X
<b>Data Logging</b>			
Uniform time sampling	X	X	X
Max sampling rate	?	300 Hz	300 Hz
Conditional sampling		X	X
Advanced Mathematical analysis tools		X	X
Math formula support		X	X
Support for axis control (min/max)		X	X
Prediction tool	X		
Support for 3rd party sensors	X	X	X

<b>Support</b>			
Robot Educator	X		
Help	X	X	X
Extended Help		X	X
Tutorials	X	X	X
Challenges		X	X
Support Website	X	X	X
Execution highlighting		X	X
<b>Libraries</b>			
Ready for use subroutines (array sorting; coerce; trig; etc.)		X	X
Behaviors		X	X
Textrix		X	X
Wait fors	X	X	X
<b>Code readability</b>			
Easy to read	X	X	X
Program diagram shows all the parameters (no additional windows are necessary)		X	X
<b>Learning curve</b>			
Easy to learn	X	X	X
Reduced instruction set	X	X	X
Deeper exploration possible		X	X
<b>Data Acquisition</b>			
Vernier SensorDAQ			MS Windows
Vernier LabQuest and LabQuest Mini			X
NI myDAQ			MS Windows
Fischertechnik Driver			MS Windows
NI Vision Development Toolkit			MS Windows
NI Vision Builder			MS Windows
<b>NI myDAQ Instruments</b>			
Multimeter			MS Windows
Oscilloscope			MS Windows
Function Generator			MS Windows
Bode Analyzer			MS Windows
Dynamic Signal Analyzer			MS Windows
Arbitrary Waveform Generator			MS Windows
Digital Reader			MS Windows
Digital Writer			MS Windows



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