Frequently Asked Questions

Q: Which robot am I supposed to build?

A: There are two recommended robot models that can be used in the lessons. The Taskbot is a full-featured model that is the preferred model for the Robotics Engineering activities. Its strengths are flexibility, expandability, and applicability to all the lessons in *Robotics Engineering Vol. 1: Introduction to Mobile Robotics*. This additional capability, however, comes at the expense of being larger and taking somewhat longer to build than other NXT robots, notably the alternative Robot Educator model whose building instructions come printed with the kit.

The Robot Educator Model, or REM (so called because it is used in the Robot Educator section of the LEGO MINDSTORMS Education NXT Programming Software), is a smaller, simpler, and easier model to build. It is a good choice for new builders in classes that will only be using the basic lessons in the Introduction to Mobile Robotics. However, due to its simplicity, REM lacks several features that are needed to do the more in-depth investigations and activities. For instance, it cannot be used for the gearing activities, because it does not have gears.

In short, you should build the model that better fits your needs. Use the larger Taskbot if you plan to do most of the Robotics Engineering activities. Use the simpler Robot Educator Model if you only intend to do a limited subset of the activities, but check to make sure that the activities you want are REM-friendly first!

	Taskbot	REM
Full Speed Ahead	Yes	Yes
Wheels & Distance	Yes	NO
Right Face	Yes	Yes
Measured Turns	Yes	NO
Clap On, Clap Off	Yes	Yes
Frequency & Amplitude	Yes	Yes
Follow the Guidelines	Yes	Yes
Faster Line Tracking	Yes	NO
Obstacle Detection	Yes	NO
Field of View	Yes	Unsupported
Get in Gear	Yes	NO
Gears & Speed	Yes	NO
Hello! My Name Is	Yes	Yes
Full Stop	Yes	Unsupported
Ramp It Up	Yes	NO

Q: There's a 'Getting Started' button when I open up the NXT programming software, but a different one when I open up the Robotics Engineering activities! Which one should I use?

A: The Robotics Engineering activity software and the NXT programming software are separate programs, and each tries to support its users as best it can.

The Robotics Engineering videos will best support the use of the Robotics Engineering lessons, and should be your primary reference for any Robotics Engineering activities. The built-in NXT Software programming help (including the Getting Started screen you see when you start up the NXT Programming Software) will help you find quick and direct solutions to your programmingrelated questions. In particular, it is better at troubleshooting problems with loading or running programs, but will not have any information pertaining to the lessons.

Note that the Robot Educator and the Robotics Engineering activities write their programs in different styles that are not totally interchangeable. It is recommended that if you are using the Robotics Engineering lessons, that you follow the Robotics Engineering programming style, so that you can be assured that the step-by-step lesson instructions will apply fully to your program.

Q: What is STEM? What does it have to do with me?

A: STEM stands for Science, Technology, Engineering, and Math. These disciplines are closely related, and share many common concepts, skills, and applications. Research has shown that giving students a strong experience with a concrete situation that bridges different, interrelated spheres of knowledge helps to improve their understanding of all subjects involved, because the linkages are made clear and sensible by the activity context. In short, students gain a deeper understanding of material in all four STEM disciplines by seeing how it fits in with the other pieces in a real-world situation.

Sometimes you will also see the abbreviation CSTEM, which stands for Communications, Science, Technology, Engineering, and Math. This is the same as STEM, but with communication (the sharing of information) also included. Communication is just as natural a fit into a rich context like robotics as science or math, due to the emphasis on teamwork and the propagation of knowledge to achieve common goals.

For more information on this subject, please see the "Why Robotics?" document in the Preparation section of the Teacher CD.

Q: My school already has a robotics club/team. What more is there to be gained by bringing it into the classroom?

A: The activities in "*Robotics Engineering Volume 1: Introduction to Mobile Robotics*" are designed to both support and build knowledge of robotics and programming, and to provide opportunities to teach or reinforce key classroom concepts in science, math, technology, and engineering. They also provide excellent opportunities for students to build key workplace competencies in areas such as planning and teamwork.

The Investigations and Explorations in the Projects section are specifically targeted at academic concepts that students have traditionally had trouble with: ratios and proportions, measurement, scientific inquiry, and many others. You can find a complete list of which activities target which concepts in the Course Planning section of the Teacher CD.

Additionally, in a longer course, you will have opportunities to allow students to branch out into open-ended engineering activities which will give them opportunities to understand the technological design process, its motivations, and to continue to apply and reinforce their math/science/technology/teamwork skills.

For more information on the targeted concepts and disciplines, please see the Course Planning area on the Teacher CD.

Q: The Answer Keys have really long answers to the questions asked. Are students really supposed to be able to answer this thoroughly? How do I know how much is an acceptable amount?

A: The answer keys supply answers that are much more in-depth and complete than a student would be expected to give. This additional information is for your benefit as instructor, to better understand why the answer is as shown, or to alert you that perhaps there should be other acceptable answers besides what is on the answer key. The essence of a minimal, short answer is shown in **bold** for most questions. Based on your own personal and professional preference, you can accept more or less detailed responses than that.