

Boe-Bot Robotics Kits Used in Education

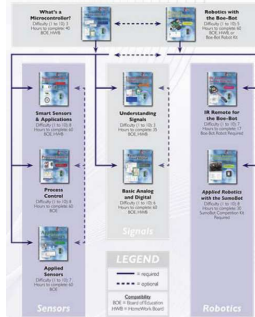
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About Parallax



- Privately held company in Rocklin, CA
- Founded by Chip Gracey & Lance Walley in 1987
- 35+ employees in Research and Development, Sales, Manufacturing, Education, Marketing and Technical Support
- Designs and manufactures microcontrollers, robots, and sensors
- Strive to provide the electronics design industry with products that are technically innovative, unique, and economical

Stamps in Class Program



- Used in technology and pre-engineering programs from middle school to college
- Teaches electronics and programming in an integrated, hands-on fashion
- Introduces diverse subjects
 - Programming
 - Electronics
 - Process control
 - Physics
 - Sensors
 - Robotics
 - Digital signals

The Boe-Bot Robot

- Flexible, reprogrammable robotics platform
- Features the BASIC Stamp 2 microcontroller and easy-to-learn PBASIC programming language
- Robotics with the Boe-Bot text includes 40+ hands-on activities
- Expandable with sensors and hardware add-on kits
- Used in thousands of classrooms worldwide

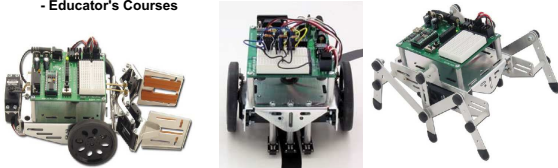


Classroom Applications

- **Middle School (Ages 11-14)**
 - Create handouts with simple concepts
 - Code is given to students
- **High School (Ages 15-18)**
 - Told to follow book instructions
 - Only then more complicated code is given
- **University (Age 18+)**
 - Follow book at faster pace, but ideas are expanded on Ohm's Law, Kirchhoff's Current Law, etc.
 - Used in many introductory microcontroller, engineering, and mechatronic courses

Why Teachers Choose the Boe-Bot

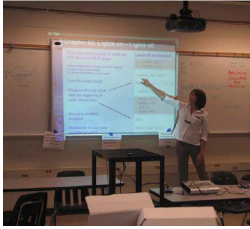
- Cost-effective
- Easy to get started, infinite possibilities
- Resources & support
 - Parallax Educator's Forum
 - Free PDF downloads for all books
 - Educator's Courses



Programming Languages

- **PBASIC is a great first programming language**
 - Easy to understand and get started with
 - Creates a strong foundation in elemental programming concepts
- **Higher-level courses (i.e. university) need more language options**
 - C is an industry standard: prepares students for the workforce
 - Assembly may be eventually needed for high-performance applications
 - New language variants are being developed for specific industries and new microprocessor architectures
- **The ability to learn programming languages is an important skill in itself**

Teacher Support: Educator's Courses



- Two day teacher training events
 - *What's a Microcontroller?* (Day 1)
 - *Robotics with the Boe-Bot* (Day 2)
- Teachers get to keep all kits used in the course
 - Helps solidify concepts learned
 - Demonstrate to faculty
- Attendees range from middle school science teachers through university professors

Course Benefits

- Provides us with feedback on how well concepts are presented
 - This information is used to:
 - Revise educational texts
 - Create supplemental activities
 - Change the way we teach the courses
- Keeps us up-to-date with educational trends and teacher needs
- Allows teachers a chance to collaborate with each other and share ideas for their classrooms



Generating Excitement

- Contests & giveaways!
- A feeling of support
 - Course instructor's contact
 - Educator's Forum
 - Free PDF downloads of all our books
 - Additional projects
 - "How to" videos on YouTube
- Breaks



Challenges

- Addressing attendees at different skill levels
 - How to best present concepts
 - Letting no one feel 'left behind'
 - Bringing a stock of additional sensors & documentation
- Being conscious of not 'overloading' attendees
- Making sure material gets covered
 - Outline 'key concepts' to be covered during the course



What Students Want

- Small, topic-based projects
 - Instant gratification
 - Relatable projects
 - Multimedia resources
- The ability to grow and create their own inventions



Teacher Requests

- Option to program in a C language
- Platform that allows students to delve more deeply into the topics that interest them
- Quick & easy to use software and materials
 - Allows teachers more time to concentrate on the content of their math, science, or engineering class
- Accompanying CAD package for software simulation
- Ability to explore and change the robot's circuits
- Reusable & low cost platform

Future Plans



- Adding a new educational program centered around the Propeller chip
- Developing a C language for use with the Propeller
 - Will be as easy to pick up as PBASIC
 - Available on multiple platforms (Windows, Mac OSX, etc.)
- Materials will be more project-based and application-specific