Using Robotics To Promote STEM Education

STEM = Science, Technology, Engineering and Math

Overview:

Robotics is a fun, highly engaging platform that fosters the core skills required for successful life long learning in the 21st century. Robotics reinforces the core skills found in our standard applied science, technology, and math curriculum while teaching leadership, teamwork, time management, and organizational and design skills.

Students learn how to engineer complex mechanical devices while simultaneously learning how to program a robot to complete a number of tasks and challenges. Working together in engineering teams, students solve tasks and challenges, and then compete against other teams in class or group competitions. Robotics can be easily tailored to meet the needs of a diverse learning community (girls in science, gifted, First Nations, at risk, and academically motivated students).

Professional Development Opportunities:

Workshop participants will be introduced to the highly acclaimed and popular Lego NXT Mindstorms, and other platforms. See sidebar for more information. Send an email to info@gearbots.org if you are interested in learning more.

About the GEARBOTS Robotics Engineering Program:

Thanks to the generous support from the Mitchell Odyssey Foundation, BCIT's School Energy, and Yale Secondary School, the GEARBOTS Engineering Program is able to offer an innovative program that promotes _STEM_ education (science, technology, engineering and math) to students ages 9-14[+]. GEARBOTS currently offers high school courses, non-credit after school courses, and an annual one day engineering challenge and a summer camp.

GEARBOTS Robotics Engineering Program
"Engineering For The Mind"

WORKSHOPS:

OPTION A:
Title: Introduction to Robotics
Session Length: 1.5 hours
Topics: General overview of robotics, theory behind the initiative, philosophical approach used, appropriate learning / teaching style to use, platform options, sample curriculum to implement, possible suppliers, setting up a lab and other logistics, creation of competitions / challenges for assessment, and possible funding options.

OPTION B:
Title: Introduction to Programming in NXT-G Language
Session Length: 5 hours
Prerequisite: Completion of **Option A**
Topics: Basic overview of engineering and programming in NXT environment: motor blocks (measured distance and degree turns), sensor blocks (calculating thresholds), and completion of an introduction challenge.

OPTION C:
Title: How to make your robotics program sustainable
Session Length: 1.5 hours
Prerequisite: Completion of **Options A and B**
Topic: This session will deal with the logistical aspects of making your robotics program sustainable. Topics include: leveraging resources and funding and how to set up a school based or district challenge.

OPTION D:
Title: Advanced Programming in NXT-G Language
Session Length: 5 hours
Prerequisite: Completion of **Options A and B**
Topics: making logic blocks, math blocks, condition statements, variables, multiple tasks, cascading switches, my blocks, and data hubs.

OPTION E:
Title: Introduction to Science and Data Logging
Session Length: 5 hours
Prerequisite: Completion of **Option A and B**
Topic: How to use the NXT platform to support inquiry-based activities for teaching science concepts such as motion, heat, sound, light and colour.

GEARBOTS
EDUCATIONAL RESOURCES

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