IOWA STATE UNIVERSITY
College of Engineering

University Honors Program
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Toying with Technology Application for Student Learning

Introduction:

The Toying with Technology Program on campus teaches non-STEM students how to build and program NXT Mindstorms Robots. These students then take this knowledge they learn in class to local schools and student groups through outreach events. However, the current system in place can be confusing at times, and still takes a lot of direction from student helpers, which is problematic when dealing with a large group of children. To solve this problem, this project aims to create better documentation and resources for the teachers and students.

Deliverables:

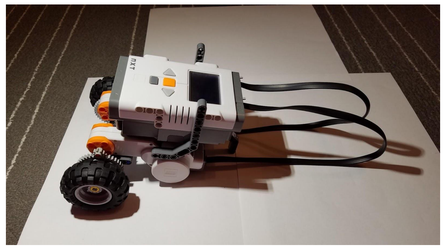
- Step by step instructions using words as well as photos
- Instructions on how to connect the robot to the computer
- Programming instructions
  - What particular lines of code do
  - How block programming and code programming relate

Objectives:

- To help students gain a greater understanding of programming, robotics, and engineering
- To provide Toying with Technology instructors and students additional resources to help with the class in the future

Methods:

- Identify issues in existing documentation
- Observe students
  - Students at outreach events
  - Students in class
  - Individual test subjects
- Make new documentation
  - Address issues
- Test new documentation

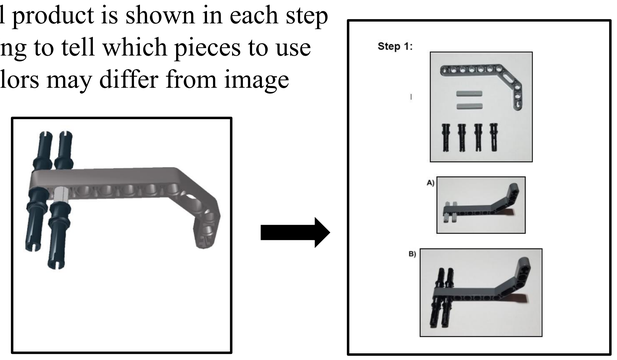


Results:

This project resulted in the creation of robot building instructions, setup and connection instructions, as well as a PowerPoint on the programming fundamentals.

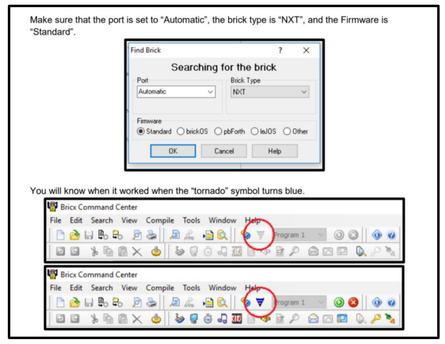
Robot Building Instructions:

Issues with existing design
- Only final product is shown in each step
- Challenging to tell which pieces to use
- Actual colors may differ from image



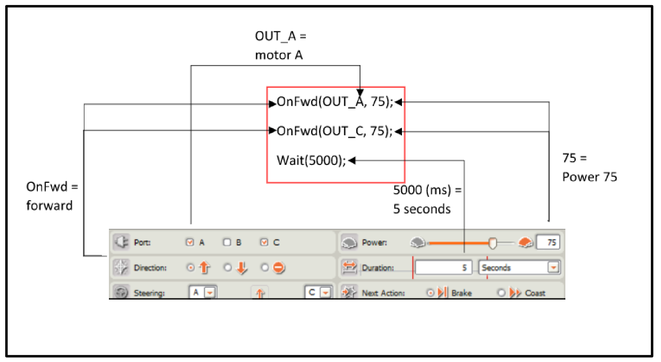
Setup and Connection Instructions:

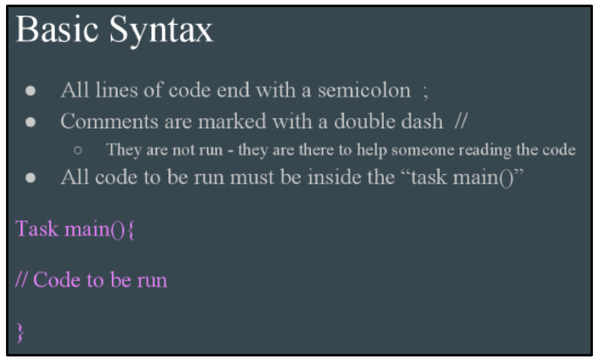
- Explain where to find and compile programs on the computer
- Download programs to robot
- Run programs on robot



Programming PowerPoint:

- Basic syntax
- Line by line code
- Coding examples
- Compare types
  - Block
  - Code





Conclusion:

These new instructions have been distributed to the Toying with Technology class, and should assist with the program. If students can gain a greater understanding of robotics and programming, more talented and passionate students may wish to pursue engineering in the future.