Robotic Merit Badge Session #1

- July 11, 2015
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Agenda

- Class Overview
  - Schedule
  - Materials for the Class
  - Robotics Merit Badge Requirements
  - Robotics Showcase
- The Four D’s of Robotics
- Safety Working in Robotics
- Introduction to Your Robot Platform - Edison
  - Development Tips
  - Exercises
- Assignment to work on before Session #2

Schedule

Class Dates	Descriptoin	Special Topics
7/11	Introduction, Material Distribution, Safety	Programming
7/25	Sensors and Mechanical Design	Gears and Mechanics
8/8	Design Review	Robotics in Space
8/22	Robotics in Industry	Open Source and Robotics
8/29	Robotics Showcase	

Expectations

- Be prepared - Review Class Reference Guide.
- Be on time
- Participate
- Write down ideas, designs, concepts in your notebook
- Be creative
- Ask questions

Material Inventory

- Carrying Case
- Edison Robot
- 4 AAA NiMH batteries
- Engineering notebook

Scout-Provided Materials and Preparation

- Blue Card signed by Scoutmaster
- Printed Workbook
- Computer/laptop with Edware account
- Sony compatible Remote Control
- AAA NiMH battery charger
- Pen/Pencil for taking notes
- Legos

Merit Badge Requirements

All Requirements are listed in the Workbook:

- Safety
- Robotics in industry
- General Knowledge
- Design/Demonstration – Engineering Notebook
- Competitions
- Careers

Complete the workbook on your own for Merit Badge Counselor review/check-off

Robotics Showcase

- Start thinking about your robot design
- Be creative and have fun.
- More details will be announced at the 2nd Session
- If you design a robot with two Edisons, I will give you another Edison robot!

The Four D’s of Robotics

The Four D’s of Robotics

- Dangerous
- Dirty
- Dull
- Difficult

Safety Working with Robotics

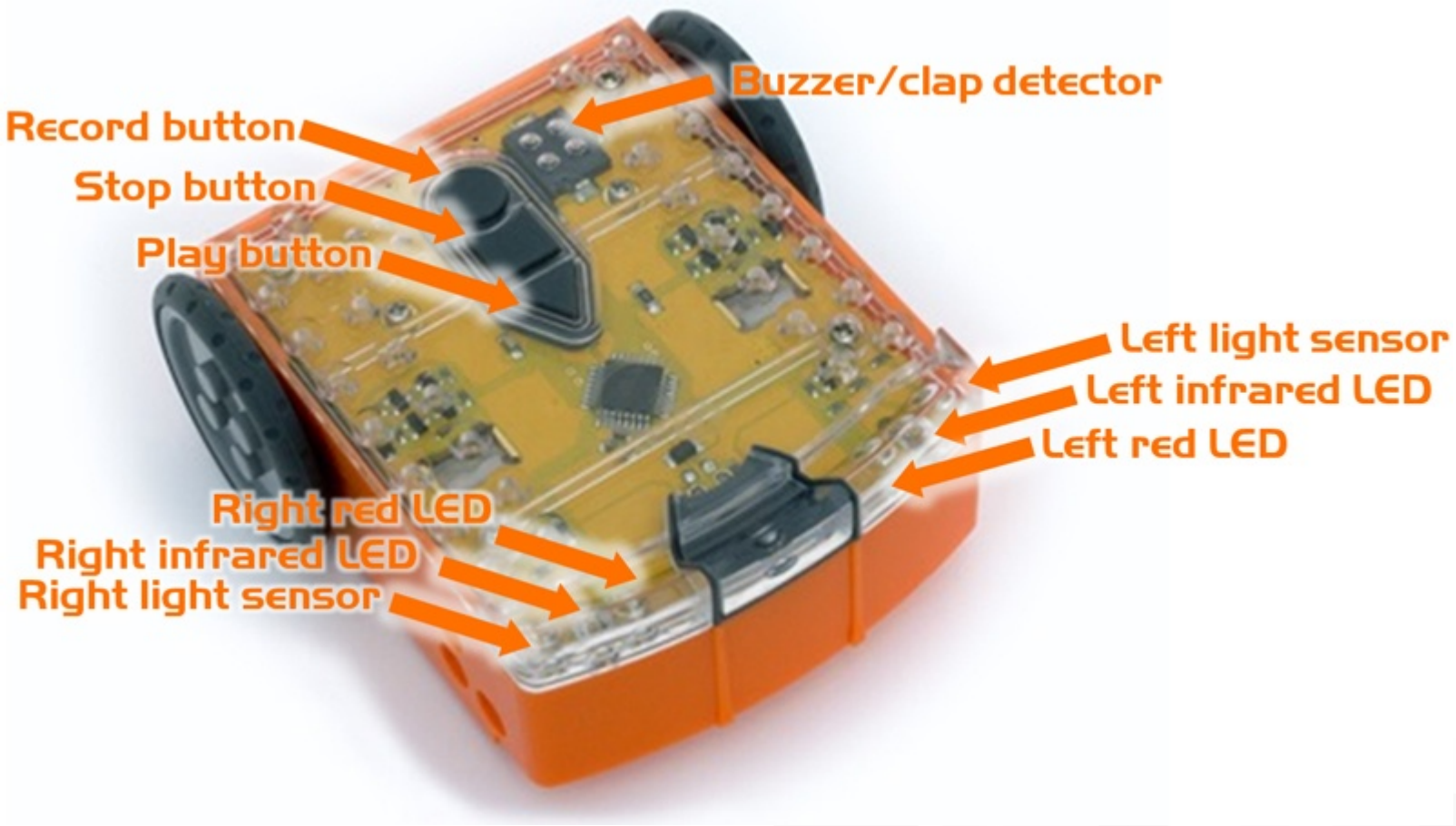
Safety Working with Robotics

- Have a clean work area
- Keep small pieces away from young children and babies
- Electro-static discharge
- Protective gear

Programming Tips

- A robot will do exactly what you tell it to do, but not always what you want it to do
- Write a little, test a little
- Write lots of small programs to understand how things work before attempting a large program.
- Save programs often.
- Create different versions of the program at stable development points.
- Look at example programs to see how they work

Introduction to Your Robot Platform - Edison



- Play Button – Start Program
- Stop Button – Stop Program
- Record Button – 1 press to download, 3 to read barcode

Introduction to Your Robot Platform - Edison

- Power Switch
- Programming cable port

Introduction to Your Robot Platform - Edison

- Programming Cable plugs into audio jack

Introduction to Programming Edison

- Edware Programming Environment
  - Color Coded Icons
    - Red - Control
    - Blue - Read Sensor/button
    - Green - Data Operations
    - Yellow – Control
  - Graphical programming Advantages
    - Easy to learn and visualize
  - Disadvantages
    - Hard to manage large programs

Analyzing The Test Program

- Load the Test Program
- Follow the logic of the the program. What does it do?
- Program your Edison using the “Program Edison” button

Programming Exercises – Generating an SOS Signal

- Create a program to generate the SOS Morse Code signal with one LED
  - 3 short blinks,
  - 3 long blinks,
  - 3 short blinks
  - Pause
  - Repeat.
- A short blink is 0.25 seconds on
- A long blink is 0.75 seconds on
- Each blink is separated by 0.75 seconds of “off”
- Pause between each SOS word is 1.75 seconds
- Save Program as BlinkSOS

Programming Exercises – Using Sensors

- Modify the BlinkSOS program to start blinking when an object is detected and stop blinking when no object is detected.
- Save the program as BlinkSOSDetect

Assignment

- Finish Class Exercises
- Work through EdBook 2 Exercises
- Think of three possible robot designs and write down your ideas in the engineering notebook.