

EV3 Robotics Encounter for Beginners

Goal: To introduce students to Robotic Technology using the Lego Mindstorm EV3 Robots

Audience: Students who have little to no experience using the EV3 Robots

1 x Facilitator. 1 youth or adult Guide for every 4 Students.

Equipment:

1 per Student & Facilitator:

EV3 Castor Bot (prebuilt)

Robot Kit

Computer with Mindstorm Software and Robot Educator

“EV3 Skills Passport” & Pencil

EV3 Instruction Manual (paper book that comes with the Kit)

Optional: Print page 28 of User Guide “Full Block Pallet”

1 x Overhead projector & Laser Pointer

1 x Partially Built Castor Bot (Thru Pg 12 of the Instruction Manual)

1 x Electronic Copy of EV3 User guide found in Mindstorm Software (for Overhead)

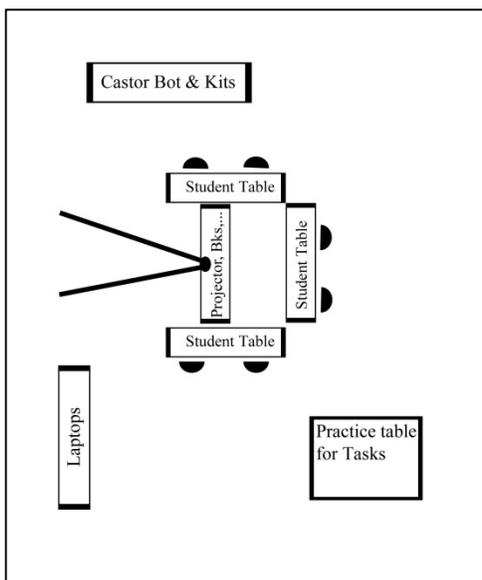
1 x Practice Table & Task Equipment

Set Up:

Course Runs 9:30-Noon (2.5 hours)

Computer software is opened on each computer & everything is charged.

Registration table is in the Hall.



EV3 Beginner Robotics Encounter: Schedule & Facilitator Guide

9:20 – 9:35 - **Register**

- Students sit at tables watching Overhead videos of Robots in industry

9:35 – 9:40 **“Welcome”** (5 minutes)

- Introduce Facilitator & Guides. “Who has used EV3 before?” “Robots?” “Any Lego kit?”
- Remind Students of the 1 Rule we have: Be Kind (to each other, the Guides, and to the equipment)
- Guides: Hand out “EV3 Skills Passport” and pencils. Students, flip through it.

9:40 – 9:50 **“A. Foundations”** (10 minutes)

- “Page 1 of the Passport outlines all of the activities we will complete during the 2-1/2 hours we are together. We have already begun to lay the Foundation of our Robotics Encounter, found on page 2.”
- Read through Context & Purpose.
- **Task 1:** Briefly discuss robots that they may have seen on the videos. Write 1-2 ideas on lines provided in the Passport.
- **Task 2.** Show the finished EV3 Castor Bot. Then Hold up the Partially Built Castor Bot.
- Guides: Hand out EV3 Instruction Manuals. Take a moment to flip through it.
 - “Sometimes you run out of time when building a robot and must begin again days later. Who can tell me what page the person stopped building at? (A: Pg 12) Where should they begin building again? (A: Pg 13) What can you do to make it easier to remember where you stopped building or programming? (A: Write a note,...)”
- **Skills.** On Page 2 of the Passport, read each skill, then have the student initial the box indicating that s/he has practiced that skill.

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9:50 – 10:15 **“B. On Board Programming”** (25 minutes)

- Guides: turn on the Castor Bots, but don't hand them out yet.
- “Turn to Page 3 of the Passport.” Read the Context, Purpose, and Task.
- Facilitator: On the Overhead, open the User Guide Pg. 5 (EV3 Brick).
 - Explain the Brick and what each of the buttons does. (Back, Center, Left/ Right/ Up/ Down)
 - Explain the Brick Interface (Pg. 25-26 of User Guide.)
 - Explain that the Students will use the “Brick Programming App”.
 - In the Robot Educator, Open BASICS tab, then “Brick Programming”. Walk through steps to program. (Reference also Pg. 28 of User Guide).
 - Leave actual program on the Overhead. (If Students understand this quickly, a longer program is found on Pg. 40 of the Instruction Manual.)
- Guides: Hand out the Castor Bots. Stand by to assist.
 - Students: Build & run the program shown on the Overhead. There should be time for them to create their own program.
 - For many kids, it is helpful to have a print out of the “Full Block Pallet” found on the bottom of Pg. 28 of the User Guide, while they are building their program.
- **Skills.** Read page 3 and have students sign Passport.

10:15 – 10:40 **“C. Computer Programming”** (25 minutes)

- Facilitator: With Overhead, demonstrate how to open the “Straight Move” program using the computer software. (Robot Educator > Basics > Straight Move). Be sure your EV3 Bot is connected to Facilitator Computer.
- Walk through the different pages of the program, where to find the command boxes, how to build the program, and how to download. Show them how to change the “circled” items. Ask: “What should this program make the robot do?”
- Critical that they Download only (NOT Download & Run).
- Guides: Hand out the computers and cord to download program to robot. Stand by to assist with programming questions. Extra Guides begin setting up Tasks for “D. Free Design”.

- Have Students program the Straight Move. If they are successful, have them go back and change 1 feature of the program (ie, rotations, time to wait, etc...). "Did your robot perform differently?"
- If there is time, have them continue through Curved and Tank Move programs. Do not use Sensors today.
- **Skills:** Read page 4 and sign Passport.

10:40 – 11:35 **"D. Free Design"** (55 minutes)

- Walk kids to each of the Tasks, explaining the goal. Meanwhile Guides, provide each Student with corresponding EV3 Mindstorm Kit.
 - Examples of Tasks: (Same forward & back action, but different styles may appeal to each Student.)
 - Bowling.
 - Push the Pig to the Barn without touching the Barn or injuring the pigs.
 - Travel to the Castle without hitting a poison tree.
- "It is not expected that you complete all three Tasks. Choose whether to program on the Brick or the Computer. At the end of the time, share your design."

11:35 – 11:45 **"D. Free Design Discussion"** (10 minutes)

- Have Students stop building and share. Go around the room inviting Students to show what they have built, learned, and things they might change if they had more time.

11:45 – 12:00 **"Clean Up"** (10 minutes)

- It is critical that the Students help put away the robots, computers, and miscellaneous equipment. It shows responsibility, teamwork, and respect.
- **Skills.** Read page 5 and sign Passport. Highlight points on page 6 and back cover.