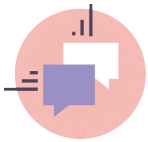
Build and Prep

Robotics



OVERVIEW

Students learn about robotics through watching videos and group discussion. For this lesson, stduents build the EV3 educator model using their Lego Mindstorm kits.

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OBJECTIVES

Students will be able to:

- Describe what it means to be a robotics engineer
- List three possible uses for robots

AGENDA

Length: 45 minutes

1. Introduction to robots
2. Introduction to EV3
3. Build

MATERIALS

- EV3 Educator Model Building Instructions http://robotsquare.com/wp-content/uploads/2013/10/45544_educator.pdf

INTRODUCTION TO ROBOTS

Length: 10 minutes

Students learn about the robotics field and explore cool things robots can do.

Teacher Actions	Student Actions
1 Introduce Tech and Tape: Tech and Tape is a collaboration between 9 Dots and DIY Girls -- two Los Angeles-based nonprofits dedicated to providing students with a fun tech education. The goal for this class is to create Sumo bots that will wrestle each other in a tournament. To create the Sumo bots we are going to have to learn about robotics!	
2 Watch [Darpa robotics challenge][video1]	
3 Discuss Which do you think was the coolest robot? Why?	3 Students raise their hands to offer answers.
4 Watch [A day in the life of a robotic engineer video] [video2]	

5 Discuss What do you think it means to be a robotic engineer? What are some ways that you think robots are used currently?	5 Students raise their hands to offer answers.
6 Talk about modern uses for robots: • Surgery • Factories • Search and rescue • Cleaning • Bomb disposal • Exploration (space, sea)	

INTRODUCTION TO EV3

Length: 5 minutes

Students learn specifics about how the Mindstorm EV3 robots work.

Prep:

Teacher Actions	Student Actions
1 Explain the sensors: • Motor - used for driving the robot. Also a strong building piece. • Touch sensor - used for detecting when the robot has touched an object. • Ultrasonic sensor - used for measuring distance. • Color sensor - used for checking colors.	1 Students take notes on their paper to clarify what the sensors are used for.
2 Show students the building plans for the EV3 Educator Model. Explain that this robot is helpful for learning how to program the robot, and that students will be coming up with their own designs later in the unit.	
3 Discuss Why is it important to organize Lego pieces properly? • Future building can be more efficient and more fun if it is not necessary to hunt for every little piece.	3 Students raise their hands to offer answers.

BUILD

 Length: 30 minutes

Student build their robots using the LEGO EV3 Educator Model instructions

Prep:

Teacher Actions	Student Actions
1 Tell students that the first step is to organize their building materials. Students should use the organizer chart that is on the box cover in their EV3 kits.	1 Students organize their lego box according to the diagram provided with the boxes.
2 Tell students they have the rest of the class to build their robots according to the instructions. Emphasize the importance of using the correct Lego pieces for each step. Rushing and using the wrong ones will lead to robots that do not function properly.	2 Students should now begin building using the plans.