



CAREER READINESS

LESSON FOCUS/BASIC ROBOTICS AND PROGRAMMING

GENERAL DESCRIPTION

Students will learn that there are a wide variety of jobs and career paths for civilians in the Navy that are associated with Robotics and Robotic processes. The students will apply basic STEM Science, Technology, Engineering and Mathematics principles learned in HS courses.

LEARNING OBJECTIVES

1. The students will be able to identify different STEM focused civilian careers offered by the Navy that relates to Mechanical and Electrical engineering.
2. The students will be able to follow basic technical drawings and instructions to build a Robot from a provided kit of parts.
3. The students will be able to Program the basic functions of the robot that may contain sensors.

RESOURCES

Links for ONR Careers:

<https://www.onr.navy.mil/en/Education-Outreach/naval-stem>

<https://www.nrl.navy.mil/Careers/>


<https://www.onr.navy.mil/work-with-us>

<https://www.nrl.navy.mil/careers/opportunities/>

ACTIVITY | 1 - 2 hours

Objective(s)	#1	Have the students work in pairs to review the Naval job descriptions that are listed in these documents (above) related to Robotics, Mechanical and Electrical Engineering. The team will create a diagram of possible career paths that involve an Educational path to the Navy.
Grade	High School, College, Navy	
Result	The team will present their findings and engage in a round Table discussion to explore findings.	

ACTIVITY | 2 PHASES

Objective(s)	#2, #3	 Robotics Safety - Hazardous Materials
Grade	9 - 12	
Subject:	Using the provided Robotics Kit the team of 2 students will: PHASE 1 2 - 3 HOURS <ul style="list-style-type: none">• Build a Basic robot from a provided set of Instructions (VEX IQ Claw Bot)• Program the robot using provided Software for basic motion, and arm functions. PHASE 2 4 - 5 HOURS <p>The Team will:</p> <ul style="list-style-type: none">• Accept the challenge of moving a Hazardous materials container to a specific location.• Plan and execute a redesign of the robot to safely contain and transport the material.• Program the robot to move the material to a specific location Driver Controlled.• Program the robot to move the material to a specific location autonomously.	

MATERIALS REQUIRED FOR EACH TEAM

1 - VEX IQ Gen 1 or Gen 2 Robotics kit. (<https://www.vexrobotics.com/iq>)

1 - PC with access to access to

- Build Instruction (<https://www.vexrobotics.com/iq/downloads/build-instructions>).
- Software for programming. (<https://www.vexrobotics.com/vexcode/install/iq>)

1 - Flat table (2 x 6) with chairs and access to ac power.

1 - Hazardous Material object (Instructor decision).

1 - Notebook + Pencil and ink pens.