

How to link Robotics to the Ontario Curriculum Outcomes and Expectations

1. Find your course code in the Ministry Curriculum Document:
<https://www.edu.gov.on.ca/eng/curriculum/secondary/teched.html>
2. Proceed to page 5 to identify the Fundamental Concepts
3. Page 7 indicates the teaching responsibilities: This key paragraph is important

“ Using a variety of instructional, assessment, and evaluation strategies, teachers provide numerous **hands-on** opportunities for students to develop and refine their **problem solving skills, critical and creative thinking skills, and communication skills, while discovering fundamental concepts through activities and projects, exploration, and research.** The activities offered should enable students to relate and apply these concepts to the social, environmental, and economic conditions and concerns of the world in which they live. “

4. Page 17 indicates **the problem solving methods and approaches**

Parts Substitution - Diagnostics - Reverse Engineering - Divide and Conquer - Extreme Cases Considering - Trial and Error - The Design Process

5. Choose your subject area; for this example lets use Computer Technology TEJ20

List the Overall Expectations

- A1. identify and describe the functions of, as well as important advances related to, **electronic** and computer components;
- A2. demonstrate a basic understanding of computer networks and their **components**;
- A3. demonstrate a basic understanding of binary numbers and **digital logic**.
- B1. install and configure the hardware and operating system of a workstation, and use file-management techniques effectively;
- B2. construct and test simple interfaces and other **electronic circuits**;
 - Specific Expectations**
 - B2.1 safely construct and test electronic circuits (e.g., LED circuit, flasher, timer), using both breadboard and soldering techniques to connect discrete components and/or integrated circuits;**
 - B2.2 use appropriate procedures to prevent damage to computer hardware and electronic components (e.g., use anti-static wrist strap and grounding mat when**

handling sensitive components; avoid overheating solid-state devices when soldering);

B2.3 describe and build an interface to connect a computer to a simple peripheral or robotic device (e.g., LED traffic light, DC motor, robotic arm);

B2.4 trace the operation of a system consisting of a computer, a program, an interface, and external hardware to ensure that the interface circuit functions properly;

B2.5 use appropriate test equipment to measure electrical quantities (e.g., voltage, resistance).

B3. assemble and configure a simple computer network;

B4. install and use a variety of **software**;

B5. apply fundamental programming concepts to develop a variety of simple programs, including a program to **control an external device**.

C1. identify harmful effects of the widespread use of computers and associated technologies on the environment, as well as agencies that reduce these effects;

C2. identify effects of the widespread use of computers and **associated technologies on society**

D1. follow appropriate health and safety procedures when assembling, using, and maintaining computer systems;

D2. demonstrate an understanding of ethical and security issues related to the use of computers;

D3. identify various careers related to computer technology, and describe the education and/or training required for them.

6. Visit CarlRobotics.com and you will see a robotic project that will meet all these needs in the Area of B2

The same hands on learning process can be applied to other Tech courses

Science courses

Physics courses

Math courses

For more information contact Rick Alexanderson Rick.alexanderson@ocsb.ca

Other helpful sites: www.arduinoteachers.com
www.stpetertej.com
www.OttawaMakerSpace.com

