

TEJ20 Computer Technology

An Introduction to Arduinos

[Abstract](#)

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Project Overview

The Arduino is an exciting low-cost and open-source platform which lets students learn basic programming and electronics while making interactive projects.

In this set of activities, students will learn the basics of Arduinos by using them to wire some introductory circuits. Along the way, they will learn the fundamentals of Ohm's Law, which defines the relationship between Voltage, Current, and Resistance.

Project Challenge

The project is broken down into three phases:

1. getting introduced to the Arduino
2. creating and programming some simple circuits
3. reflecting on the process by documenting their learning in an ePortfolio

Connections

Science, Technology, Engineering and Mathematics (STEM)

This project supports the fundamental principles around STEM. It encompasses all aspects of STEM; material properties, engineering concepts, computer aided design, and mathematics

Differentiated Instructions (DI)

Provide an open-end approach when having students select a product. Have students choose their own product. A choice board with examples may help.

Project Criteria

Ideally, each student will have their own Arduino to complete the activities, or where DI warrants it, and Arduino can be shared with between two students. For each Arduino, there should be a set of supporting parts, including but not limited to:

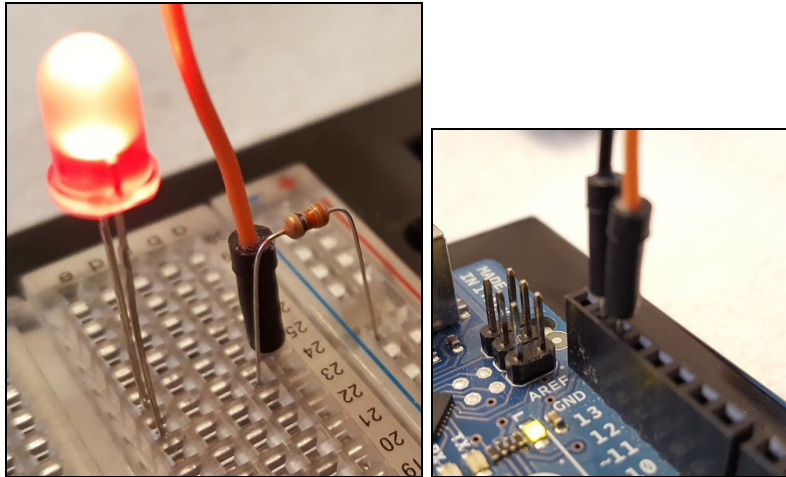
- a breadboard
- 330 and 1K Ω resistors
- a 5V motor
- MORE HERE

Each student will also require access to the World Wide Web and have access to online tools such as Google Docs and Google Sites.

Troubleshooting equipment such as a multimeter would be beneficial, but is not mandatory at this level.



Examples



Project Synopsis and Timelines

Act #	Activity Title/Name	Time (hrs.)	Curriculum Expectations	Assessment & Evaluation	Connections?
1	Getting to Know the Arduino		A1., A1.1, A1.2, A1.4 A3., A3.1 B2., B2.1, B2.2, B2.3, B2.5 B4. B4.2 B5., B5.1, B5.2,	<ul style="list-style-type: none"> ● K/U ● T ● C ● A 	<ul style="list-style-type: none"> ▪ Ontario Curriculum ▪ Growing Success ▪ DI ▪ STEM ▪ Math Literacy ▪ Literacy
2					<ul style="list-style-type: none"> ▪ Ontario Curriculum ▪ Growing Success ▪ DI ▪ STEM ▪ Math Literacy ▪ Literacy



3					<ul style="list-style-type: none">▪ Ontario Curriculum▪ Growing Success▪ DI▪ STEM▪ Math Literacy▪ Literacy
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Activity 1 - Getting to Know the Arduino

Minds On (Engaging Prior Knowledge)

Description

It is assumed the students have no prior knowledge with Arduinos, programming, or electronics.

This series of lessons and activities will provide an overview of the Arduino. There is a slideshow that will get the students started with the theory and first few activities but then they will need to use some critical thinking skills to complete the remaining activities.

The lesson will start with motivational videos about the Arduino leading into some simple activities to get started with the programming and the basic electronics.

Criteria and Instructions

- Need something here about notes and/or questions related to the videos

Prior Knowledge	Connections
None assumed, other than basic computer experience (opening and saving files), being able to search on Google, etc.	N/A
Planning Notes	Connections
Forthcoming...	



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Action (Introduce or Extend Learning)

Instructional Strategies	Connections
Activities per our grade outline, https://goo.gl/PT22VI	
Assessment and Evaluation	Connections
<ul style="list-style-type: none">• Neatness• Adherence to Black for ground, Red for power• Proper operation• More???	
Accommodations	Connections

Consolidation & Connections (Provide Opportunities for Reflection)

Reflection Paper/Exit Card	Connections
<ul style="list-style-type: none">• Some activity related to imagining future or real-world projects	



Materials, Tools and Resources

Websites
<ul style="list-style-type: none">• Getting Started with Arduino and Genuino products https://goo.gl/BHtTY1• Arduino Presentation https://goo.gl/3gkY1R• Arduino Language Reference https://www.arduino.cc/en/Reference/HomePage
Publications
<ul style="list-style-type: none">• N/A
Computer Software
<ul style="list-style-type: none">• Arduino Editor• Web Browser
Human Resources
<ul style="list-style-type: none">• N/A
Other
<ul style="list-style-type: none">• N/A
Appendices



Activity 2 - First Steps with the Arduino

Minds On (Engaging Prior Knowledge)

Description

Criteria and Instructions

Prior Knowledge	Connections
None assumed, other than basic computer experience (opening and saving files).	
Planning Notes	Connections
Forthcoming...	

Action (Introduce or Extend Learning)

Instructional Strategies	Connections
Activities per our grade outline, https://goo.gl/PT22VI	
Assessment and Evaluation	Connections



Accommodations	Connections

Consolidation & Connections (Provide Opportunities for Reflection)

Reflection Paper/Exit Card	Connections
<ul style="list-style-type: none">• Some activity related to imagining future or real-world projects	

Materials, Tools and Resources

Websites
<ul style="list-style-type: none">• Arduino Presentation https://goo.gl/frtM22
Publications
<ul style="list-style-type: none">• Link to PDF of Arduino manual
Computer Software
<ul style="list-style-type: none">• Arduino Editor



Human Resources
Other
Appendices



Activity 3 - TBD

Minds On (Engaging Prior Knowledge)

Description

Criteria and Instructions

Prior Knowledge	Connections
None assumed, other than basic computer experience (opening and saving files).	
Planning Notes	Connections
Forthcoming...	

Action (Introduce or Extend Learning)

Instructional Strategies	Connections
Activities per our grade outline, https://goo.gl/PT22VI	
Assessment and Evaluation	Connections



Accommodations	Connections

Consolidation & Connections (Provide Opportunities for Reflection)

Reflection Paper/Exit Card	Connections
<ul style="list-style-type: none">• Some activity related to imagining future or real-world projects	

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