

# GEMS Innovation Lab Certification Program

The following are guidelines only and are subject to change. Certifications and badges are awarded at the discretion of the teachers.

Certification / Badge	Requirements	Resources
<b>General Safety</b>		
Innovation Lab Safety	Pass quiz Demonstrate safety throughout	<a href="#">Lab Safety Manual</a>
<b>Programming</b>		
Coding	Turtle Academy and an original project in one of the following: <ul style="list-style-type: none"> <li>Scratch</li> <li>Pencilcode gym</li> <li>Processing</li> </ul>	Get an account at: <ul style="list-style-type: none"> <li><a href="#">Turtle Academy</a></li> <li><a href="#">Scratch</a></li> </ul> Sign up <a href="http://scratch.mit.edu/classes/204348/register/84e06f5eec2945a6999707d43a077a1b">http://scratch.mit.edu/classes/204348/register/84e06f5eec2945a6999707d43a077a1b</a> <ul style="list-style-type: none"> <li><a href="#">Pencilcode</a></li> <li>Or use <b>Processing</b> on your computer</li> </ul> Use the online tutorials to learn about the programming environments <a href="#">Processing.org</a> has tutorials for Processing
Makey Makey	Build a physical computing project using a makey makey kit and Scratch	<a href="#">Scratch</a>  <a href="#">Makey Makey - How To</a>  <a href="#">Makey Makey App Examples</a>
<b>Arduino Programming</b>		
Arduino Beginner	Wire the arduino and run the "blink sketch"	<b>Arduino</b> is installed on your computer Please follow the wiring directions to get started
Arduino Intermediate	Complete any 4 or the	

	<p>experiments (except blinking LED) here:  <a href="https://learn.sparkfun.com/tutorials/sik-experiment-guide-for-arduino---v32">https://learn.sparkfun.com/tutorials/sik-experiment-guide-for-arduino---v32</a></p>	<p>You can learn all about the Arduino by doing the experiments at <a href="#">Sparkfun</a></p>
Arduino Advanced	<p>Create an original project. You may borrow code and edit, wire the circuit.</p>	<p><a href="#">Arduino Create</a> can help you with more code, or the sketches pre programmed in Arduino can give you ideas</p>
<b>3d Design</b>		
3d design beginner	<p>Create an artistic or functional design with appropriate dimensions. Resize, group,</p>	<p>Use <a href="#">Tinkercad</a> to get started with basic shapes or use <a href="#">Sketchfab</a> to “model” with clay. Both have tutorials. There is a getting started with Tinkercad video <a href="#">on this page</a>.</p>
3d design advanced	<p>Use a mesh editor to design a more detailed object</p>	<p><a href="#">Vectary</a> and <a href="#">Clara</a> are both online mesh editors with good built in tutorials. You can download</p>
3d printing	<p>Export .stl file, save to network location, Load new filament, adjust settings, initiate printing process, clean final print</p>	<p>Read the printing information <a href="#">on this page</a>.  When you are ready to print for the first time, make sure an adult or a certified user is with you.</p>
<b>Laser Cutting</b>		
Laser Cutting design beginner	<p>Create a svg file suitable for lasercutting using Corel Draw using your own drawing.</p>	<p>Read about getting started with Coreldraw <a href="#">on this page</a>. Watch the video. Then complete the tasks on this document: <a href="#">Getting Started with Coreldraw</a></p> <p>Also you may be able to get your design started using <a href="https://vectr.com">https://vectr.com</a></p>

Laser cutting design advanced	Create a svg file suitable for lasercutting using Corel Draw which uses a mixture of your own and imported artwork.	
Laser cutting	Set up and run laser cutting job	
Laser cutting project	Create a 3d/layered/multiple part laser cut project	
<b>Circuits</b>		
Circuits	Create temporary series and parallel circuits to light one or more L.E.Ds	See materials and guide at circuit station
With Solder	Make permanent connections using the the appropriate amount of solder	
<b>Sewing</b>		
Hand sewing	Create a bookmark/other small project	Directions can be found on this page: <a href="#">Fashion and Technology</a>
Sewing with conductive thread	Create a working circuit on a premade item	Use <a href="#">this guide</a> to get started. Look at the simple circuit and parallel circuit activities.
Machine sewing	Create a bag or other small project	
E-textile	Create a e textile project (circuit on a sewn object.)	
<b>Video production / Digital Storytelling</b>		
Storyboarding	Create a detailed workable plan for a video that considers all actor directions, images, sounds, transitions, etc.	Blank Example <a href="#">here</a> Filled in Example <a href="#">here</a>

Editing	Using iMovie, Movie Maker or other successfully	
Green Screen	Use Green Screen by doink to produce a video.	Doink has a tutorial built in!
Music composition	Use <a href="#">Soundation</a> to create original music to enhance your video	To get started use this <a href="#">Soundation Tutorial</a> .
Kidpix	Create a slideshow and export as a video	
Branching choices story	Use Scratch, Hyperstudio, or google slides to create an experience where the user controls choices in the story.	
Tutorial (instructable) creator	Create a video, slide presentation, or other product that teaches a skill or shows how to complete a project.	
<b>Jewelry skills</b>		
Use of findings	Create a chain with jump rings and clasp	Directions are given on this page: <a href="#">Fashion and Technology</a>
Metal work	Create a pendant or charm with metal working tools	
Wirework	Create a pendant, chain or cabochon with wire	
Electronics in jewelry	Design a piece of jewelry that will hold a circuit	
<b>Paper Crafting</b>		
Origami	Create a minimum of three origami projects using different folding techniques	

Paper circuits	Create a paper circuit with a switch	
Using paper circuits	Create a card/diorama/origami with a circuit	
<b>E-Cutter</b>		
Design	Use the e-cutter work environment to create a file for cutting	
Cutting	Choose the correct materials, blades and settings to accurately cut the design	
Assembly	Create a project using the e-cutter	