**Designing Masks for the Laser Cutter using Adobe Illustrator (inc Laser Induction)**

|  |  |  |
| --- | --- | --- |
| **Date:** | **Class/Group:** | **Time:** **Room: Fabrication Lab** |
| **Topic: Mask 2 Designing Masks for the Laser Cutter using Adobe Illustrator (inc Laser Induction)**  |
| **Specific Objectives/Learning Goals:** * The intention of the **Designing Masks for Laser Cutter using Adobe Illustrator (AI)** is to

 introduce participants to basic skills involved in using Adobe Illustrator with the laser cutter. AI can be used to create and convert a hand-made prototype into digital designs that reproducible and sharable. * The intention of the **Laser induction** is to enable participants to become familiar with the practical use, basic theory and safety behind the use of the Trotec Laser cutter.

**Learning Outcome:*** Understanding how to effectively set up an AI document for use on The Edge’s Laser cutter
* Using a range of basic features in AI to create designs for Laser cutting.
* Become confident with terminology around the Laser cutting machine
* Become familiar with the safety procedures in the workshop and with the use of the Laser Cutter.
 |
| **Prior Learning:****- No prior learning required*** Experience with the use of vector based graphic programs like Illustrator are an advantage
* Alternatively skills in generating dwg files.
 | **Resources/Materials required:****-Secure a HOT WORK PERMIT*** 10 pens
* 10 laptops
* 10 USB sticks with files for lesson
* 10 pieces of Corrugated cardboard
* TV + facilitators laptop
* 10 print outs of laser cutter induction paperwork
* Sample prototypes + material sample board showing cutting and engraving on the laser cutter
* Extra printed copies of the power-point for inductees to seek answers for their paperwork.
* 5 Hot Glue guns + sticks
* 10 Pairs of Scissors
* 5 Craft Knife
* 10 Precut Mask kits
* Instructions for each of the three kits- Gorilla, Lion Cub and Wedge Tail Eagle.
* 10 Rulers
* 5 Staplers
* AI shortcuts list
* Laser RGB pallet
 |
| **Lesson Steps** |
| **Time:** | **Procedure** | **Comment** |
| *00.00**00.10**00.20**00.35**00.45**01.00**1:15**1.20**2.00* | 1. **Pre-Lesson**

**Secure a HOT WORK PERMIT**Prepare Television + Computer link up at the front of the class.Open the Laser cutter power point induction.Ensure each participant has a laptop, USB stick with appropriate files, and material for the laser cutting exercise.1. **Introduction/Motivation**

-Introduce the inductees to yourself. Give participants a brief background, your experience working with The Edge and using the laser cutter..- House keeping- Toilets + Fire evacuation.- Take participants on a brief tour of the space to familiarise them with the Fab Lab and the facilities available to inductees. Make the last machine that you visit the Laser cutter.- Ask participants about any relevant personal experience. 1. **Facilitator Input - Stand around the machine and show a few prototypes**

Give an overview of the project you will create on the laser cutter today.Give a brief overview of the machine-* Materials that can be cut + the thickness of the materials.
* Engraving and Cutting functions.
* Uses for the machine- Prototyping furniture and products, signage.
* Quick + very accurate at cutting.
* Booking policy and laser materials policy
1. **Inductee Discussion**

Answer any question and get inductees to sit at a laptop.1. **Facilitator Input - Laser Induction Part 1**

Work through the Laser Cutter induction Power point.Stop at the printing preferences point, save on overloading participants with to much dry content.1. **Inductee Discussion**

Answer any question and get inductees to sit at a laptop.1. **Facilitator Input - Intro to using Illustrator to design for the laser cutter**

- Open Illustrator- Create a new illustrator file 435 x 735mm RGB ColourSave this to you USB stick Introduce Participants to basic tool drawing selection tools * **Rectangle (M)** **/ Ellipse tool (L)** - *Draw a rectangle*
* **Selection tool (V)** – *select the rectangle.*
* **Direct Selection Tool (A)** select corner anchor
* **Transform Panel** - *Resize the rectangle*
* **Pen tool (P)** *draw another composite shape, add, delete convert and manipulate anchors and handles.*

**Allow participants to experiment with these** Introduce participants to * **Text tool (T)** *– write something along a path*
* **Line and Curve Segment tool (\)**  *make a box by adding segments at 90deg to the end of the preceding segment. Complete the box by selecting the 3rd and 1st anchors (select direct selection tool shift / click on the anchors) and*

Introduce participants to * **Fill, Stroke Colour and Weight** settings
* **Isolated mode**
* **Using Guides and Smart Guides**
* **Aligning & Spacing objects**
* **Layers, Arranging and Grouping objects**

**Allow participants to experiment with these** 5 Min Break 1. **Facilitator Input - Laser Induction Part 2**

Complete the power point on the printing preferences, alternatively take the inductees over to the machine and demonstrate how to send a job to print, this may give participants more context about how to undertake this step.Get some audience participation with moving the printing bed + focusing the lense of the machine.- Demonstrate the laser log + explain its purpose.1. **Inductee Activity – reproduce mask parts in AI**

Get participants to pick one of the three mask types available. ***Explain that a small number of parts have been left out of the kits. Participants need to use AI to reproduce these parts.*** 1. **Inductee Activity** – **Cut Parts** As participants complete AI designs of missing parts they can then go on in pairs to prep their laser cutting jobs in Corel Draw and then cut these out.

Use the workflow worksheet as a guide to step participants through the printing process.1. **Inductee Activity – Construct Masks and complete Induction paperwork.** Participants not engaged reporoducing parts in AI, prepping cutting can spend more time personalising their diorama or they can get started on completing the induction paper work.

During this construction stage encourage participants consider how they might refine the design, approach construction differently and other practical uses of these tools. - 1. **Feedback and Conclusion**

Thank participants, ask for feedback and encourage them to come back with their personal projects soon.1. **Pack Up-**

-Ensure that the inductees paper work is complete, signed by the facilitator, peer and participant. Leave this paperwork for Phil to process.- Generally tidy up the space.- Thoroughly clean the laser cutter.- Leave a note or send and email on any problems you experienced with inductees or equipment in the space.- Check out at reception and let them know you have completed your induction if your are the last person to use The Fab Lab- Return the Hot Work Permit. | *Visit the ESO’s in the facilities department near the museum and pick up a hot work permit for the duration of the induction 38407243**The password the facilitator laptop is facilitator.*[*http://edgeqld.org.au*](http://edgeqld.org.au)*Booking Policy* *Laser Materials Policy**The password the bank of laptops and the 3D printer laptops is edgeuser.**Direct participants to the RGB colour chart beside the Laser**Discourage large areas of engraving to save time on the laser cutter**Bring Laser cutter paperwork and pen**http://edgeqld.org.au/laser-cutter-job-log/**-Turn on the extraction fan. Located in the science lab area. Labeled exhaust fan.**-On the second computer, get participants to work on setting up their files in corel draw - converting the line weight to hairline and the colours to the correct RGB profile.**-Be proactive as the facilitator to have print jobs banked up ready to go, to get through the printing.**Perhaps have a few copies of the printed induction powerpoint available for inductees to find answers.**Mick.byrne@slq.qld.gov.au**Phil.Gullberg @slq.qld.gov.au* |
| **Evaluation of Inductees Learning + problems experienced with equipment:** |
| **Self-Evaluation/Reflection:** |