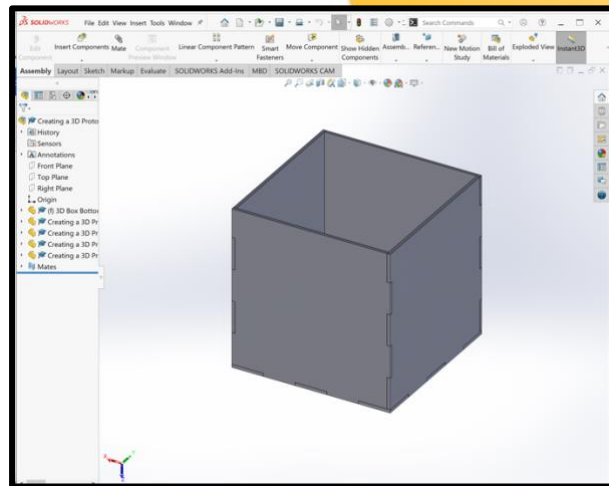


**Educational Level:**  
Higher Education

**Subject Area(s):**  
Design, Science & Engineering

**Time required:**  
1-2 hours

**Adobe Skill Level:**  
Beginner



## Creating a 3D prototype to link the digital and physical

### Overview

The ability to link the digital and physical world is a skill all Design and Engineering students will need. Taking an idea from the 3D modelling space and translating it to 2D and then taking it back to 3D in order to prototype is essential in learning this skill. This process allows you to quickly iterate your ideas and test how they hold up in the real world.

In this project, you will be taking a 3D model of a box in Solidworks and then turning it into a 2D drawing to laser cut so that you can make the box in real life. Working with Adobe Illustrator as a bridging software, you will utilise your understanding of traditional CAD software and laser cutters which will give you the foundational skills to begin to use a robot.

By completing this project, you will also gain the foundations that will allow you to create laser cut models designed within the Illustrator environment enabling you to frequently iterate your designs. This will give you the opportunity to experiment more frequently through quick design flow from Illustrator to laser cutting and cheaper materials. This process will enhance your Technology Literacy and ability to link the digital and physical world. These are fundamental skills required for your future roles or positions in the Design and/or Engineering industry.

## Supporting Tools and Resources

- Illustrator Template
- Zip file of Solidworks Components
- 3mm Plywood (maximum size 1200mmx700mm)
- Lasercutting Training
- PVA
- Masking Tape
- Solidworks
- Adobe Illustrator
- [Solidworks to Lasercutting video](#)
- Rubric/marketing guide

## Student Steps

Read through and complete each of the following steps.


- 1 [10 minutes] First, watch the [Solidworks to Lasercutting video](#) and as you watch the video, consider the following questions:
  1. What can I do to best utilise my material so I can make the most of my material?
  2. How can I minimise the amount of time it takes to Laser cut?
  3. Why is this process important?
- 2 [5 minutes] Download the zip file with the Solidworks components in it. Save all these components to your computer and open Solidworks.
- 3 [20 minutes] Follow all the steps in the [Solidworks to Lasercutting video](#). You may want to pause and play video as you follow along.
- 4 [5 minutes] Once you have converted the components for the box into an Illustrator file, double check all your settings are correct for Lasercutting.

**Note:** The settings will be different depending which lasercutter and program you are using, so make sure to double check what settings are relevant for you.

### Suggested settings:

To cut:	Red (255, 0, 0)
To etch:	Black (0, 0, 0)
To outline:	Blue (0, 0, 255)
Stroke weight:	0.01mm

- 5 [5-30 minutes] Print the Illustrator file to your Laser Cutter. The amount of time this takes will depend on how well you have set up your Illustrator file and how big your file is.



**Note:** This process will vary depending which lasercutter and program you are using

- 6 [5-30 minutes] Assemble the box using PVA and Masking tape to hold it into place while it dries.
- 7 [30-45 minutes] Go back into the original Solidworks components and make some alterations to the box to improve it. Then, repeat steps 3-6 with your new components. You can repeat this step as many times as you like until you have a box that you are happy with.

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