



# THE DIGITAL TO PHYSICAL SELF INTRODUCTION GUIDE

2 to 3D design : illustrator, inkscape, trotec, fusion 360  
laser cutting and engraving - 3D printing

**TEACH YOURSELF THE 42 WAY**

The aim of this guide is to assist you in taking your initial strides with these crucial tools. These tools find professional applications in various domains such as architecture and industrial design. While this guide provides a basic introduction, it is important to note that your skills will develop over time, enabling you to pursue intriguing projects.

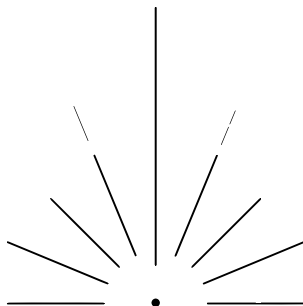
In the spirit of 42, this guide does not provide step-by-step instructions. Feel free to explore and utilize resources like Google, YouTube, or any other references you prefer. For machine-related information, you can conveniently scan the provided QR code.

I strongly recommend engaging in this guide alongside peers to observe different approaches and outcomes.

*This guide was created in the U7 subway line, after discussions and brainstorming with Gbooth and Lenny. Feel free to contact me, Imangall, for any suggestions, error reports, or general feedback, which would be greatly appreciated.*

|                                |   |
|--------------------------------|---|
|                                | <b>1 -Create a closed shape</b>   |
|                                | Sum of all sides : max 10 cm<br>Export your file in .dxf or xxx format<br>From now on we will refer to your shape as «Flurby» |
| <b>software</b><br>(your pick) | Fusion 360 (drawing environment)<br>Adobe illustrator<br>Inkscape   |

|                        |  |
|------------------------|--|
|                        | <b>2- laser-cut Flurby in mdf material</b> (or similar cheap prototyping plate)  |
|                        | <p>Get familiar with the machine settings, especially the speed to power ratio. Remember you can scan the QR.</p> <p>Use material thoughtfully, considering its environmental impact. That is if you don't plan to have a long relation with Flurby but he is just a test, maybe use a piece of scrap material that was already engraved</p> |
| <b>software (must)</b> | <p>Inkscape</p> <p>Trotec</p>  |

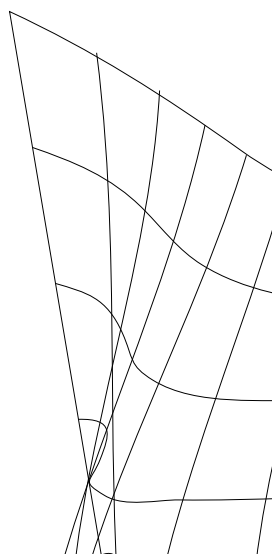


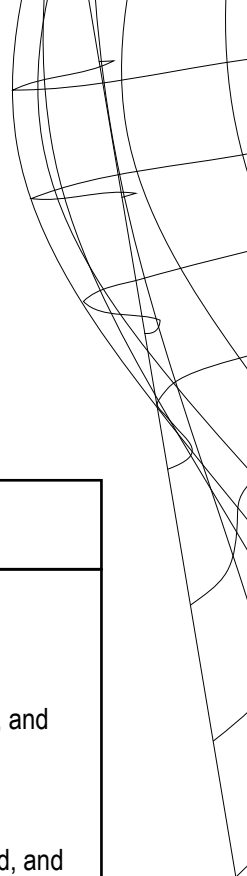
**Congratulations**, you made the step from creating a bunch of 0 and 1 in some obscure memory to control high tech machinery to create a physical object. Just to give you an idea, the accuracy of this model is +/- 0.015 mm.

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|                            | <b>3- on your original design, add (inside the shape) a pattern, marks, text, a hole...</b>  |
|                            | And laser engrave it into the previously cut piece of mdf<br>You might need to read more thoroughly the laser cutter man (scan the qr)<br>Naturally this time you don't want to cut the outline of your object |
| <b>software<br/>(must)</b> | Inkscape<br>Trotec   |

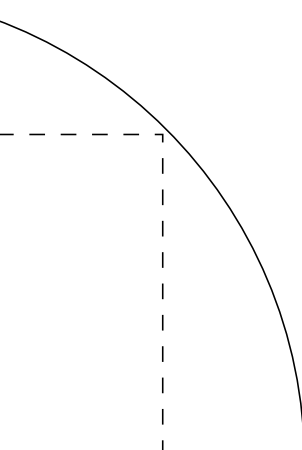
***You just made the step from 2D to simple 3D  
(the engraving is a form of recess in the material)***

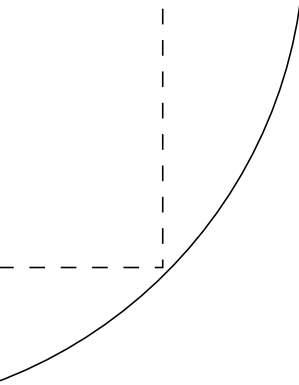
|                            |  |
|----------------------------|--|
|                            | <b>4 - Make Flurby sexy, get familiar with Fusion</b>  |
|                            | <p>4- open fusion, (this time in the modeling environment) extrude flurby (the tool is called "extrude"</p> <p>Welcome to the world of 3D, where Flurby is curvy, shapy, sexy.</p> <p>Play around:</p> <p>You can add some drawings to the face of flurby and extrude (positively or negatively)</p> <p>Add some fillets</p> <p>Add a hole and tap it for a screw to get into your Flurby</p> <p>Wathever comes to your beautiful mind</p> |
| <b>software<br/>(must)</b> | Fusion360  |





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|----------------------------|---|
|                            | <b>5- print your flurby OR BETTER jump to 6-</b>  |
|                            | <p>A few tips:</p> <p><b>Design Considerations:</b></p> <ul style="list-style-type: none"><li>- Ensure the design is suitable for 3D printing: Check for overhangs, small details, and intricate features that may require additional support structures.</li></ul> <p><b>Slicing Software:</b></p> <ul style="list-style-type: none"><li>- Choose appropriate settings: Adjust parameters such as layer height, print speed, and infill density to balance print quality and time.</li><li>- Generate support structures if needed: Enable supports for models with overhangs or complex geometries.</li><li>- Orient the model correctly: Position the model in the slicing software to optimize support placement and minimize weak points.</li></ul> <p><b>Monitor the Print:</b></p> <ul style="list-style-type: none"><li>- Stay attentive during the print: Observe the initial layers to ensure proper adhesion and check for any early signs of issues.</li><li>- Address issues promptly: If you notice any problems like poor layer adhesion, warping, or extrusion inconsistencies, pause the print and troubleshoot.</li></ul> |
| <b>software<br/>(must)</b> | Inkscape<br>Cura (recommended but you can use another slicer)   |





|                 |  |
|-----------------|--|
|                 | <b>6 - do something useful</b>   |
|                 | <p>Let's be honest, you might have developed an emotional attachment to your flurby, but the reality is that it's essentially just a shapeless blob. Instead of wasting plastic without any purpose (I personally don't support the benchy trend), why not engage in something meaningful for yourself and your community? Take a look around, grab a caliper, and figure out a practical solution on your own.</p> <p>For example, you could design a holder for a tool like a pencil or the compressor gun in the dirt lab. Consider creating an organizing tray or a cover, or anything else that serves a purpose. When thinking about your object, keep these aspects in mind: how it interfaces with the specific item (how does it hold the pencil?), and how it interfaces with the environment (will it sit on a table, hang from a shelf using double-sided tape, attach to a pegboard, or stick to a metal surface using magnets available in the lab).</p> <p>While 3D printing (see point 5-) offers more flexibility, your creation can also be made using 3D-cut materials.</p> |
| <b>software</b> | By now you should know what to use   |

Capture an image of your creation and share it in the relevant Slack channel. To enhance your skills, consider participating in one of the available open sessions on 3D modeling or laser printing. Additionally, explore the projects listed on the Fablab Notion for further opportunities to experiment and learn.

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