

We are the makers - IoT Learning Scenario - TITLE

1. Title of the Scenario	Introduction to CAD modelling in tinkercad: Making a name tag
2. Target group	All ages who are new to CAD modelling or 3D printing
3. Duration	2 hours depending on the amount and speed of 3D printers
4. Learning needs	3D drawing skills, Designing for 3D printing, Boolean operations in geometry, 3D printing basics, thinking in 3D, Camera orientation
5. Expected learning outcomes	Using basic 3D shapes as a base for design. Understanding perspective and camera position Learning the basics of 3D design Getting familiar with Tinkercad interface
6. Methodologies	As this lesson plan is very well suited as the very first lesson for 3D printing and 3D design, there will be a step by step guide used for scaffolding the learning activity. The teacher will walk around the classroom and answer questions and help out when needed. The tinkercad Cheatsheet can be used for reference to specific features.
7. Place / Environment	Classroom with 3D printers, Makerspace, Fablab or similar.
8. Tools / Materials / Resources	Projector, 3D printers and equipment (spatulars, plyers, tweezers, bed adhesive etc.), computer for each student with internet connection, Slicing software, printed handouts, printed tinkercad Cheatsheet.
9. Step by step description of the activity / content	<ol style="list-style-type: none"> 1. Make sure that all participants get tinkercad accounts. 2. Open a new design from the tinkercad dashboard. 3. Provide the participants with the handouts and the tinkercad Cheat Sheet, and provide the design prompt. 4. Have the participants follow the instructions in the handouts, and make their nametag. 5. Walk around and help the participants with the assignment, and provide scaffolding. 6. When the first participants are done, start their prints so all participants can watch the printing process. Watching the printing process is the easiest way to understand the limitations of 3D printing. 7. When all participants are done designing there will most likely be a printing queue. You can now gather many nametags in a single prints, and try to get all nametags printed before the next lesson.
10. Feedback	The feedback will happen through the scaffolding during the activity itself. Here the designs can be complemented, and suggestions can be added.
11. Assessment & Evaluation	As this is a very basic activity no formal assessment in the form of a grade is necessary. However, the nametag task is defined in such a way that it will cover the basics of tinkercad, and therefore after the name tag is printed the participants can self assess its success.