



Refreshing summer puzzle

Learning Objectives:

- Know how to manipulate simple shapes using tinkercad.com
- Understand how 3D printers work.

Level of Difficulty: Level 1

List of Materials Required:

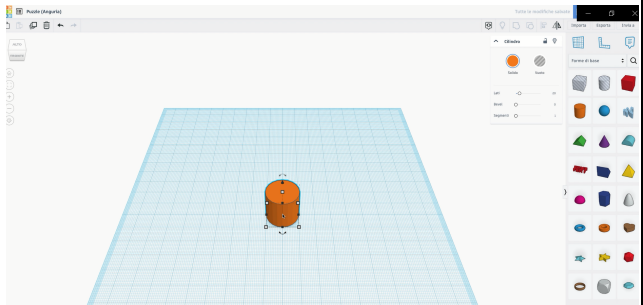
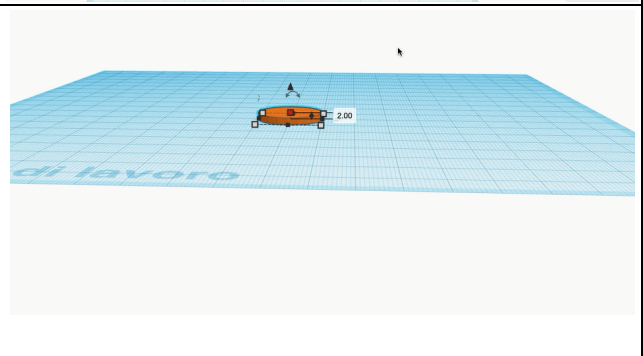
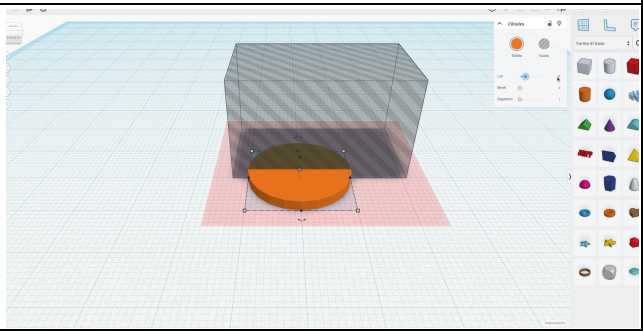
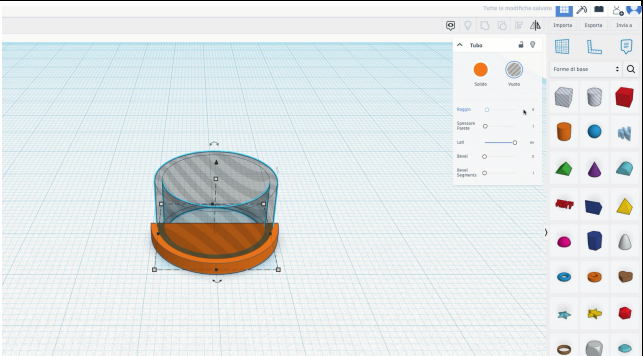
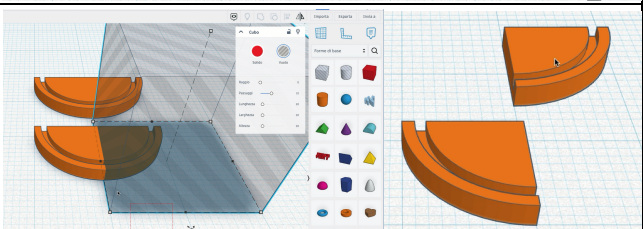
- A 3D printer
- A spool of filament for the 3D printer
- A cutter to remove supporting material or the puzzle from the work plane

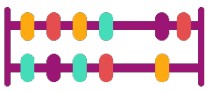
3D Modelling Skills Needed:

- Know how to move an object in the workplane
- Know how to create a cone
- Know how to create a hole
- Know how to resize an object
- Know how to group objects
- Know how to elevate and lower objects on the workplane



Step-by-step 3D Modelling

<p>Step 1</p>	<p>Create a cylinder by selecting it from the preset-shapes-menu</p>	
<p>Step 2</p>	<p>Resize the cylinder in the settings menu: Base: 10 cm Highs: 2 cm (consider for every other cone at least a +0.5 in height)</p>	
<p>Step 3</p>	<p>Select a cube, make it a hole from the menu, and split the cylinder in half by overlapping the two shapes, then group it.</p>	
<p>Step 4</p>	<p>You can create the crust of your watermelon by selecting the ring shape from the menu, resize the radius to 9 cm and the thickness to 1 cm and overlap it with the half-cylinder. Transform it into a hole, align and group the two shapes.</p>	
<p>Step 5</p>	<p>Duplicate the watermelon, then create a cube and split the watermelons in half by grouping the two shapes.</p>	

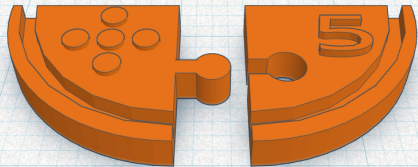


Step 6	Create a cylinder, resize it to 2x2 cm and place it on one side of the two halves of the watermelon. Do the same with a rectangle sized 2x1 cm and group the two.	
Step 7	Duplicate the obtained shape. One will be a hole, the other one will be your conjunction piece. Group the conjunction with one side of the watermelon and the hole with the other side of the watermelon. Resize (+0.2) the hole so that the two pieces will match.	
	You have two options: draw the seeds with a 3d pen after you printed the watermelon or create a cylinder sized 1.5x1.5 and place them like shown in the picture. Group the dots and the halved watermelon.	
	Select text from the menu, resize it to 3x2 cm, and place it on the other side of the watermelon. Group it.	



Creation of the Exhibit

Assemble/disassemble and store the exhibits, accompanied by the corresponding time-frames

<p>Step 1</p>	<p>Print the watermelons from 1 to 10. Remember to separate the two halves for the printing procedure.</p>	
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Design Map

Summary of the key steps for developing and creating the 3D Exhibit.

