



## Match the solids

### **Learning Objectives:**

- Know how to manipulate simple shapes using tinkercad.com
- Understand how 3D printers works.
- know how to modify files already made in order to appropriate them.

**Level of Difficulty:** Level 1

### **List of Materials Required:**

A 3D printer

A spool of filament for the 3D printer (one color is enough)

A regular printer and a laminator for the cards

A pair of scissors, or a cutter

Sand paper (optional)

### **3D Modelling Skills Needed:**

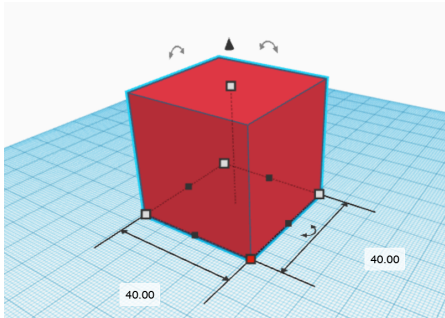
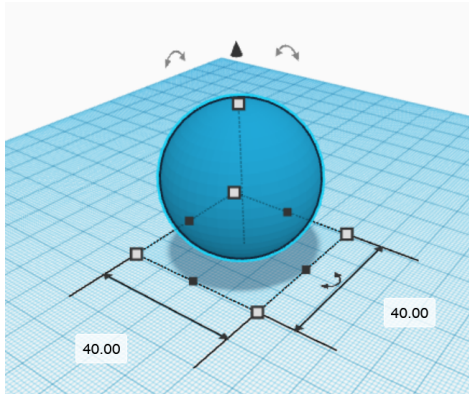
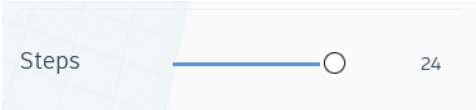
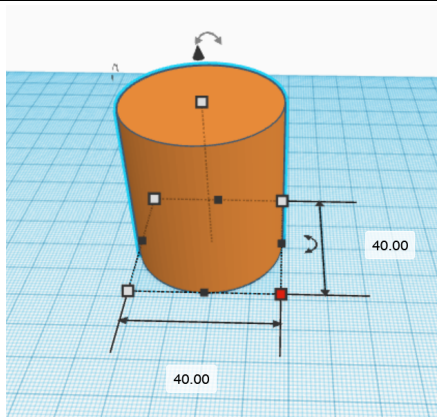
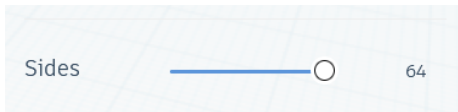
Know how to move an object on the plan

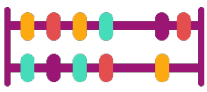
Know how to resize an object

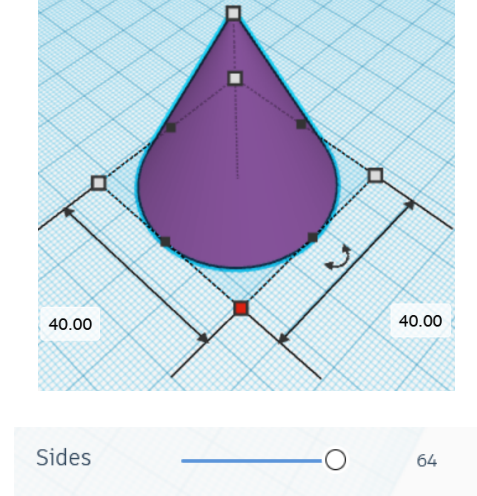
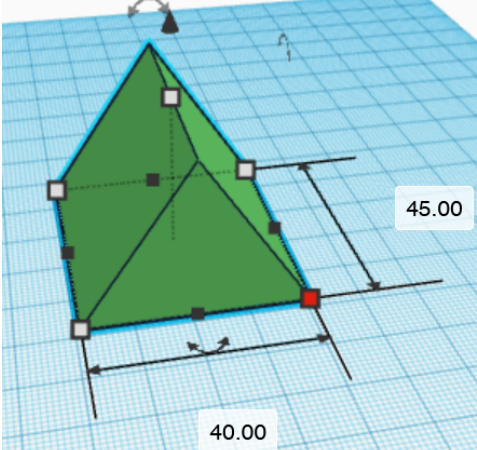
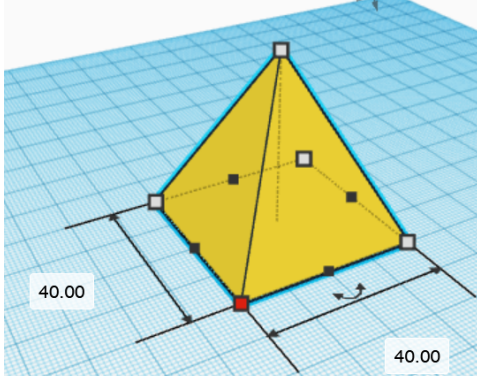
Know how to smooth the surface of spheres, cones and cylinders.



## Step-by-step 3D Modelling

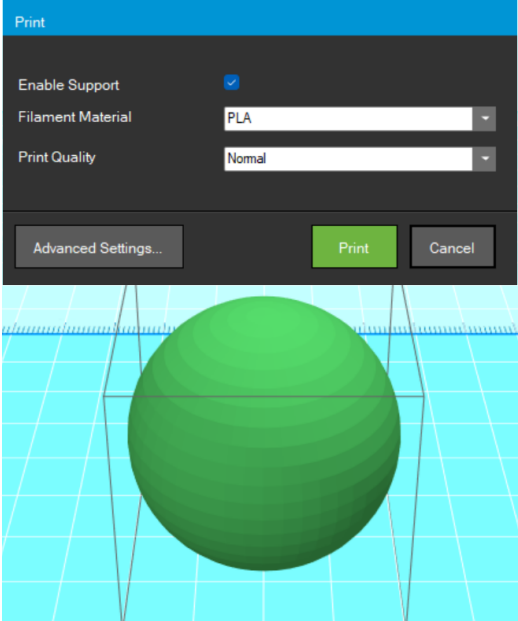

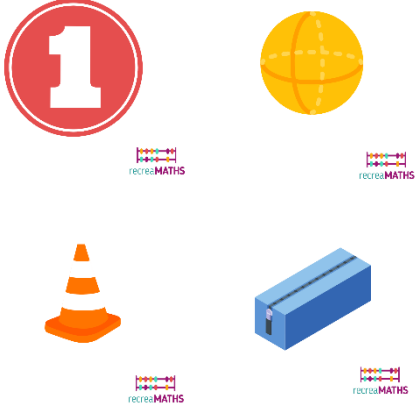
|                      |   |  |
|----------------------|---|--|
| <p><b>Step 1</b></p> | <p>Create a cube and resize it.</p> <p>Dimensions: 40x40x40</p>   |    |
| <p><b>Step 2</b></p> | <p>Create a sphere and resize it.</p> <p>Dimensions: 40x40x40</p> <p>Make the surface of the sphere smoother by increasing the number of steps to the highest value possible.</p> | <br>  |
| <p><b>Step 3</b></p> | <p>Create a cylinder and resize it.</p> <p>Dimensions: 40x40x45</p> <p>Make the surface smoother by increasing the number of sides to the highest value possible (64).</p>        | <br> |



|                      |   |  |
|----------------------|---|--|
| <p><b>Step 4</b></p> | <p>Create a cone and resize it.</p> <p>Dimensions: 40x40x45</p> <p>Make the surface smoother by increasing the number of sides to the highest value (64).</p> |    |
| <p><b>Step 5</b></p> | <p>Create a triangular polyhedron (a "roof") and resize it.</p> <p>Dimensions: 40x45x30</p>   |   |
| <p><b>Step 6</b></p> | <p>Create a pyramid and resize it.</p> <p>Dimensions: 40x40x40</p>  |  |

## Creation of the Exhibit

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

|                      |   |  |
|----------------------|---|--|
| <p><b>Step 1</b></p> | <p>Print the solids with your 3D printer.</p> <p>Make sure to enable support for the printing of the sphere in your slicer software.</p> <p>Otherwise it will collapse.</p> |    |
| <p><b>Step 2</b></p> | <p>You can use sand paper and the cutter to smooth out the rough edges and the traces of the support for the sphere.</p>  |  |
| <p><b>Step 3</b></p> | <p>Print the cards to match the solids with.</p> <p>Cut the cards from the printed sheet of paper and laminate them.</p>  |  |

## Design Map

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

