

Create a forest

STEP 1: Go to Tinkercad.com, sign in, and create a new design.

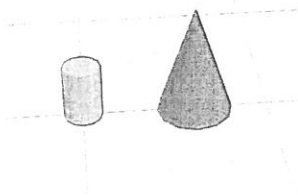
STEP 2: Locate **Shape Generator** on the right hand side of the screen. Find the object called **Terrain** (found in the **Community** menu - at the end). Drag the terrain tile onto your work plane.

STEP 3: Drag the **Ruler** tool onto your Work plane (located at the top right of your screen). Resize your terrain tile by clicking on the dimensions and typing in new numbers so the tile measures **30 mm x 30 mm**. Press **Enter** to confirm.

STEP 4: When the terrain tile is selected, you should see the **Inspector** menu with three sliders that you can use to modify the shape of the terrain. Modify your tile until it is to your liking. Adjust the height of your tile to make the terrain more dramatic. Will it be a hilly forest or a flat landscape? You decide.

STEP 5: Building Trees!

- Drag a **cylinder** from the **Geometric** menu onto the **Work plane**.
- Resize the cylinder to **2 mm long, 2 mm wide, and 3 mm high**.
- Now repeat the same procedure to select and place a **cone**.
- Resize the cone to **4 mm long, 4 mm wide, and 6 mm high**.
- Your Tinkercad design might now look something like this picture. Feel free to change the colors of your trunk and treetop as you like. This has no effect on the printing, just fun on the screen.



STEP 6: Grouping your shapes

Select the cone and look at its measurements. Drag the black teardrop shaped handle on top of the cone and pull it upward **3 mm**, so it's at the same height as the top of the cylinder (Or click on the Z-height number and type in 3).

- Now you need to get the cone lined up directly over the cylinder. You can try to do this by moving the cone with the **mouse and/or arrow keys**, but it's much easier and more accurate to use Tinkercad's **Align** tool. Select the **cylinder** and the **cone** at the same time by holding **Shift** and selecting both objects.
- Click on the **Adjust** button in the top menu bar, and choose **Align** from the dropdown menu. You should see black pins around your two selected objects. These pins represent different possible alignment positions for the objects.
- You want the **cone and the cylinder** to be **center-aligned** in both the **x-axis direction** and the **y-axis direction**. To do this, click on the center pin in the **x-axis direction** and the **center pin** in the **y-axis direction**. Your objects will snap into alignment.
- Now **group** the cylinder and cone objects together so they act as one combined unit. Make sure that both objects are still selected, and then press **Group** in the top menu bar.

STEP 7: Placing your trees on the terrain

Select and drag your tree onto the terrain tile. You can raise or lower the position of the tree with the black arrow handle above the tree.

- If you want to make your tree taller, shorter, wider, thinner, larger, or smaller, you can do so with the white and black handles around the tree object. For example, pull on the top white dot to stretch the tree taller, or pull out a corner dot to make the tree wider.

TRY THIS:

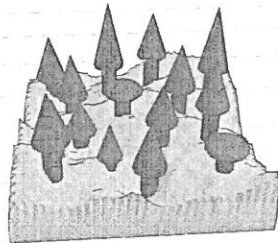
To make an interesting forest tile, you'll need a lot of trees of different shapes and sizes. Use your creativity to make and place your own unique set of trees.

- Select your first tree and **copy/paste** to make a second one by using the **Edit** menu (or by using the **hotkeys** on your keyboard).
- Arrange your trees to make a small clustered forest, a large dense forest, or a sparse forest with room for a path, depending on what you like.
- Scale some trees up and down using the black and white squares around each object. Not all trees are the same in real life, so your forest may be more realistic

if you vary the tree sizes. Make sure the trees don't exceed a height of **15 mm**, and the cylinder trunks don't get too thin or fragile.

- Try making a few different kinds of trees by experimenting with different geometric shapes for the treetops.
- When you're done with your forest tile, click and drag a selection window around all of its components and press **Group**. If you'd like to keep the multiple colors of your trees and landscape, click on **Color** in the **Inspector** window and select **Multicolor**. Of course, the color of your final 3D printed tile will be determined by the color of filament in your printer, not by the colors you choose in Tinkercad.

It should look something like this:



LET'S PRINT!

- To export this tile for 3D printing, go to the **Design** menu and select **Download for 3D Printing**.

Press the **STL** button and wait for the design to begin downloading.

- Import the **STL** into **MakerBot Desktop** and prepare for printing. Print time should be roughly 20 minutes.

Here is what can be done with terrain tiles: Water, mountains, desert, forest, etc.

