

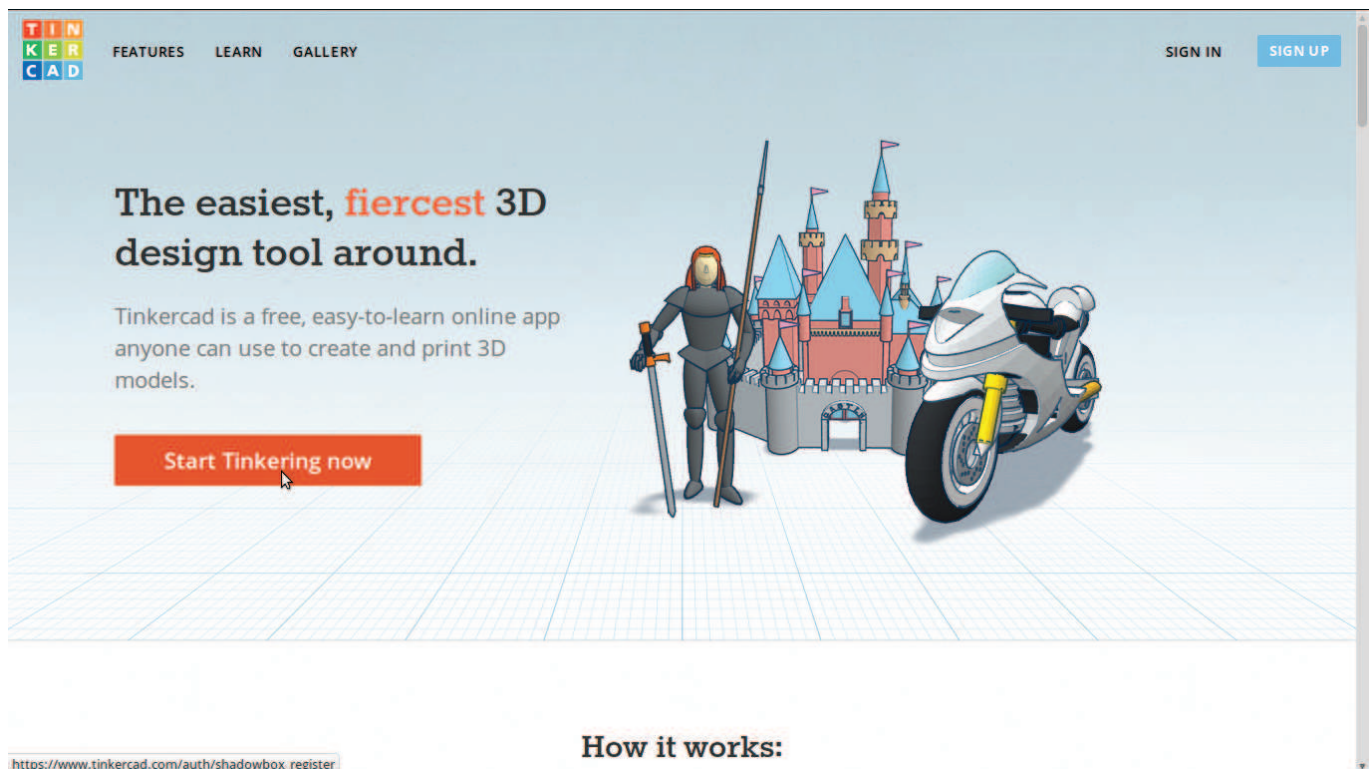
# Design for 3D printing

This is a brief introduction to tinkercad, a simple web based 3D design tool. You will need internet access for this activity.

Tinkercad has been around for a few years now, and is the easiest way we've found to get started with 3D modeling for 3D printing. Objects are built from a basis of pre-made shapes, that are combined, grouped and used to cut and build upon each other.

Don't be fooled by the apparent simplicity of this approach, Tinkercad can be used to create complex models and is a great starter program. We are going to make a simple key fob, with initials carved into it.

Go to <https://www.tinkercad.com> If you have time you can scroll down to the 'take a tour' video, but for now lets get straight into it by clicking on 'start tinkering now'



TINKERCAD

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## The easiest, fiercest 3D design tool around.

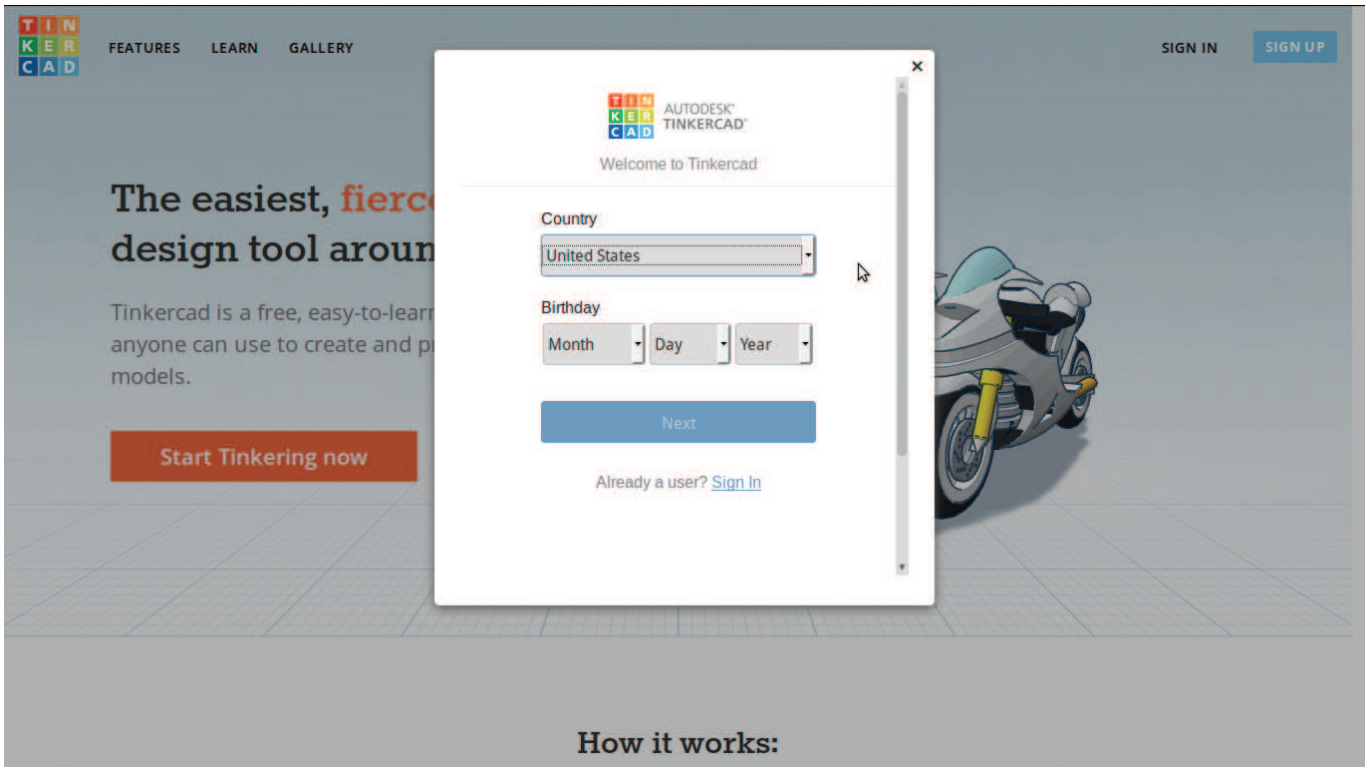
Tinkercad is a free, easy-to-learn online app anyone can use to create and print 3D models.

Start Tinkering now

How it works:

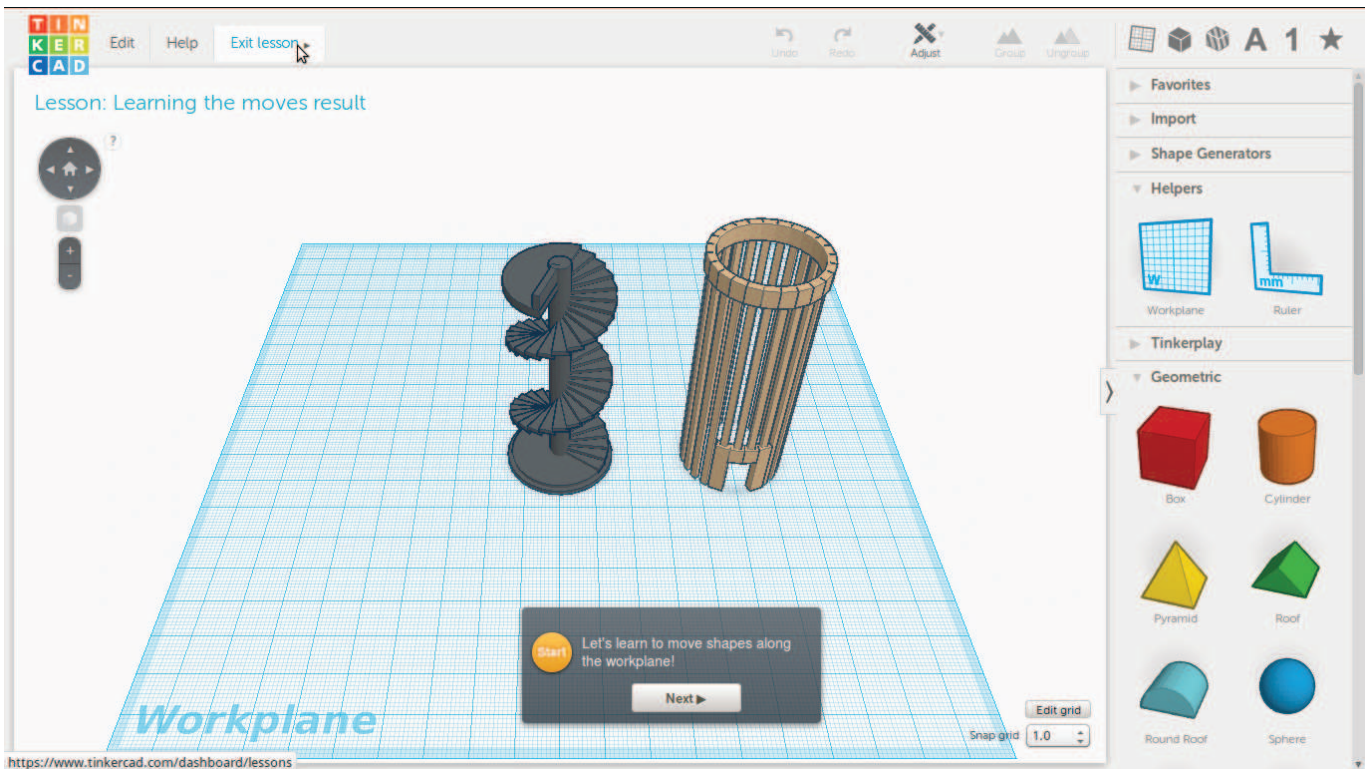
[https://www.tinkercad.com/auth/shadowbox\\_register](https://www.tinkercad.com/auth/shadowbox_register)

You'll need to sign-up using your email or facebook ID. You don't need to check your email to log in.

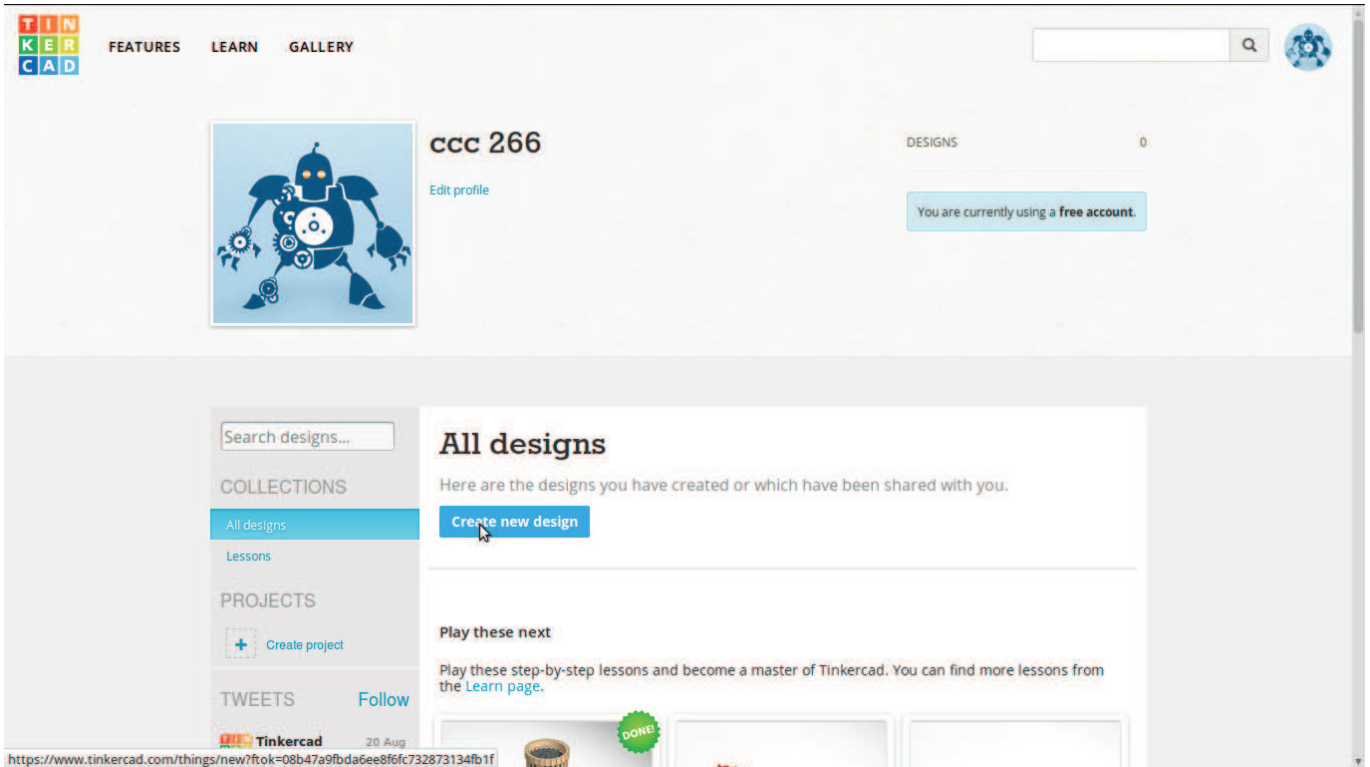


### How it works:

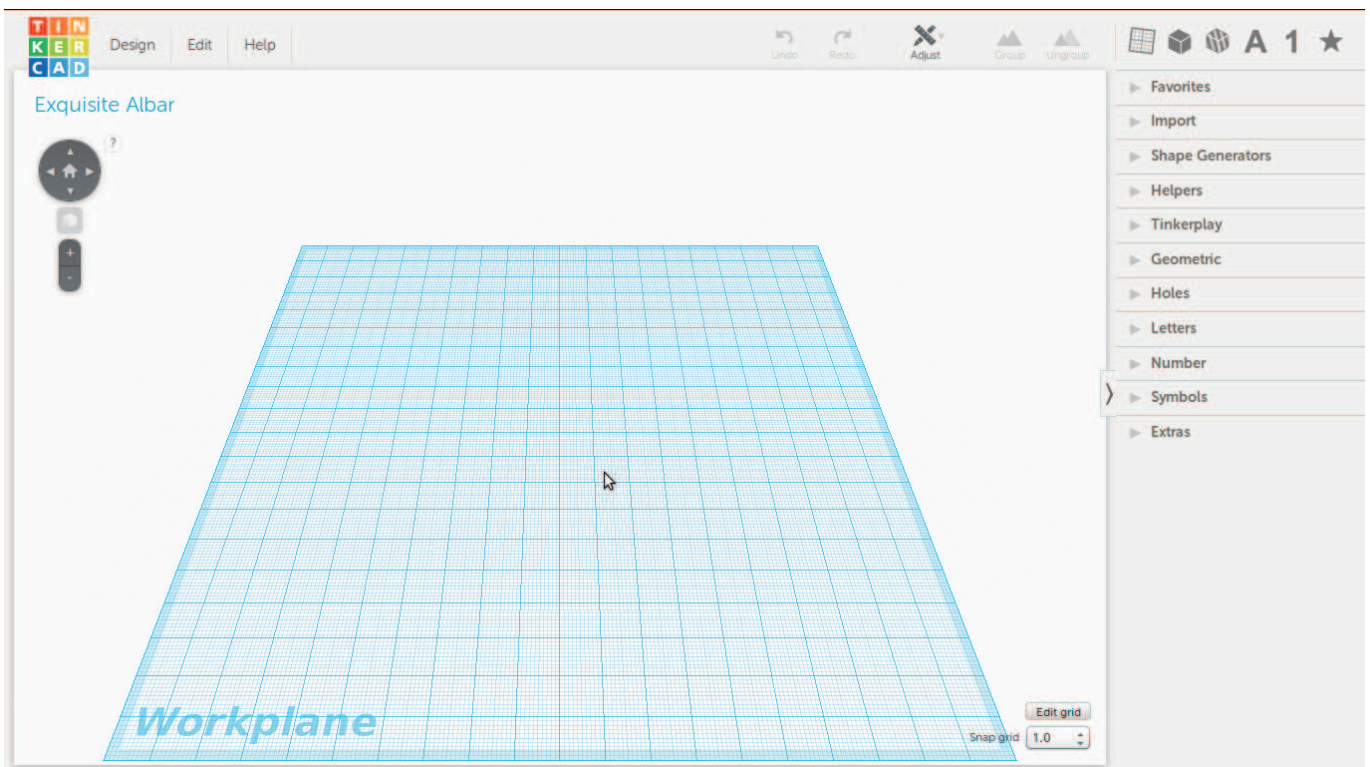
Once tinkercad loads, you'll be pushed straight into a lesson. We want to 'exit lesson' straight away to do our own tutorial. Otherwise anything we do won't be saved.



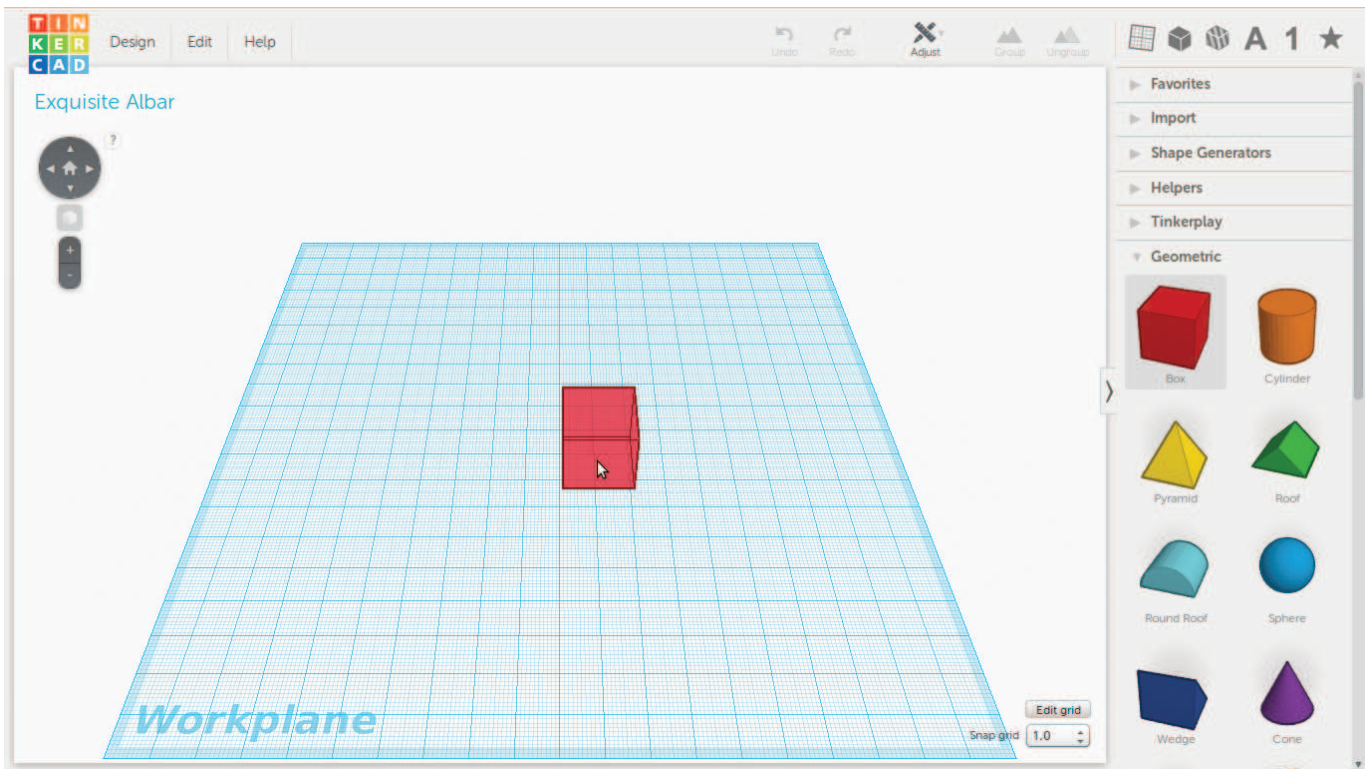
Once you exit, you'll see your user page. You can customise this later, for now we want to 'create new design'



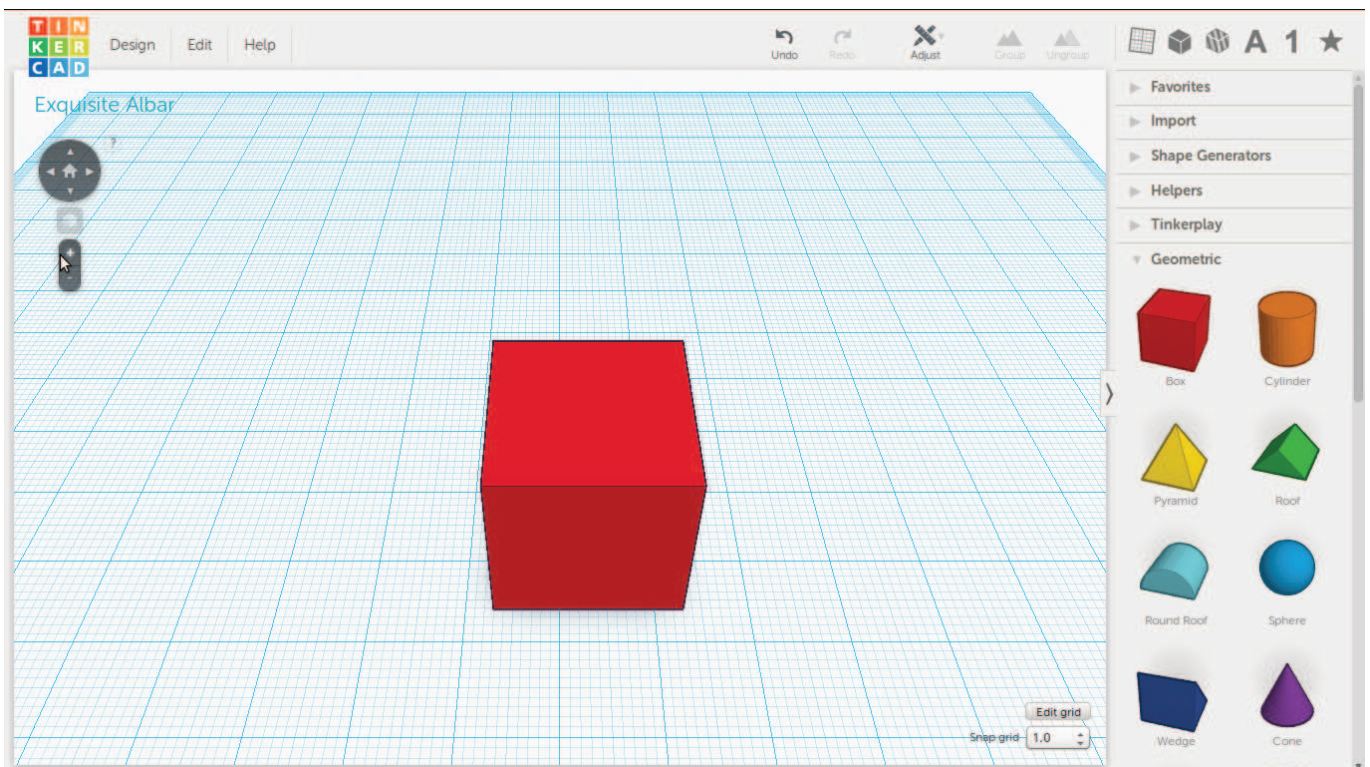
Now we are back onto our workspace, which is nice and empty. Tinkercad has given your design a name in the top left. Below the name are some controls for moving around in 3D space. Have a play with them now.



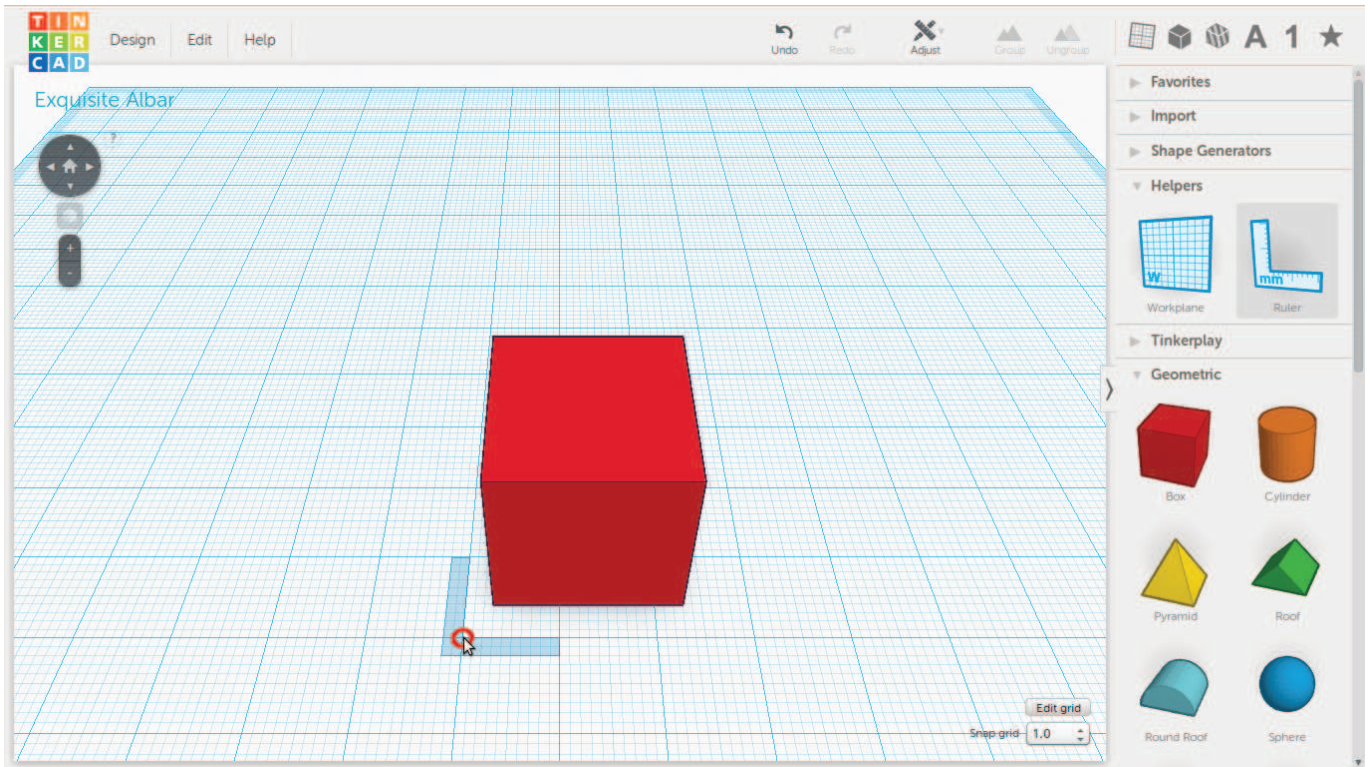
Once you can move around, have a look at the panel on the right of your workspace. We want to start with a simple shape, so click on the arrow next to 'Geometric' to open up the menu, then grab a cube and drag 'n drop it onto your workplane.



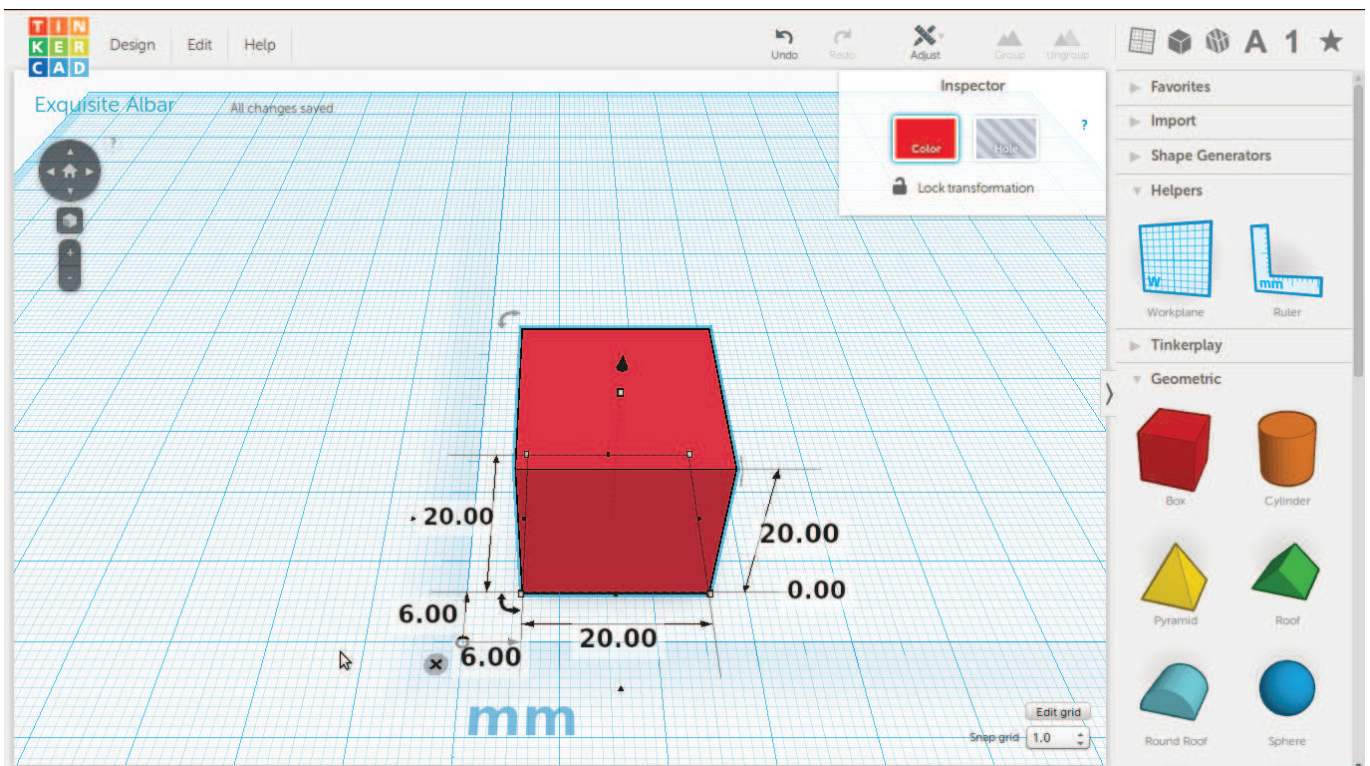
Zoom in closer to your block, either using the zoom buttons on the top left or your mouse scroll wheel.



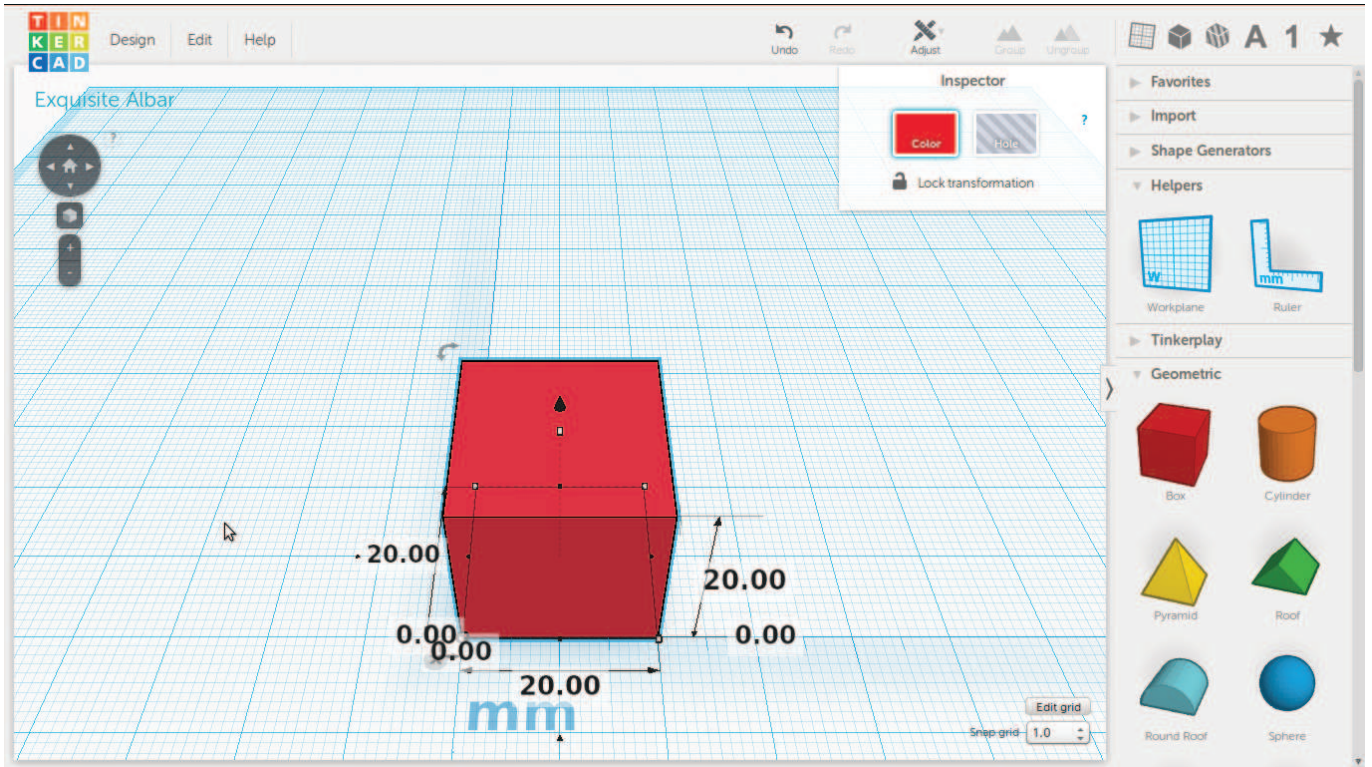
Now we are going to add a ruler from the 'Helpers' menu. The ruler helps us be precise and measure our design, which is vital when we want to make an object for 3D printing. Drop the ruler on the corner of a box on the workplane.



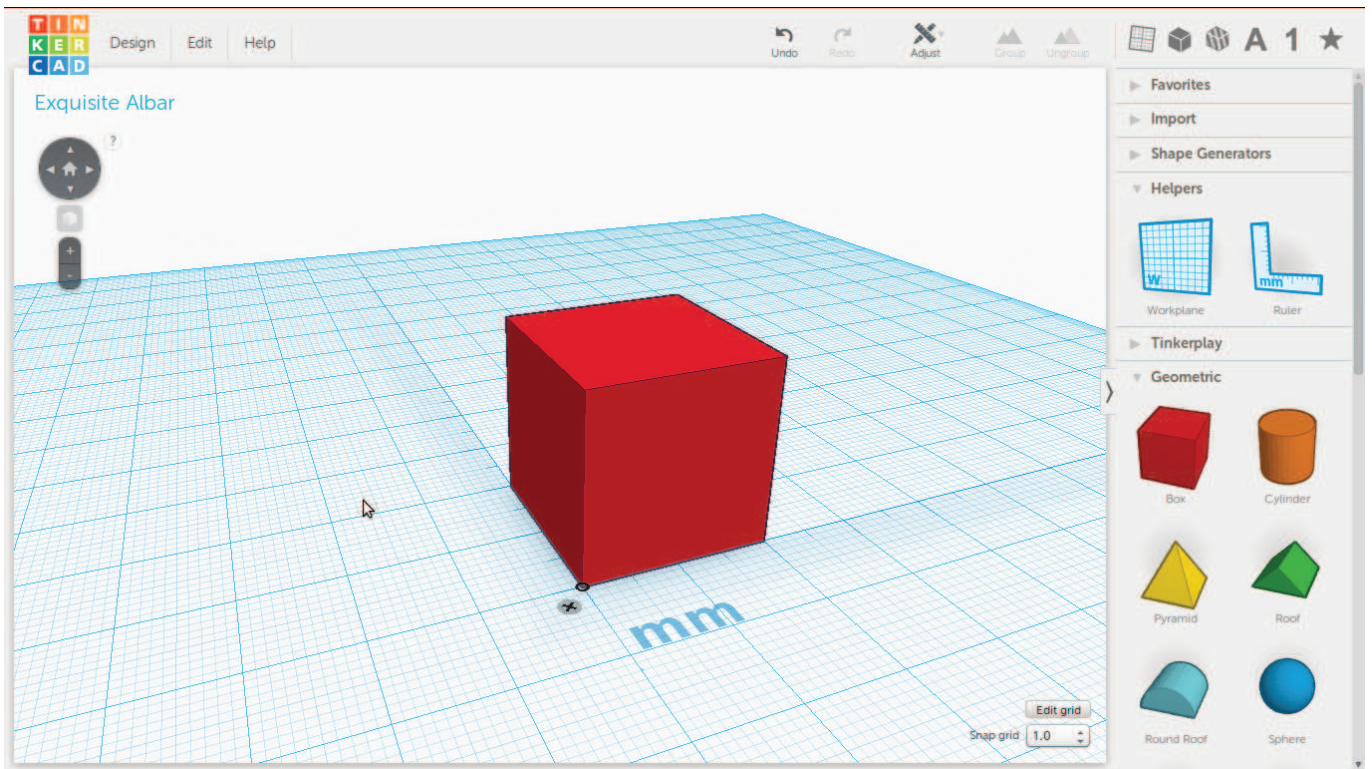
You will now see the dimensions (size) of your box, and its locations the workplane. How long, tall and wide is it? How far is it from the zero of the ruler?



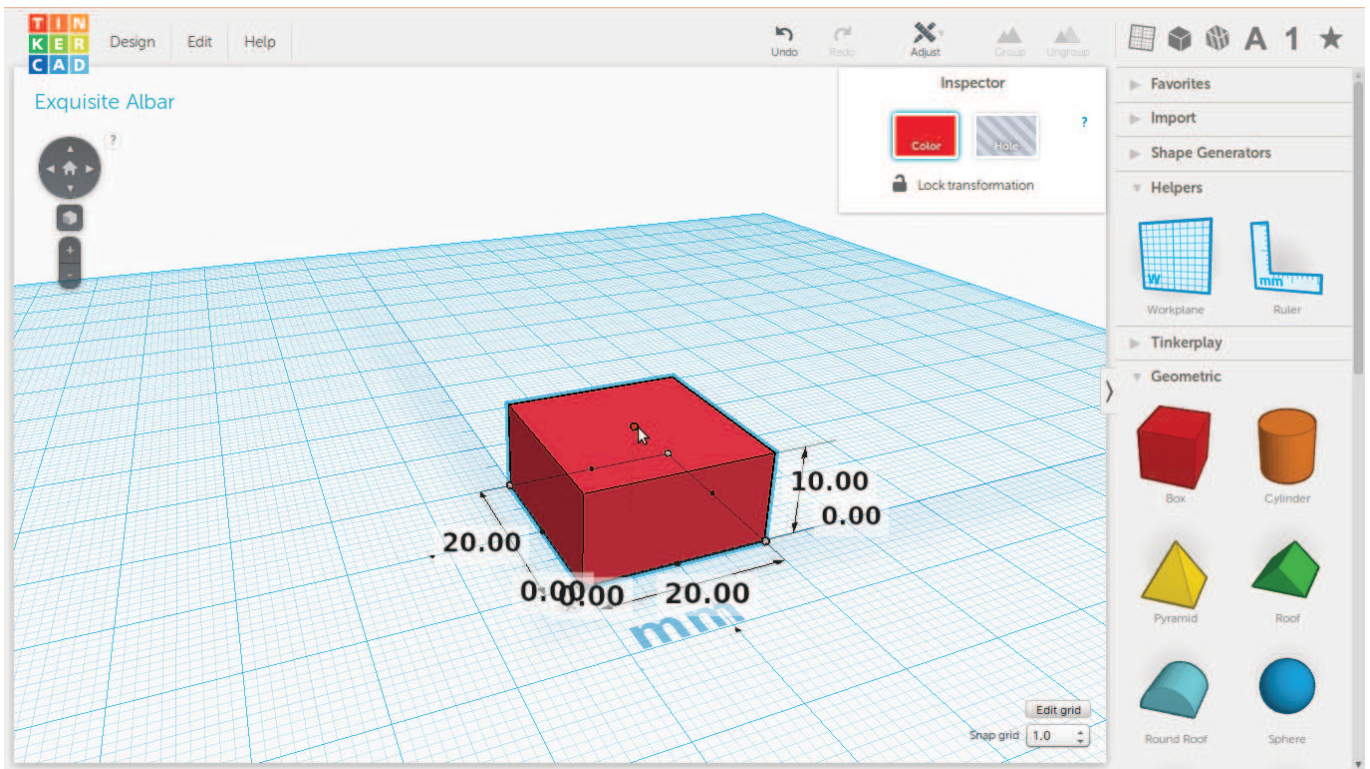
Move you box till its exactly on the zero point of your ruler. You can do this by just clicking and dragging with the mouse.



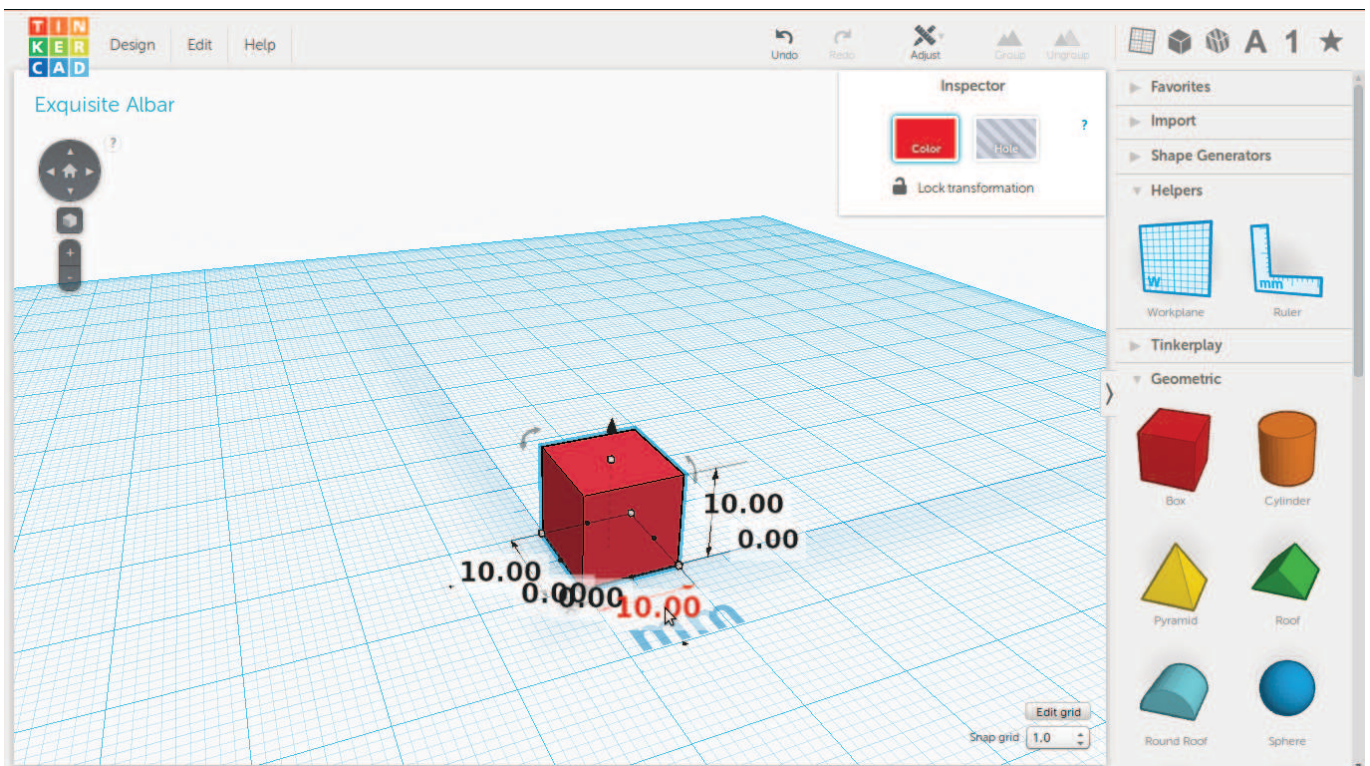
You can click anywhere outside of an object to get rid of the rulers.



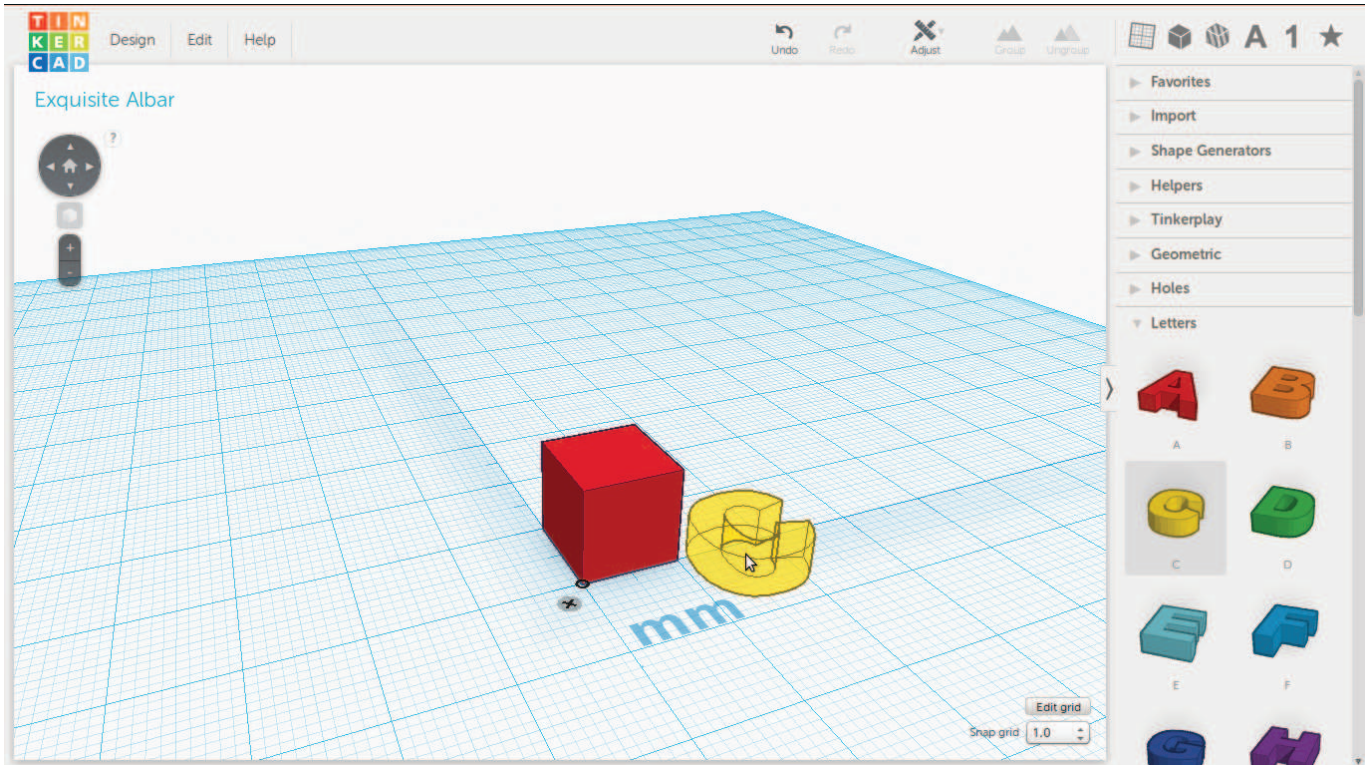
Now its time to to resize our block. We are going to make it 10 mm by 10 mm. You can resize by grabbing a 'handle' like the little dot on the top of the box. Grab the dot and drag your mouse down to make the block shorter, pay attention to the measurments on the sides till your reach 10 mm.



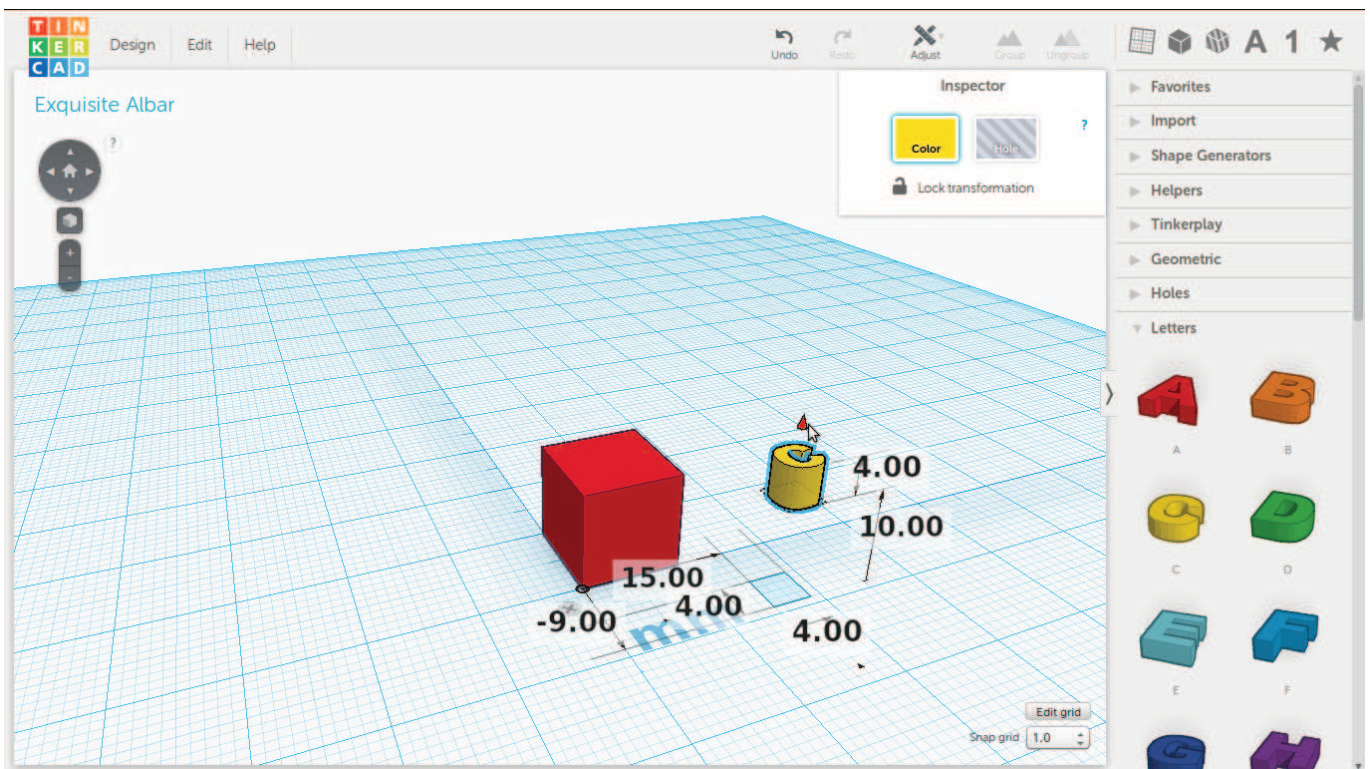
Another way to resize is to click on the measurement you want to change and enter in the exact number you want, lets do this for the other two sides of our box.



Now its time to add our initials. Click on the 'Letters' triangle on the right, and select your first letter. I've grabbed a C for CCC.

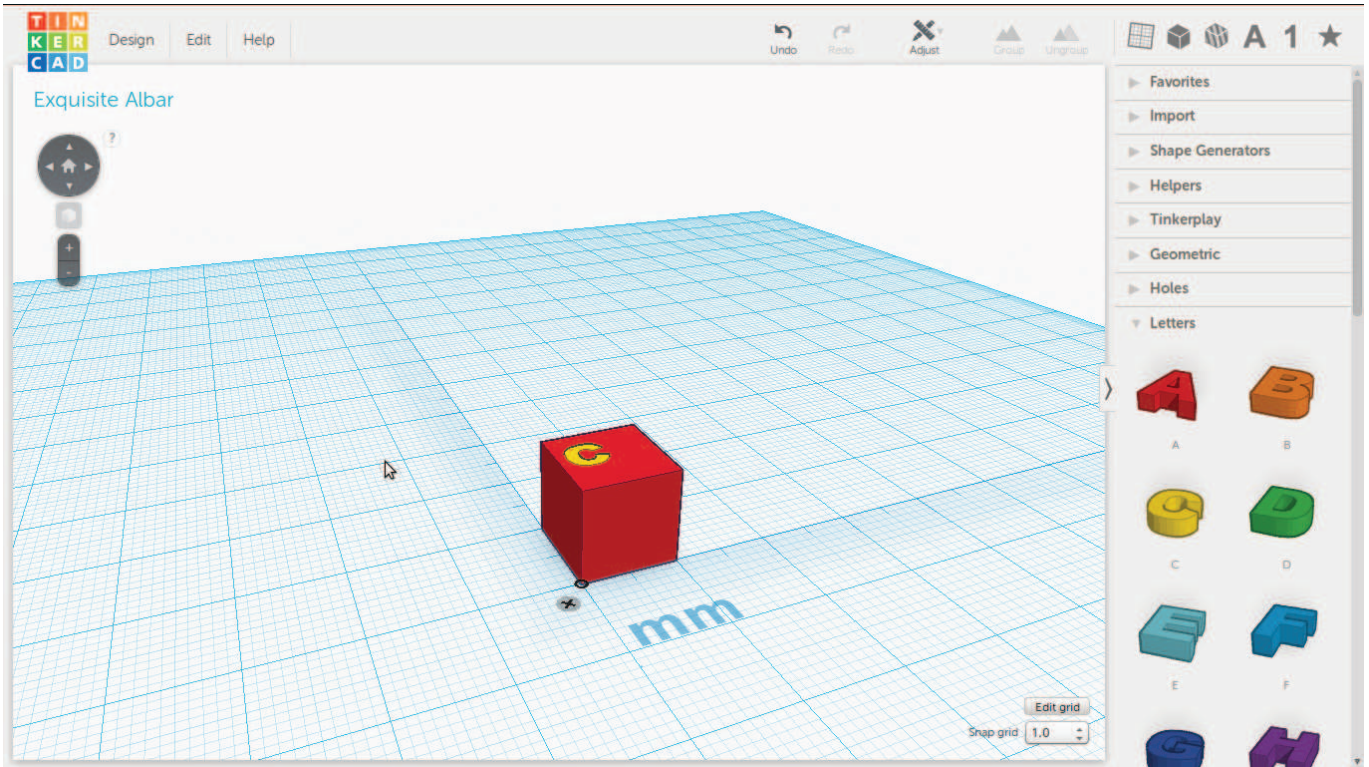


Once again resize your letter. We are going to stick the letter into our block, you will see why later on, but for now just resize it to about four by four MM. You can now lift your letter up using the little cone on the top. Watch how the measurements on your ruler change to tell you the how far up the letter is.

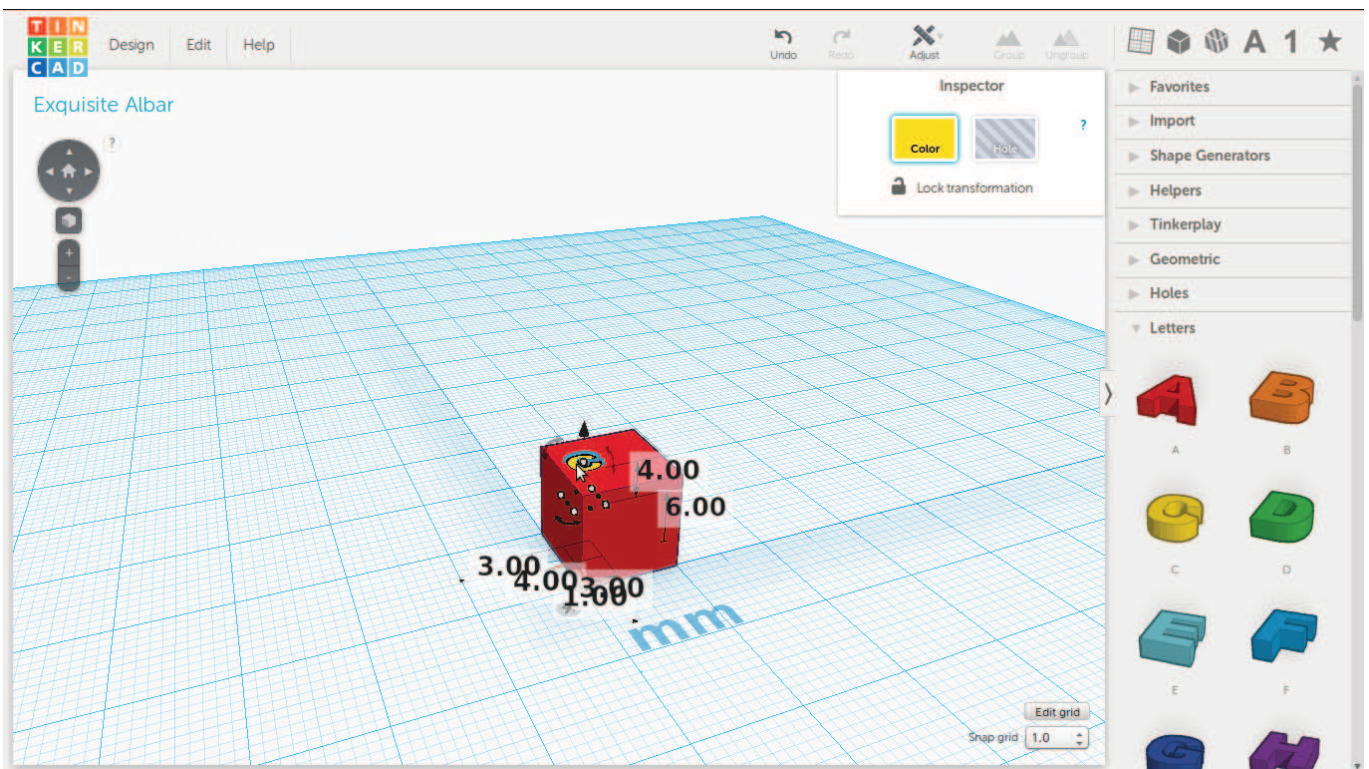




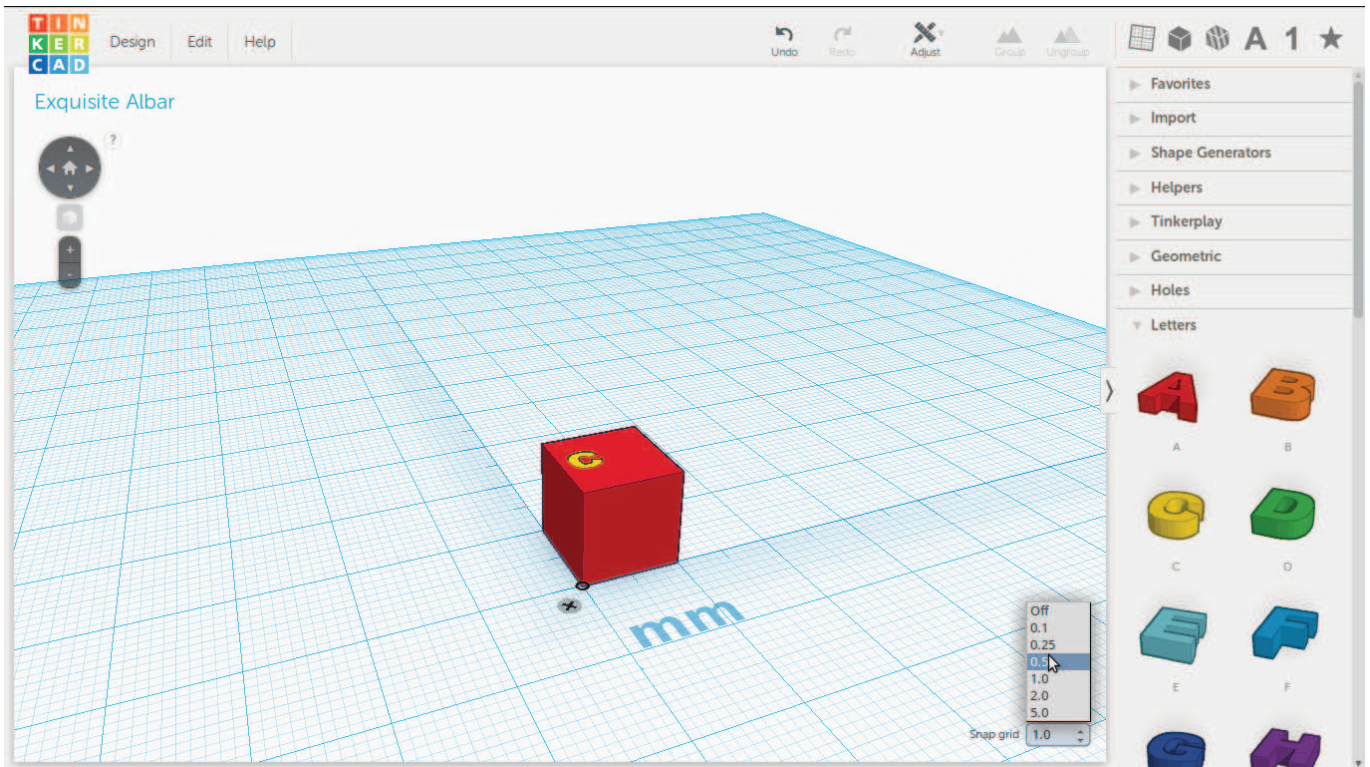
Drag your Letter over the the top of your box and lower it down until it is just visible. Click outside your box somewhere to check how it looks without the ruler numbers.



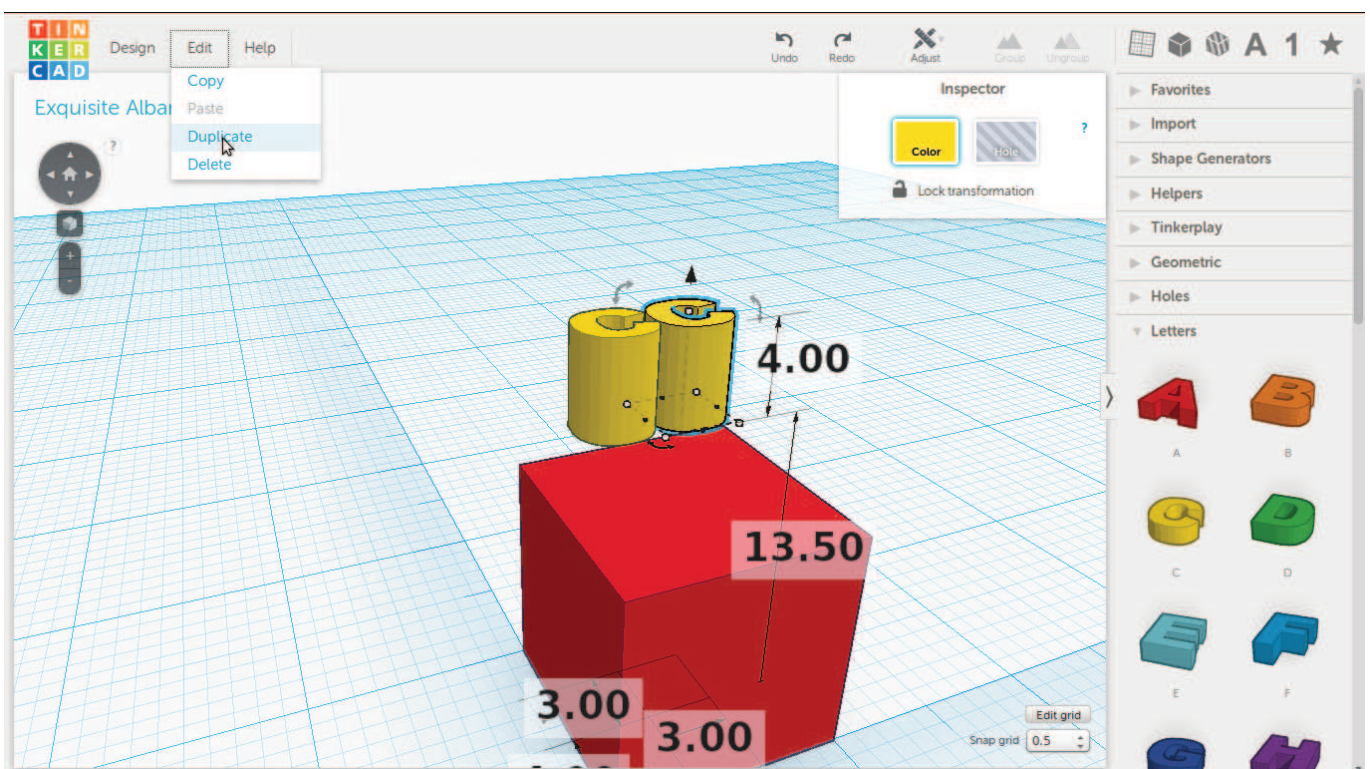
Now try moving your letter around with the arrow keys. This is a nice way to nudge shapes around.



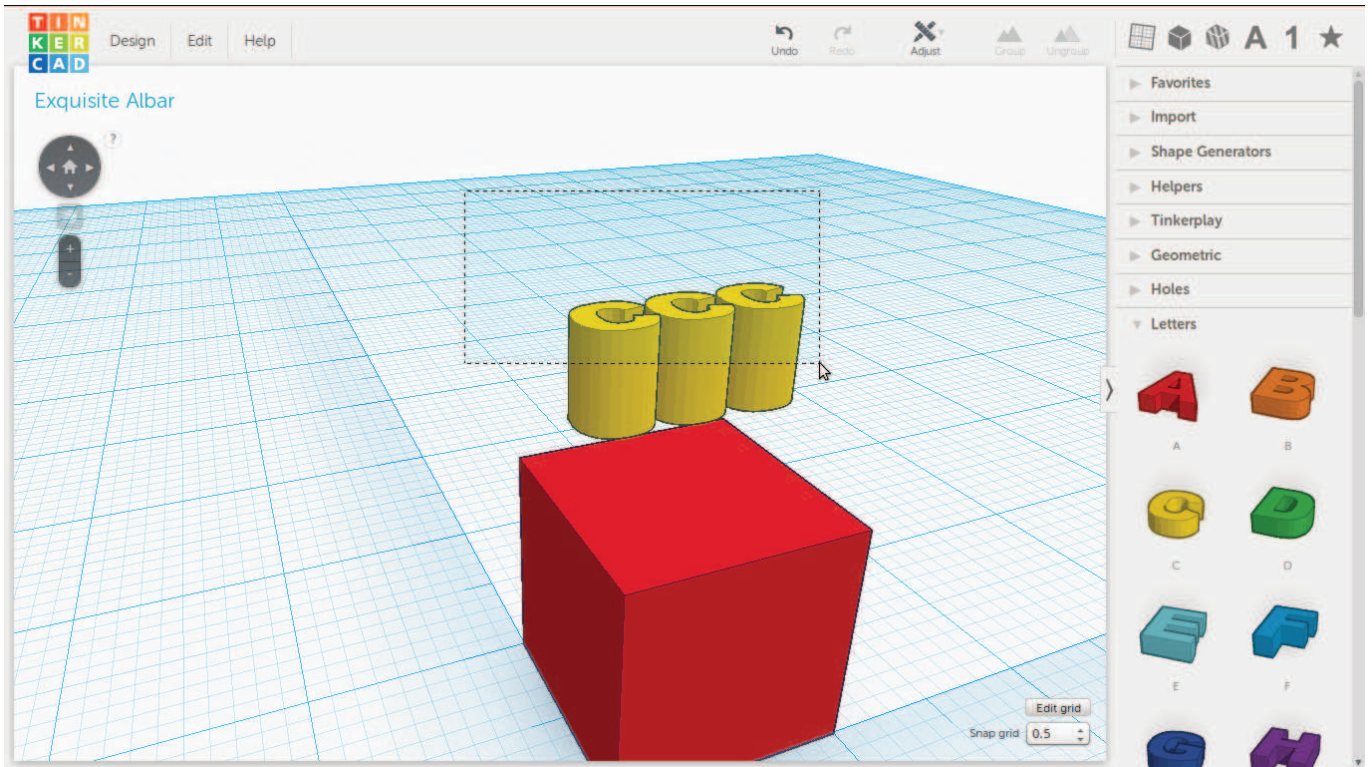
We want to be more precise with our movement to get our letter exactly where we want it. So go down to the snap grid in the bottom left and change it to a half (0.5) mm.



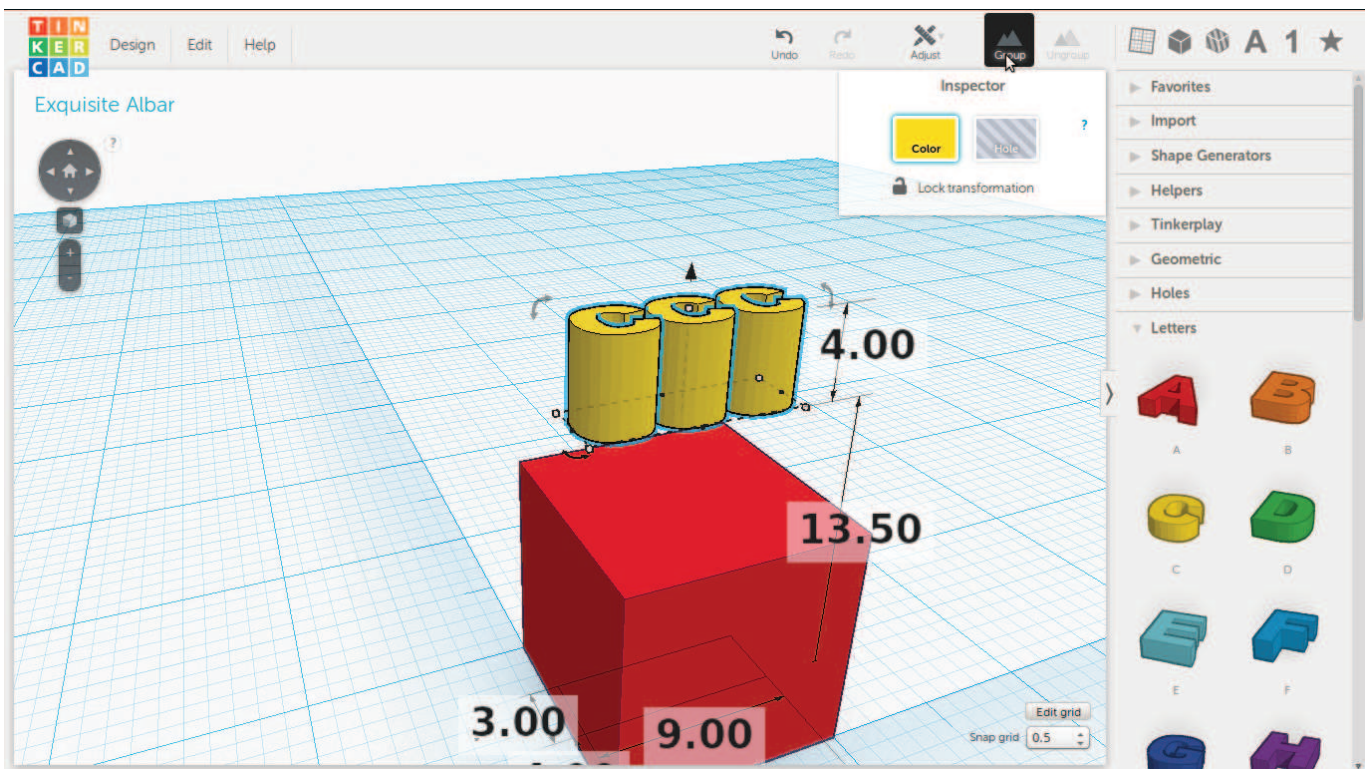
Lets make another letter, but we'll cheat this time. Grab the cone and move your letter up, then go to the Edit menu and select Duplicate. Your duplicate letter is in exactly the same place as our original, so click and move it (using the arrow keys, or mouse) till its just touching the first letter.



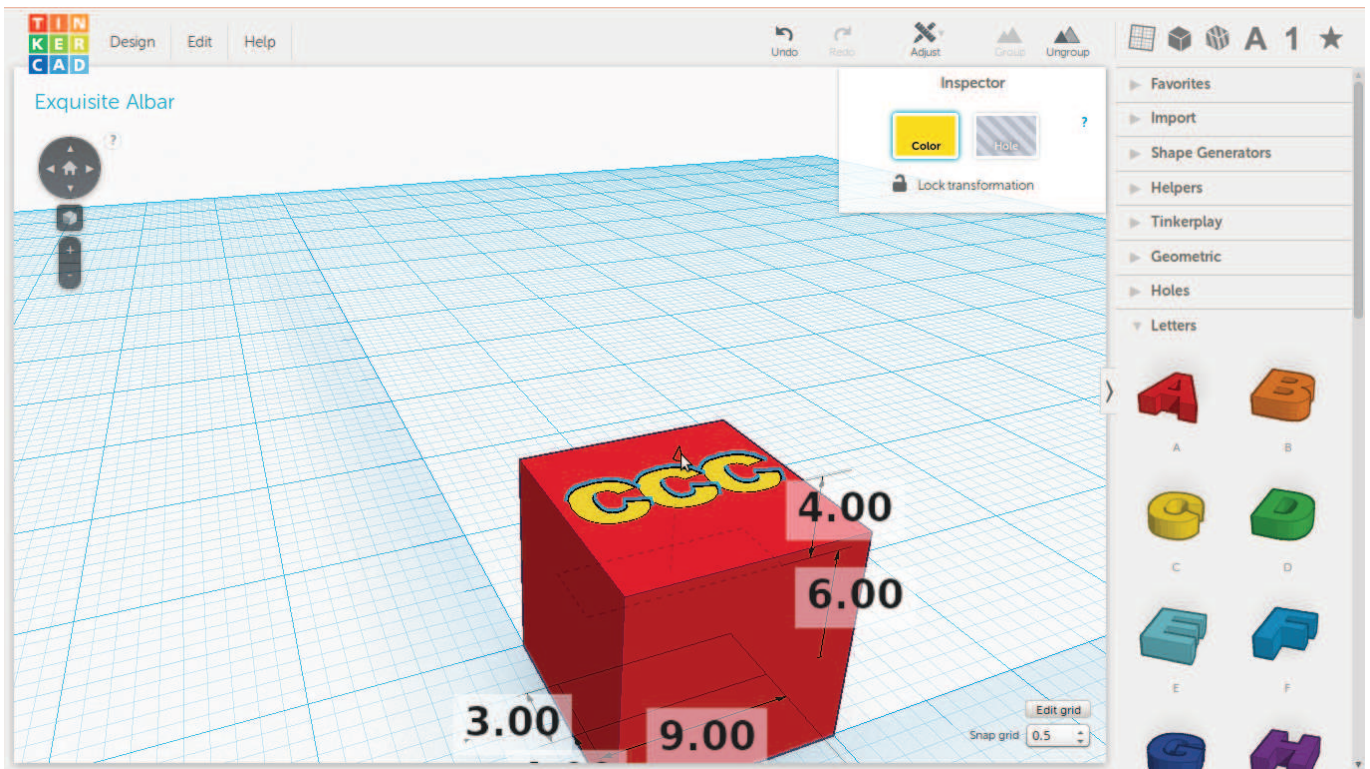
Do the same to make another letter, then drag a selection box over them all to select them together.



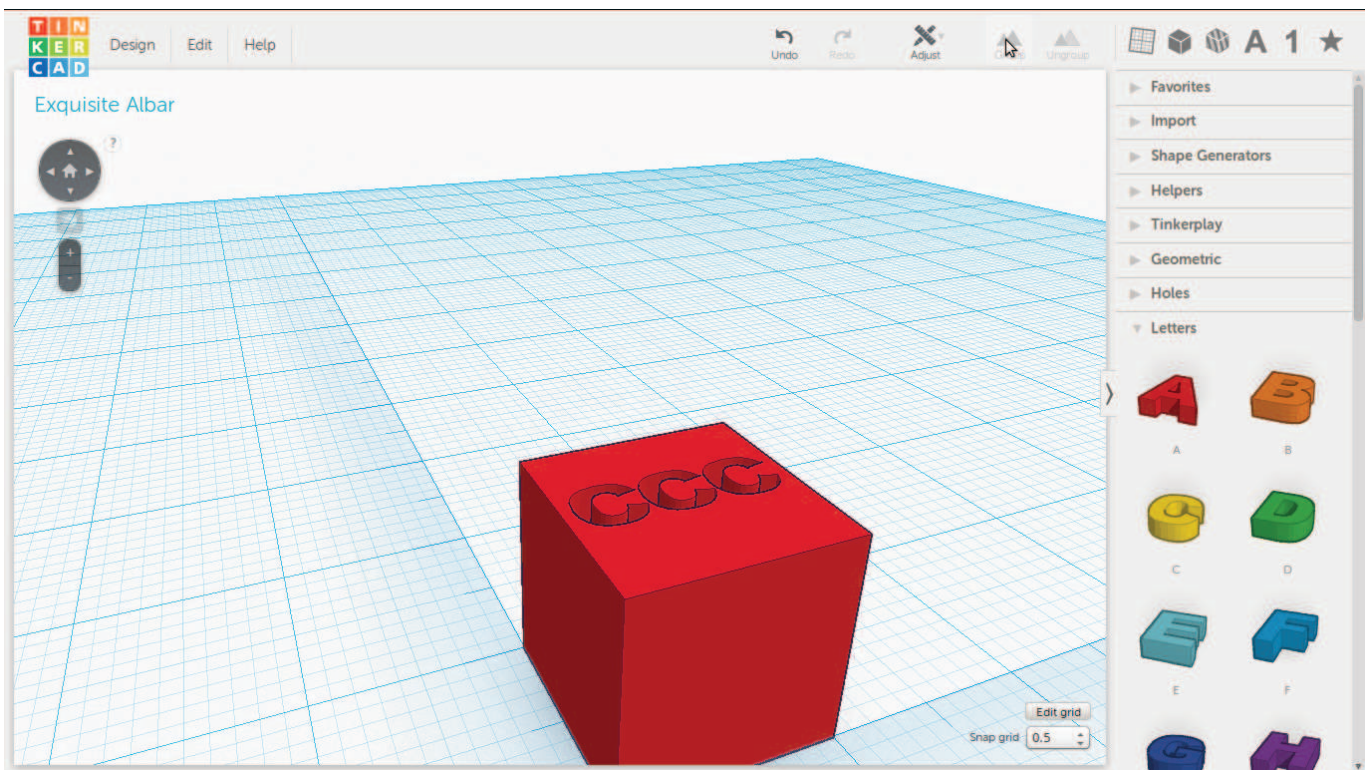
You can tell the letters are all selected with a little blue outline. Now go to the Group Button on the menu, and you can now move them all around at once.



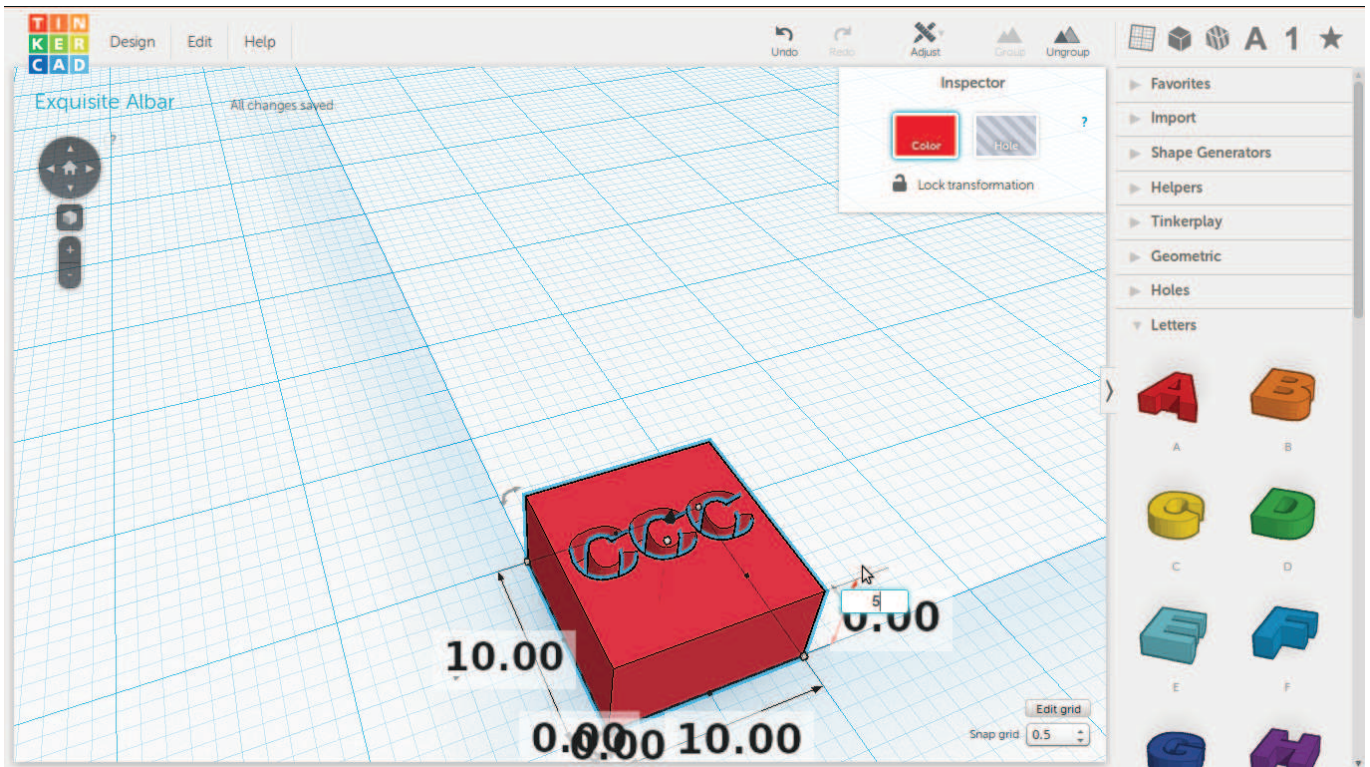
With our new group - click on the cone and lower them all at once into the square, so the top is just showing again. Then its time for some more magic - click on the 'hole' button in the inspector in the top right of the window.



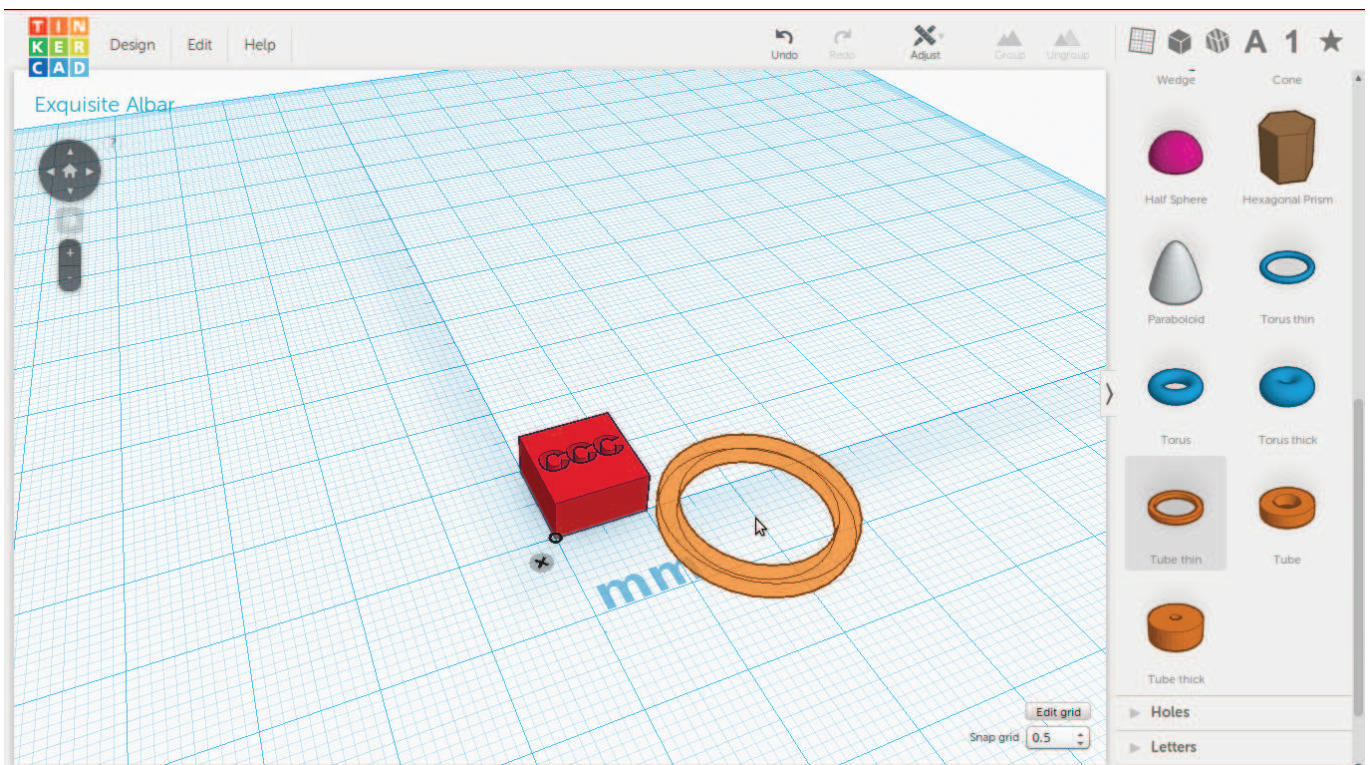
And now your letters have 'carved' a hole into the block.



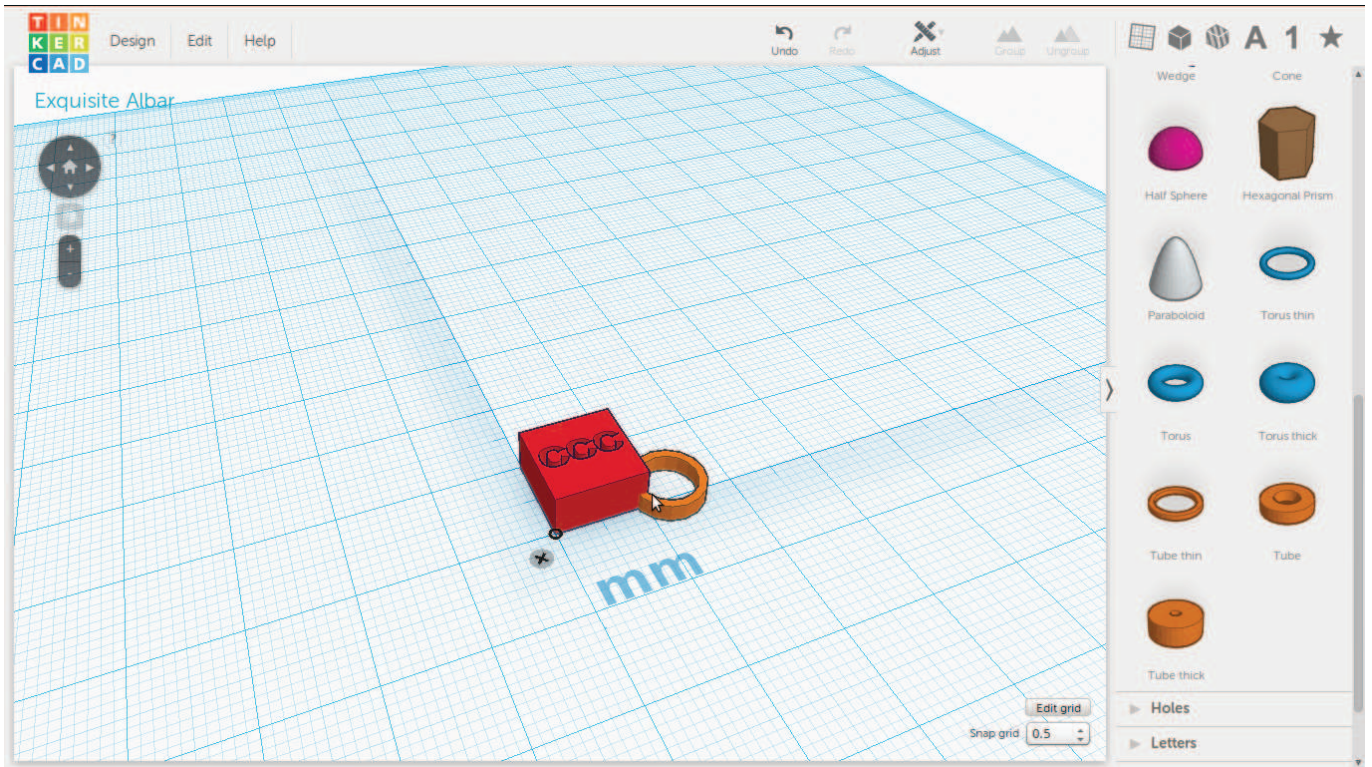
Its time to make the block a little smaller again to make it more like a keyring. Use any way you like to drop the height to 5mm. I clicked and typed.



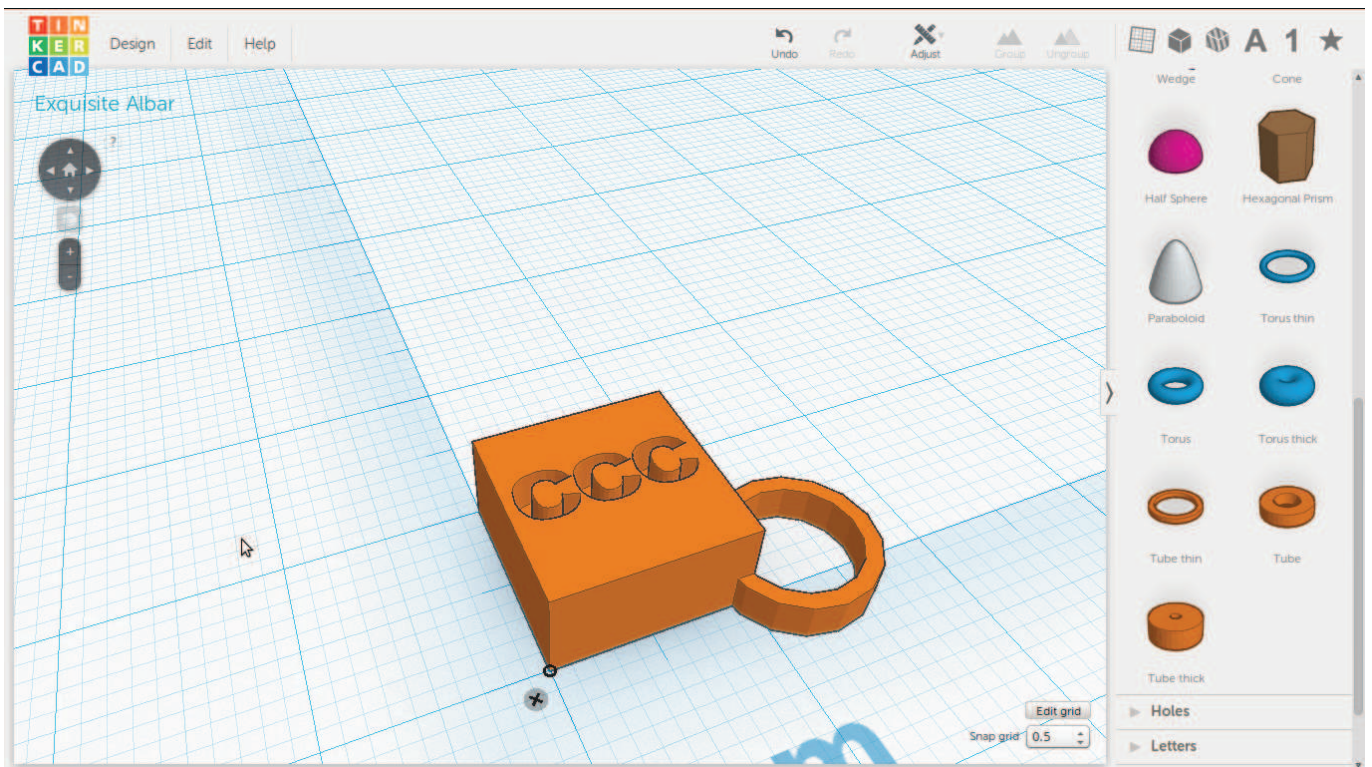
Grab a 'Tube thin' from the geometric menu on the right.



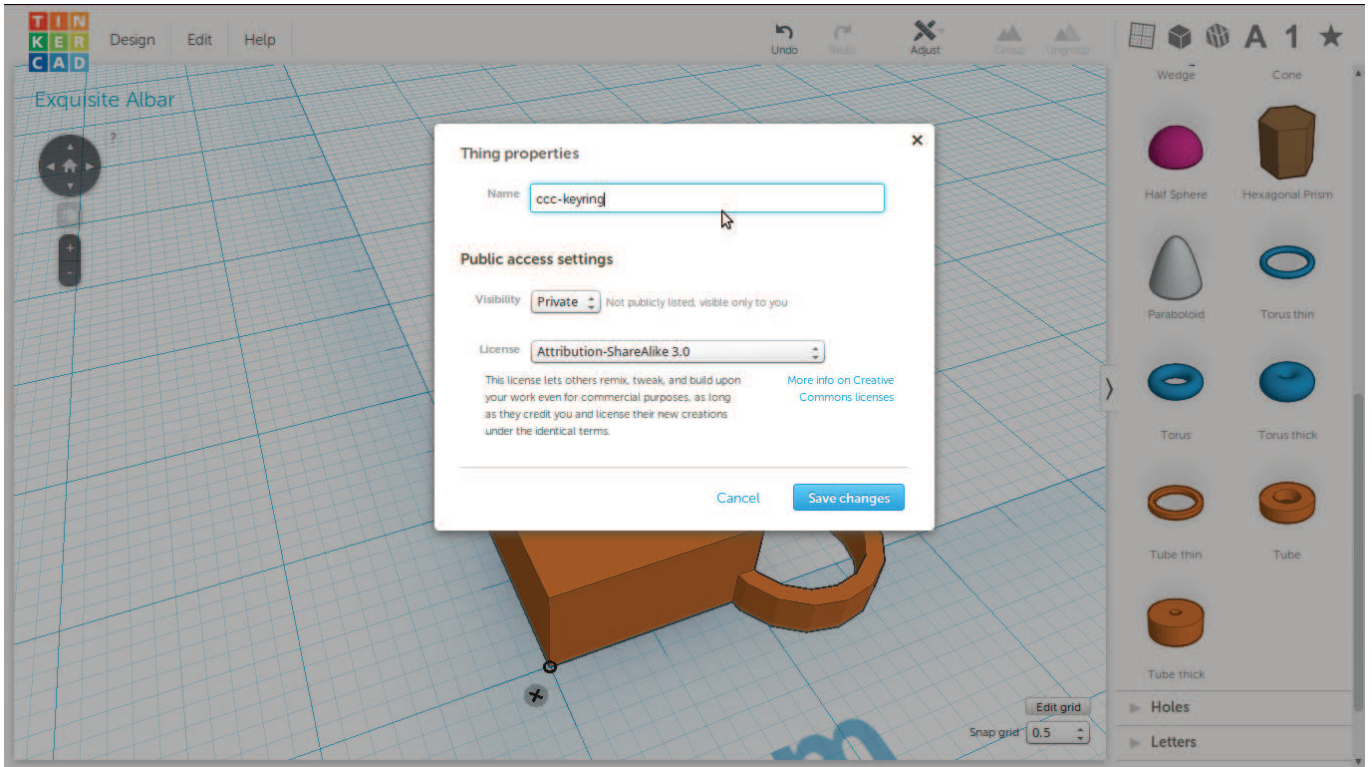
Move and resize it until it looks right.



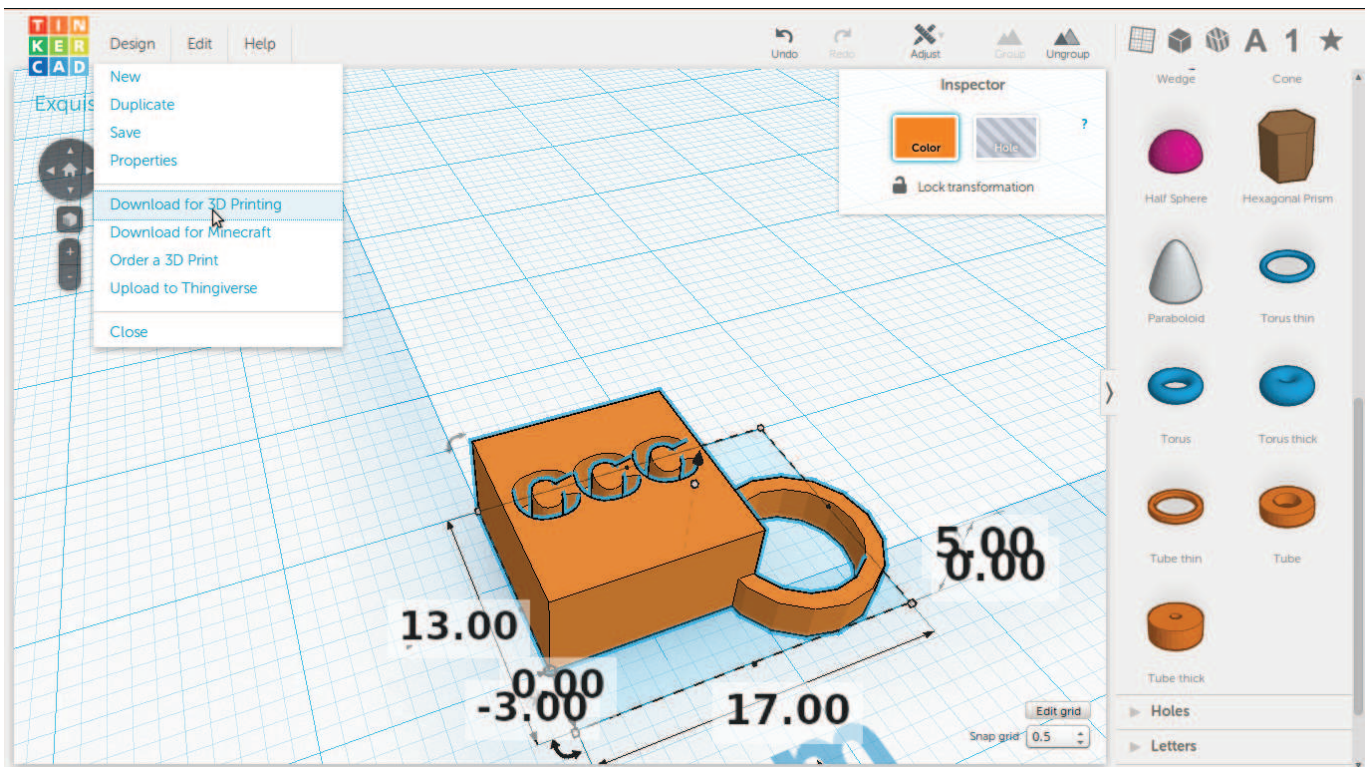
Then group it - this locks the shapes together so we can't mess it up later. And you are done!



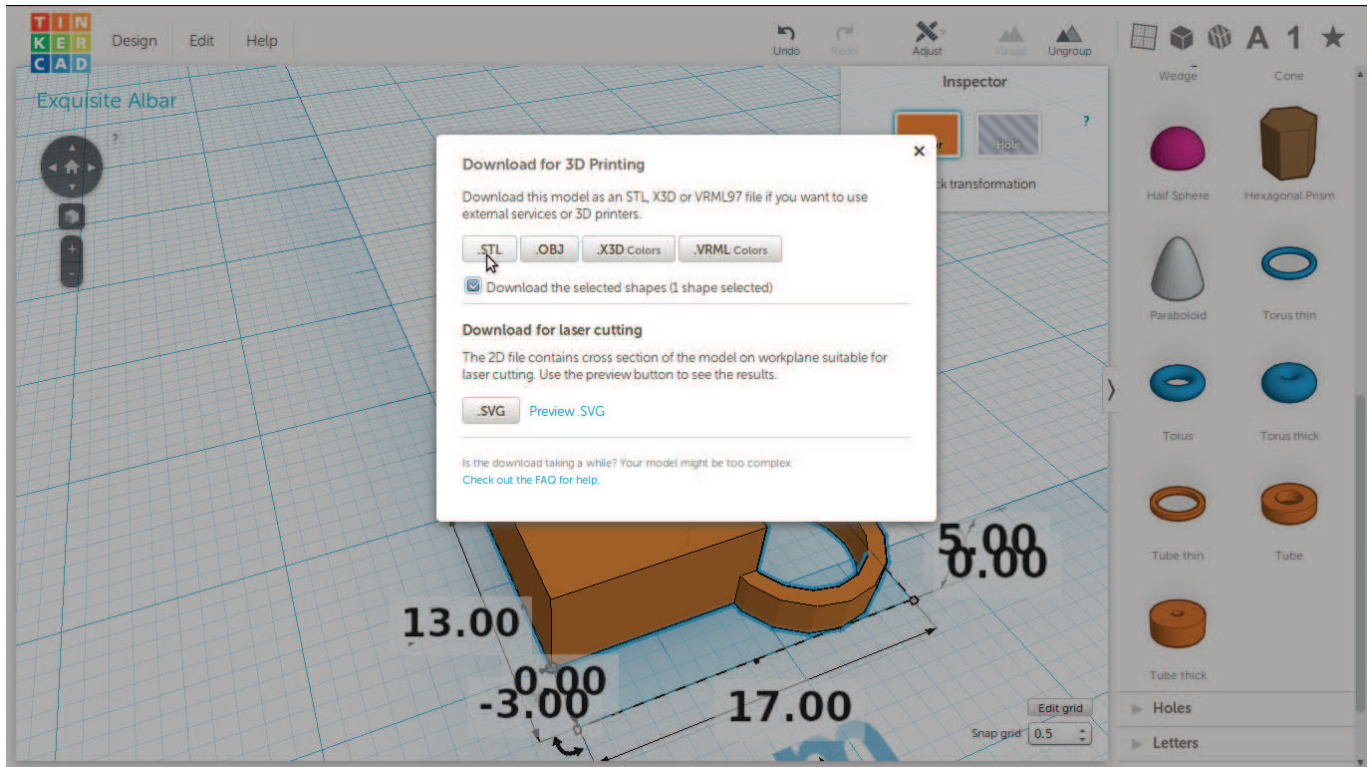
Its time to give our thing a proper name - use the Design Menu and select properties. You can set how you want to share your thing here..



Lets download our keyring for 3D printing, once again use the design menu, this time selecting Download for 3D Printing.



Choose .STL as the file format and save it to your computer!



Now you can take your file to your local library, or The Edge at SLQ and print it out!