Subject: Any good startup guides for making models with explicit measurements in Blender?
Posted by prismspecs on Tue, 29 Jan 2013 23:23:47 GMT
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As the title suggests, I'm new to Blender and 3d printing. What I need is very simple, unfortunately the learning curve for modeling applications is a bit daunting. I really just need a flat rectangle about 10mm thick and 10mm wide by 200mm long with 16 circular holes measuring 6.5mm in diameter. I realize to get there I need to master the interface and get acquainted with basic modeling. I also need to figure out how to set Blender up to do measurements in mm rather than BU. Any suggestions?

Subject: Re: Any good startup guides for making models with explicit measurements in Blender?
Posted by Fredd on Wed, 30 Jan 2013 01:07:50 GMT
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In the unit scene data under properties, click meter use the dimensions for the default cube,now 2m^3,next in the N panel replace 1 dimension with 10mm, the next with 10 mm, the third with 200mm. You notice it gets tiny. Apply scale(CTRL A). Now in the N panel in edit mode, click local. Add a cylinder, input the radius you want in mm, height you want in mm, and for a smoother interior surface bump up the vertices to 64. They are small, but in correct scale for when you upload to SW(select meter.) To prove this change from meter to none in scene units. dimensions are now shown in a percentage of a meter, which are the values SW reads for obj and stl formats..If you do not want to deal with setting unit measurements at upload, export a dae file. Remember if you want to move something a distance, you need to input it in mm in the operator panel. Further weirdness as long as meter is selected, you can input values in cm and mm. using the solidify mod you can also input values in mm. Any more questions ask away .
For simplicities sake, create a cube1^3 in blender units,add a cylinder(fill type triangle fan) with verts bumped up to 64, a height more than 1 blender unit radius .325.Time to perform a boolean difference mod op. While cube is selected use mod, set cylinder as object, use difference.Apply. Now use the array mod, count 20, click merge,apply. With this done select interior faces,delete faces only. Now set unit settings to meter, set dimensions to 10 mm x 10mm x 200mm. apply scale,upload as meters for a stl, or a dae .Always double check normals and if it is manifold as always

File Attachments

1) holey.blend, downloaded 31 times

Subject: Re: Any good startup guides for making models with explicit measurements in Blender?
Posted by Ray716 on Thu, 31 Jan 2013 01:26:26 GMT
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What I do is just assume that 1 blender unit will equal 1mm . BUT if you want an exact conversion, then fallowing what Fredd wrote will give you what you are looking for.

Ray

Subject: Re: Any good startup guides for making models with explicit measurements in Blender?
Posted by prismspecs on Thu, 31 Jan 2013 20:46:49 GMT
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So what you're saying is that I would just tell Shapeways that 1BU should be equal to 1mm when I submit my design, and that's taken care of at printing?

Subject: Re: Any good startup guides for making models with explicit measurements in Blender?
Posted by Ray716 on Thu, 31 Jan 2013 20:56:20 GMT
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that's what I do, and it's worked out find for me. Just make sure you apply any scale, rotation or location that you made while going back and forth. BUT if you ONLY scale while in edit mode you should be fine. There are a lot of us Blenderheads here if you get stuck with anything

Ray

Subject: Re: Any good startup guides for making models with explicit measurements in Blender?
Posted by Youknowwho4eva on Thu, 31 Jan 2013 20:56:34 GMT
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Depending on file type, yes. So if you export STL, or OBJ from blender, 1BU will equal whatever unit you specify at upload.

Subject: Re: Any good startup guides for making models with explicit measurements in Blender?
Posted by prismspecs on Fri, 01 Feb 2013 02:37:30 GMT
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Thank you for the instructions! How does one "set the vertices" of a newly created cylinder? And under which menu can I find these "mods" ?

Subject: Re: Any good startup guides for making models with explicit measurements in Blender?
Posted by Fredd on Fri, 01 Feb 2013 05:50:32 GMT
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Whenever you create a primitive mesh with Shift A,cubes spheres, cylinders, etc there are options in the operator panel at the bottom of the tool panel.For the cylinder, I did not know if you knew the tricks with catmull clark subdivision/ creases to really create smooth holes. Setting the verts to 64 should be fine for the print size. The fan type option is meshy, SW hates Ngon fill. I hate Ngons too. The technique Ray mentioned is Less of a headache. But you wanted to know about precise measurements, Thus I blabbed, . It is a good technique especially if you click display Edge length option in the N panel to double check wall, detail thickness. The array modifier is used to make duplicates of a mesh basically along an axis at a certain interval.Powerful tool. Boolean difference mod is too. Something you need to tinker with if you ever need to create an escape hole for a model with wall thickness.

Subject: Re: Any good startup guides for making models with explicit measurements in Blender?
Posted by prismspecs on Tue, 05 Feb 2013 00:01:20 GMT
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Thanks for your help! I just can't find where the menu is that allows me to apply these mods.

Subject: Re: Any good startup guides for making models with explicit measurements in Blender?
Posted by AmLachDesigns on Tue, 05 Feb 2013 08:35:05 GMT
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Quote: For the cylinder, I did not know if you knew the tricks with catmull clark subdivision/ creases to really create smooth holes.

Hi Fredd,

you clearly know Blender - could you give me a hint about this Catmull-Clark stuff? How would you use it in this instance?

Thx

Subject: Re: Any good startup guides for making models with explicit measurements in Blender?
Posted by prismspecs on Tue, 05 Feb 2013 19:39:27 GMT
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Would someone mind telling me why Shapeways rejected my model?

Getting much more comfortable w/ Blender on the plus side, thanks y'all.

File Attachments

1) 1.blend, downloaded 32 times

Subject: Re: Any good startup guides for making models with explicit measurements in Blender?
Posted by JACANT on Tue, 05 Feb 2013 20:29:48 GMT
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Export your model as STL from Blender.
Open it in Netfabb http://www.netfabb.com/basic.php
You will notice the Red Exclamation Mark which means it needs repairing and the size needs scaling.
GoTo Part - Scale. Scale by 10.
Click on the Red Cross 'repair'
There are 32 'Shells' and 45 'Holes'.The yellow lines are holes which need to be filled.
Click on Automatic repair. Apply repair. There are still 4 Shells
GoTo Part - Export part as STL. Save.
Click on Repair again.

Upload in millimeters.

Subject: Re: Any good startup guides for making models with explicit measurements in Blender?
Posted by JACANT on Tue, 05 Feb 2013 21:00:45 GMT
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This image should explain what is happening and how I cleaned up the shell on the right.
When you have 'Holes' in a model. Netfabb will close them by creating walls. In this case it has created walls back to back on each of the cubes. Which is why you can see the lines around each 'cube'. There are a number of tools you can use when in Repair Mode, that can be applied on seperate triangles faces or shells. You can delete or create triangles and faces. Just hover over the icons in the tool bar.
This is how I cleaned up the shell on the right. By deleting one face then all the internal walls and creating a new face to replace, by adding triangles. The face with holes is a bit different. You have to 'Add triangles' between each hole, then right click on one of the new triangles you have made and choose 'Close Hole'. Do this on each side.

Edit. You can make your model cheaper by making it hollow. Don't forget it needs a hole from outside to inside for this. Also remember the 'minimum wall thickness' for each material.

File Attachments

1) walls created from holes.png, downloaded 144 times

Subject: Re: Any good startup guides for making models with explicit measurements in Blender?
Posted by prismspecs on Wed, 06 Feb 2013 02:01:25 GMT
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If I scale by 10 won't that throw off my model? I can't select cm otherwise it wouldn't be a problem.

Thanks for your help... very, very confusing software. Seems strange that there isn't a better application for this. I figured it would print hollow automatically... since a shape is just a number of exterior faces, why is it not hollow?

Subject: Re: Any good startup guides for making models with explicit measurements in Blender?
Posted by prismspecs on Wed, 06 Feb 2013 02:26:10 GMT
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I think I fixed those issues, now my question is how can I make a model hollow?
One way that comes to mind is simply to start with my cube and create another slightly smaller cube and do a difference mod. Then of course I'll add a hole for the unused material to come out during printing.
Is that the only way or is there a simple way to do this in Blender? And can someone send me a link to this fabled script that gives you a price estimate on your print? And how can I use scripts?

Subject: Re: Any good startup guides for making models with explicit measurements in Blender?
Posted by JACANT on Wed, 06 Feb 2013 16:13:05 GMT
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I don't really know the answer as to how Blender exports it's sizes. I just know from your original question the sizes you wanted. I just downloaded your DAE attachment, opened it in Blender, then just exported it as an STL. So I could open it in Netfabb. It needed scaling by ten.
I think you need to read up on what 3D printing is. http://www.shapeways.com/tutorials/ There is one link there about making a model hollow
The files that the 3D printers use are based on the outside face of your model. All internal parts are usually just ignored or they confuse the program. What is inside, what is outside. That is why you need to create a 'hole/tunnel' from the outside to the inside, with a wall thickness not below the minimum required by the material.

Subject: Re: Any good startup guides for making models with explicit measurements in Blender?
Posted by prismspecs on Wed, 06 Feb 2013 18:22:33 GMT
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Hmm I appreciate the response but I've built a 3d printer before. It seemed easier years ago with Sketchup which is why I'm confused B^) I received advice earlier in the thread that I should make my model hollow, so I don't think that shapeways only looks at the outer walls. I'm just curious if the best way to achieve this is to create two shapes and use a difference mod to hollow the larger one out.

Edit: That link you provided did confirm my inclination. For anyone reading this in the future... to

make a hollow shape you just create a smaller version of your model and subtract it from the original. Took forever to find that info! Still getting invalid model even when I have solid shapes for some reason, no reason is given and Netfabb won't open my STL file ;-/

File Attachments

1) solidbasic.stl, downloaded 29 times