# DESIGN A TECHY TRINKET BOX
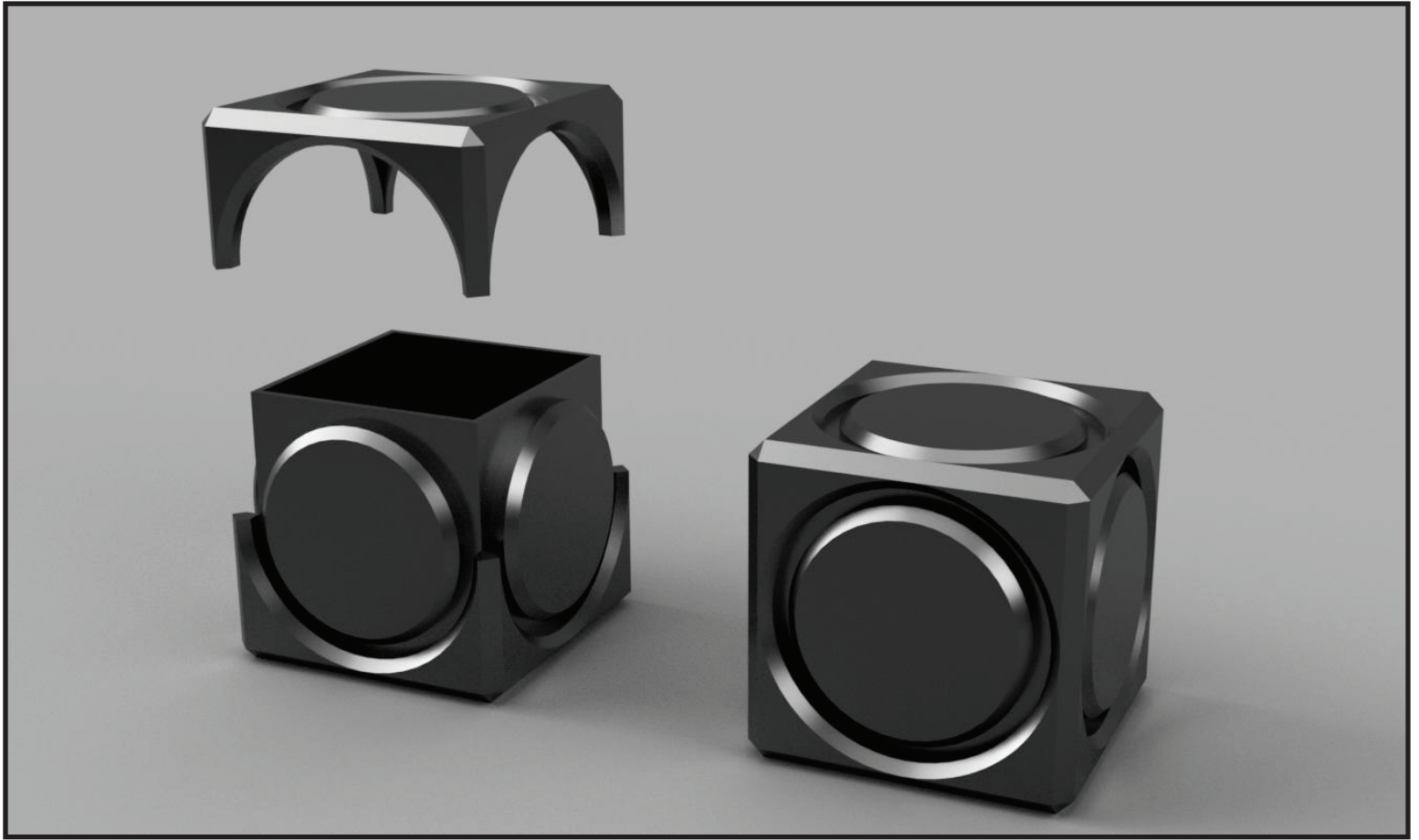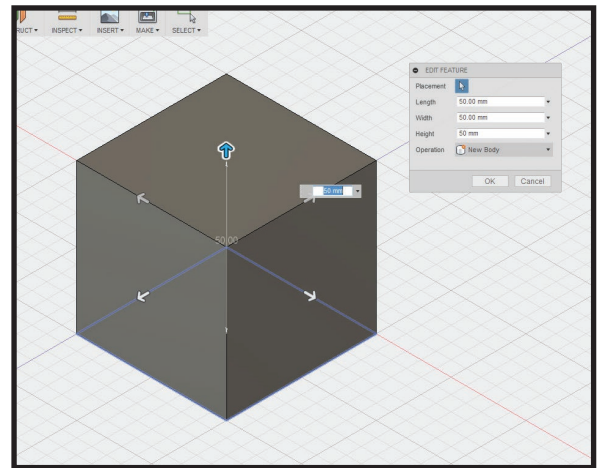
(Autodesk Fusion 360 Tutorial - Intermediate Level - Written by Maz a.k.a. Rose M.)



1. Create the inside box. Select create > "Box", select the X Y plane, and create a box with dimensions of "50mm x 50mm x 50mm". Click "Okay" to accept. In the tree on the left, find the bodies section, double click "Body 1", change the name to "Inside Box", and hit "Enter/Return" to accept.



2. Create a corner box. Select create > "Box", select the "Top" face of the 50mm x 50mm x 50mm box, select the center point of the top face to begin box, make the box dimensions of "30mm x 30mm x 30mm". Set the operation to "New Body". Click "Okay" to accept.
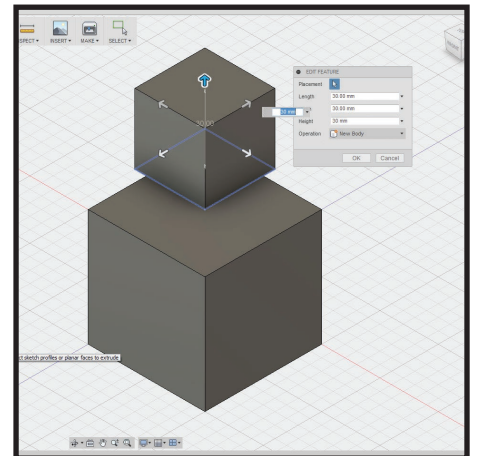
3. Pattern the corner box. Select create > Pattern > "Rectangular Pattern", change pattern type to "Pattern Bodies", select the corner box, in the dialog box click the gray text "no selection" next to "Directions", select two of the perpendicular edges on the top of the inside box, in the dialog box set the "Quantity" to "2" and "Distance" to "30mm", and click "Okay" to accept.
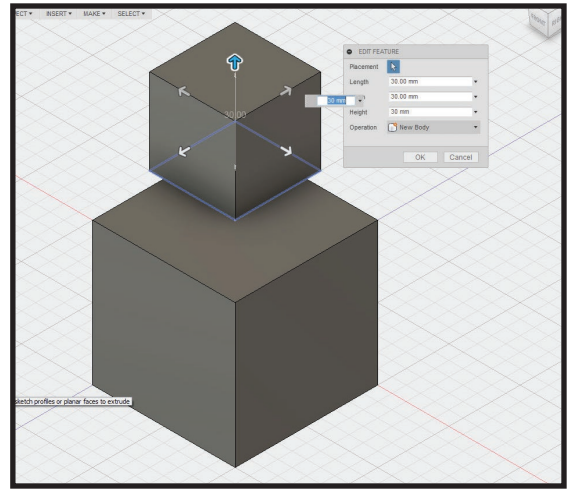
4. Move the pattern of corner boxes. In the tree layout on the left, find the "Pattern Group" in the "Bodies" tree, and select each of the pattern boxes. Right Click / CMD + Click on of the four pattern bodies and select "Move". On the z axis move the group of selected boxes down "25mm". Click "Okay" to accept.

5. Copy the set of pattern boxes. In the tree layout on the left, find the "Pattern Group" in the "Bodies" tree, and select each of the pattern boxes. Using the keyboard, press "CTRL+C/CMD+C" to copy and "CTRL+V/CMD+V" to paste, on the z axis move the copies down "30mm". Click "Okay" to accept.
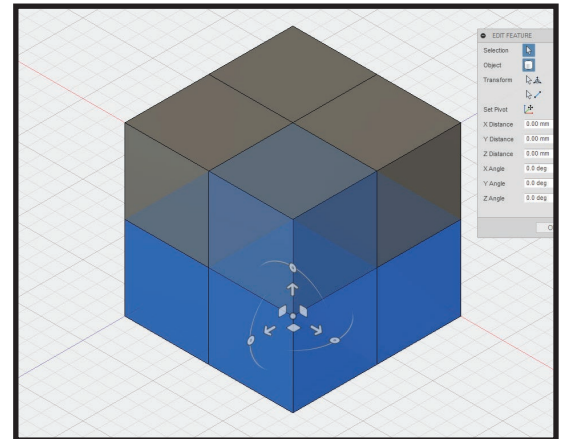
6. Create circle sketches for round buttons. In the sketch drop down, select the "Center Diameter Circle", click a top face on the corner box to select plane, click the corner point on the corner box that is in the center of the inside box, put out or enter "50mm", and hit "Enter/Return" to lock the value, hit "Enter/Return" again to accept. Select all of circle sketch, open the pop-up wheel menu(Right Click/CTRL+Click), select "Press Pull", set value to "-5mm", click "Okay" to accept.
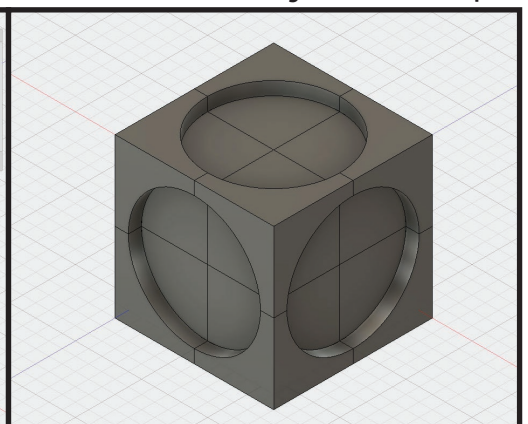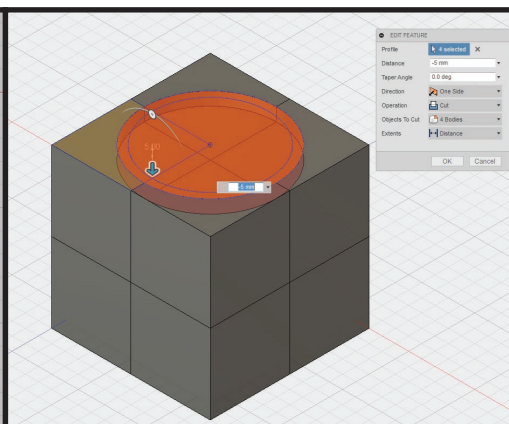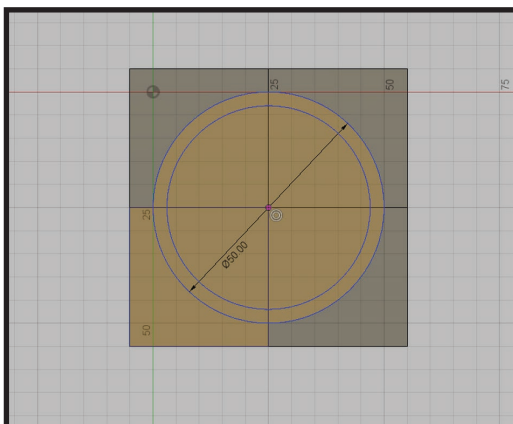
7. Repeat step 6 for all 6 sides of the box total.

8. Extrude the button circle shape. In the timeline, find the first circle sketch made, activate the action to edit(double click), select sketch > "Offset", select the circle sketch, and offset "3mm" toward the inside. Select all of the inside circle sketch, open the pop-up wheel, select "Press Pull", set value to "-5mm", switch the operation value to "New Body", and click "Okay" to accept. At the top on the tool bar, click "Stop Sketch" to get out of sketch mode. In the tree on the left, find the sketches section of the tree, hide the circle sketch by clicking the "yellow light bulb"(the bulb will gray out and the sketch will disappear).
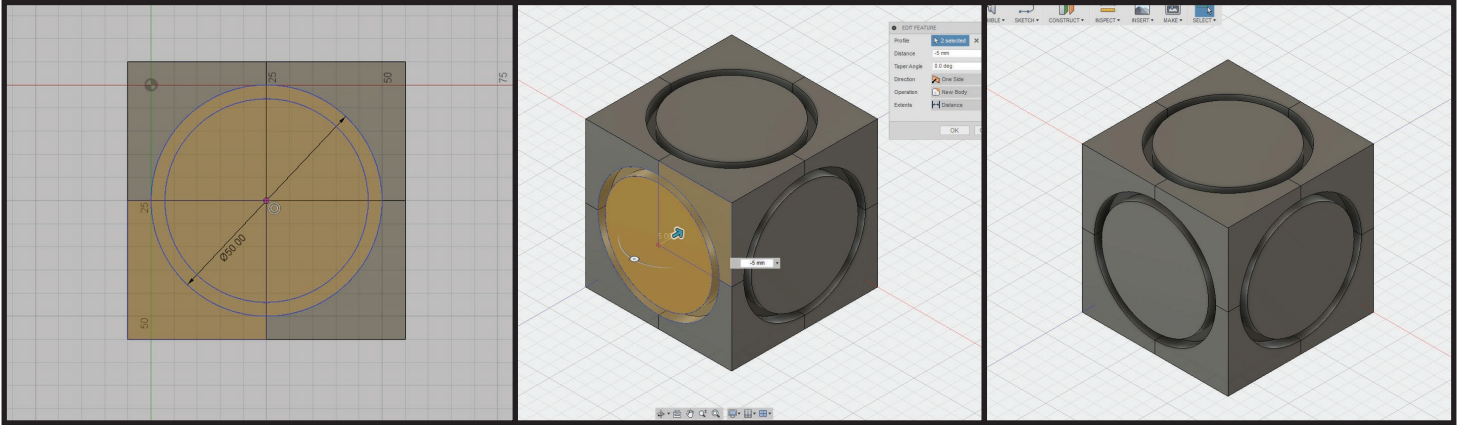


9. Repeat step 8 for all 6 sides total, however choosing the different sketch actions in the timeline in descending order.

10. Chamfer the corner edges. Click on an edge of a corner box, open the pop-up wheel menu, and select "Chamfer". Click on all the edges near the corners of the corner boxes to select them. Orbit around the workspace to select them all  by dragging the viewport box or selecting the Orbit tool near the bottom. Set the chamfer value to "3mm" and click "Okay" to accept.
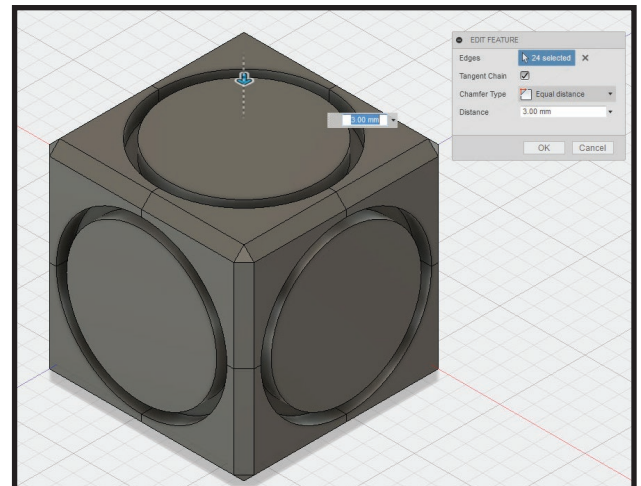


11. Chamfer the round button edges. Click on an edge of the circle, open the pop-up wheel menu, and select "Chamfer". Click on all the curved edges of the circles to select them. Orbit around workspace to select them all  by dragging the viewport box or select-ing the Orbit tool near the bottom. Set the
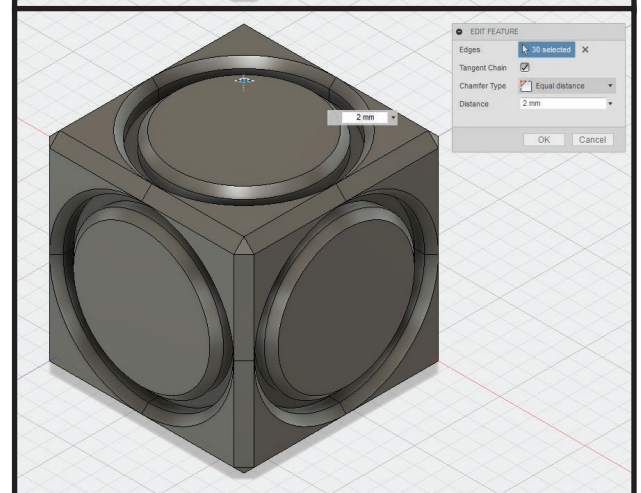
chamfer value to "2mm" and click "Okay" to accept.

12. Create a copy of the inside box before combining the outer shell. In the tree on the left, find the bodies section, select the inside box, hit "CTRL+C/CMD+C" to copy, "CTRL+V/CMD+V" to paste, and hit "Enter/Return" to accept in exact position. Click on the light bulb of original "Inside Box" and the copy of the "Inside Box" to hide.

13. Combine the outer shell. In the tree on the left, find the bodies section, select all of the bodies except for the "Inside Box" bodies, from the modify menu select "Combine", set the operation to "Join", and click "Okay" to accept.
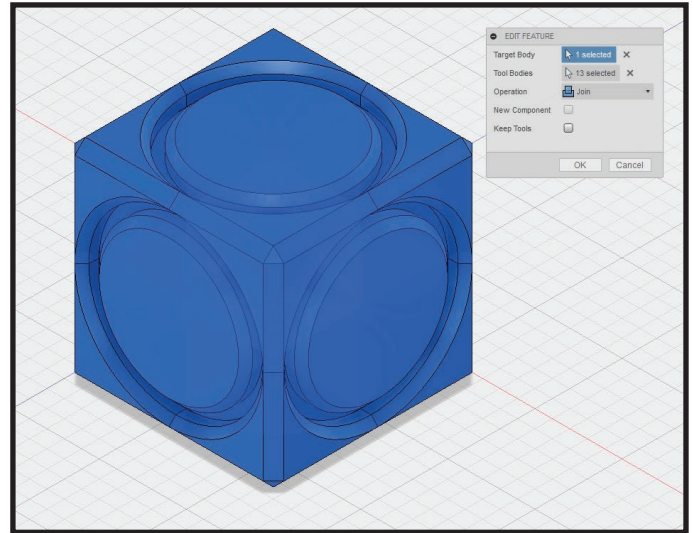


14. Subtract the inside box geometry from the outer shell. In the modify menu, select "Combine", select the outer shell first, select the "Inside Box" copy, set the operation to "Cut", and click "Okay" to accept.

15. Slice the outer shell to make the lid. In the tree on the left, find the bodies section, and click on the light bulb to hide each round button on the sides. Select the "Sketch" tool, select either the X Z plane or Y Z plane, click and drag a horizontal line sketch through the center of the outer shell. In the modify menu select "Split Body", click to select the outer shell, in the dialog box on the right click the gray text "no selection" next to "Splitting Tool", click the line sketch, and click "Okay" to accept.
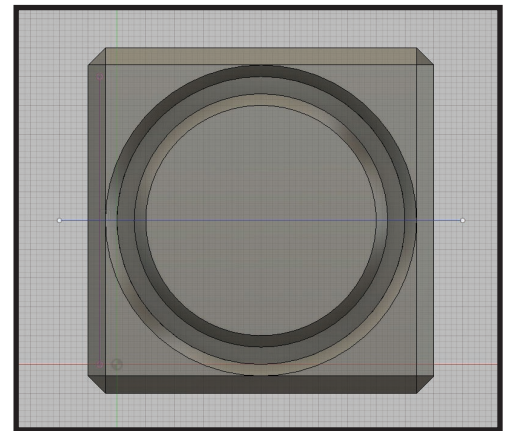


16. Create the lid. Unhide all the bodies by clicking on light bulbs for each body in the tree on the left. Hide the top round button body and the top outer shell frame. Click to select the top face of the inside box, open the
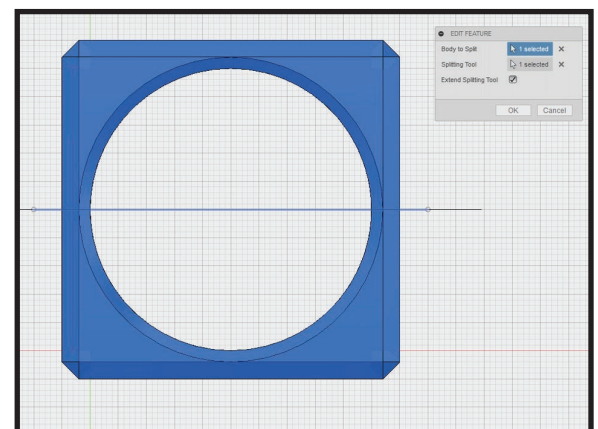
pop-up wheel menu, select "Extrude", set the value to "1.6mm", change operation to "New Body", and click "Okay" to accept. Unhide the top round button and the top shell frame. In the modify menu select "Combine", click the round button, the top shell frame, and the "1.6mm" thick body. Set the operation to "Join" and click "Okay" to accept.

17. Create the empty space for the trinket box. Hide the lid. Click to select the top face of the inside box, open the pop-up wheel menu, select "Shell", set the value to "1.6mm", and click "Okay" to accept.
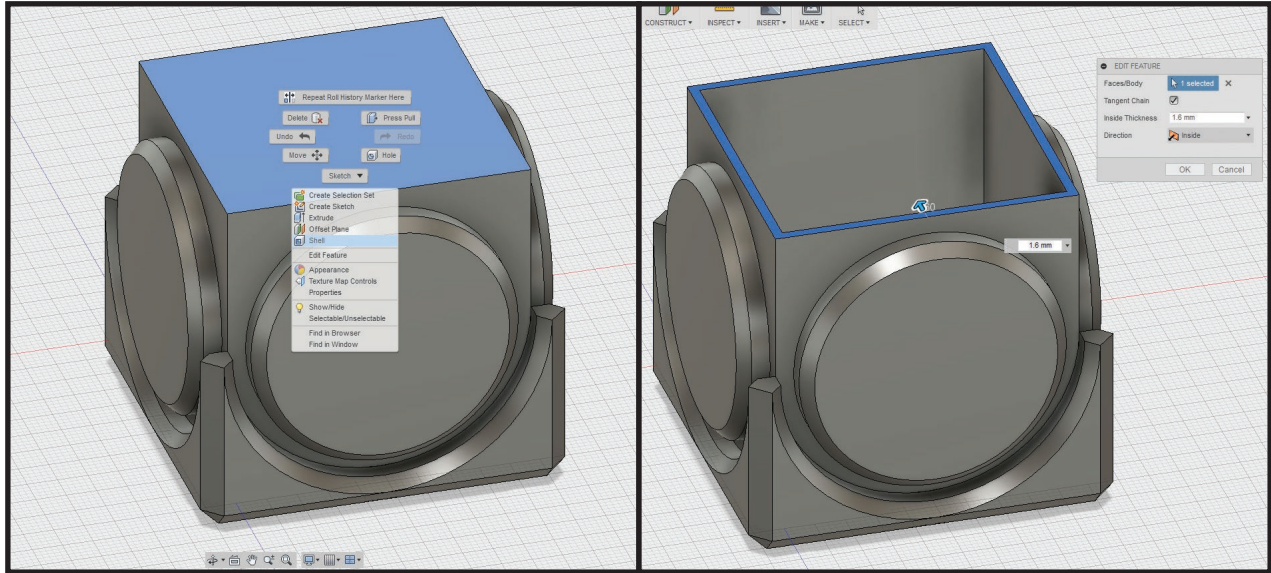


18. Finish the box. While holding "Shift", select all of the bodies for the box section in the tree, in the modify menu select "Combine", set the operation to "Join", and click "Okay" to accept.

19. Make a copy of your box and lid. In the tree on the left, find the bodies section, select the lid, hold "CTRL/CMD" and select the box. Hit "CTRL+C/CMD+C" to copy, "CTRL+V/CMD+V" to paste, and use the x or y arrows to move the copy away from the original box.
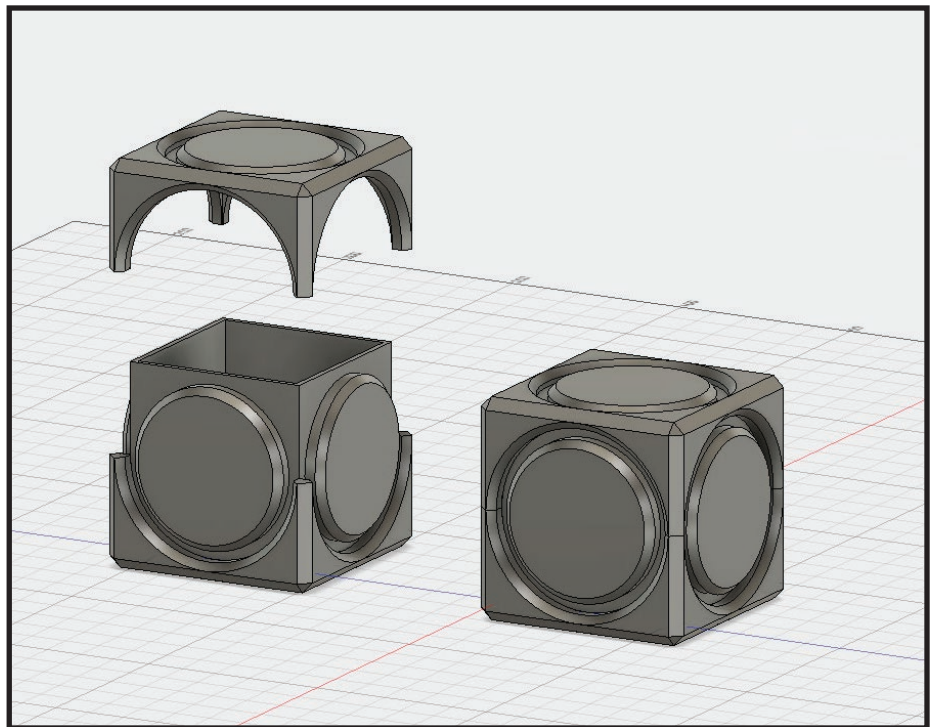
20. Create tolerance for the lid to fit properly after printing. Select the lid body, open the pop-up wheel menu, select "Move", and on the z axis move the lid up away from the box enough so you can see inside easily. Orbit the view to see inside the lid. Select an inside face on the lid, open the pop-up wheel menu, select "Press Pull", set the value to "-0.2mm", and click "Okay" to accept. Do this for all the faces on the inside of the lid that would touch the outside of the box. To check and make sure all the lips of the lid are the same thickness, use the "Inspect" tool at the top on the toolbar.
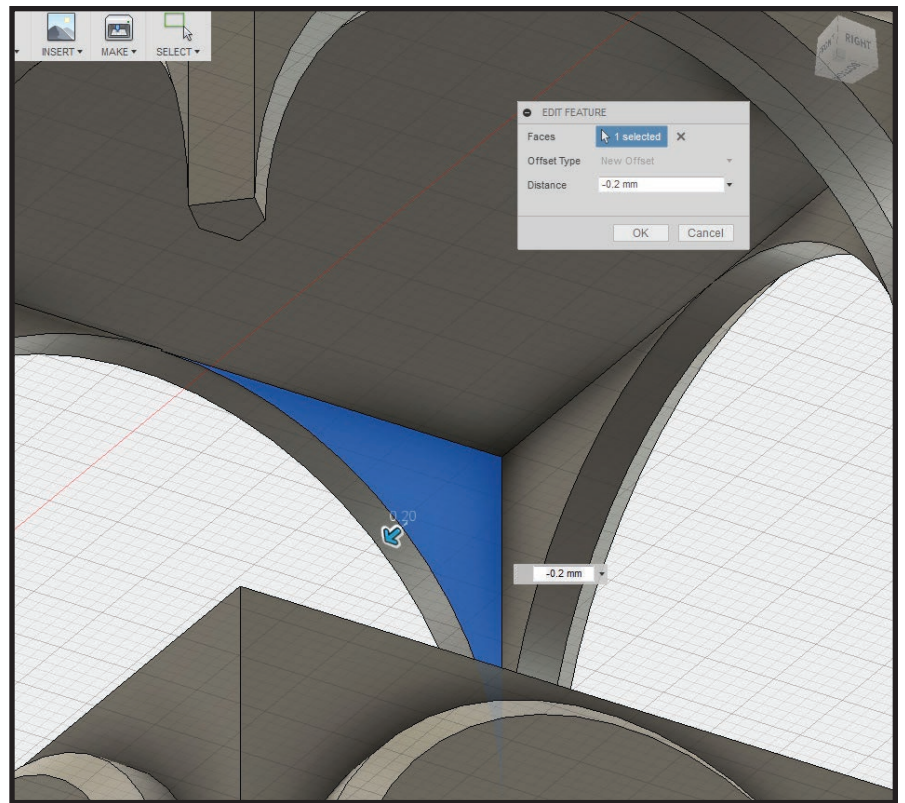
Congratulations! You now have a techy looking trinket box. Feel free to spice it up any way you like with text or other shapes. Keep in mind printing guidelines for designing. When you're finished you could export each piece separately for printing. (Exporting together could be difficult since you would need to flip the lid to print upside down on FFF/FDM machines.)