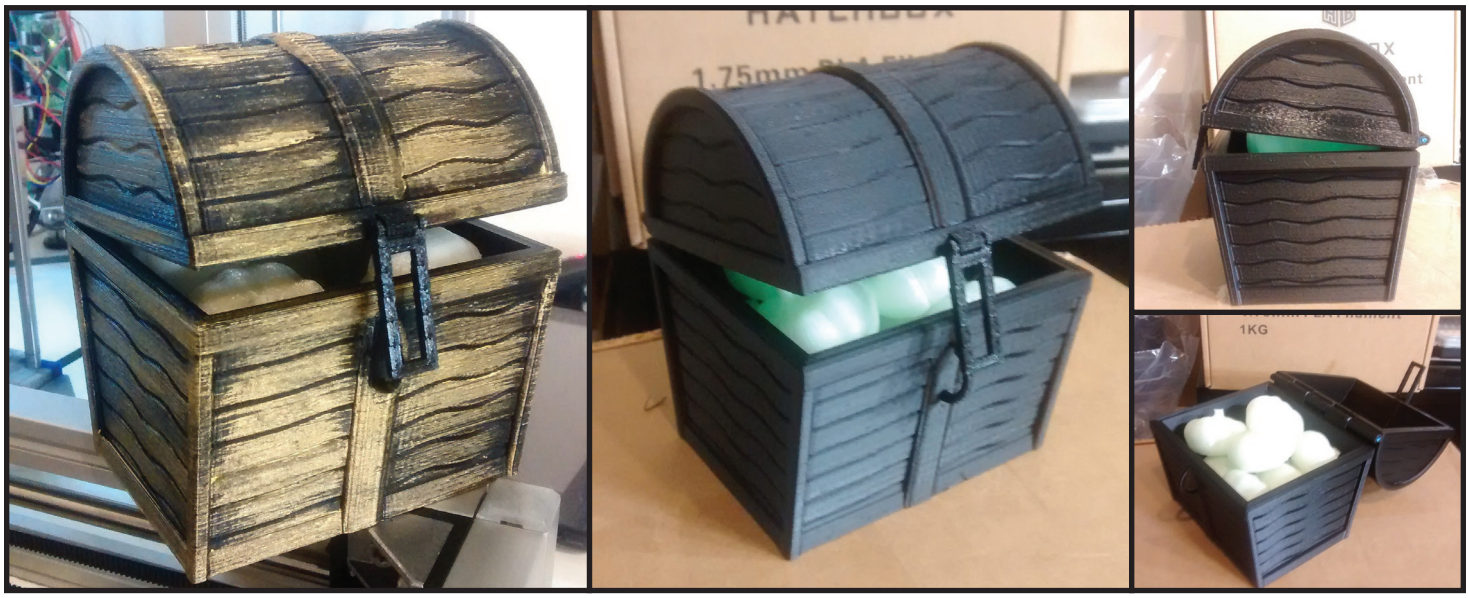
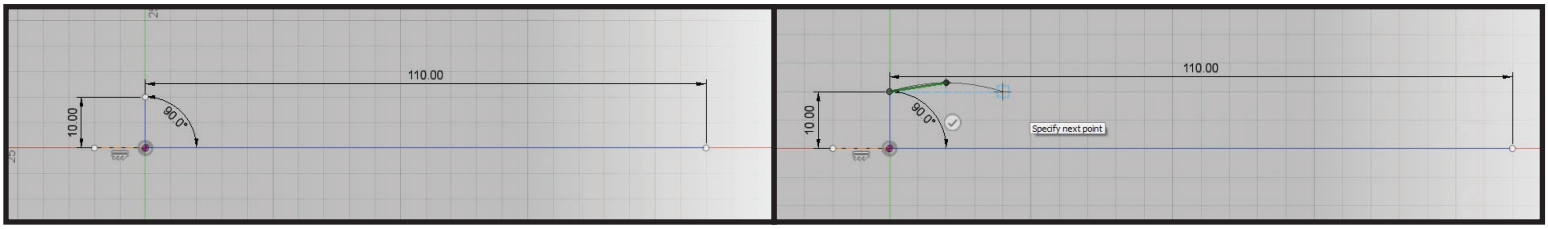
TREASURE CHEST IN FUSION 360

(Fusion 360 Tutorial - Intermediate Level - Written by Maz a.k.a. Rose M.)

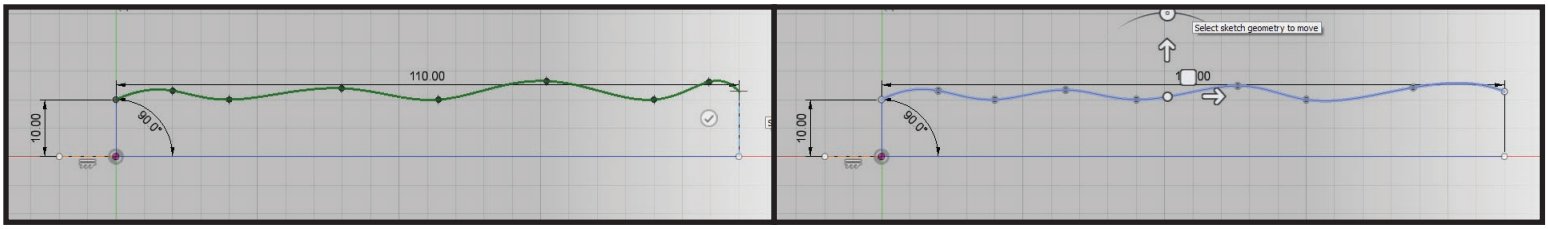


STEP 1: CREATE PLANK FOR TREASURE CHEST

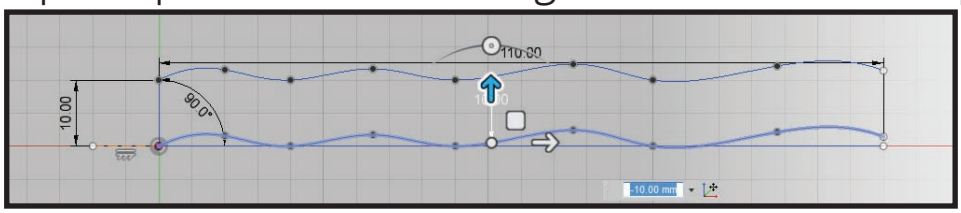
• Create the sketch for the plank. To do this, press "L" to activate the "Line" tool, set floor plane as sketch plane, make first sketch line vertical "10.00mm", and second sketch line "110.00mm" to make an "L".



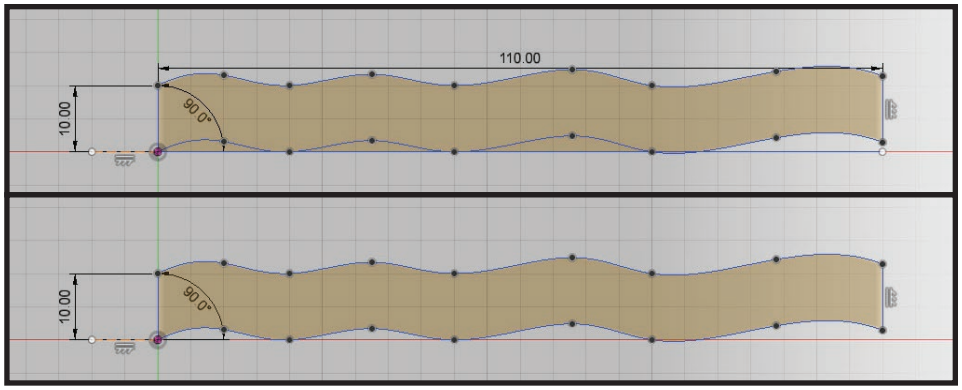
• In the sketch menu at the top, select "Spline", set first point opposite of the "110.00mm" line on top of the "10.00mm" line, and create a curvy line running along the "110.00mm" line till the end.



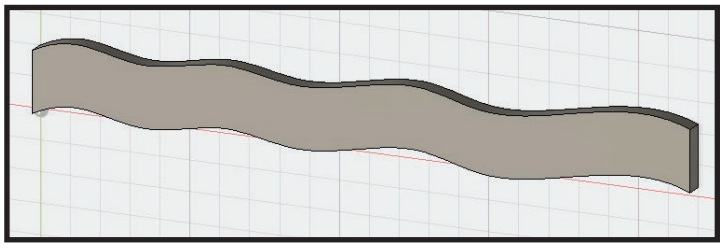
• Once finished sketching spline, select the spline and make a copy. Using the move tool, move the copied spline down to be aligned with the bottom point on the "10.00mm" line.



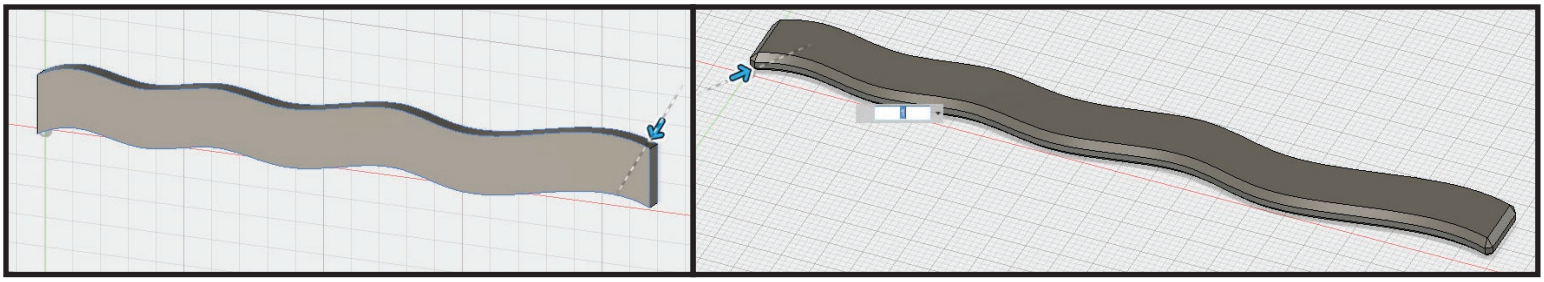
• Use the line tool to close the end of the plank sketch. Select the straight "110.00mm" line and delete.



• Extrude the plank sketch "3.00mm".

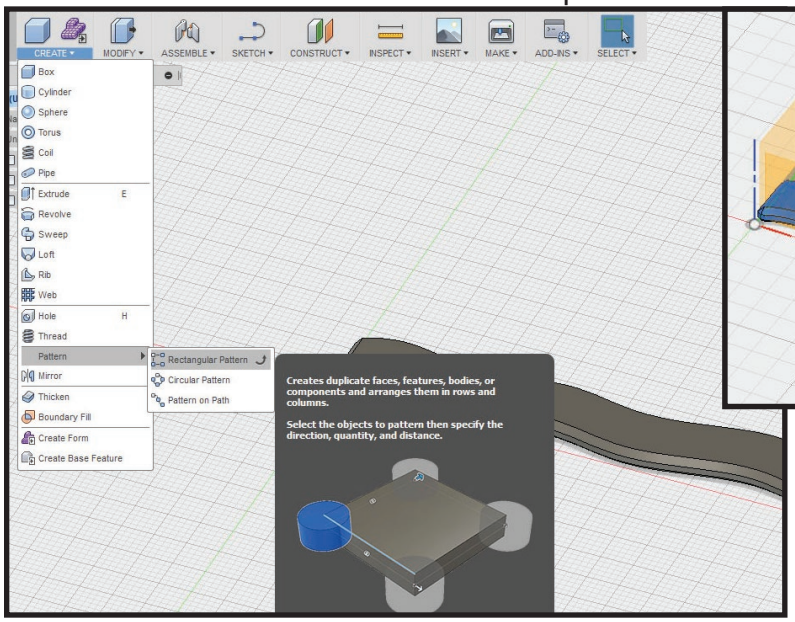


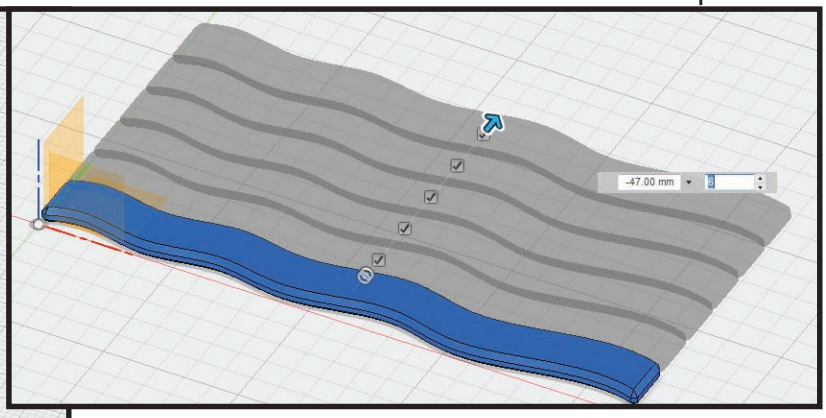
• Chamfer all the edges on the plank body between "0.5mm - 1.00mm".



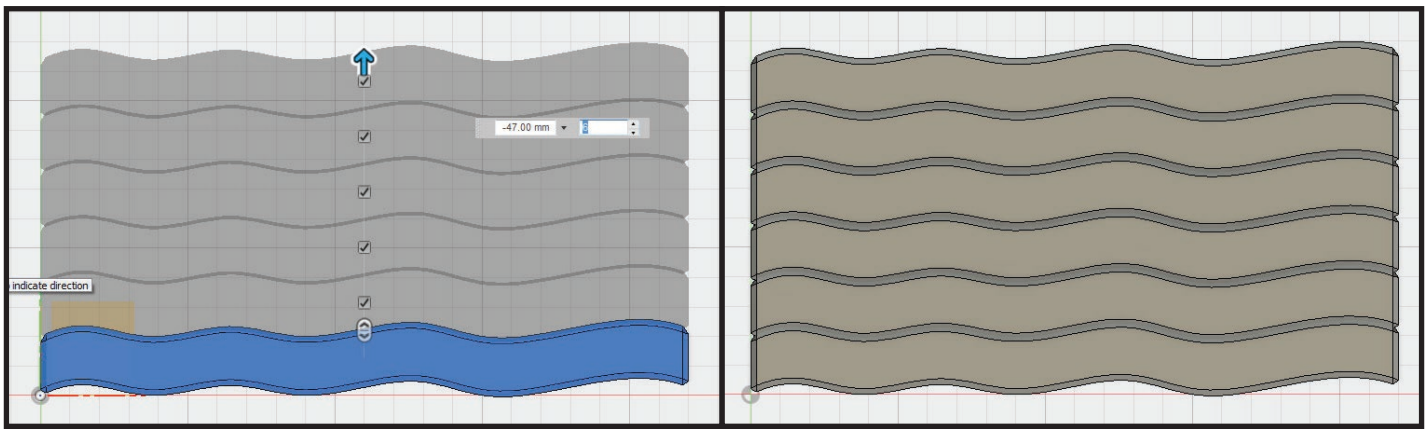
STEP 2: CREATE THE BOTTOM PANEL OF THE TREASURE CHEST

• Use the pattern tool to create a panel of the planks. To do this, go to "Create > Pattern > Rectangular Pattern", select the plank body to pattern, select the origin line running from the front to back of workplane to set as direction, change pattern quantity to a value that would equal 60mm - 80mm(6 - 8 planks), and click + drag the arrow to pull out the pattern distance. To check the width of the planks to be no more than 80mm, use the "Inspect" tool on the outside face of first and last plank.



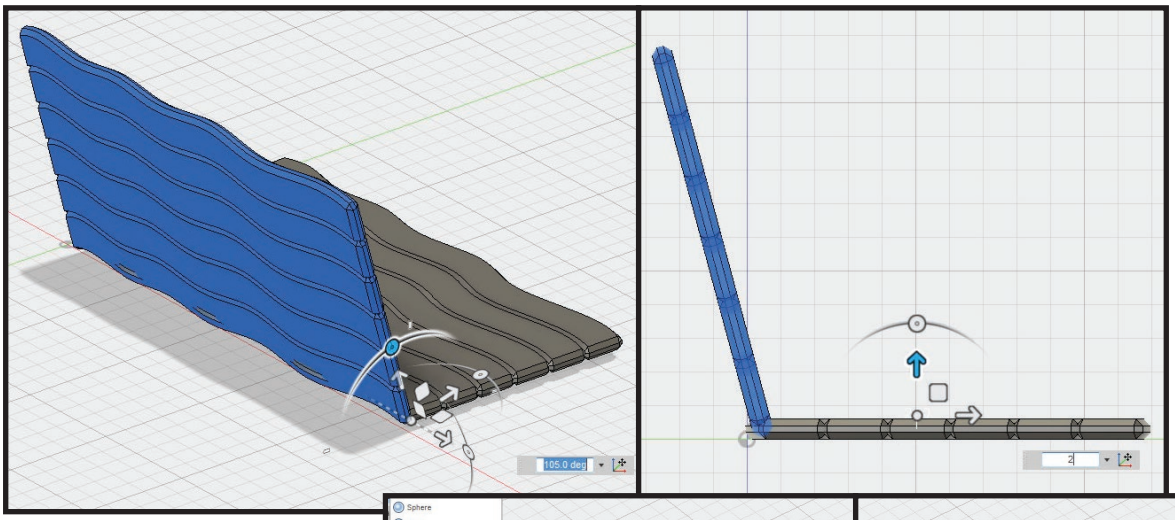


• Shape of plank designed will determine the unique distance between each plank. Switching to the "Top" viewport will help to see gaps easier between each plank. Each plank in the pattern should overlap just enough to avoid holes. Edit the pattern action in your timeline as needed to achieve the desired distance between planks without having holes.

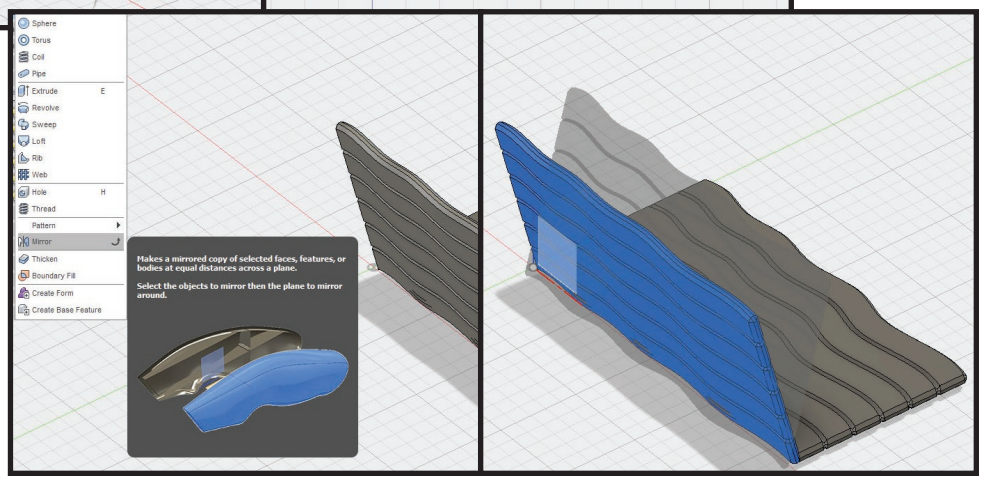


STEP 3: CREATE FRONT, BACK, & SIDE PANELS OF TREASURE CHEST

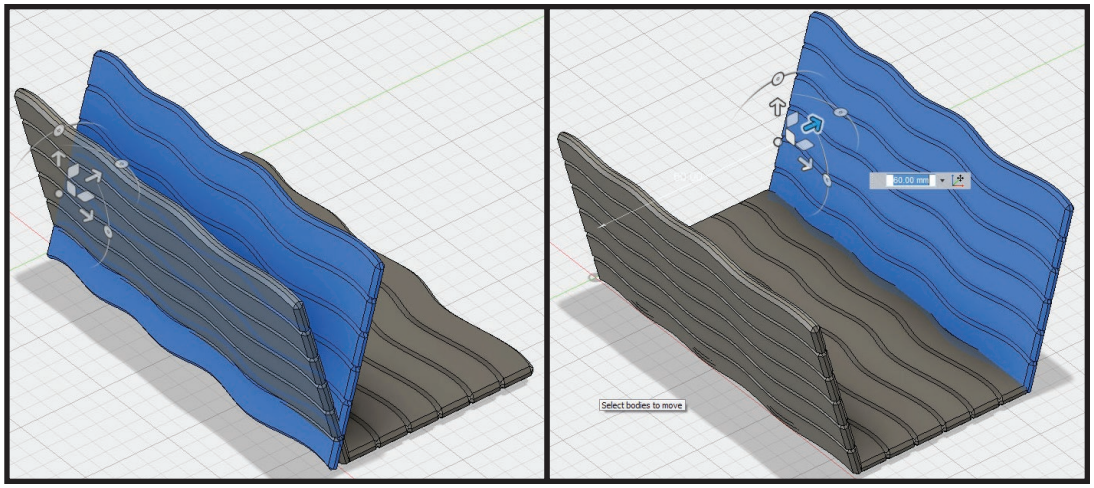
• Using the bottom panel, duplicate, and rotate up to be the front. To do this, select all the plank bodies, create copy, while in the move tool set a pivot point to the bottom most corner edge of the first plank, rotate to "105° " to create an "L" with the bottom and front, and move the front planks along the "Z" axis to make sure the front planks do not pass below the edge of the flat face on the bottom planks.



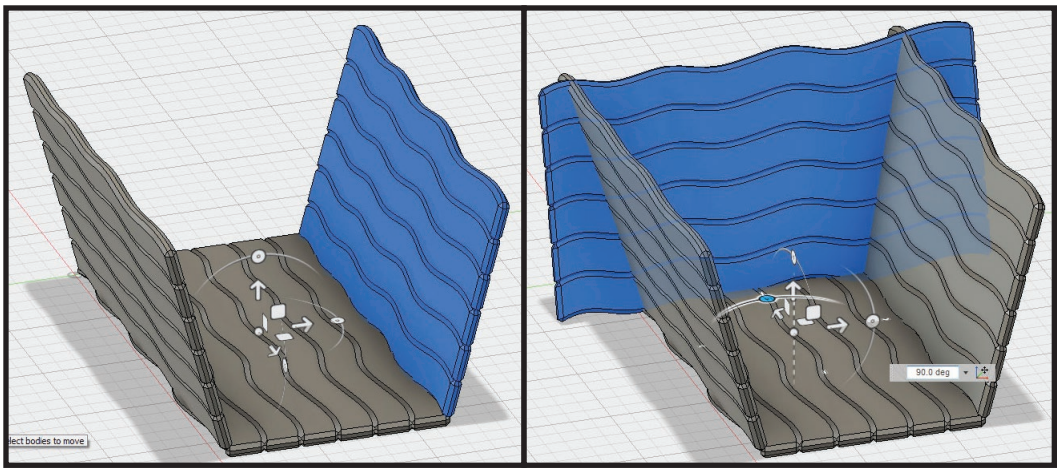
• Using the front panel, create a mirror of the front panel to be the back panel. To do this, select all the plank bodies for the front panel, use the "Mirror" tool in the create menu at the top, and set the mirror plane as the front plane.



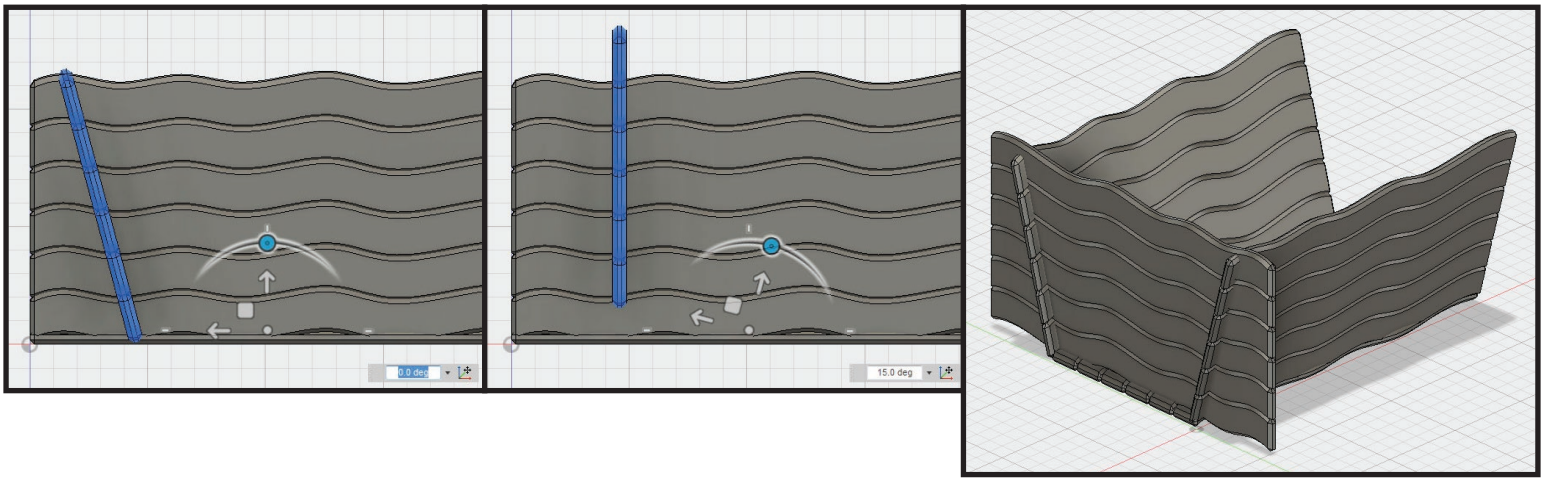
• Use the move tool to position back panel in opposite but similar position to the front panel.



• Using the back panel, duplicate, and rotate to be side panel. To do this, select back panel planks, duplicate, while in the move tool rotate on the floor plane "90° ", and position to cover the front + back + bottom panels.

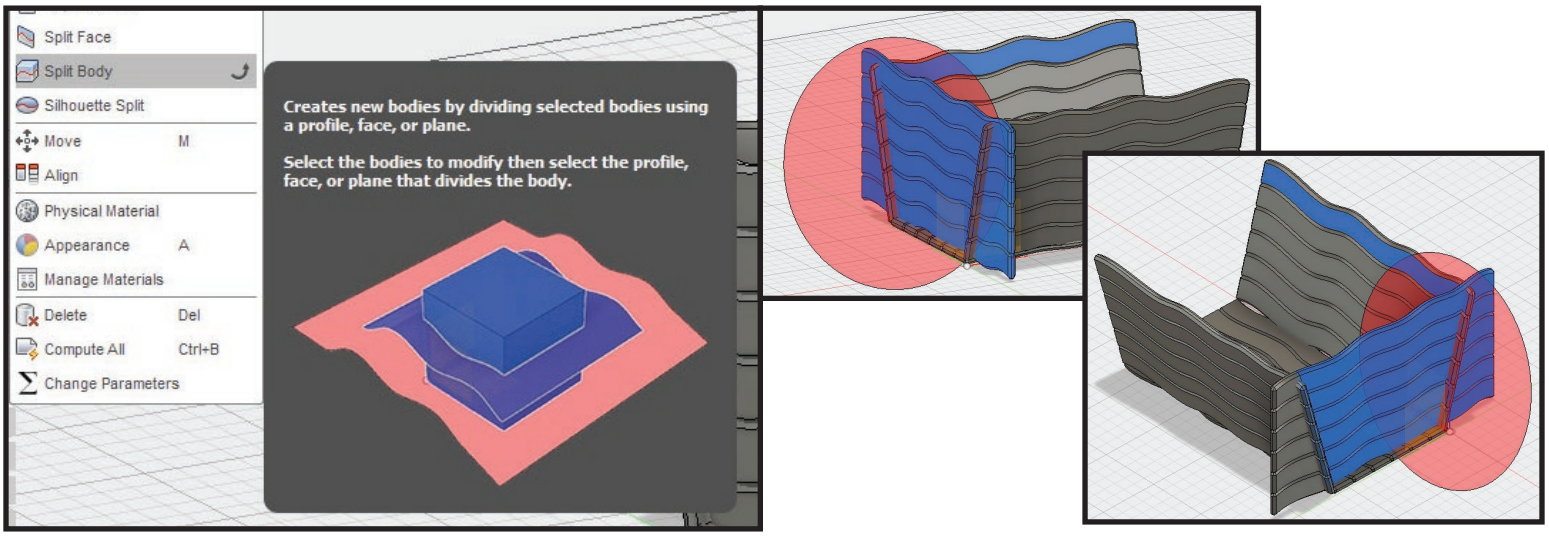


• Also rotate copied planks to be at 90° angle to the bottom planks.

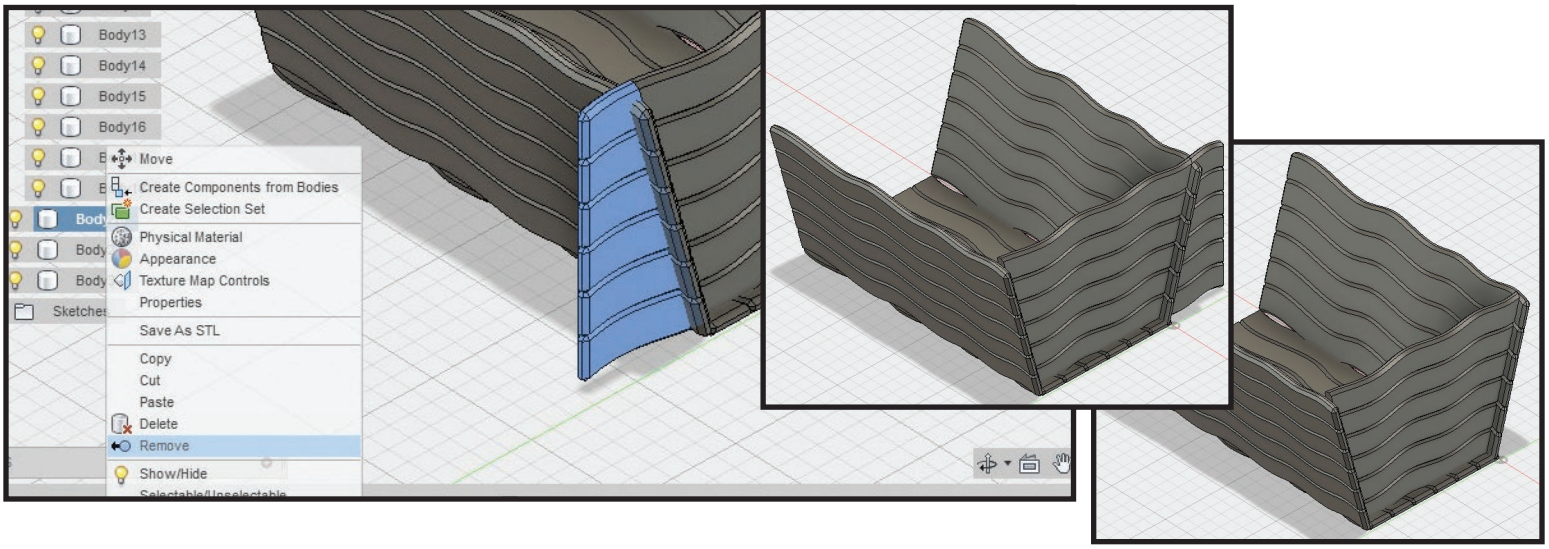


• Combine all the side plank bodies into one body.

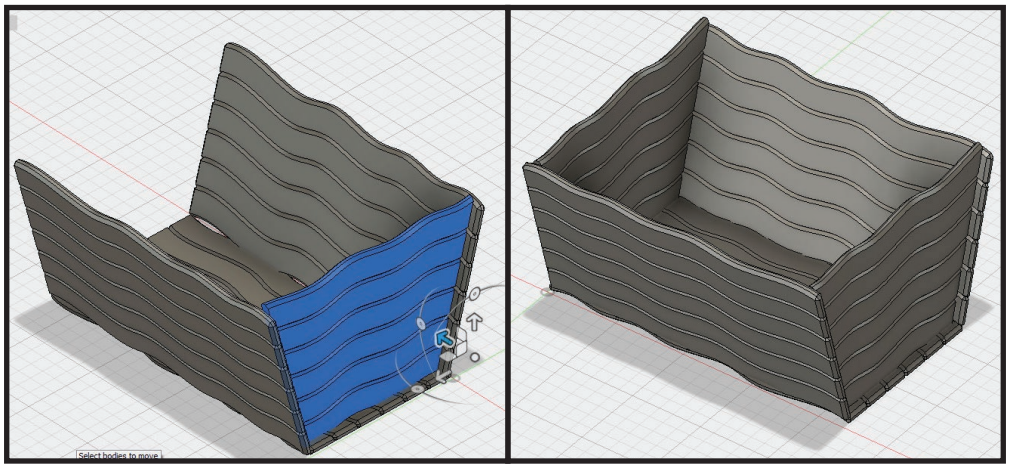
• Trim the side panel of planks to be flush with front and back. To do this, use the split body tool, select side panel as body to split, and select inside flat face of front panel as splitting tool. Repeat this for the back and bottom panels.



• Cleanup the remnants left behind from trimming. To do this, find the bodies in the browser tree and select remove.

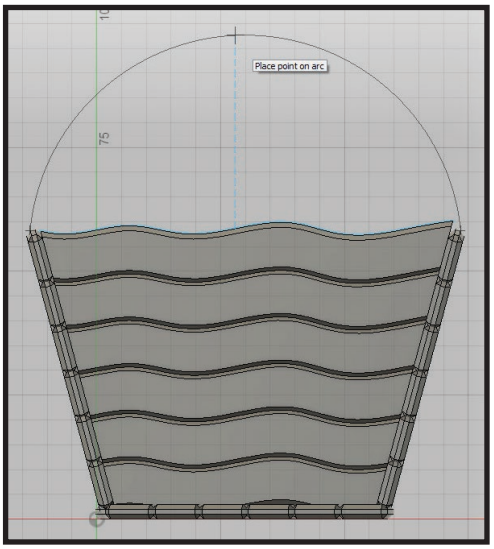


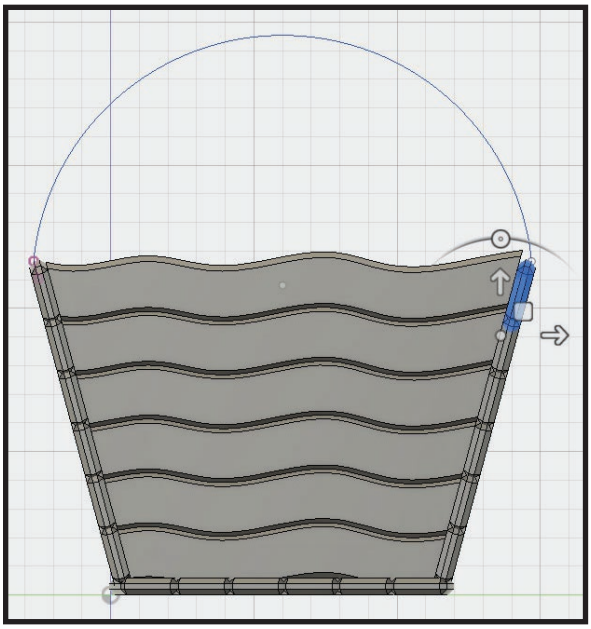
• Using the side panel, create a mirror of the side panel to be the opposite side panel. To do this, use the "Mirror" tool in the create menu at the top, select side panel as mirror, and select flat face on the side panel as mirror plane. Use the move tool to position side panel on opposite side.



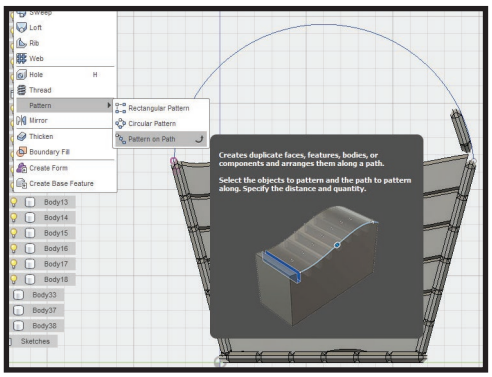
STEP 4: CREATE ROUNDED TOP OF TREASURE CHEST

• Using an arc sketch, project a pattern of planks over the top of the chest. To start, select the "3-Point Arc" tool from the sketch menu at the top, set sketch plane to be on the left of the chest, set first point on the top edge of the back panel, set second point on the top edge of the front panel, and pull arc up to desired curve shape.

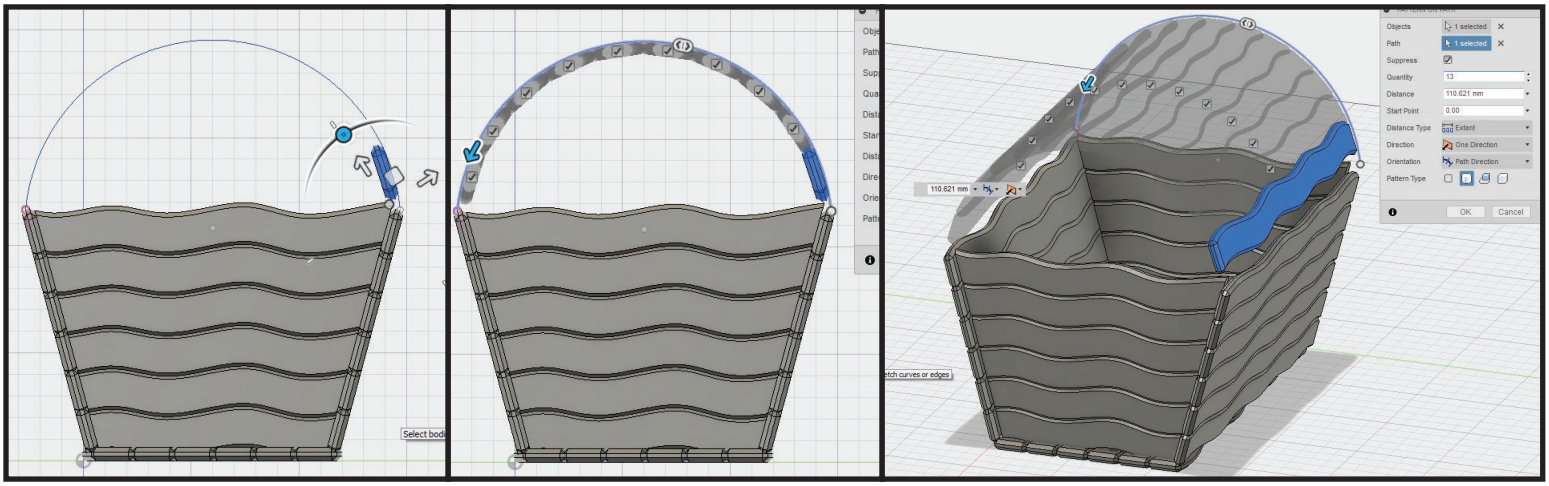




• Next, use the arc path to project the pattern of planks. First there needs to be one plank body aligned to the inside of arc path and rotated to same angle. To do this, duplicate the top plank on the front panel, move it up to the edge of arc path, and rotate plank to same angle as the arc.

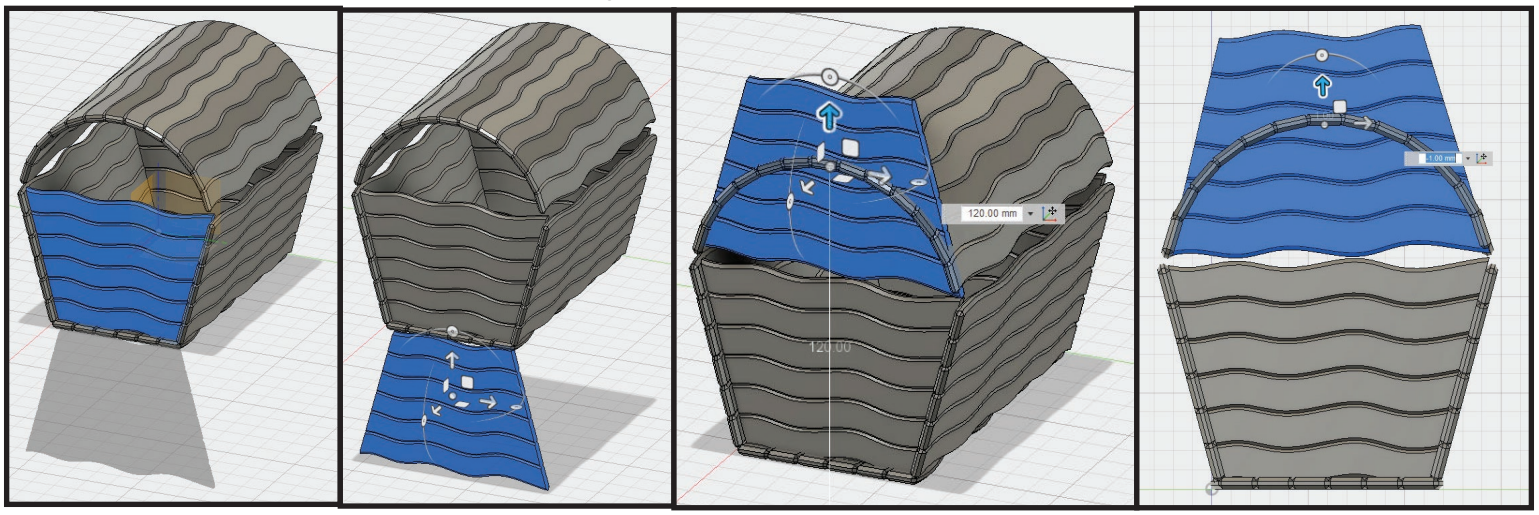


• In the create menu at the top, select "Pattern on Path", select plank as body to pattern, select arc as pattern path, change the "Orientation" to "Path Direction", and change quantity to enough planks that will have no holes between each of the planks. Edit the pattern action in your timeline as needed to get the right amount of planks for the top.



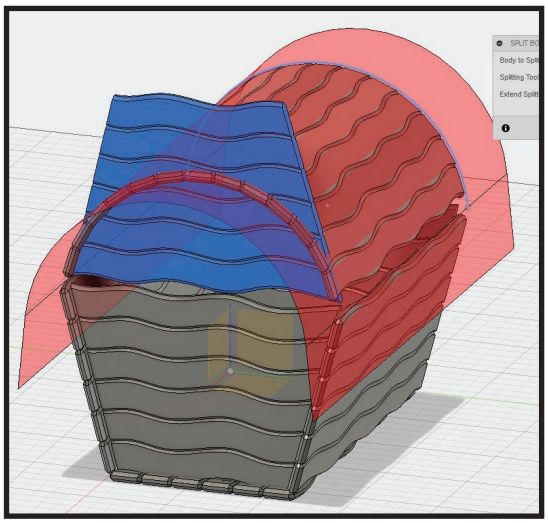
STEP 5: CREATE SIDE PANELS FOR LID OF TREASURE CHEST

• Mirror the bottom side panels to be the top side panels and trim. To do this, first mirror the bottom side panel using the "Mirror" tool in the create menu at the top. Choose the floor plane as the mirror plane and position mirrored side panel to cover entire curve of chest top.



Repeat for the opposite side of chest.

• Trim part of the plank panel that is above the lid and remove. To do this, use the "Split Body" tool in the modify menu at the top, select the top side panel, and select the arc sketch as the splitting tool. Remove the remnant leftover from splitting in the browser tree.

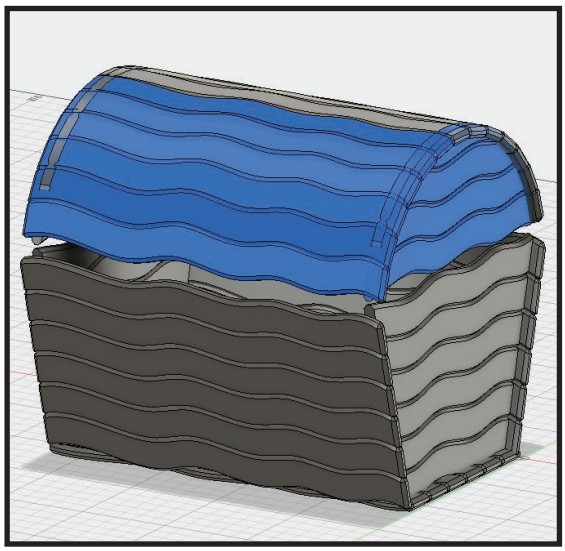


Repeat for the opposite side of chest.

STEP 6: COMBINE BODIES TOGETHER FOR CHEST TOP & BOTTOM

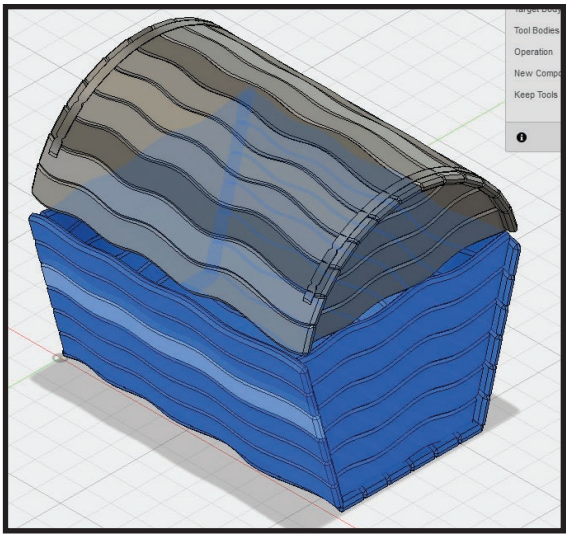
! Save your file now before combining !

• Select all the bodies for the top of the chest, use the "Combine" tool in the modify menu at the top, and set to join. Be patient, as this action can take a long time for the software to process. Depending on the complexity of the plank design , this may take several minutes(or possibly crash the software). If any errors are encountered, such as software crash, try combining in sections.



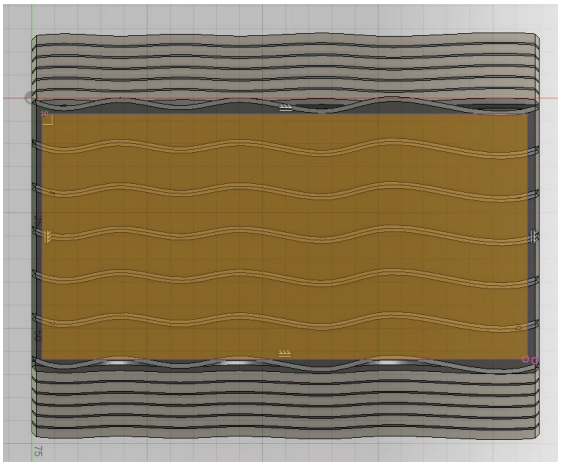
Repeat for bodies of the bottom of chest.

There should now only be two bodies in the browser tree. If there are more than two bodies in the browser tree, remove unnecessary bodies as needed.



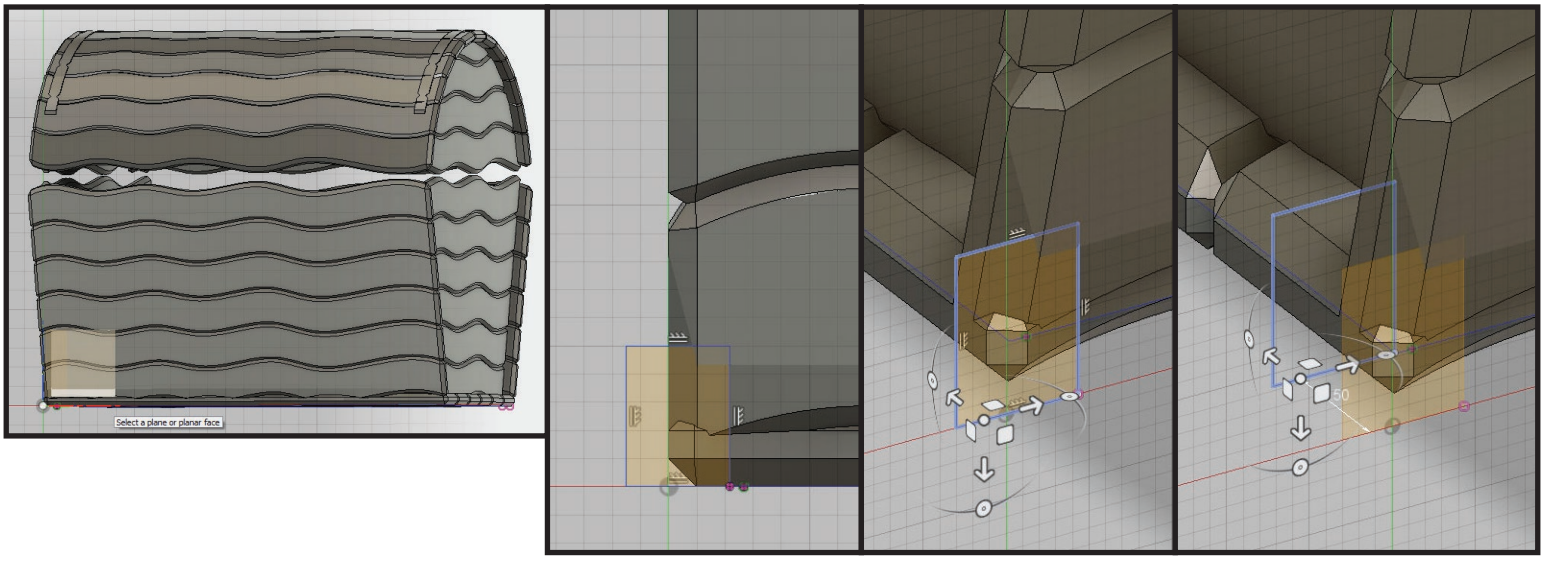
• In the browser tree on the left, rename the chest top to "Chest Top", and rename the chest bottom to "Chest Bottom".

STEP 7: CREATE BOTTOM TRIM OF TREASURE CHEST

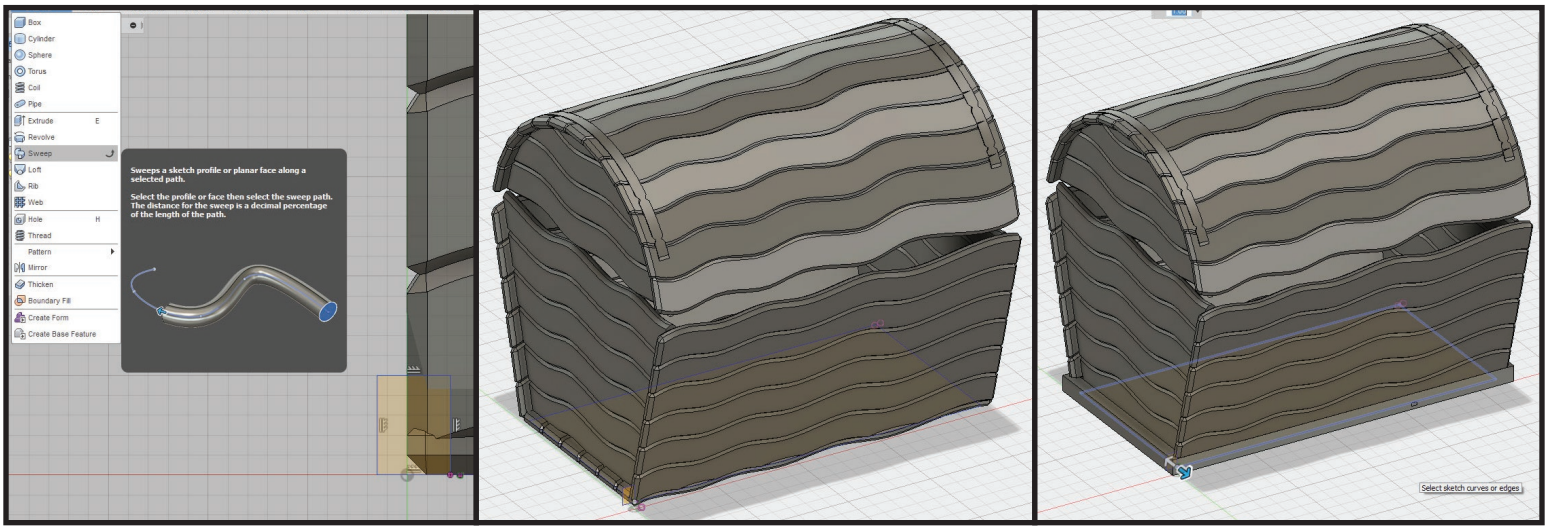


• Using sketches and sweep tool, create the bottom trim of the chest. To do this, start a sketch using the "2-Point Rectangle" from the sketch menu, select the floor plane, change to "Bottom" viewport, set the first point of the rectangle to just inside the top left corner of the chest bottom, and set the second point in the bottom right corner of the chest bottom. Ideally the rectangle should be inside the bottom plank panel with a margin of about 10mm-15mm border.

• Start a new sketch with a "2-Point Rectangle", select back plane as sketch plane, set first point on the edge of the previous sketch, and pull the rectangle away from chest to be big enough to cover any holes between the seams of the panels. Use the move tool to position rectangle sketch made on back plane to touch at the corner point of rectangle sketch made on bottom face.

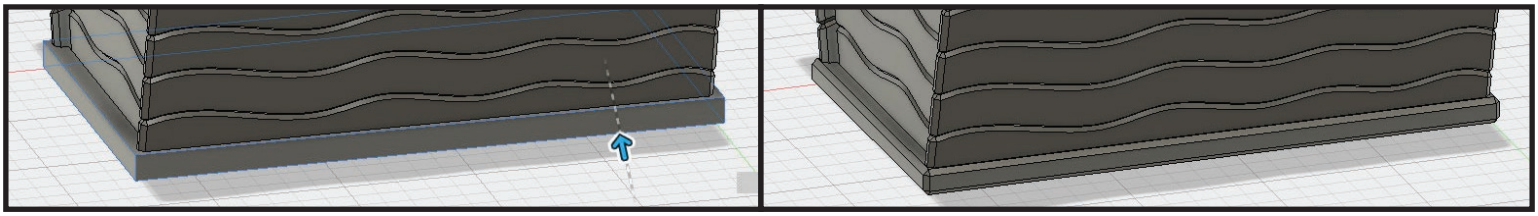


• Using the "Sweep" tool from the create menu at the top, select the second rectangle sketch as the profile, select the first rectangle sketch as the path, and set to "New Body".



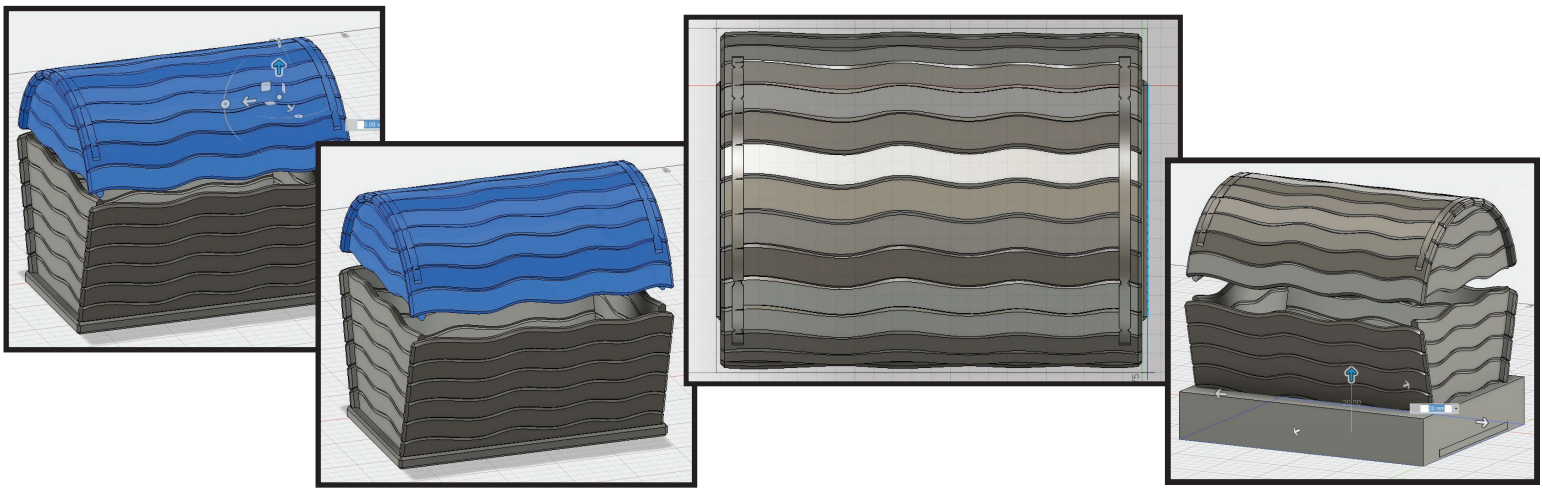
Continue editing the sketches in the timeline, as needed, to get the bottom trim on the chest to cover any holes between panels. Get creative and make the outside edge of rectangle into something more intersting like an "S".

• Chamfer all the edges of bottom trim and combine to chest bottom.

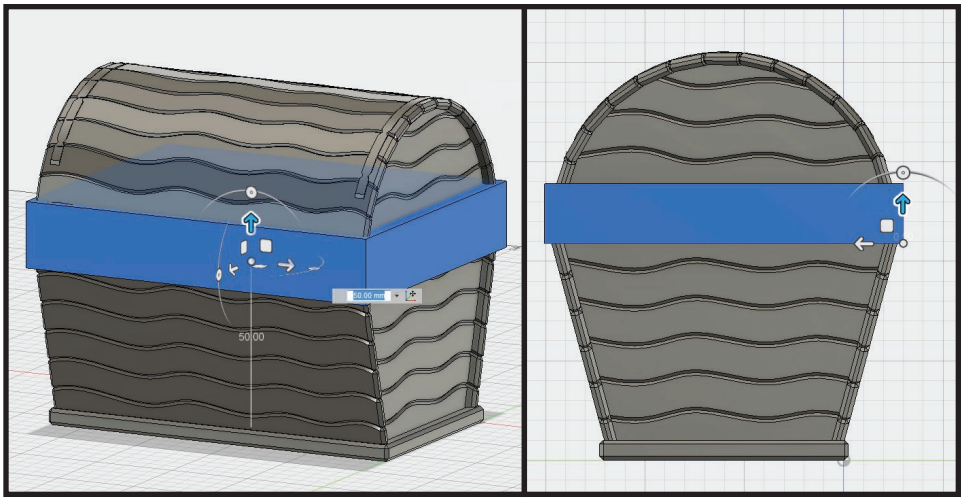


STEP 3: CREATE TRIM BETWEEN LID & BOTTOM OF TREASURE CHEST

• Use a simple box to create the trim for the chest top and top of the chest bottom. To do this, first move the chest top "5.00mm" up on the "Z" axis. Select "Box" from the create menu at the top, select the floor plane, change to the top viewport, click just outside the top left corner of the chest and drag box to just outside the bottom right corner. Set the "Operation" to "New Body" and the height of the box to "20.00mm".

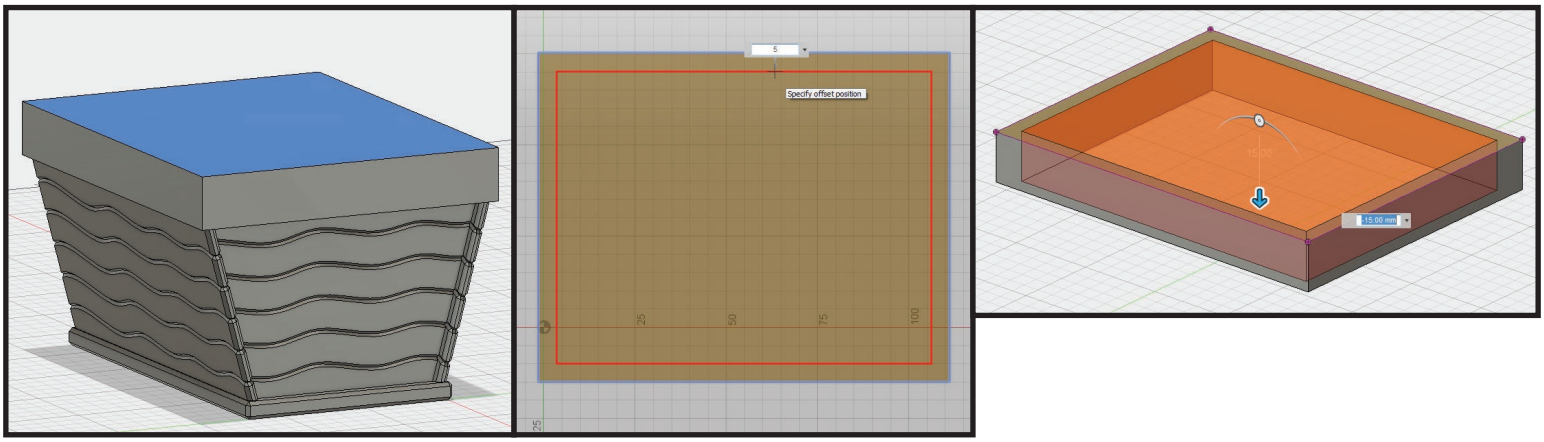


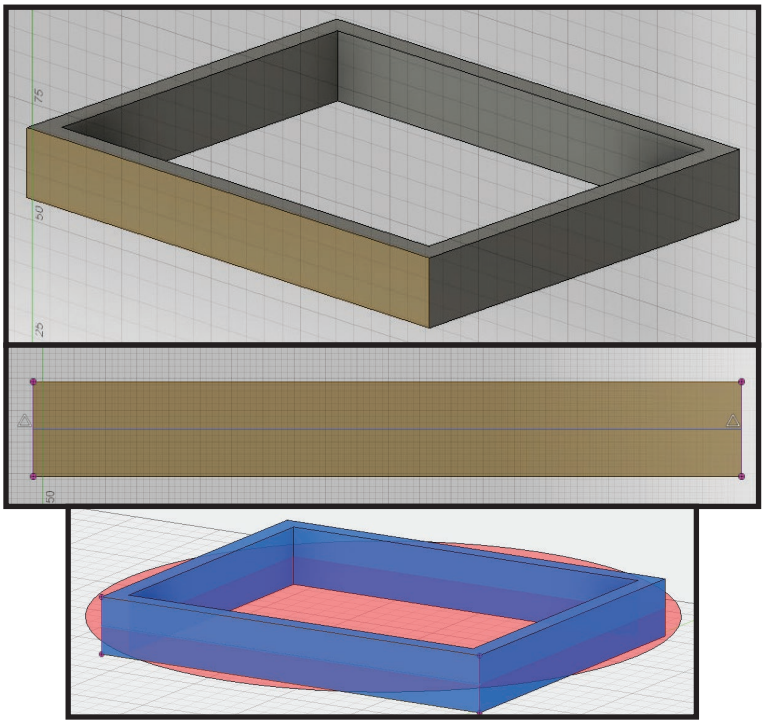
Using the move tool click + drag box along the "Z" axis to position box to cover gap between chest top and bottom.



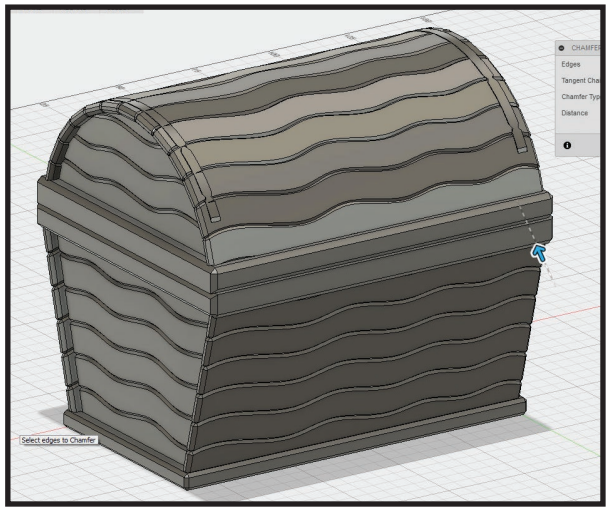
Edit the box action in the timeline, as needed, to adjust the height of the box to be shorter or taller to cover the gap between the chest top and bottom. Reposition along Z axis as needed.

• Hide chest top and bottom. Project a sketch of the top face of box and offset inward "5.00mm". Extrude the rectangle sketch to cut through entire box. Unhide chest top and chest bottom.



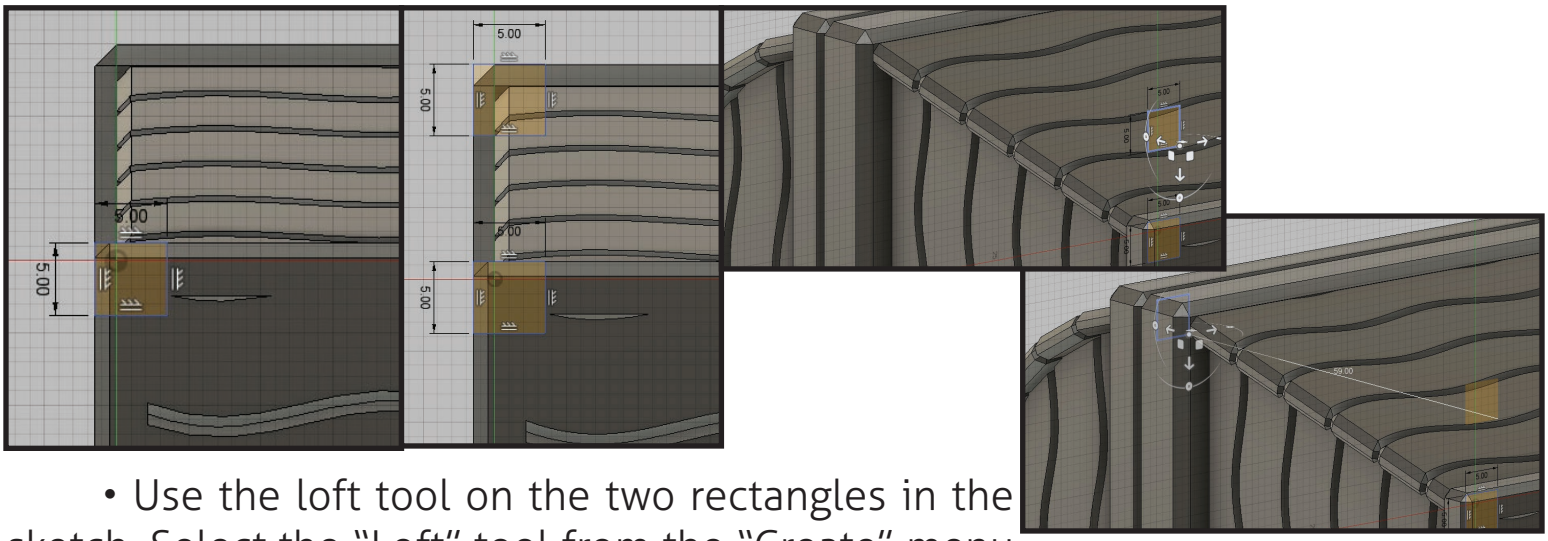


• Split box in half using both a sketch line and the "Split Body" tool. Chamfer edges on each box half. Combine each trim to respective part of chest.

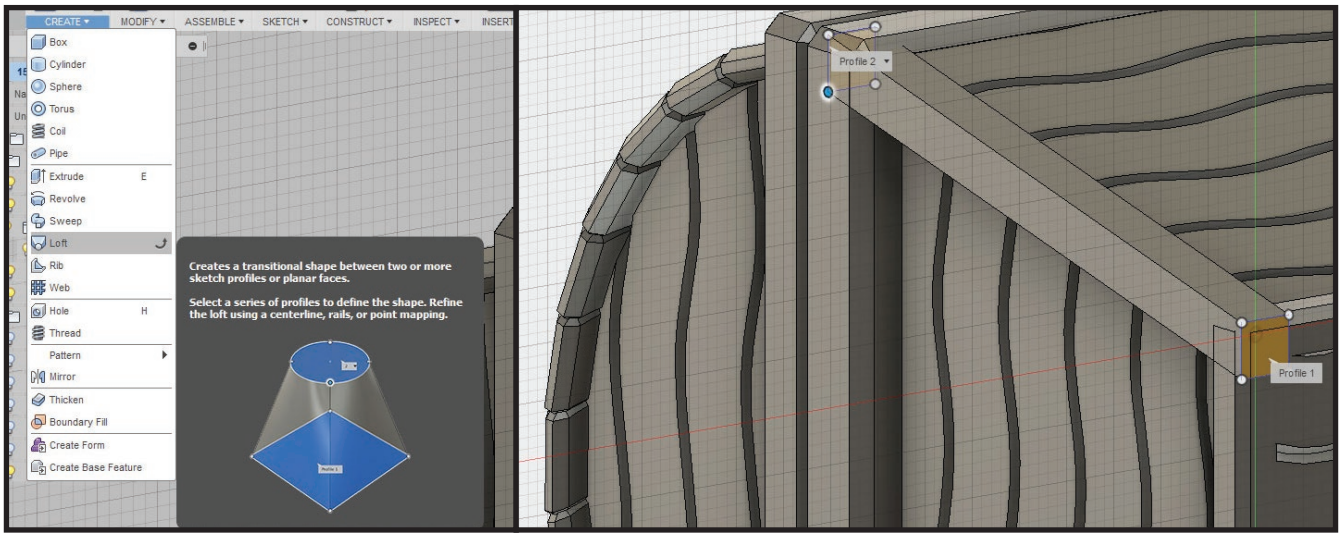


STEP 9: CREATE TRIM FOR SIDE CORNERS OF CHEST BOTTOM

• Using the loft tool and sketches, create the trim pillars for chest bottom. First make two sketches for the loft. To do this, select a "2-Point Rectangle" from the sketch menu at the top, select the floor plane, change to "Bottom" viewport, set first point in the top left corner inside chest bottom trim, and set second point to create "~5mm x ~5mm" rectangle. Make sure the rectangle sketch isn't constraint to the chest bottom. Duplicate the rectangle sketch and move up along the "Z" axis to be positioned on the top edge of the chest bottom.



• Use the loft tool on the two rectangles in the sketch. Select the "Loft" tool from the "Create" menu at the top, select the first rectangle, select the second rectangle, and set operation to "New Body".

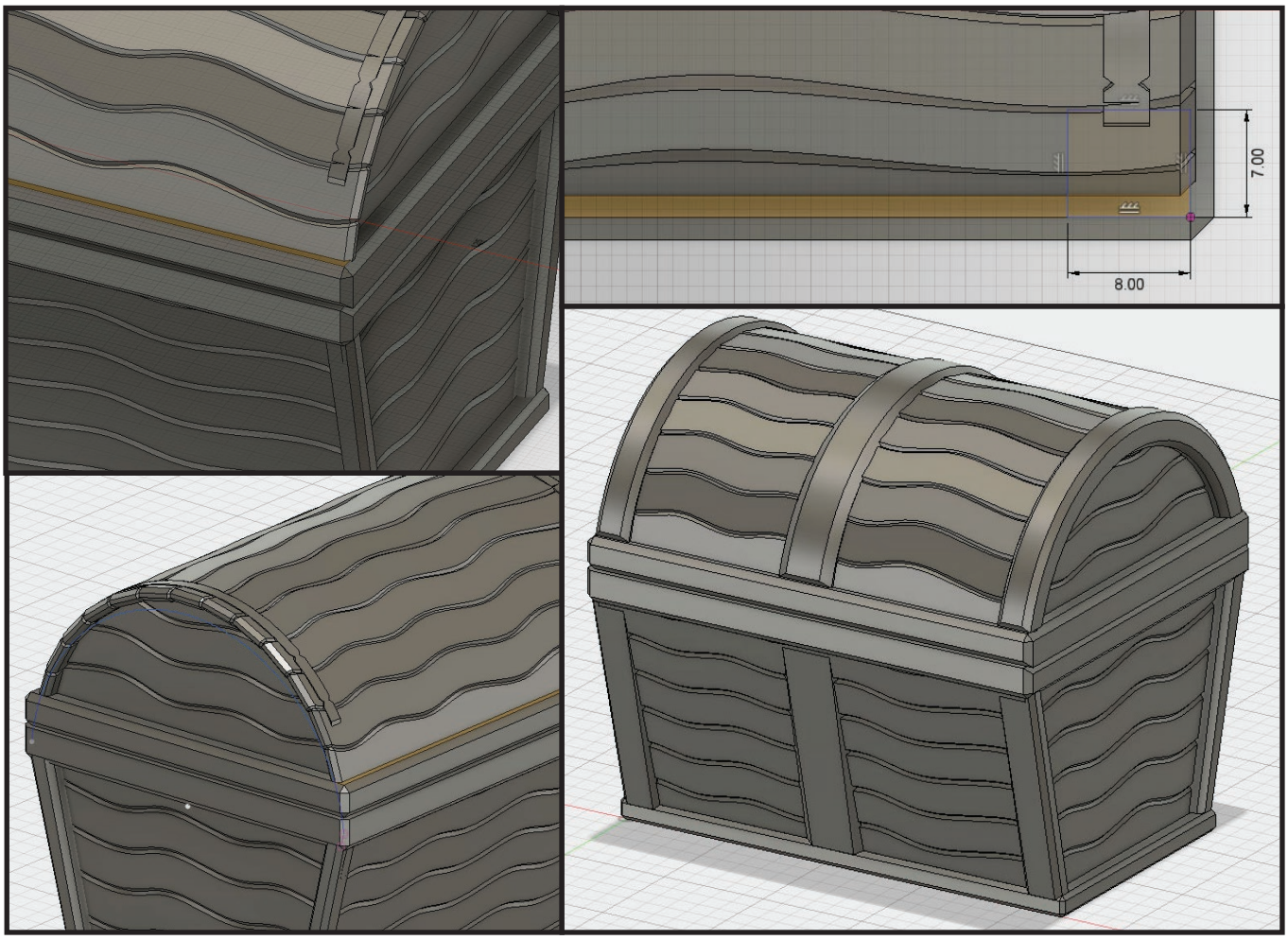


Reposition rectangles in the sketch through the timeline, as needed, to achieve desired look for the trim on the chest bottom side corners.

• Use the mirror tool in the create menu to duplicate trim pillars around the chest bottom. Chamfer edges of trim on the chest bottom side corners if desired.

STEP 10: CREATE TRIM FOR CURVE ALONG TOP OF TREASURE CHEST

• Use a sketch and sweep tool to create trim along curve of the top. To do this, start a sketch with the "2-Point Rectangle", select top flat face on the trim of the chest top, set first point in the corner on the trim, and set second point just inside the curved planks. Unhide the "Arc" sketched in the beginning of the lesson on "Step 4". Using the "Sweep" tool in the "Create" menu at the top, select rectangle sketch as the profile, select arc as the path, and set operation to "New Body".



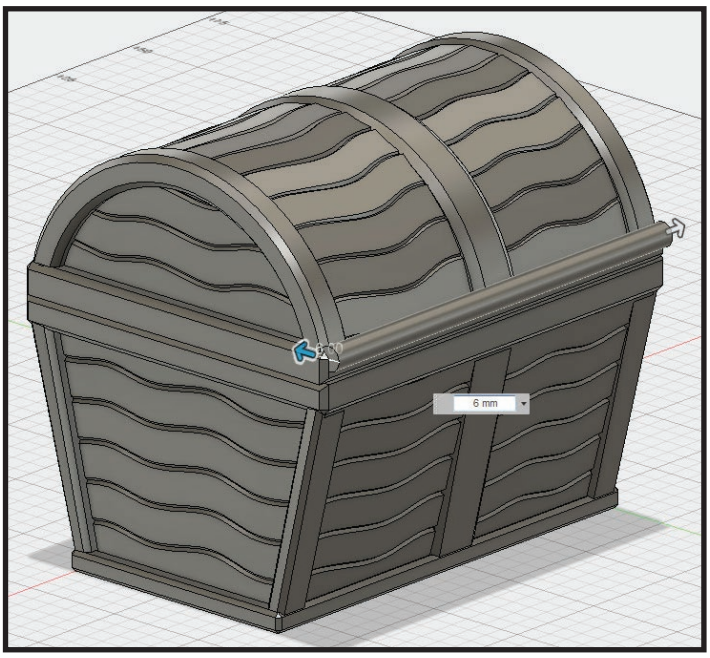
Edit the rectangle sketch in the timeline, as needed, to a desired look for the curve trim along the top of chest. Middle curved trim was achieved by duplicating, non-uniform scaling, and positioning to the middle.

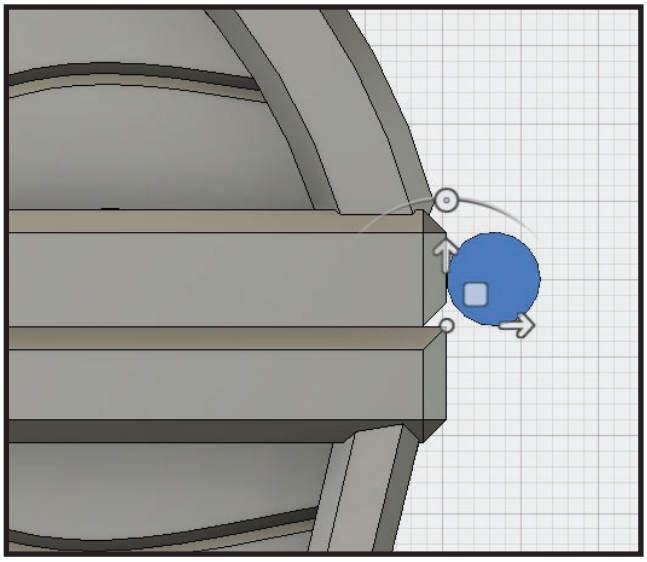
• Use the mirror tool to duplicate trim. Select the "Mirror" tool from the "Create" menu at the top, select the curve trim, and select the left plane as the mirror. Use the move tool to reposition the trim along the side of chest top. Chamfer edges on curve trim if desired.

• Combine curved trim to chest top. Delete any faces that may stick outside the bottom of the chest top.

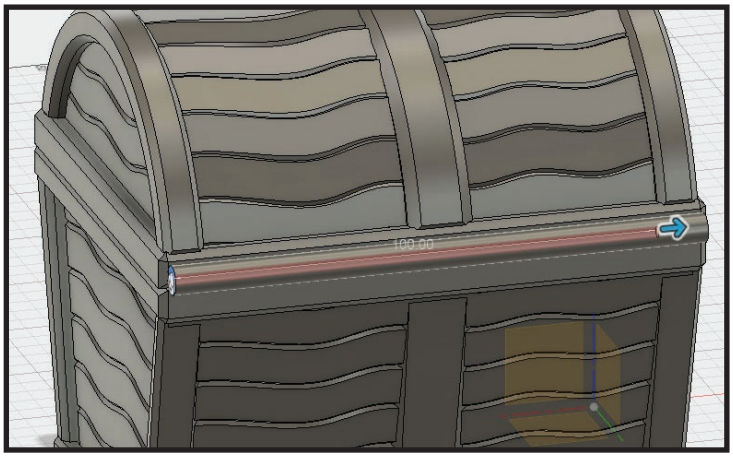
STEP 11: CREATE HINGE PIPE SECTIONS FOR TREASURE CHEST

• Use the pipe tool to create a cylinder along the back of the chest. To do this, select the pipe tool in the create menu at the top, set section size to "6.00mm", and operation to "New Body".



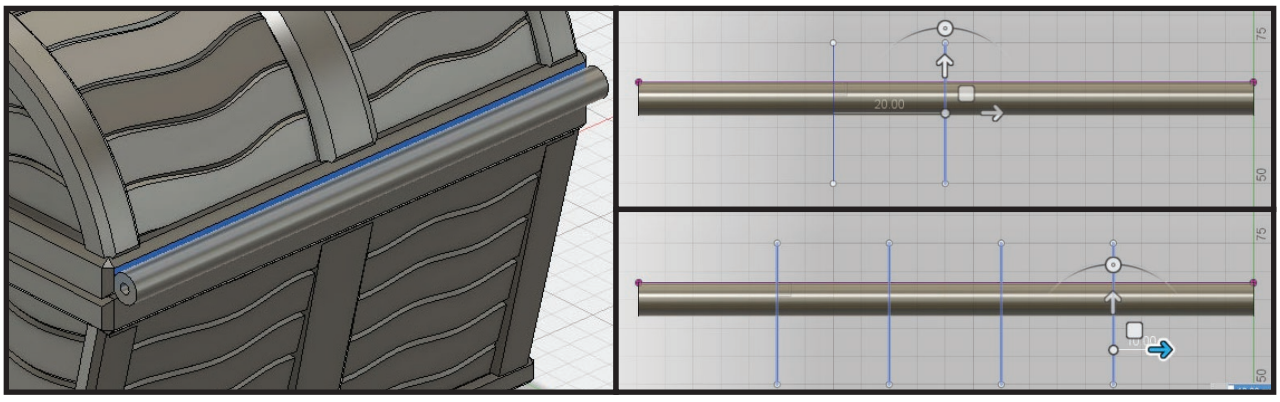


• Using the move tool, position pipe on back flat face of chest top trim, and make very bottom edge of chest top flush with bottom edge of hinge pipe.

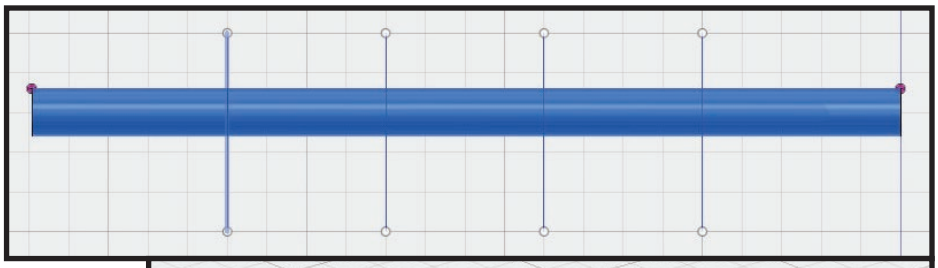


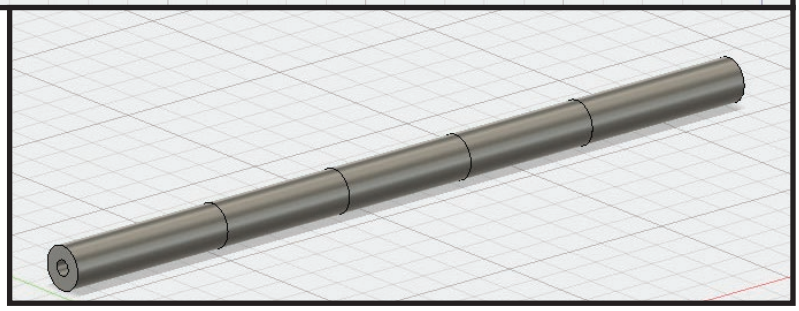
• Cut hole into hinge pipe. To do this, select right flat face on hinge pipe, select hole tool from option menu, click + drag + snap hole to center of hinge pipe, set diameter to "2.2mm", and drag end of hole up to curve trim of chest top on opposite side.

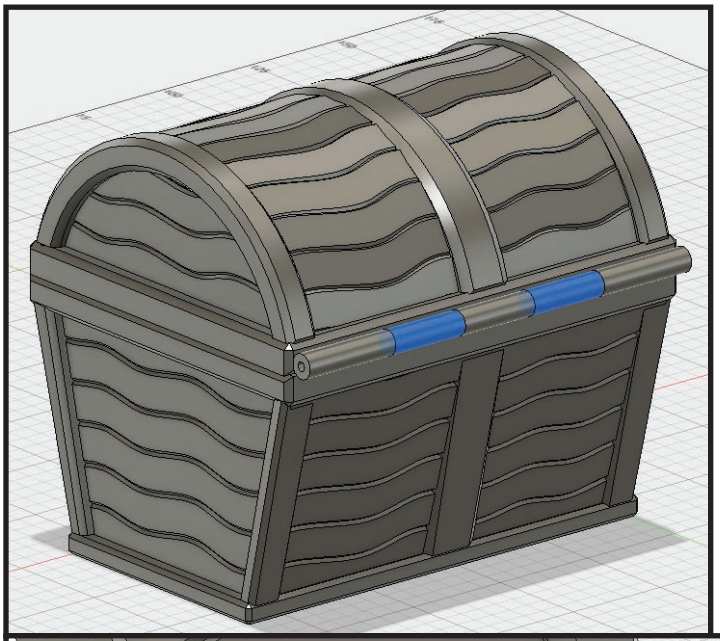
• Create a new sketch to use for splitting the hinge pipe into sections. To do this, start a sketch with the line tool(hotkey "L"), select the back flat face on chest top trim, and sketch four separate lines of equal distance from each other.



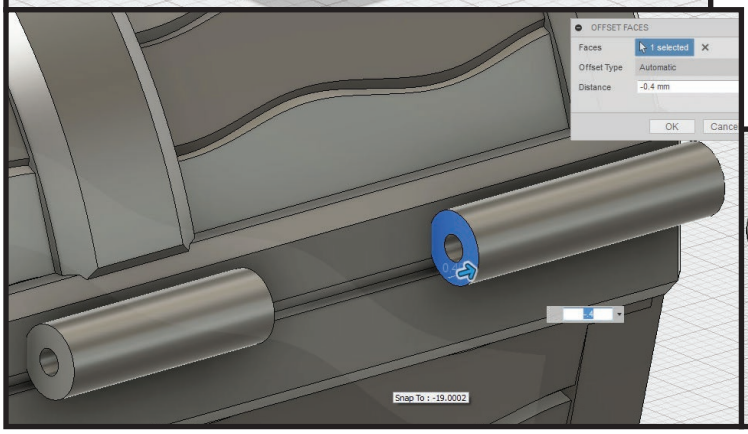
• Use the split body tool in the modify menu at the top to split hinge pipe into sections. Repeat split body on left over section of hinge pipe.

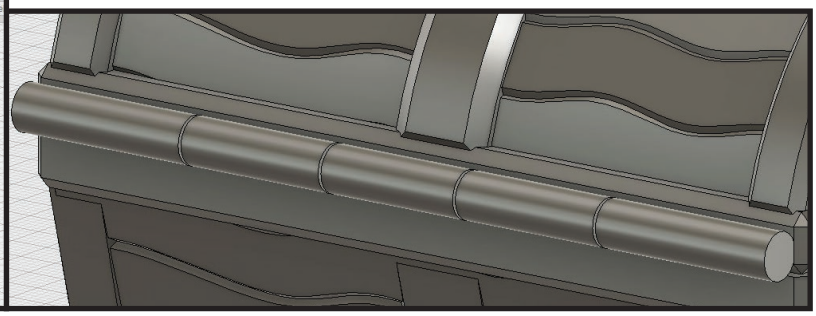






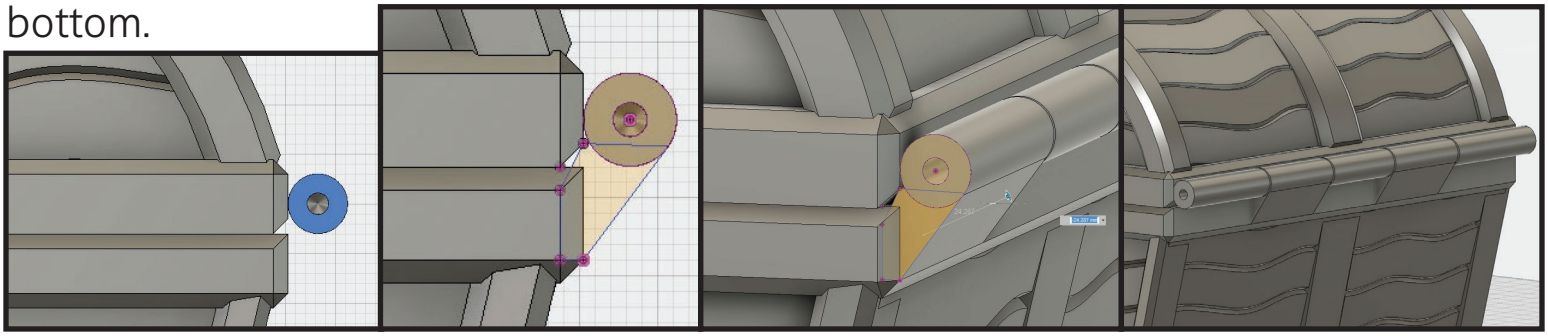
• Add fitting tolerance to the hinge pipe sections. To do this, hide second and fourth hinge pipe sections, use "Press/Pull" on flat faces of both ends on third hinge pipe section set to "-0.4mm", and use "Press/Pull" on flat face of first and fifth hinge pipe section set to "-0.4mm" toward inside chest. Unhide second and fourth hinge pipe sections.



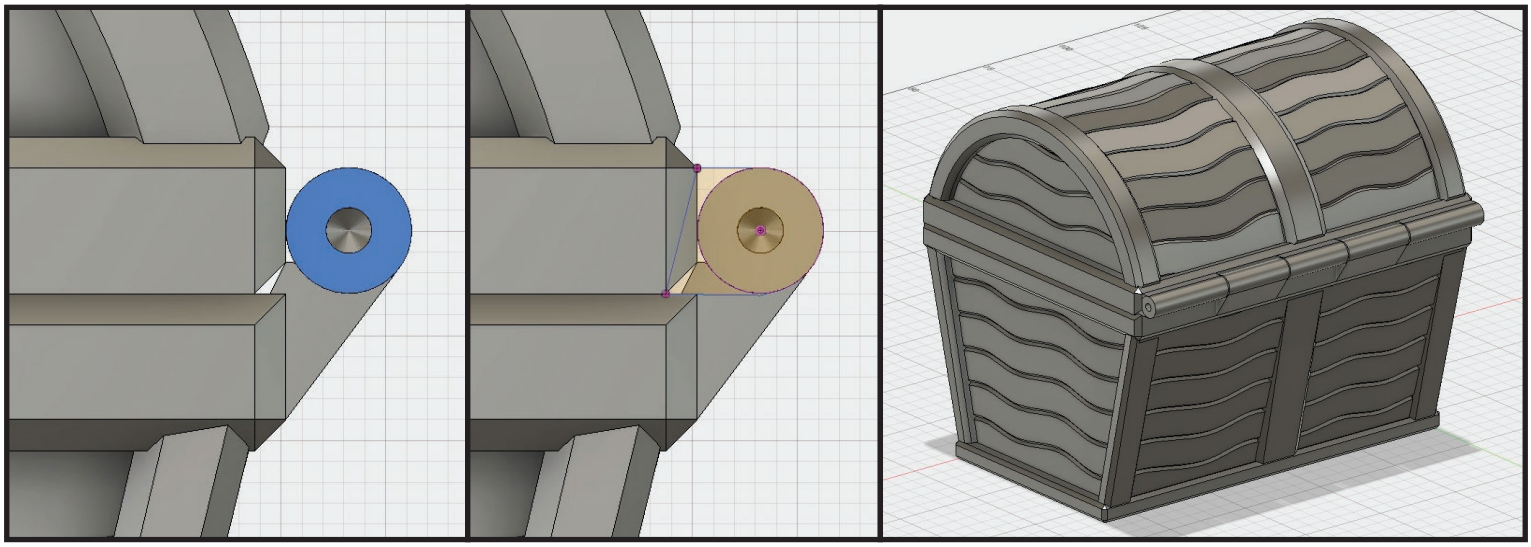


STEP 12: ATTACH HINGE PIPE SECTIONS TO TREASURE CHEST

• Create geometry for hinge sections to attach to chest bottom. To do this, create a new sketch on hinge pipe section, project circle of hinge pipe, and create sketch lines as shown in picture. Extrude support structure for hinge pipe as new body, duplicate, position under 2nd & 4th hinge pipe secction, and combine to chest bottom.

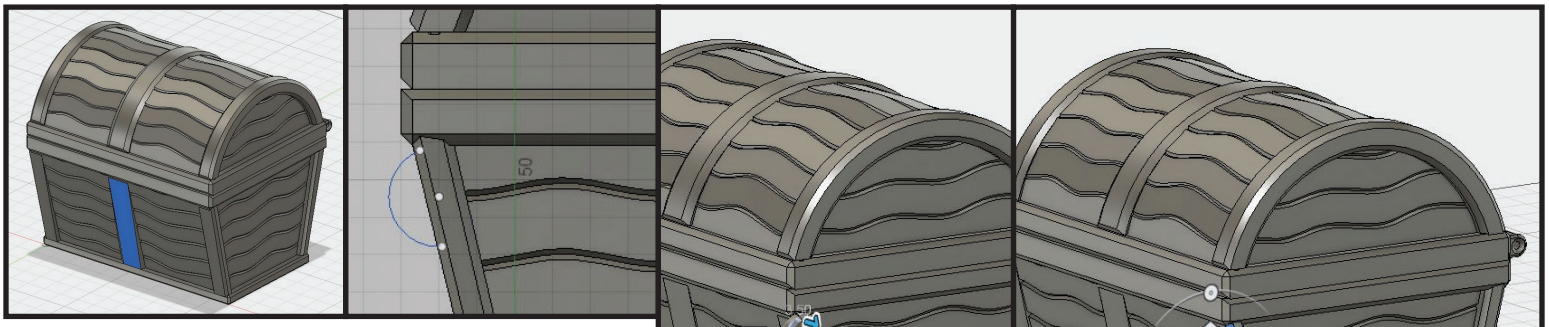


• Create geometry for hinge sections on chest top for support. To do this, draw a sketch line running from bottom edge of chest top to edge of hinge pipe curve and close sketch. Extrude sketch distance of hinge pipe section as new body. Duplicate, and position under hinge pipe section one + three + five, each. If body doesn't stretch from each end on a hinge pipe section, offset faces as needed. Combine hinge bodies together with chest top.

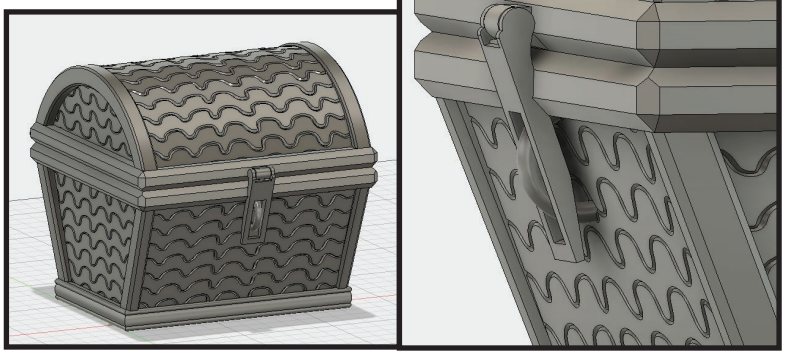


Use fillet as desired to strengthen hinge attachment on chest top.

STEP 13: CREATE LATCH FOR TREASURE CHEST (CHALLENGE)



• Create an arc sketch along contour of chest bottom front as shown. Use arc to make pipe with section size of "3.5mm". Position arced pipe on middle of chest bottom front. Combine pipe to chest bottom.



Continue examining pictures shown to figure out how the hinged latch was designed or even design your own.