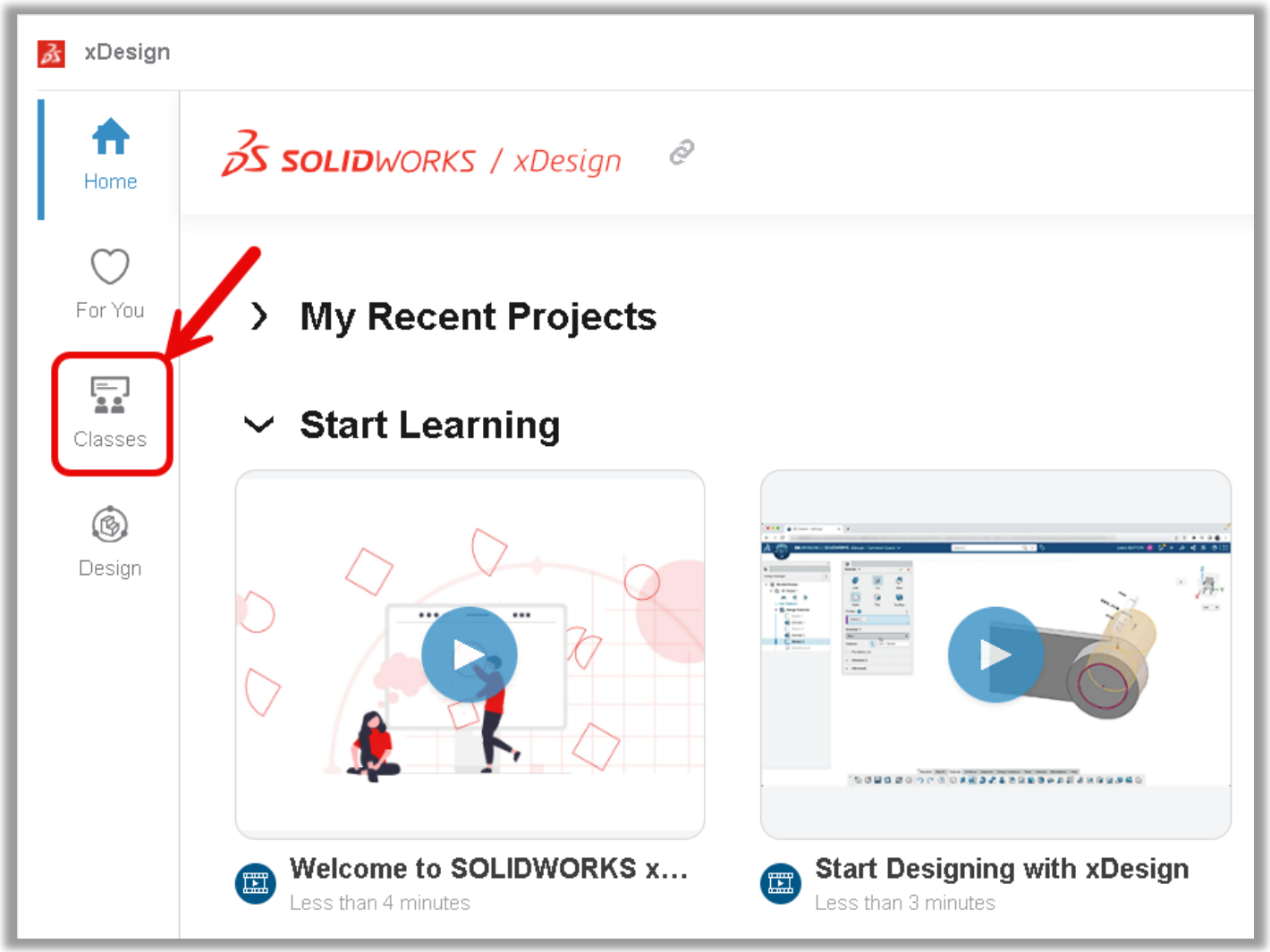
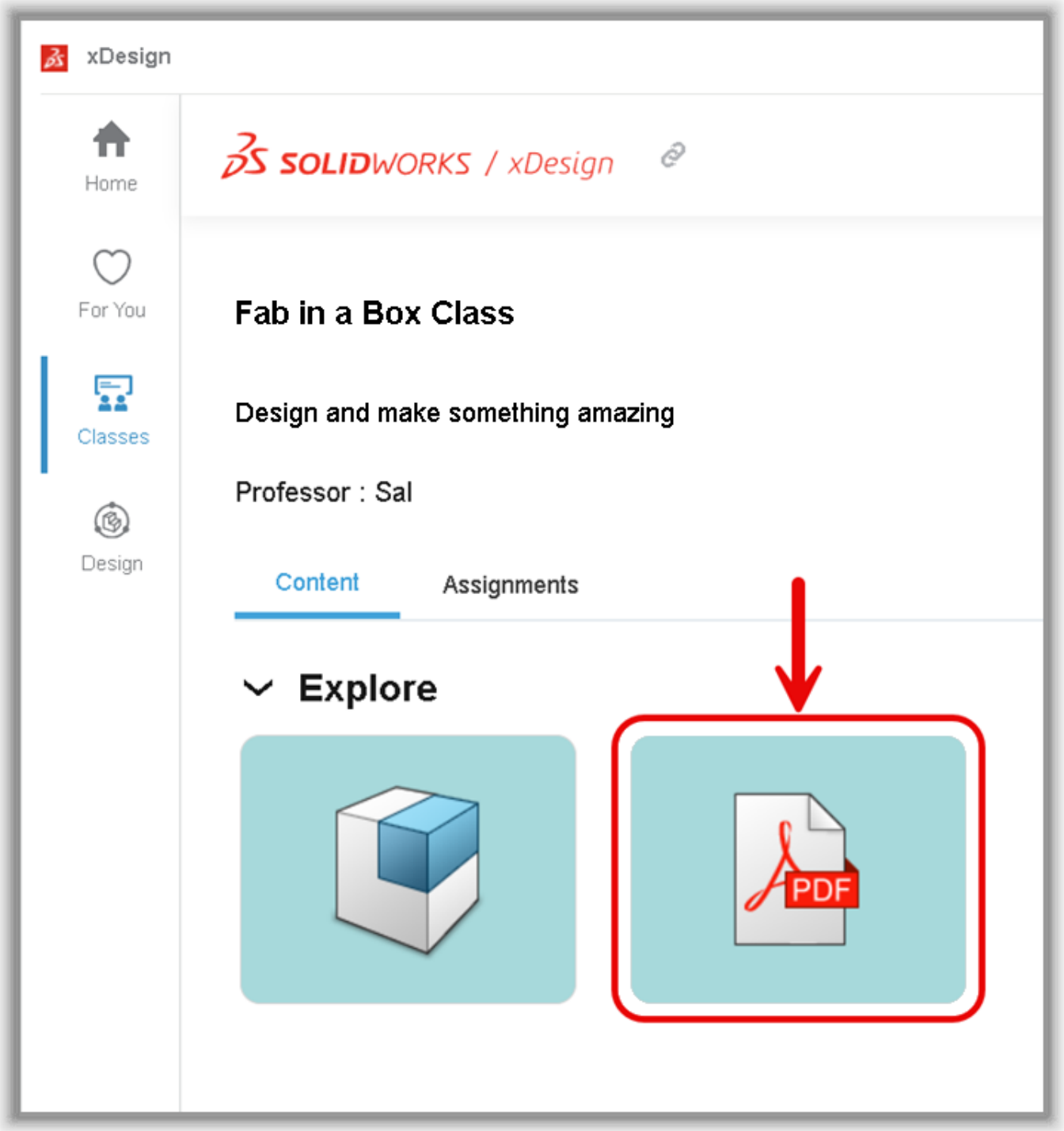
Design and fabricate your own custom mold.

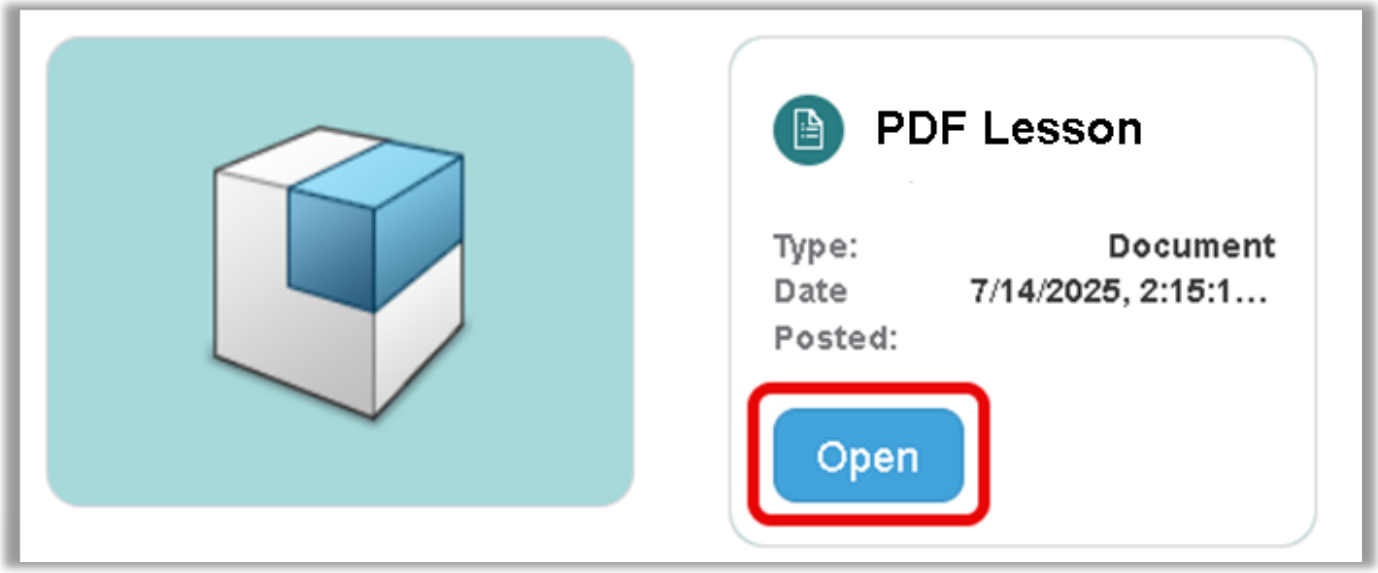
1. Click the **Classes** tab



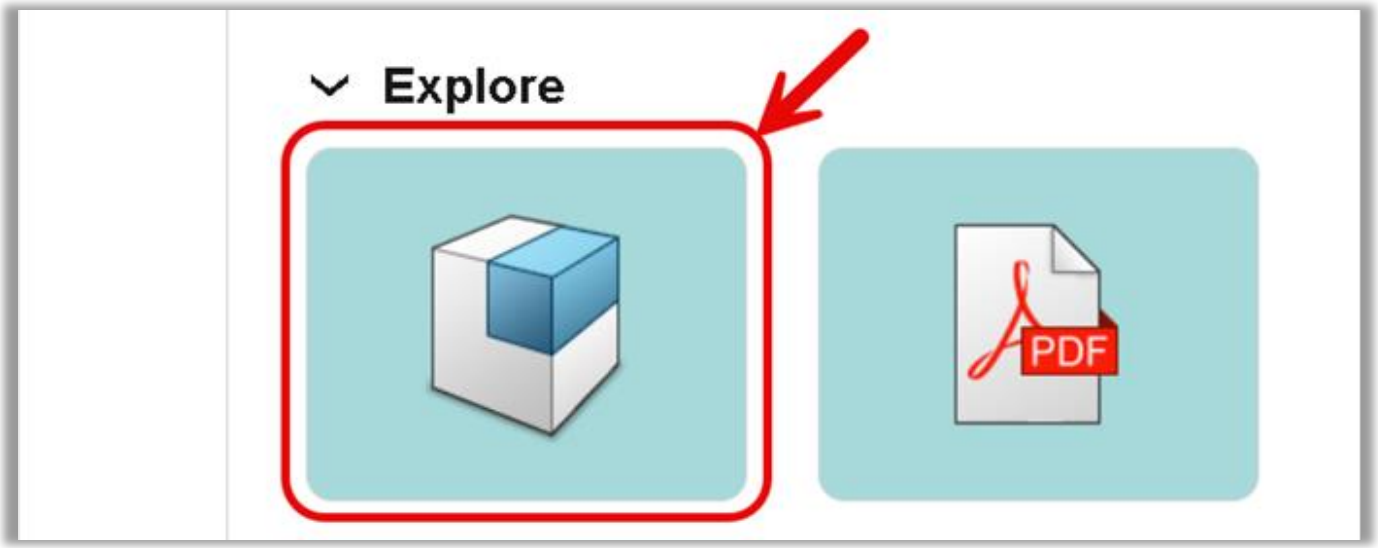
2. Hover over the PDF tile



3. Click **OPEN**



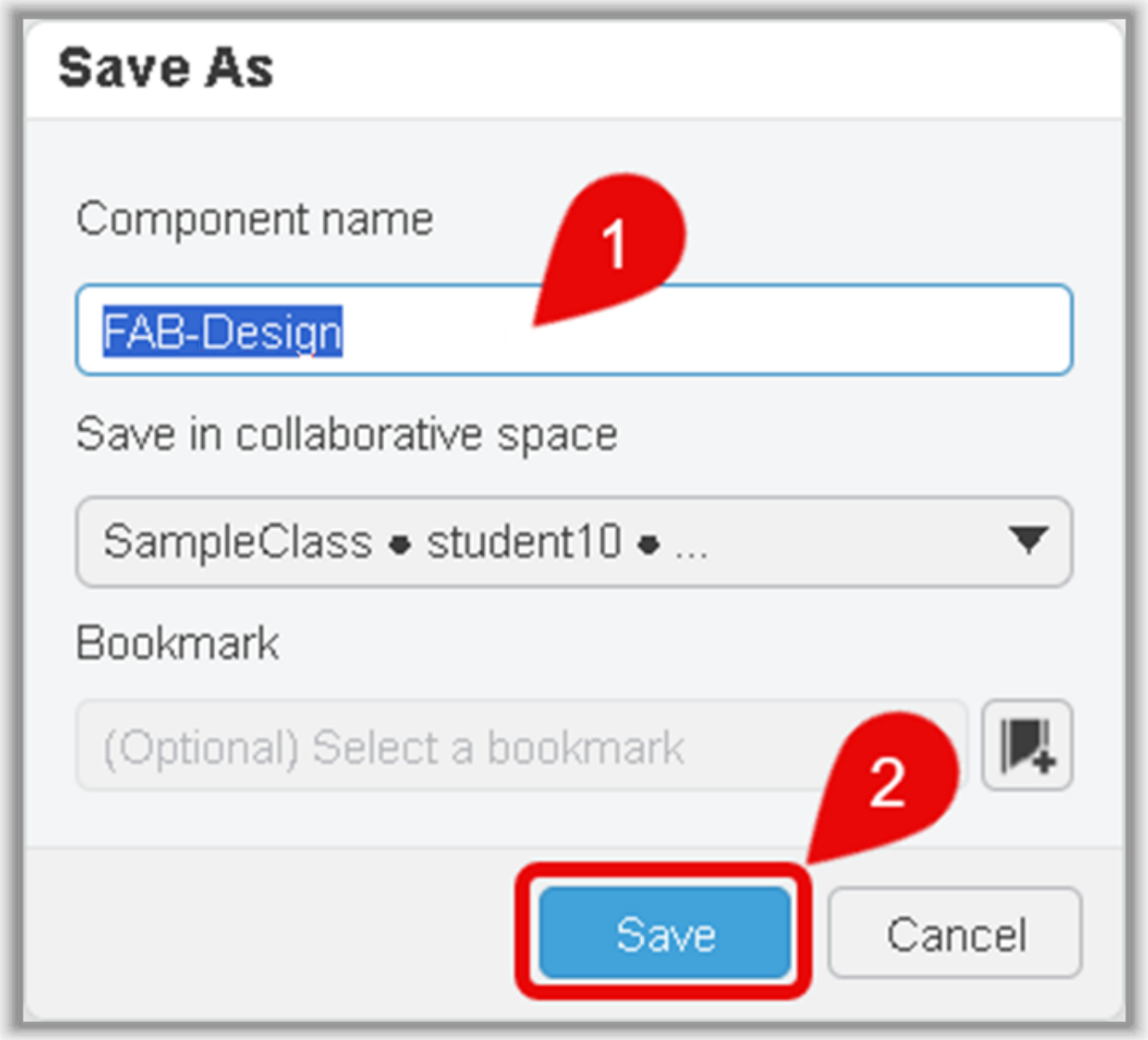
4. Hover over the "**<u>Mold and Cast – Custom Mold"</u>** tile



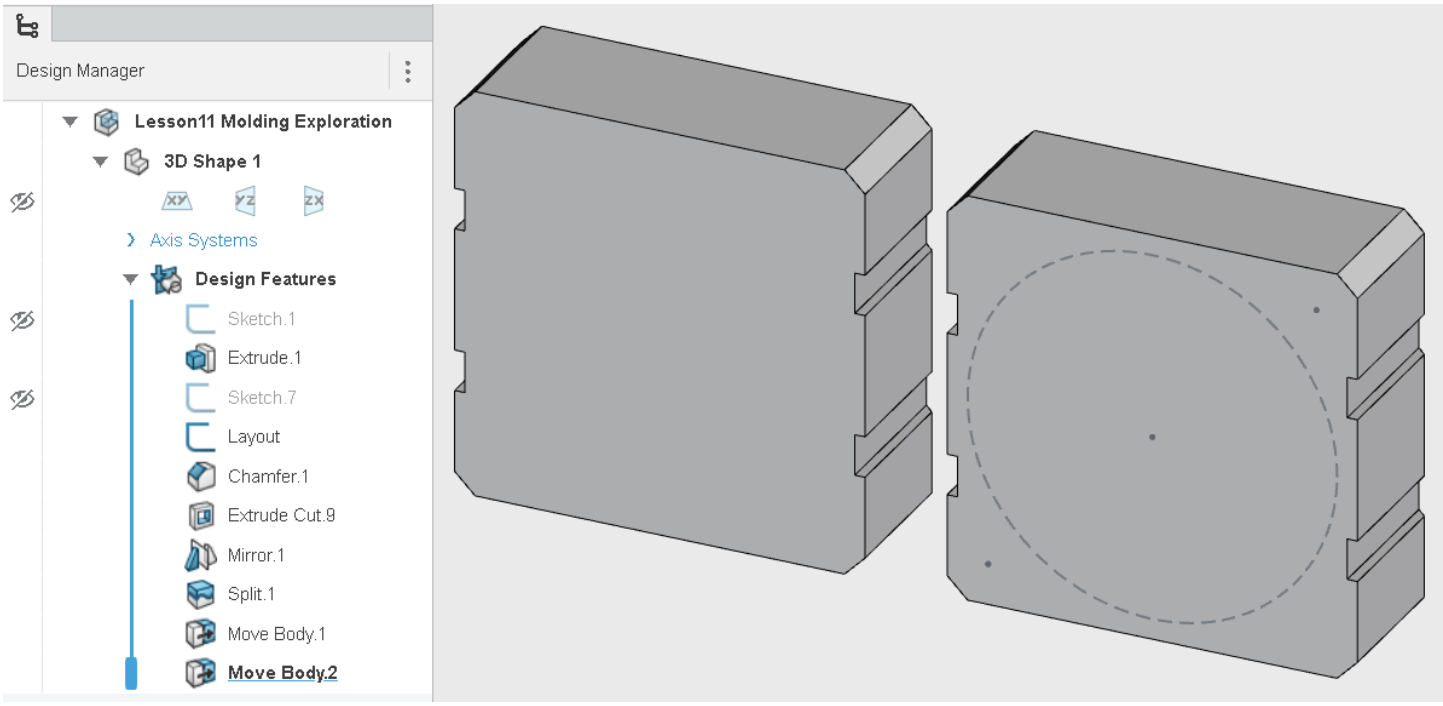
5. Click **OPEN**

6. Click **Save As** on the Standard tab of the Action Bar

7. [1] Type a name for your design, then [2] click **Save**

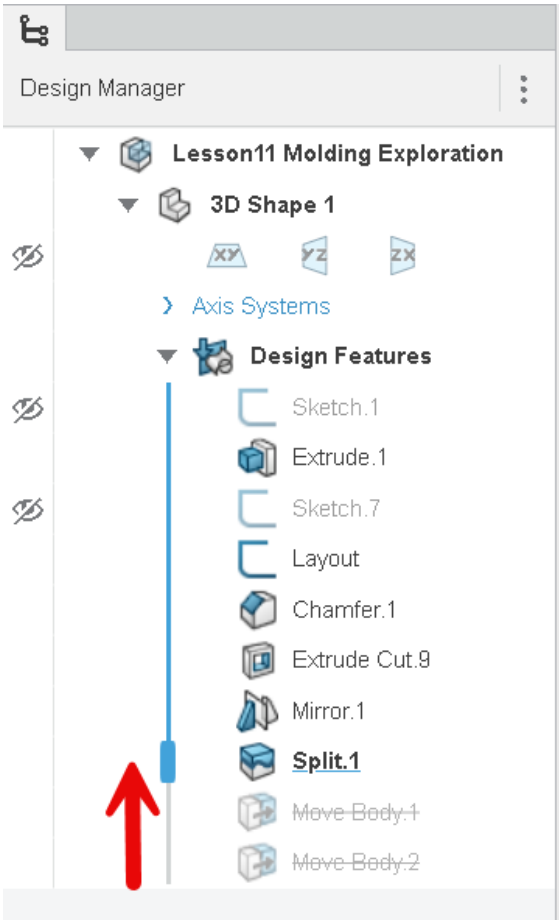


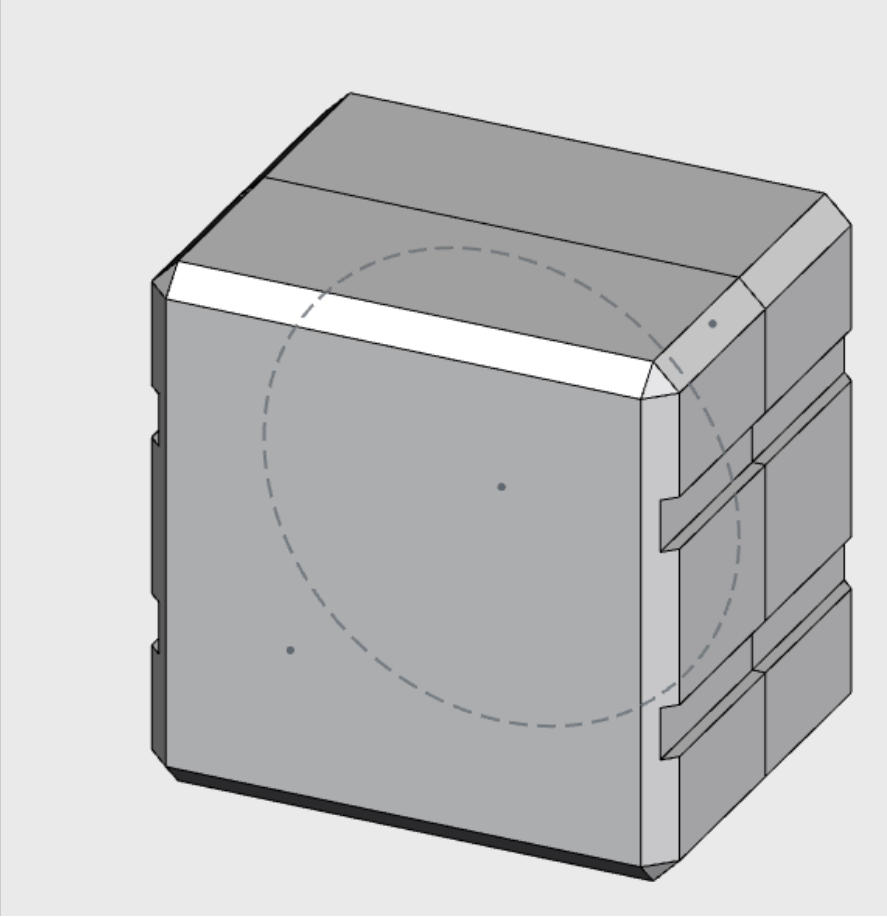
***Notice that a two-part mold has been started for you, complete with a layout sketch you'll reference to design your custom model



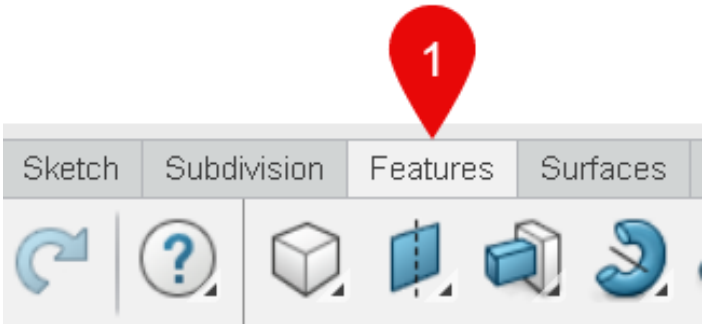
***Let's start by adding locating features that will help the two halves of the mold align properly when closed.

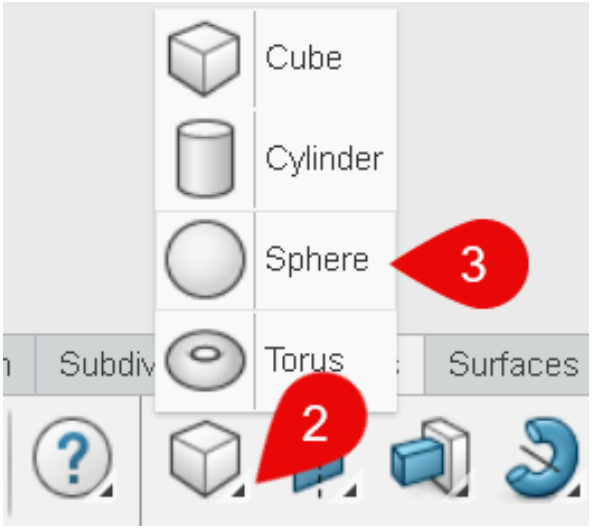
8. Drag the blue rollback bar up the Design Manager and drop it just above the Move Body.1 feature. This will bring the mold halves back together





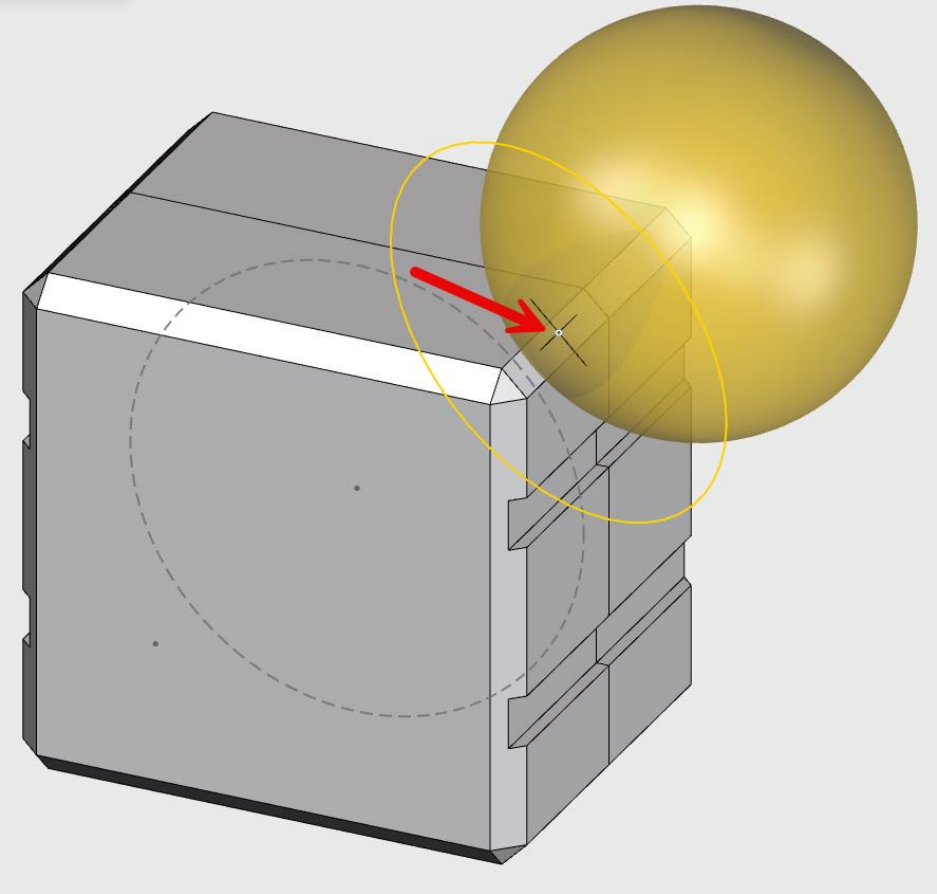
9. [1] Activate the “Features” tab of the Action Bar, [2] Click the small expander under the “Cube” feature, [3] Click the “Sphere” feature



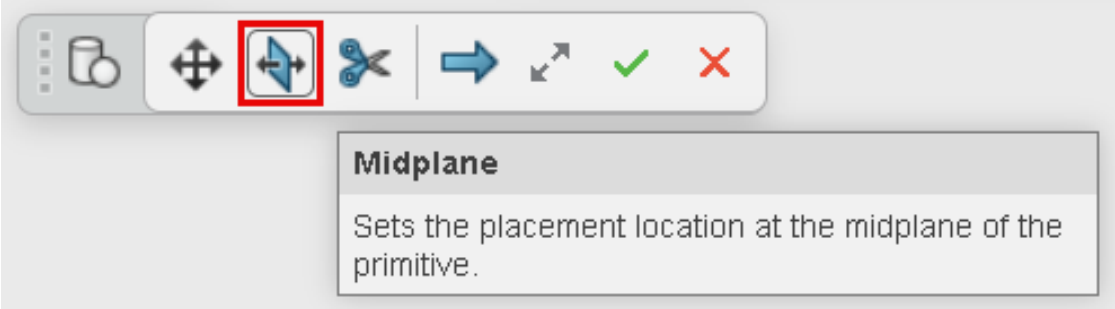


***Notice that there is now a preview sphere attached to your cursor.

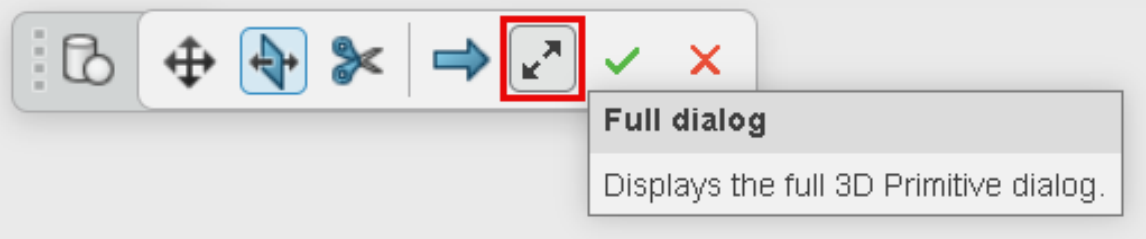
10. Move the sphere to the sketch point near the upper right-hand corner of the mold until it snaps into place. Click to place the sphere.



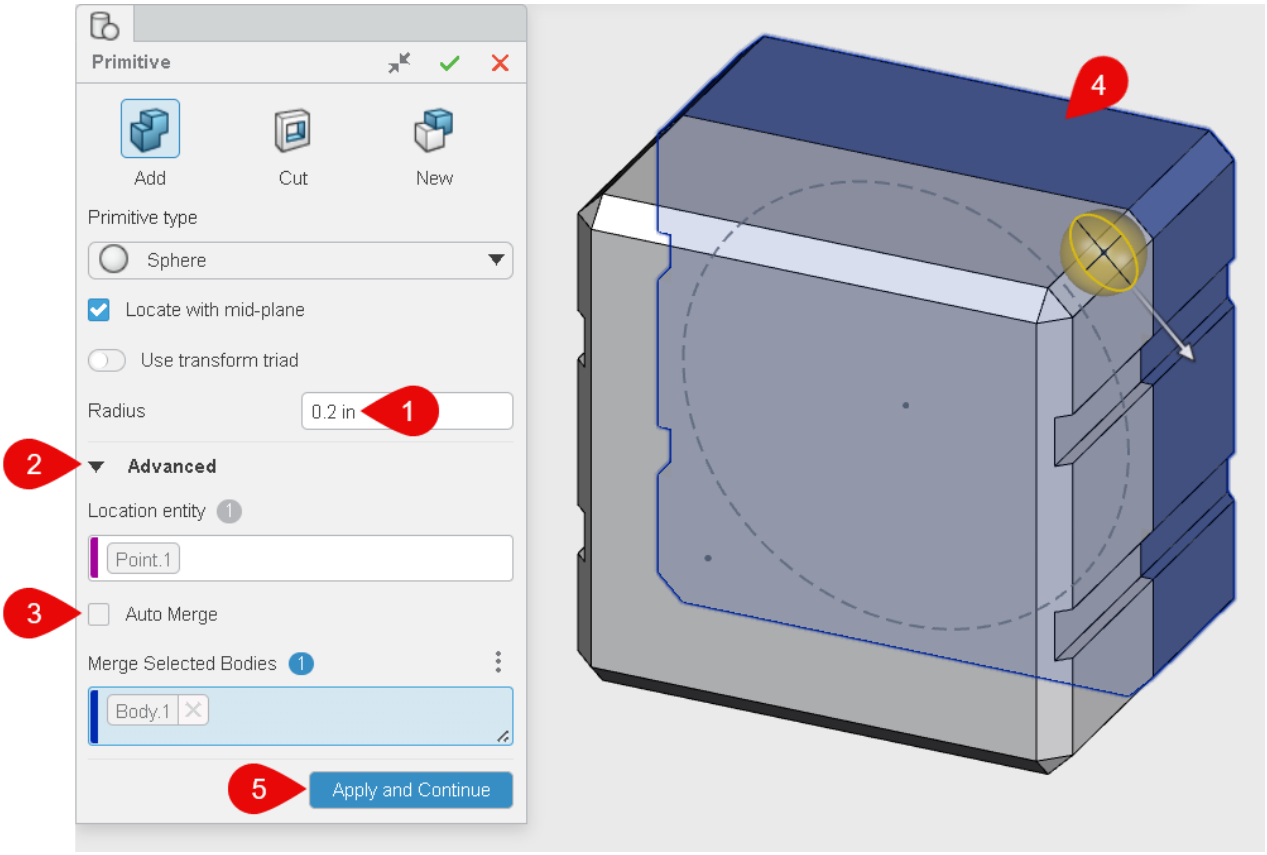
11. Click the “Midplane” button on the context toolbar. This will center the sphere on the sketch point.



12. Click the “Full dialog” button on the context toolbar.

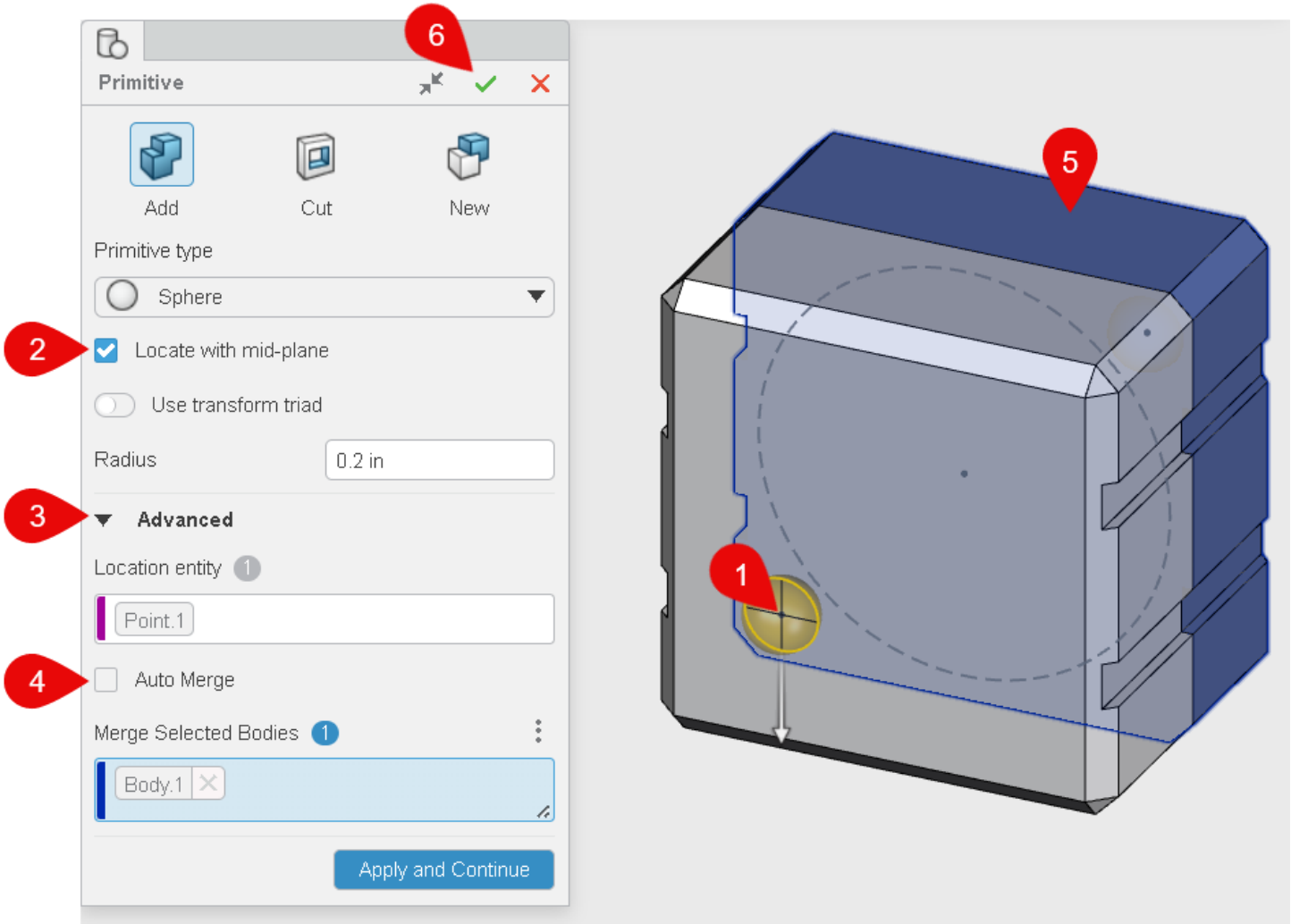


13. [1] Enter a value of 0.2” for the radius, [2] Expand the “Advanced” section of the dialog, [3] Uncheck “Auto Merge”, [4] Select the rear half of the mold, [5] Click “Apply and Continue”

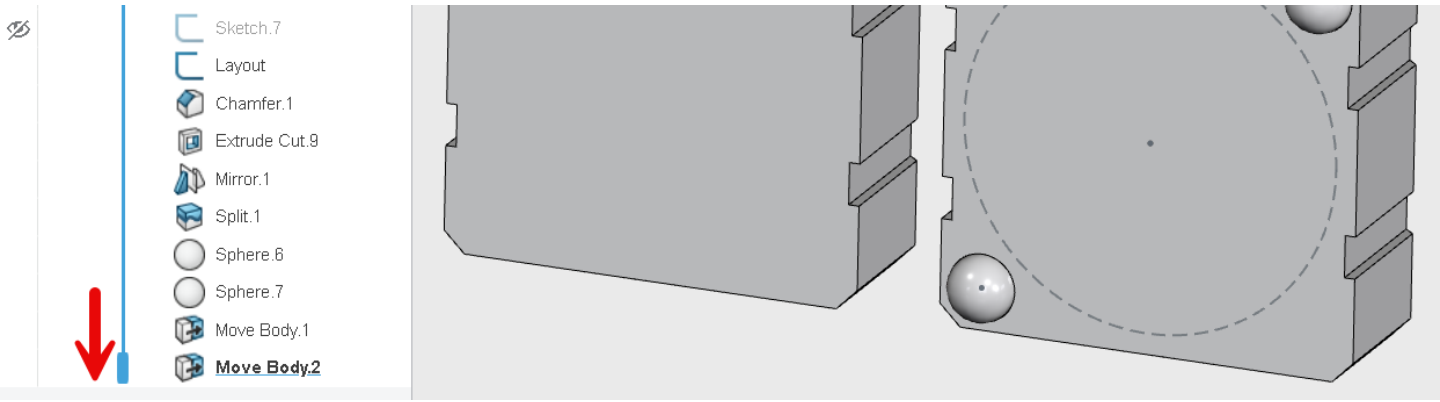


***Notice that you now have another preview sphere attached to your cursor

14. [1] Move the sphere to the sketch point near the lower left-hand corner of the mold until it snaps into place, then click to place the sphere, [2] Check the “Locate with mid-plane” option, [3] Expand the “Advanced” section of the dialog, [4] Uncheck “Auto Merge”, [5] Select the rear half of the mold, [6] Click OK

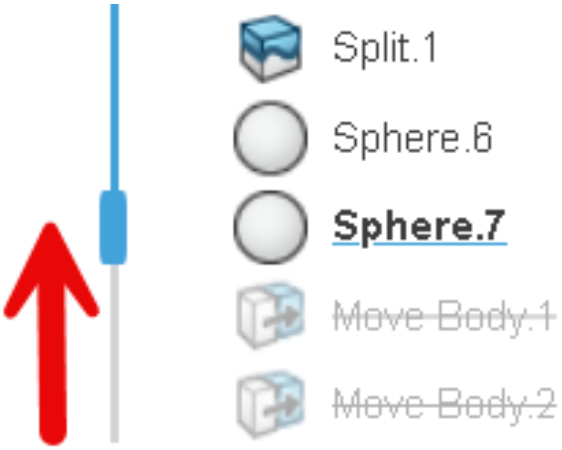


15. Drag the blue rollback bar to the bottom of the Design Manager to see the results of your effort.

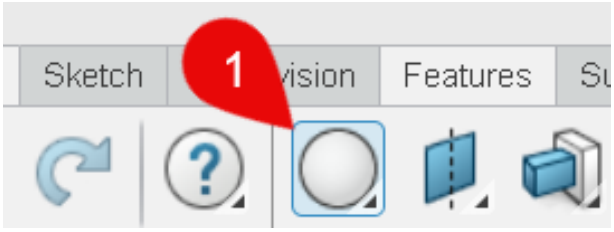


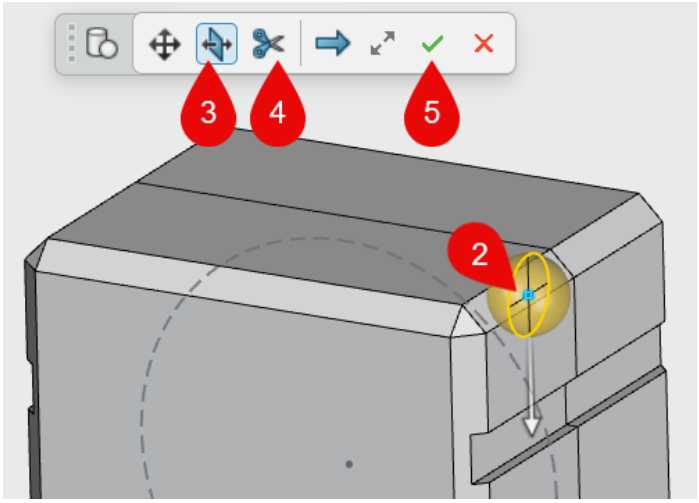
***Notice that you've successfully added two hemispheres to the rear half of the mold. Now let's add the corresponding hemisphere pockets to the front half of the mold.

16. Just as we did before, start by dragging the blue rollback bar up the Design Manager and dropping it just above the Move Body.1 feature. This will bring the mold halves back together.

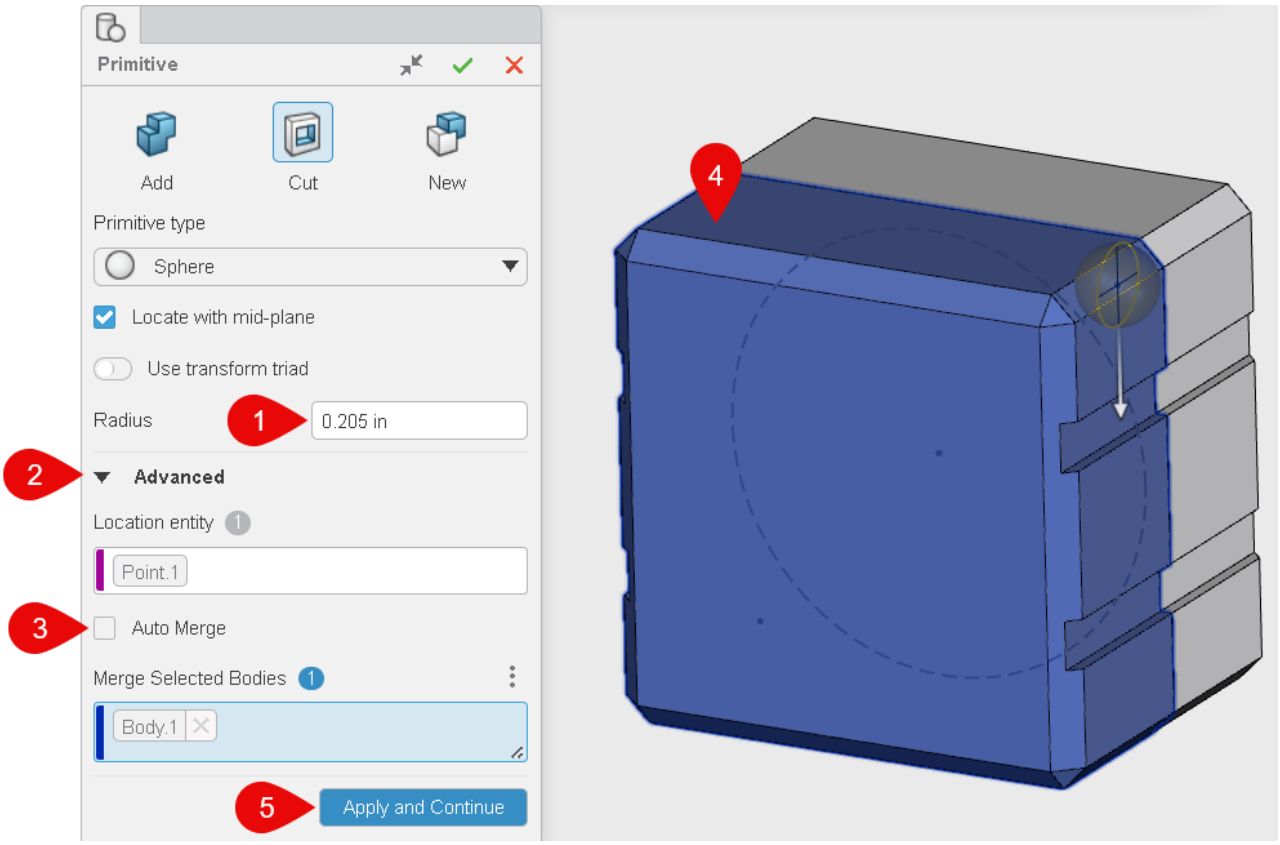


17. [1] Click the **Sphere** command on the Action Bar again, [2] position it on the sketch point in upper right-hand corner of the mold, [3] click the “Midplane” button on the context toolbar, [4] Click the “Cut” button on the context toolbar, [5] Click the “Full dialog” button on the context toolbar.



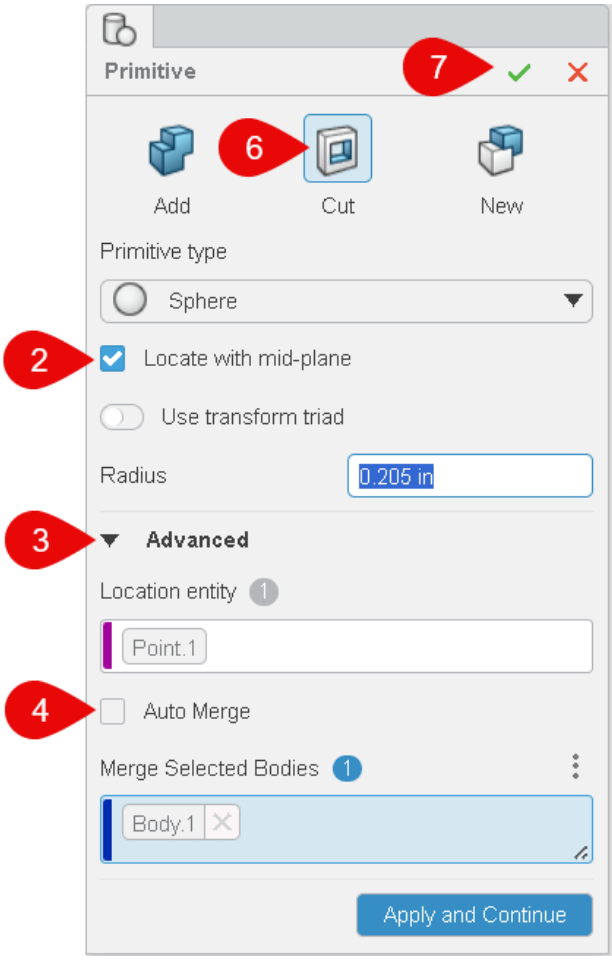


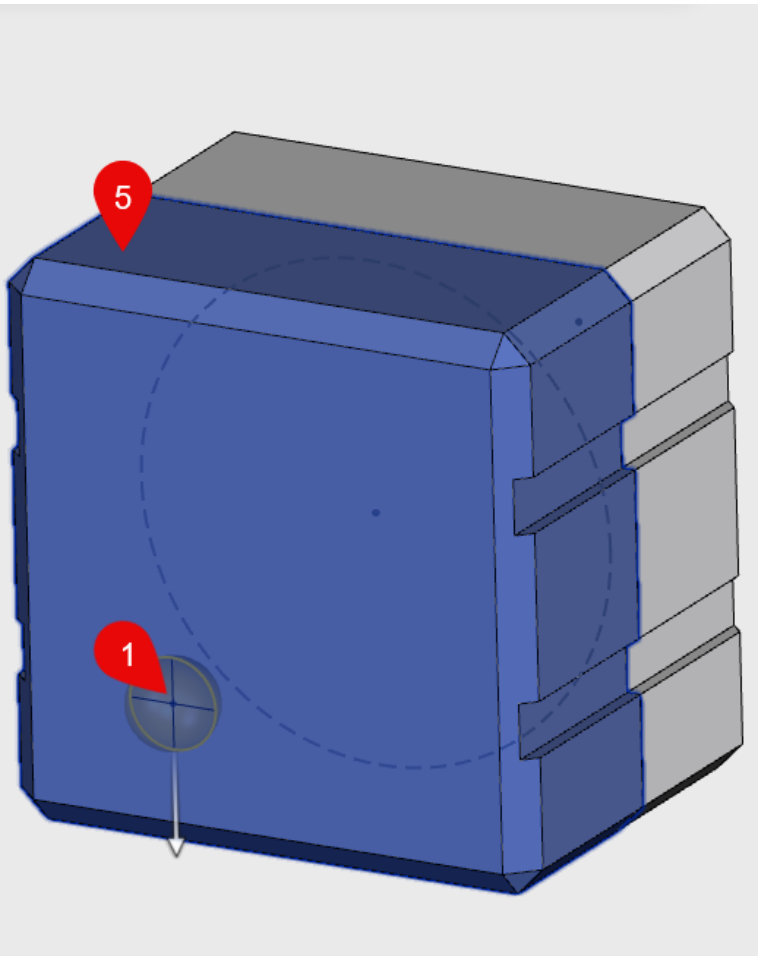
18. [1] Enter a value of 0.205” for the radius, [2] Expand the “Advanced” section of the dialog, [3] Uncheck “Auto Merge”, [4] Select the front half of the mold, [5] Click “Apply and Continue”



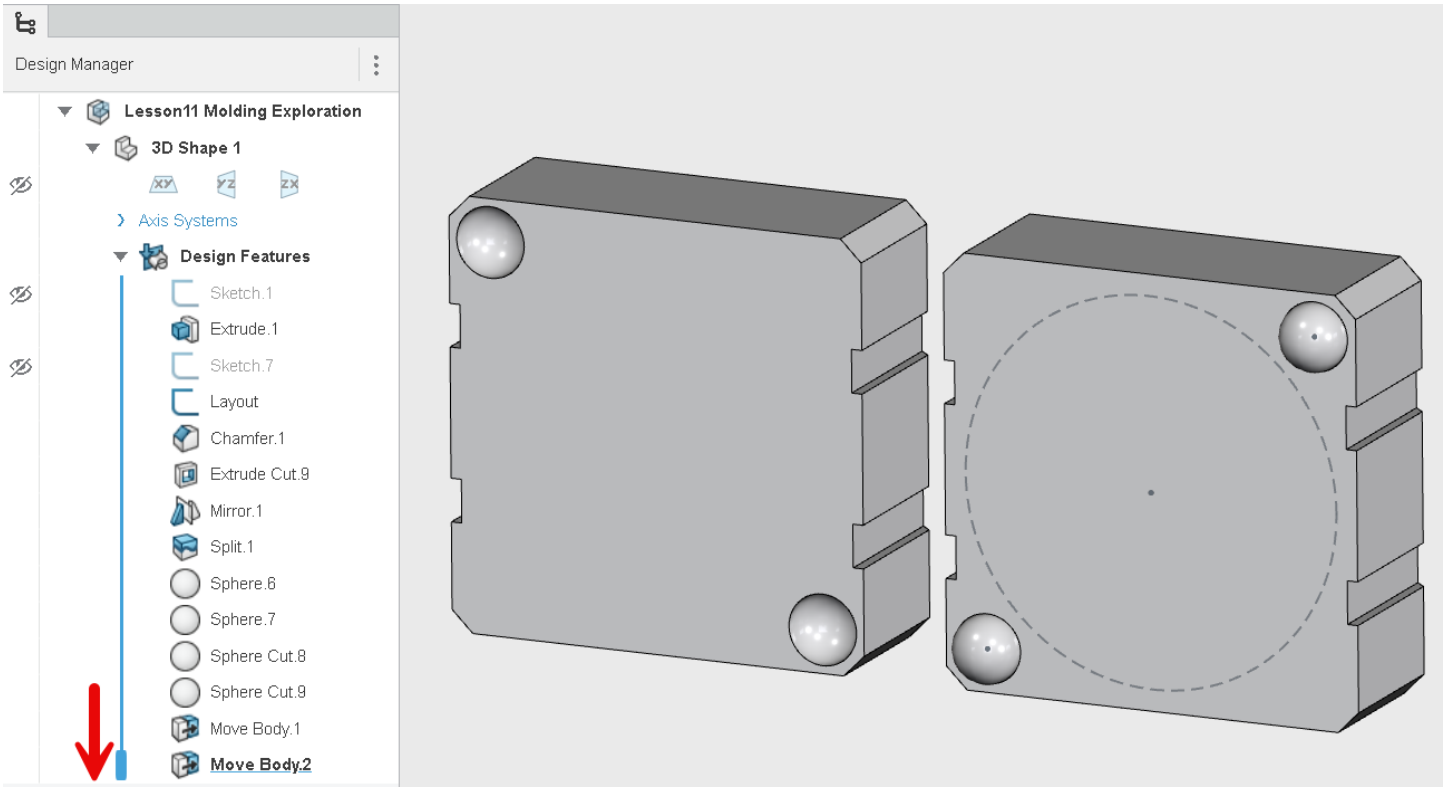
***Notice that you have another preview sphere attached to your cursor

19. [1] Move the sphere to the sketch point near the lower left-hand corner of the mold until it snaps into place, then click to place the sphere, [2] Check the “Locate with mid-plane” option, [3] Expand the “Advanced” section of the dialog, [4] Uncheck “Auto Merge”, [5] Select the front half of the mold, [6] ***IMPORTANT*** - Make sure that the “Cut” button is pressed, [7] Click OK



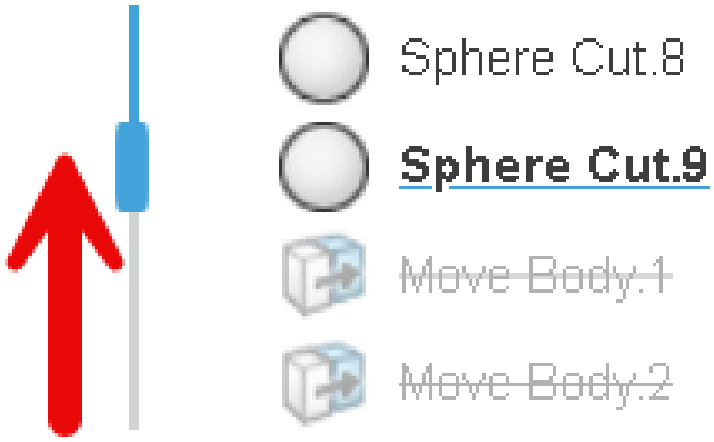


20. Once again, drag the blue rollback bar to the bottom of the Design Manager to see the results of your effort.

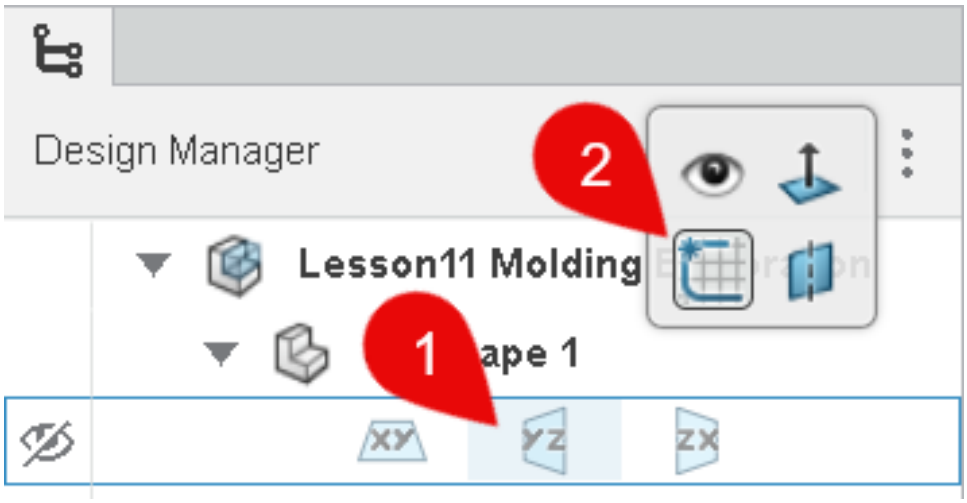


***You've successfully added two hemisphere pockets to the front half of the mold. Now let's focus on creating the cavity inside the mold

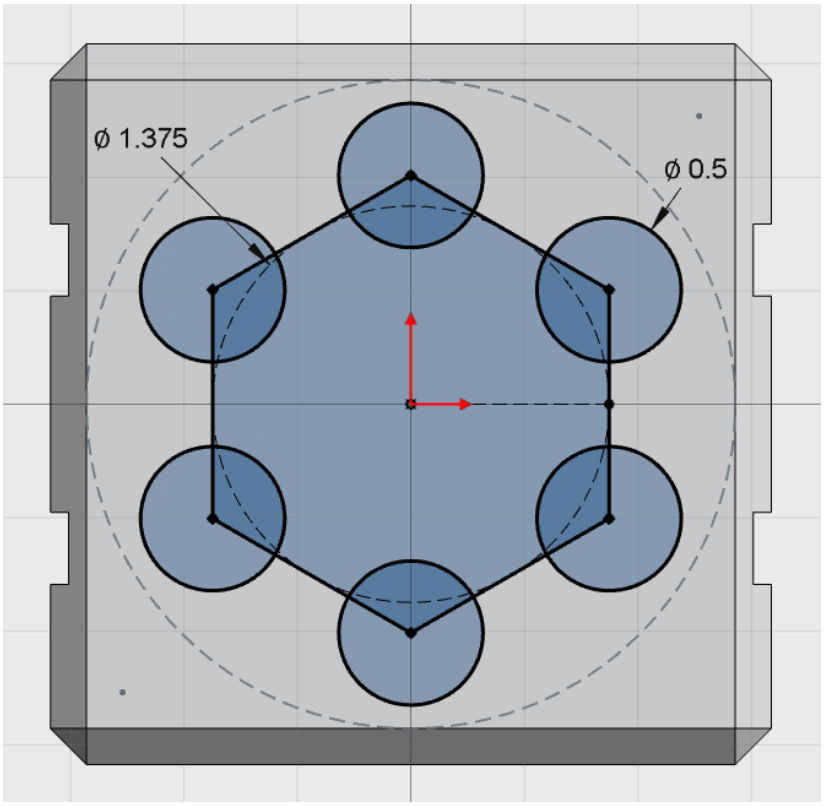
21. Drag the blue rollback bar up the Design Manager and drop it just above the Move Body.1 feature.



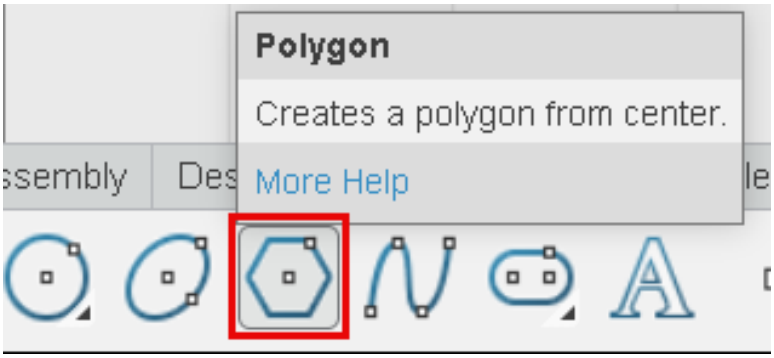
22. [1] Select the YZ plane from the Design Manager, [2] Click the “Create Sketch” button on the context toolbar



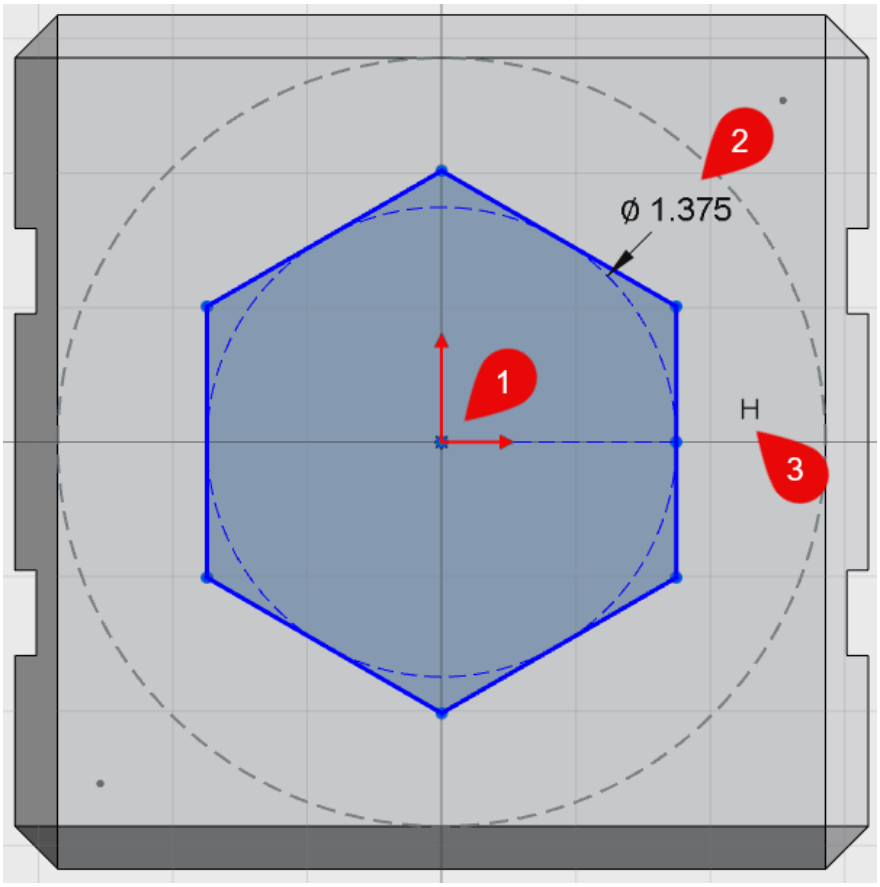
***At this point you can sketch whatever shape you want. If you're already comfortable sketching in xDesign, feel free to sketch something and then skip ahead to step 28 (just be sure to keep your sketch within the dashed circle). If you're new to sketching in xDesign, follow these steps to sketch this shape:



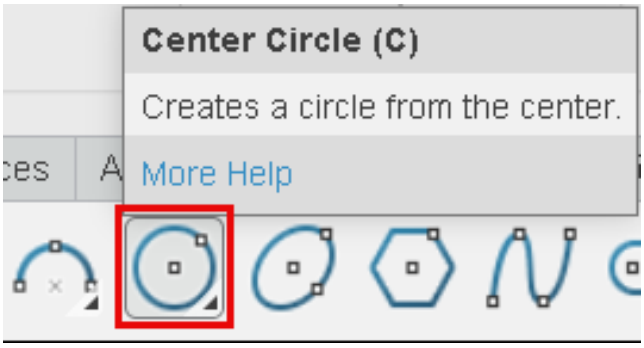
23. Click the **Polygon** command on the Action Bar



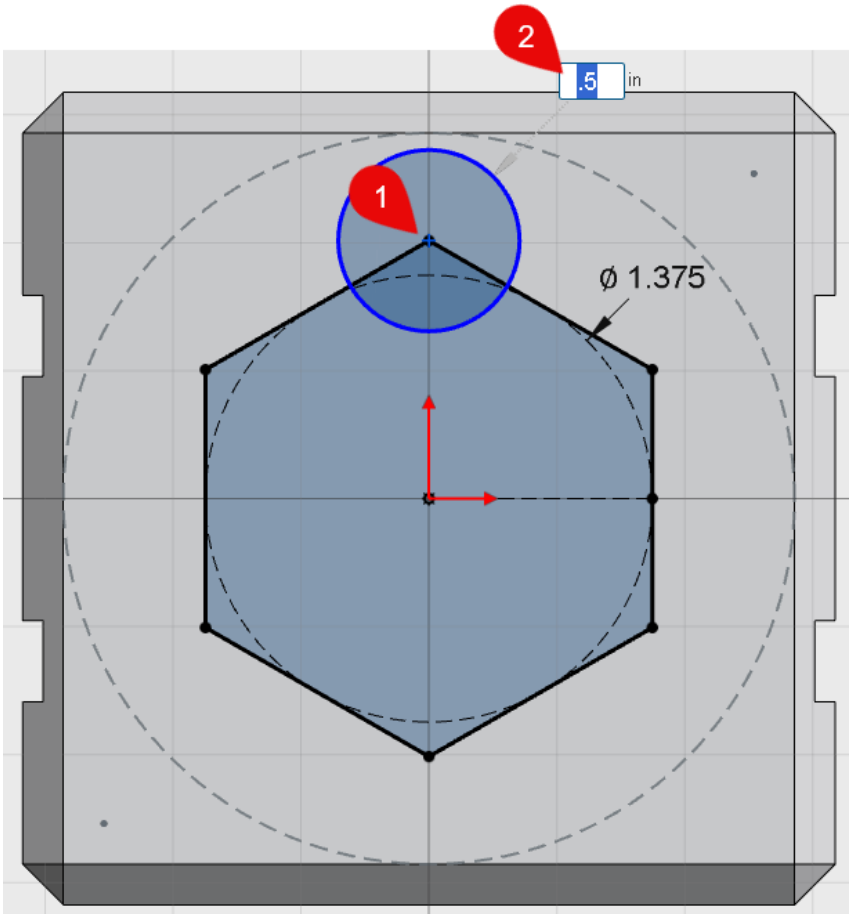
24. [1] Click the origin to place the center of the polygon, then move your mouse to the right to start sizing it. [2] type 1.375 and press enter, [4] rotate the polygon so the dashed line is horizontal (you'll see an "H" next to your cursor) and then click to complete the polygon.



25. Click the **Circle** command on the Action Bar

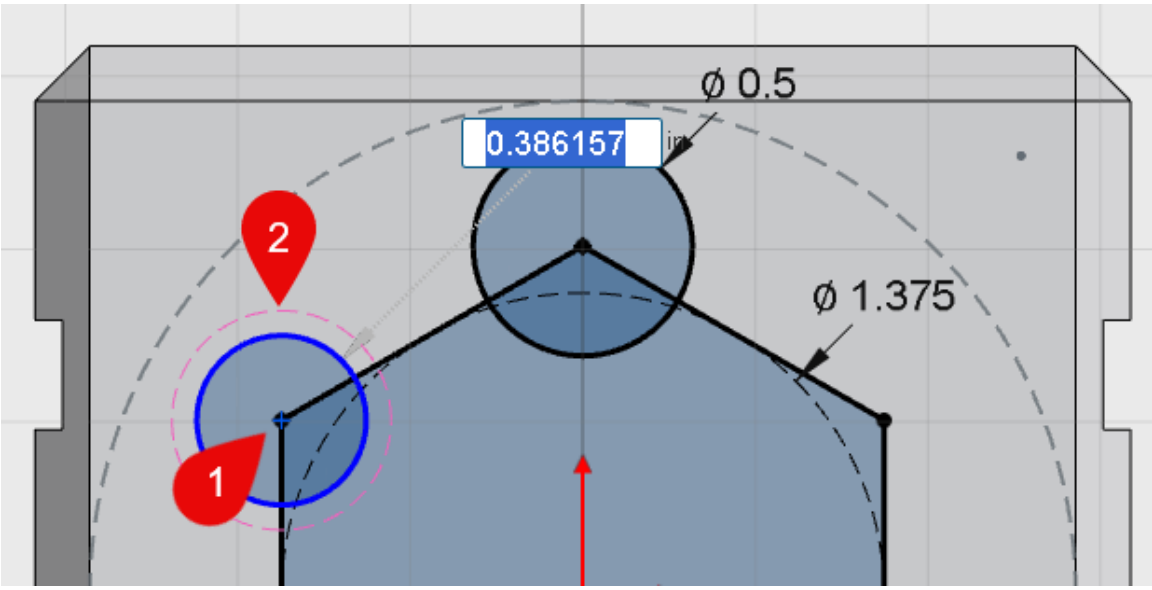


26. [1] Click the uppermost point of the polygon to place the center of the circle, then move your mouse to the right to start sizing it. [2] type 0.5 and press enter



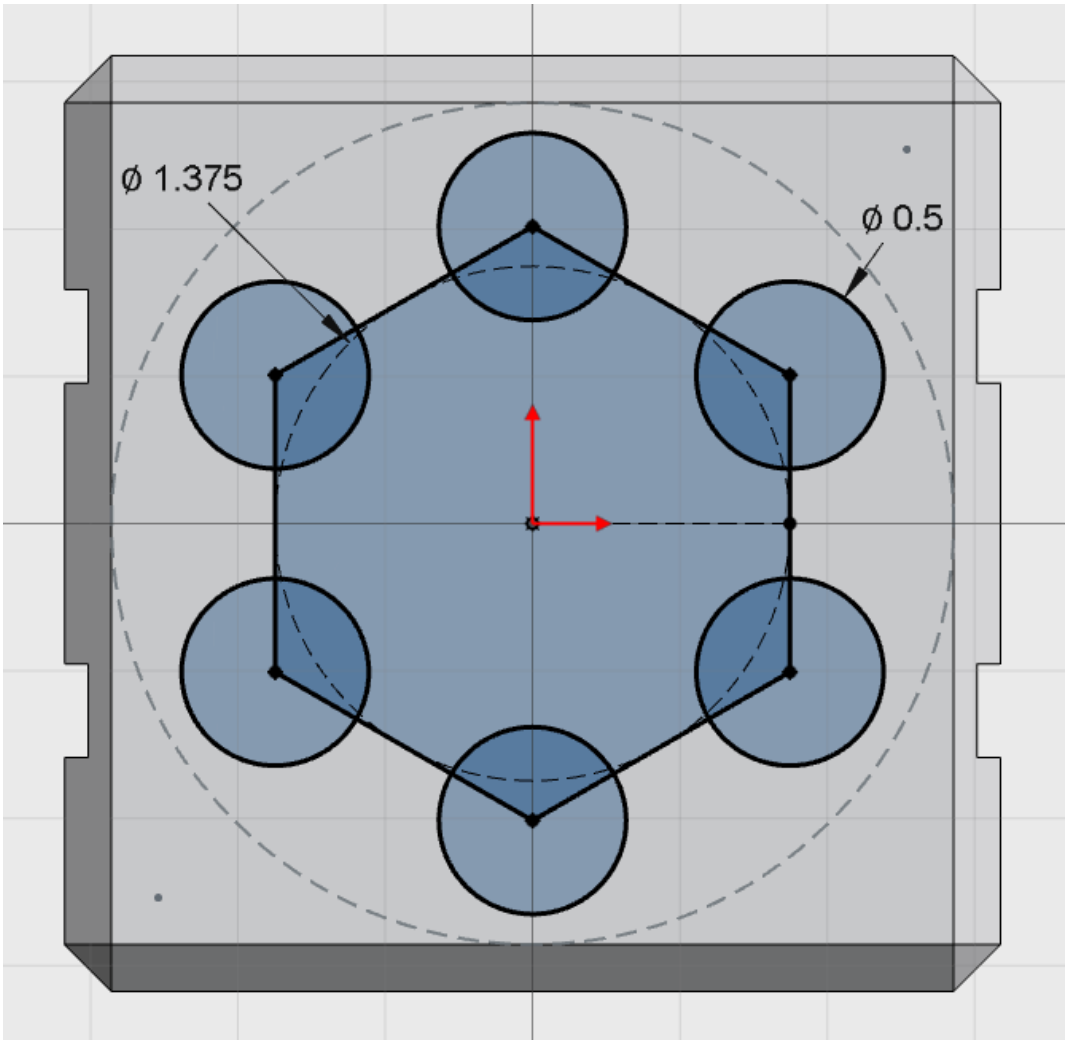
***Now draw circles of the same exact size at each point of the polygon.

27. [1] Click another tip of the polygon to place the center of the circle, then move your mouse to the right to start sizing it – this time, ignore the dimension field, [2] move your cursor to snap the diameter of the circle to the dashed pink circle and then click (this will create an equal relationship between this circle and the one you just dimensioned)

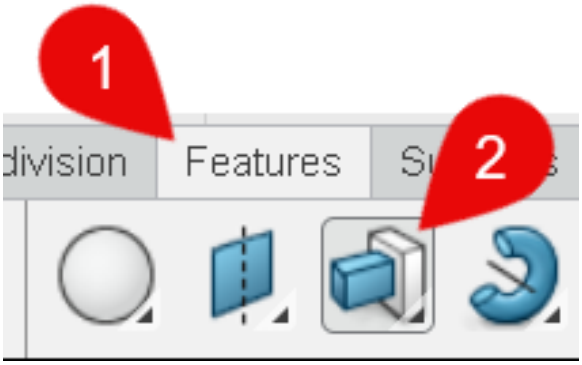


28. Repeat this process to sketch the other four circles, setting each one equal to the first

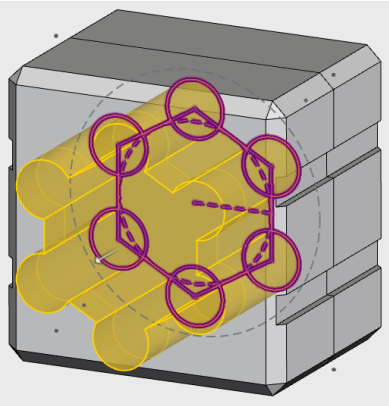
    ***Your sketch should now look like this



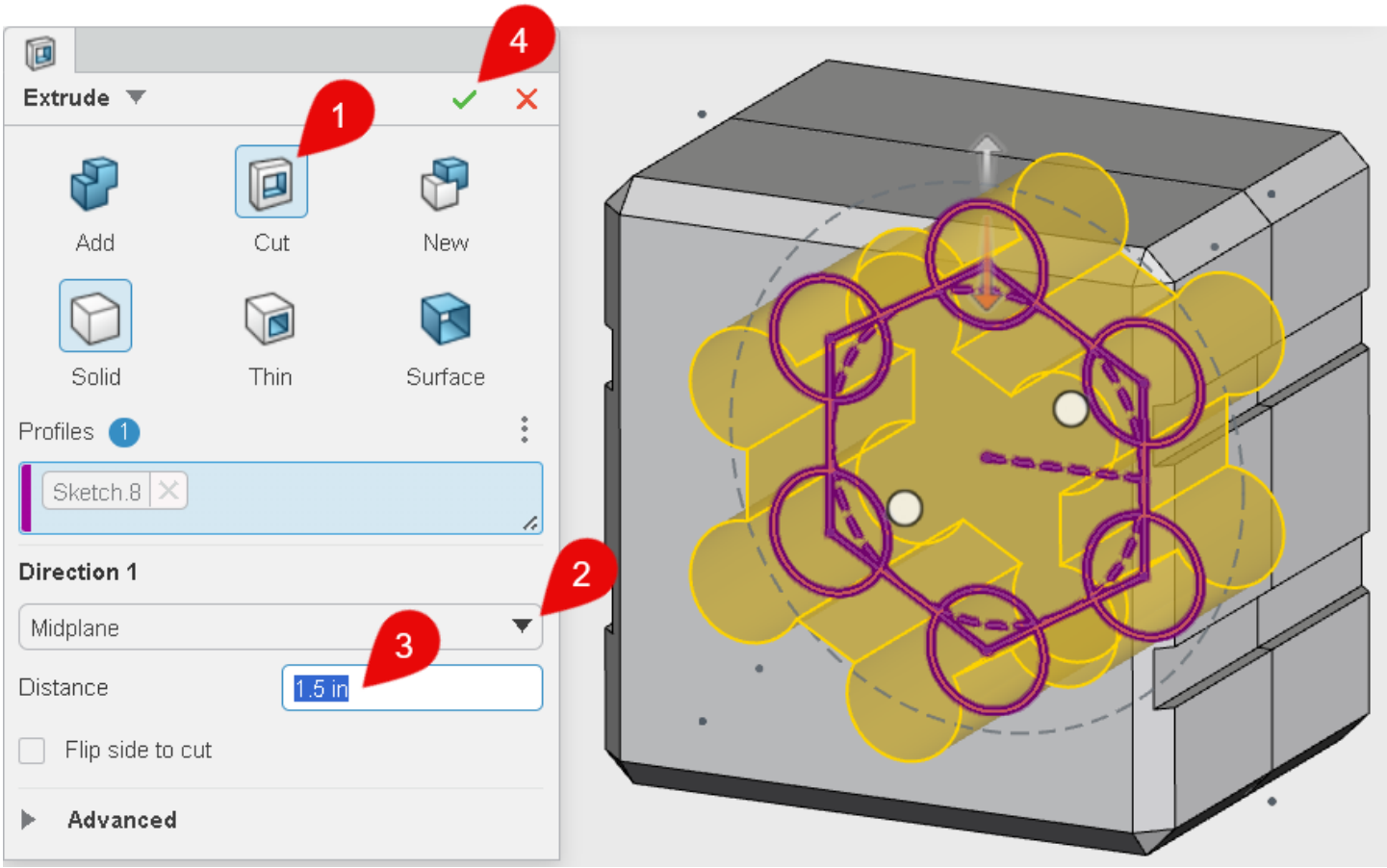
29. [1] Click the **Features** tab of the Action Bar, then [2] click the **Extrude** command



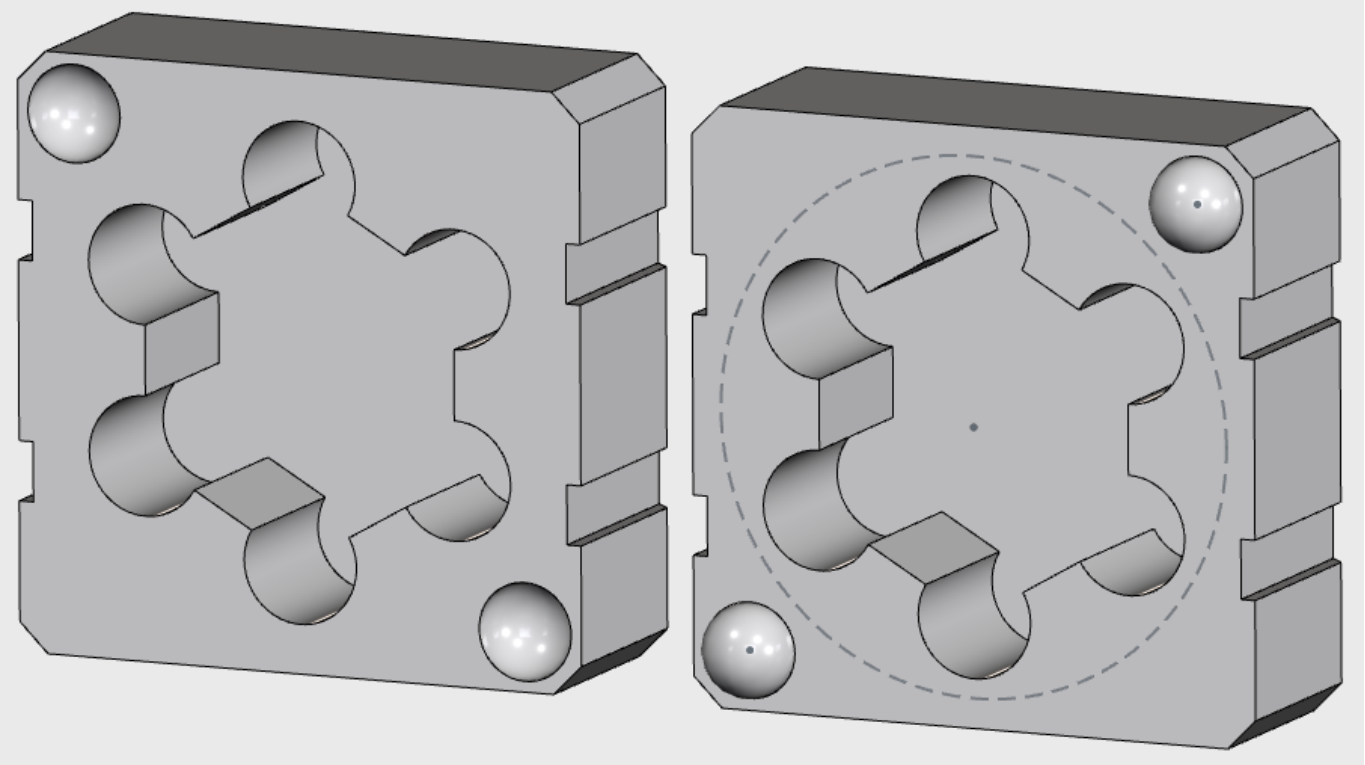
30. Click and drag your middle mouse button in the empty graphics area to rotate the model so you can better see the extrude preview



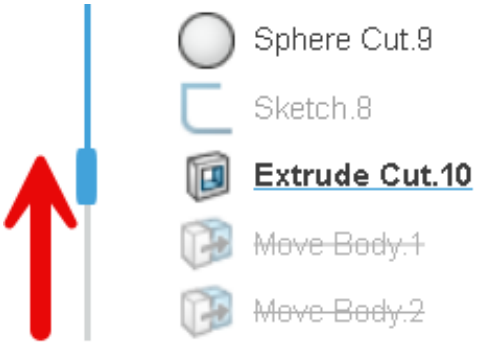
31. [1] Click the “Cut” button, [2] set the Direction1 to Midplane, [3] enter a Distance of 1.5, [4] Click OK



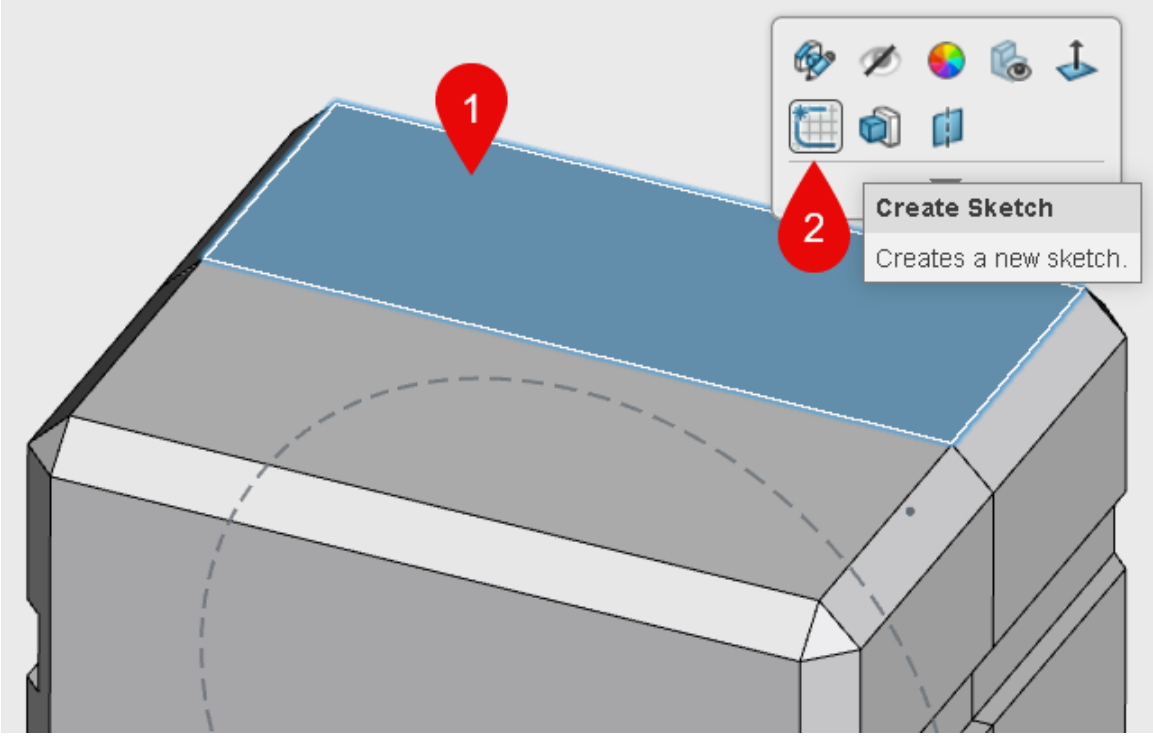
***Feel free to roll the model to the bottom of the Design Manager to see the inner details of the cut you just made, but be sure to roll the model back to its collapsed state before completing the next steps



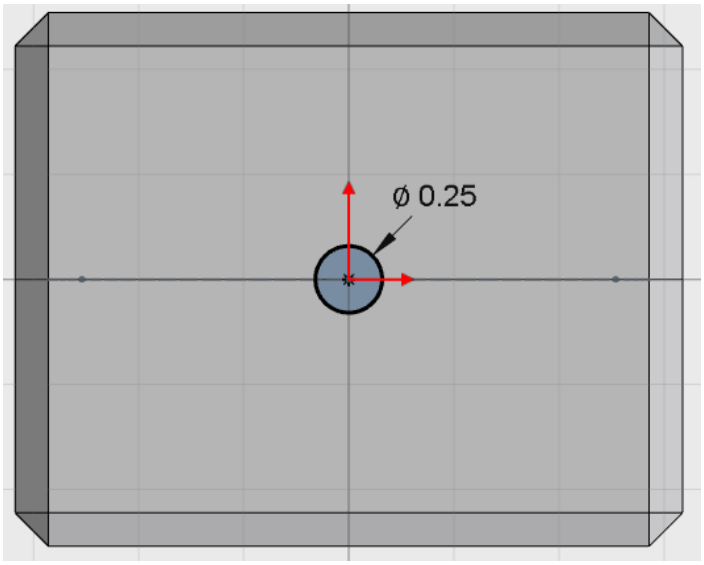
***__IMPORTANT__ – make sure the model is rolled back to its collapsed state before proceeding



32. [1] Select the top face of the mold, then [2] Select the “Create Sketch” command from the context toolbar



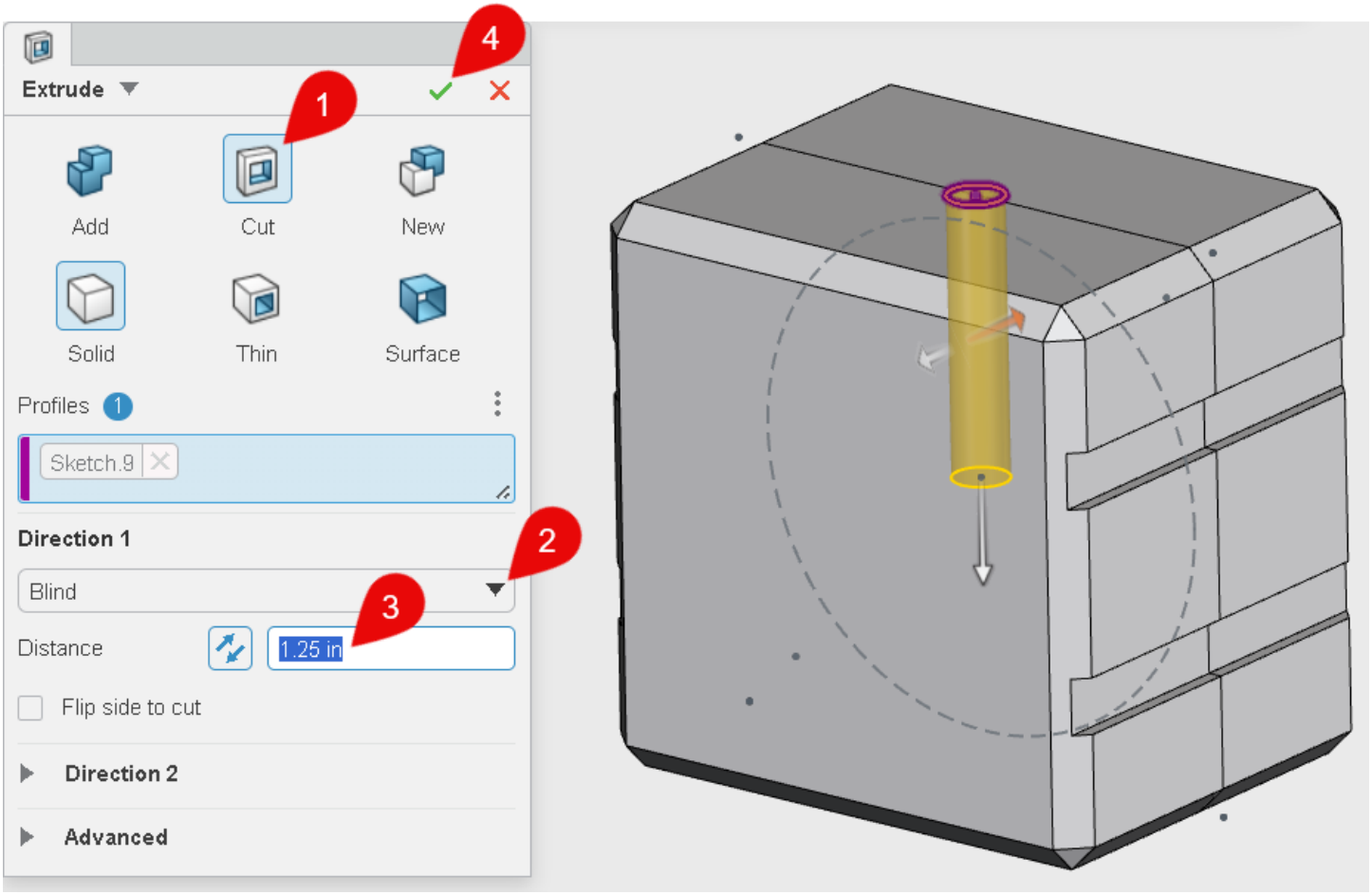
33. Turn on the **Circle** command and draw a 0.25” diameter circle whose center point is snapped to the origin



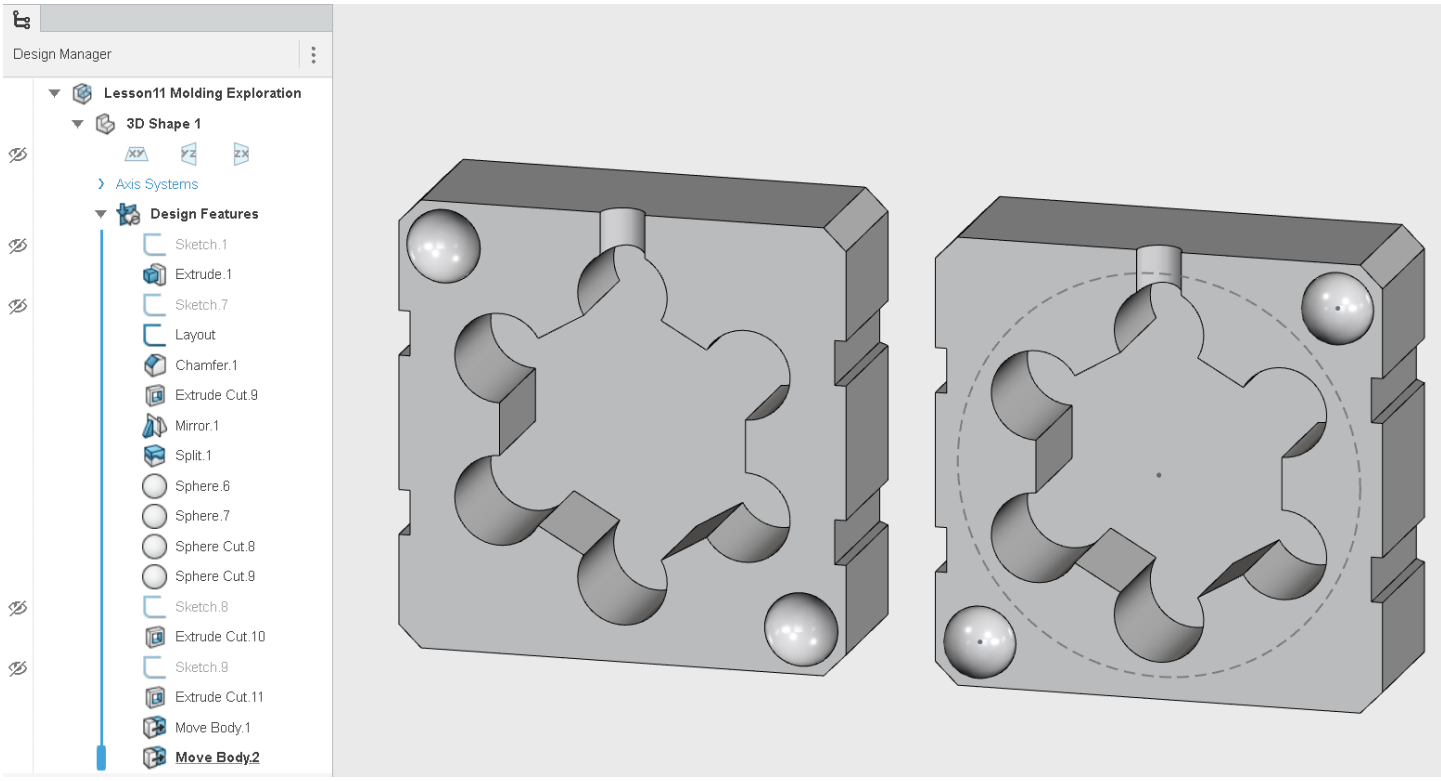
34. Click the **Extrude** command on the Features tab of the Action Bar

35. Rotate the model so you can better see the preview

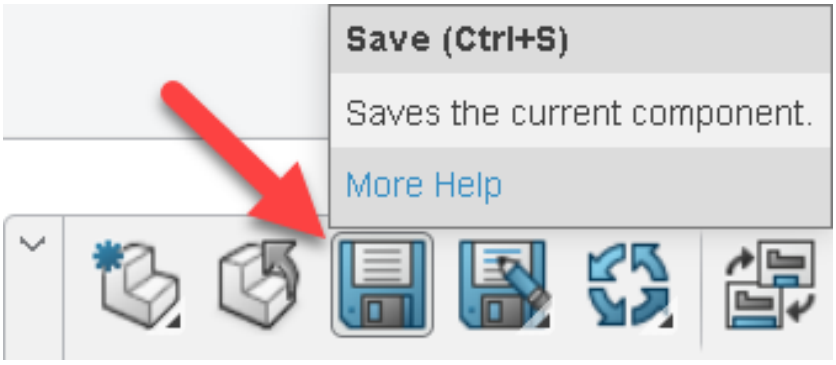
36. [1] Click the “Cut” button, [2] set the Direction1 to Blind, [3] enter a Distance of 1.25, [4] Click OK



37. Drag the rollback bar to the bottom of the Design Manager

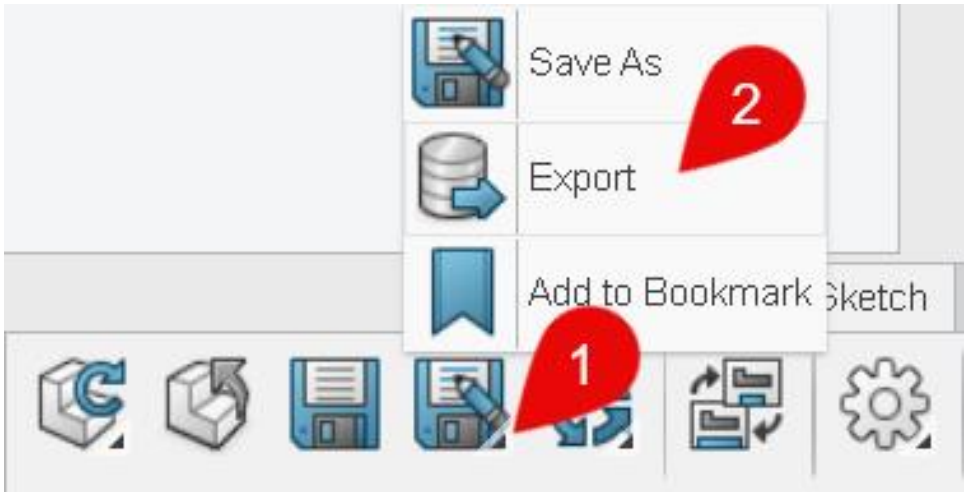


38. Click “Save” on the Action Bar to save your custom mold

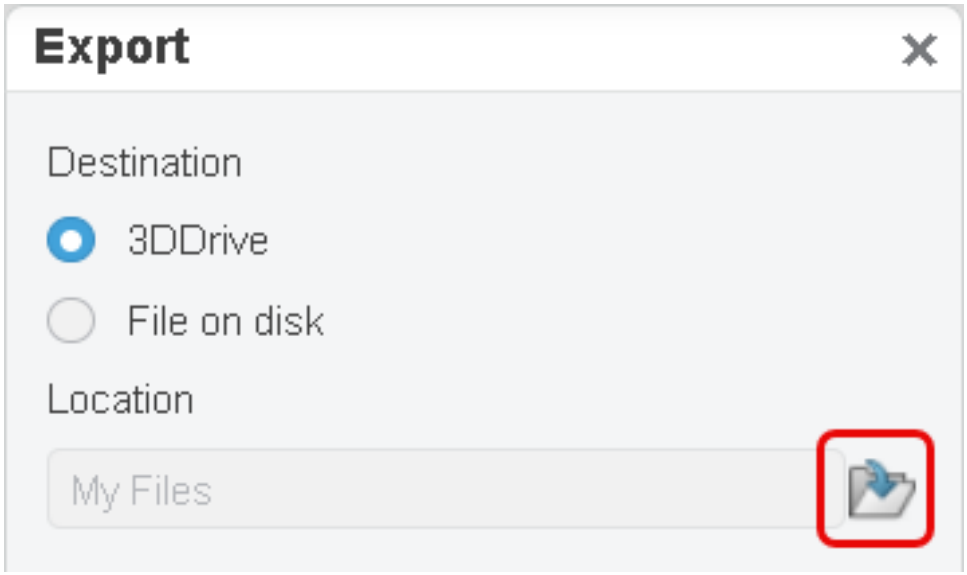


FABRICATE YOUR MOLD

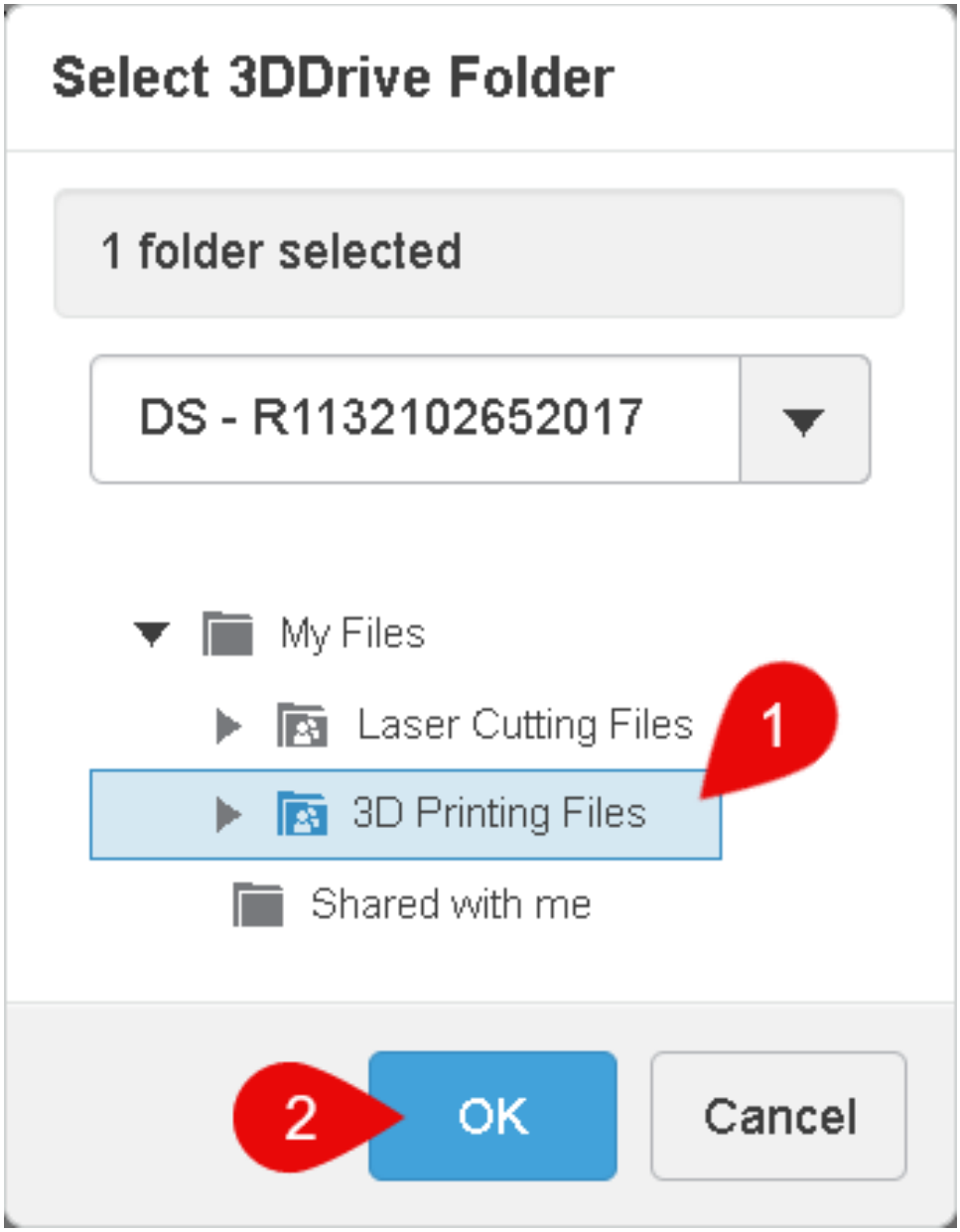
39. [1] Click the flyout corner under the Save As command on the Standard tab of the Action Bar, and then [2] click the **Export** command



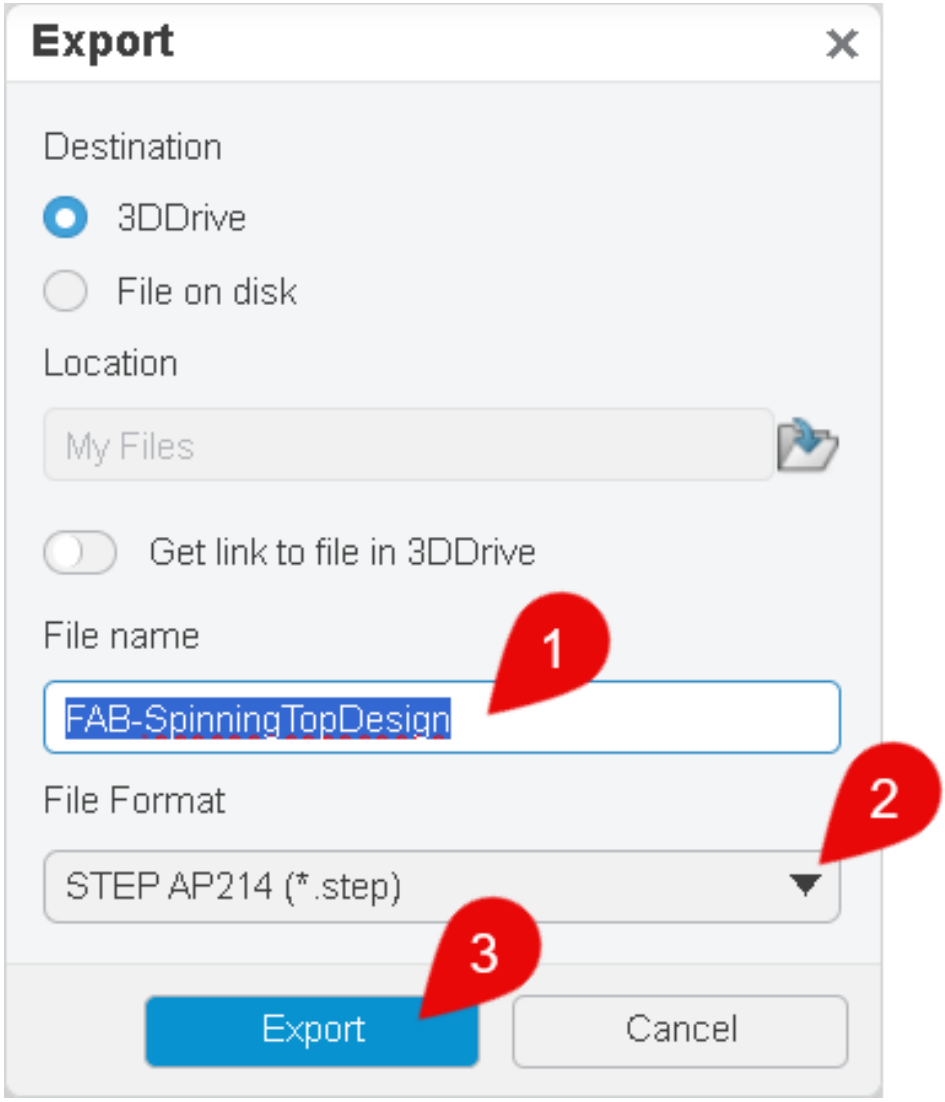
40. Click the Location folder button



41. [1] Select the folder your instructor told you to use to save your files, then [2] click **OK**



42. [1] Give the file a unique name, [2] change the format to “**STEP AP214**”, and then [3] click **Export**



Congratulations!

You’re ready to 3D print your mold!

See your teacher for further instruction!