

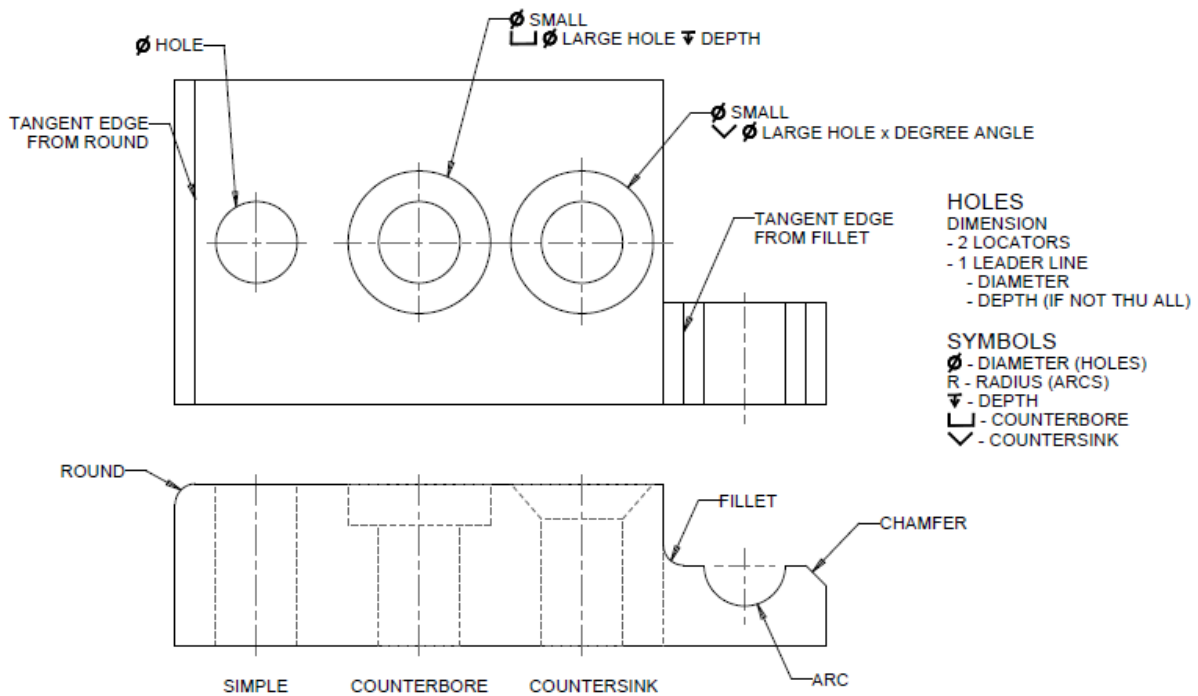
Creo: Counterbore and Countersink Tutorial

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This tutorial is designed to show how to create a Counterbore hole in two different ways.

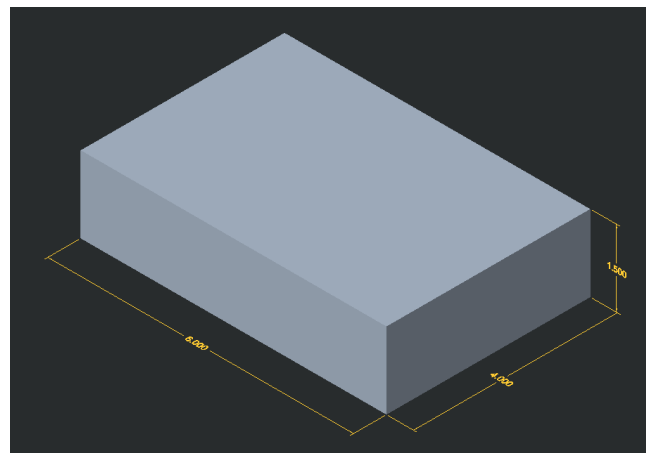
1. Creating 2 Extrudes
2. Using the Hole Tool

Types of Holes



Starting Block

1. Design a 6 x 4 x 1.5 Block
2. Rename Extrude 1 to BASE



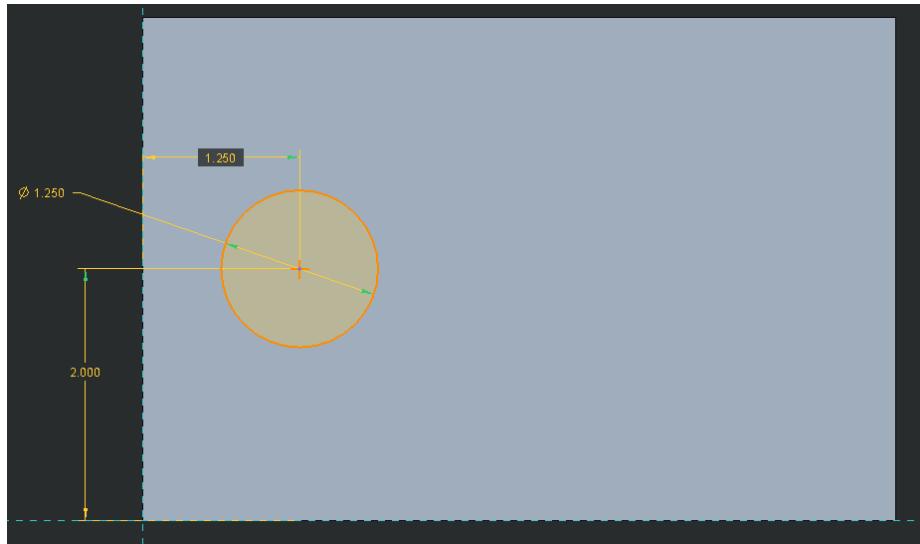
Counterbore Holes

Counterbore Extrudes

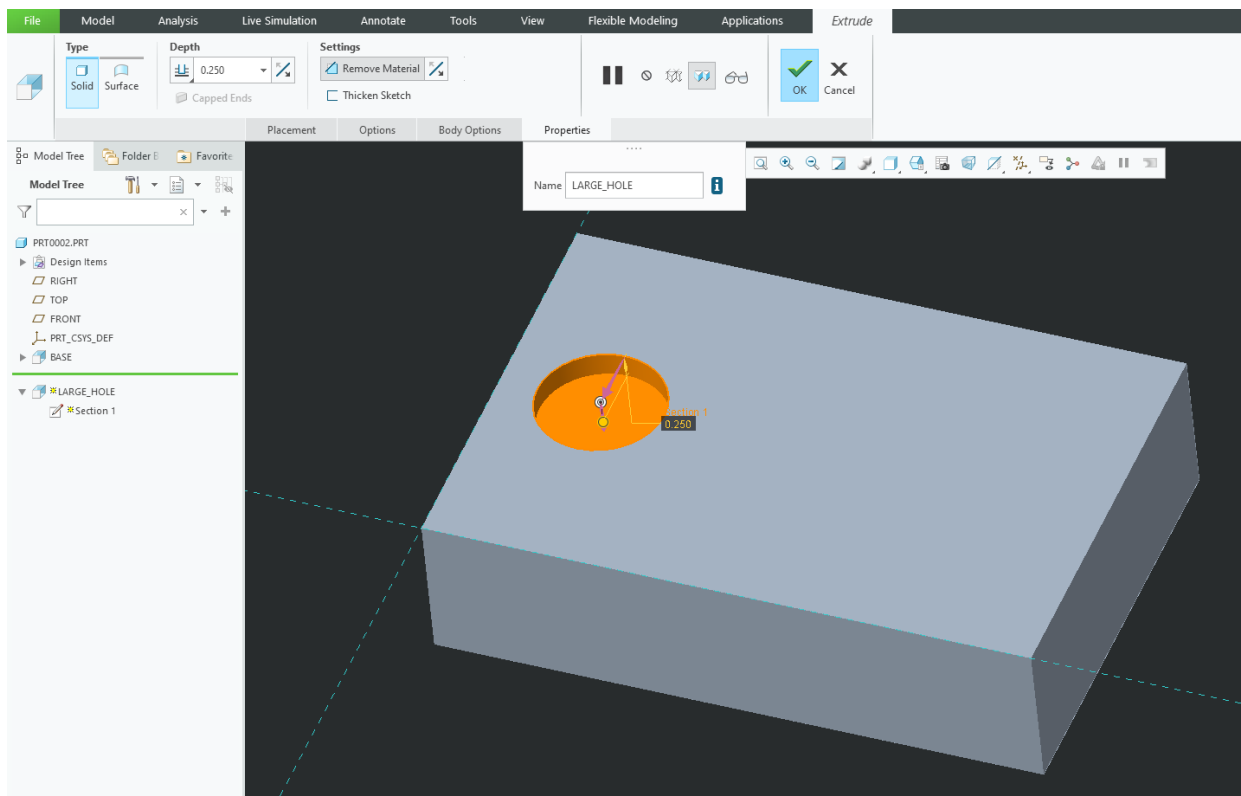
When creating a Counterbore hole it does not matter which hole you cut first when using CADD software. When cutting a real Counterbore hole in a piece of metal or wood then the user should always cut the large hole first then the smaller hole.

A. Large Hole One

1. Select Extrude Icon > select Top Surface of the part
2. Draw a circle with the shown dimensions



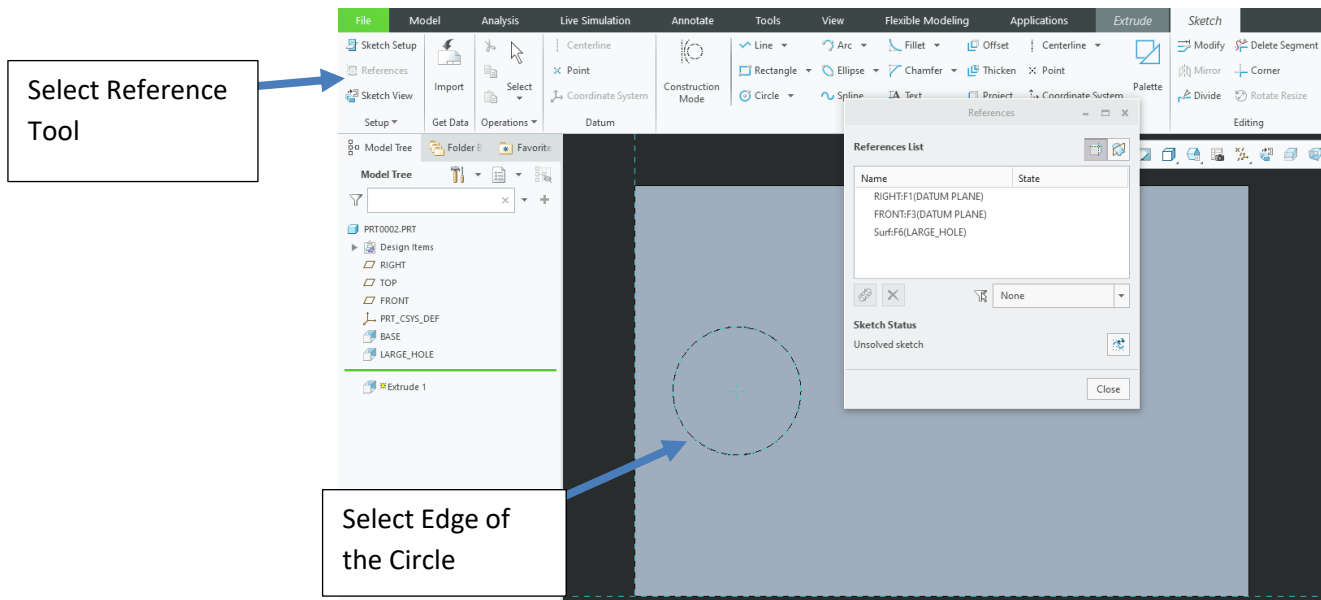
3. Green Check
4. Set depth of hole to .250
5. Properties Tab > Rename Hole to Large_Hole



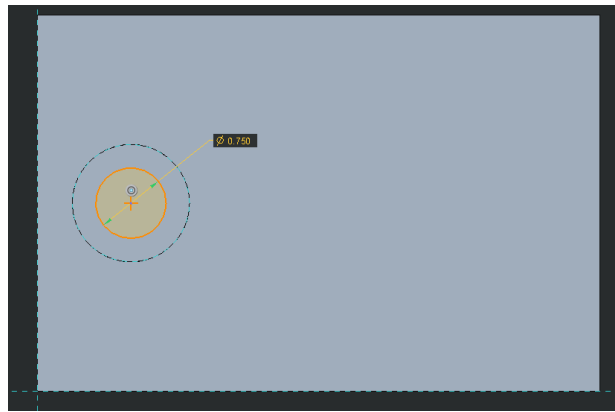
6. Green Check to accept

B. Small Hole 2

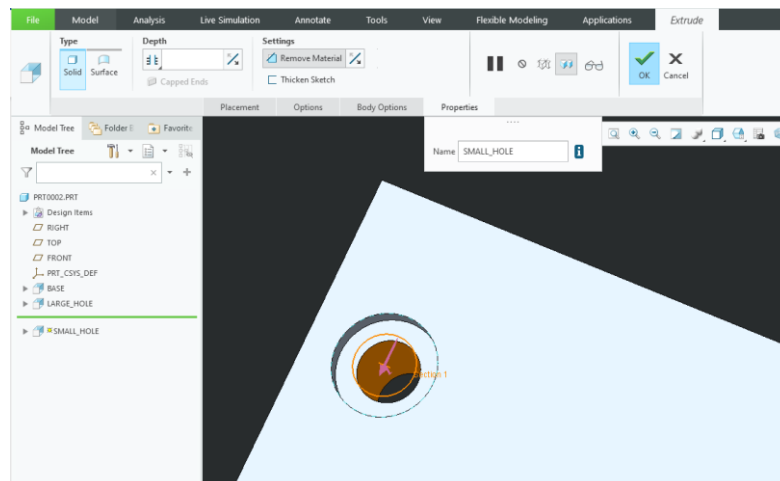
1. Layout Tab > Select Extrude Icon > Select the Top of the Base Block or the Bottom of the Large Hole
2. Use the reference tool to select the preexisting circle



3. Select Circle Tool > Place Cursor at the Center of the Large Hole (NOTE: Center Point is referenced) > Place Hole > Set Diameter to .750



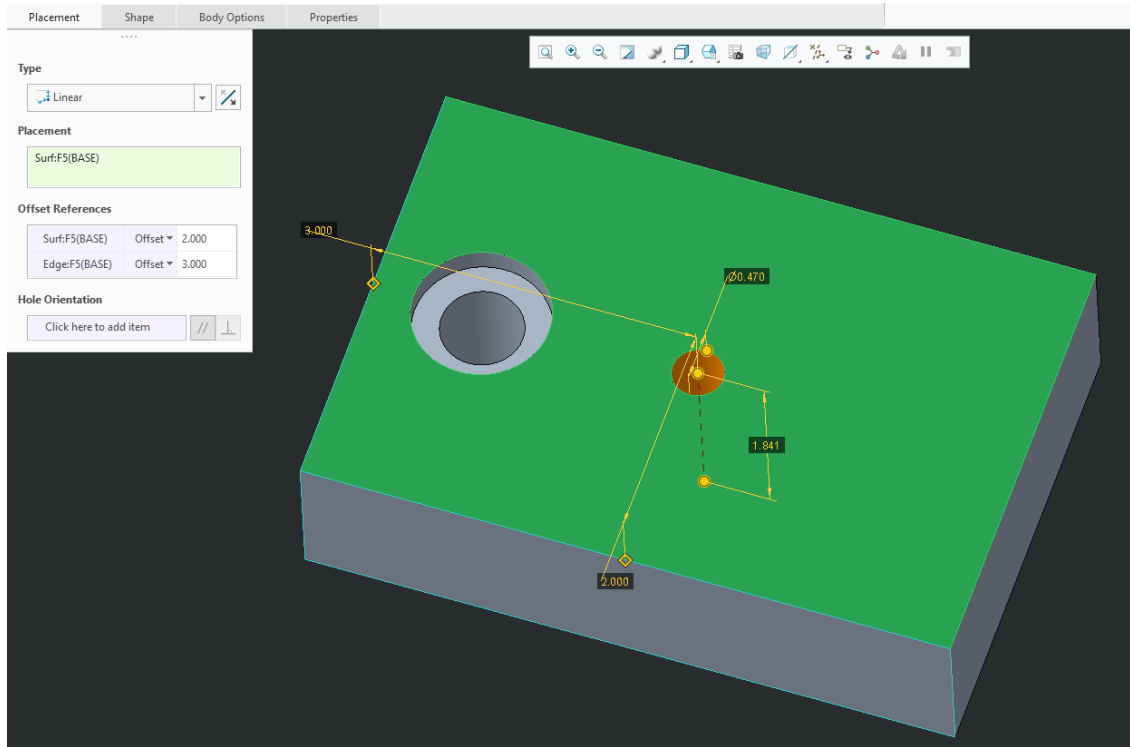
4. Green Check
5. Set the depth To Through All > Select Remove Material
6. Select Properties Tab > Change Name to Small_Hole



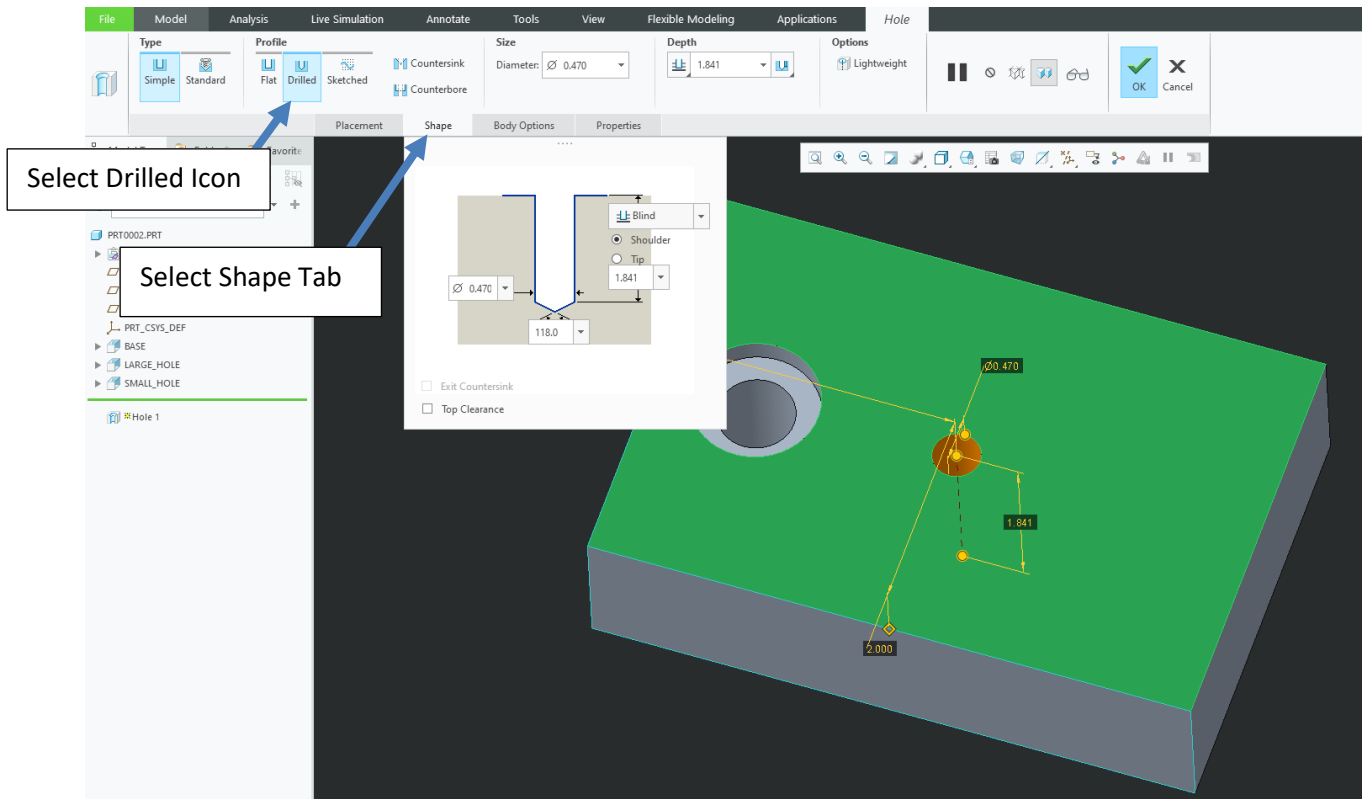
7. Green Check

C. Hole Tool

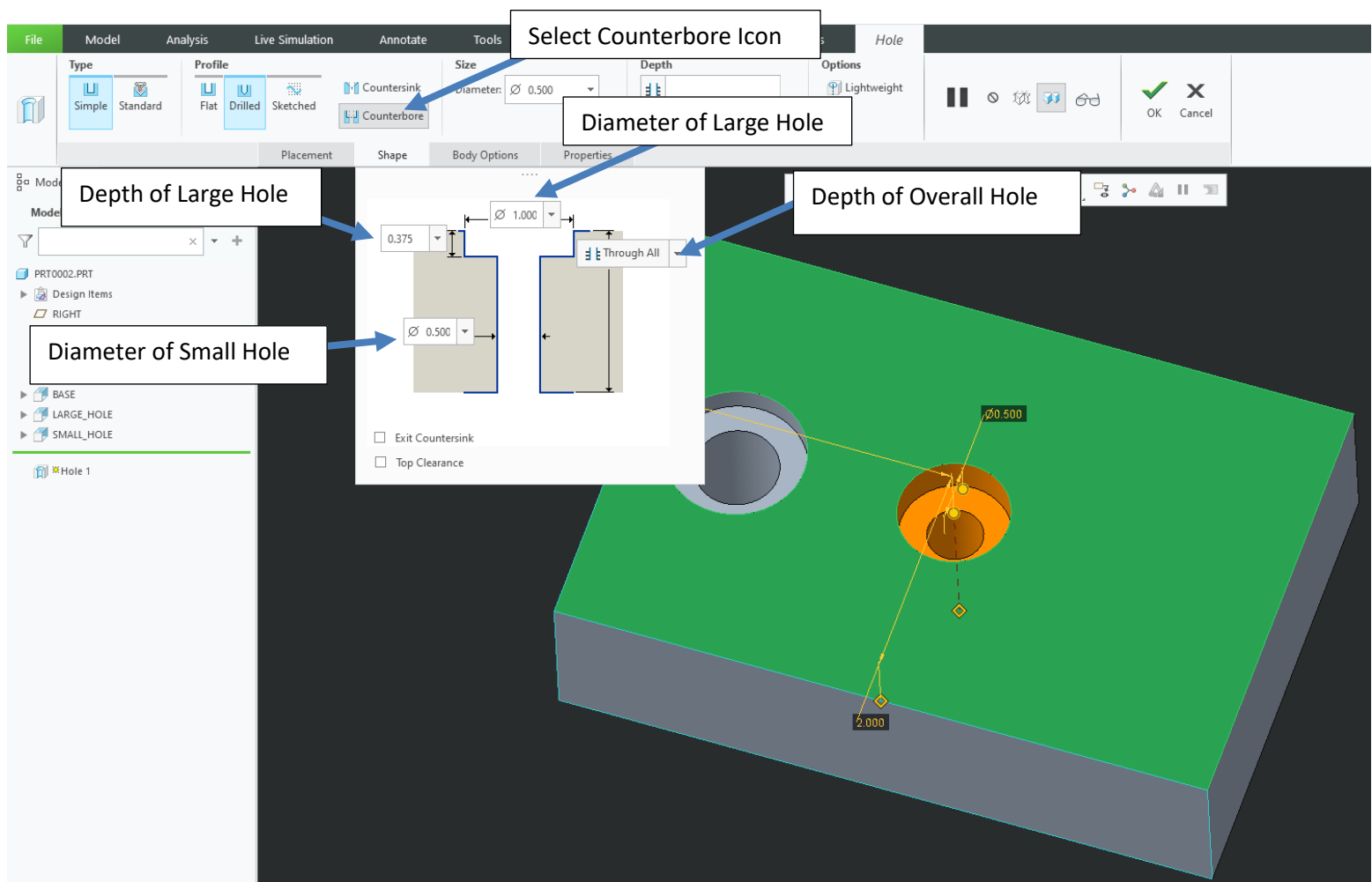
1. Select Model Tab > Hole Tool > Select the Top Surface of the Part
2. Place Locators as shown (From the Left Surface 3 and from the Front Surface 2)



3. Hole Tab > Profile Select Drilled Icon > Select Shape Tab



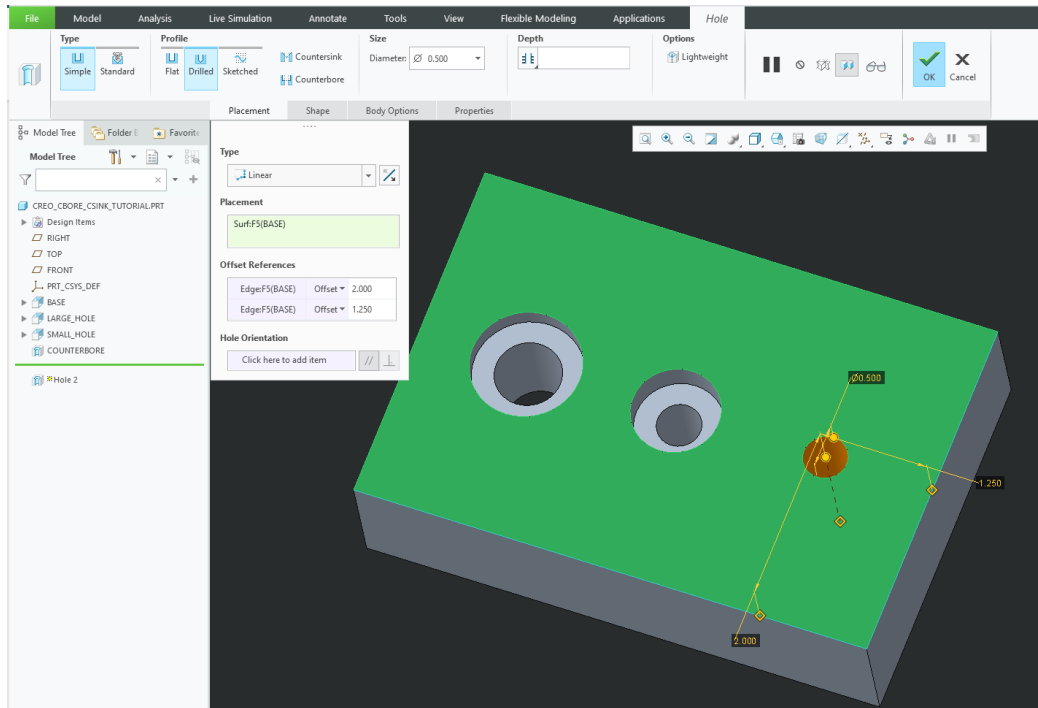
4. Select Counterbore Icon > Notice the Shape of the Hole changes > Set the Dimensions as shown
 - a. Diameter of Large Hole 1.000
 - b. Diameter of Small Hole .500
 - c. Depth of Large Hole .375
 - d. Depth of Overall Hole: Through All



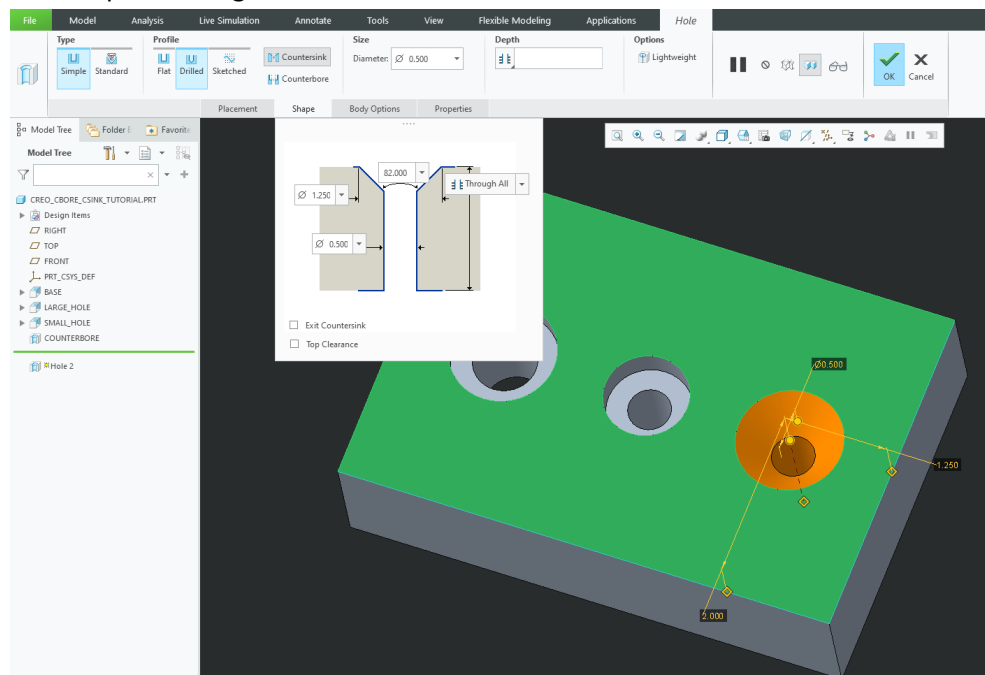
5. Properties Tab Rename as CounterBore
6. Green Check to Place

D. Countersink Hole

1. Select the Hole Tool > Select the Top Surface of the Part > Set Locators as shown (From the Right Surface 1.25 and from the Front Surface 2)



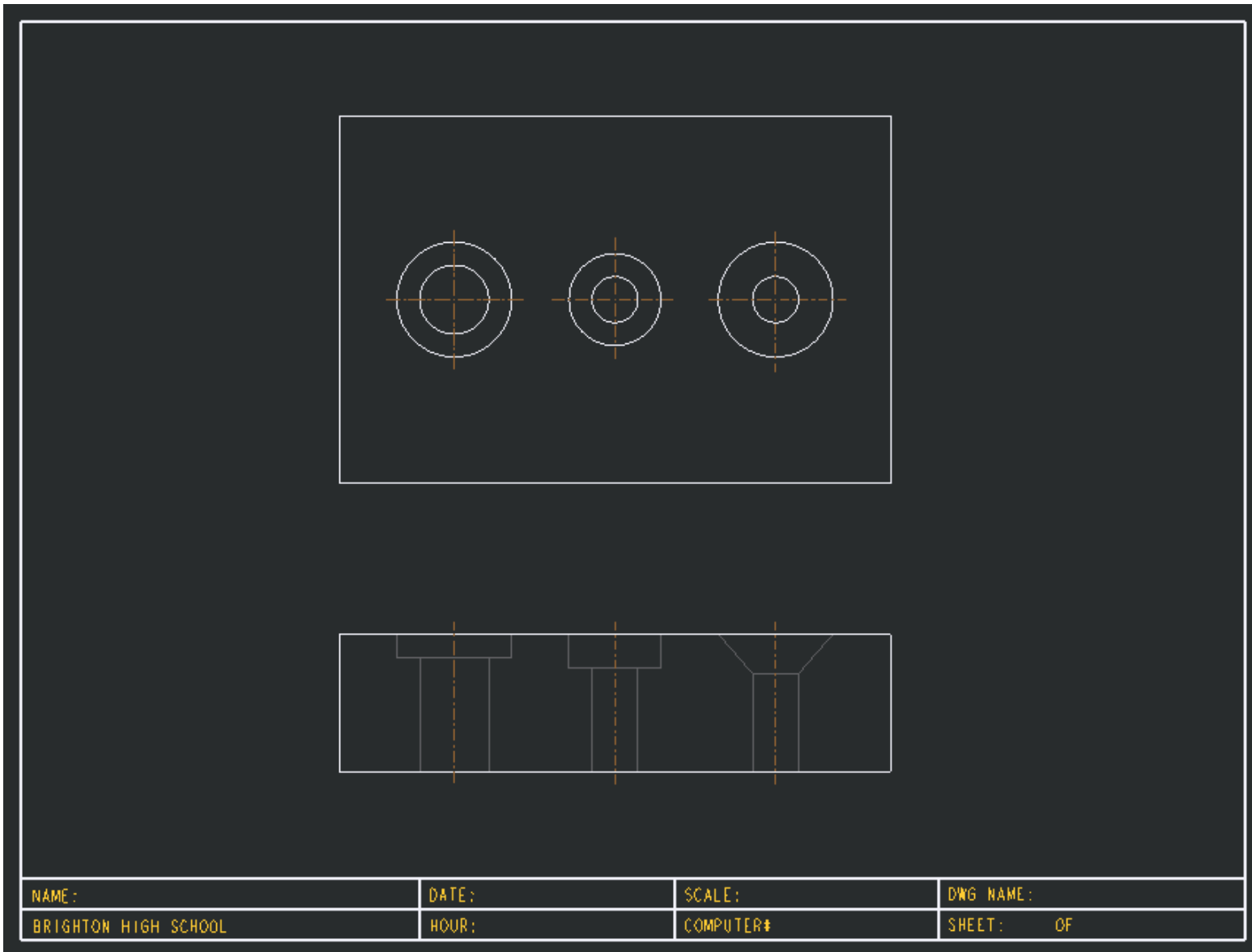
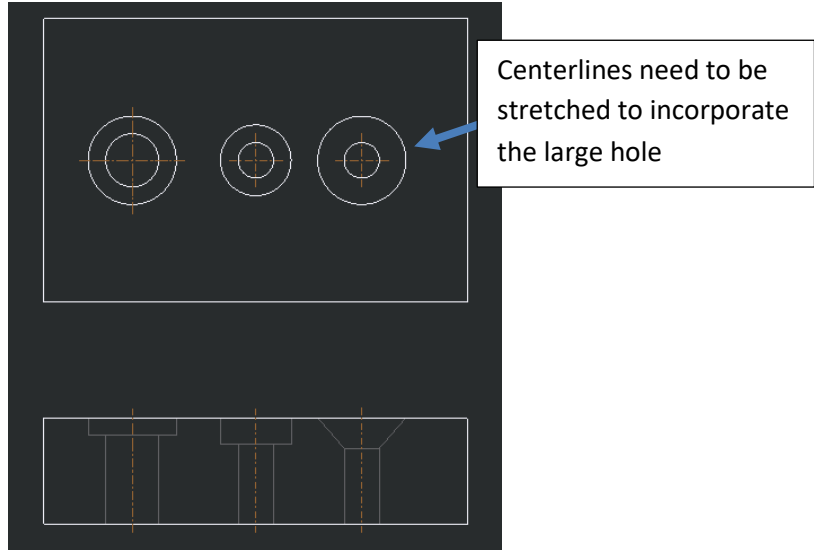
2. Select Profile: Drilled Icon > Select Countersink Icon > Set Values as Shown
 - a. Diameter of Large Hole (Top of Taper Angle): 1.25
 - b. Diameter of Small Hole: .500
 - c. Taper Angle: 82°
 - d. Overall Hole Depth: Through All



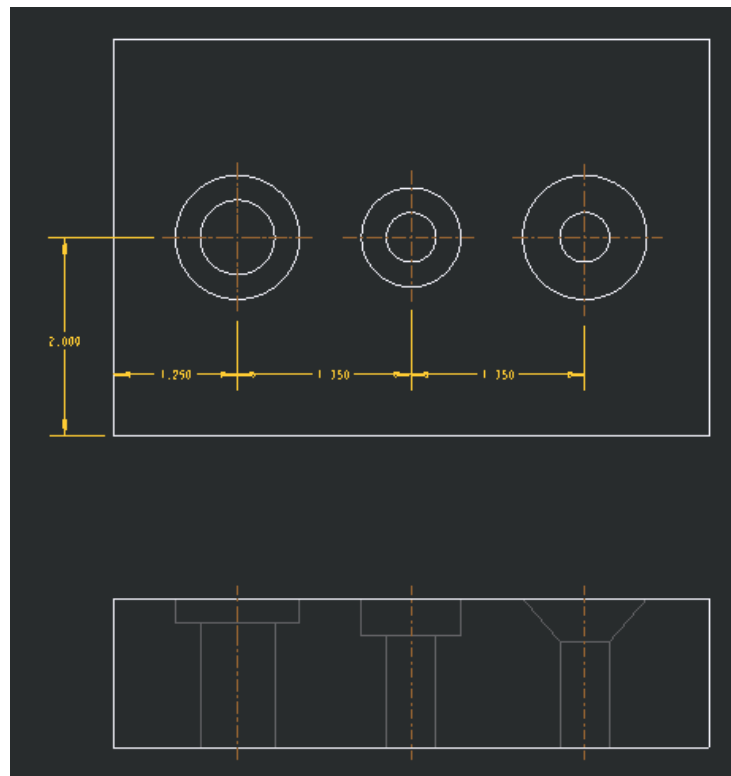
3. Properties Tab > Rename Hole to Countersink
4. Green Check to Accept
5. Save Part

E. Layout

1. Select New > File > Drawing > Select A-Size Title Block Format > Place the Top and Front View as Shown > Set Scale to .750 = 1.00 > Place Centerlines (Note Centerlines may have to be stretched to incorporate the howl feature)



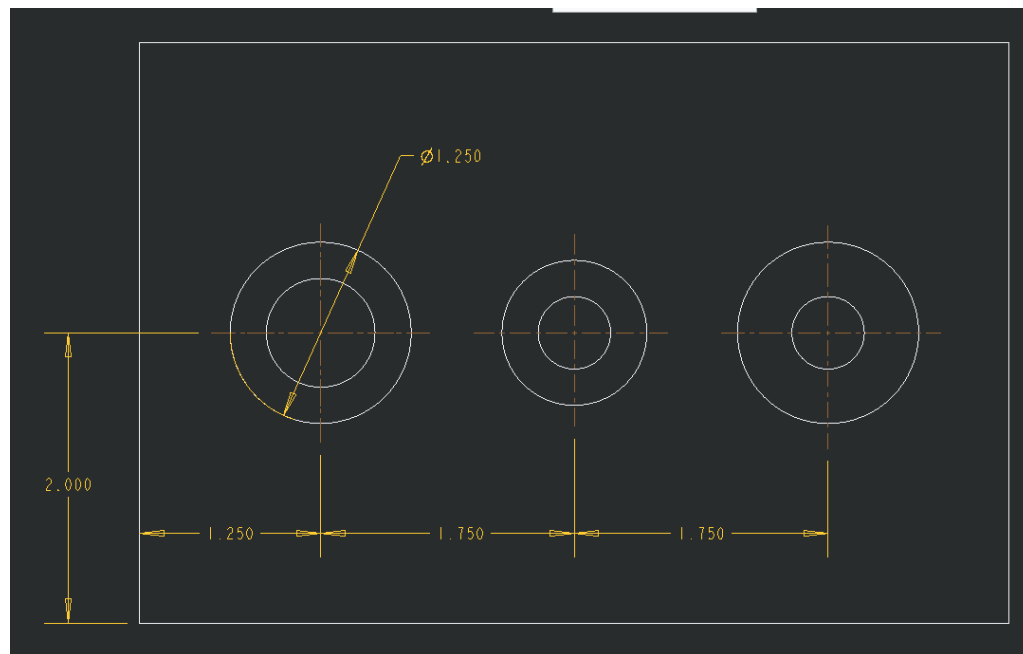
2. Place Locator Dimensions



3. Dimension Counterbore Hole

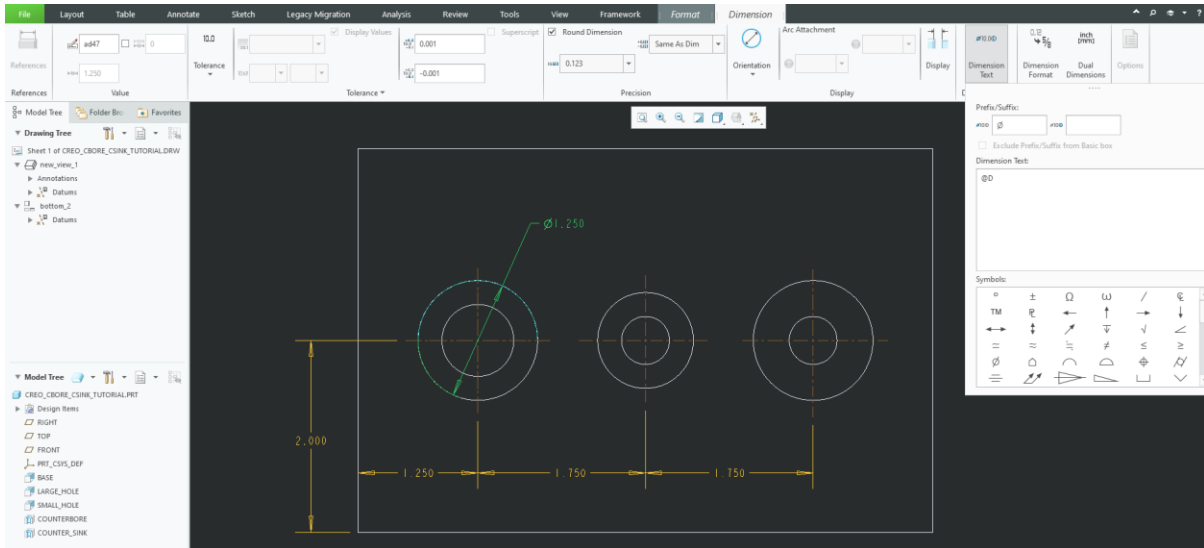
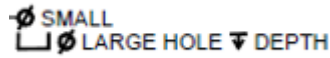
NOTE: Leader Line Arrow should always be placed off of the larger of the two concentric circle/holes

- a. Select Dimension Tool > Double Click on the Larger Hole > Middle Mouse Button to Place Diameter

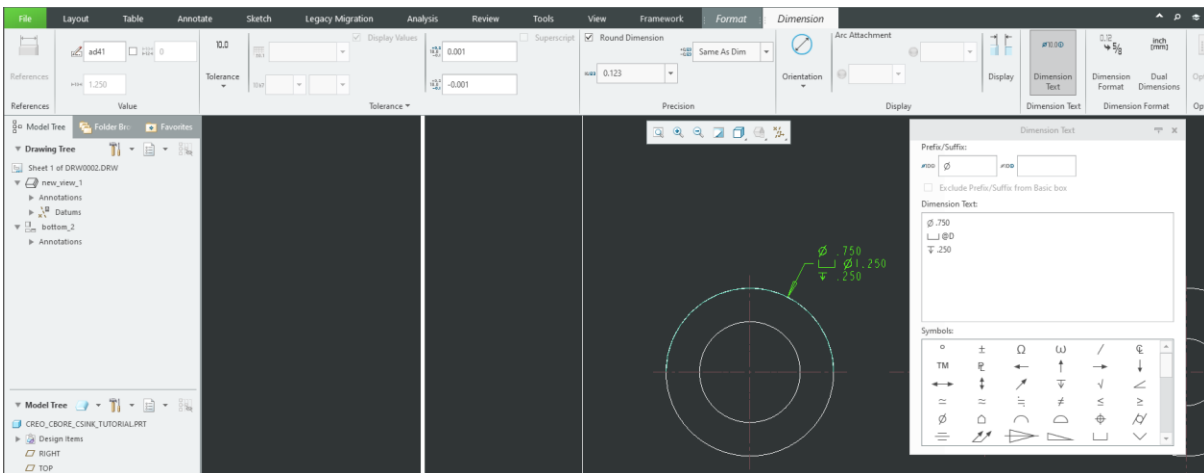


- b. Flip the Arrow of the Dimension

- c. Select the Dimension > Dimension Tab will open > Select Dimension Text (NOTE the @D is a variable that represents the dimension that is selected)
Dimension Setup for a counterbore is as follows.



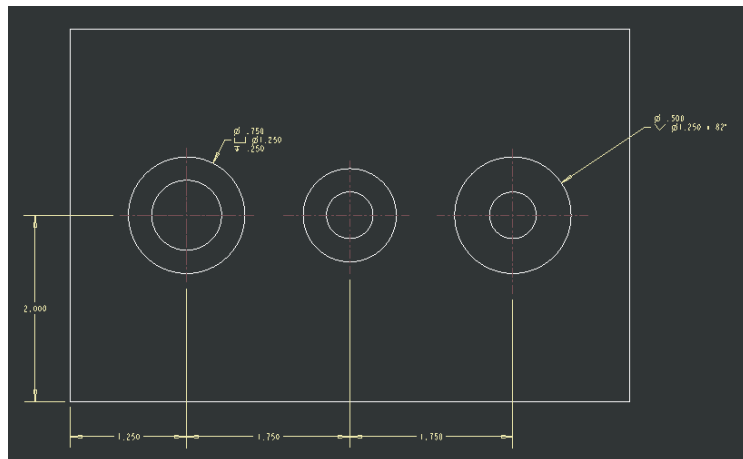
Set the Dimensions as shown



4. Dimension Counter Sink Hole

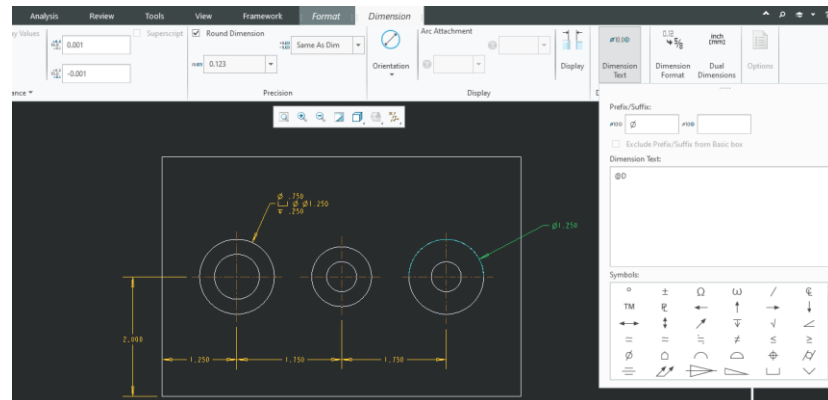
NOTE: Leader Line Arrow should always be placed off of the larger of the two concentric circle/holes

- a. Select Dimension Tool > Double Click on the Larger Hole > Middle Mouse Button to Place Diameter > Arrow

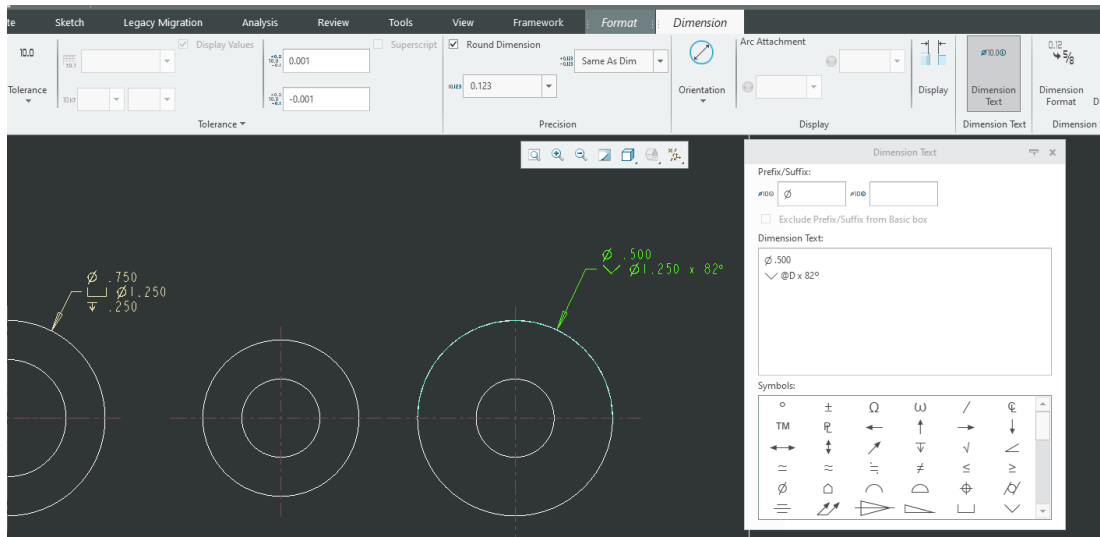


- b. Select the Dimension > Dimension Tab will open > Select Dimension Text (NOTE the @D is a variable that represents the dimension that is selected)
Dimension Setup for a countersink is as follows.

✓ **SMALL**
✓ **∅ LARGE HOLE x DEGREE ANGLE**



- c. Set the Dimension as follows



5. Dimension the Middle Counterbore Hole
6. Fill out the Title Block

Submission: Print the Layout and Submit