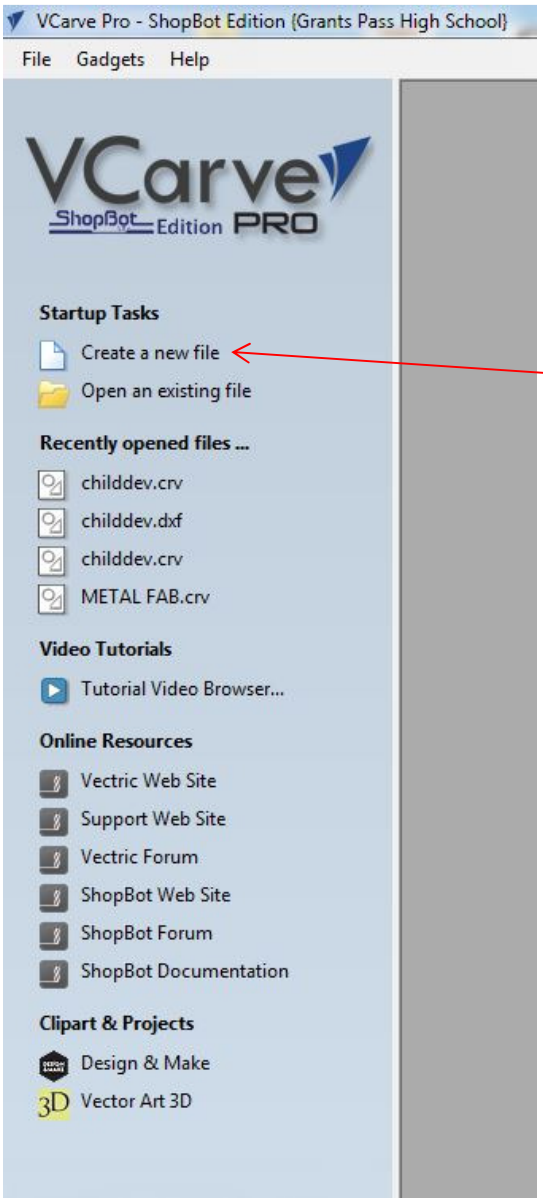
Summer STEM Academy

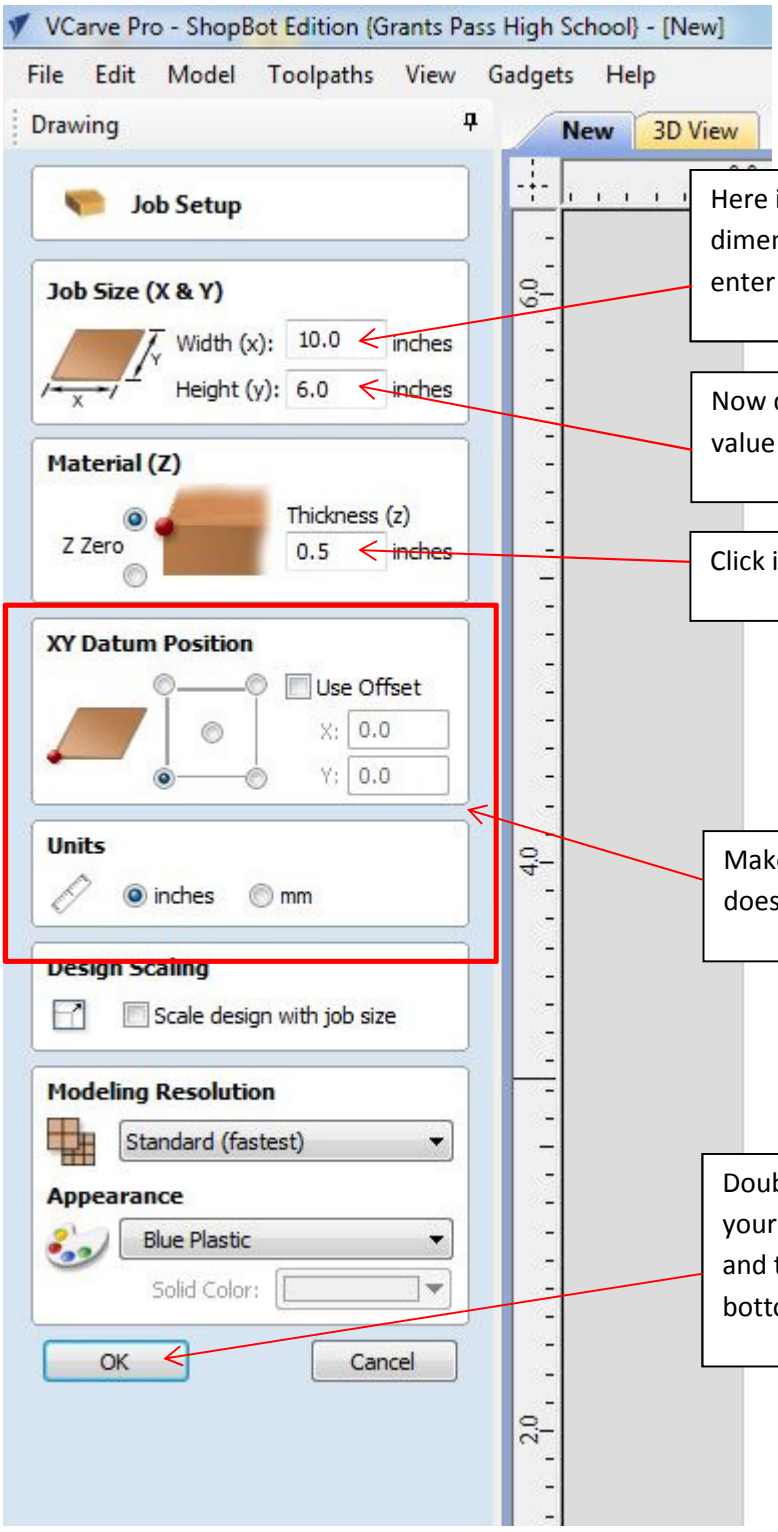
6 X 10 HDPE Sign Instructions

Follow these instructions to draw your personalized sign on the CNC router in the Woodshop / Manufacturing shop.

1. Log on to your computer and double click on the “VCarve Pro” icon on the desktop. Your screen should look like the image below.



Use the left mouse button to click on the “Create a new file” icon.



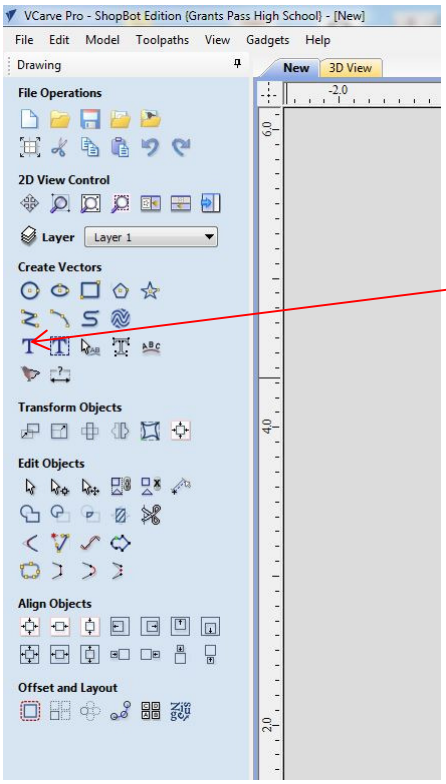
Here is where you will set your material dimensions. Click in the "Width" box and enter 10.0

Now click on the "Height" box and enter a value of 6.0

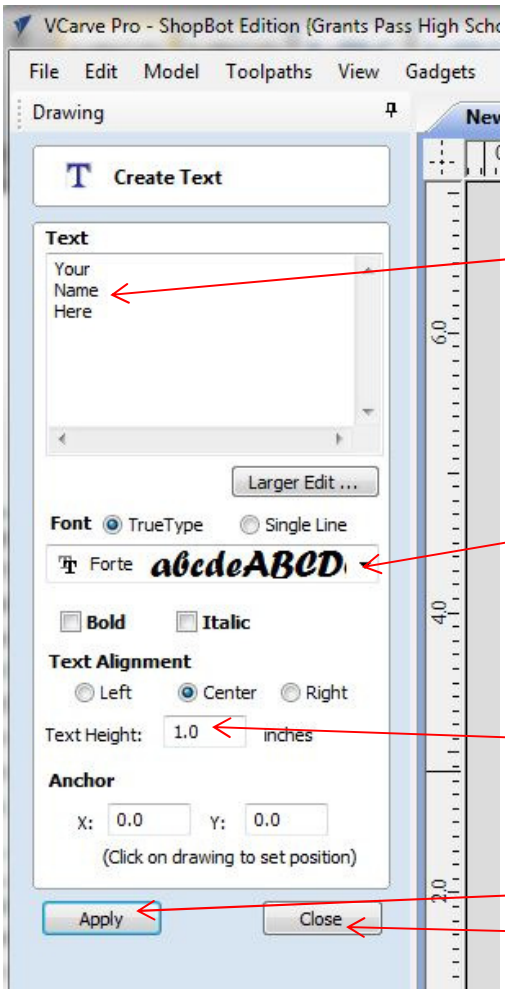
Click in the "Thickness" box and enter 0.5

Make sure that everything else looks like it does here.

Double check everything and make sure your settings match what you see on the left and then click on the "OK" button at the bottom.



Now we are going to enter some text onto your material. Click on the "Text" icon.

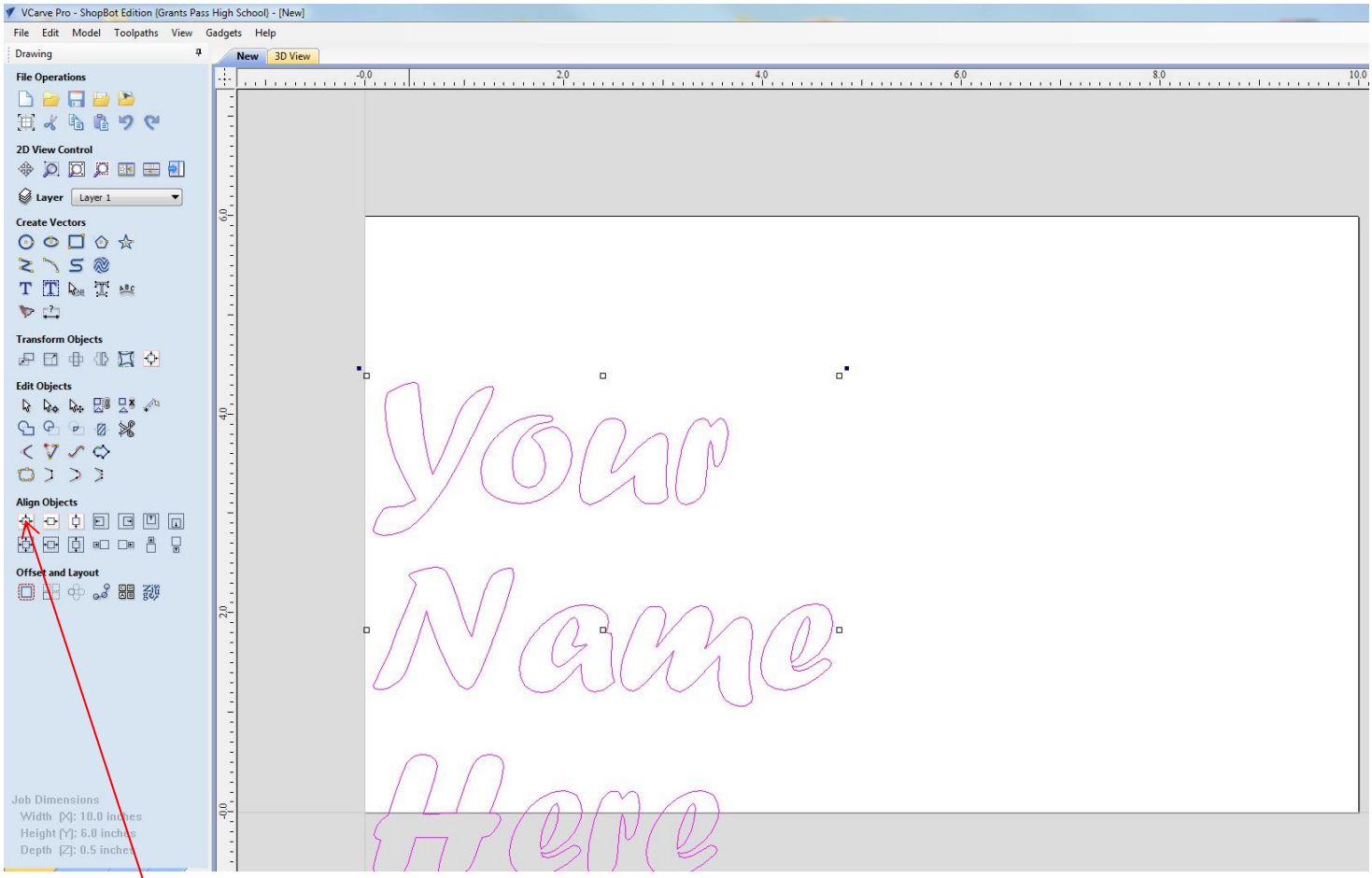


You need to type your name (or whatever you would like to see) in the Text box. Use the enter key when entering your text so that every word is on its own line.

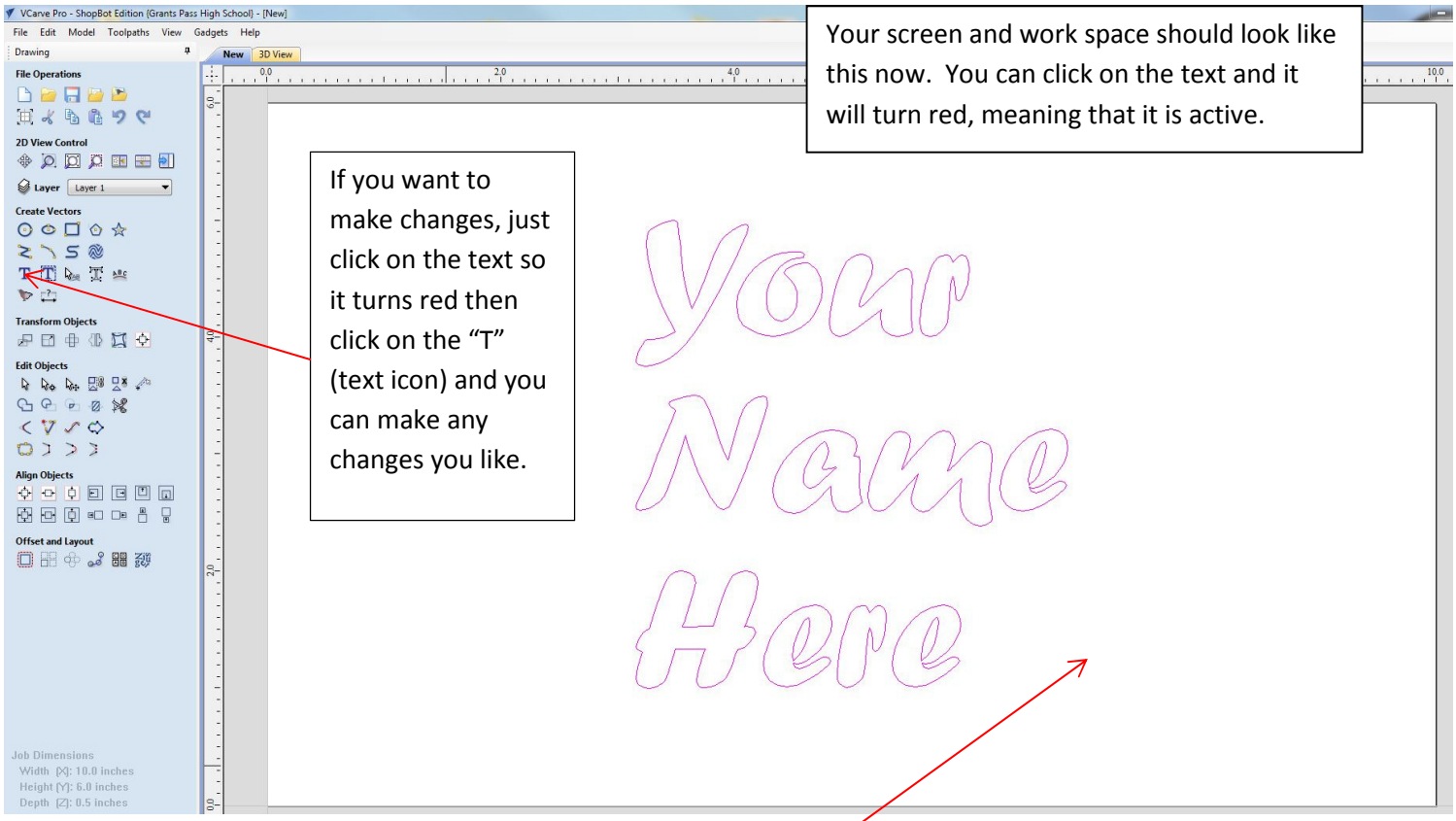
Choose a font that you like from the available fonts board.

We are going to use a "Text Height" of 1.0 inch. If your name is too big we will need to make some changes so it will fit.

Now you can click on the "Apply" button, then click on the "Close" button.



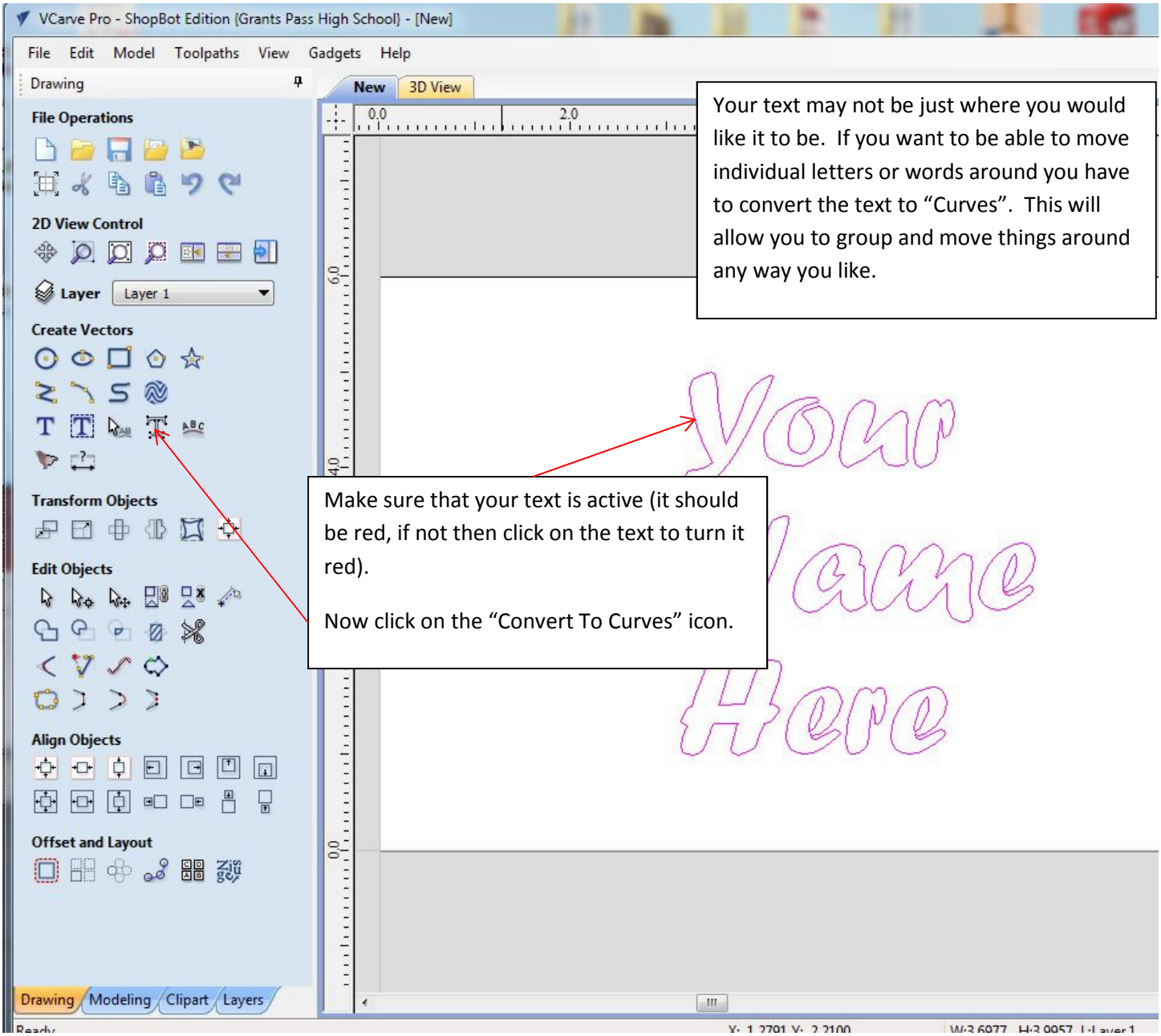
Your text is going to be in a weird place so we need to center it on your material. Click on the “Center on Material” button under “Align Objects” to place your text in the middle of the material.

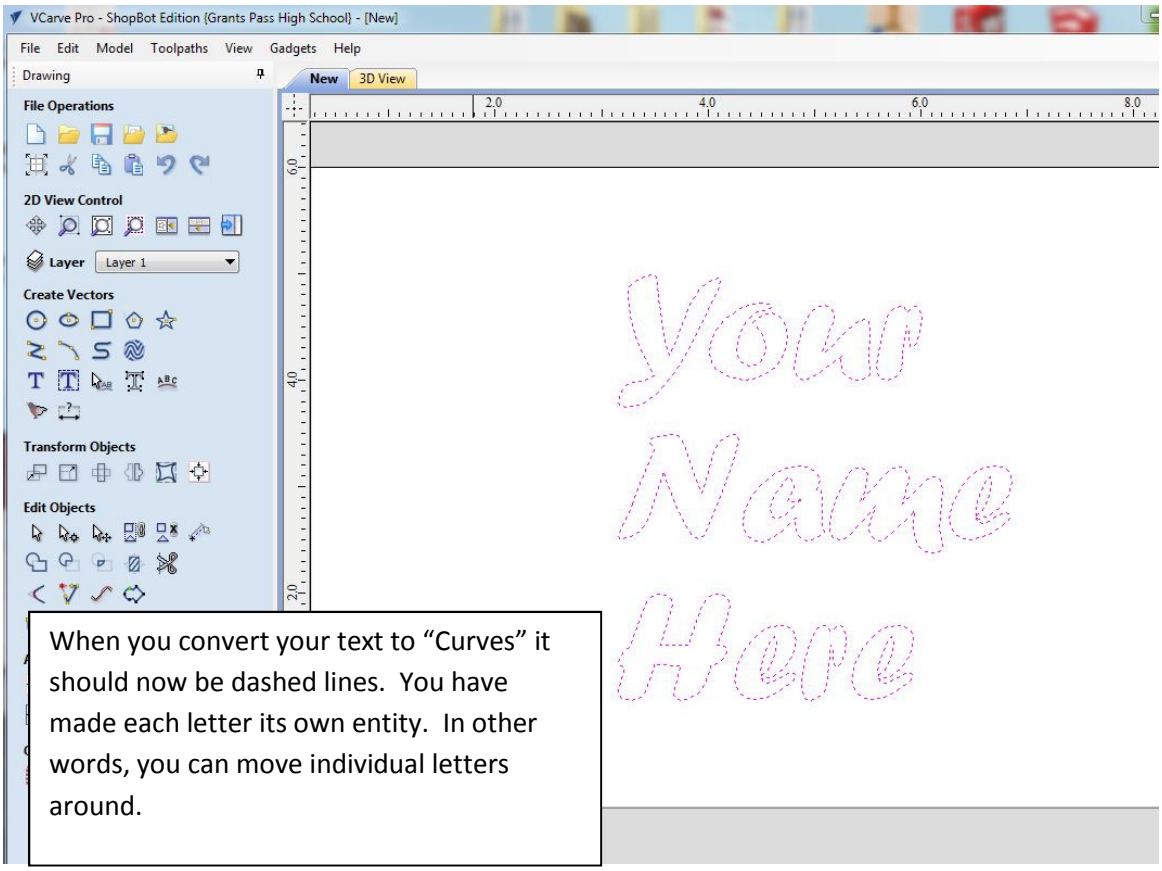


Your screen and work space should look like this now. You can click on the text and it will turn red, meaning that it is active.

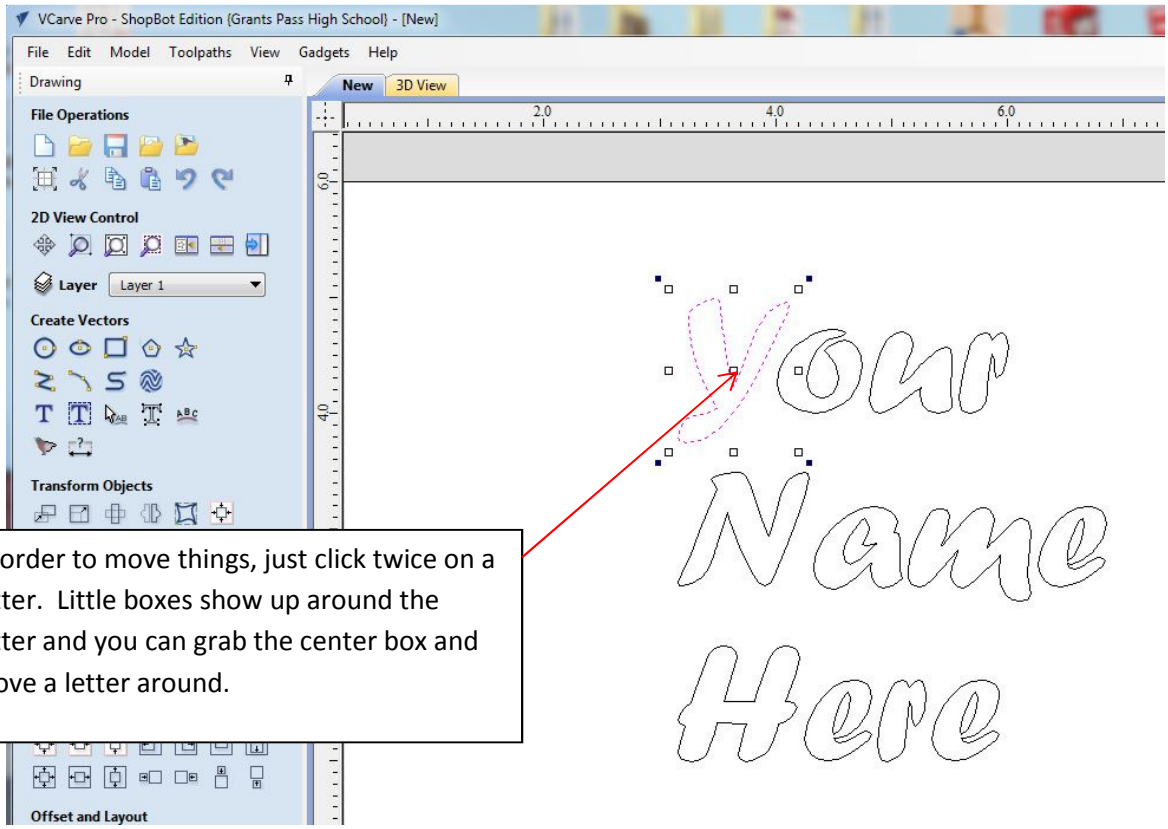
If you want to make changes, just click on the text so it turns red then click on the "T" (text icon) and you can make any changes you like.

Clicking anywhere on your material outside of the text turns it black and makes it inactive.

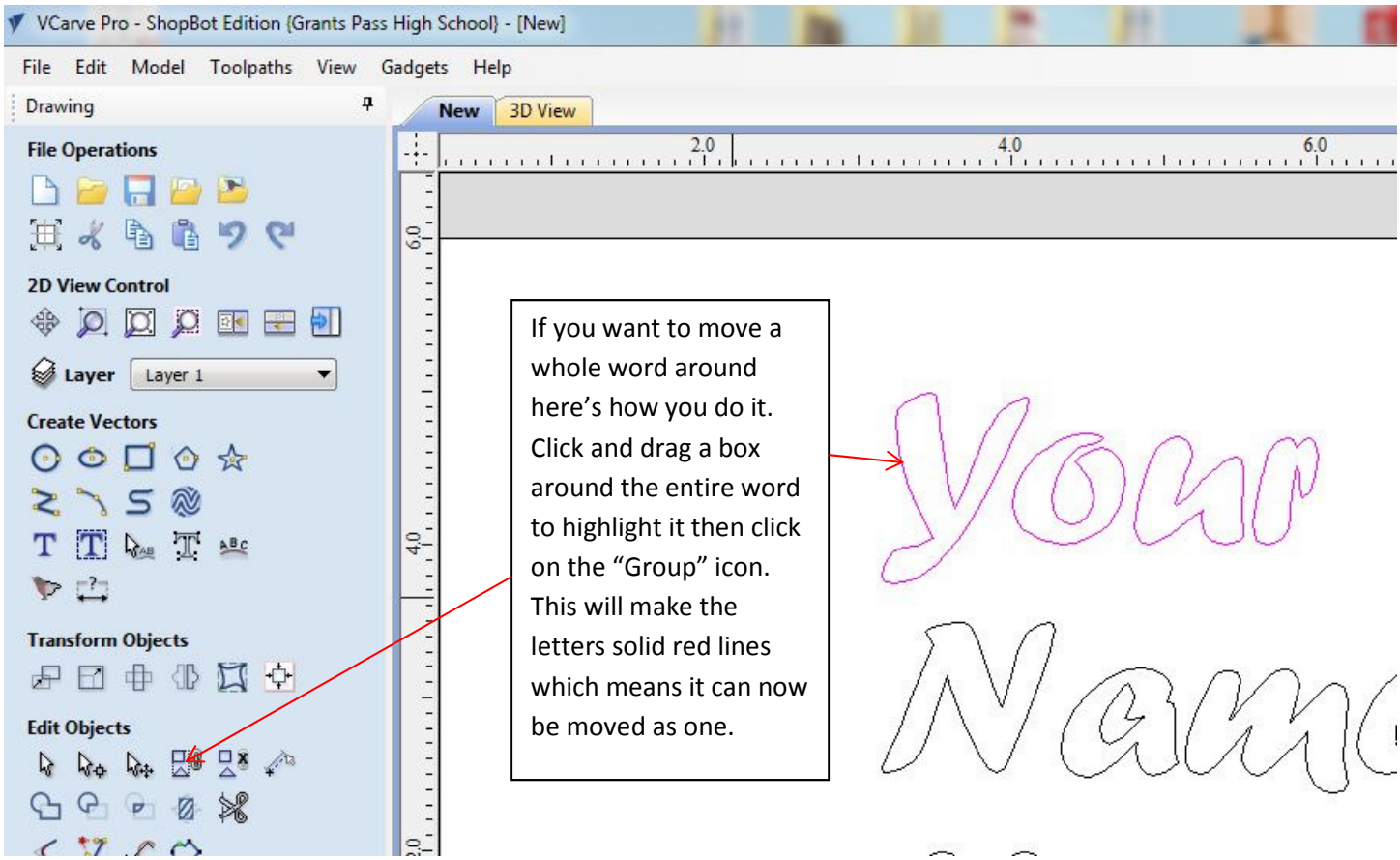

VCarve Pro - ShopBot Edition {Grants Pass High School} - [New]
File Edit Model Toolpaths View Gadgets Help
Drawing
File Operations
2D View Control
Layer
Layer 1
Create Vectors
Transform Objects
Edit Objects
Align Objects
Offset and Layout
Drawing Modeling Clipart Layers
New
3D View
Your
Name
Here
Your text may not be just where you would like it to be. If you want to be able to move individual letters or words around you have to convert the text to "Curves". This will allow you to group and move things around any way you like.
Make sure that your text is active (it should be red, if not then click on the text to turn it red).
Now click on the "Convert To Curves" icon.

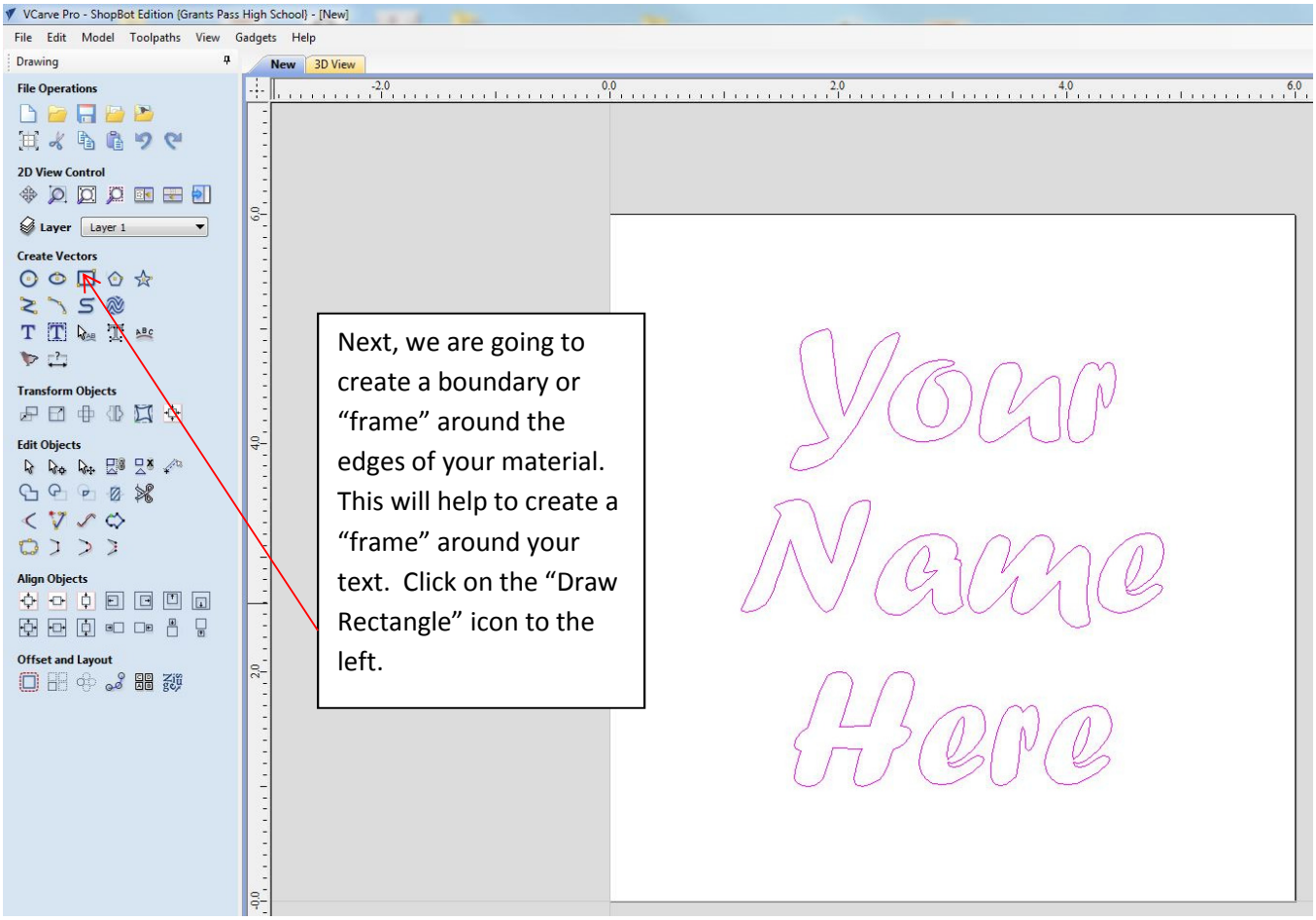


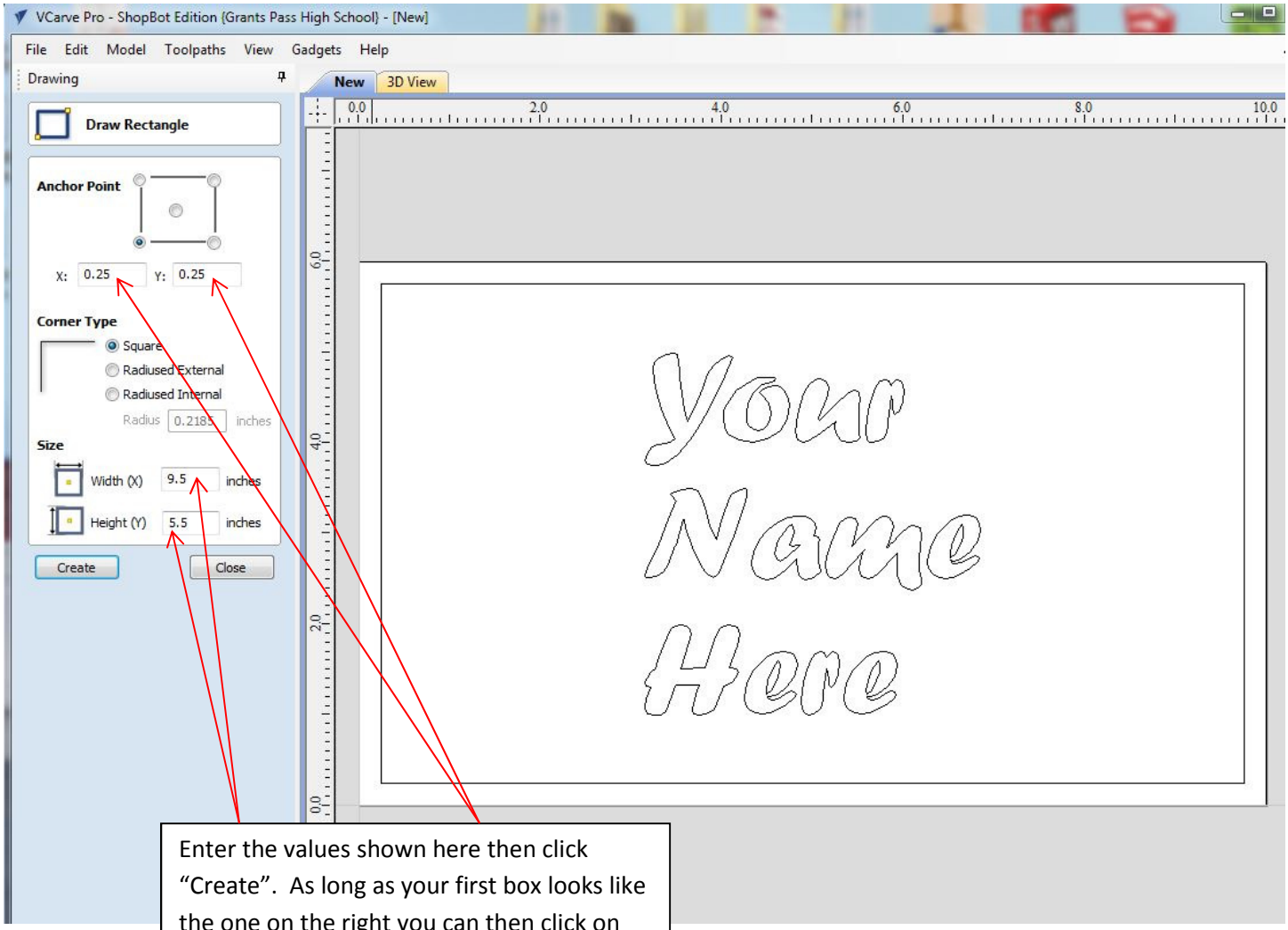
When you convert your text to “Curves” it should now be dashed lines. You have made each letter its own entity. In other words, you can move individual letters around.



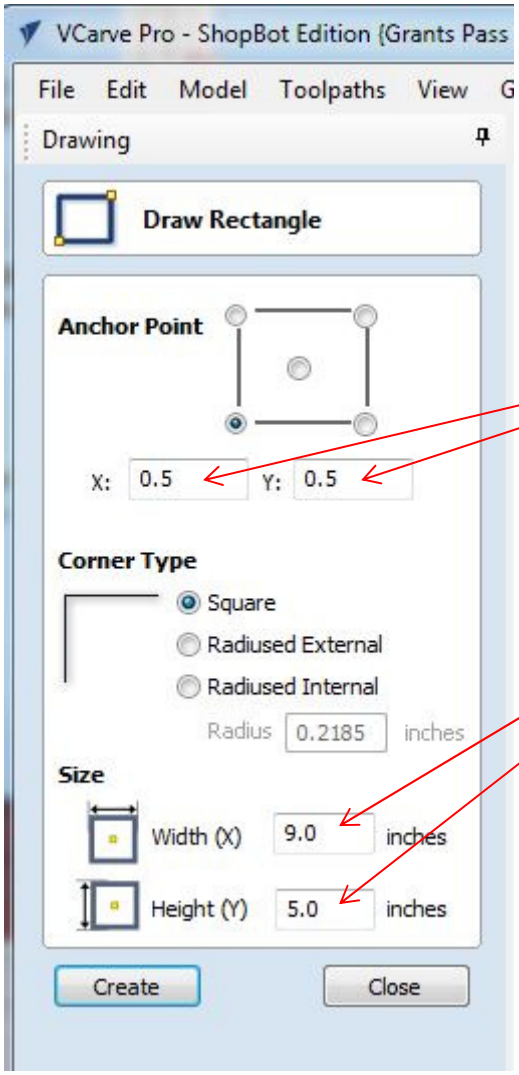
In order to move things, just click twice on a letter. Little boxes show up around the letter and you can grab the center box and move a letter around.


VCarve Pro - ShopBot Edition {Grants Pass High School} - [New]
File Edit Model Toolpaths View Gadgets Help
Drawing
File Operations
2D View Control
Layer
Layer 1
Create Vectors
Transform Objects
Edit Objects
New
3D View
If you want to move a whole word around here's how you do it. Click and drag a box around the entire word to highlight it then click on the "Group" icon. This will make the letters solid red lines which means it can now be moved as one.
Your
Nam

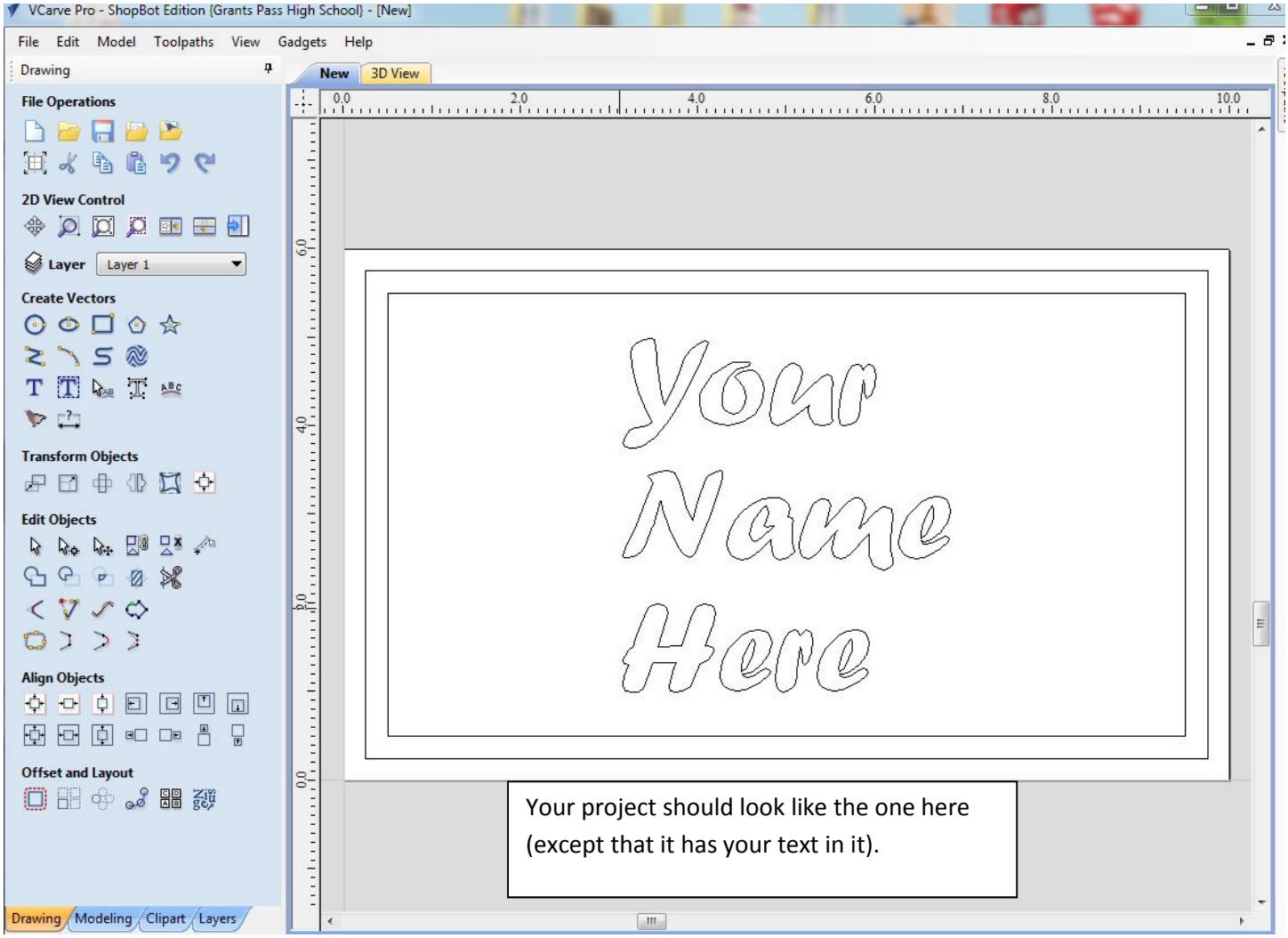

VCarve Pro - ShopBot Edition {Grants Pass High School} - [New]
File Edit Model Toolpaths View Gadgets Help
Drawing
File Operations
2D View Control
Layer
Layer 1
Create Vectors
Transform Objects
Edit Objects
Align Objects
Offset and Layout
New
3D View
Next, we are going to create a boundary or "frame" around the edges of your material. This will help to create a "frame" around your text. Click on the "Draw Rectangle" icon to the left.
Your
Name
Here

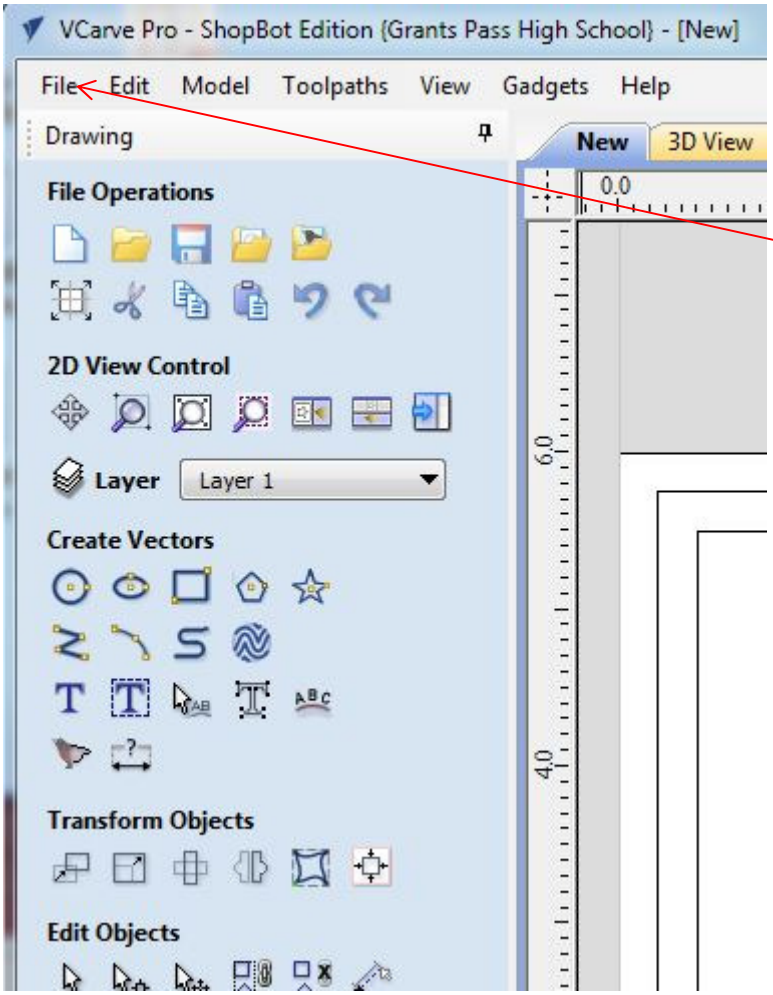


Enter the values shown here then click "Create". As long as your first box looks like the one on the right you can then click on "Close".

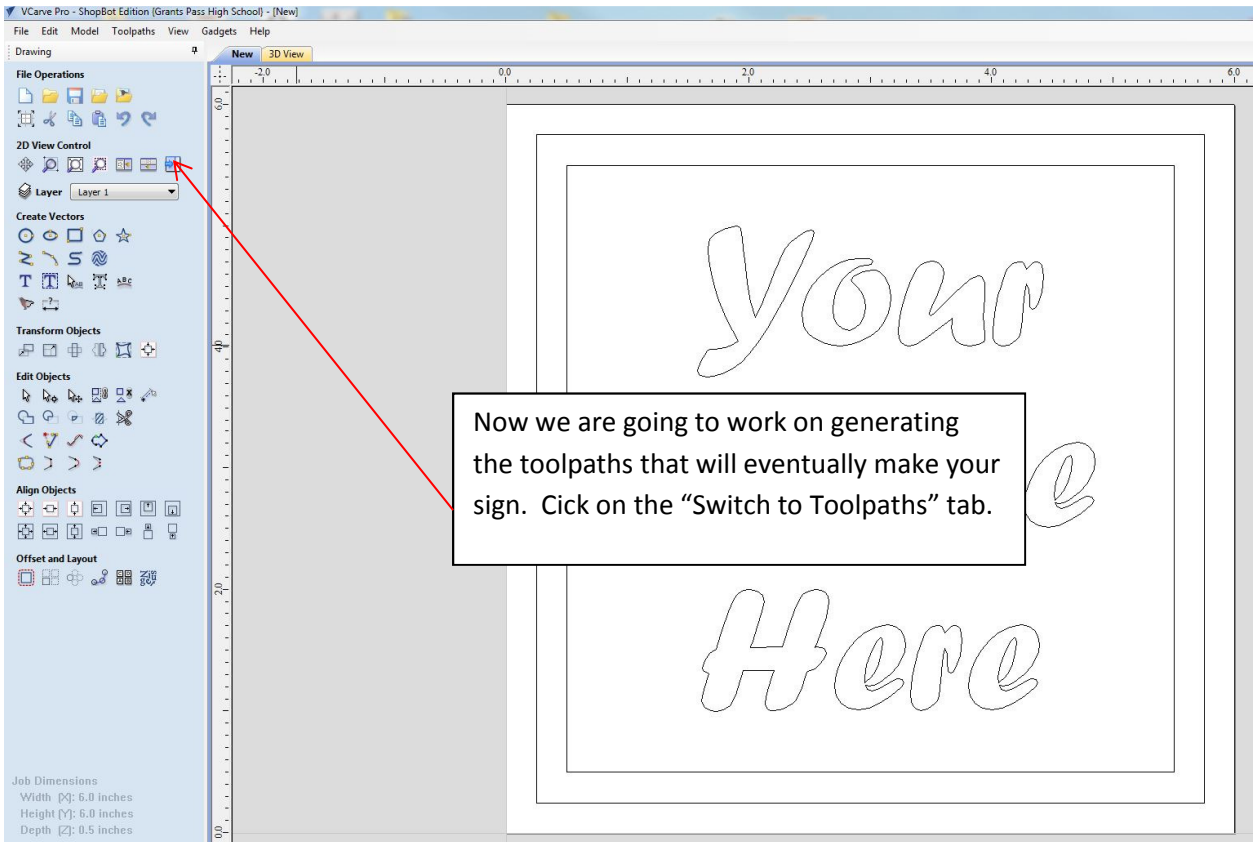


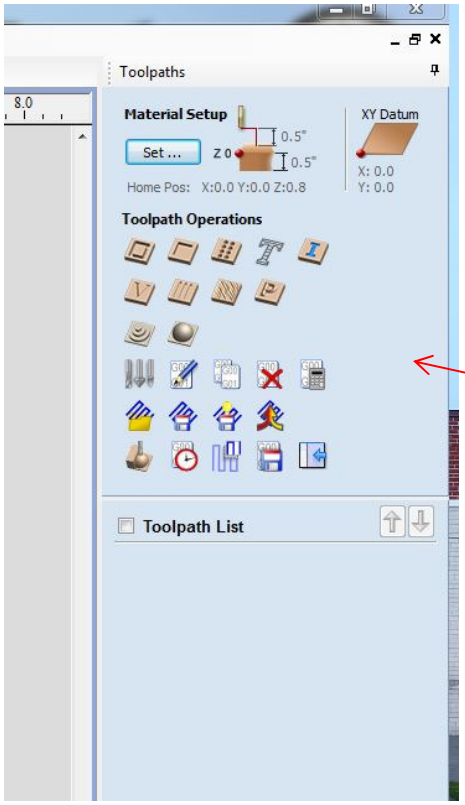
We are going to create a second box that is a quarter of an inch smaller than the first one all the way around. This will define the "frame" that we will be cutting. Enter all of the values shown here then click "Create" then "Close".


VCarve Pro - ShopBot Edition (Grants Pass High School) - [New]
File Edit Model Toolpaths View Gadgets Help
Drawing
File Operations
2D View Control
Layer
Layer 1
Create Vectors
Transform Objects
Edit Objects
Align Objects
Offset and Layout
Drawing Modeling Clipart Layers
New
3D View
Your
Name
Here
Your project should look like the one here
(except that it has your text in it).

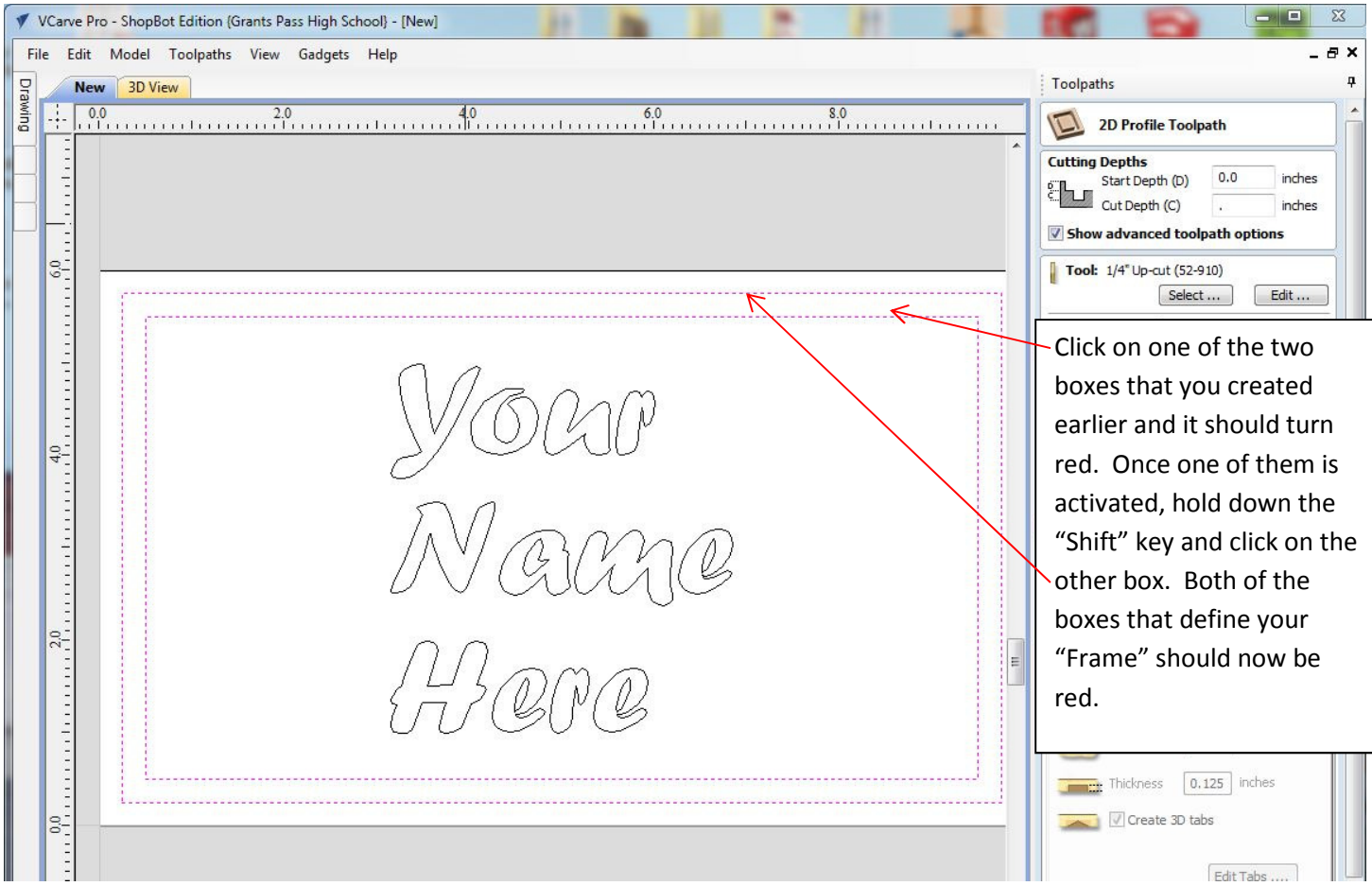


Before going any further you should save your drawing. Click on the "File" button in the upper left corner of the window then move down and click on the "Save As" option. Save this file on to your desktop or a flash drive, Use your first name and last initial as the filename.

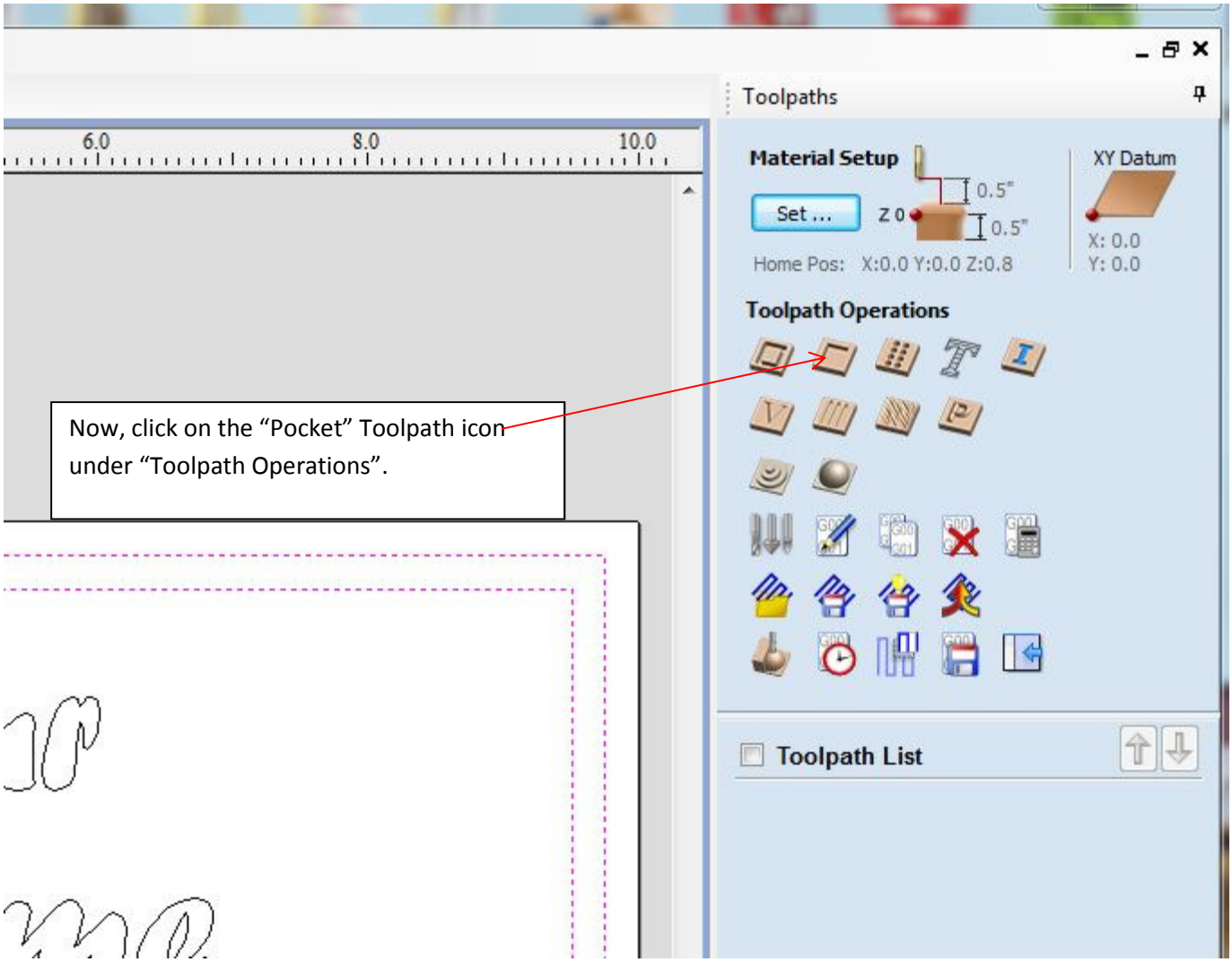


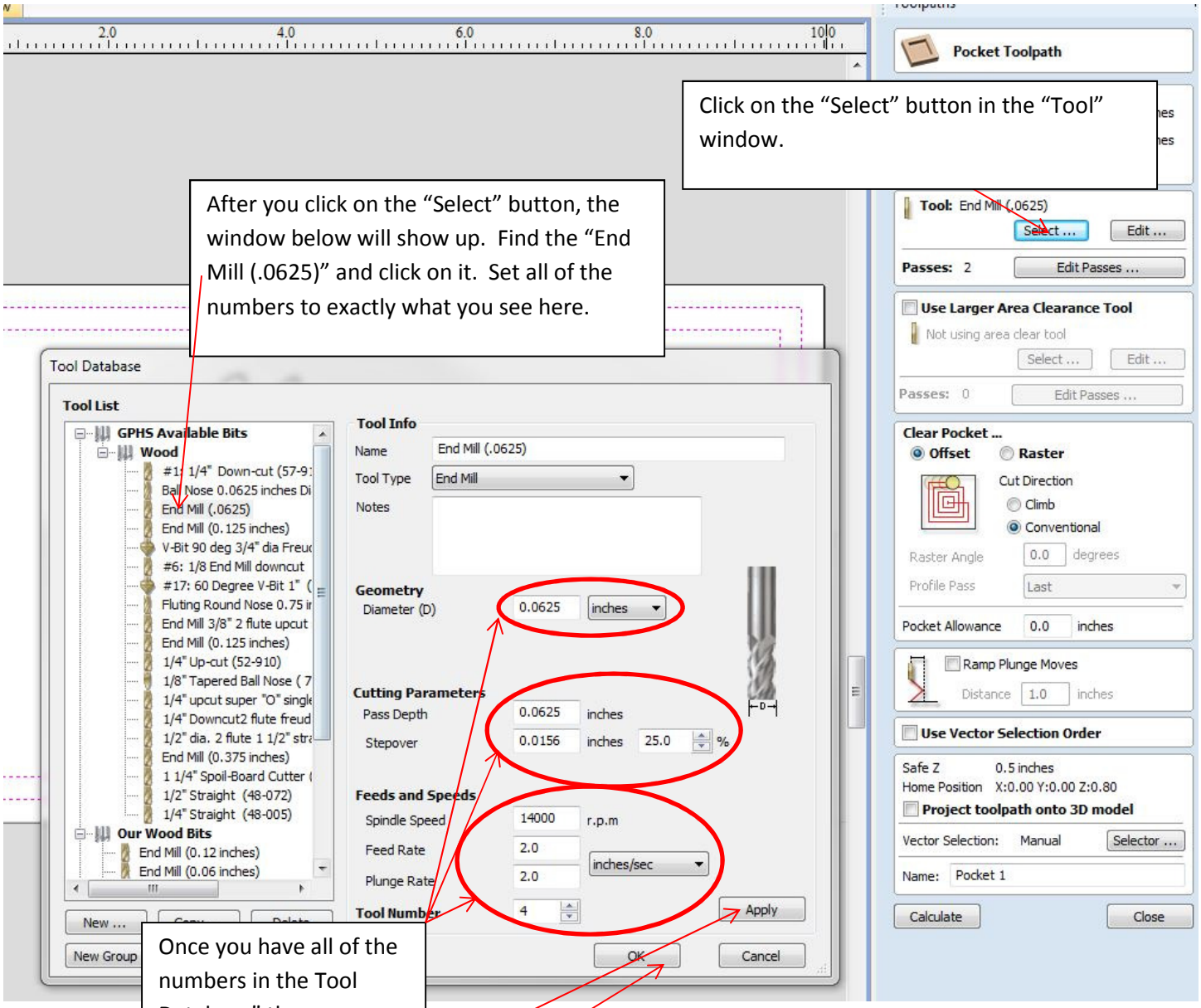


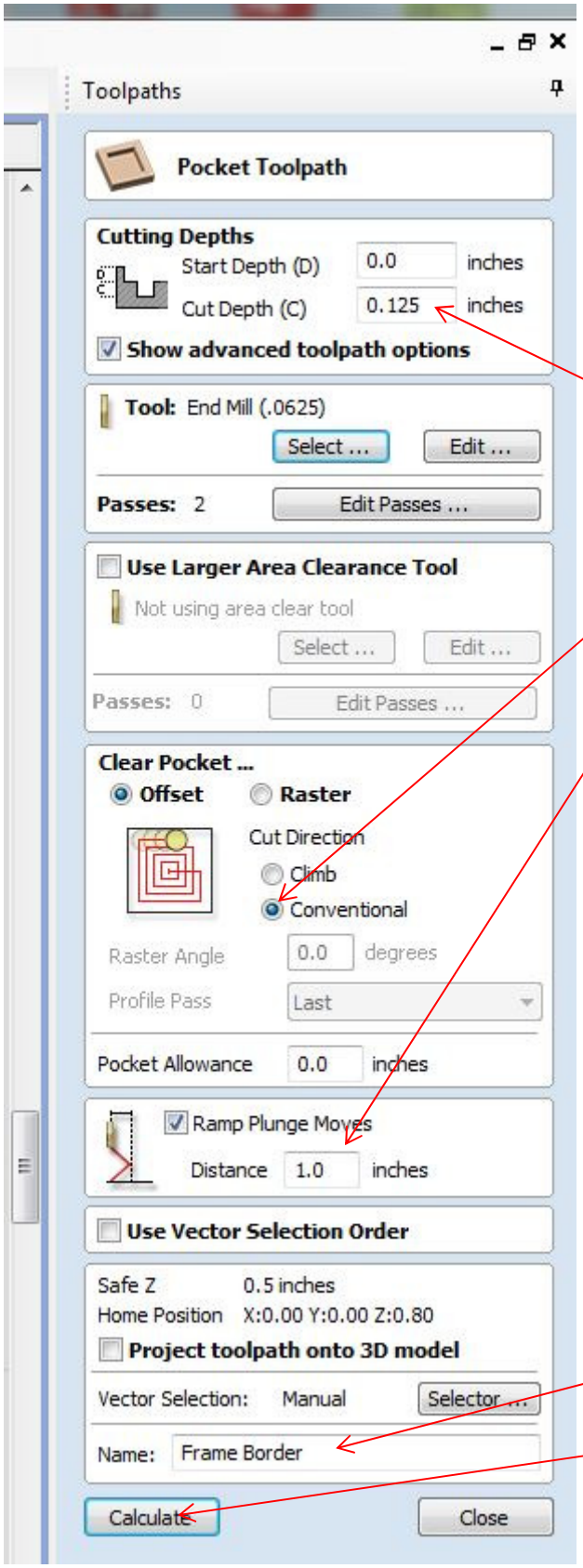
The toolbar that was on the left before has now been replaced with the “Toolpaths” toolbar on the right. This is where we will generate the “G Code” that will instruct the machine just how to go about cutting out your sign.



Click on one of the two boxes that you created earlier and it should turn red. Once one of them is activated, hold down the "Shift" key and click on the other box. Both of the boxes that define your "Frame" should now be red.

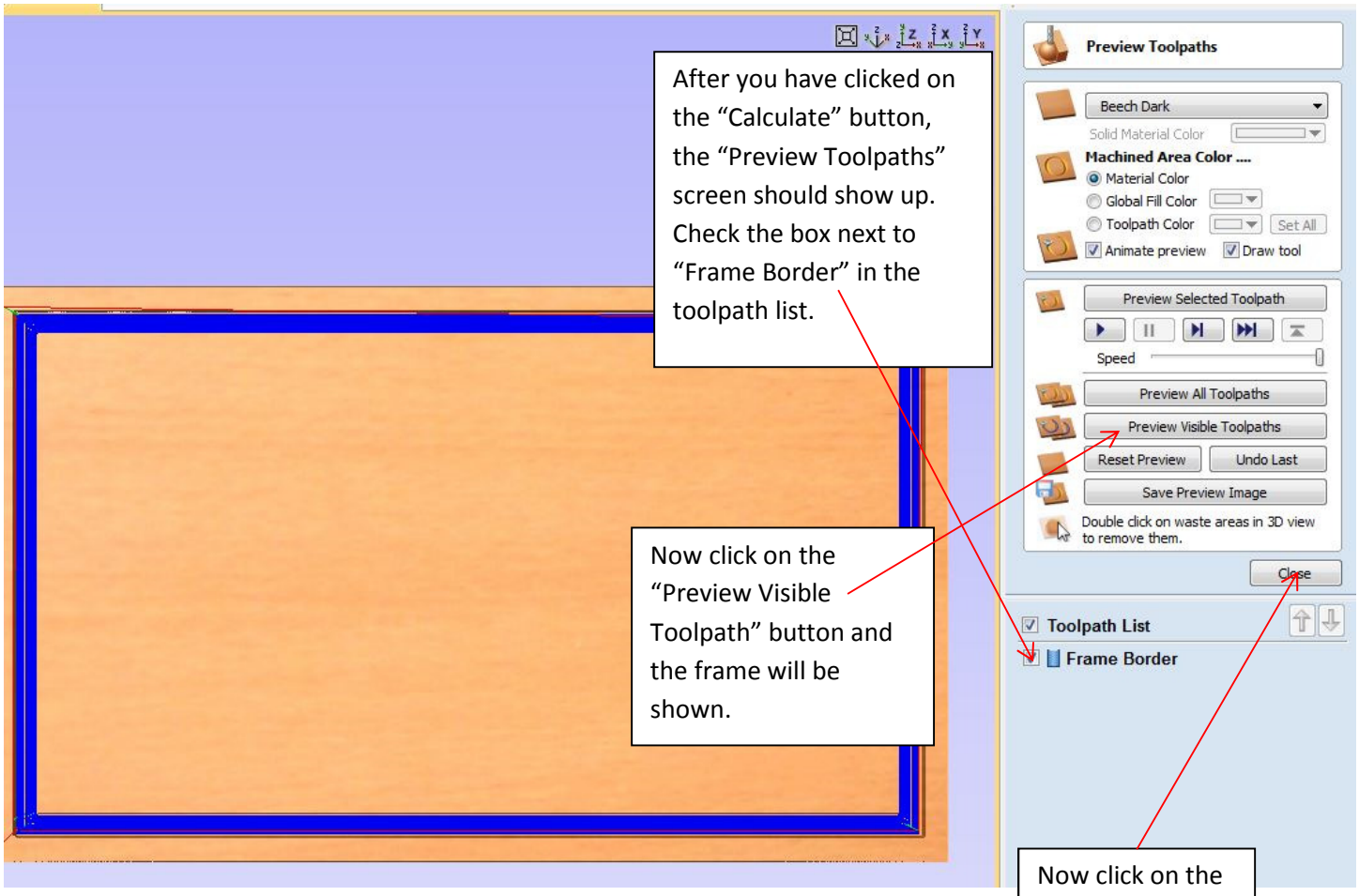

Toolpaths
Material Setup
Set ...
Z 0
0.5"
0.5"
XY Datum
X: 0.0
Y: 0.0
Home Pos: X:0.0 Y:0.0 Z:0.8
Toolpath Operations
Toolpath List
6.0
8.0
10.0
Now, click on the “Pocket” Toolpath icon under “Toolpath Operations”.

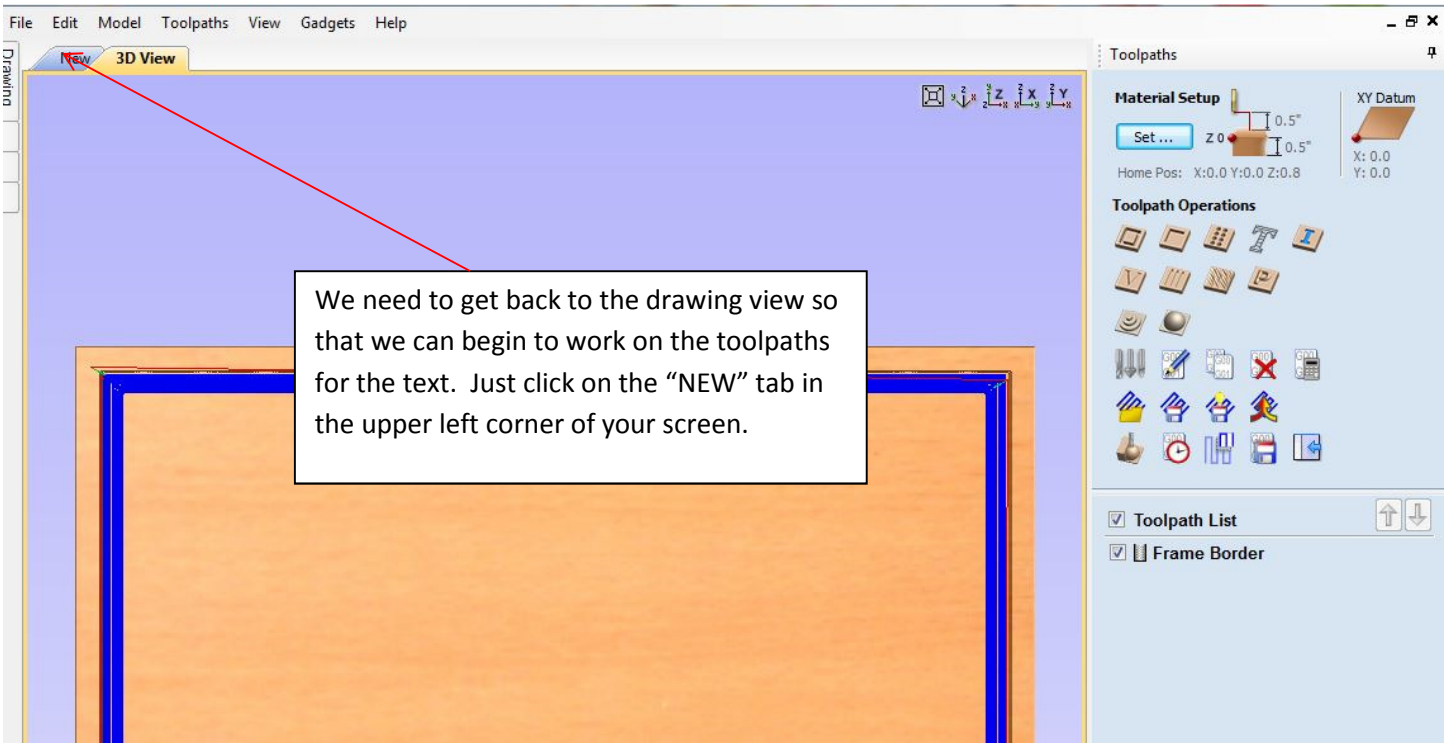

Click on the “Select” button in the “Tool” window.
After you click on the “Select” button, the window below will show up. Find the “End Mill (.0625)” and click on it. Set all of the numbers to exactly what you see here.
Once you have all of the numbers in the Tool Database” the same as you see here, click on the “Apply” button to save all of your settings then click on “OK”.
Pocket Toolpath
Tool: End Mill (.0625)
Select ...
Edit ...
Passes: 2
Edit Passes ...
Use Larger Area Clearance Tool
Not using area clear tool
Clear Pocket ...
Offset
Raster
Cut Direction
Climb
Conventional
Raster Angle
Profile Pass
Pocket Allowance
Ramp Plunge Moves
Distance
Use Vector Selection Order
Safe Z
Home Position
Project toolpath onto 3D model
Vector Selection:
Manual
Selector ...
Name:
Pocket 1
Calculate
Close
Tool Database
Tool List
GPHS Available Bits
Wood
End Mill (.0625)
End Mill (0.125 inches)
#6: 1/8 End Mill downcut
End Mill 3/8" 2 flute upcut
End Mill (0.125 inches)
1/4" Up-cut (52-910)
1/4" upcut super "O" single
1/4" Downcut2 flute freud
End Mill (0.375 inches)
1/2" Straight (48-072)
1/4" Straight (48-005)
Our Wood Bits
End Mill (0.12 inches)
End Mill (0.06 inches)
New ...
New Group
Tool Info
Name
End Mill (.0625)
Tool Type
End Mill
Notes
Geometry
Diameter (D)
0.0625
inches
Cutting Parameters
Pass Depth
0.0625
inches
Stepover
0.0156
inches
25.0
%
Feeds and Speeds
Spindle Speed
14000
r.p.m
Feed Rate
2.0
Plunge Rate
2.0
inches/sec
Tool Number
4
Apply
OK
Cancel

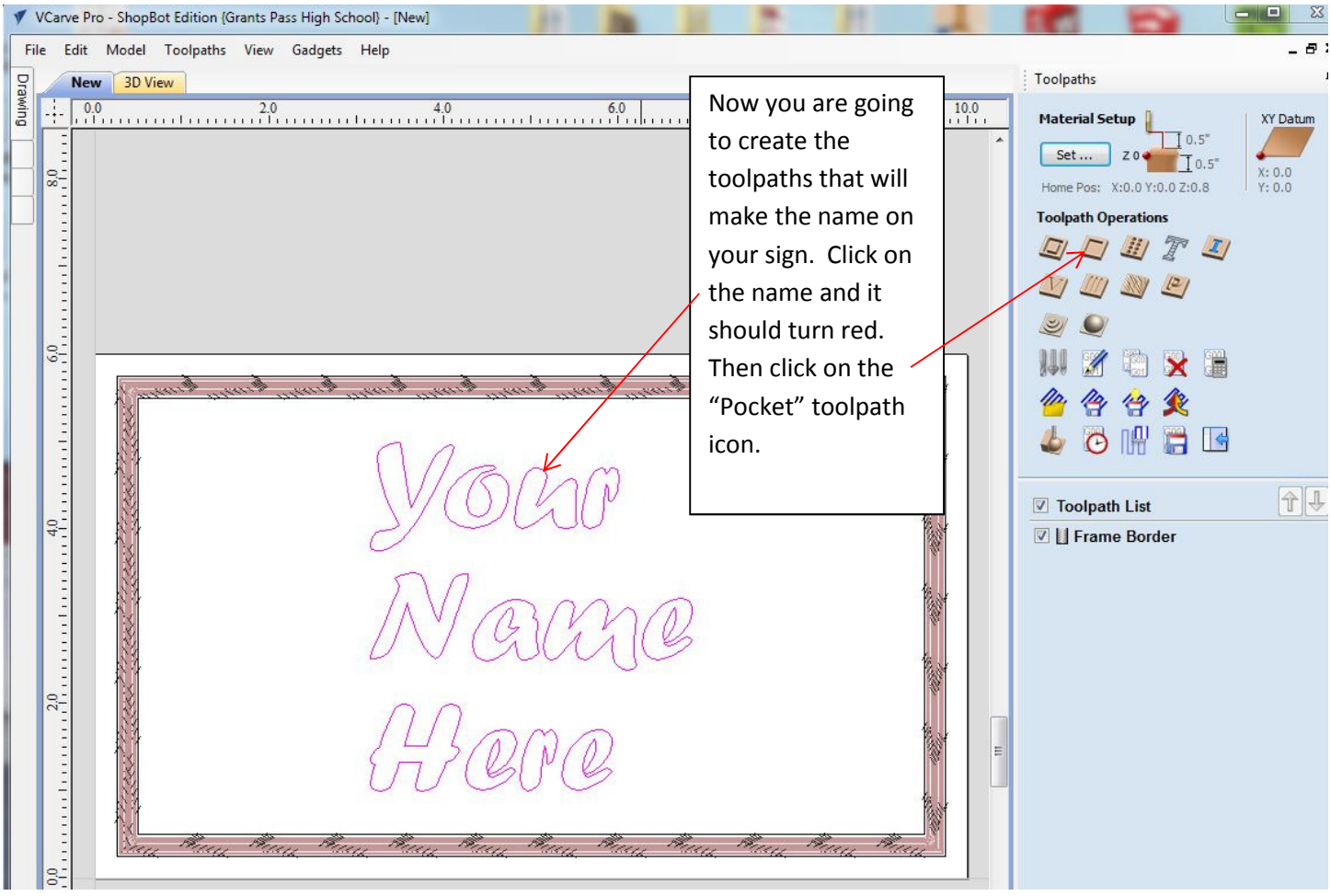


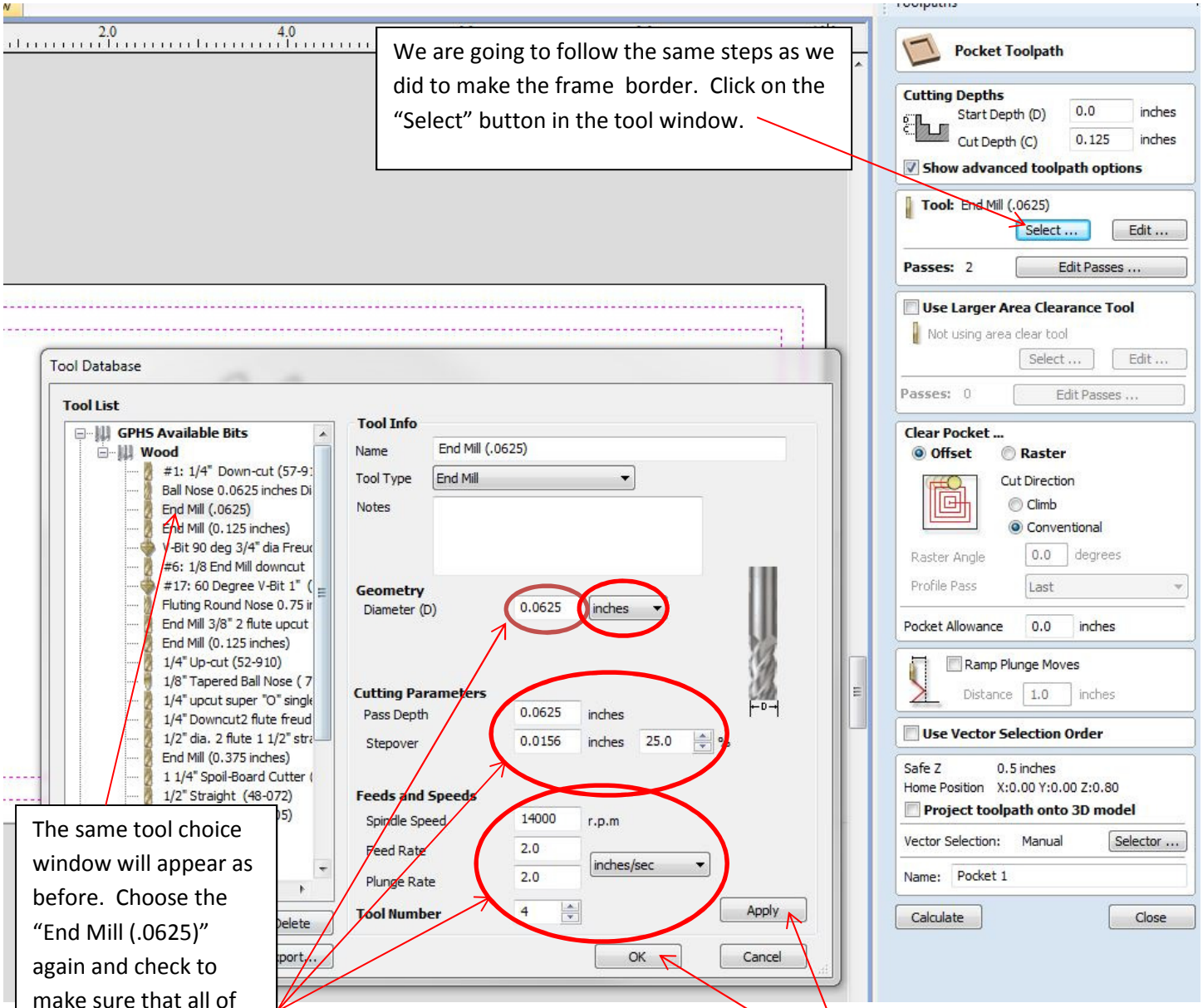
Once you closed the “Tool Database” window, check that the “Pocket Toolpath” window has the same settings as you see here.

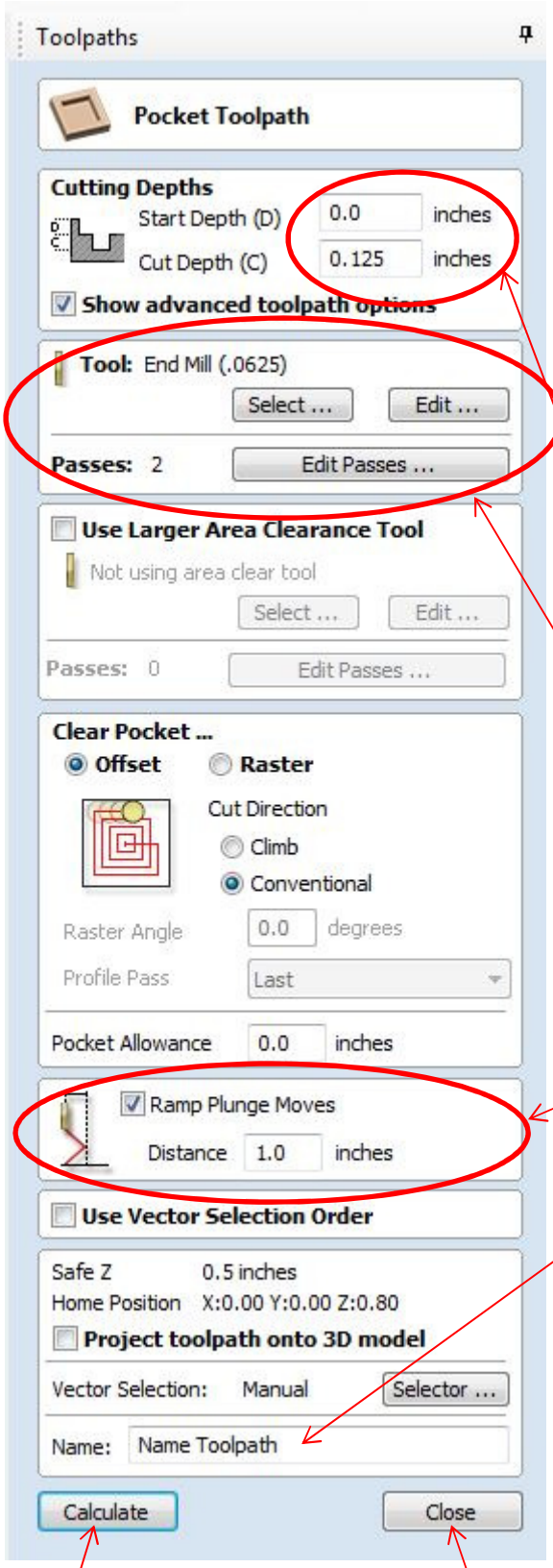
Give the file the name you see here and click on the “Calculate” button.


After you have clicked on the “Calculate” button, the “Preview Toolpaths” screen should show up. Check the box next to “Frame Border” in the toolpath list.
Now click on the “Preview Visible Toolpath” button and the frame will be shown.
Now click on the “Close” button to exit this screen.
Preview Toolpaths
Beech Dark
Solid Material Color
Machined Area Color ....
Material Color
Global Fill Color
Toolpath Color
Set All
Animate preview
Draw tool
Preview Selected Toolpath
Speed
Preview All Toolpaths
Preview Visible Toolpaths
Reset Preview
Undo Last
Save Preview Image
Double click on waste areas in 3D view to remove them.
Close
Toolpath List
Frame Border


File Edit Model Toolpaths View Gadgets Help
New
3D View
Drawing
Toolpaths
Material Setup
Set ...
Z 0
0.5"
0.5"
XY Datum
X: 0.0
Y: 0.0
Home Pos: X:0.0 Y:0.0 Z:0.8
Toolpath Operations
Toolpath List
Frame Border
We need to get back to the drawing view so that we can begin to work on the toolpaths for the text. Just click on the "NEW" tab in the upper left corner of your screen.

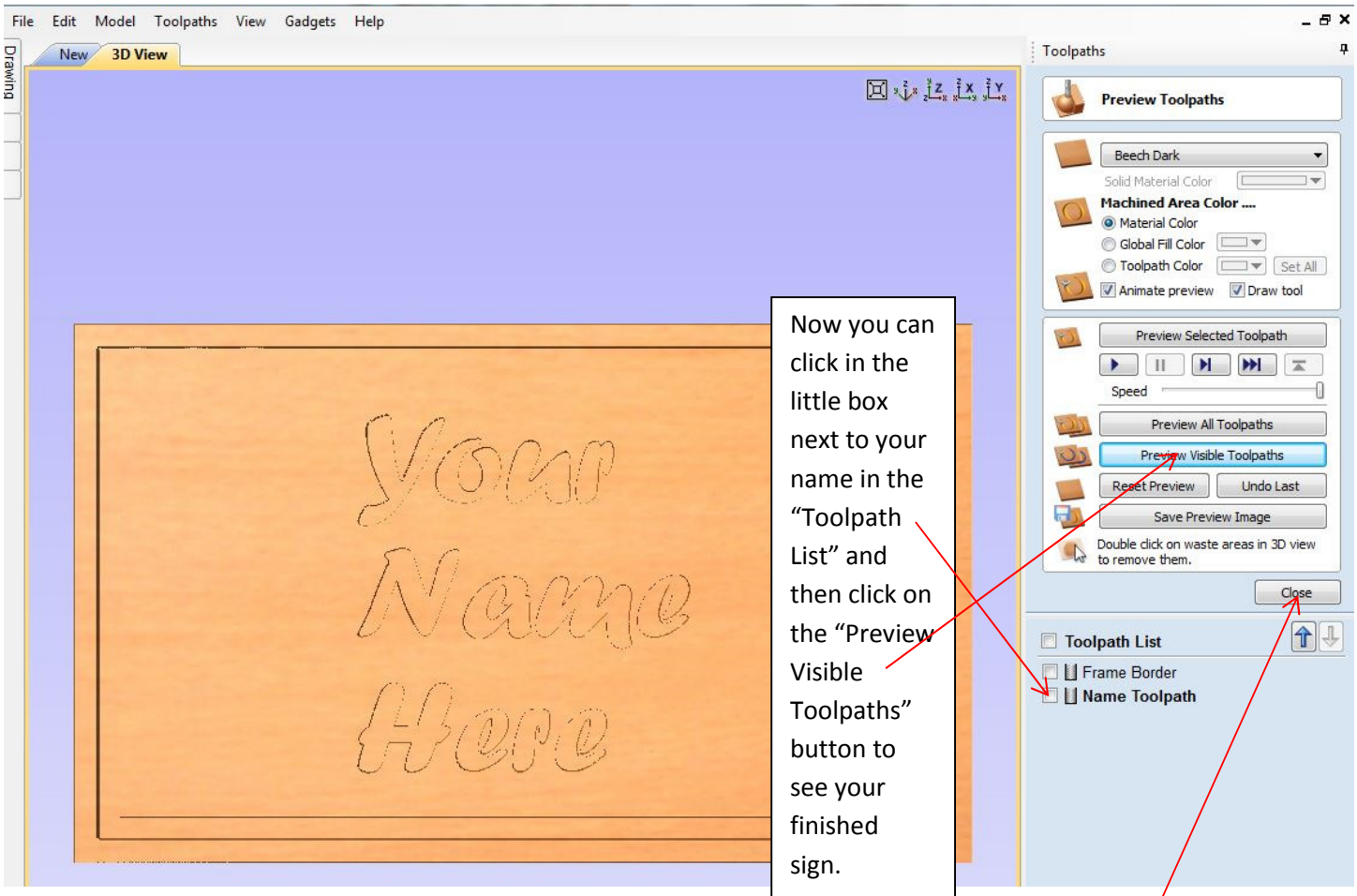

VCarve Pro - ShopBot Edition (Grants Pass High School) - [New]
File Edit Model Toolpaths View Gadgets Help
New
3D View
Drawing
Toolpaths
Material Setup
Set ...
Z 0
0.5"
0.5"
XY Datum
X: 0.0
Y: 0.0
Home Pos: X:0.0 Y:0.0 Z:0.8
Toolpath Operations
Toolpath List
Frame Border
Your Name Here
Now you are going to create the toolpaths that will make the name on your sign. Click on the name and it should turn red. Then click on the "Pocket" toolpath icon.


We are going to follow the same steps as we did to make the frame border. Click on the "Select" button in the tool window.
Pocket Toolpath
Cutting Depths
Start Depth (D) 0.0 inches
Cut Depth (C) 0.125 inches
Show advanced toolpath options
Tool: End Mill (.0625)
Select ...
Edit ...
Passes: 2
Edit Passes ...
Use Larger Area Clearance Tool
Not using area clear tool
Select ...
Edit ...
Passes: 0
Edit Passes ...
Clear Pocket ...
Offset
Raster
Cut Direction
Climb
Conventional
Raster Angle 0.0 degrees
Profile Pass Last
Pocket Allowance 0.0 inches
Ramp Plunge Moves
Distance 1.0 inches
Use Vector Selection Order
Safe Z 0.5 inches
Home Position X:0.00 Y:0.00 Z:0.80
Project toolpath onto 3D model
Vector Selection: Manual
Selector ...
Name: Pocket 1
Calculate
Close
Tool Database
Tool List
GPHS Available Bits
Wood
#1: 1/4" Down-cut (57-9
Ball Nose 0.0625 inches Di
End Mill (.0625)
End Mill (0.125 inches)
V-Bit 90 deg 3/4" dia Freu
#6: 1/8 End Mill downcut
#17: 60 Degree V-Bit 1" (
Fluting Round Nose 0.75 i
End Mill 3/8" 2 flute upcut
End Mill (0.125 inches)
1/4" Up-cut (52-910)
1/8" Tapered Ball Nose (7
1/4" upcut super "O" singl
1/4" Downcut2 flute freud
1/2" dia. 2 flute 1 1/2" str
End Mill (0.375 inches)
1 1/4" Spoil-Board Cutter
1/2" Straight (48-072)
Delete
Import...
Tool Info
Name End Mill (.0625)
Tool Type End Mill
Notes
Geometry
Diameter (D) 0.0625 inches
Cutting Parameters
Pass Depth 0.0625 inches
Stepover 0.0156 inches 25.0 %
Feeds and Speeds
Spindle Speed 14000 r.p.m
Feed Rate 2.0
Plunge Rate 2.0 inches/sec
Tool Number 4
Apply
OK
Cancel
The same tool choice window will appear as before. Choose the "End Mill (.0625)" again and check to make sure that all of the parameters are set to what you see here.
Once all of the boxes are the same as what you see here, click on "Apply" then click



Everything should look the same as it does here. The only thing you need to do is to give the toolpath a name. Give it your own name so we can find it later when we go out into the shop to cut your sign.

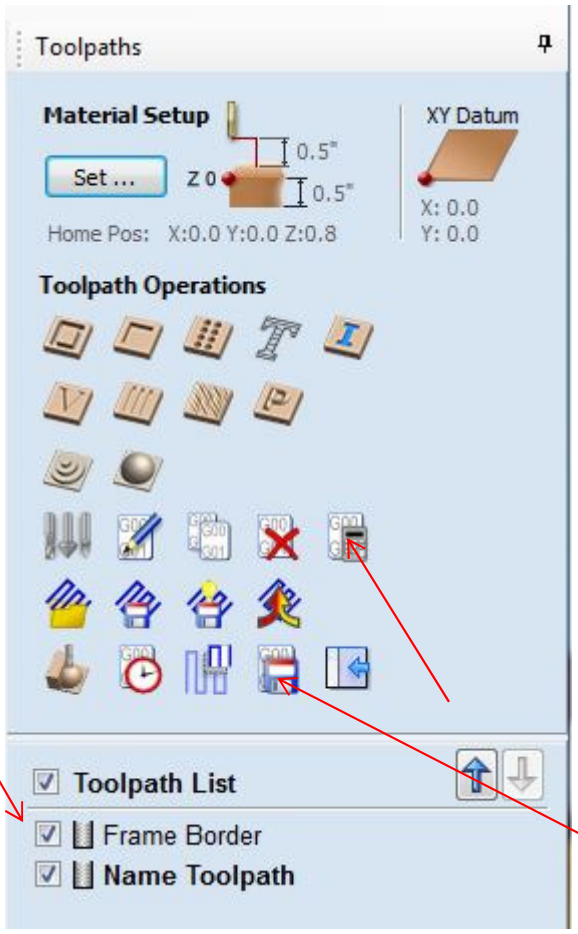
Now you can go ahead and click on the “Calculate” button then click on the “Close” button.



Now you can click in the little box next to your name in the "Toolpath List" and then click on the "Preview Visible Toolpaths" button to see your finished sign.

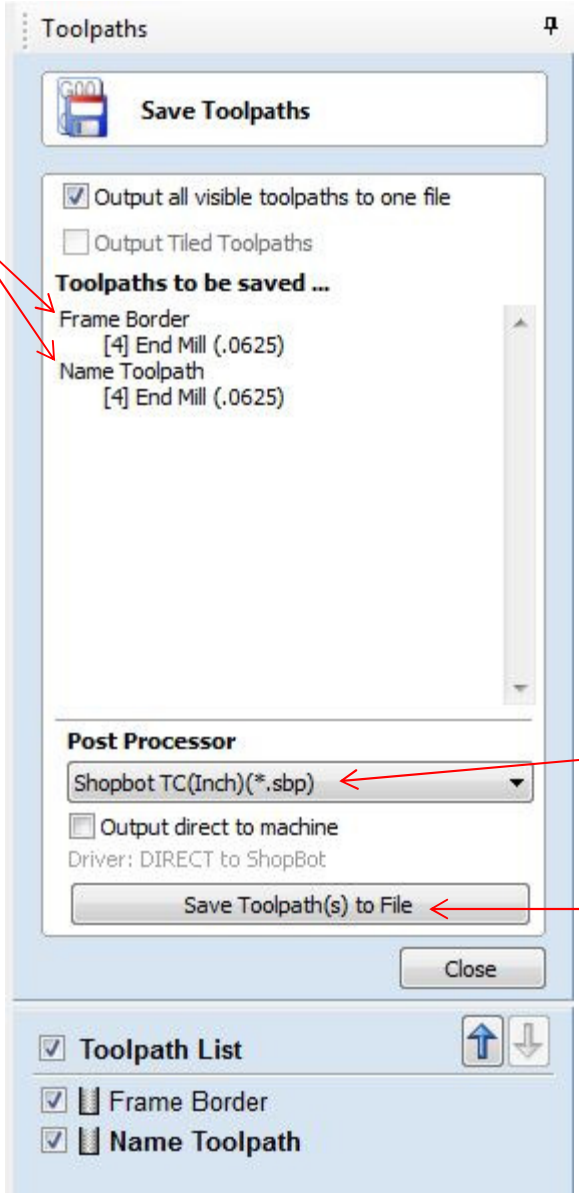
If everything looks good, click on the "Close" button to exit out of this window.

We need to save your toolpaths next so make sure the boxes are checked in the “Toolpath List”.



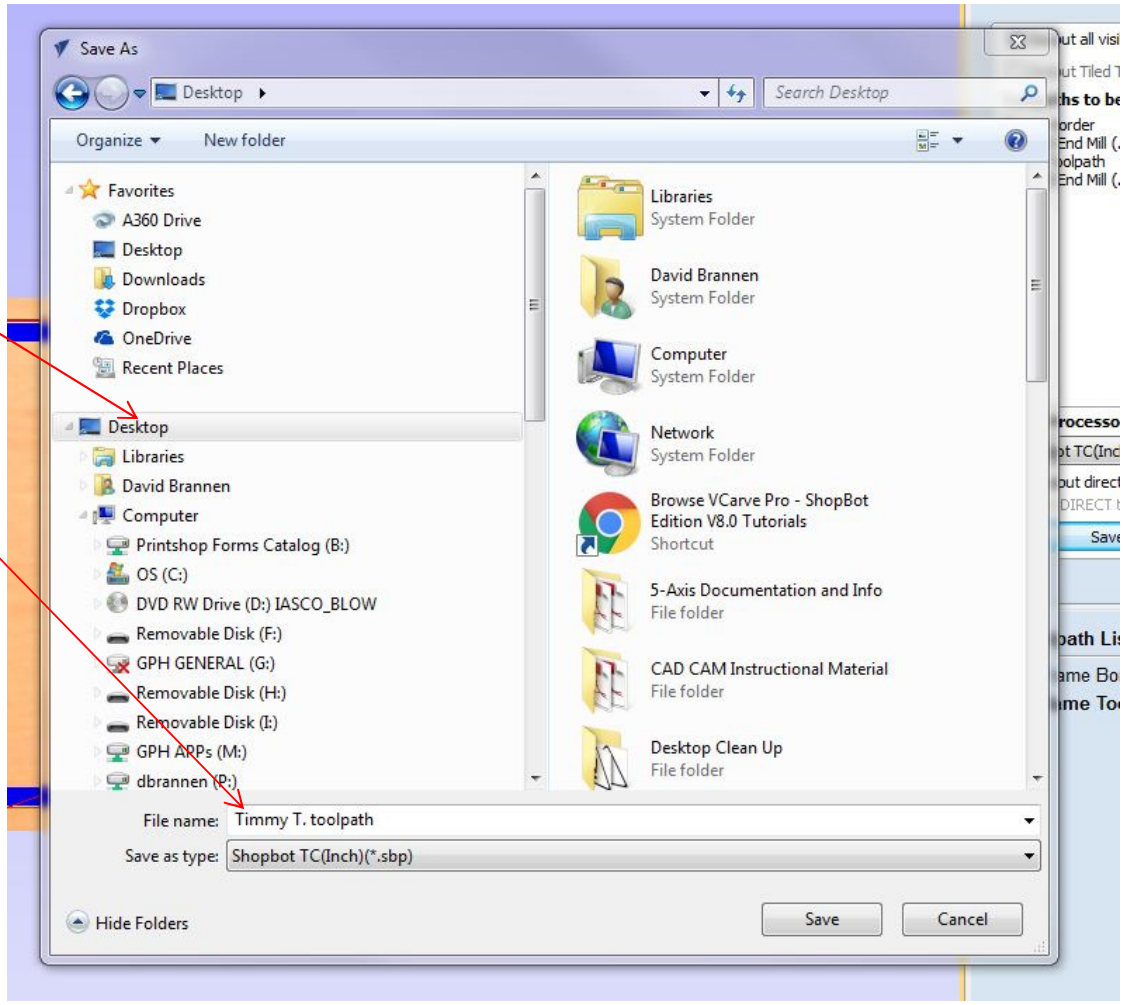
Once you have checked the boxes for each toolpath, click on the “Save Toolpath” icon.

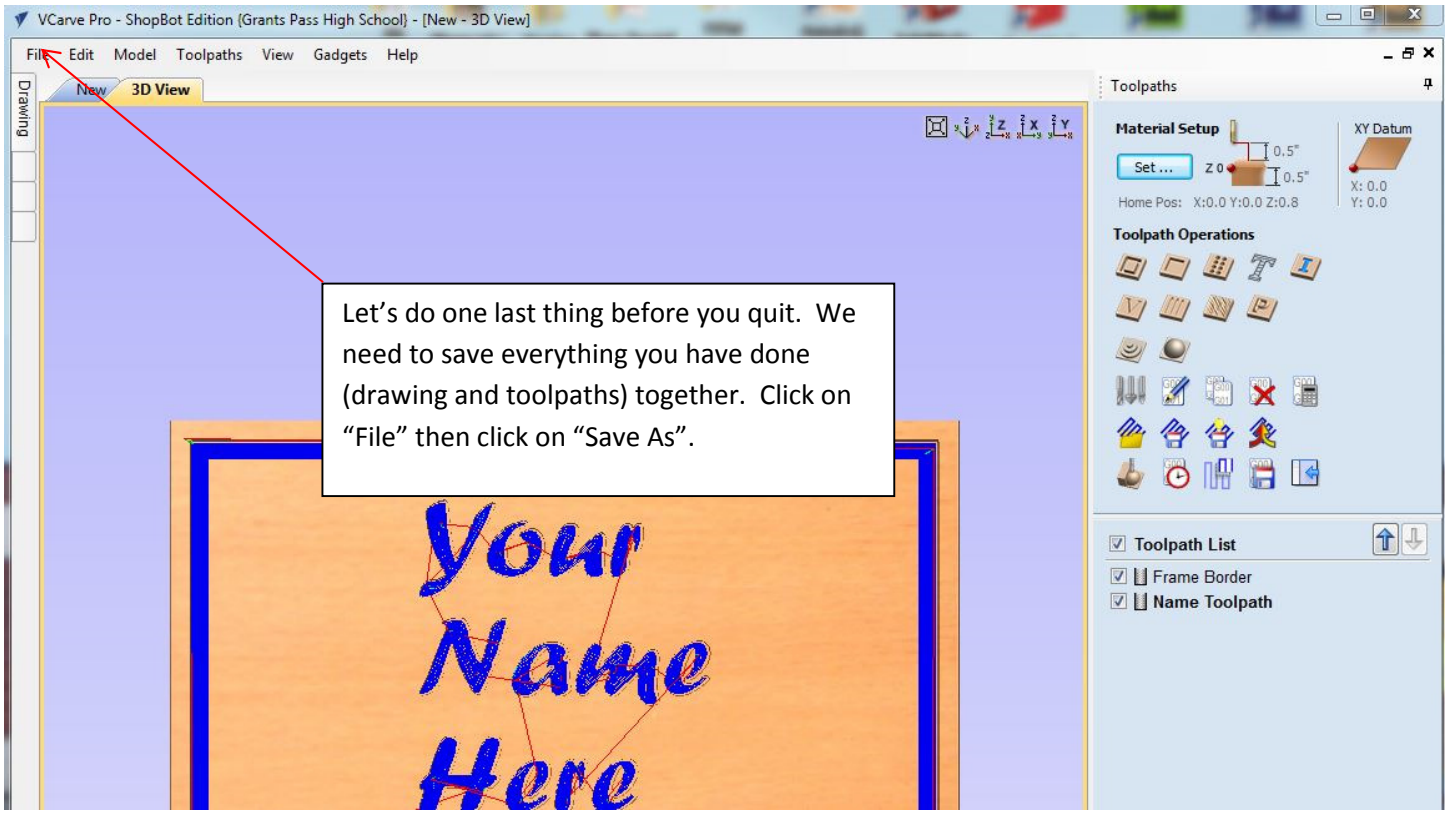
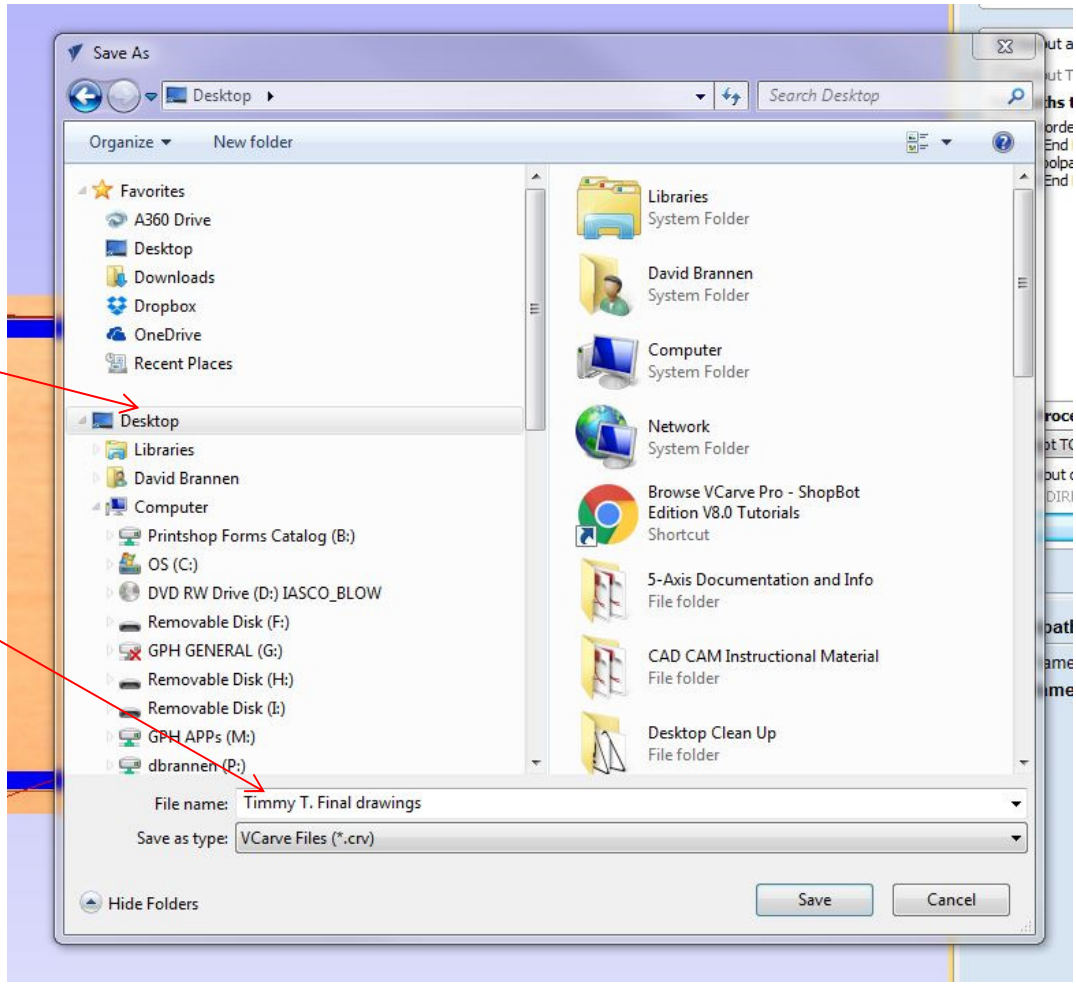
You should see the two toolpaths that you are saving in the window. The Frame VCarve and the Name toolpath.



Make sure that the "Post Processor" information matches what you see here and then click on the "Save Toolpaths to File" button.

Save it to your Desktop and name it with your first name, last initial and the word "Toolpath", just like you see here.




VCarve Pro - ShopBot Edition (Grants Pass High School) - [New - 3D View]
File Edit Model Toolpaths View Gadgets Help
Drawing
New
3D View
Let's do one last thing before you quit. We need to save everything you have done (drawing and toolpaths) together. Click on "File" then click on "Save As".
Your Name Here
Toolpaths
Material Setup
Set ...
Z 0
0.5"
0.5"
Home Pos: X:0.0 Y:0.0 Z:0.8
XY Datum
X: 0.0
Y: 0.0
Toolpath Operations
Toolpath List
Frame Border
Name Toolpath

Save the file to your Desktop. Give it a name using the format you see here.