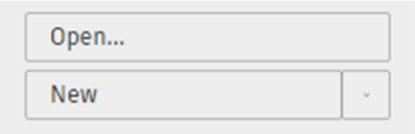
Autodesk Fusion 360 Guide

Please remember to save!

Setting Units

Step 1: Hit the *New* button on the left side of your screen to create a file.



Step 2: Select the user icon  on the top right corner and select *Preferences*.

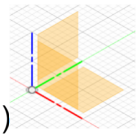
Note: The icon may display your initials and look different from the picture above.

Step 3: Under *Default Units,* change the default unit for *Design* and *Manufacture* to “in” and *Simulation and Generative Design* to “English (in).”

Step 4: Select *Apply* and *OK*.

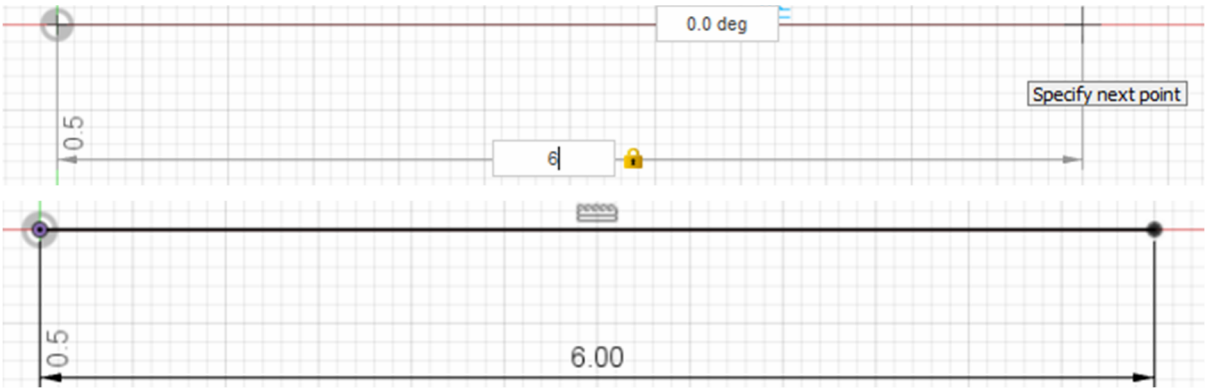
Creating a Sketch

Step 1: From the *SOLID* tab, in the *CREATE* toolbar, select *Create Sketch.* 

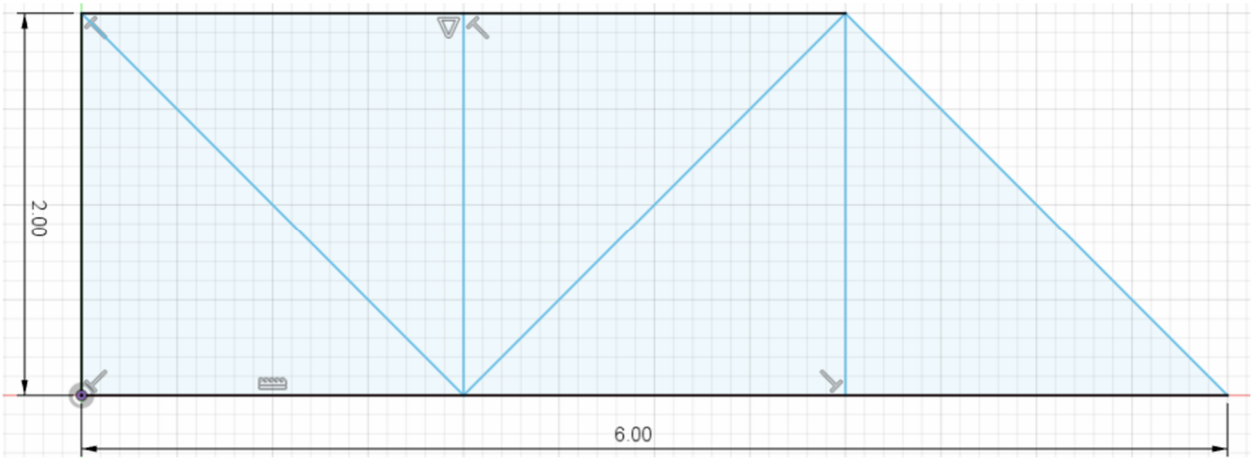
Step 2: Select the XZ Plane (darker shaded)  or select *Front*  in the top right corner and select the plane that pops up in the middle of your screen.

Step 3: From the *SKETCH* tab, in the *CREATE* toolbar, select the *Line* tool  to create a sketch of the desired bridge design.

Step 4: Place the first point at the origin  , type the length for half of the desired bridge, and press Enter. For this example, the ½ length is 6 in.

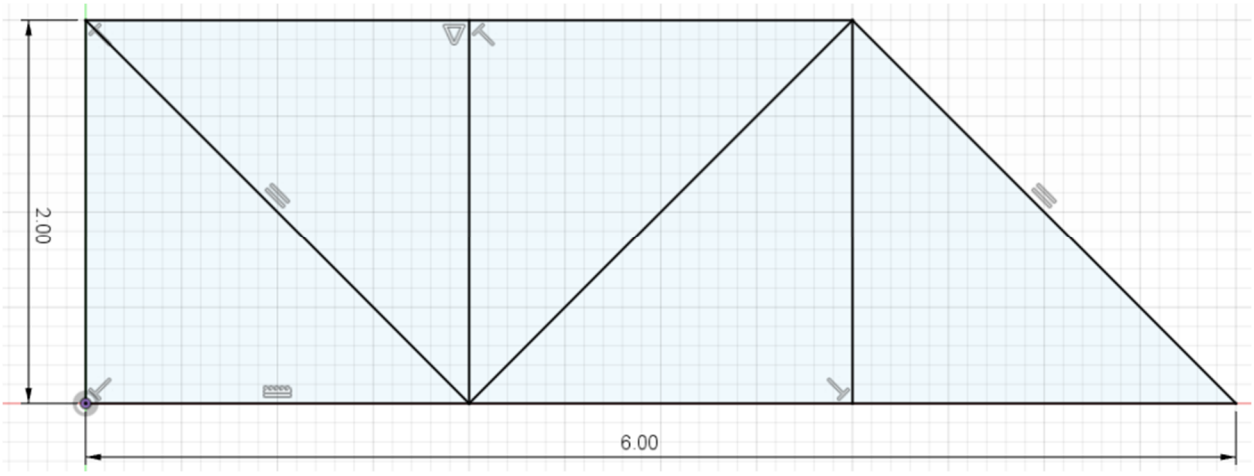


Step 5: Use the *Line* tool and draw a sketch of the desired bridge design. Please see the example below.

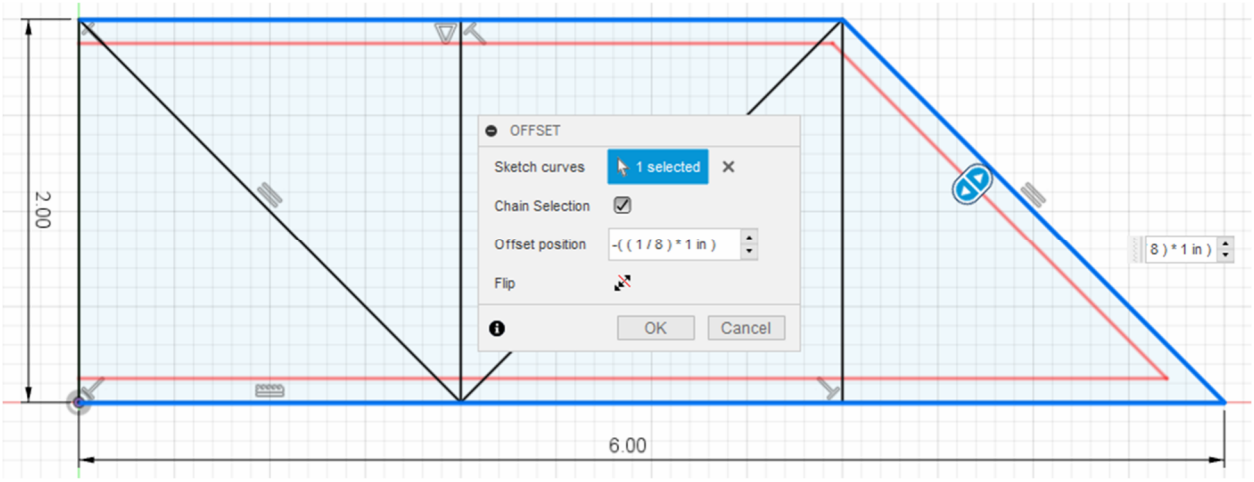


Note: Blue means it is not fully constrained, whereas black is fully constrained.

Step 6: In this example, to fully constrain the sketch, select the *Parallel* tool  in the *CONSTRAINTS* toolbar and click on the rightmost and leftmost diagonal lines. Please note that depending on the design, different constraints will be used.

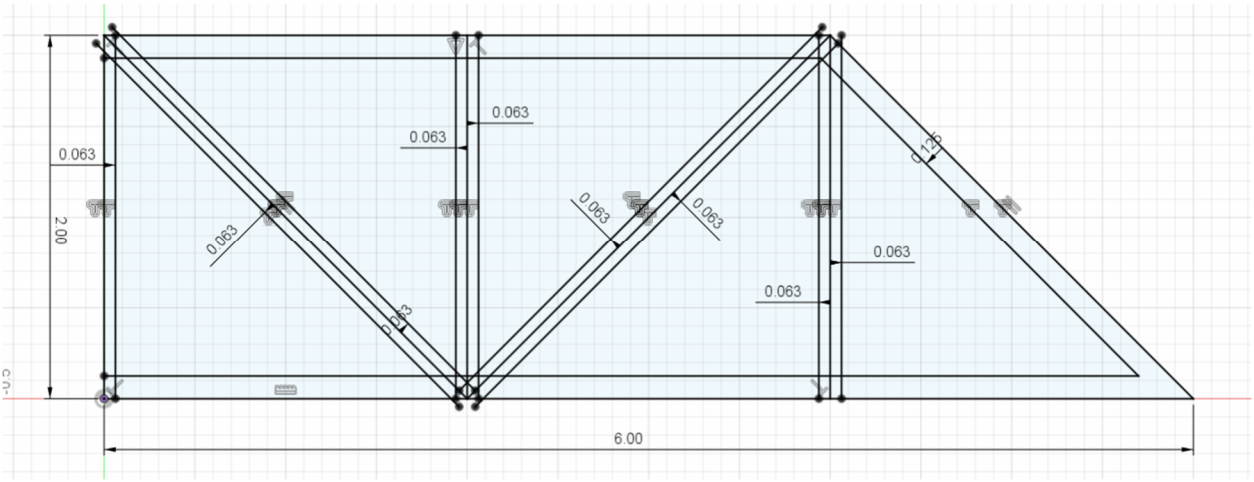


Step 7: Select the *Offset* tool  in the *MODIFY* toolbar. Select the outer edge of the design, type in the thickness of the member (⅛ in), select the *Flip* icon  if needed, and press Enter.



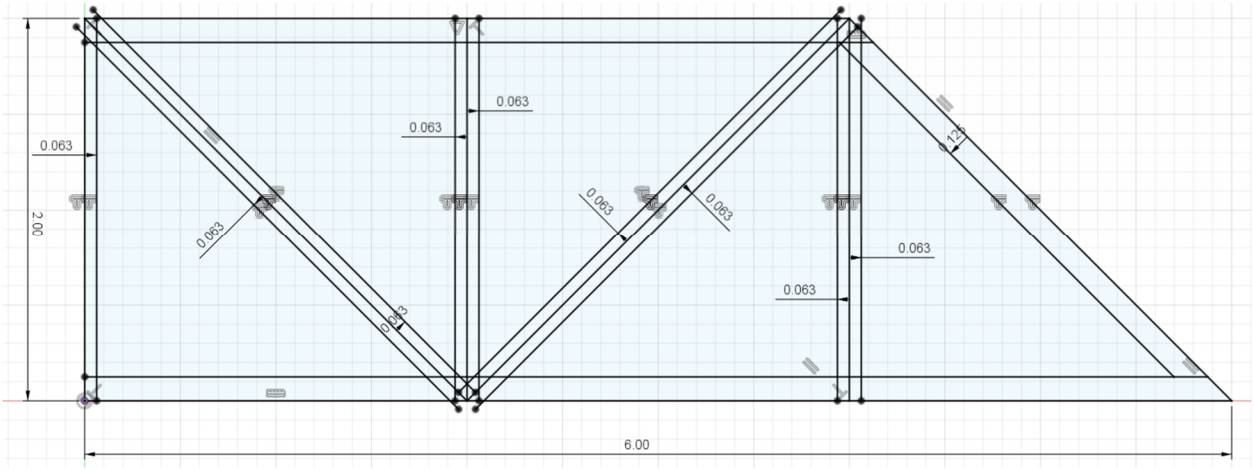
Step 8: Use the *Offset* tool and/or line tool to draw the thickness of all members. For inside lines a (1/16 in) offset can be done on each side of the original line.

Note: Select *Flip* or type a negative sign (-) to offset in the opposite direction.



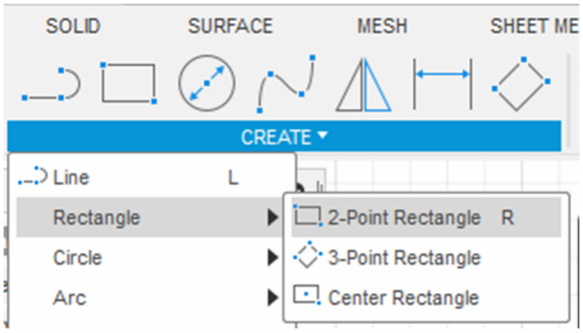
Note: The line on the left should be offset to ½ the offset distance (1/16 in) since it will be mirrored later.

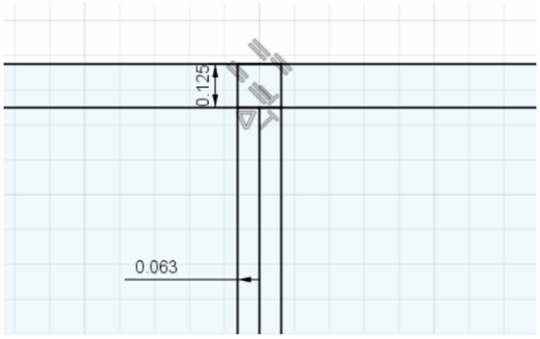
Step 9: Use the *Line* tool to define how the members connect. Make sure each member is a closed shape and make sure to close all members. If the member is shaded, it is closed, and vice versa.

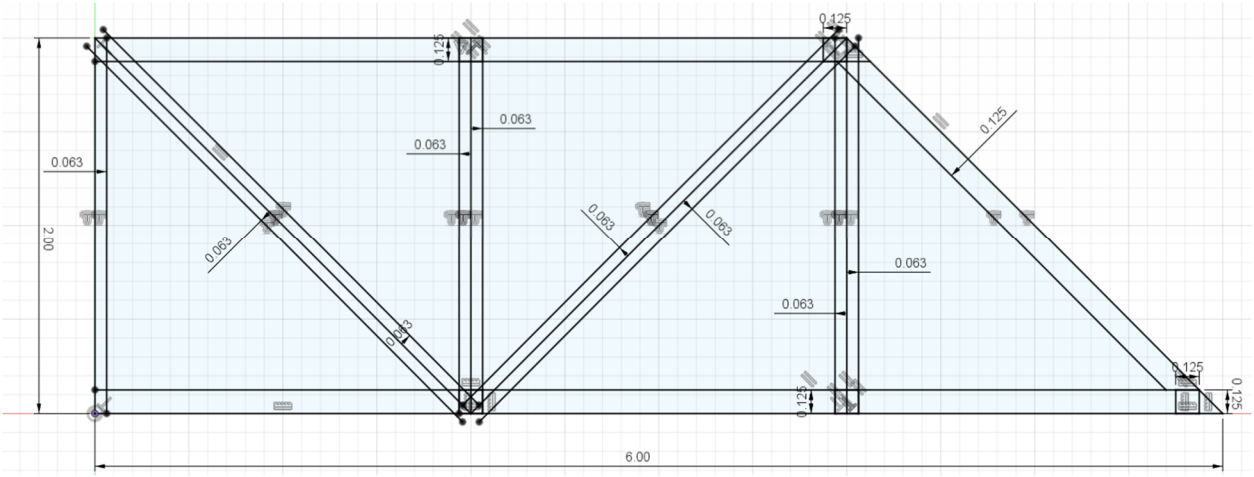


Note: In this example, the difference from Step 8 to Step 9 is on the rightmost diagonal member, since all other members are clearly defined by offset lines.

Step 10: Use the *Rectangle* tools to draw the location of connection members. Please see the examples below.





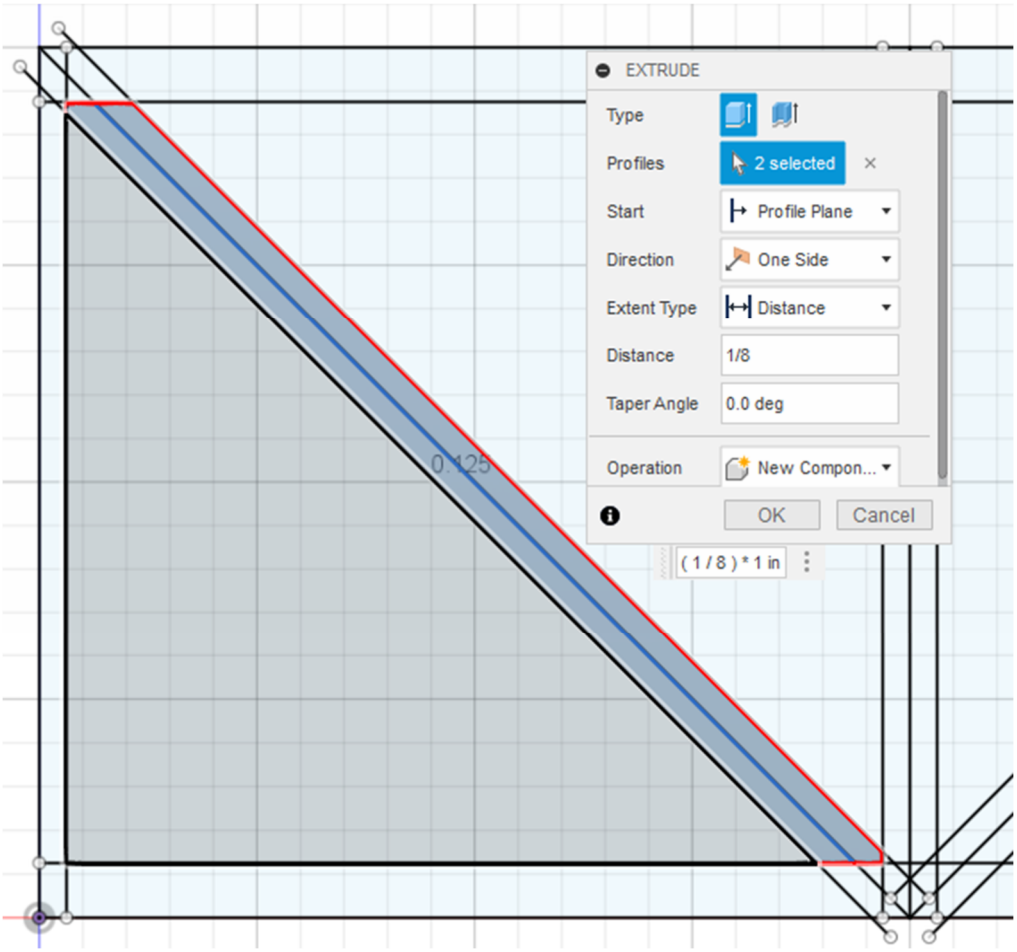


Step 11: Select *FINISH SKETCH* when done. 

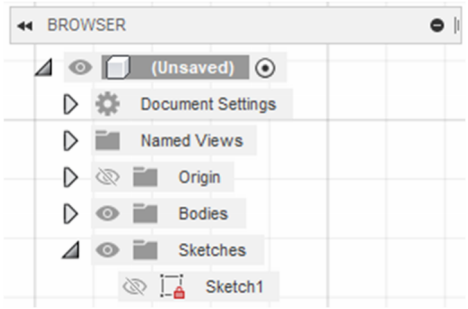
Creating a 3D Model

Step 1: From the *SOLID* tab, in the *CREATE* toolbar, select *Extrude*. 

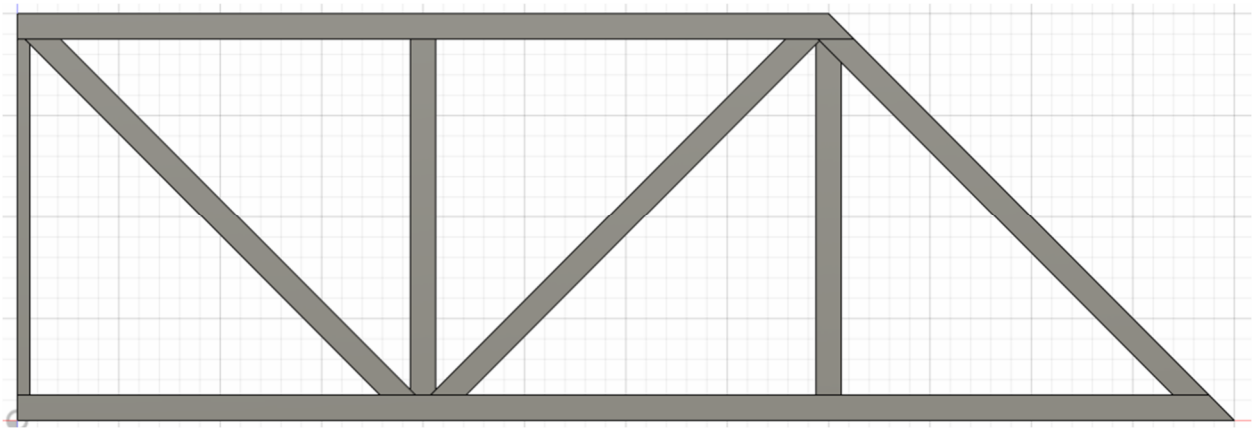
Step 2: Select all sections of a member, enter the thickness of the member (⅛ in) in *Distance*, select *New Component* in *Operation*, and select *OK*. Repeat for all members.

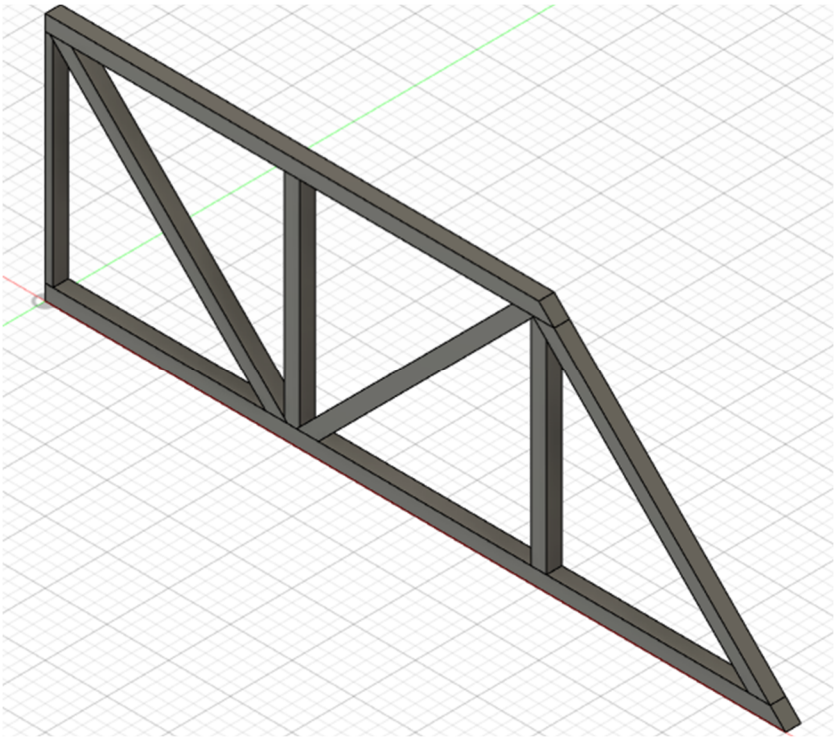


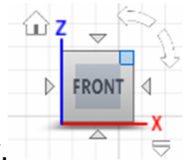
Note: The sketch will disappear after extruding the first member. Select the hidden eye icon for "Sketch1" for the sketch to appear.



It will look similar to the images below when all members are extruded. (Sketch turned off)



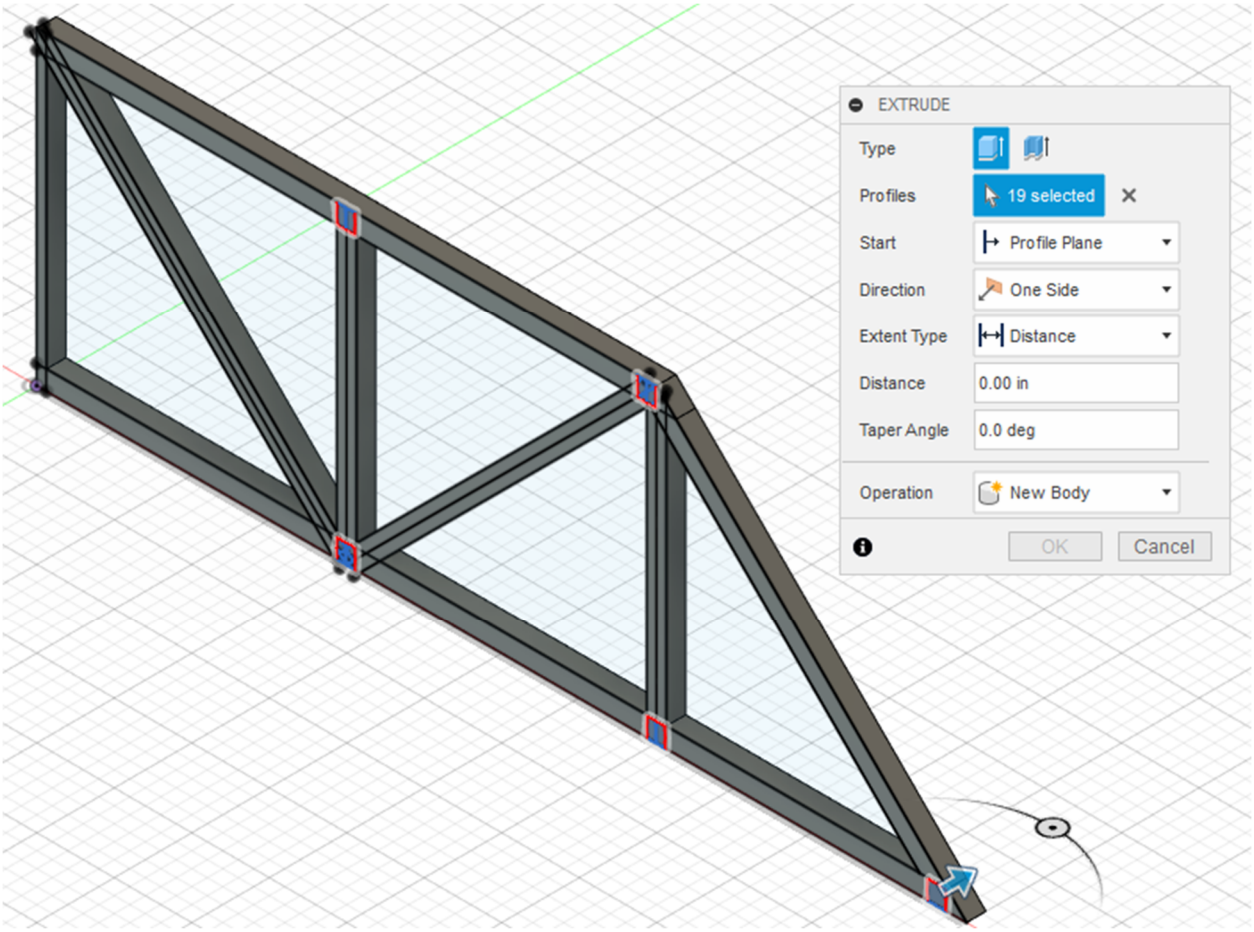




Step 3: Select the top right-corner view.

Step 4: Select *Extrude.*

Step 5: Select all the connection members drawn earlier.



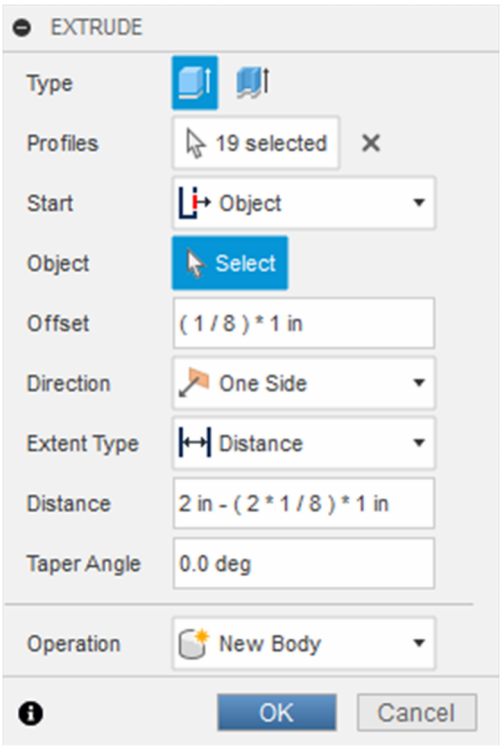
Step 6: Change the following and select *OK*.

Start: *Profile Plane* to *Object*

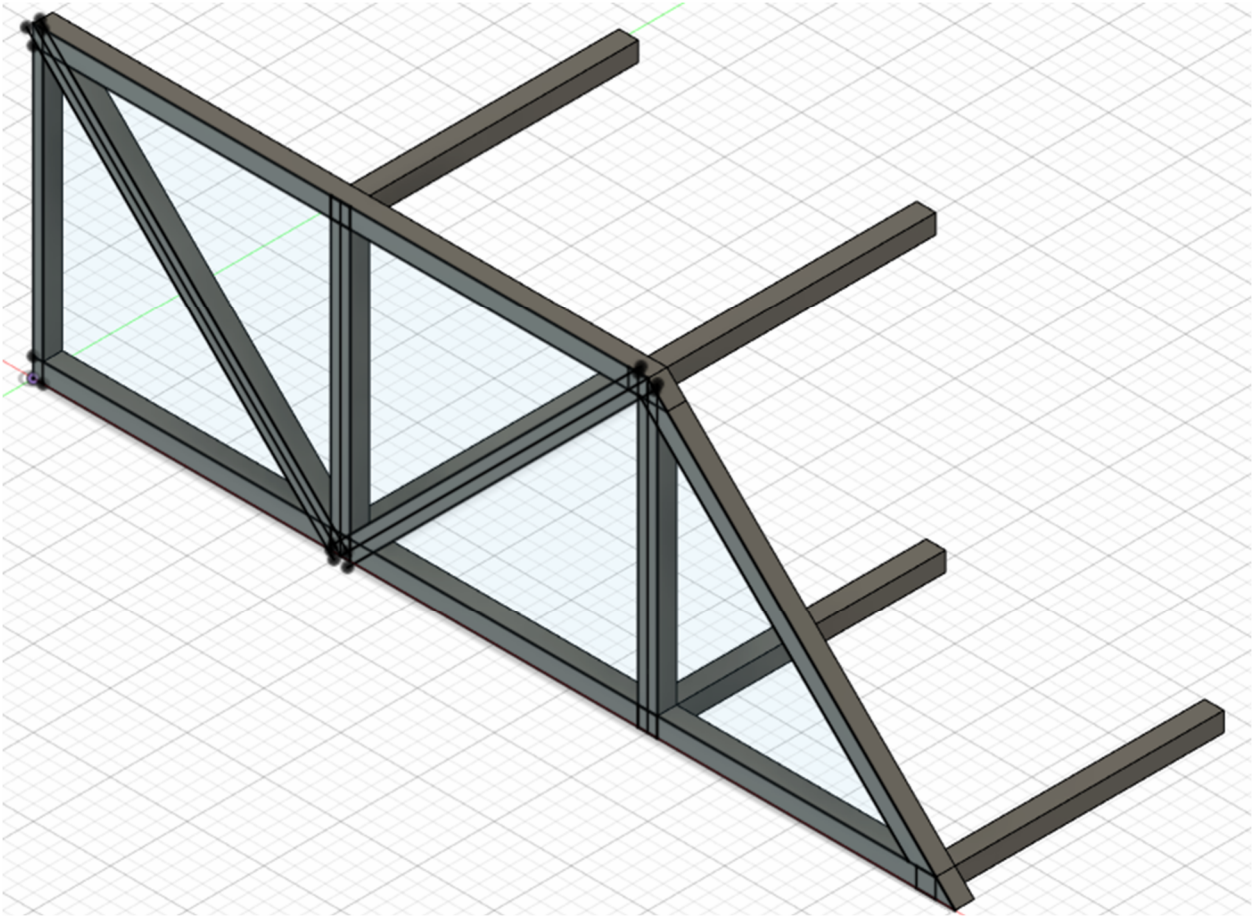
Offset: ⅛ in (thickness of member)

Distance: width of bridge - 2*⅛ in

Operation: *New Body*



Should look similar to the image below.



Step 7: From the *SOLID* tab, in the *MODIFY* toolbar, select the *Move/Copy* tool. 

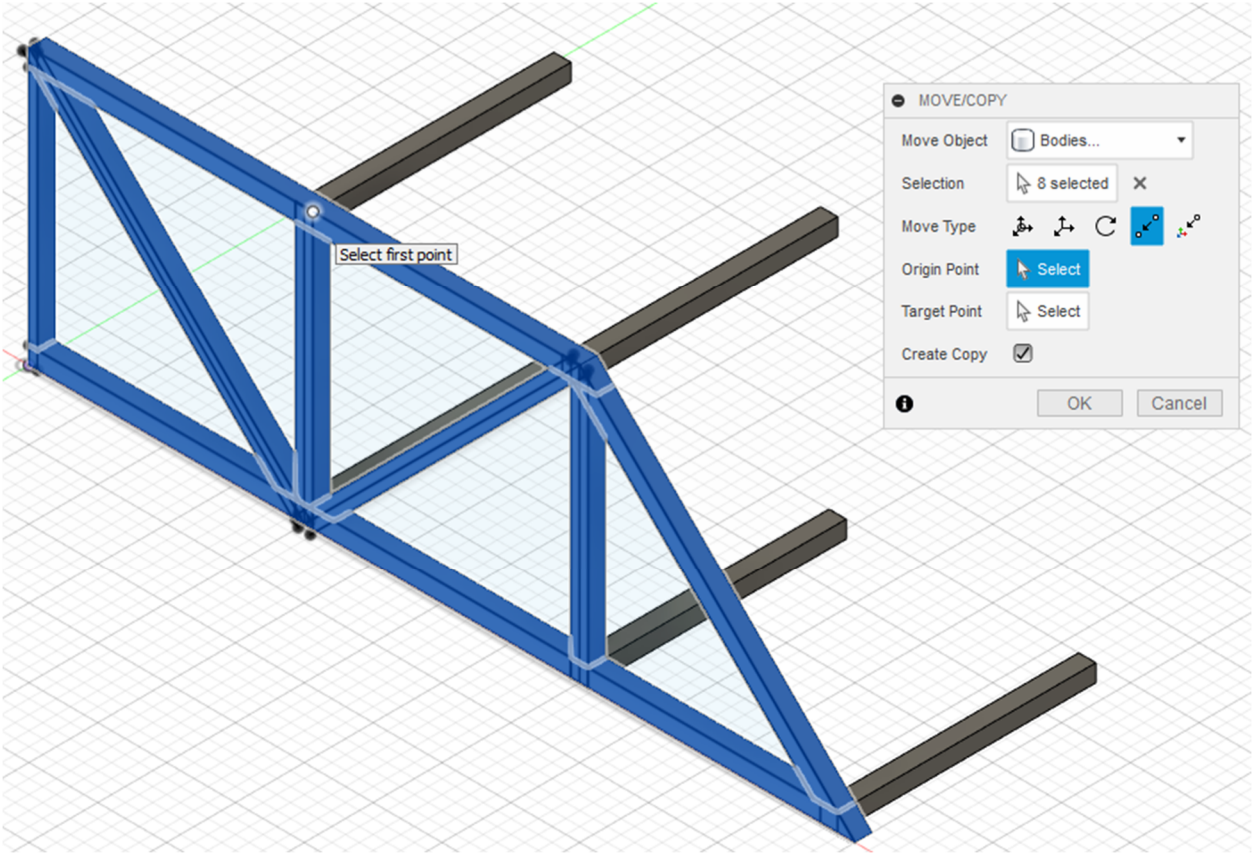
Note: Please see the images for reference for Steps 8 to 11.

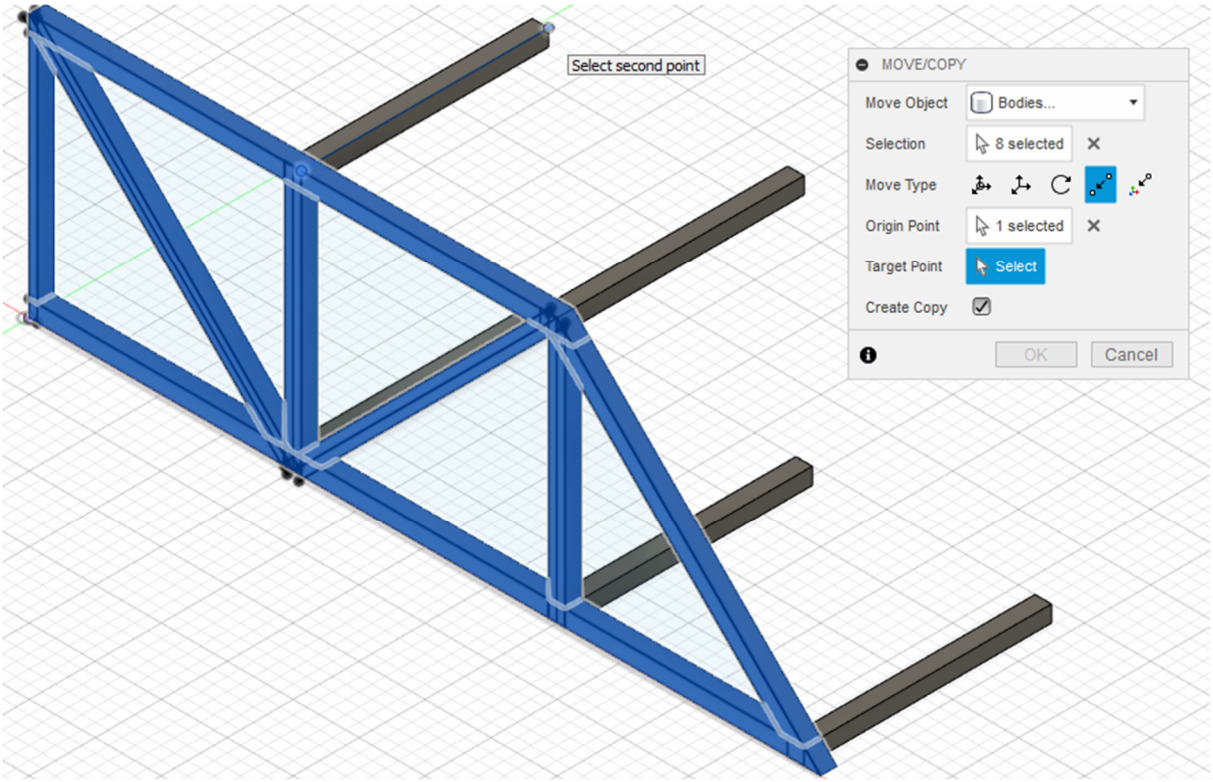
Step 8: Select all members of the truss. Change *Move Type* to *Point to Point*.

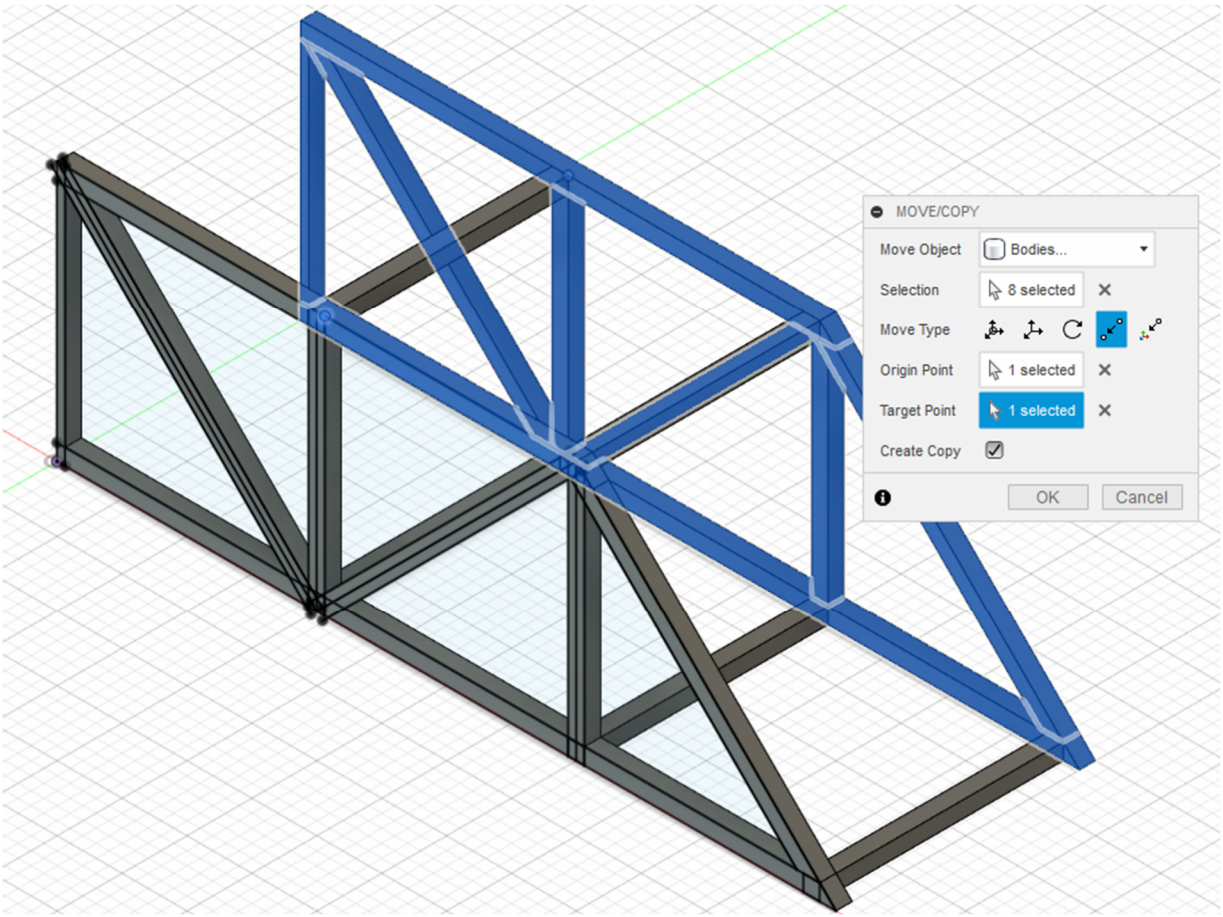
Step 9: Select the *Origin Point* to be the front face of the truss (one corner of a square).

Step 10: Select *Create Copy*.

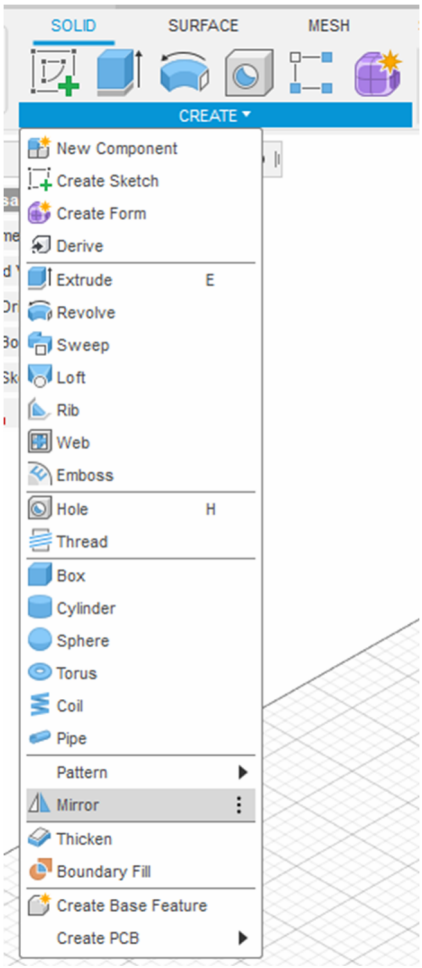
Step 11: Select the *Target Point* to be the same corner at the end of the connection member and select *OK*.



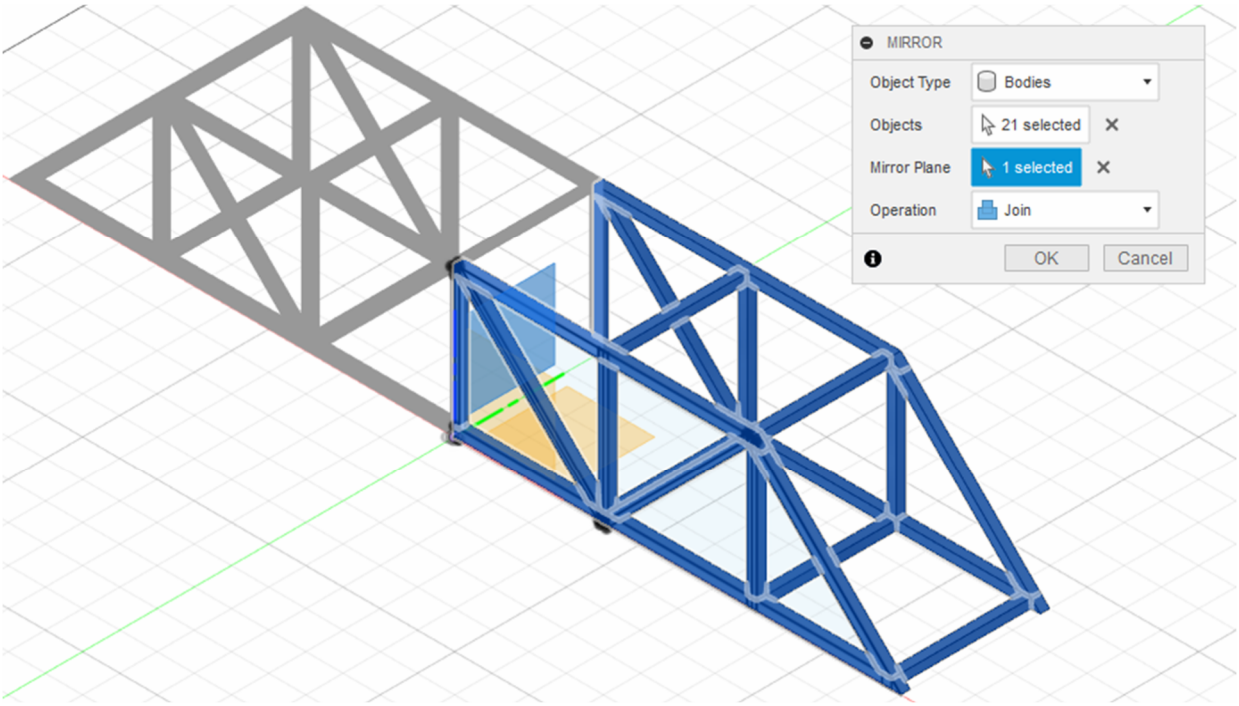

Select second point
MOVE/COPY
Move Object
Bodies...
Selection
8 selected
Move Type
Origin Point
1 selected
Target Point
Select
Create Copy
OK
Cancel


MOVE/COPY
Move Object
Bodies...
Selection
8 selected
Move Type
Origin Point
1 selected
Target Point
1 selected
Create Copy
OK
Cancel

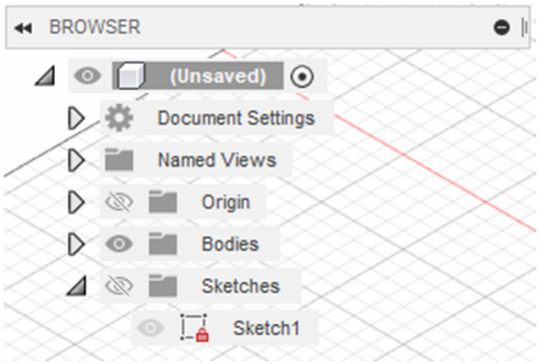
Step 12: Select the *Mirror* tool in the *CREATE* drop-down.

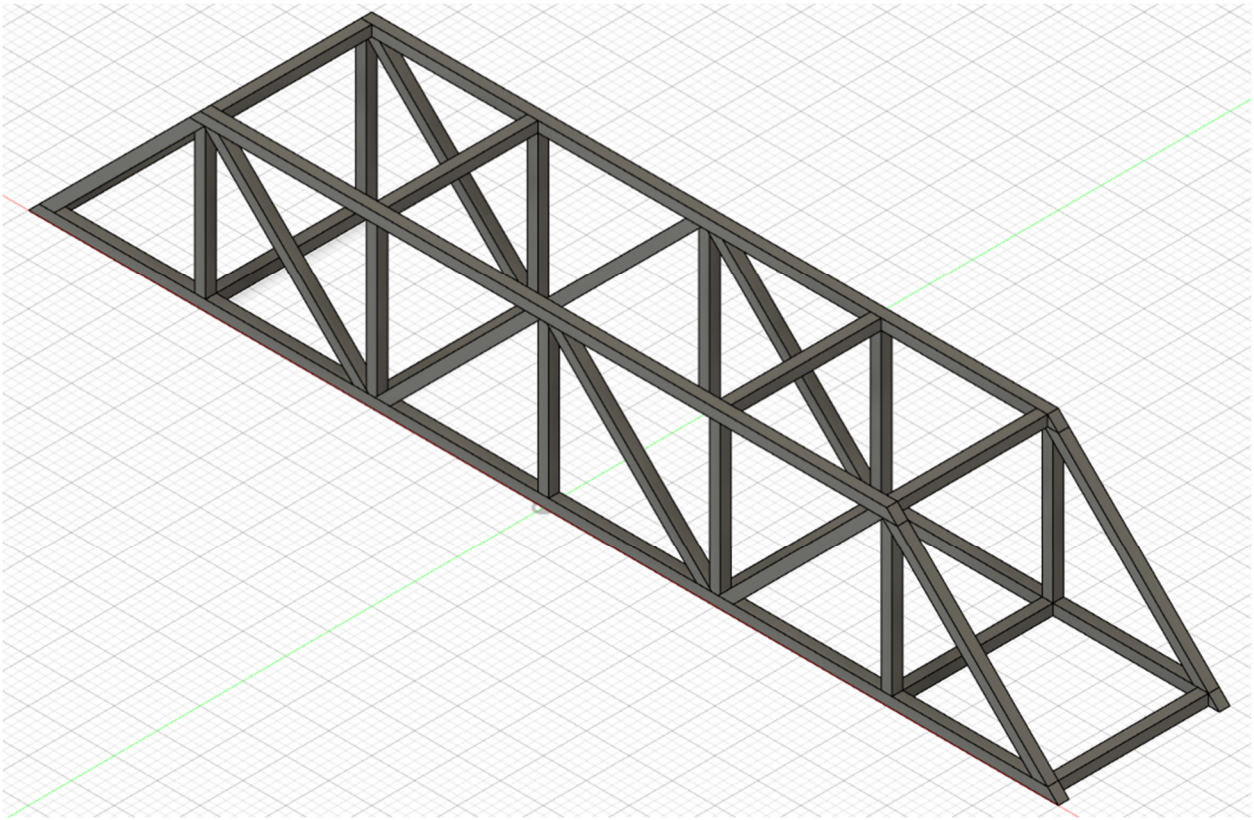


Step 13: Select all members, select the YZ Plane, and select *OK*.



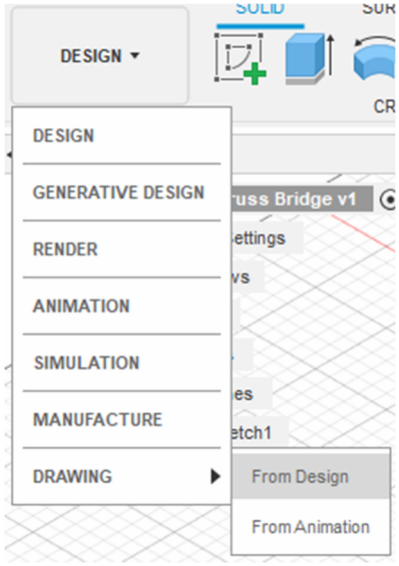
Step 14: Turn off *Sketches* and rotate the view to see the completed model.



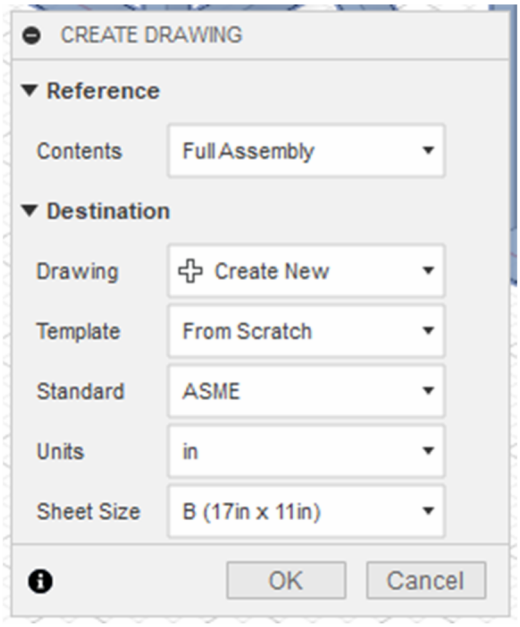


Creating a Drawing

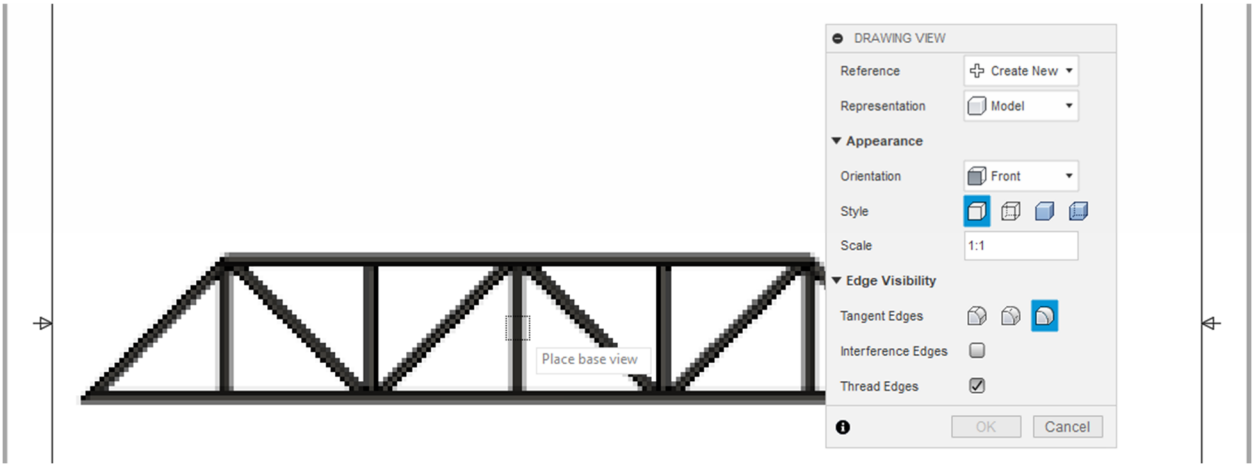
Step 1: Select *DESIGN*, then select *From Design* in the *Drawing* dropdown.



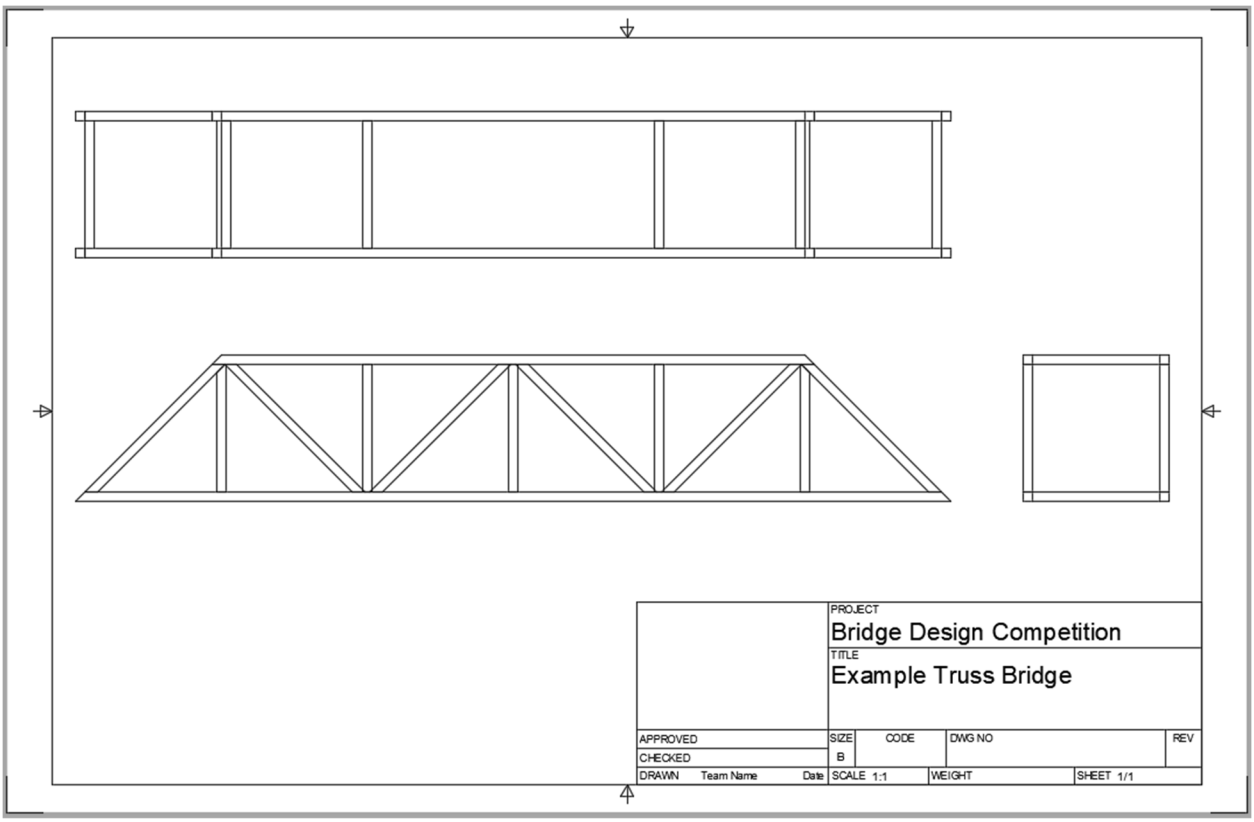
Step 2: Select the appropriate drawing/sheet options and select *OK*.



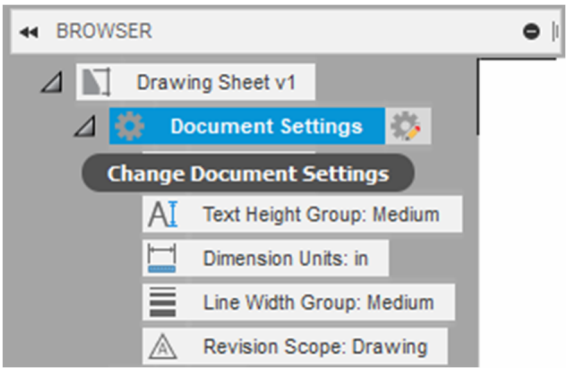
Step 3: Select the appropriate *Orientation* and *Scale* and place the view. Change other settings, if necessary.



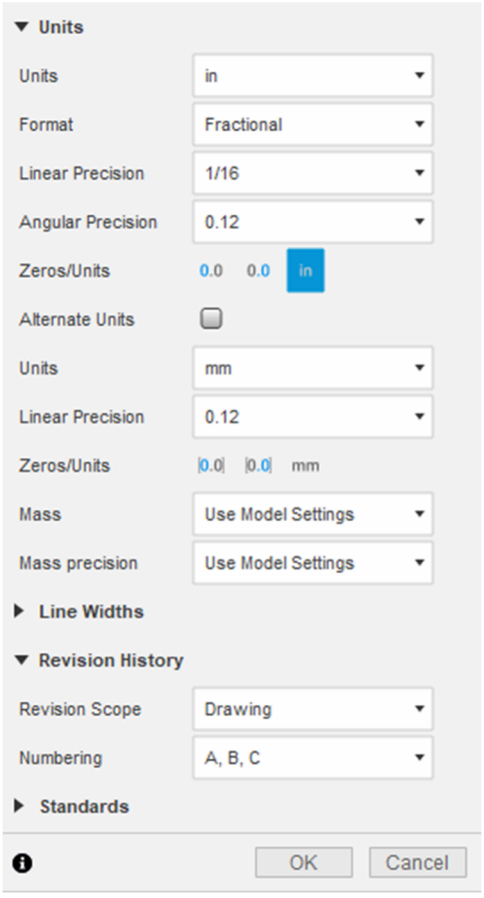
Step 4: From the *DRAWING* tab, in the *CREATE* toolbar, select *Projected View*  to draw other views of the bridge. Please see the example below.



Step 5: Select *Change Document Settings*. 

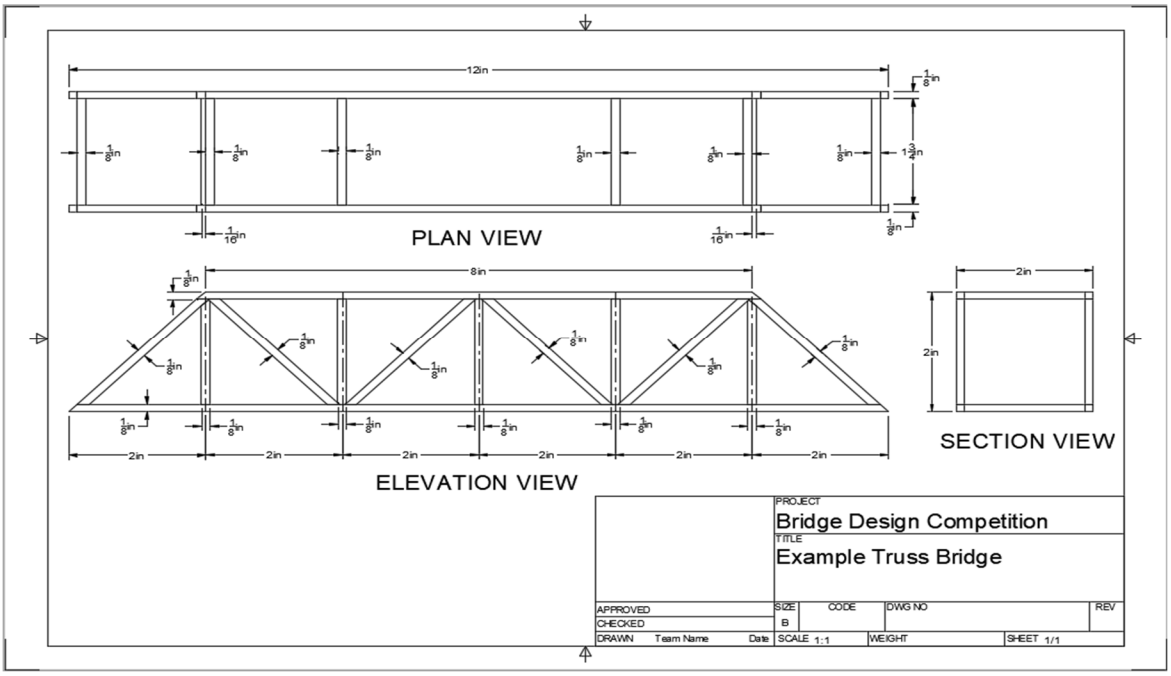


Step 6: In the *Units* dropdown, select the appropriate dimension settings and select *OK*.



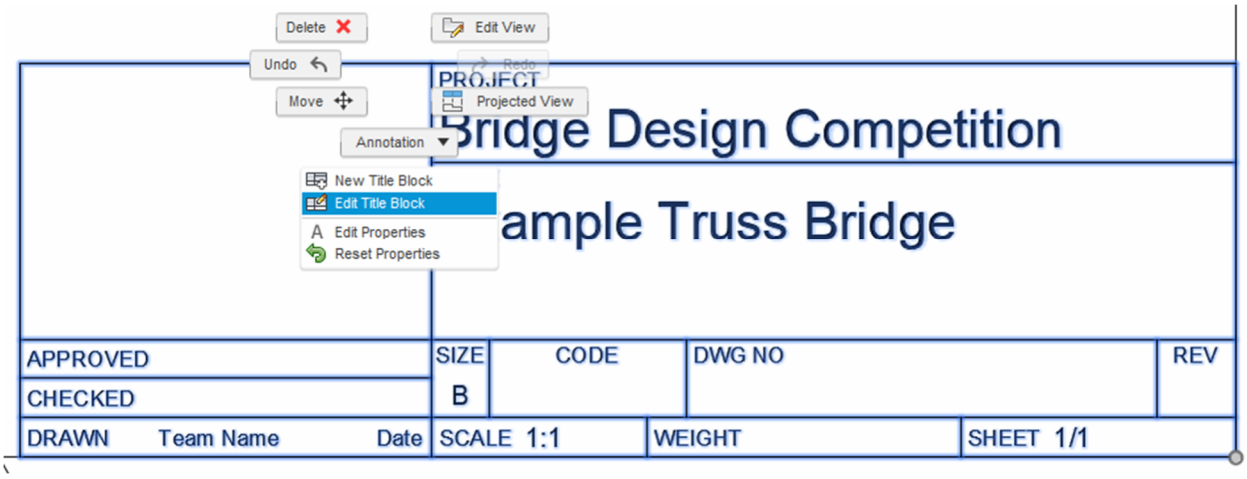
Step 7: From the *DRAWING* tab, in the *DIMENSIONS* toolbar, select the *Dimension* tool  to dimension the drawing. Use other tools if necessary.

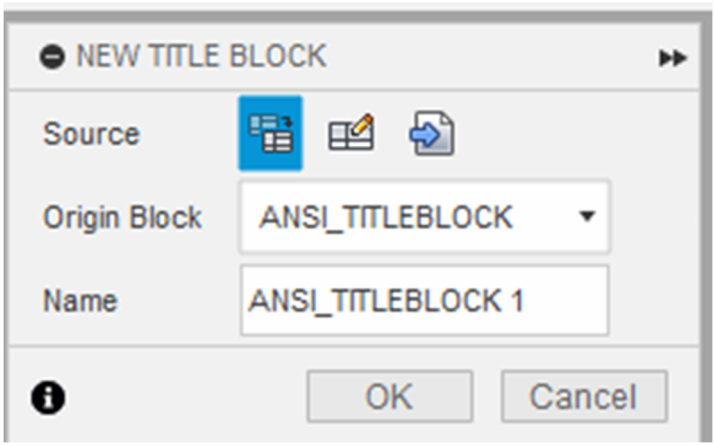
Step 8: From the *DRAWING* tab, in the *TEXT* toolbar, select the *Text* tool  to label the different views.



Note: The size of the text can be adjusted by changing its *Height* in the text window located on the right of your screen.

Step 9: Complete the Title Box with appropriate information. Teams must create a Title Box that includes information required in the competition guidelines. Adjust the shape and location of the Title Box accordingly. To edit the Title Box, select the Title Box, right-click, and select *Edit Title Block* under the *Annotation* dropdown. Then select *OK* in the window that pops up.





Step 10: Select *Export* 

from the *DRAWING* tab to export the drawing as a PDF.

Don't forget to save!