


# Autodesk Fusion 360 Guide

**Please remember to save!**

## Setting Units

Step 1: Select the user icon  on the top right corner and select *Preferences*.

Step 2: Under *Default Units*, change the default unit for *Design* and *Manufacture* to “in” and *Simulation and Generative Design* to “English (in).”

Step 3: Select *Apply* and *OK*.

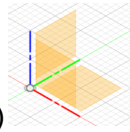
# Autodesk Fusion 360 Guide

## Creating a Sketch

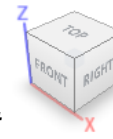
Step 1: From the *SOLID* tab, in the *CREATE* toolbar, select *Create Sketch*.



Step 2: Select the XZ Plane (darker shaded) or select *Front*



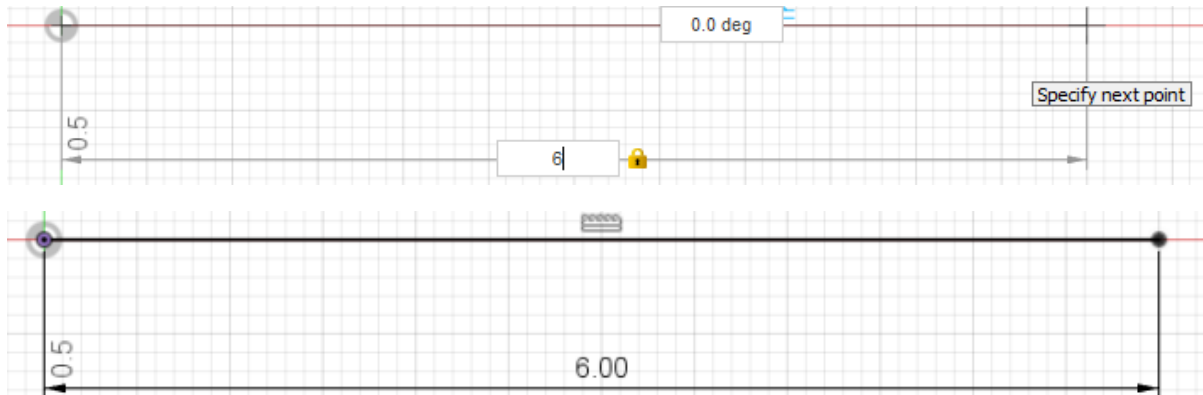
in the top right corner.



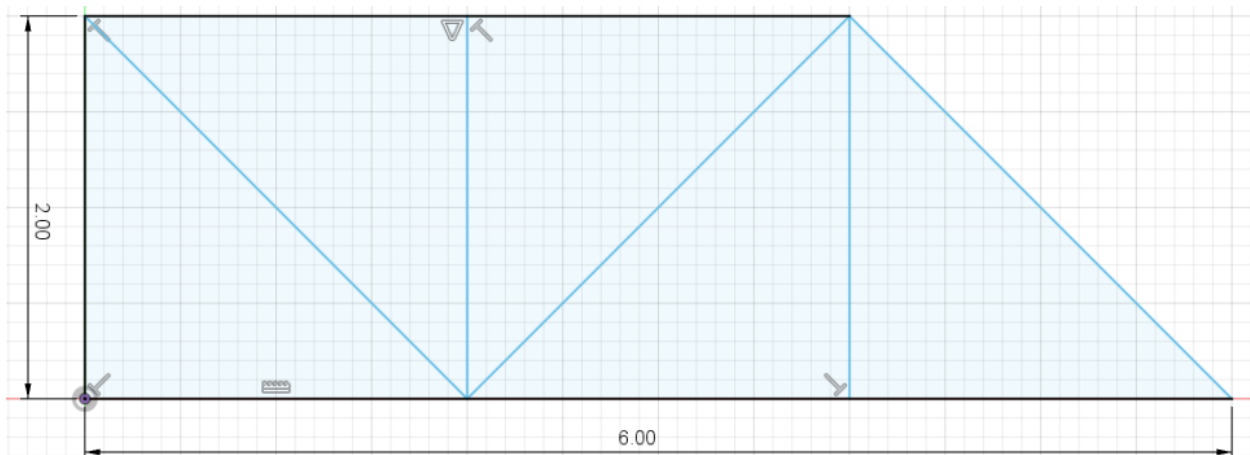
Step 3: From the *SKETCH* tab, in the *CREATE* toolbar, select the *Line* tool to create a sketch of the desired bridge design.



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  $\frac{1}{2}$  length is 6 in.




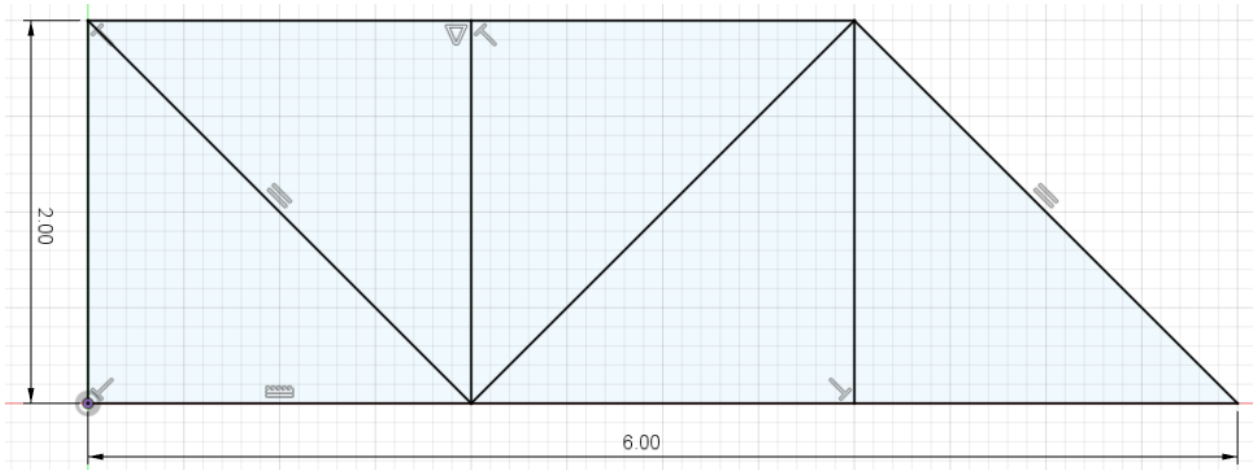
Step 5: Use the *Line* tool and draw a sketch of the desired bridge design. Please see the example below.





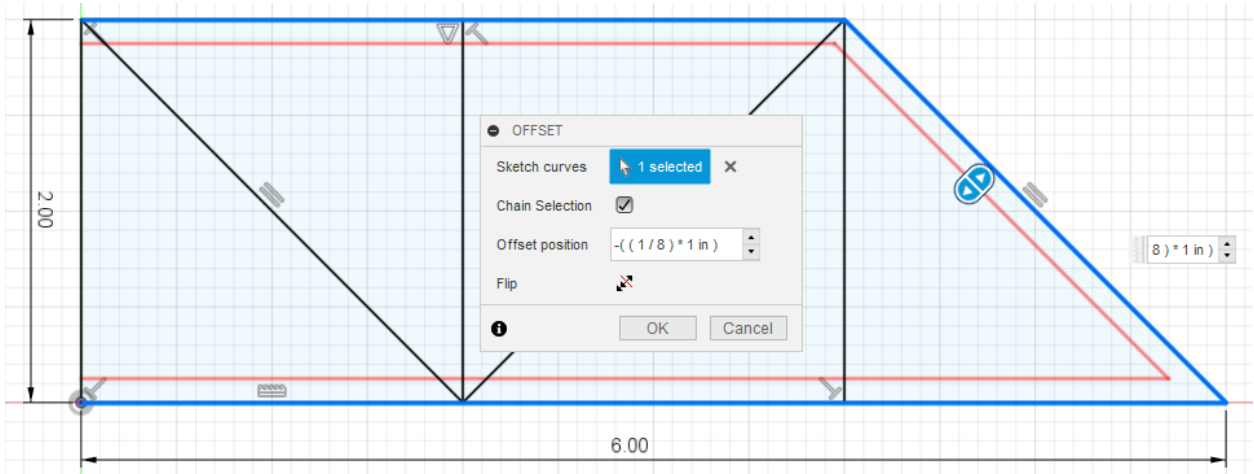
Note: Blue means it is not fully constrained, whereas black is fully constrained.

# Autodesk Fusion 360 Guide

Step 6: For this example, select the *Parallel* tool  in the *CONSTRAINTS* toolbar to fully constrain the sketch. Please note that depending on the design, different constraints will be used.



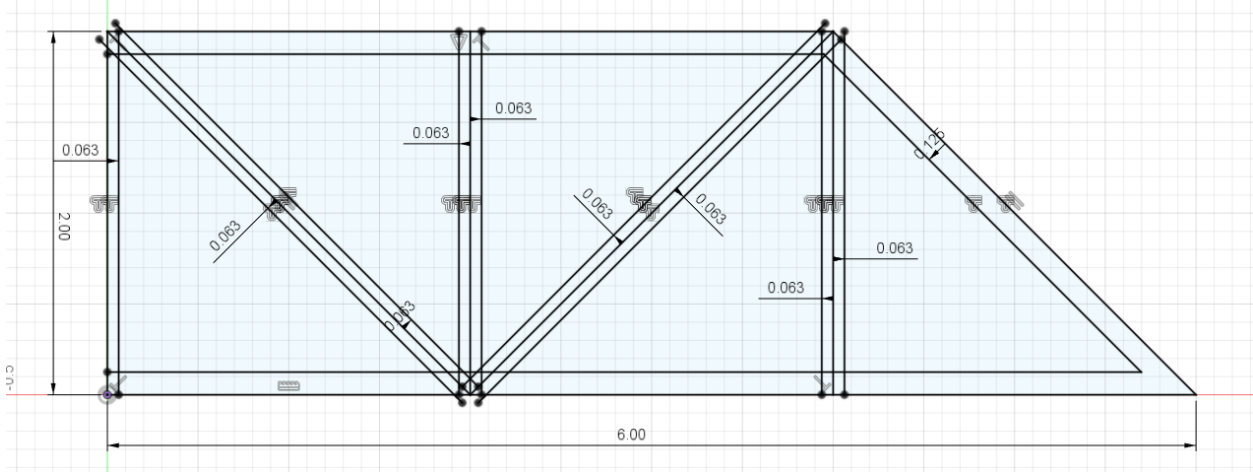
Step 7: Select the *Offset* tool  in the *MODIFY* toolbar. Select the outer edge of the design, type in the thickness of the member ( $1/8$  in), select the *Flip* icon , and press Enter.



# Autodesk Fusion 360 Guide

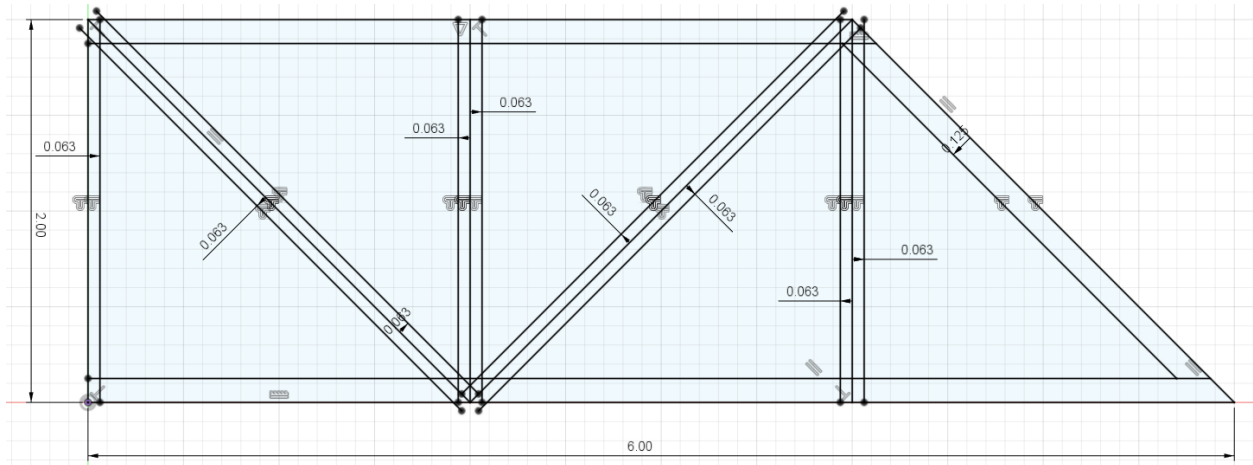
Step 8: Use the *Offset* tool and/or line tool to draw the thickness of all members.

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



Note: The line on the left should be offset to  $\frac{1}{2}$  the offset distance (1/16 in) since it will be mirrored later.

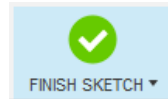
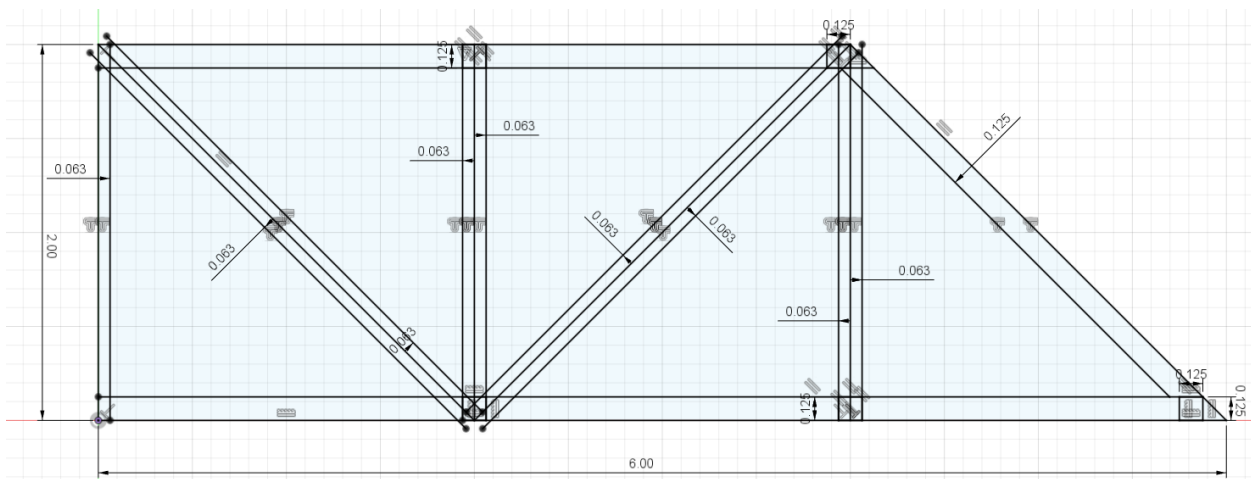
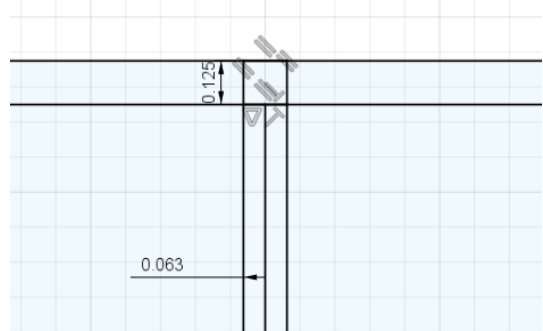
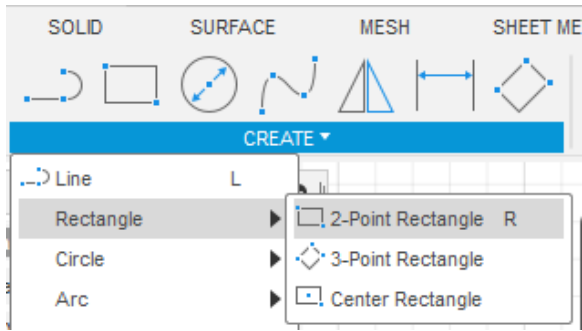
Step 9: Use the *Line* tool to define how the members connect. Make sure each member is a closed shape and make sure to close all members. If the member is shaded, it is closed, and vice versa.



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

# Autodesk Fusion 360 Guide

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.

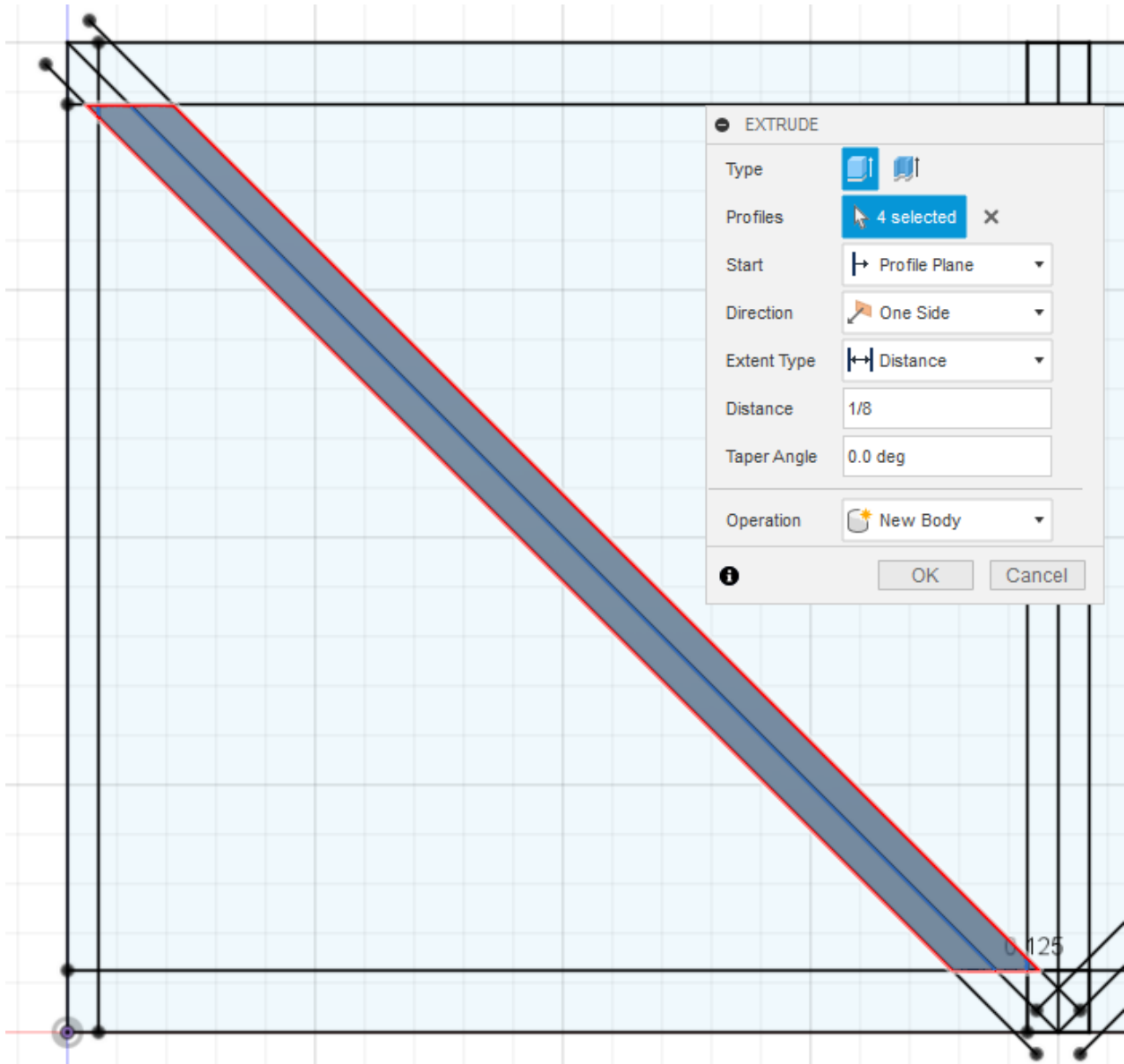
# Autodesk Fusion 360 Guide

## Creating a 3D Model



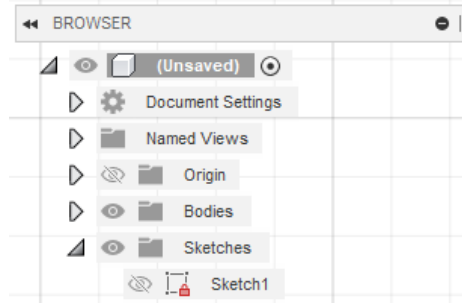
Step 1: From the *SOLID* tab, in the *CREATE* toolbar, select *Extrude*.

Step 2: Select all sections of a member, enter the thickness of the member ( $\frac{1}{8}$  in) in *Distance*, select *New Body* in *Operation*, and select *OK*. Repeat for all members.

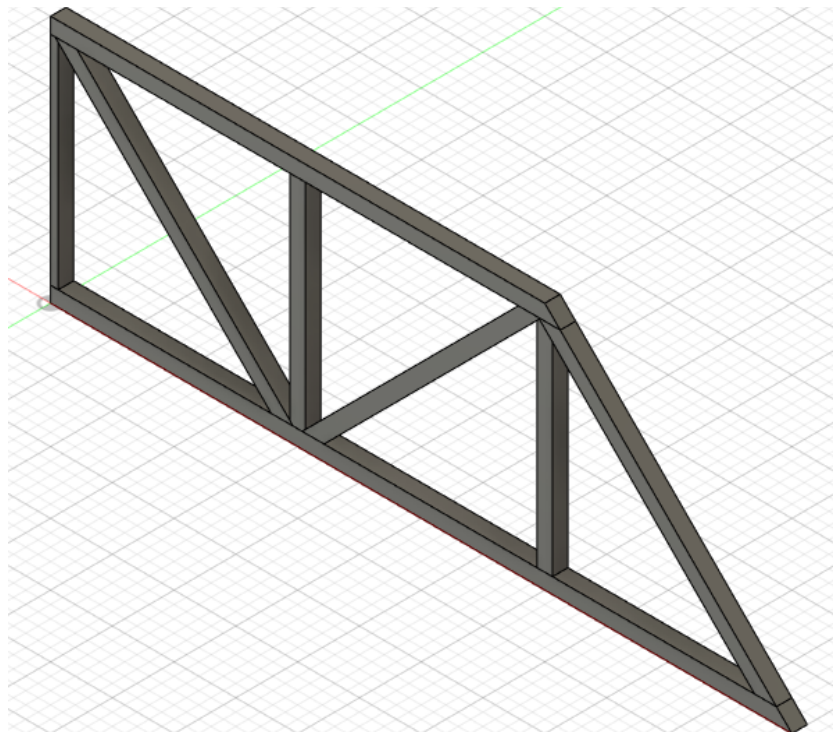
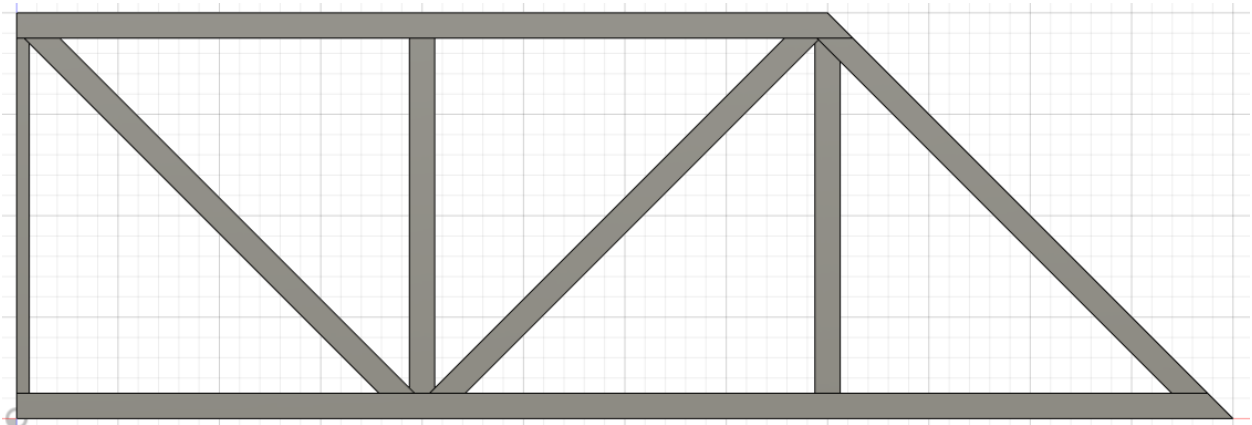


# Autodesk Fusion 360 Guide

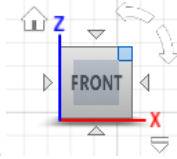
Note: The sketch will disappear after extruding the first member. Select the hidden eye icon for “Sketch1” for the sketch to appear.



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



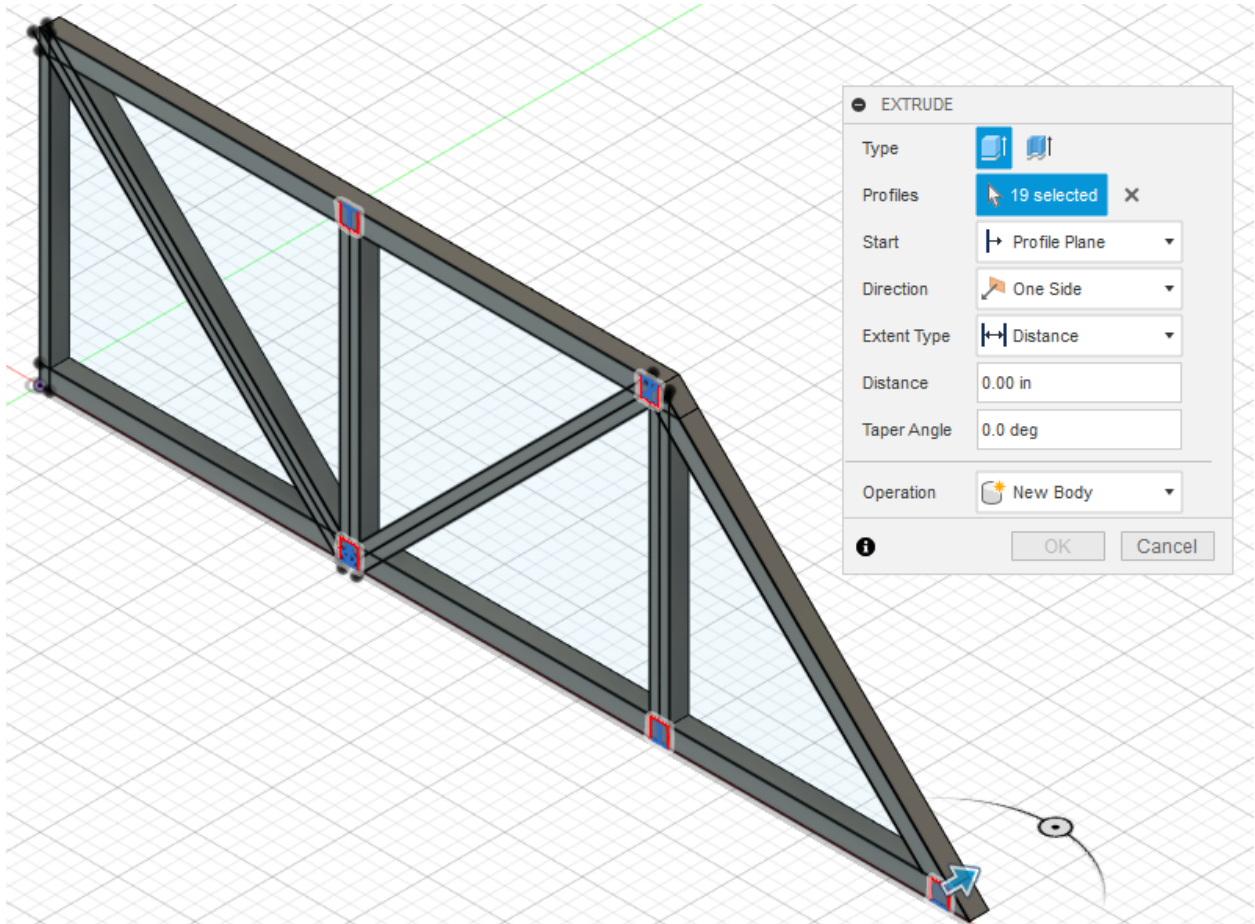
# Autodesk Fusion 360 Guide



Step 3: Select the top right-corner view.

Step 4: Select *Extrude*.

Step 5: Select all the connection members drawn earlier.





## Autodesk Fusion 360 Guide

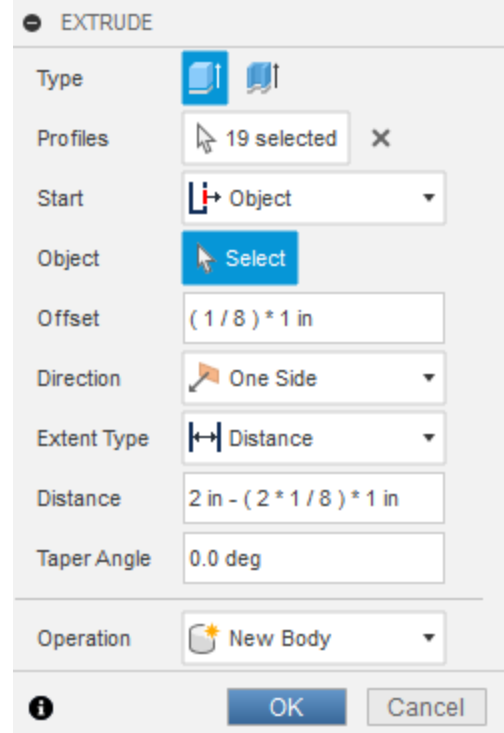
Step 6: Change the following and select OK.

*Start: Profile Plane to Object*

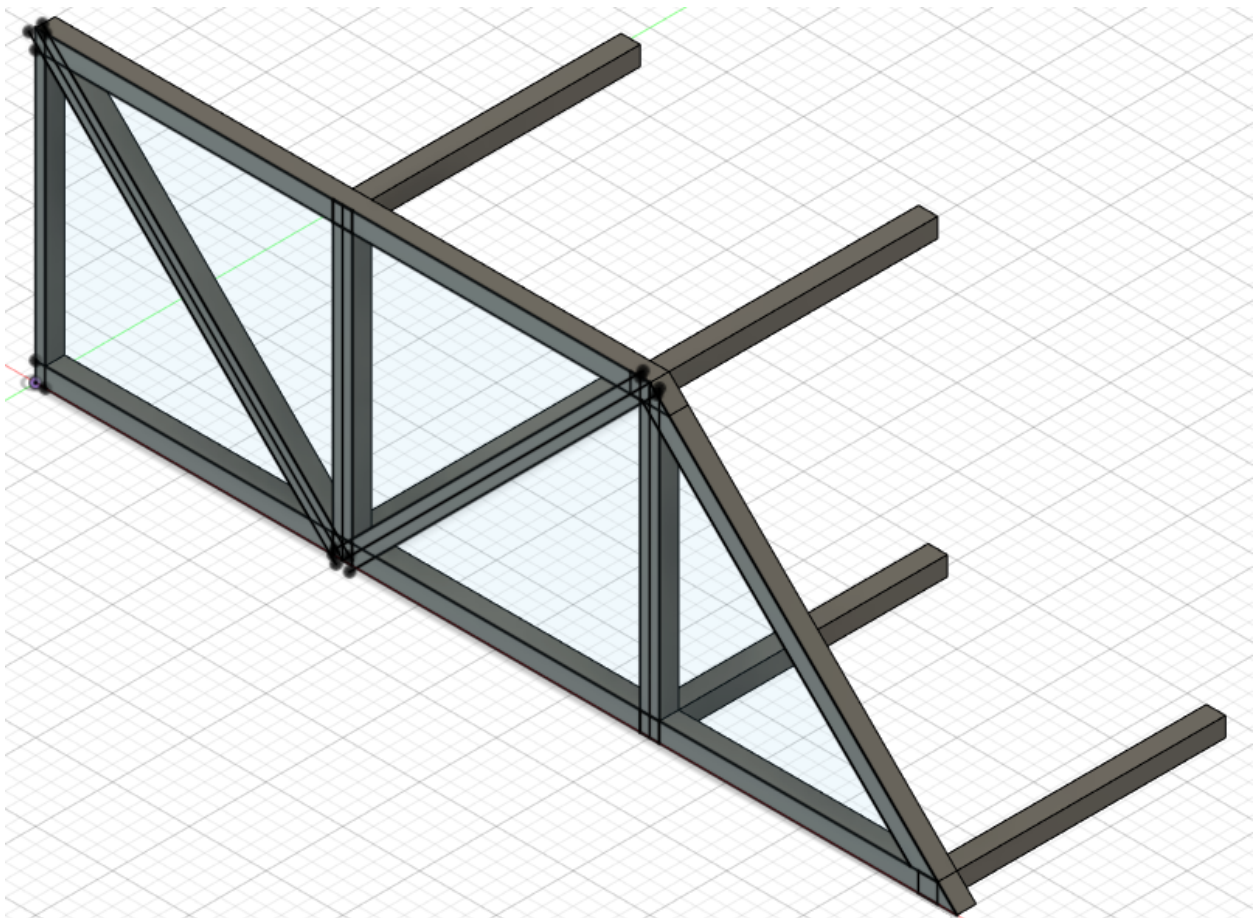
*Offset:  $\frac{1}{8}$  in (thickness of member)*

*Distance: width of bridge -  $2 * \frac{1}{8}$  in*

*Operation: New Body*



Should look similar to the image below.



# Autodesk Fusion 360 Guide

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



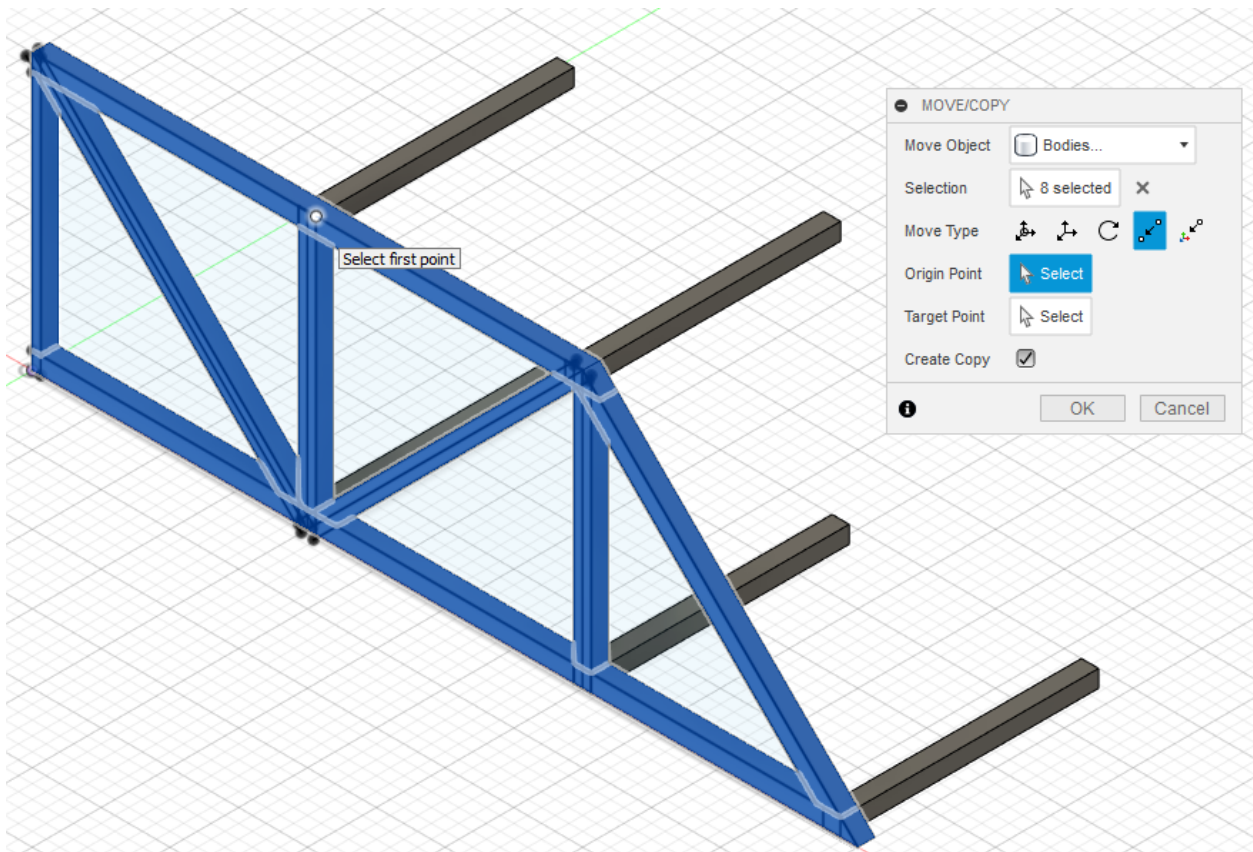
Note: Please see the images for reference for Steps 8 to 11.

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

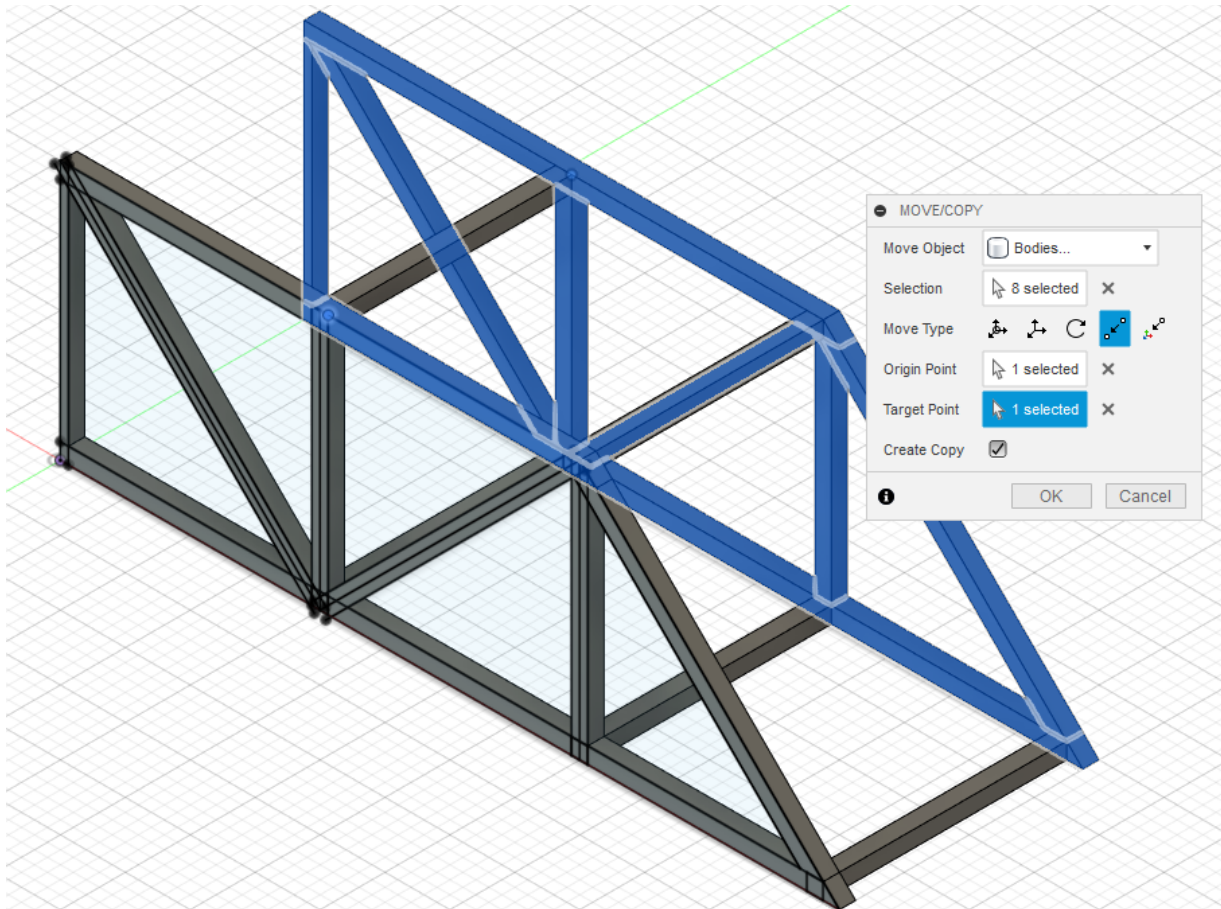
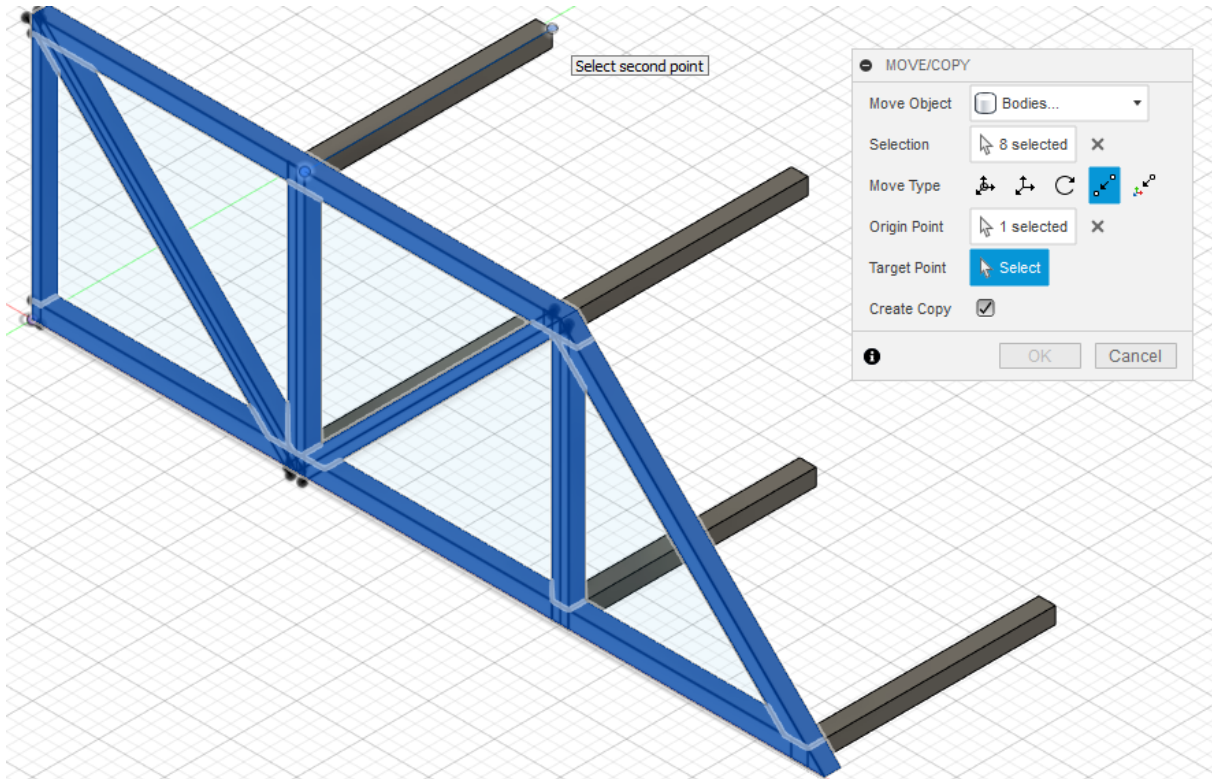
Step 9: Select the *Origin Point* to be the front face of the truss (one corner of a square).

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*.

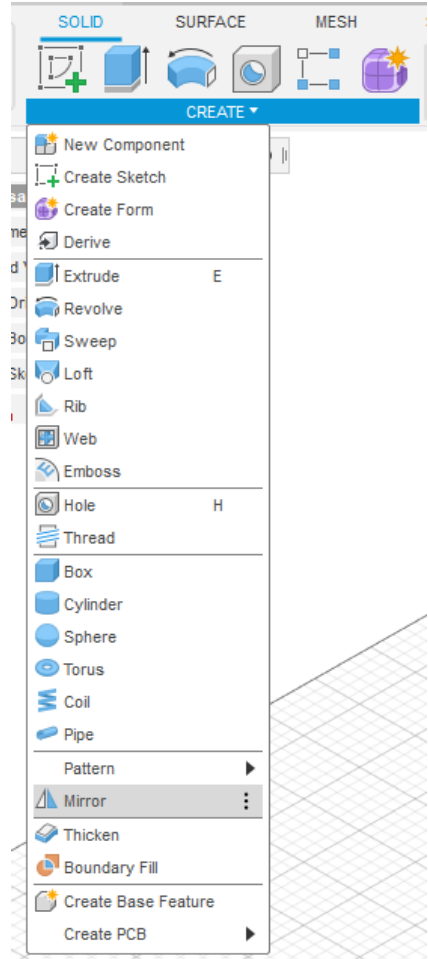


# Autodesk Fusion 360 Guide

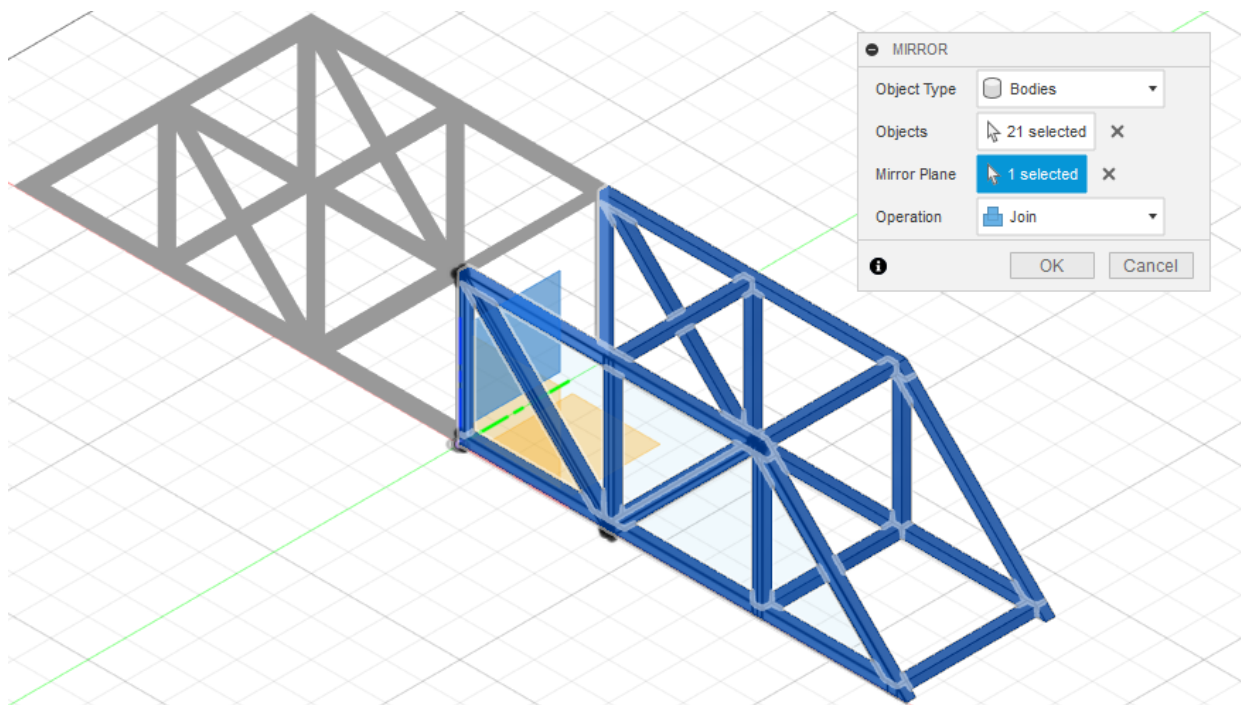


# Autodesk Fusion 360 Guide

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

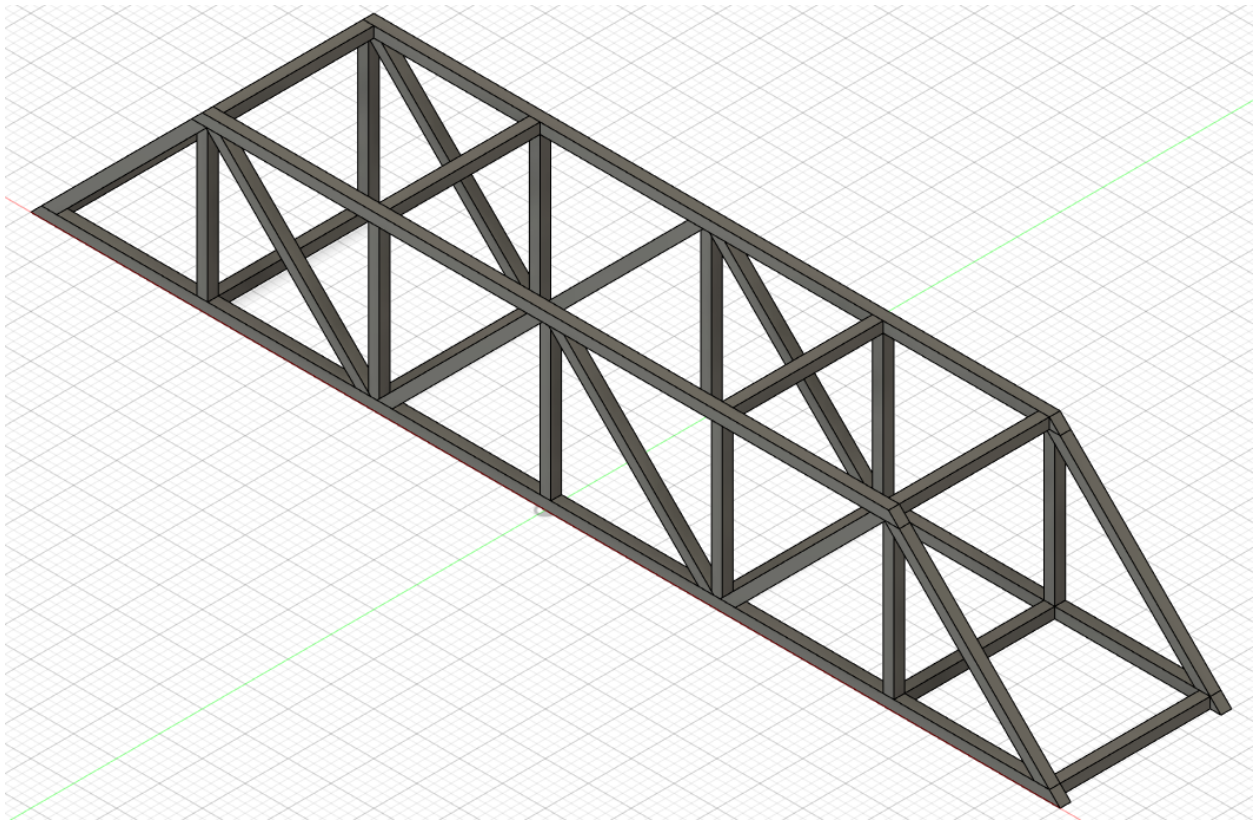
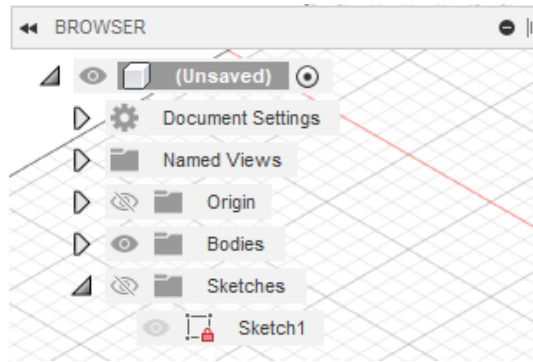


Step 13: Select all members, select the YZ Plane, and select *OK*.



# Autodesk Fusion 360 Guide

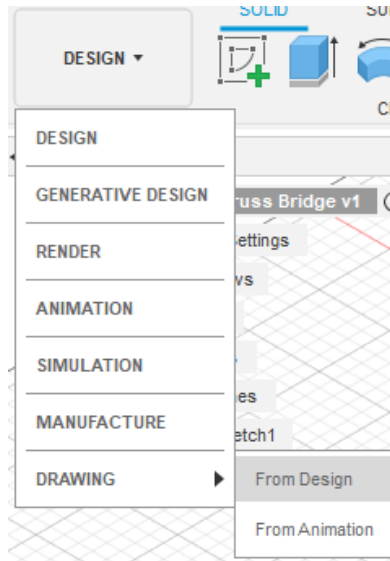
Step 14: Turn off *Sketches* and rotate the view to see the completed model.



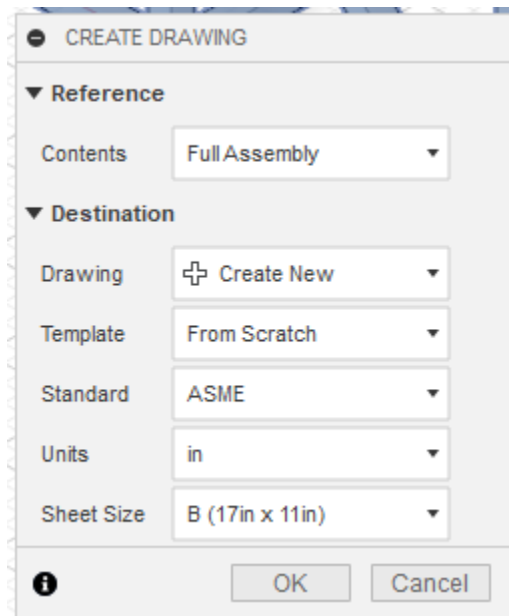
# Autodesk Fusion 360 Guide

## Creating a Drawing

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

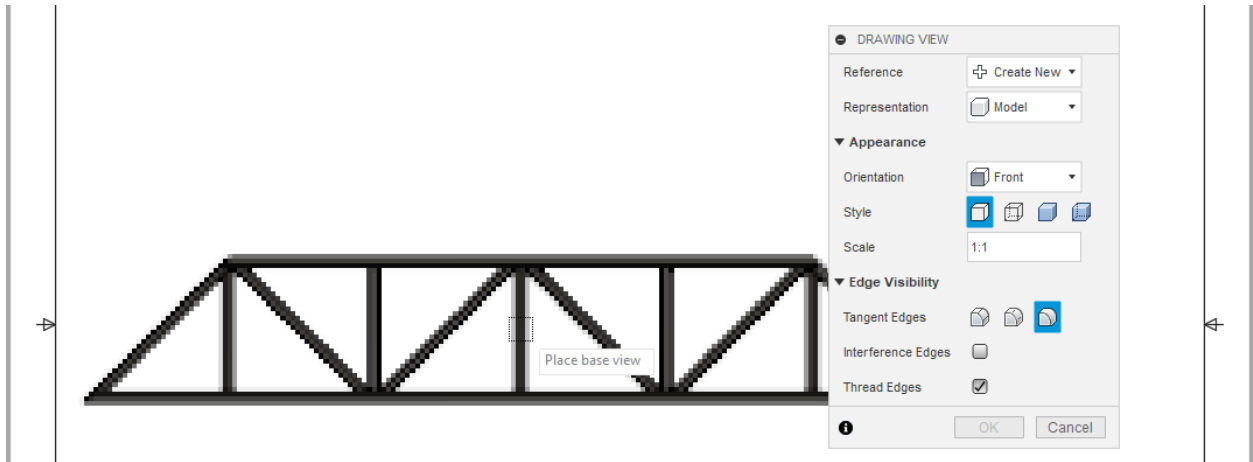



Step 2: Select the appropriate drawing/sheet options and select *OK*.

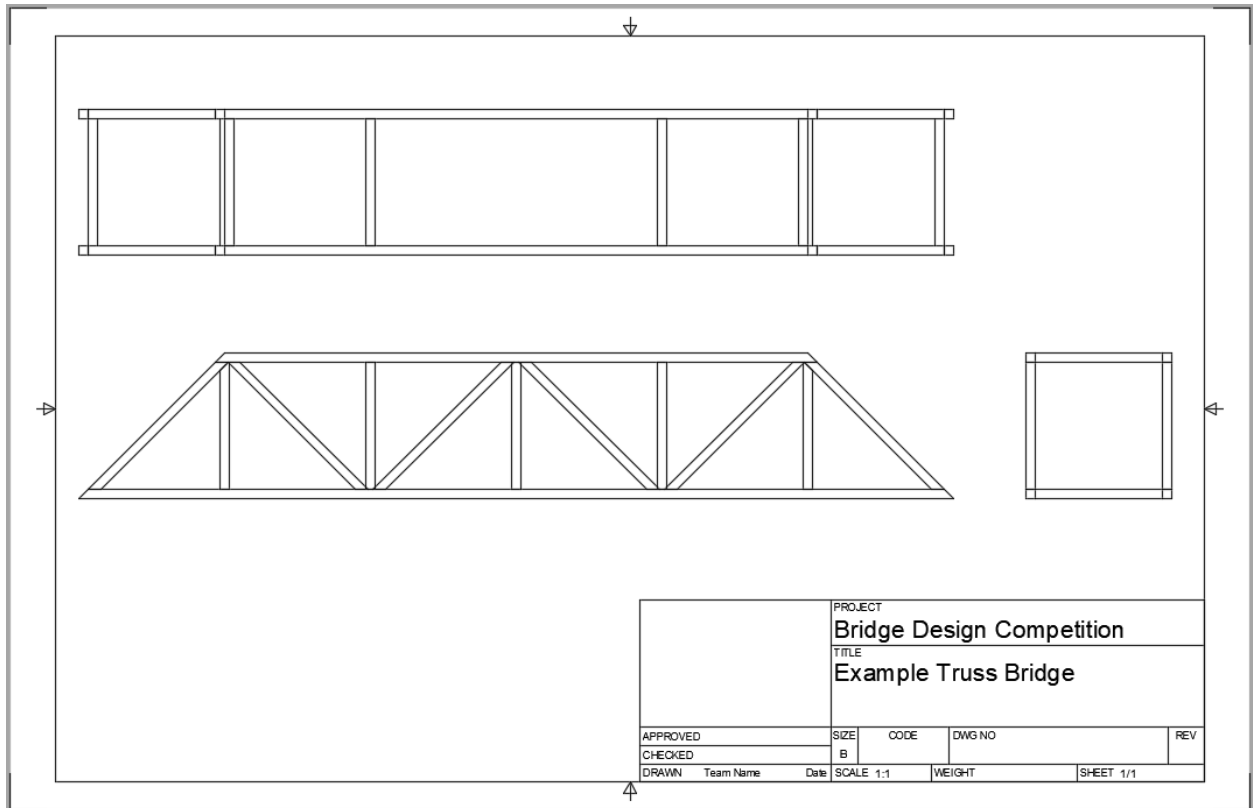


# Autodesk Fusion 360 Guide

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

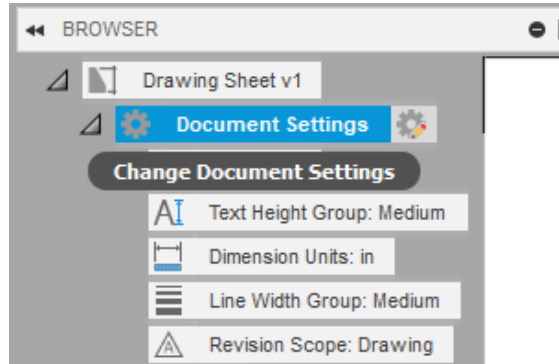


Step 4: From the *DRAWING* tab, in the *CREATE* toolbar, select *Projected View*  to draw other views of the bridge. Please see the example below.

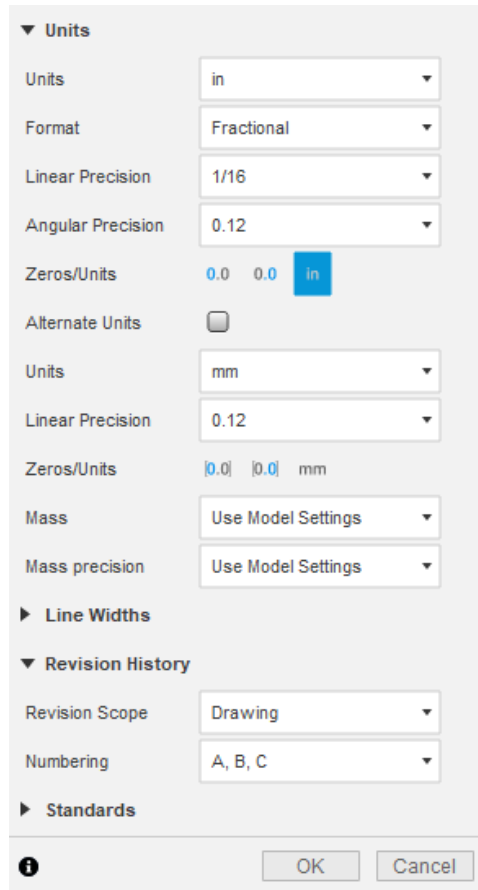


# Autodesk Fusion 360 Guide

Step 5: Select *Change Document Settings*.



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



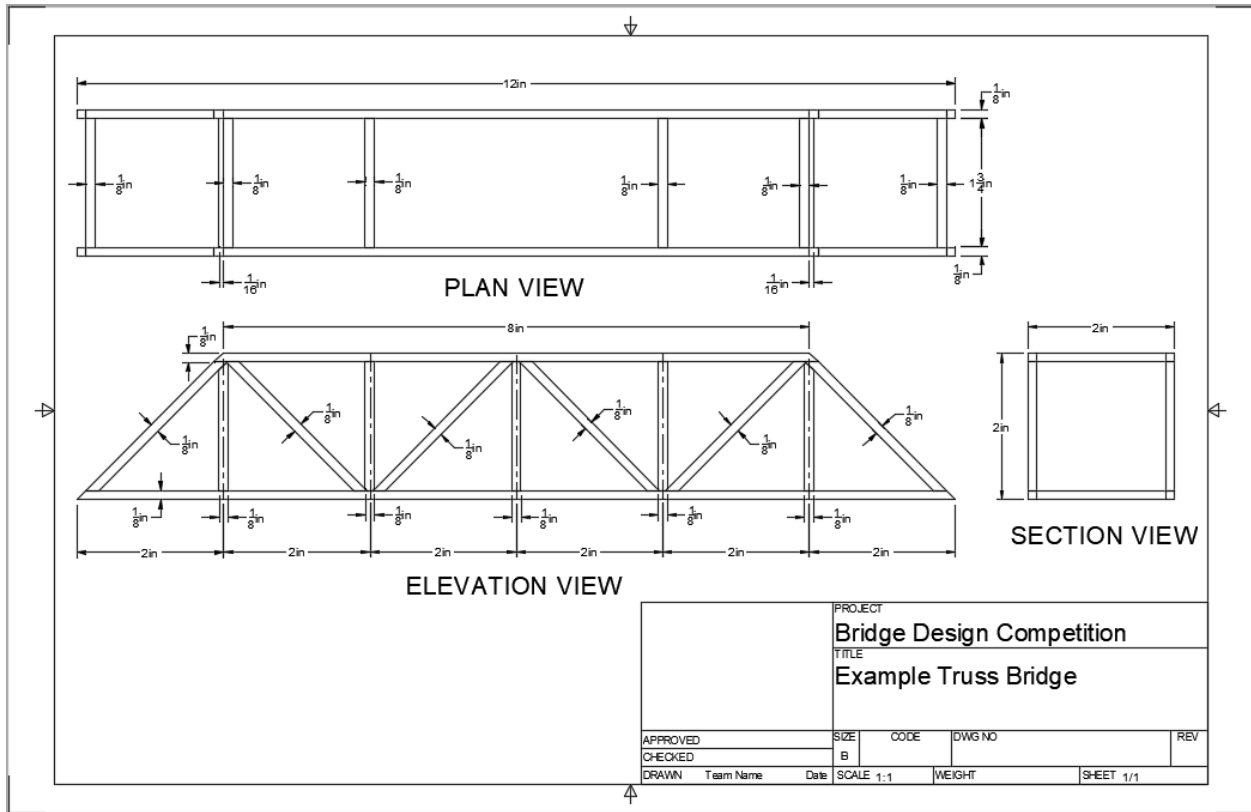
Step 7: From the *DRAWING* tab, in the *DIMENSIONS* toolbar, select the *Dimension* tool to dimension the drawing. Use other tools if necessary.



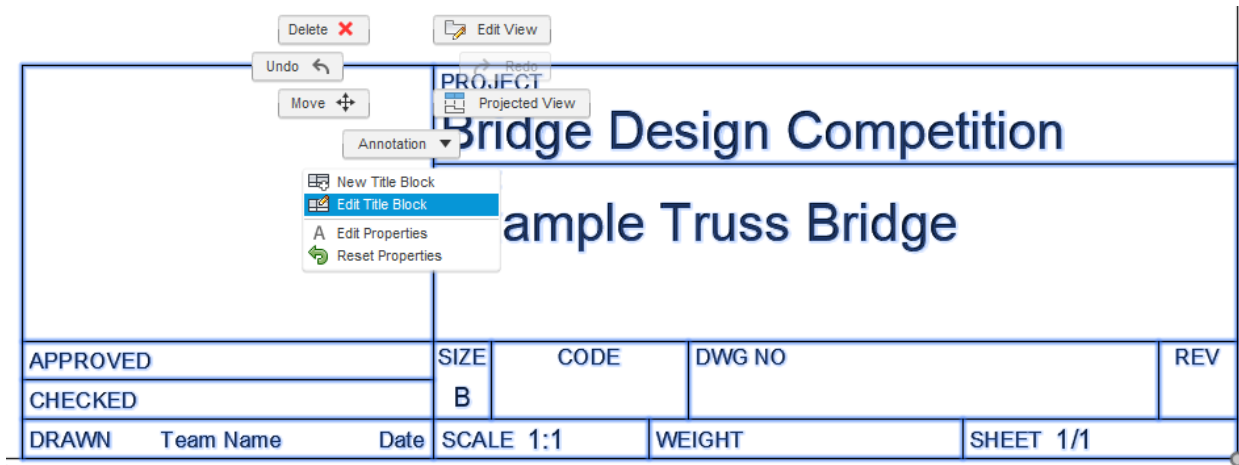


# Autodesk Fusion 360 Guide

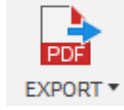
Step 8: From the *DRAWING* tab, in the *TEXT* toolbar, select the *Text* tool **A** to label the different views.



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.

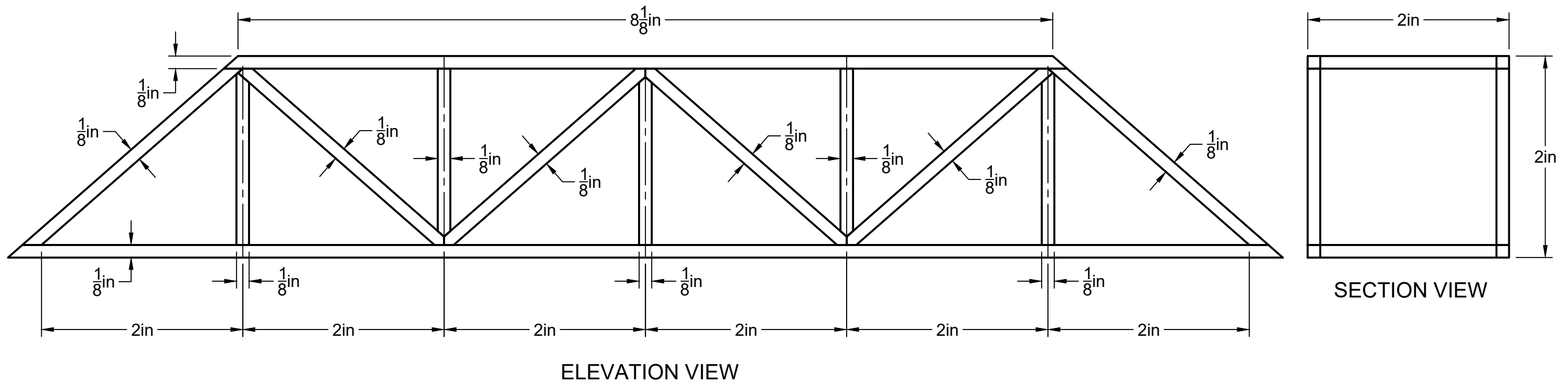
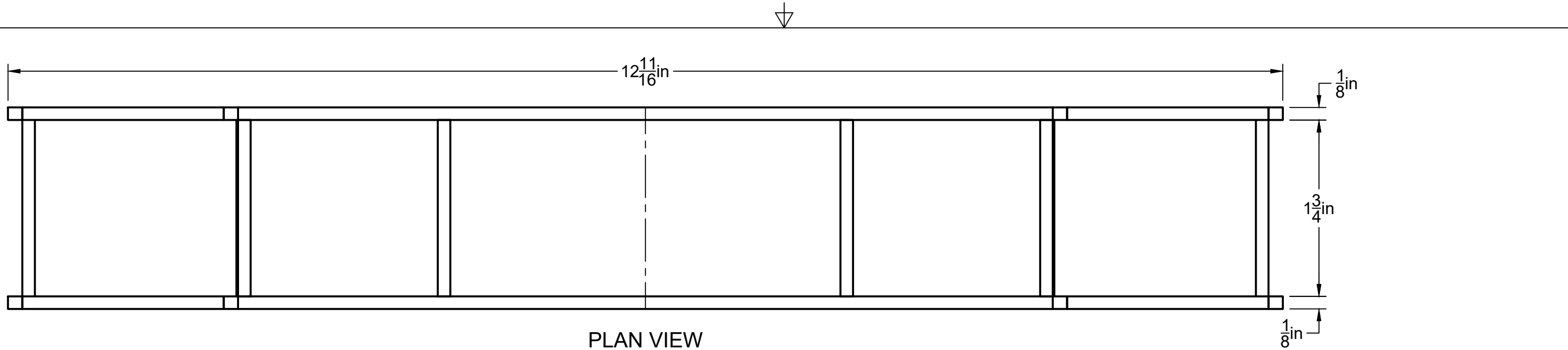


## Autodesk Fusion 360 Guide



Step 10: Select *Export* from the *DRAWING* tab to export the drawing as a PDF.

**Don't forget to save!**



	PROJECT <b>Bridge Design Competition</b>			
	TITLE <b>Simple Truss Bridge</b>			
APPROVED	SIZE	CODE	DWG NO	REV
CHECKED	B			
DRAWN	TEAM NAME	DATE	SCALE 1:1	WEIGHT
				SHEET 1/1