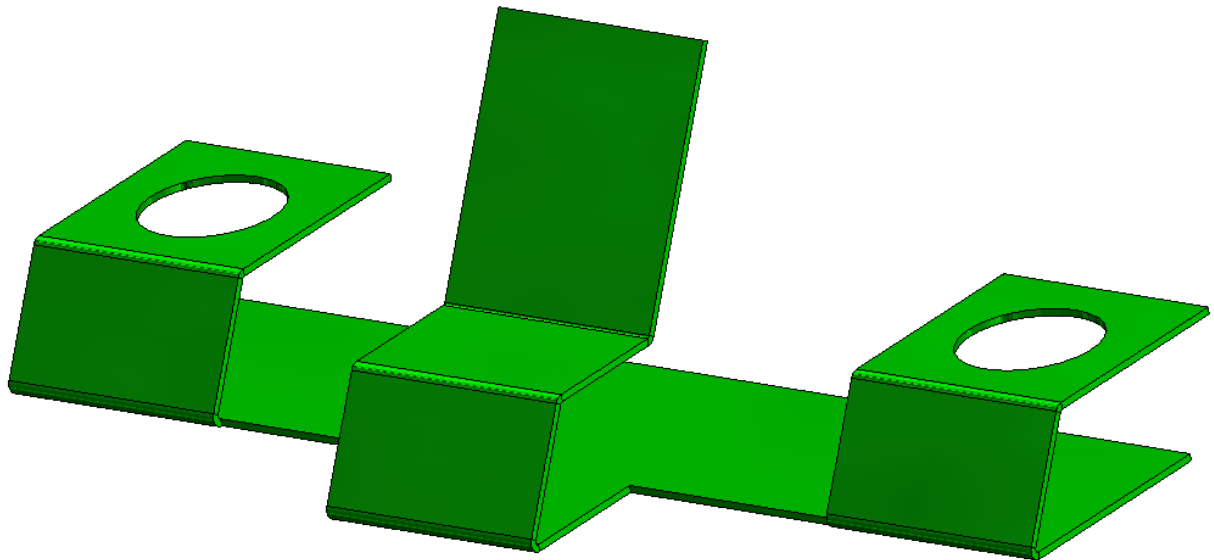
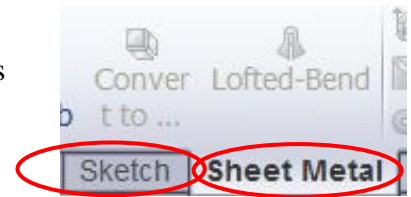


Docking Station Exercise 4.



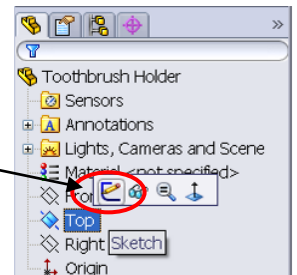
Prerequisite Knowledge	Previous knowledge of the following commands is required to complete this lesson; Sketch (Line, Centerline, Circle, Add Relations, Smart Dimension, Mirror Entities), Sheet Metal tools and Edit Materials .
Focus of lesson	This lesson focuses on designing a sheet metal part from the flattened state. In this case, you create a sheet metal part and then insert bend lines on which to fold the part.
Commands Used	This lesson includes Sketch commands (including Convert Entities), Base Flange, Extruded Cut, and Sketched Bend.
New File	Create a new part file.
Save File	Save the file as ' Docking Station ' to a folder called ' Docking Station ' (Continue to save periodically throughout the exercise)

Getting Started Activate Sketch and Sheet Metal tabs on the command manager as outlined in earlier exercises

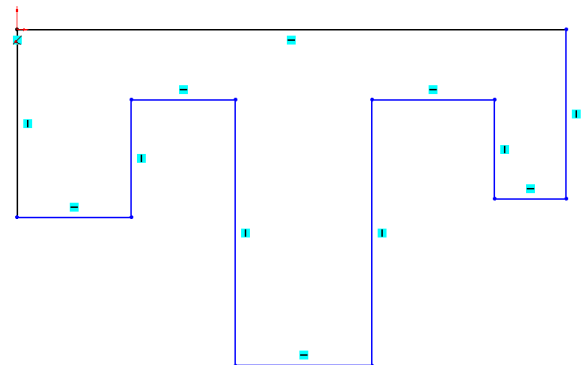


Creating a sketch We begin by creating a sketch to generate the piece of acrylic required to manufacture the object.

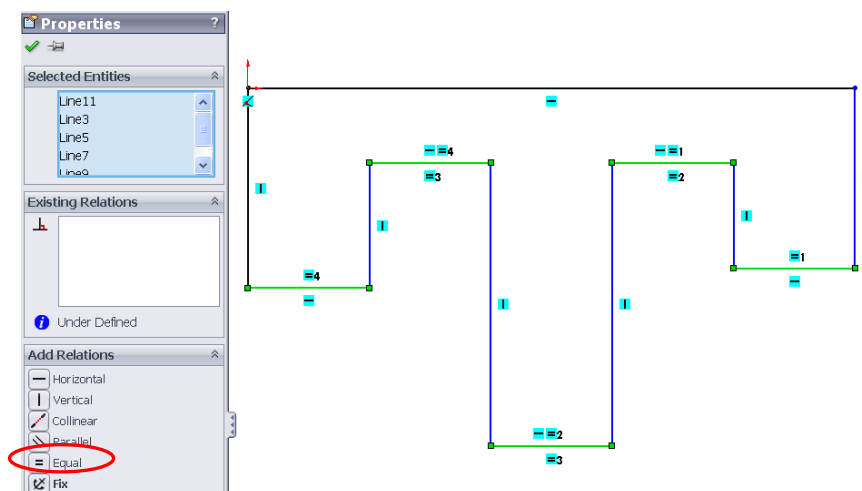
Choosing a plane Choose the **Top plane** from the Design Tree and select the sketch icon from the pop up toolbar



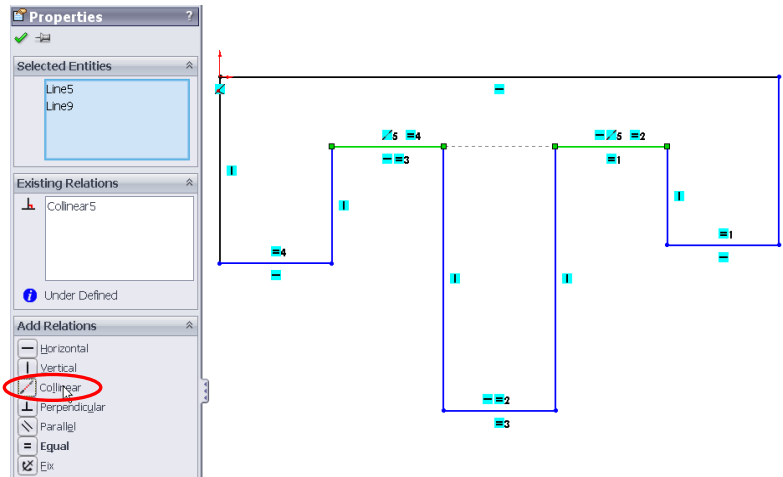
Creating a sketch Select the **Line** command and create a sketch as shown



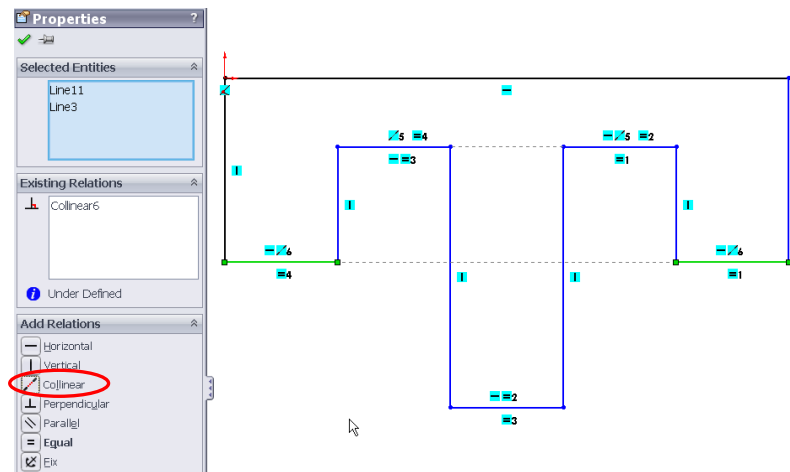
Add relations Add an 'Equal' relation between the five horizontal lines



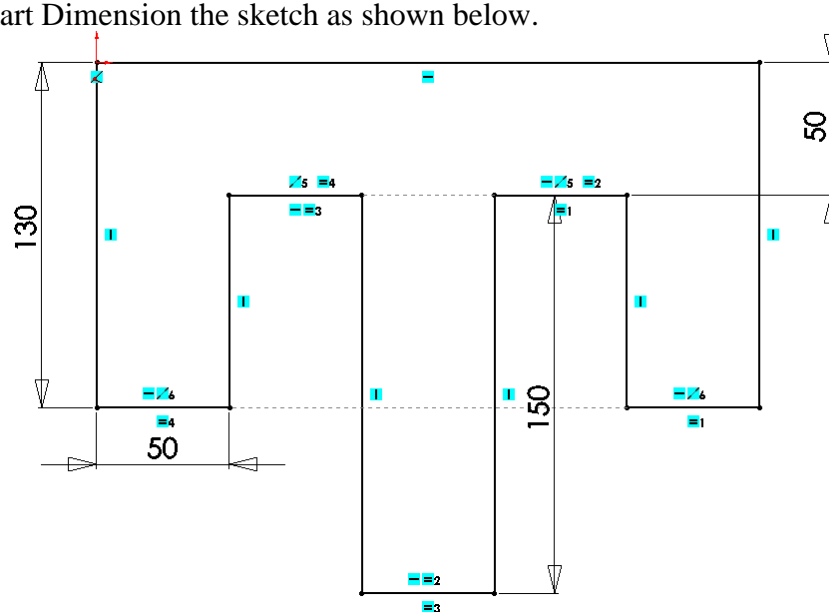
Add a 'Collinear' relation between the two horizontal lines shown.



Add another 'Collinear' relation between the two horizontal lines shown.



Smart Dimension Smart Dimension the sketch as shown below.




Exit the sketch.

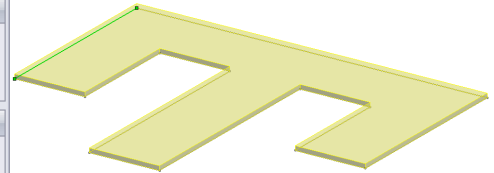
Creating the Sheet Metal Feature

Select Base Flange from the Sheet Metal toolbar

Select the sketch

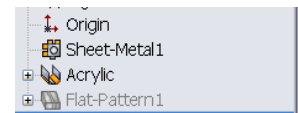
Apply a thickness of 3mm

Select Ok 



Rename Base Flange1

Rename this feature as 'Acrylic'

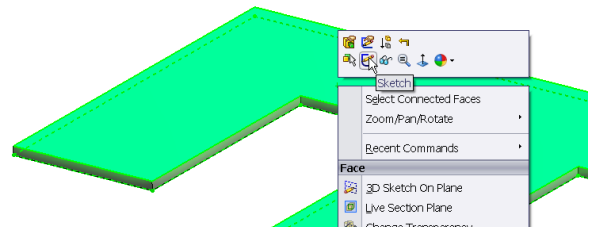


Sketch for bends

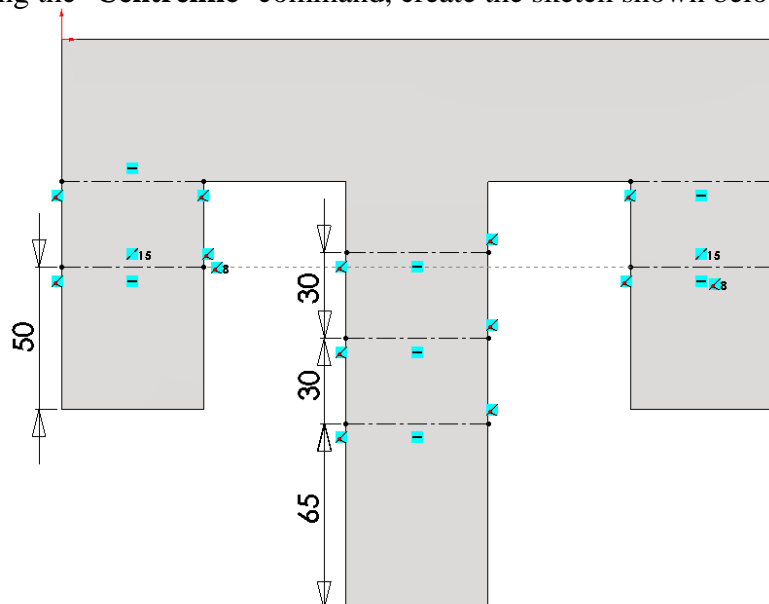
We will now create a sketch to include all the bending lines. We will subsequently use 'Convert Entities' from the sketch toolbar when creating the various bends. In this way, we can edit the position of all the bends from one sketch.

Right click the top face as indicated. Select the sketch icon from the pop up toolbar

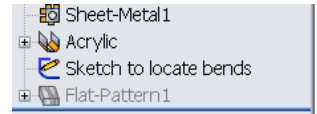
Select 'Normal to'



Using the 'Centreline' command, create the sketch shown below



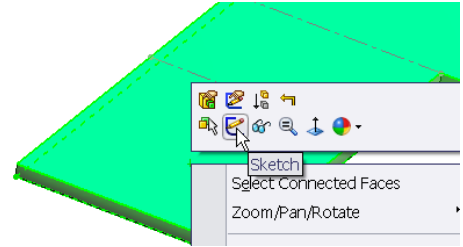
Exit the sketch and rename as 'Sketch to locate bends'



This sketch should be left visible

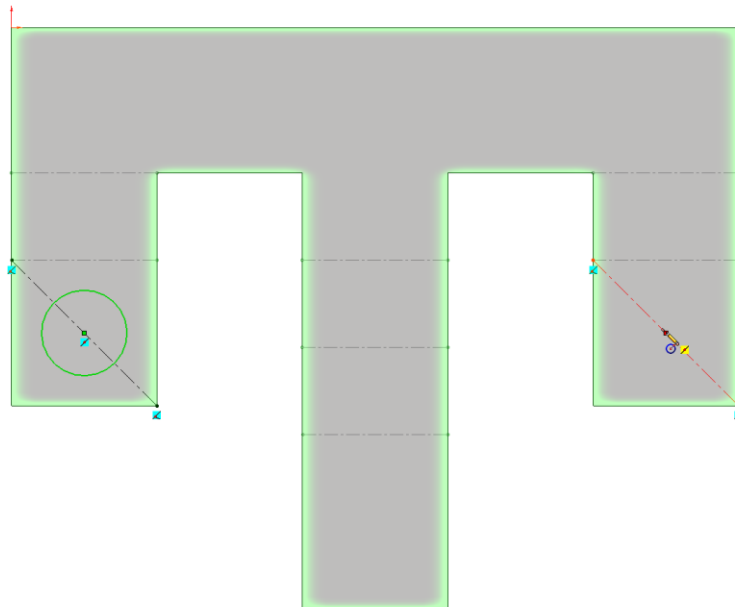
Circular Holes

Right click the top face as indicated.
Select the sketch icon from the
pop up toolbar

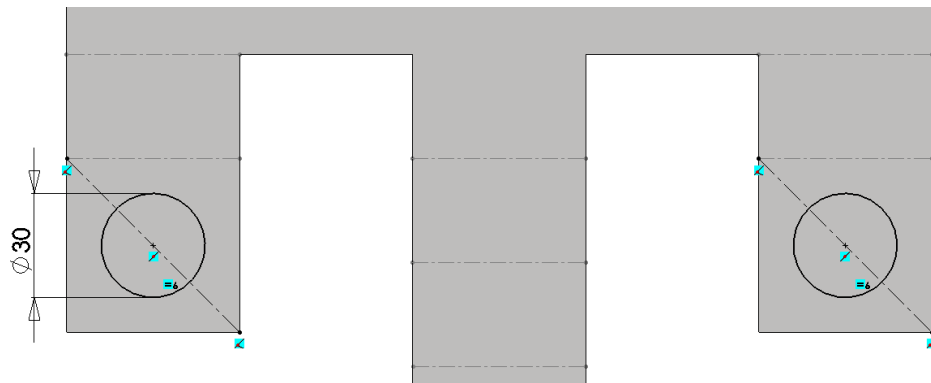


Select 'Normal to'

Use a diagonal centreline to help locate the centre of the circles. Sketch the circles with the centre on the diagonals as shown.



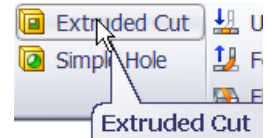
Add an 'Equal' relation between the two circles and dimension as indicated below.



Exit the sketch

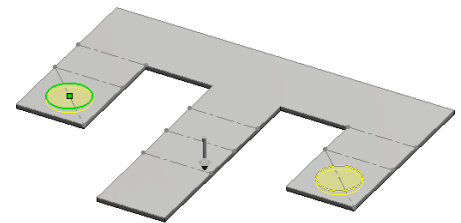
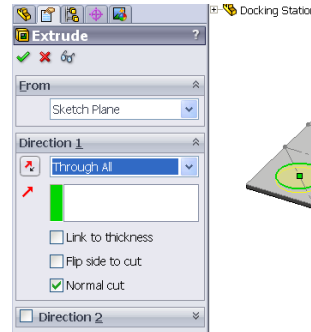
Extruded Cut


Select Extruded Cut from the Sheet Metal toolbar.



Select the previous sketch created

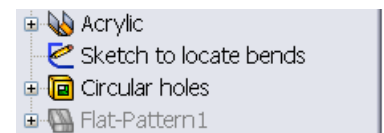
Choose 'Through All' as the end condition of 'Direction 1'



Select Ok 

Rename feature

Rename feature as 'Circular holes'.

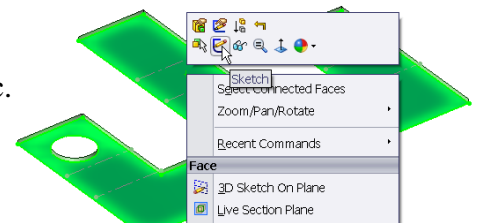


Sketched Bends

We will need to create five sketched bends in total – 3 for the centre piece and two for the side pieces.

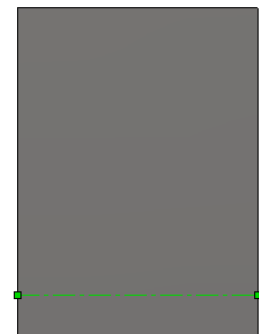
Sketched Bend 1

Create a sketch on the bottom face of the acrylic.



Select the first centreline on the centre piece in the graphics area (this line is located in the 'Sketch to locate bends')

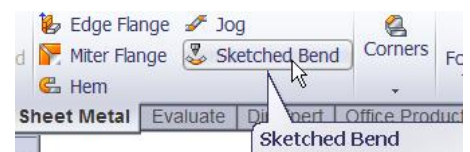
Choose 'Convert Entities' from the Sketch toolbar



This creates a line in the existing sketch which will be used to form a bend.

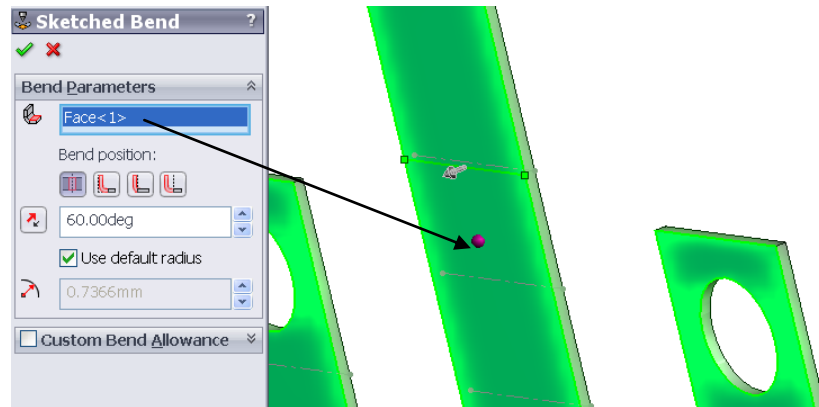
Exit the sketch.

Select 'Sketched Bend' from the Sheet Metal toolbar.



Select the following options in the property manager:

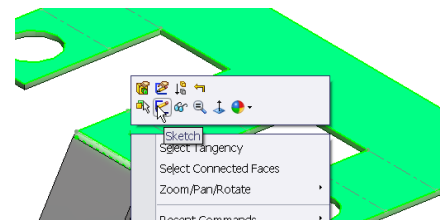
- The face that you wish to remain horizontal after the bending process
- 'Bend Centerline' as the Bend Position
- 60° as the bending angle
- Default radius as the bending radius



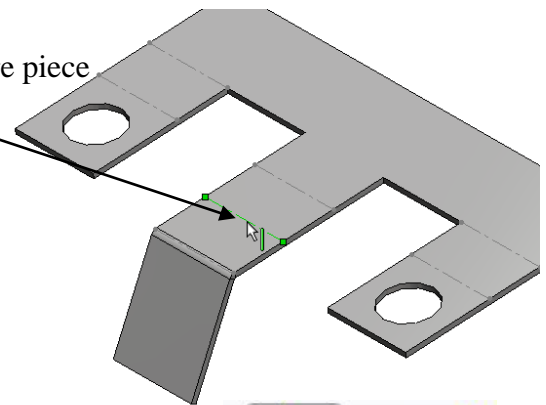
Select Ok 

Sketched Bend 2

Create a sketch on the top face of the acrylic.



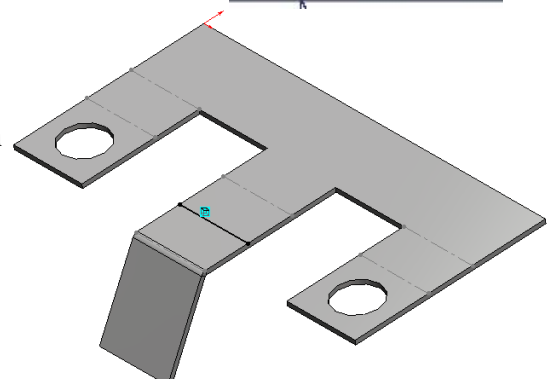
Select the second centreline on the centre piece



Choose 'Convert Entities' from the Sketch toolbar



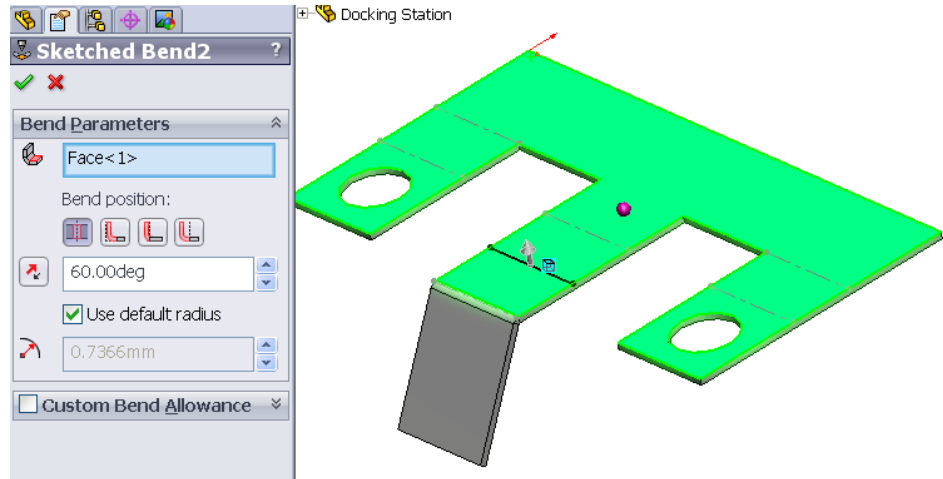
This creates a line in the existing sketch which will be used to form a bend.



Exit the sketch.

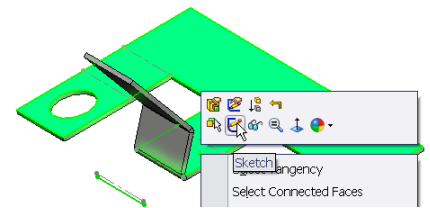
Select 'Sketched Bend' from the Sheet Metal toolbar.
Choose the following options in the property manager:

- The face that you wish to remain horizontal after the bending process
- 'Bend Centerline' as the Bend Position
- 60° as the bending angle
- Default radius as the bending radius

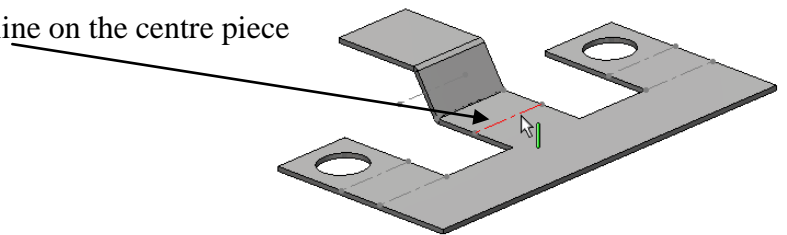


Select Ok 

Sketched Bend 3 Create a sketch on the top face of the acrylic.



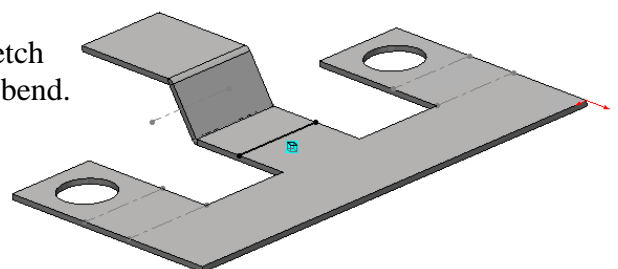
Select the third centreline on the centre piece



Choose 'Convert Entities' from the Sketch toolbar

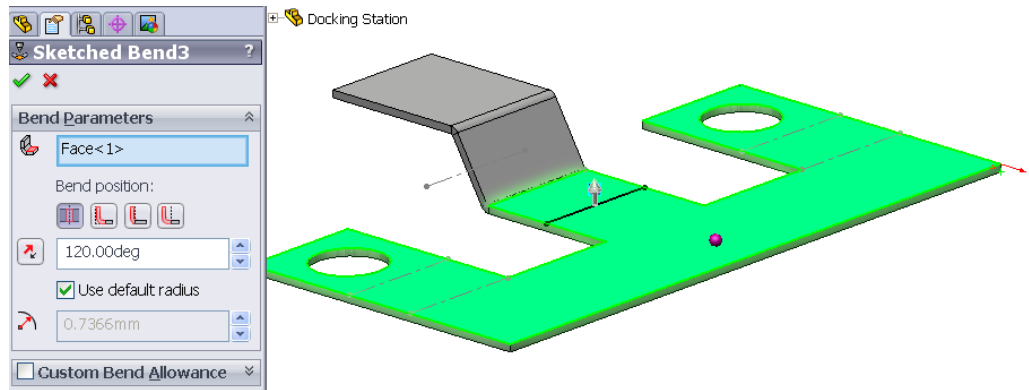
This creates a line in the existing sketch which will be used to form the third bend.


Exit the sketch.



Select 'Sketched Bend' from the Sheet Metal toolbar.
Choose the following options in the property manager:

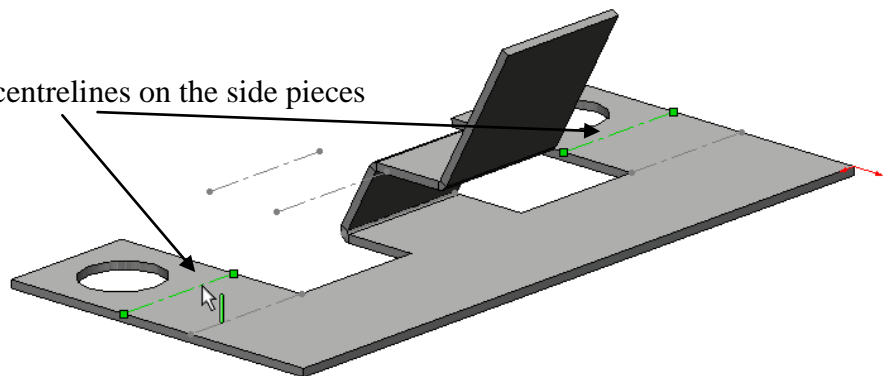
- The face that you wish to remain horizontal after the bending process
- 'Bend Centerline' as the Bend Position
- 120° as the bending angle
- Default radius as the bending radius



Select Ok 

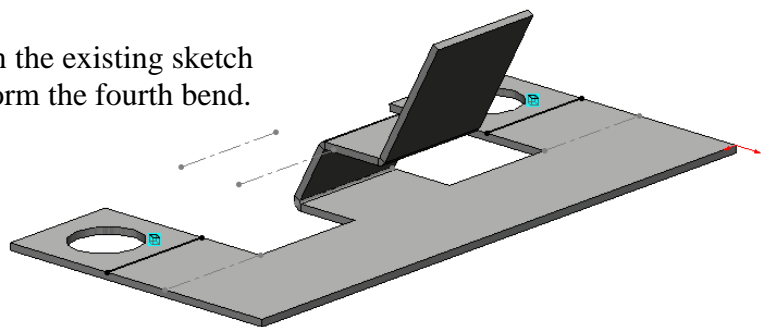
Sketched Bend 4 Create a sketch on the top face of the acrylic.

Select the two centrelines on the side pieces



Choose 'Convert Entities' from the Sketch toolbar

This creates two lines in the existing sketch which will be used to form the fourth bend.

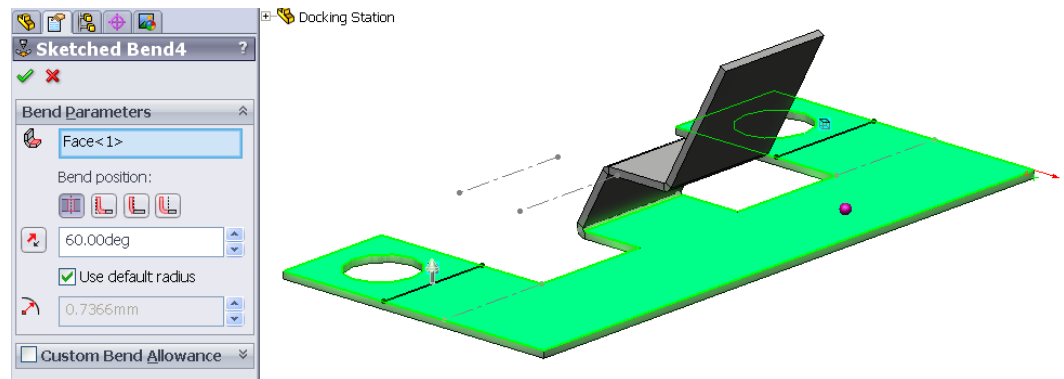


Exit the sketch.

Select 'Sketched Bend' from the Sheet Metal toolbar.

Choose the following options in the property manager:

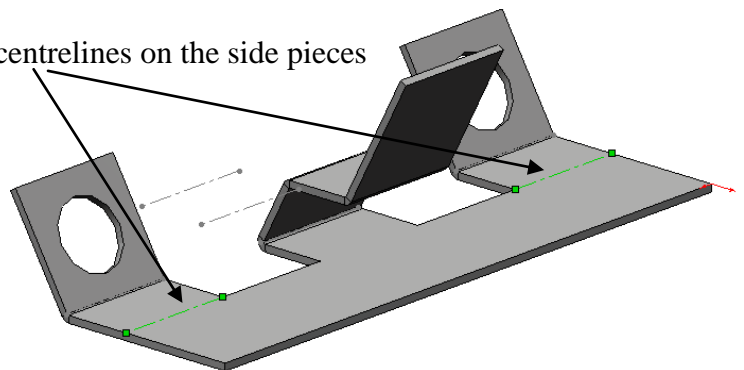
- The face that you wish to remain horizontal after the bending process
- 'Bend Centerline' as the Bend Position
- 60° as the bending angle
- Default radius as the bending radius



Select Ok 

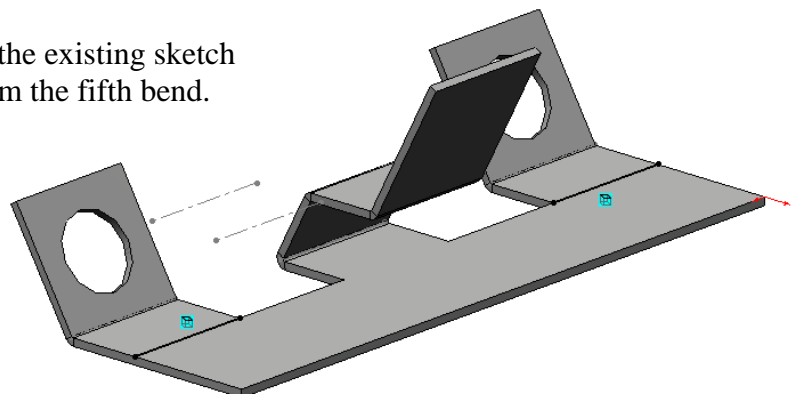
Sketched Bend 5 Create a sketch on the top face of the acrylic.

Select the remaining two centrelines on the side pieces



Choose '**Convert Entities**' from the Sketch toolbar

This creates two lines in the existing sketch which will be used to form the fifth bend.

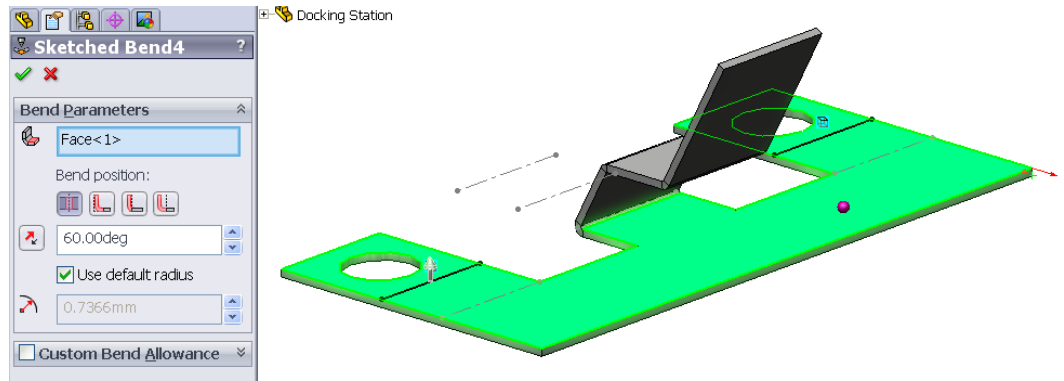


Exit the sketch.

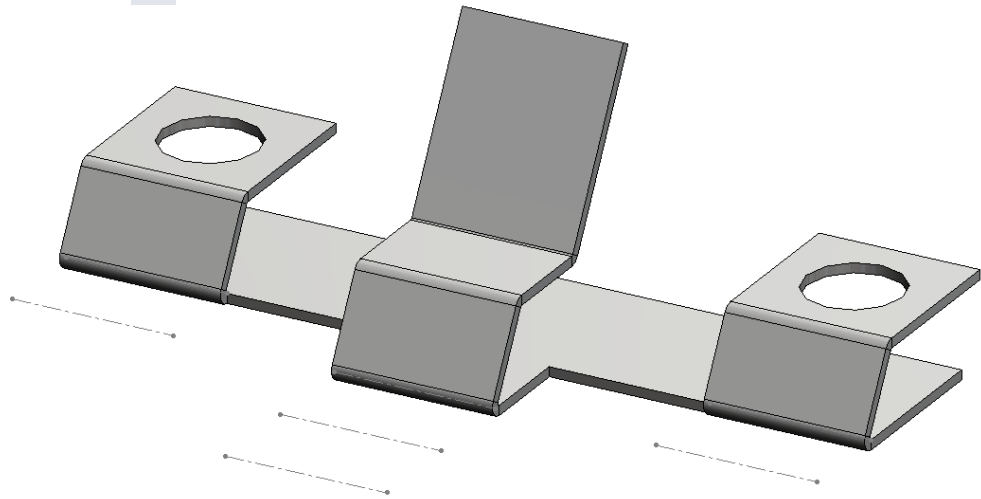
Select 'Sketched Bend' from the Sheet Metal toolbar.

Choose the following options in the property manager:

- The face that you wish to remain horizontal after the bending process
- 'Bend Outside' as the Bend Position
- 120° as the bending angle
- Default radius as the bending radius

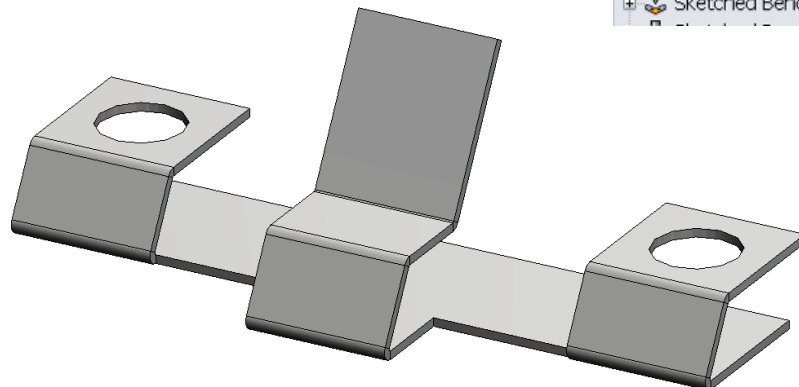
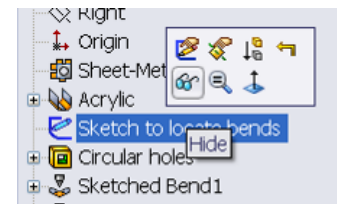


Select Ok 



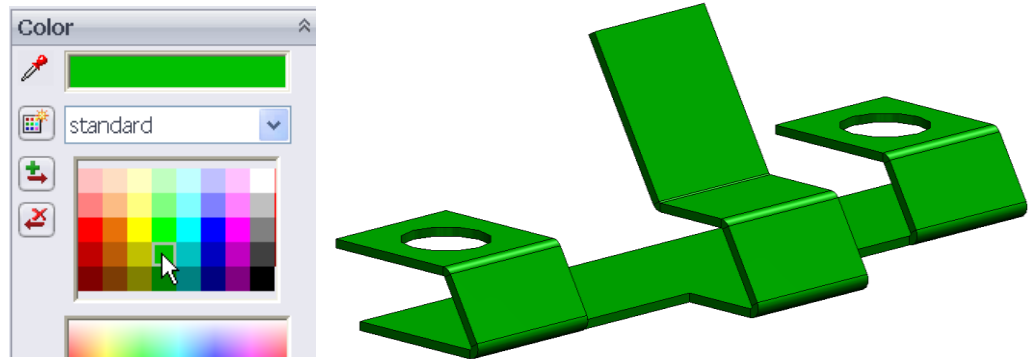
Hide Sketch

Hide the 'Sketch to locate bends' so that the Centrelines will be no longer visible



Edit Material Apply 'Acrylic (Medium-high impact)' as in previous exercises

Apply Colour Right click on any face of the docking station and apply a colour



Save Save the 'Docking Station' part file.

