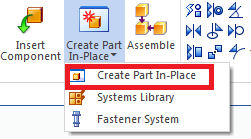
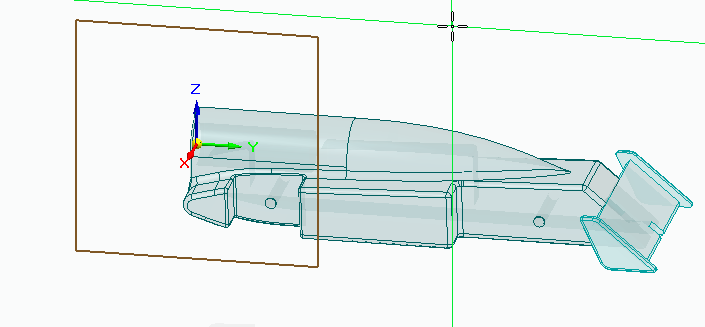
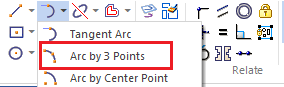
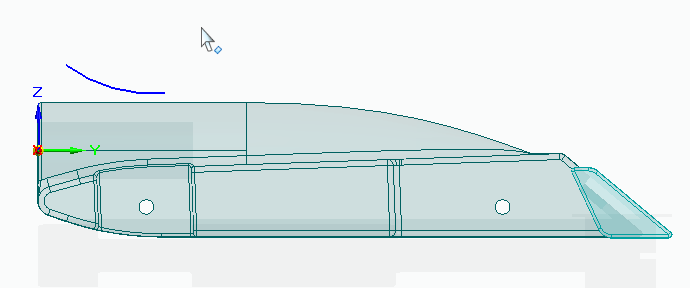
**F1 in Schools Tutorial Script - 03 Rear Wing**

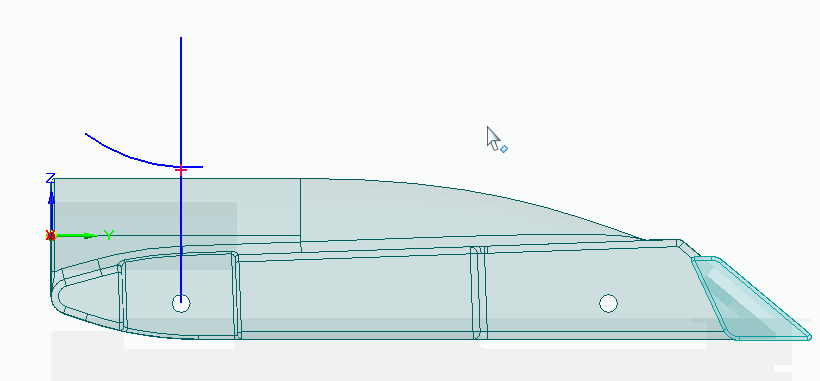
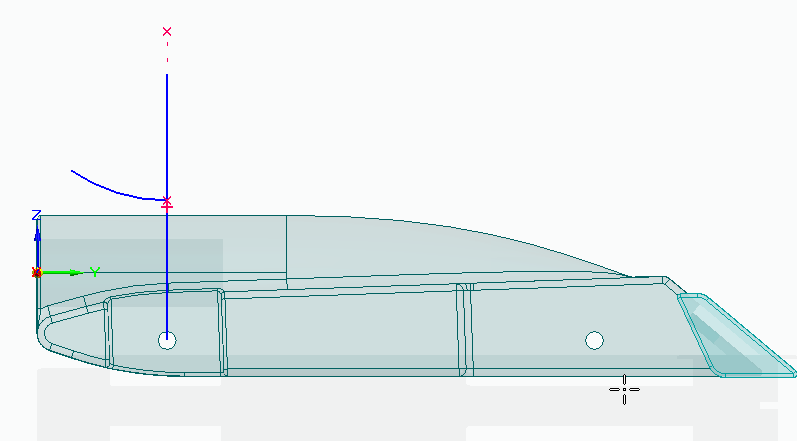
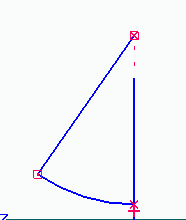
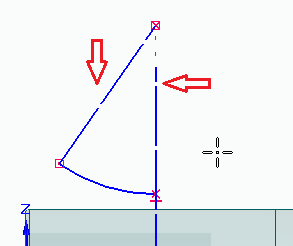
* Start your rear wing design by using the previously made F1 Body design assembly. (My\_F1\_Car\_Assembly.asm)
* Create new part in place.
  + Select “Create Part in Place”
  + Select OK when dialogue box comes up.
  + Select Polyurethane for material in dropdown menu.
  + Click on the Green checkmark button.
  + 2017-10-02 10_44_33-Solid Edge ST10 - Assembly - [My F1 Car Assembly .asm].pngSave the part file ex. (rear\_wing.par)
* Orient the model in order to sketch on the correct plane.
  + Using the orientation cube in the lower right corner, click on the Right view.
  + Press F3 to lock to the Right plane.

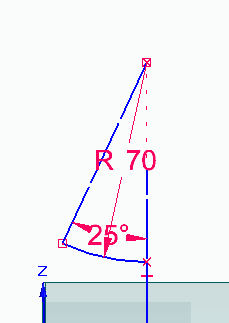


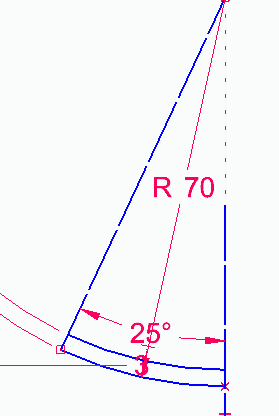
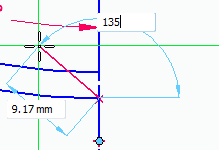
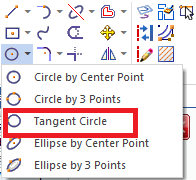
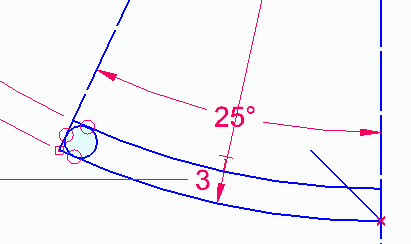
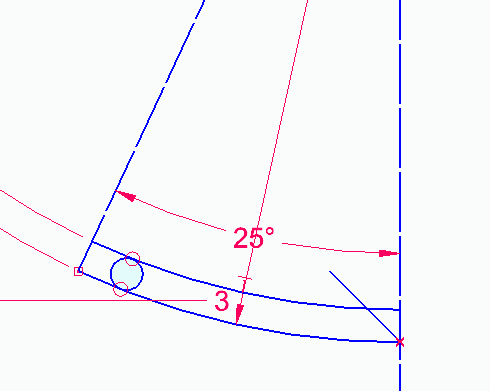
* Click on the arc button and select “Arc by 3 Points”.

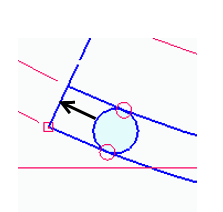
* Draw an arc using 3 points above the car body.
  + This is an estimation and correct dimension will be applied later.

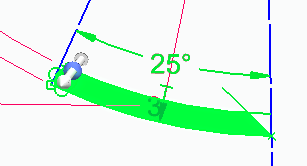
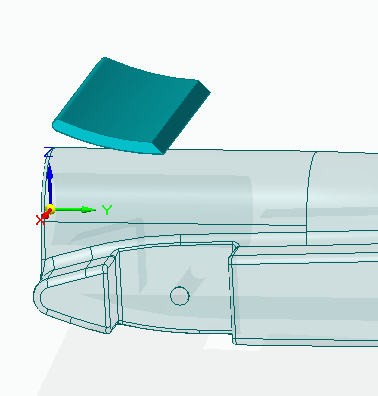


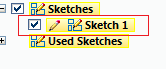
* Using the line sketch feature, draw a line starting from the centerline of the rear wheel axle upwards.
* Click on the connect button in Relate section to align the arc center to the vertical line.
* Using the same connect button, connect the arc and the centerline to remove the remaining arc segments.
* Draw another line from the arc centerline to the other end of the arc.
* Click on the construction button and select both straight lines.



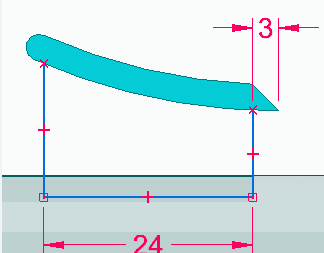
* Using the smart dimensions, define the radius of the arc 70mm.
* Define the angle of the arc 25 degrees.
* To define the thickness of rear wing:
  + Offset the arc by clicking on the offset button and selecting the arc.
  + Offset the arc to the inside 3 mm.
* Sketch an angled line from the lower endpoint of the arc
  + Line should be at a 135° angle as shown.
  + Press the tab key to enter the angle dimensions instead of length.
* Sketch a circle on the trailing edge to create the back end of the wing.
  + Select the tangent circle option from the dropdown menu.
  + Place the circle between the two arcs.
  + Apply a third tangent relationship between the arc and   
    the angled line as shown.



* Taking advantage of the synchronous technology,   
  click and drag a box around the sketch   
  to select the enclosed shape.
* Extrude the enclosed shape 80 mm.
  + Press shift to toggle symmetry.

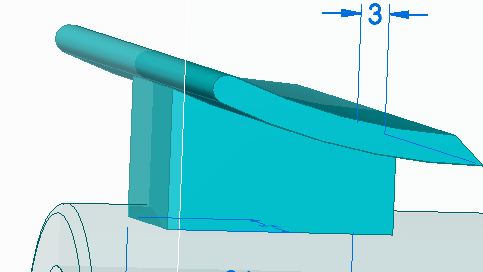


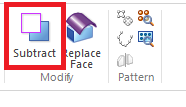
* Since we no longer need the sketch,   
  we can delete the sketch in the pathfinder.

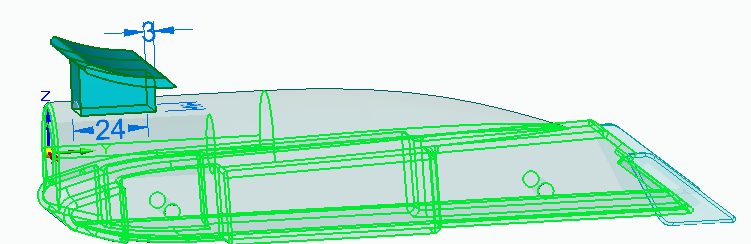


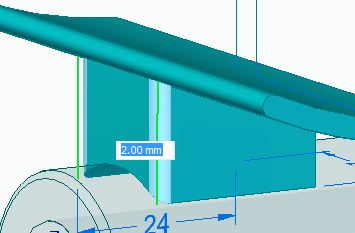
* Sketch 3 lines on the center plane to create the  
   mounting structure for the rear wing.
  + Using the smart dimensions, add a few   
    dimensions to the sketch.
* Use the extrude feature to create a solid extrusion.
  + Extrude the structure 20 mm symmetrically.
  + Make sure to select chain option from the dropdown menu.

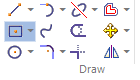
2017-10-17 10_42_06-Solid Edge ST10 - Synchronous Part - [Part1].png

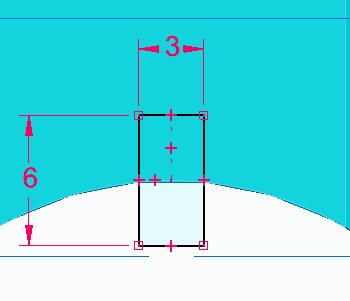
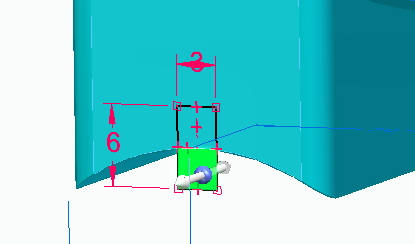


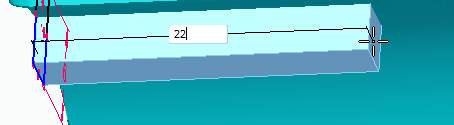
* Use the subtract feature to subtract the wing from the car body.

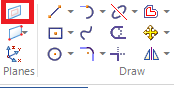
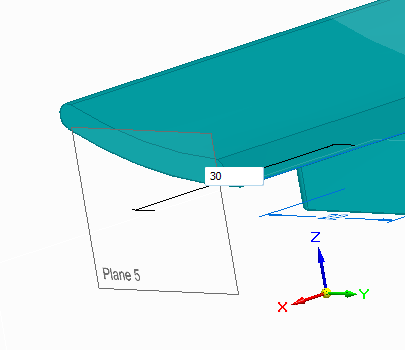
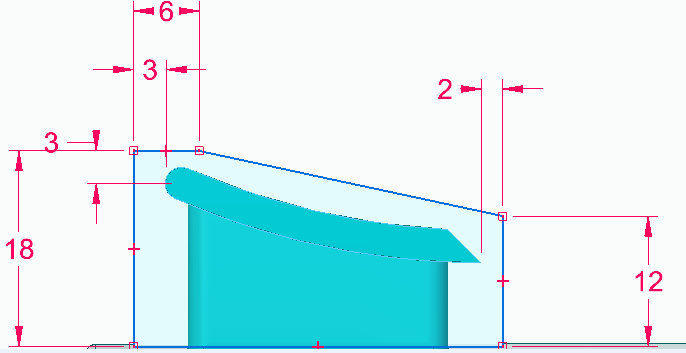


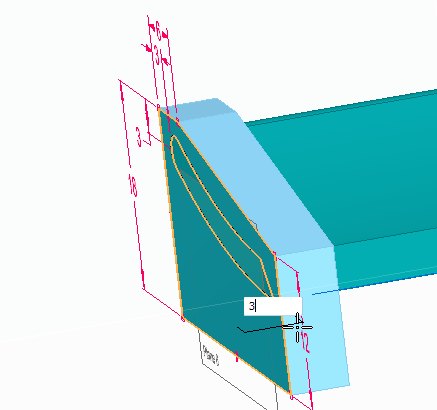
* Add rounds to the model to make it aesthetically pleasing.
  + Round the 4 corners on the support structure.



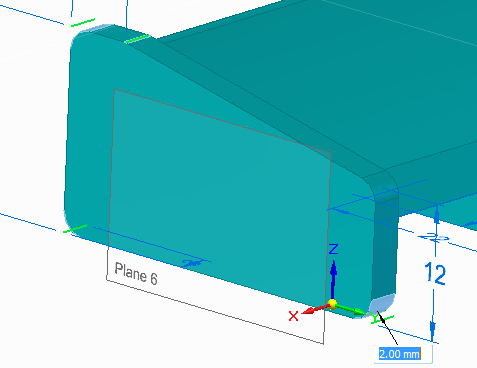
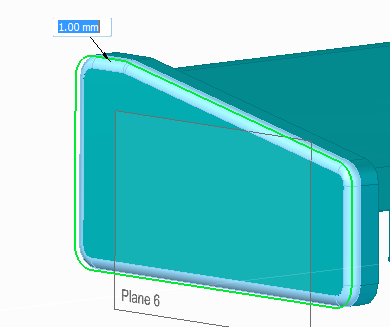
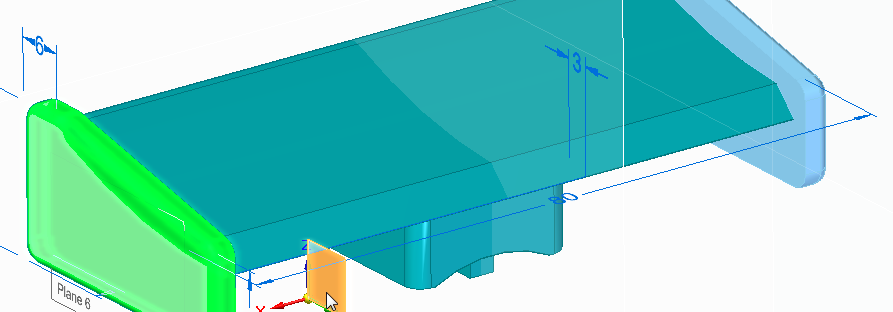
* Sketch a rectangle by center on the back side of the wing.
  + Dimension the rectangle 3 mm wide and 6 mm height.
* Extrude the lower region of the rectangle.
  + Extrude 22 mm towards the leading edge of the wing.

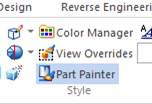
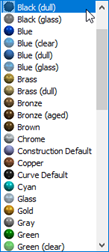
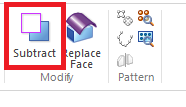
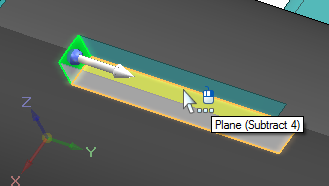
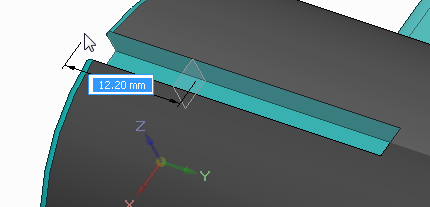
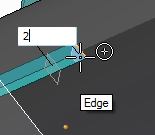


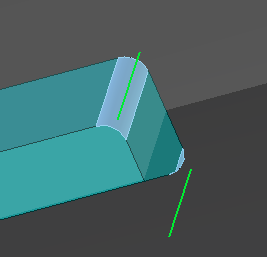
* Using the Pathfinder, delete the rectangle sketch.
* Use the coincident plane feature to create a plane coincident to the side of the mounting structure.
  + Using the steering wheel, translate the plane so that it is coincident to the end face of the wing.
* Use the new sketch plane to create a sketch for the support structure at the end of the wing.
  + Use smart dimensions to add a few measurements to the sketch.

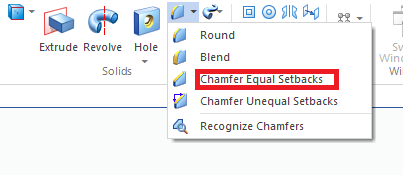
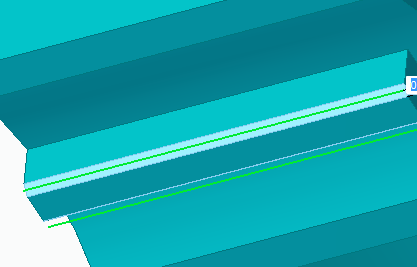
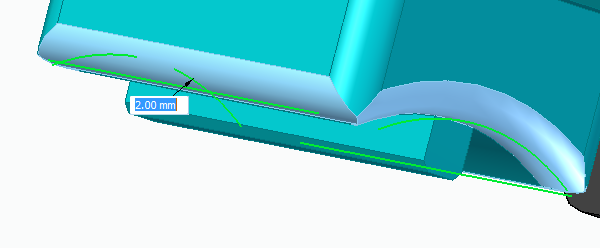
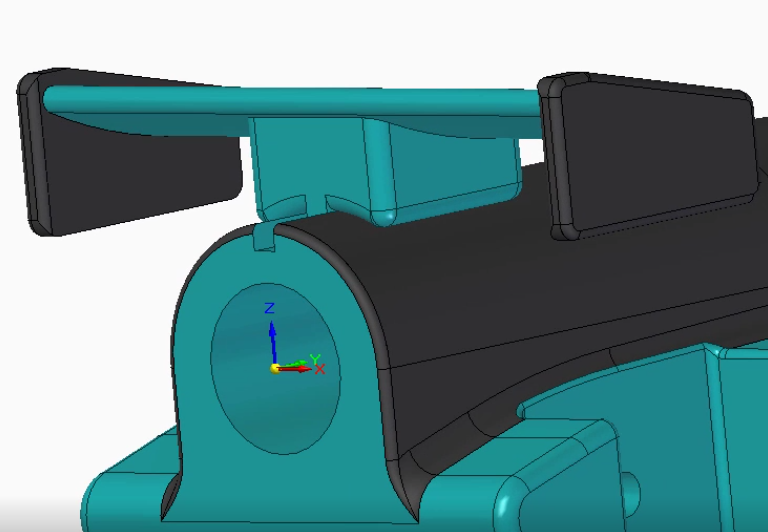
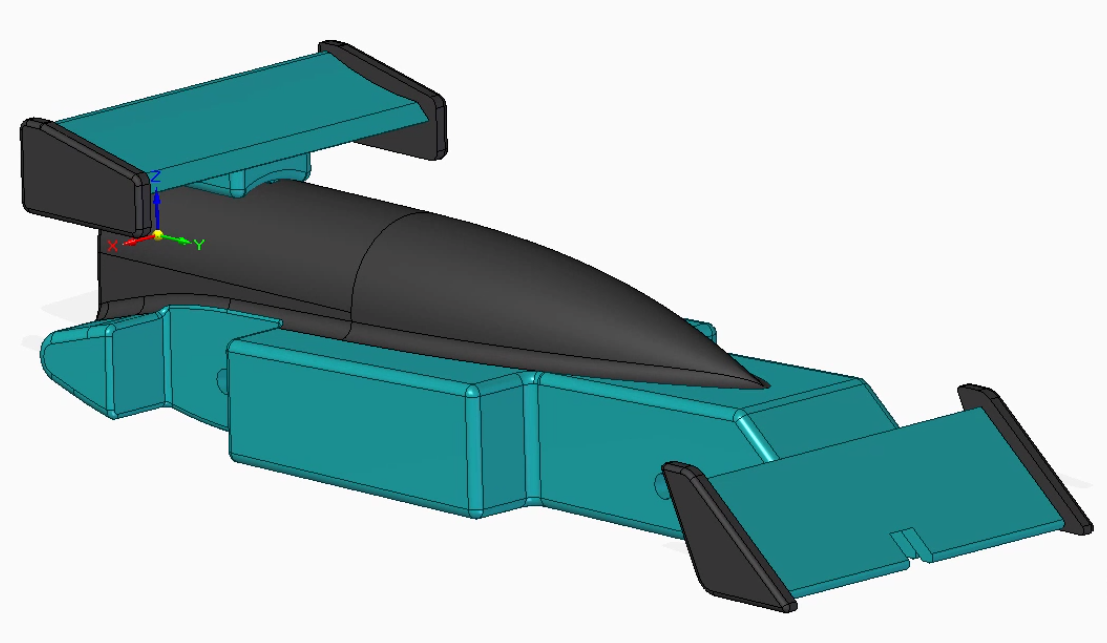


* Select the sketch and the wing arc to   
  extrude 3mm towards the center plane.

* Add rounds to the 4 corners of the structure for aesthetic purposes.
  + Select face round option in the drop down menu to add round to the entire face of the support structure.
* Click and drag a box around the entire support structure to select it.
  + 2017-10-17 11_13_48-Solid Edge ST10 - Synchronous Part - [Part1].pngMirror the entire structure across the center plane using the mirror feature command.

* Use part painter feature to paint the two end structures of the wing.
  + Paint the structures Black (dull).
* Click on the “Close and Return” button to close and return to the top level assembly.
* Use the subtract feature to subtract the rear wing body from the   
  car body to remove the interference
* Uncheck the box next to rear wing part in the pathfinder so   
  that you can see the slot in the car body.
* Click on the car body and select edit in place
  + Extend the resulting slot by dragging   
    the end face beyond the edge of the part
  + Also drag the front end of the slot an extra 2 mm.



* Add rounds to the corners of the slot using   
  the Round feature.
  + Specify a 0.5 mm radius for these  
    rounds.
* Click on “Close and return” button to exit and return to the assembly.
* Check the box next to rear wing part in pathfinder to see the entire assembly.
* Select the rear wing and click Edit in Place option to work with only the wing.
  + Add chamfers to the bottom edge of the key.
  + Select “Chamfer Equal Setbacks” from the dropdown menu.
* Add 2 mm rounds to the bottom of the wing.
  + Make sure to round all four sides of the wing as shown in the picture below.
* Click on Close and Return button.
* Save the assembly to save the changes to the parts.
* Now you have completed the rear wing of the F1 Car.