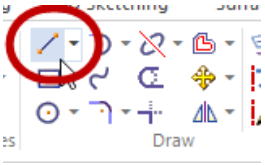
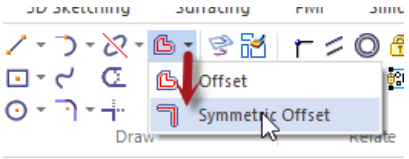
Solid Edge Robot Claw Linkage Tutorial

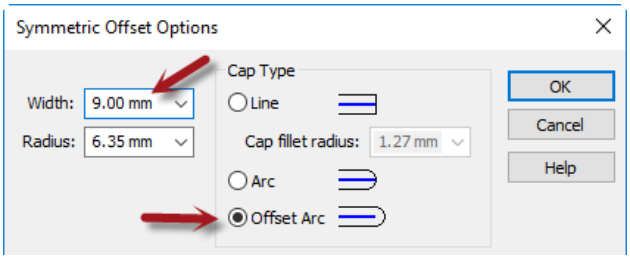
- Start by creating a NEW part file using a Metric Part template.

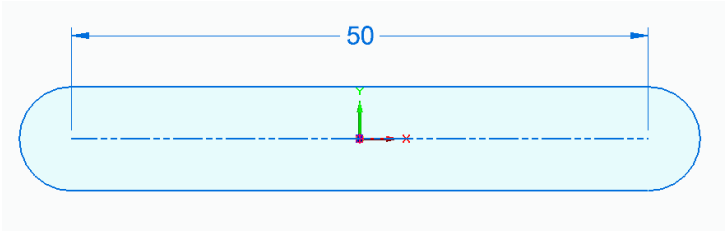


- Select the Line command and lock to the (x,y plane) by pressing F3 when the plane highlights under the cursor.
  - Press CTRL+H to orient to the sketch view.
  - Click on the origin as the start point and then press "S" to create a Symmetric line about the origin point.
  - Sketch a Horizontal Line that is 50 mm long.

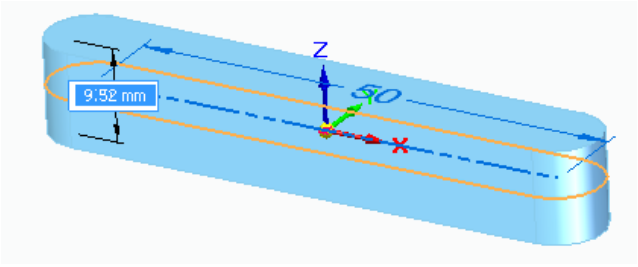


- Select the Symmetric Offset command found on the drop-down menu under the Offset command.
  - Set the width to 9 mm and toggle on Offset Arc in the Symmetric Offset options
  - Select the horizontal line to offset "from" and click the green checkmark or right click to accept.



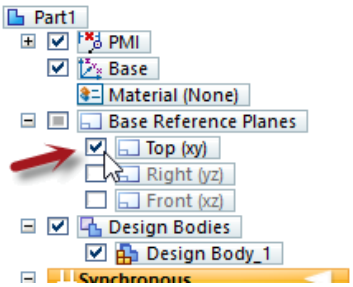


- Press CTRL+I to orient to an isometric view

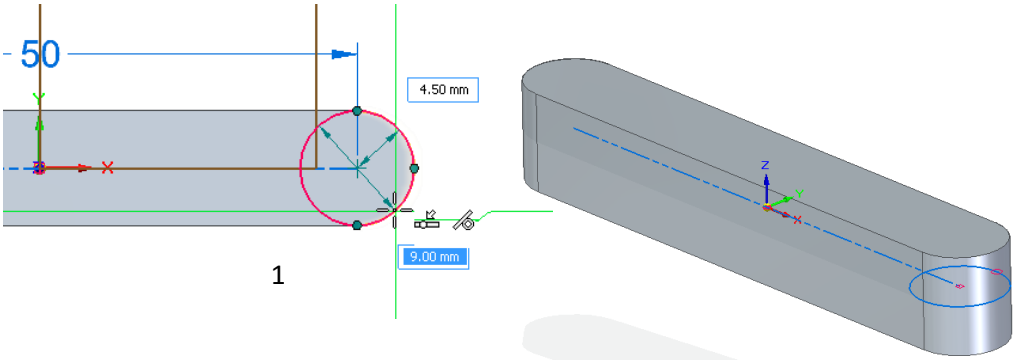


- Select the region created by the sketch and click an arrow to begin extruding into a 3D feature.
  - Tap "Shift" to extrude symmetrically and key-in 9.5 mm for the height.

- From the PathFinder, expand the Base Reference Planes entry and toggle on the Top Ref. Plane.

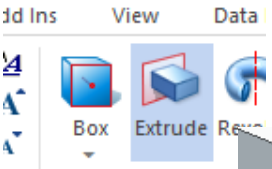


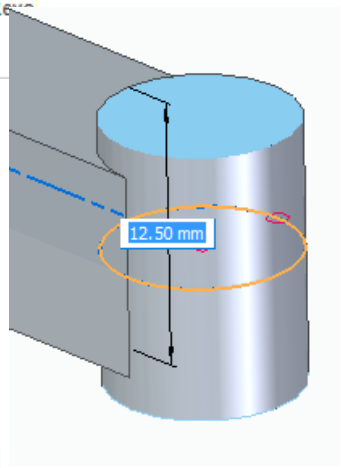
- Select the Circle by Center Point command and lock to the Top plane.
  - Press CTRL+H to orient to the sketch view.
  - Sketch a circle that is concentric with the arc and the same diameter as the arc.



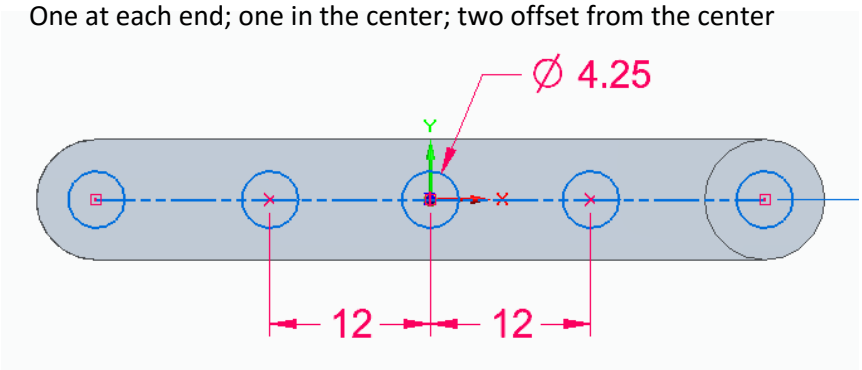
- Press CTRL+I to orient to an isometric view

- Select the Extrude command from the Command Ribbon.
  - Change the selection option to “Single” in the QuickBar.
  - Be sure the option is set to ADD material
  - Select the circle and extrude symmetrically 12.5 mm



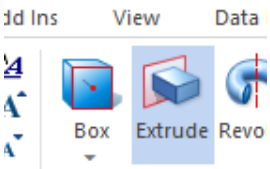


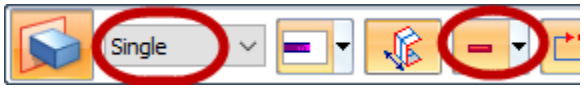
- Select the Circle by Center Point command and lock to the Top plane once again.
  - Press CTRL+H to orient to the sketch view.
  - Sketch five 4.25 mm circles as shown.
    - One at each end; one in the center; two offset from the center

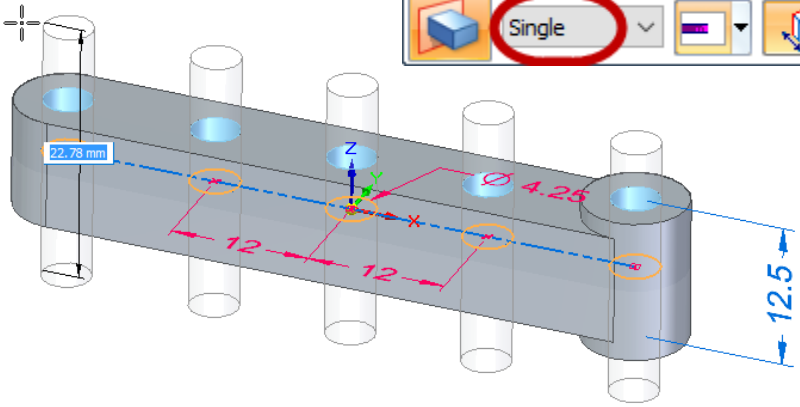


- Press CTRL+I to orient to an isometric view

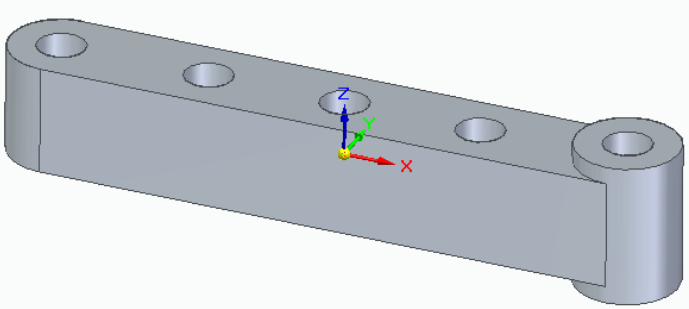
- Select the Extrude command from the Command Ribbon.
  - Set the selection option to “Single” in the QuickBar.
  - Be sure the option is set to SUBTRACT material
  - Select the circles and extrude symmetrically through the part.



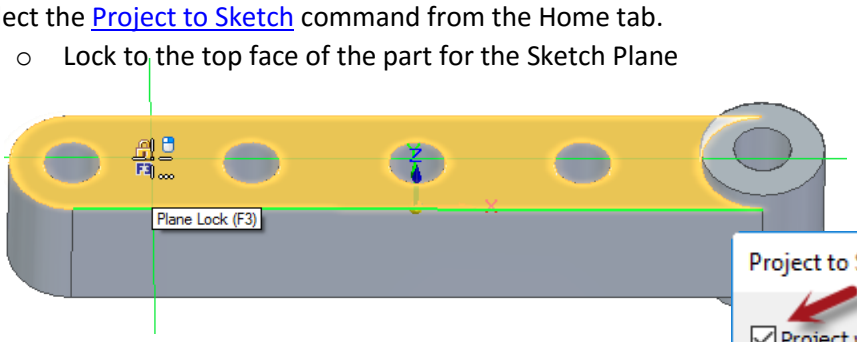


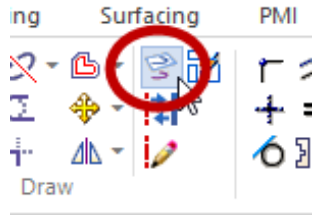


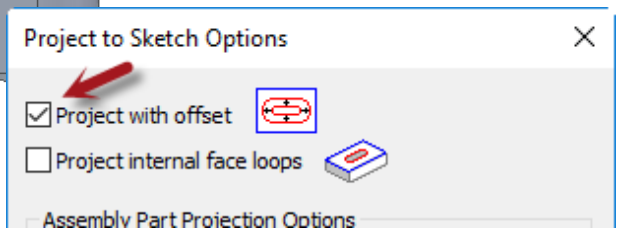
- Hide the PMI dimensions, Ref. Plane and Sketches by unchecking those entries in PathFinder.



- Select the Project to Sketch command from the Home tab.
  - Lock to the top face of the part for the Sketch Plane

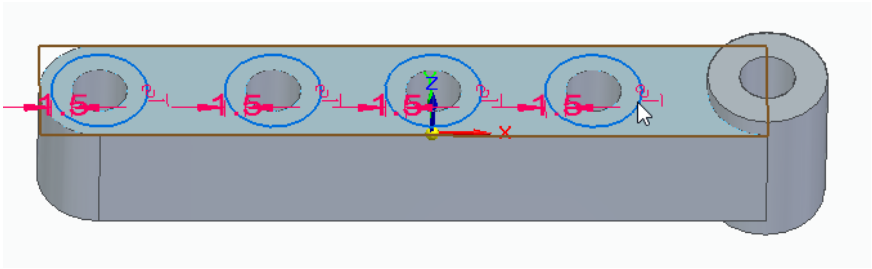




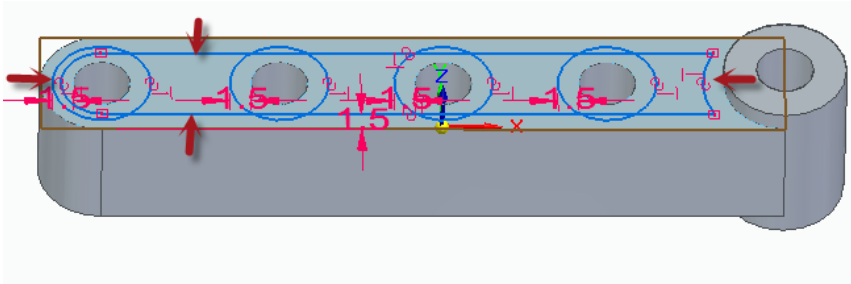


  - Select the option to Project with Offset and click OK
  - Set the distance to offset as 1.5 mm

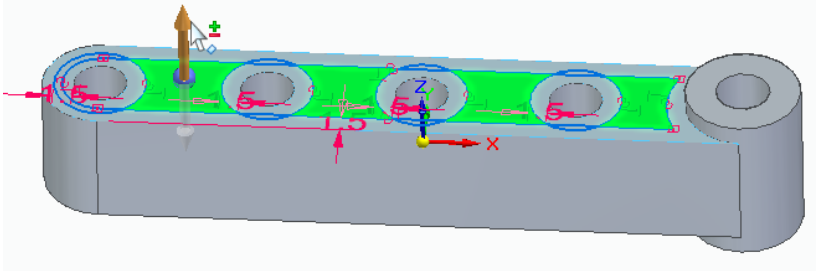
  - Select each of the 4 circles on that face and offset each one to the outside.



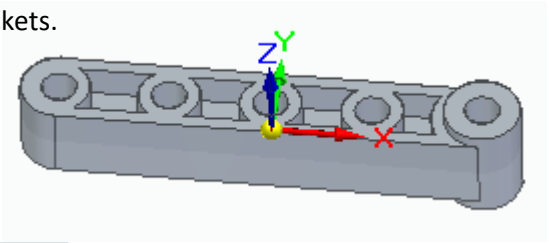
  - Change the Select option in the Quickbar to “Single Face” and offset the face edges to the inside.



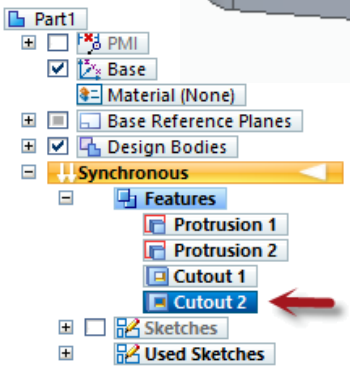
- Select the 4 regions resulting from the intersecting sketches.
  - After selecting the first region, press the spacebar to multi-select the other 3 regions.



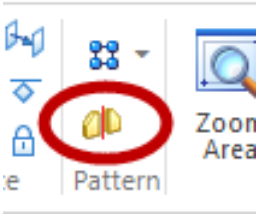
  - Select the arrow and drag into the part 4 mm to create blind pockets.
    - Tap the “Shift” to toggle off symmetric cut
  - Hide the sketches and PMI dimensions from PathFinder.
  - Show the Top Ref. Plane once again



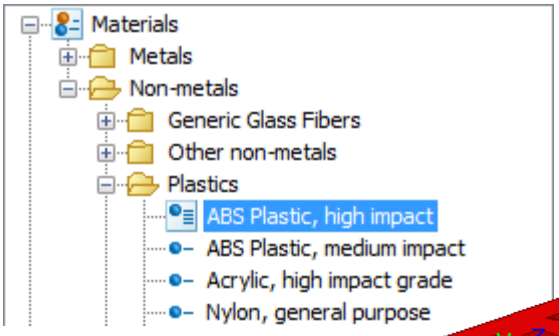
- From the PathFinder, select the last Cutout feature.



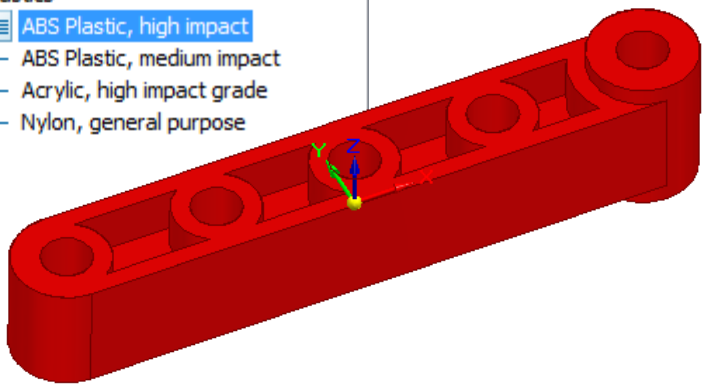
- Select the Mirror command.
  - Select the Top Ref. plane as the Mirror Plane
  - Press Esc to exit the select set
  - Hide the Top Ref. Plane



- Double click the Material entry in PathFinder to open the Material Table.
  - Expand Non-Metals > Plastics
  - Select ABS Plastic, high impact
  - Click Apply to Model



- Close and Save the model as **CLAW LINKAGE.par** in the ../ROBOT CLAW/Library folder.



Before Tutorial

Select the following link to install the free Siemens Solid Edge 3D CAD software for your classroom (www.siemens.com/plm/solid-edge-highschool). Students can download and install their own free copy of Siemens Solid Edge. (www.siemens.com/plm/solid-edge-student).

After Tutorial

Help your students improve their 3D Spatial Thinking and Creativity with more examples on the GearupU website. Developed by a Utah State design and engineering teacher focusing on STEM to STEAM, GearupU exposes students to a world of amazing patterns, shapes and artistic designs and gets them excited about STEM. Students with no background in 2D or 3D design should start with Class 1.