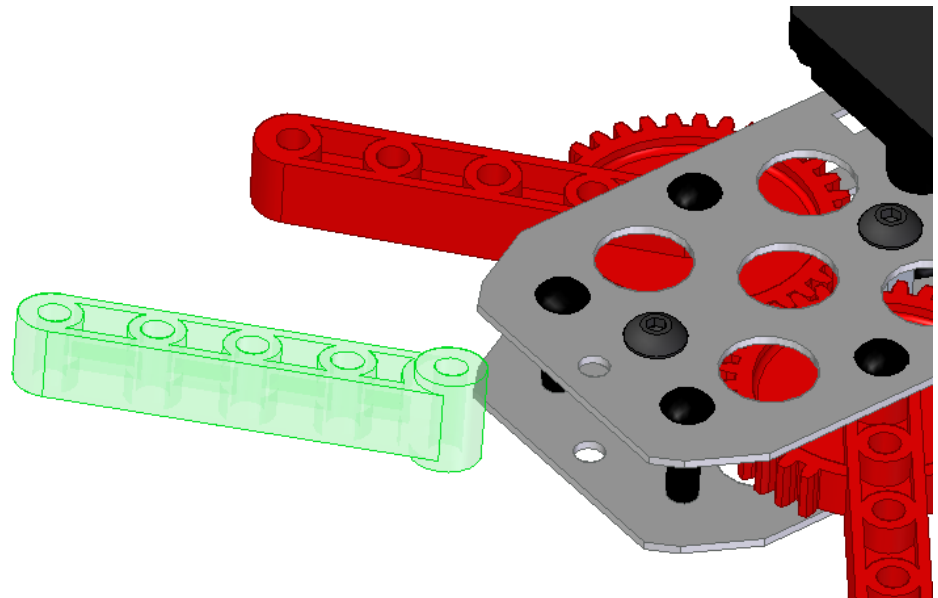
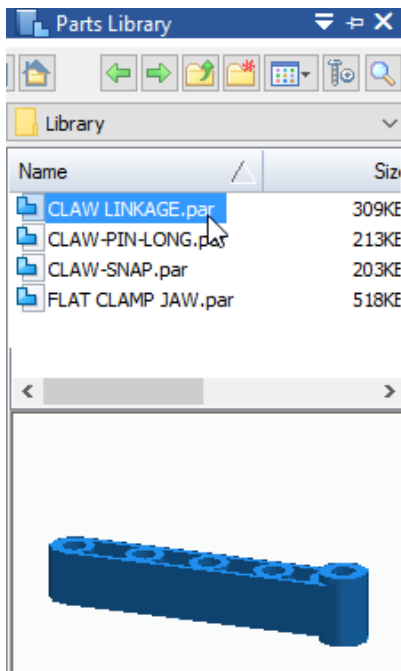
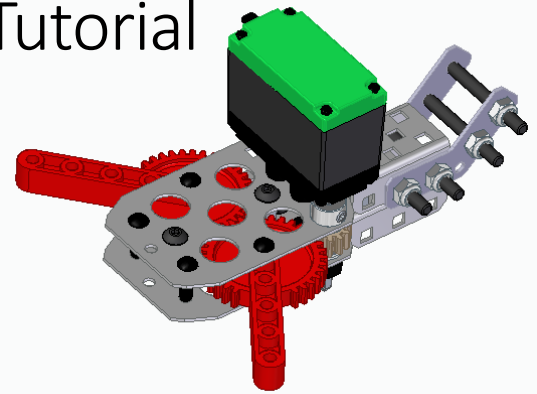


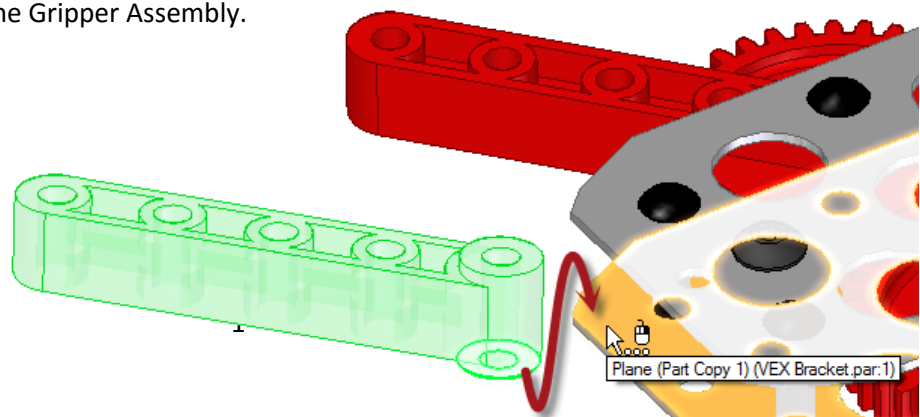
Solid Edge Robot Claw Assembly Tutorial



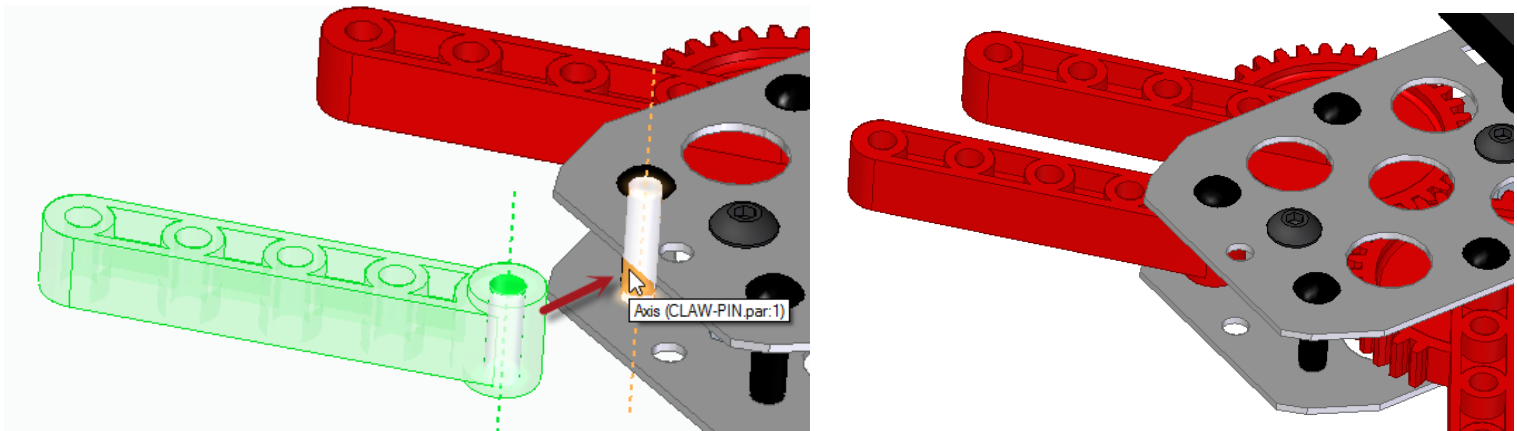
- Start by opening the **Claw Assembly.asm** from the ROBOT CLAW folder.
- Expand the Parts Library from the fly-out menus.
 - Navigate to ..\ROBOT CLAW\Library folder
- Select the CLAW LINKAGE part you just completed modeling.
 - Place your cursor in the Preview window at the bottom of the Parts Library and rotate the preview by pressing and holding the middle mouse button (wheel) and dragging.
 - Orient the part close to the orientation it will be in the assembly.
 - This orientation will be remembered when you drag the part into the assembly and will be easier to [assemble](#).



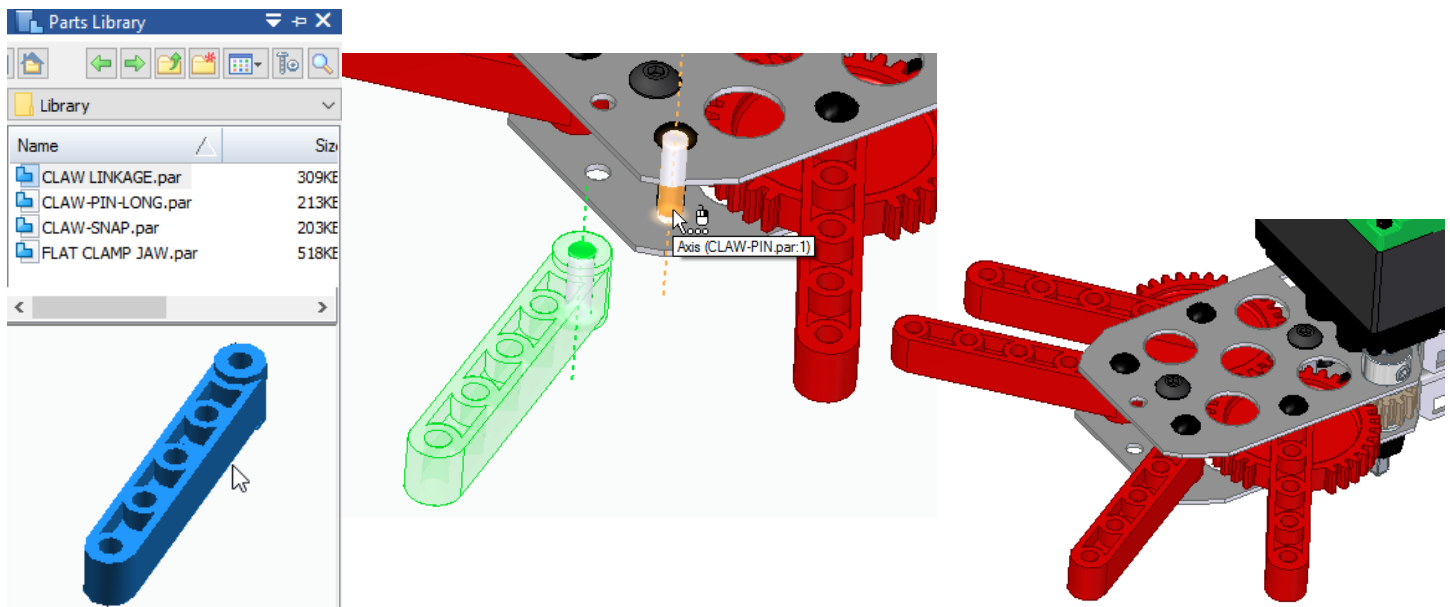
- The default assembly relationship is [FlashFit](#).
 - If the first face selected is a planar face, the relationship created will be a mate or planar alignment.
 - If the first face selected is a cylinder, the relationship created will be an axial alignment.
 - Select the bottom face of the stepped area of the CLAW LINKAGE part and mate to the top face of the bottom plate of the Gripper Assembly.



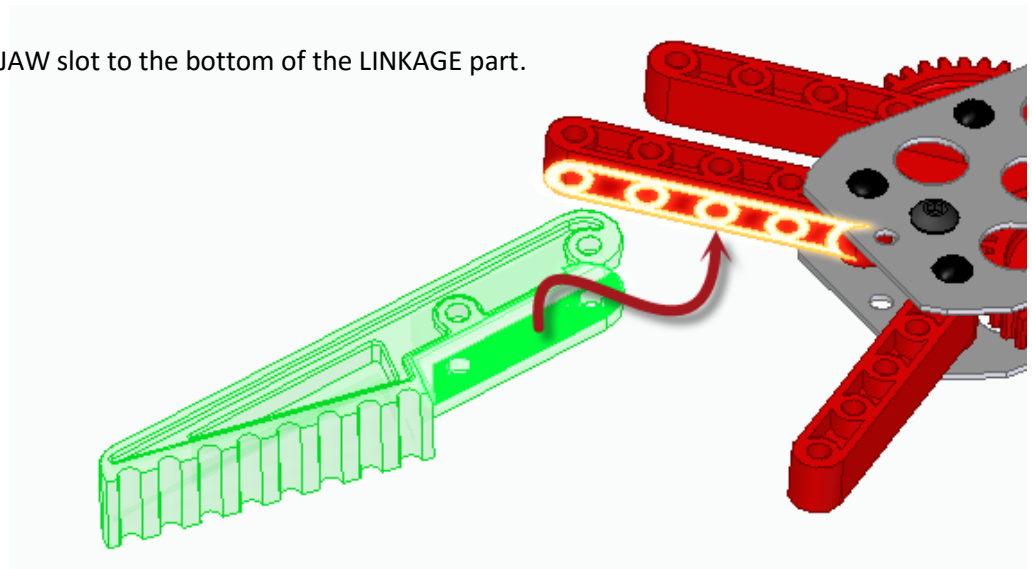
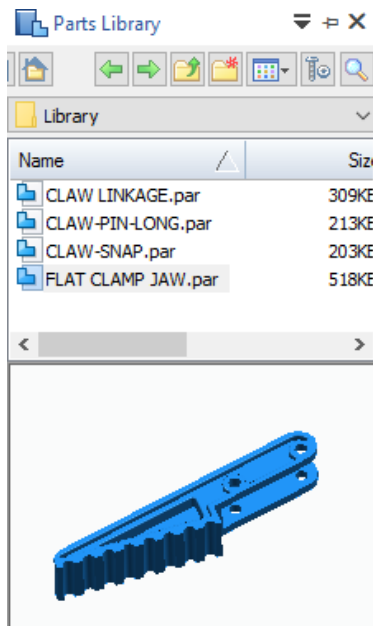
- Select the hole in the stepped end of the CLAW LINKAGE and align to the Pin in the end of the Gripper Assembly



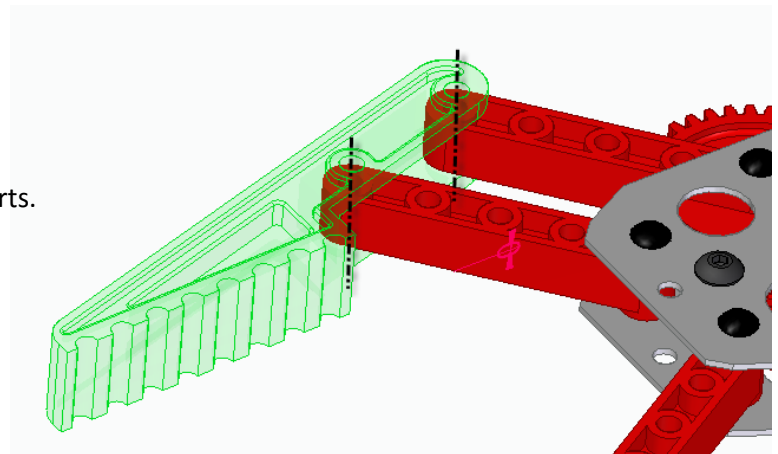
- In the Parts Library, select the CLAW LINKAGE part again.
 - Place your cursor in the Preview window at the bottom of the Parts Library and rotate the preview to orient the part for the other side.
 - Repeat the same steps described above to assemble it into position.



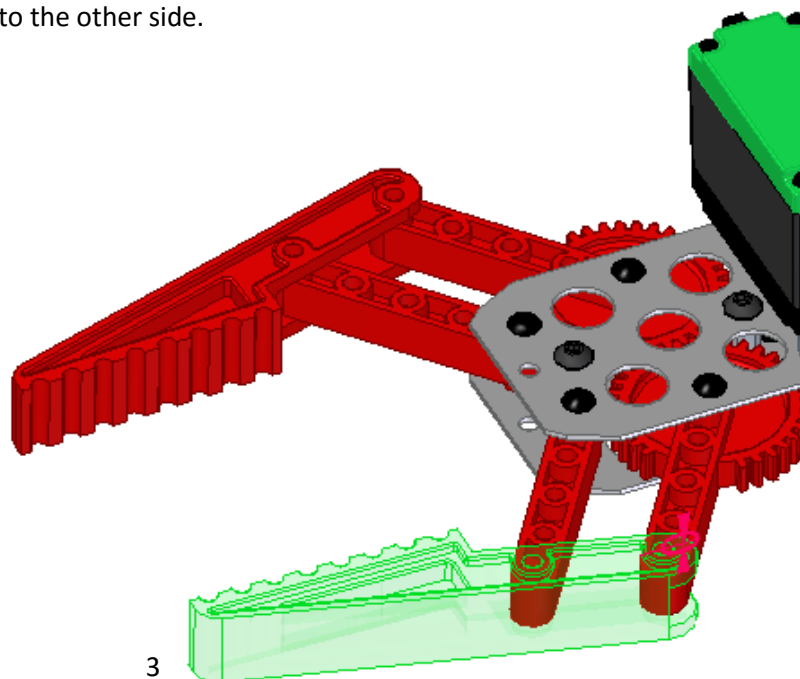
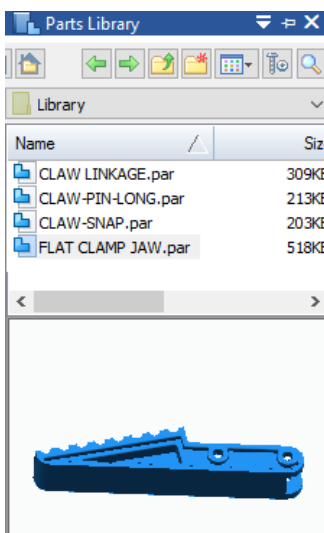
- Next, find the FLAT CLAMP JAW in the Parts Library and orient the preview for assembly as the previous parts.
 - Drag in the JAW part.
 - Mate the face of the JAW slot to the bottom of the LINKAGE part.



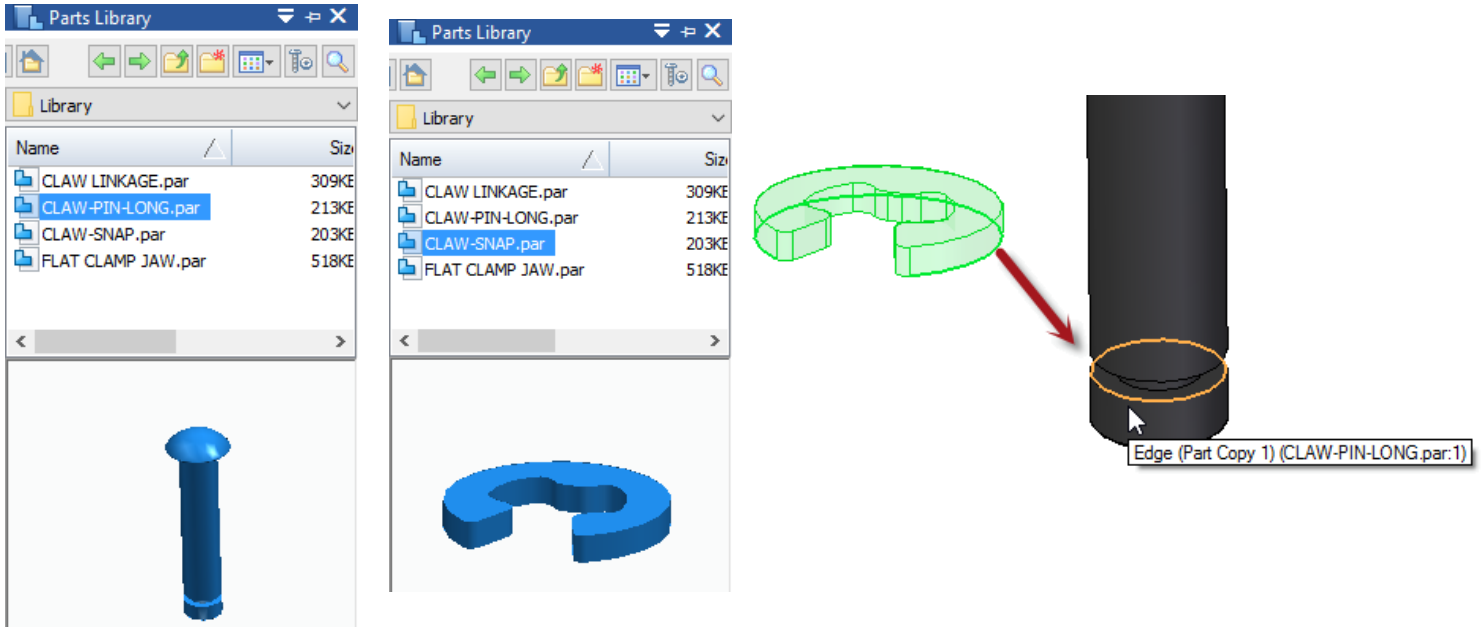
- Next align the two holes in the JAW to the 2 end holes of the LINKAGE parts.



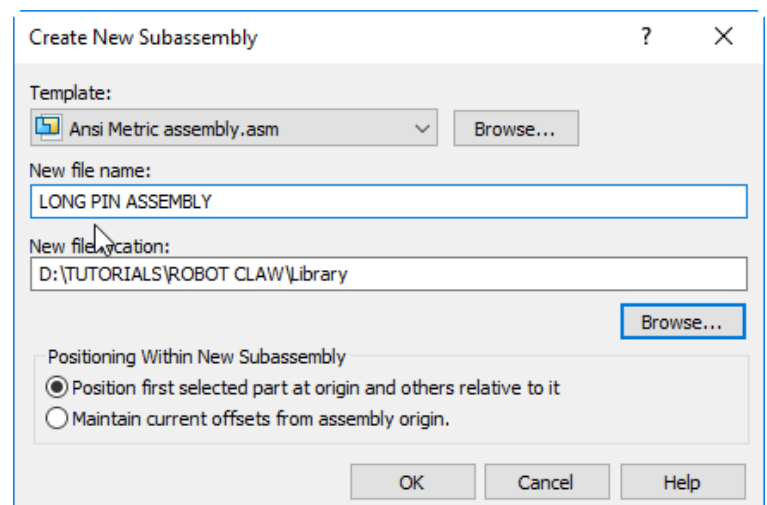
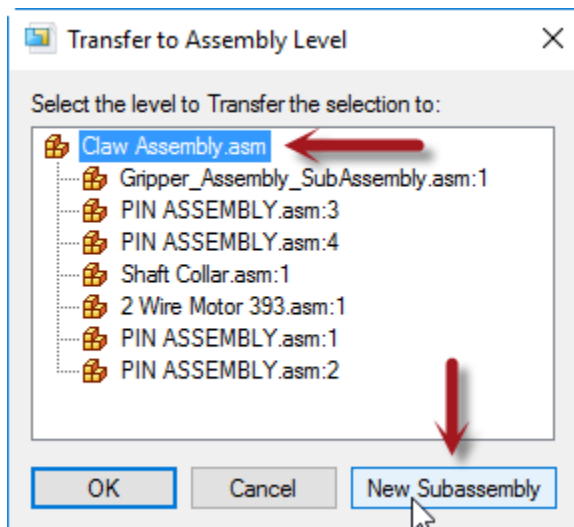
- Repeat the previous steps to add a jaw to the other side.



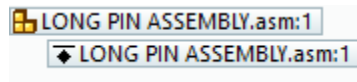
- From the Parts Library, drag the CLAMP-PIN-LONG.par into the graphics area.
 - Press ESC before adding any relationships.
- Drag in CLAW-SNAP.par and assemble to the groove in the bottom of the pin.
 - Aligning a circular edge to a circular edge with [FlashFit](#) will automatically create a planar alignment and a cylindrical alignment in one step.



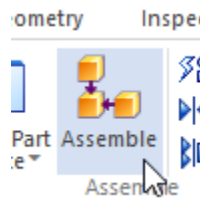
- Now let's create a NEW subassembly of the CLAW-PIN-LONG and CLAW-SNAP.
 - Select both parts graphically, or from the PathFinder, and select the [Transfer command](#).
 - Highlight the top assembly and select the New Assembly button.
 - Point to the Library folder as the save location and name the new assembly: LONG PIN ASSEMBLY.
 - Click OK to dismiss the Transfer dialog.



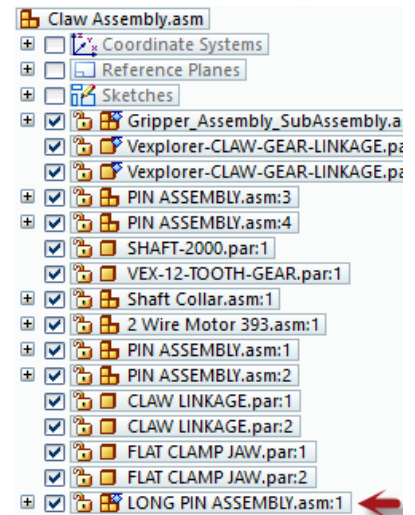
- Now that we have a subassembly we need to assemble it in place.
 - First we need to remove the [Ground relationship](#) that is added when the subassembly was created with Transfer.
 - Select the LONG PIN ASSEMBLY in PathFinder and in the bottom pane of the PathFinder select the Ground relationship and press the delete key.



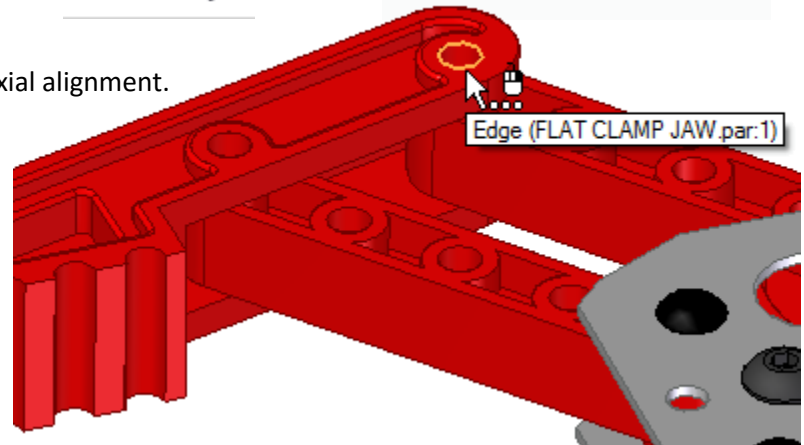
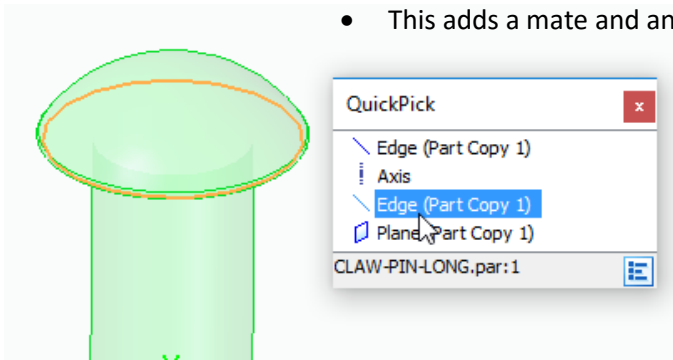
- With the Pin assembly still selected, click the Assemble command.



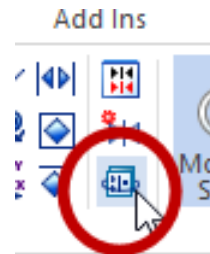
- Pick the bottom edge of the head of the pin. This may require using QuickPick to get the correct edge.
- Select the top edge of a hole in the FLAT CLAMP JAW.



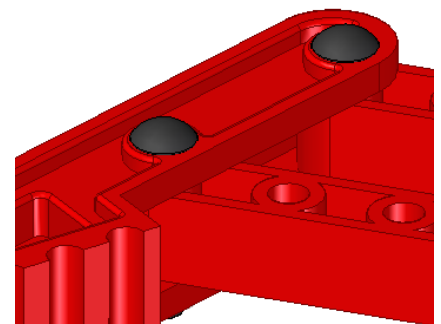
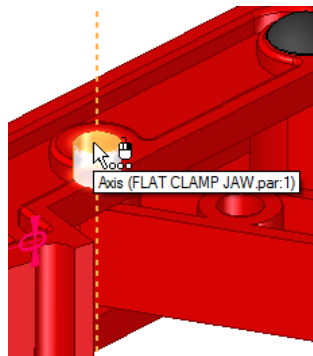
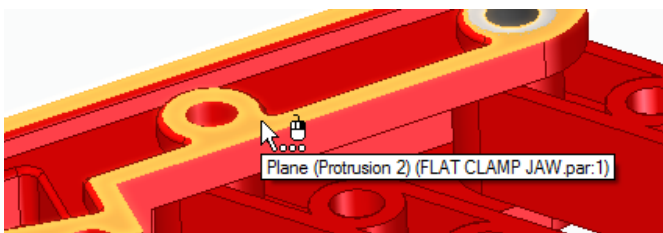
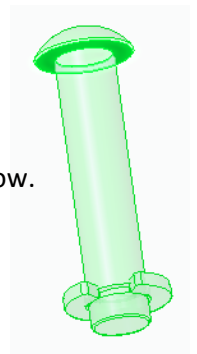
- This adds a mate and an axial alignment.



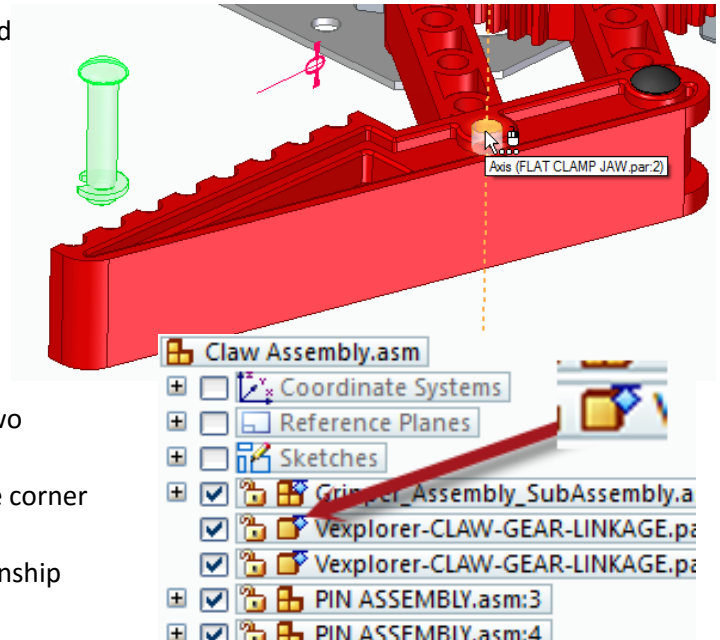
- We need to place 3 more Pin assemblies, so let's capture the relationships in the Pin subassembly to use for the other locations.
 - Select the LONG PIN ASSEMBLY in PathFinder.
 - Select [Capture Fit command](#) from the Assemble collector.
 - Click OK to learn the relationships.



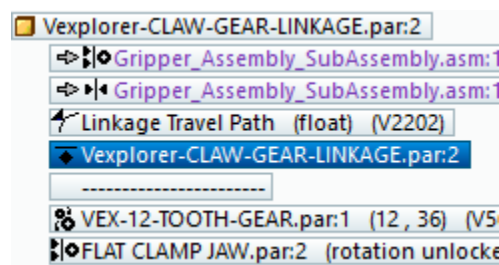
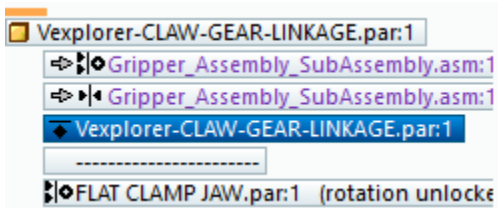
- From the Pathfinder, Select the LONG PIN ASSEMBLY and drag another copy into the graphics window.
 - Note the bottom face of the pin highlights for the Mate relationship.
 - Select the top face of the FLAT CLAMP JAW as the target for the mate.
 - Next a cylinder in the Pin highlights for the axial alignment.
 - Select the other hole in the FLAT CLAMP JAW as the target for the alignment.



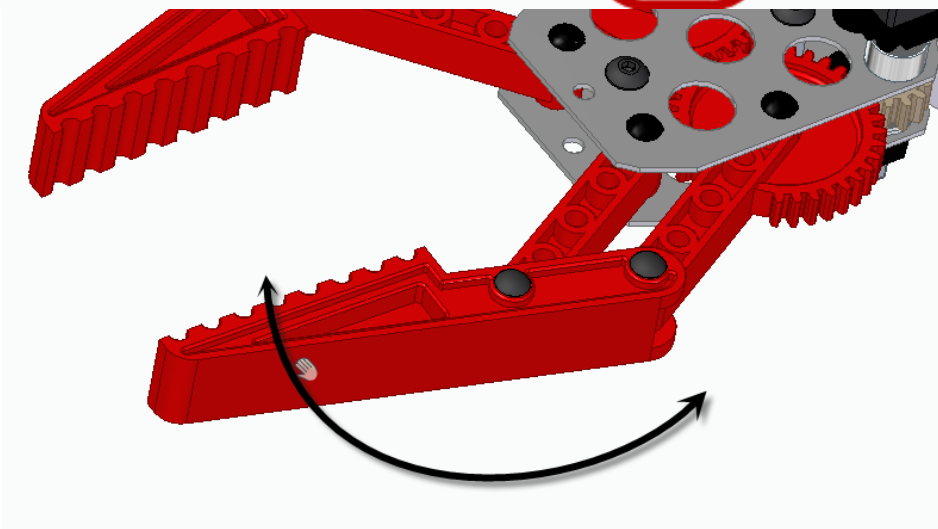
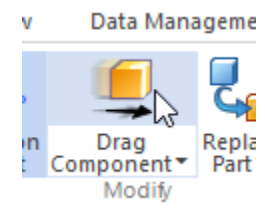
- Drag in 2 more Pin Assemblies from the PathFinder and select the target faces and holes on the other FLAT CLAMP JAW part for each.



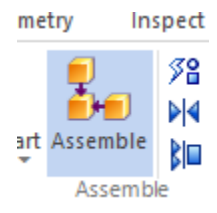
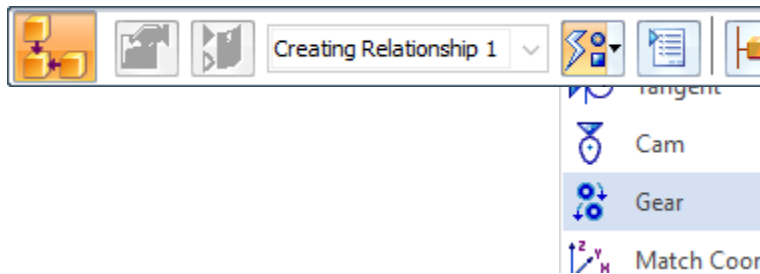
- Notice that in the PathFinder, near the top, that the two CLAW GEAR LINKAGE parts are grounded.
 - You can tell this because of the blue box in the corner of the icons.
 - Select each one and delete the Ground relationship in the bottom pane of the PathFinder.



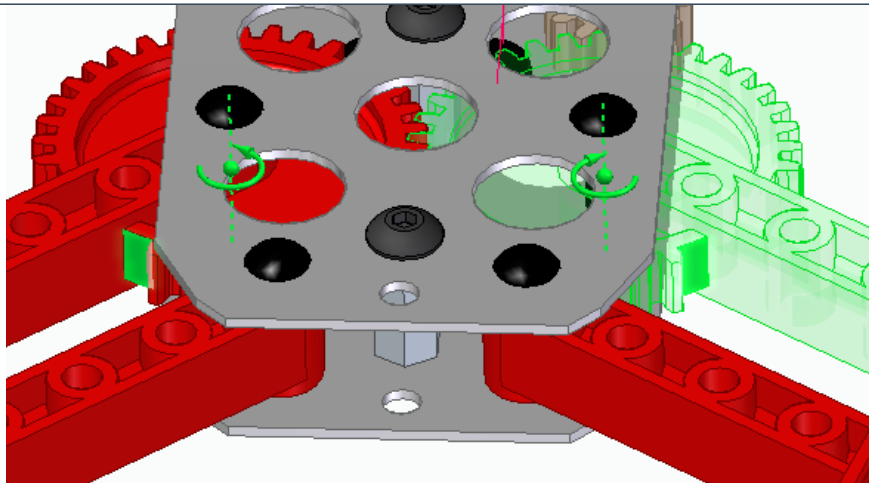
- Select the [Drag command](#) and graphically select the jaw closest to you.
 - Hold down the left mouse and begin to drag to see the motion of the jaw.
 - Note only one jaw is moving
 - Click Reset in the Quickbar and escape the command.



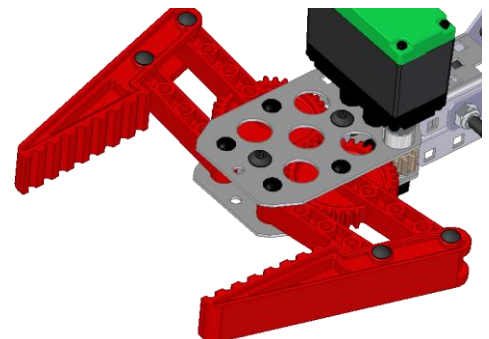
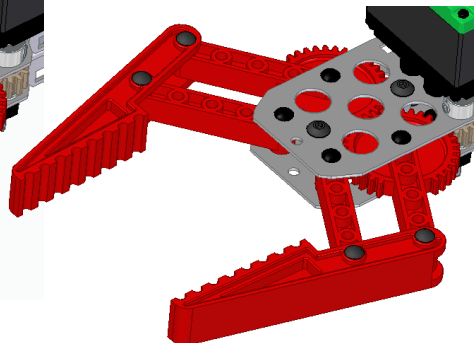
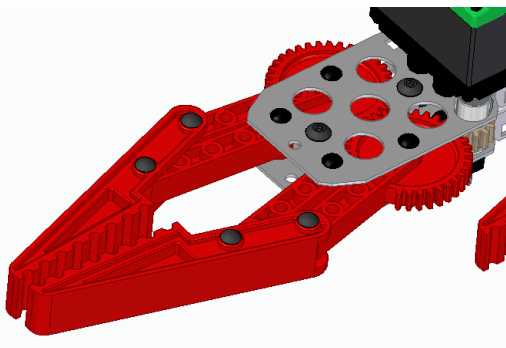
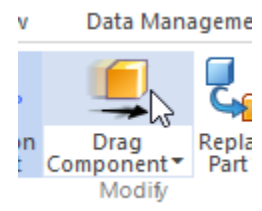
- We need to add a [Gear relationship](#) between the two CLAW GEAR LINKAGE parts.
- Click the Assemble command and change the relationship type to Gear from the drop down.



- Select a cylindrical face of one of the CLAW GEAR LINKAGE parts to select its centerline.
- Select the corresponding face on the other CLAW GEAR LINKAGE parts to pick up its centerline.
- Be sure the Green arrows are showing the rotation in **opposite** directions.
 - If they show the same direction, click the Flip button at the end of the QuickBar.
 - The gears are the same size and number of teeth, so the ratio can be left at 1:1.
- Click OK to complete the creation of the Gear relationship.

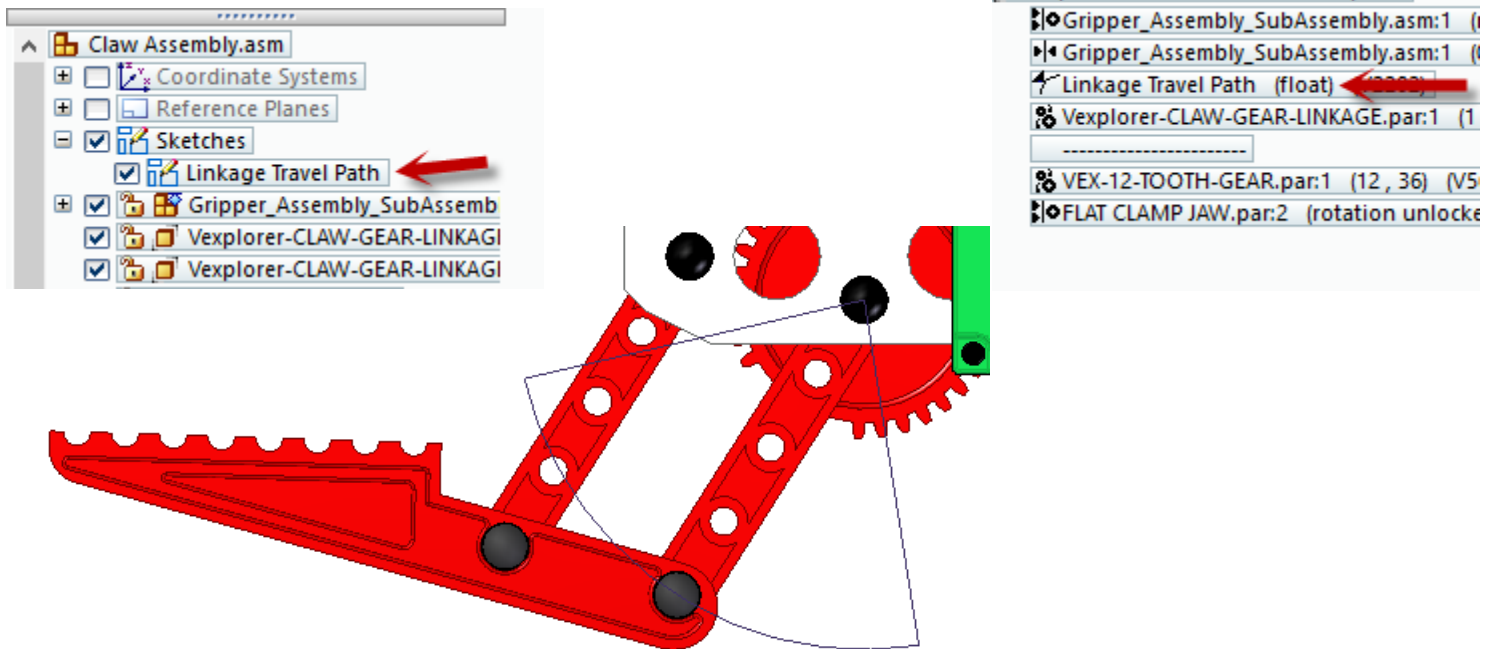


- Select the [Drag command](#) again and graphically select either jaw.
 - Hold down the left mouse and begin to drag to see the motion of the meshing gears and the realistic movement of the jaws.



Unrestricted

- NOTE – the limit of the jaw's motion is due to a predefined [Path relationship](#) to a sketch defining the limits of the jaw.



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.