Welcome to this advanced level Solidworks 2005 tutorial. This exercise assumes that you have completed and fully understood the concepts and tools explained in the previous tutorials. In this tutorial we shall be trying to create a common medicine vial that you’re seeing on screen.

At first glance it’s just a cylinder that’s had its insides scooped out, but the neck assembly is a complex intersection of shapes. This tutorial will hopefully give you an idea of how to approach complex parts and learn to break them down into simple shapes that can be constructed using simple sketches and tools.

As always, let’s begin with opening a new part file by clicking on file, new and then choosing part.

Let’s go to the top plane and draw a circle. I’ll keep it at around 40 to 50 units. Using the line tool, I’m going to draw a chord on one side of the circle. You can press shift to make sure it’s a straight line.

Then using the trim tool, which you’ll find in tools, sketch tools, trim tool… I’m going to chop off the remaining part of this circle.

Continuing to use line tools, I’m going to draw a set of lines as shown.

Once I finish those lines, I’m going to use the center line tool to draw a line about which I shall mirror those little step-lines that I drew a minute ago.

Once I have my center line in place, I’m going to use ctrl+click to select the lines that I drew earlier. As you may have guessed, I’m going to mirror this arrangement using tools, sketch tools, mirror. When I use the tool, solidworks asks you if you want to mirror the lines about the center line… I say yes and voila… I have something that looks like the neck of my vial. But as you can see we’re not just there as yet.

I’m going to first use the trim tool to remove this little line here.

Once this is done we exit the sketch and use the extrude boss/base tool to extrude this shape a little. Around 4 units should be good.

When you’re done doing that, choose the top plane of this part we just created and click top view. Click sketch and draw a circle that goes all the way to the edge of this little part as shown.

We shall extrude this circle to create the beginnings of our vial. Around 100 units should do the trick.
Once this is done…We’ll work a little more on the vial locking assembly. Click on the bottom plane of our locking assembly and go to its top view.

We first need to scoop out its insides... to do that, use the shell tool that we used in our previous tutorials. Go to features, choose shell. 1 mm should be our thickness left after we’ve scooped it out. Click ok... and there we are.

Click on the scooped in plane and move into its top view. Zoom in until you can sketch on it comfortably.

Draw our little stepped lines as shown and mirror about a center line as we did before.

First we’ll draw our centerline on the middle. And then use the mirror tool to mirror this arrangement.

We need to draw a spline curve that connects the two bottom points in this figure. To do so, choose the spline tool. Click on the starting point. Click on the point-of-inflection, or the point where you want the spline to curve the most...which in our case is along that center line and then click the final point of our curve.

Once you have this sketch ready, we can exit the sketch and then proceed to use the extruded cut tool to extrude-cut this part from our neck assembly.

Choose extrude cut. And in the options menu on the side, choose ‘through all’

A few more parts and we should be done here.

First, I’m going to choose this plane from the edge of my locking assembly of my vial and move to its top view. I’m going to draw this rectangle that hits the edges nicely. I can use the mirror tool and draw a center line to create this rectangle on the other edge too...but I’m just going to select the whole thing and use CTrl+C and Ctrl+V, the default short cuts for copy and paste.

Once I do this, I’m going to extrude these rectangles a little. Without exiting the sketch...choose the extruded boss/base tool from the features menu. Extrude to around 10 mm.

There’s just one thing that’s left to be done in the locking assembly...the latch. To do this, choose the underside plane of the locking assembly that we’ve been working on for a while now, start a spline line parallel to the curvature of our main vial body.

Copy this spline line and move the duplicate and position it parallel to the original line. As you may have guessed, we need to use the line tool to connect these two together.

Once this is done, we need to extrude this a little to create our latch itself. So go to the features menu and choose extrude boss/base. About 5 mm should do the trick.

And voila! We see that our locking assembly looks nice and pretty. There’s just a few more things we must do to make this a full-fledged vial.

We shall first make the vial’s neck.
Choose the top surface of the whole part. Go to its top view. Draw a circle as shown on screen...standard procedure and extrude a little...around 10 mm should be fine.

To scoop out the insides, we can’t use our shell tool because there’s a lot going on in the locking assembly and solidworks will throw an error message at you if you try to do so. So we’re going to manually extrude cut our way into our vial.

As you may have guessed, we just going to draw a circle on our topmost plane and cut out way through the whole vial. Since I’ve drawn this entire vial using arbitrary dimensions, I’m just going to use trial and error to see how far this cut needs to go. I can do that by looking at the blue preview that the cut tool gives me. Once I know what my desired length is. I click the green tick mark and finish this cut operation.

This vial is now complete for all practical demo purposes...but I like to add one last step to make it look a little nicer.

I shall smoothen out the edges of the locking assembly using the fillet tool.

I choose the edges by ctrl + clicking on them all, choosing the fillet tool and giving it a radius.. a small one usually.. 3 mm should do.

Our vial is complete for all modeling purposes... you can go ahead and give it a material a color and create animations with it!

Thank you for listening.