

Project 2 – Water Bottle Concept

1 Project 2 – Water Bottle Concept

1.1 Project Overview

Gain a general understanding of how digital sketching can affect the development cycle of a new product. Develop skills to use SketchBook Designer to create digital sketches.

Objectives

- Understand how digital sketching can affect the development cycle
- Paint tools versus vector tools
- Symmetry sketching feature
- Vector curve sketching tools
- Exporting of standard AutoCAD files and digital picture formats
- Use of paint/raster and vector tools to create images

1.2 Project Introduction

A major reason to use digital sketching in the development of a new product is ability to shorten the development cycle. With the initial sketches being in a digital format this allows for information to be given to various team members very early on in the cycle.

1.3 Water Bottle Story

Recently the board of directors for a beverage company approved the development of a new product line based around a vitamin enhanced water drink. The drink is to be sold at major convenience stores and grocery stores in a variety of areas around the world.

Several product brain storming meetings with all departments were held within the company. The following key items were considered to be major areas of focus for the drinks container design:

- Overall shape needs to be smooth and stylish. But still hold a given fluid amount.
- Drink needs to stand out on the store shelf when placed next to other clear drink bottles.
- A newly developed plastic created from recycled milk containers is to be used for the new bottle design. This new plastic is difficult to blow mold as a true clear plastic.
- New bottle design to have plastic wrap label so drink can be sold on an OEM basis also.
- Existing manufacturing equipment and shipment means must be taken into account to keep capital equipment expenses down.

Ok, let's get started using SketchBook Designer to assist in the initial phase of the development for the water drink bottle.

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End results of the new water bottle concept:



By creating the above image quickly and in a digital format the company was able to verify that the major areas of focus for this new bottle design were achieved. The following is how each major area was affected by having this digital sketch created early on in the development process.

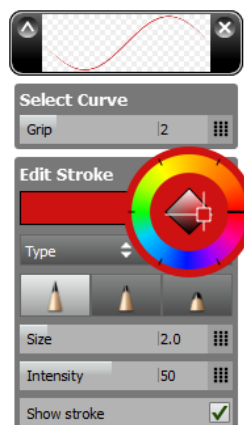
- The bottle outline was exported as a standard AutoCAD file allowing the manufacturing team to review if existing capital equipment could be used for manufacturing and shipping of the new bottle.
- Packaging team members used the exported CAD format also to calculate the volume of the new bottle.
- Images were given to the marketing group for conversation with existing customers concerning the new drink.
- Sample plastic shapes were molded from the material to verify the color shown in the image could be matched prior too production.
- The sales team also started to use the images to gain pre orders from its OEM customer base.
- Images were also used to compare the new bottle with existing bottles on the market

1.4 Water Bottle Instructions

1. With the bottle design being a tall cylinder shape let's begin by sketching in some construction lines to assist in the development of the sketch. These lines will also provide given area to work in. The width of the area will represent the overall max size we would like to have the bottle. This was determined by the existing capital equipment (manufacturing & shipping equipment) we would like to leverage for this new product.
2. In order to create these construction lines activate a vector layer and draw in a center line for the bottle and also a line for half the width. The width can be represented with a single line to the left (half the bottle). Let's also place in a line that represents the bottom of the bottle or the shelf it is resting on.

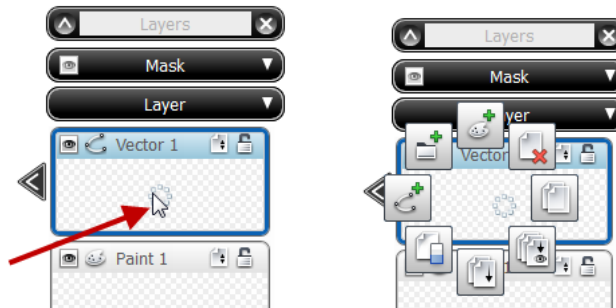


3. You will notice above the color of the sketch lines had been changed to a sharp red using the tool editor commands.

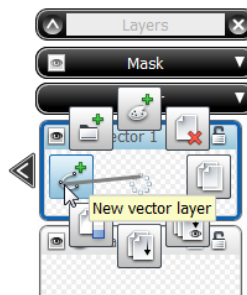


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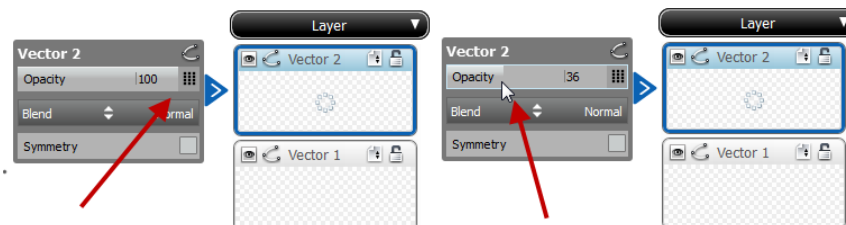
- Since we will want to remove these construction lines for the final image but still need them though out the sketching process, let's keep them on the current layer and create a new layer prior to during more sketching. Creating a new layer can be accomplished by hovering over the active layer icon box and holding down the left mouse button. This will pull up the layer marking menu.



- With left mouse button still press down simply drag the pointer over to create new vector layer icon. Then release the mouse button. A new vector layer will be created and turned into the active layer.



- In order to tone down or make the construction lines less visible, we can turn down the opacity of them by changing the opacity of the entire layer. This can be accomplished by adjusting the layer opacity under the layer options.



- The one feature on the new bottle design that will be carried over from other products will be the bottle cap / top. Since the shape and size of this feature is very well established already, and has to be incorporated no matter what, let's stay on the newly created vector layer and sketch it in.

8. We can begin by using the vector pencil drawing tool and the ellipse command and its fly out menu.



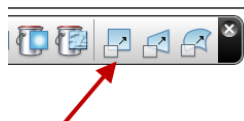
9. Let's take advantage of the construction lines by starting the center of the ellipse along the construction center line of the bottle. Then simply, drag out and create the size of the bottle cap.



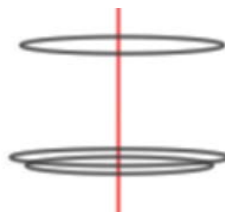
10. Once you have created the size of the ellipse you can then tag on the height or twist control point and shrink up the ellipse to give the cap a 3D look.



11. If you sketch the ellipse incorrectly the first time; simply take advantage of the vector work flow by using the select vector item and then using the scale & move transform tool.

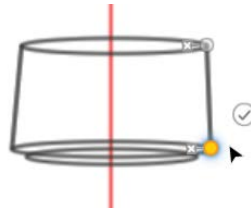


12. Go ahead and sketch in the lower bottle cap lines by using some more ellipse commands.

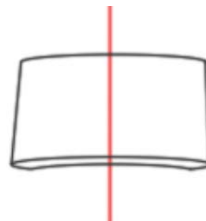


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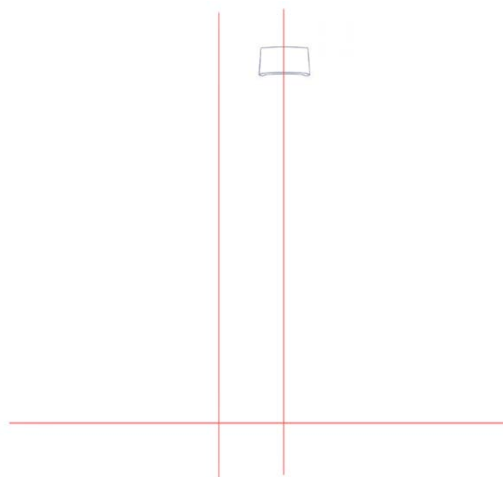
13. The side lines of the bottle cap can be created by using the point to point line command. Simply tag each end of the ellipse. In order to get a more perspective 3D look for the cap you can have the bottom portion of the cap be a little larger than top portion of the cap.



14. Use the vector trimming tools to clean up the bottle cap / top.

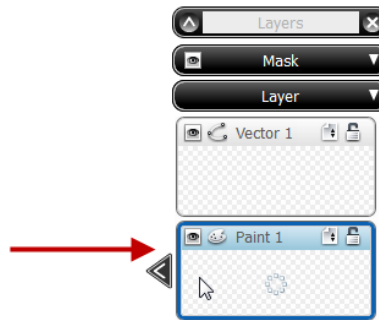


15. Ok so we know have a good foundation to start really thinking and letting the ideas flow down on the canvas for the new bottle shape.

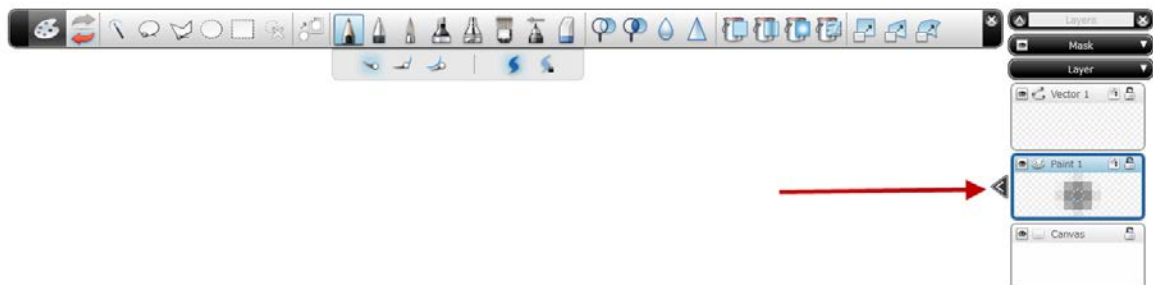


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16. One of the great things about sketchbook is the ability to work in a vector format as we have been up to this point or what is considered a paint / raster format. In order to start getting some crude ideas down for the new bottle shape lets activate a paint layer by simply tag the paint layer. SketchBook creates a vector layer and paint layer every time a new file is created.



17. You will notice that tool bar has changed along the top. When you switch between paint and vector layers different tools are available for each layer type. The tools for the paint layer or raster work flow are all very similar to traditional draw & sketching tools. Pencils, markers, brushes, air brushes, pens & erasers.



18. Since we are just playing with ideas for the shape, activate the pencil command from the tool bar.



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19. Then move down to the canvas and press the left mouse button when you would like to begin the sketch line or point the pencil down on the paper. Hold the mouse button down and drag. A sketch line will be created. Release the mouse button when done.



20. Since we are working in a paint / raster layer you will notice that the lines follow your movements exactly. Just like a pencil on a sheet of paper the only way to remove the unwanted sketch lines is to erase them. Simply click on the eraser icon on the tool bar.

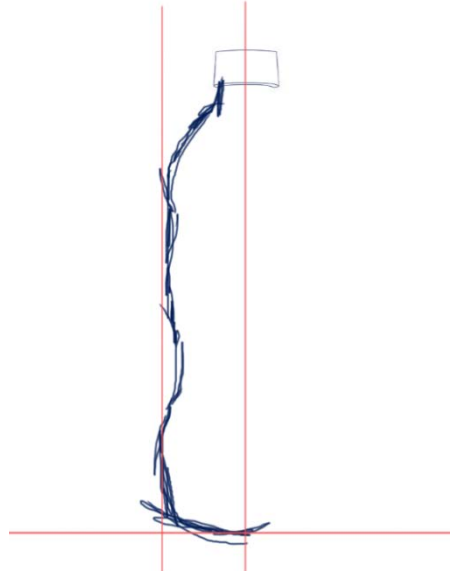


21. Then press and hold the left mouse button down then drag to the area where you would like to erase. Then drag around just as you did when you created the sketch lines. You can adjust the size of the eraser and the intensity of it through the tool editor area.

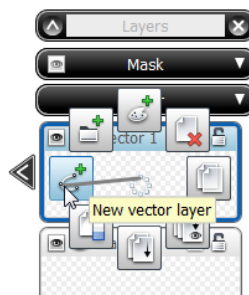


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22. Experiment with the many sketching tools in order to get the ideal bottle shape. Don't be worried if the lines are not perfect, be more concerned about getting the ideas down on the paper/canvas first. Also try using sweeping motions with your mouse just like you would with a pencil.



23. Once you have finalized the shape you would like to further develop, you can then take the sketches for the shape and start really defining them.
24. Let's create a new vector layer by hovering over the layer area and holding down the left mouse button to pull up the layer marking menu. Drag over to the new vector layer icon and release. We now have a new vector to work on.



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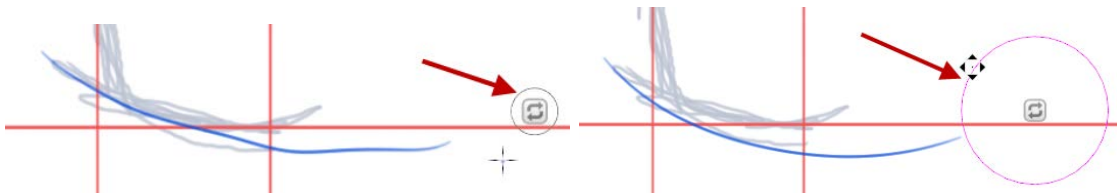
25. In order to see the vector lines we will be creating for the more defined shape, go ahead and lighten up the paint layer containing the shape paint sketch lines.



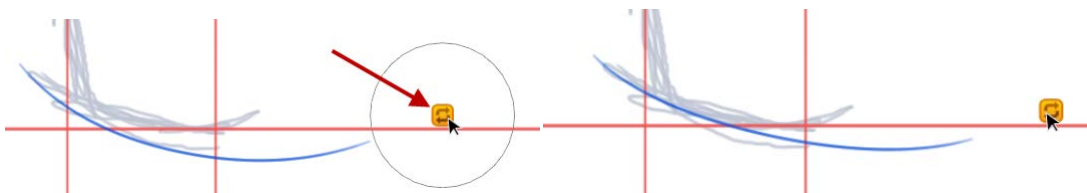
26. One of the great things with the vector tools is ability for it to auto calculating the type of line you want to draw. Let's us this to our advantage here to create some smooth flowing lines for the bottle shape. Go ahead and activate the free form sketch tool off the vector tool bar and fly out.



27. Begin by sketching a curved line for the lower bottle side. Once you have sketched in the line and released the mouse button you will notice the program has smoothed out the curve. It also has come up the edit icon as we have used in lesson one. You will also notice a light colored circle around the icon. Go ahead and tag on it and hold the left mouse button down. Drag outwards. As you drag the circle out larger you will notice the smoothness and shape of the sketch curved changing. This is very useful in creating nice smooth curves.



28. As in the previous lesson pressing the auto calculation icon will give you different options for the type of line you were sketching.

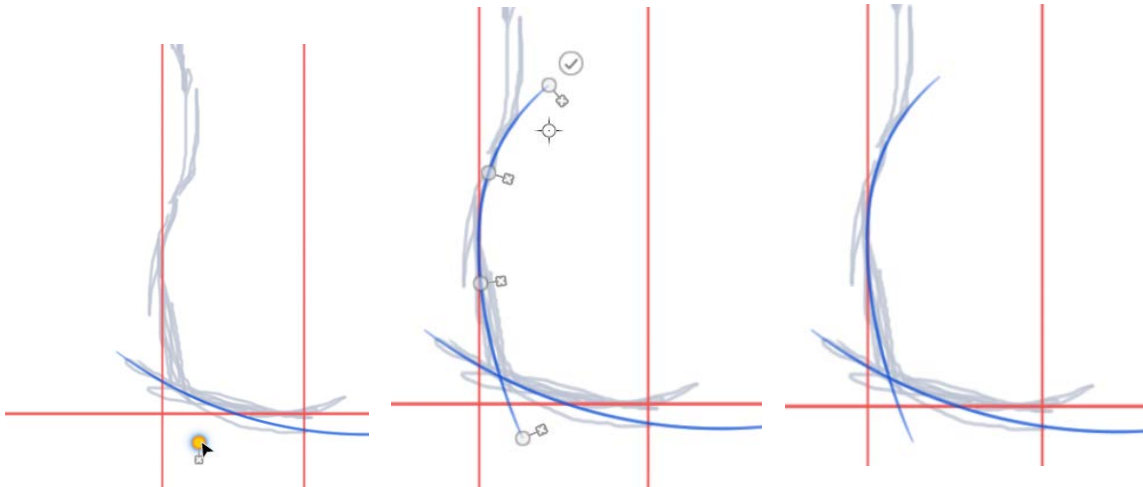


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29. Another method for creating a more defined curve for the bottle shape is using the point curve command under the sketch tool fly out.

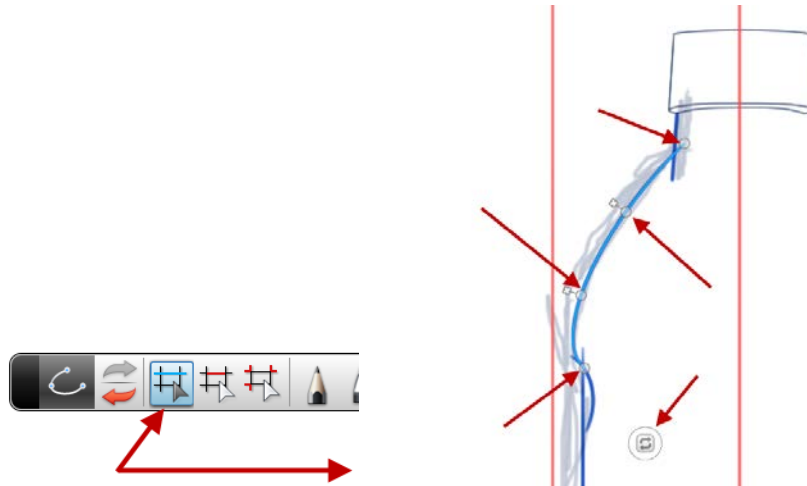


30. With this command you can create curves that go thru certain points. Simply tag the start point for the curve on the canvas. Then the next point or points. As you tag points on the canvas a curve is created. When you are satisfied with the curve simply click the circled check mark and the curve will be generated.

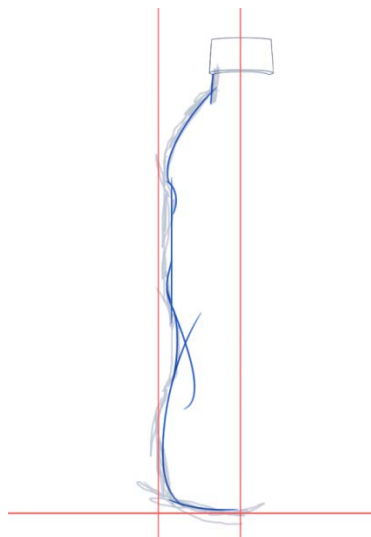


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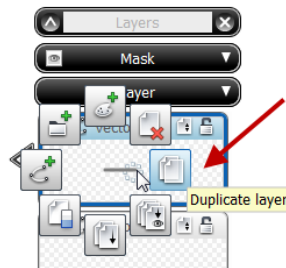
31. If you are not satisfied with any of the curves simply select them using the vector item select tool and edit them. You can drag the points that make up the curves around to get that perfect shape. If you decide that further points are required to define the curve better simply click on the curve and a new control point will be added. Remove unwanted control points also by clicking the “x” icon next to them.



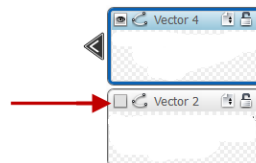
32. In order to get the ideal shape it may take a few attempts to get it all perfect. Feel free to draw various curves to assist in nailing down the perfect shape. Using various layers to try different looks is a great way to go back and forth with an idea. Also don't worry about having all the curves end perfectly. Use broad strokes to create over extended curves to get that smooth feel.



33. Once you have decided upon the final bottle shape, let's copy the layer that has the curves we wish to finalize. Use the duplicate layer command to accomplish this.



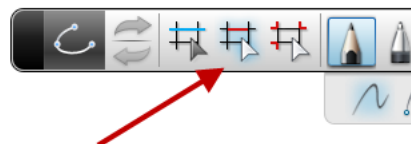
34. Go ahead and shut off the other unused layers. By just shutting them off instead of deleting them allows us to go back and review issues if required.



35. Ok let's go ahead and get the canvas and curves in good viewing position. Use the canvas manipulator commands to get a nice view so we can start to clean up the final curves.

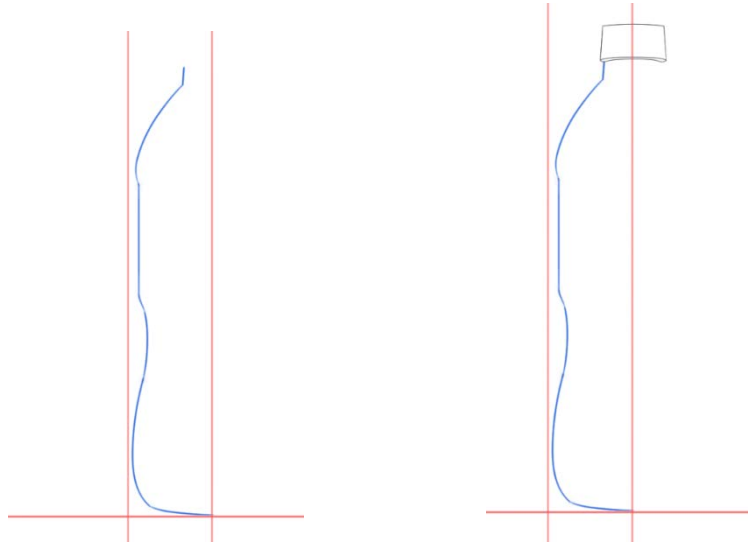


36. Go ahead and activate the vector trimming tool we previously have used.

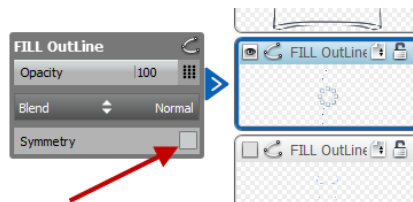


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37. Let's then go back to the layer that has our final curves on it and trim them up. In order to trim the bottom line for the bottle, you may need to quickly sketch in a trim line that would represent the center of the bottle. Simply draw a line over the top of the center construction line and delete it once the trim is complete. Since the bottle cap is on another layer as well, a simple line can be drawn in here also.

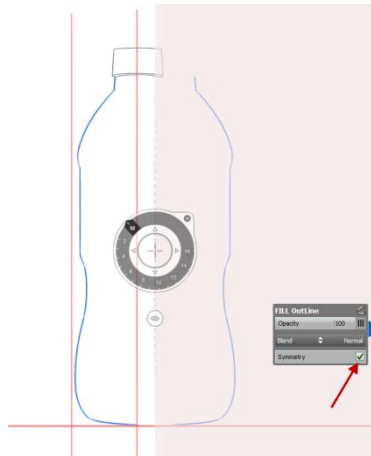


38. As you have noticed thru out this exercise we have only been sketching or developing one side of the bottle's shape. One of the huge advantages of sketching in the digital space is ability to only create one side of a symmetrical object and then mirror it to the other side.
39. For ever layer in sketchbook you have the option of turning the symmetry on for that layer. This option is available under the layer options.

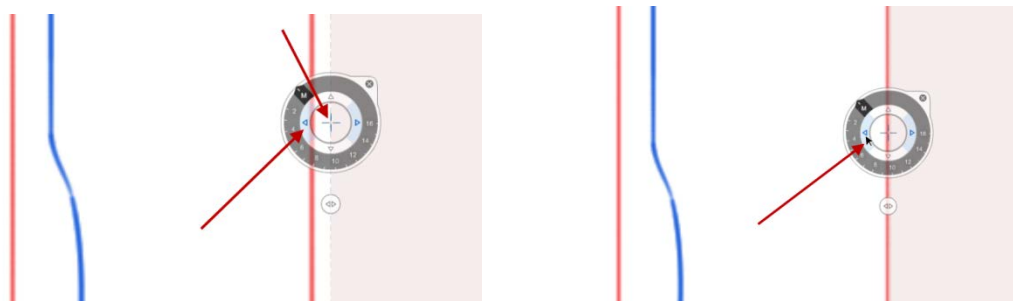


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40. Simply tag the check box and you will see the symmetry mask and control icon come up. You will also see that software has taken the sketches from the left side of the canvas and mirrored them over to the right side of the canvas as well.

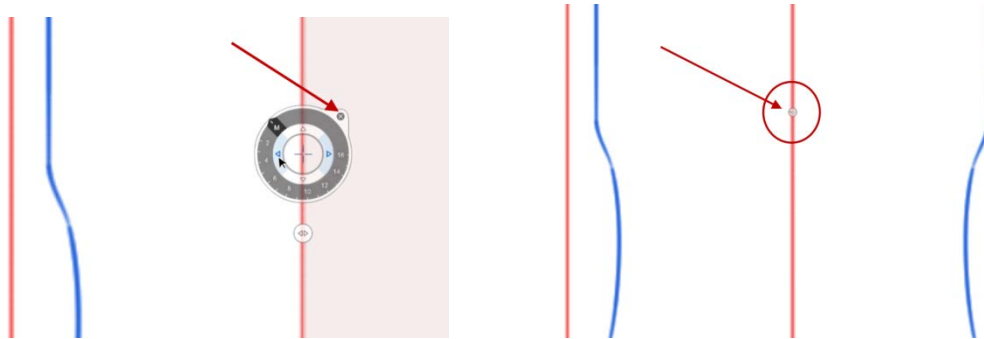


41. You will need to drag the symmetry center line over directly over the top of the center construction line in order to get the bottle the same shape and position from left to right. Use the zoom canvas function to get this right on. By tagging either the move arrow or the center of the icon will allow you to drag around the origin of symmetry line. Release the button once you are positioned correctly.

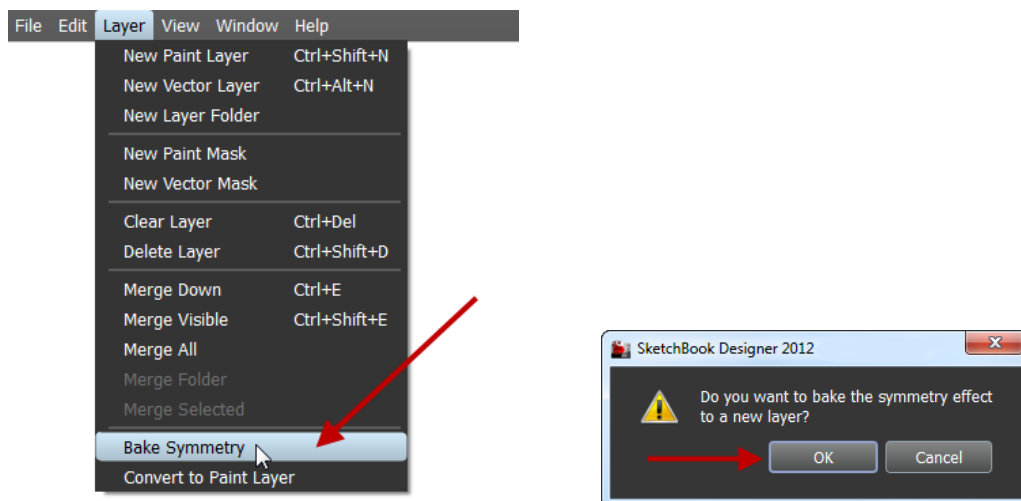


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42. Once you have the symmetry line in the correct position simply click the “x” on the dialog box to hide the symmetry control icon. If you need to reactivate the control, simply tag the solid circle where the center of the control icon once was.

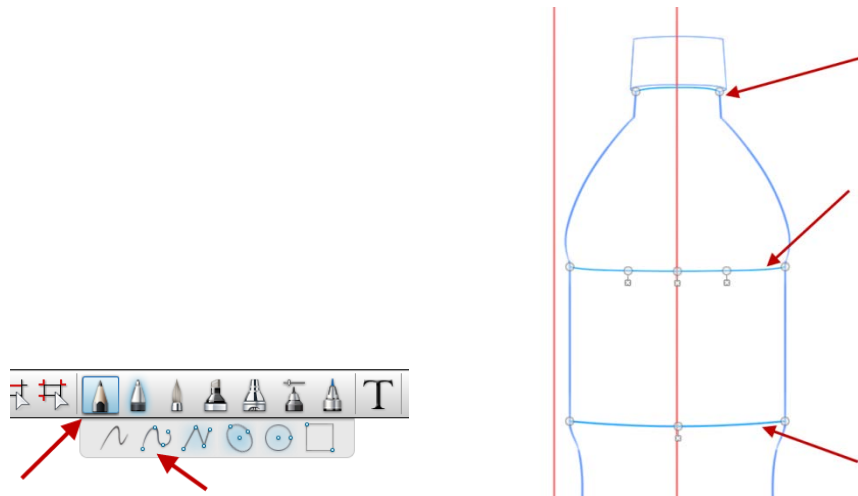


43. In order to get a nice complete outline that can be used for shading on the bottle, let's take advantage of another powerful feature of Sketchbook. Once you have a layer that has symmetry on it you can easily turn it into a regular layer with both the right and left side being editable. Go over to program control area and select the layer menu, from its pull down you will see a command called bake symmetry. Tag this then another dialog box will appear asking if you would like to bake the symmetry to a new layer, click yes.



44. Go ahead and turn off the unused layers and leave the newly created layer active.

45. To connect the top sides and get the label lines in by the cap we will need to draw in some vector curves. Go ahead and use the curve thru points function.



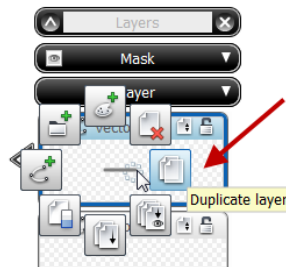
46. Let's inspect the outline curves by zooming around and making sure everything is connected or closed off. Along the bottom line it may be a good idea to ensure the left side and right side connect. Use the select vector item command and drag the end of the left side to curve to the right side curve end. You will see the end point change red when you have it snapped together.



47. Ok, let's now select all of the outline curves and change them all to a nice dark blue line prior to shading. You can also change the bottle cap lines to a gray color.



48. Go ahead and duplicate / copy the completed outline and cap layers to new layers.



49. This will give you the ability to come back to a solid starting point in case you encounter difficulty with the shading of the bottle.

50. Begin to shade by using the vector fill tools on the bottle cap. With the light source pointed directly at the bottle and our view of the bottle being nearly directly straight on the “hot spot” or lightest color shade for the cap will be in the center. In order to create a white look for the cap light grays are used in combination with white. Also keep in mind that you will need to be on the vector bottle cap outline layer for the vector fill to work for the cap.



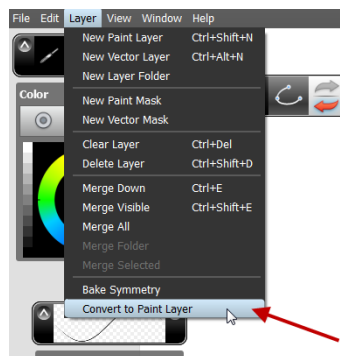
51. Let's go back to the final bottle outline vector layer and use the vector fill tools to start giving the main bottle portion some shading. Modify the perimeter of the vector fills to get the ideal look. Keep experimenting until you get the desired look.

52. Ok, we have something that is starting to take on the look and fill of the new bottle design.



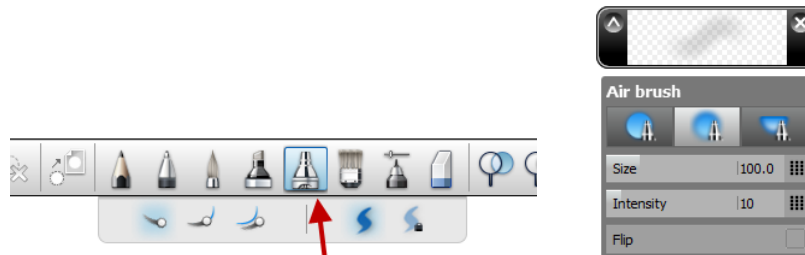
53. Let's even put some more effort into the overall image quality by putting in some highlights and shadowing. We can accomplish this by turning the recently shaded vector layer into a paint layer so we can do some free hand type of highlighting. Before you turn the layer into a paint layer, duplicate it so you can go back to it if needed.

54. To turn the recently copied vector fill layer into a paint layer, go back over to file command layer are and select the convert layer to paint layer command. You will see the toolbar and layer type change over to the paint format.



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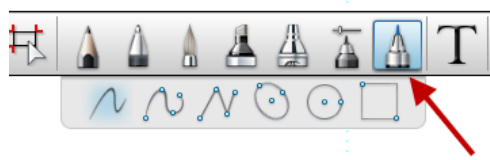
55. We can now use the air brush command in the paint tool box to apply some white highlighting to the bottle. You can control the style of air brush by changing the setting in the tool editor. Use a very low intensity setting so you can build up the paint to get the correct look.



56. The airbrush tool & others all work in the same manner as the pencil we used to sketch the initial bottle shape. Go ahead select a solid white when creating the highlights this will give the bottle a shining plastic look. Use flowing motions when creating the highlights to represent the smoothness of the plastic.



57. Another trick for using the paint tools is to have the paint tools follow a curve or line. Go ahead and start a new vector layer.
58. Then active the guided curve tool from the toolbar. This will allow us to create vector items that can be used by a paint layer as a guide.



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59. Let's now draw in some guide curves that we can use by a paint airbrush to create some highlights near the bottle's edge. These lines are cyan and dashed so sometimes they are hard to see once created.

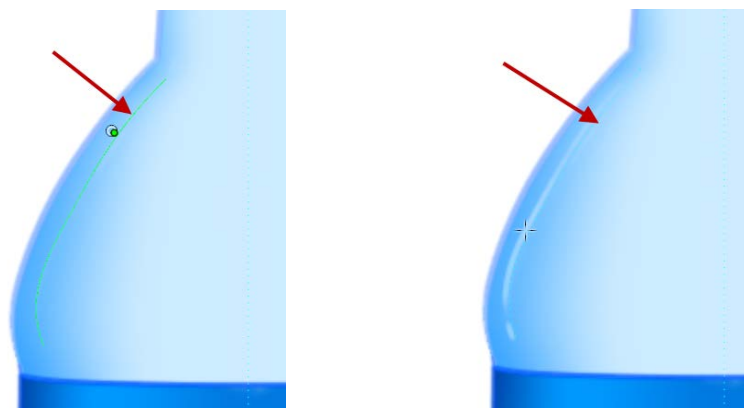


60. Go ahead and go back to your paint layer.

61. Select the air brush tool again and set up a very small tip so we can create some highlights near the edge of the bottle. Also select the follow guide curve to the outside from the fly out menu.

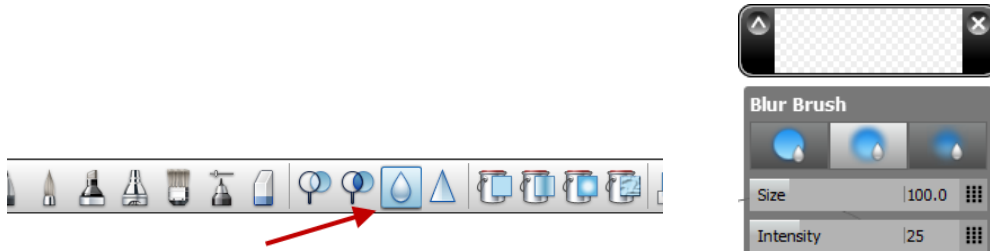


62. Before beginning to paint in the edge highlight, tag the guided curve and drag the green circle to the side of the curve you would like to paint on. Then press and hold down the left mouse button and drag. You will notice that your brush can only move along the path of the curve.



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63. Since we have turned all the bottle shading into a paint layer we can use the blur eraser tool in the paint toolbox to blend the airbrushed highlights into the major shading we first applied. Experiment with the different setting in the tool editor to get the right feel you are looking for this eraser. A very low intensity setting will allow you to slowly apply the blur so you can get the right amount.

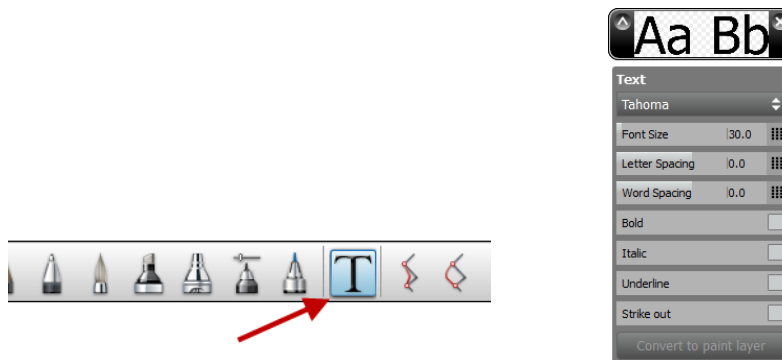


64. Experiment with the various paint tools until you are satisfied with the shading of the bottle. One of key reason to use so many different layers is give you the ability to try some shading then go backwards to try some more.

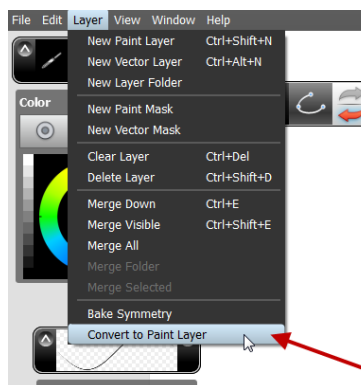


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65. Sketchbook also has the ability to create text which can then be used in the image. Text is created under the vector tool bar. To experiment with this begin a new vector layer and tag on the text tool. Then tag the spot on the Canvas to create the text. Creating the text away from the bottle image is a good idea so you can get the right look figured out.



66. You can turn that newly created vector text layer into a paint layer allowing you to move the pixels that make up the text over the bottle label.



67. Select the pixels by using the rectangle selection tool under the paint toolbar.

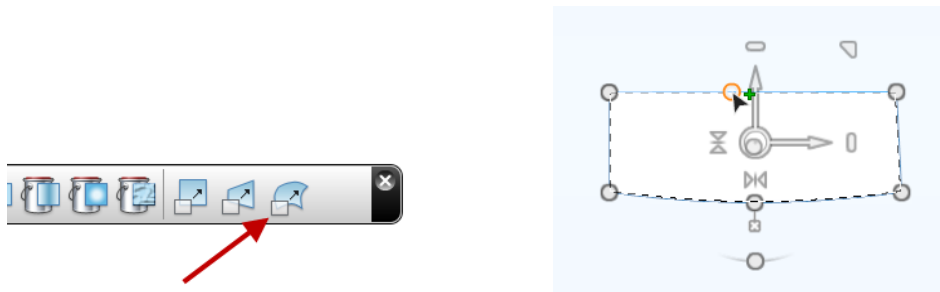


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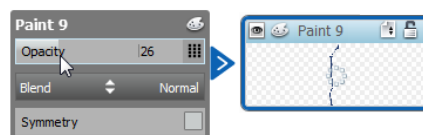
68. Then use the transform tools to move the pixels over top the bottle. This move & scale tool behaves in the same manner as vector one.



69. You can also use the wrap tool under the transform paint commands. This will allow you to bend the text / pixels giving it the look the text are right on the bottle label. You will need to add a control point to the perimeter shape then move it around to get the pixels to follow an arc shape.



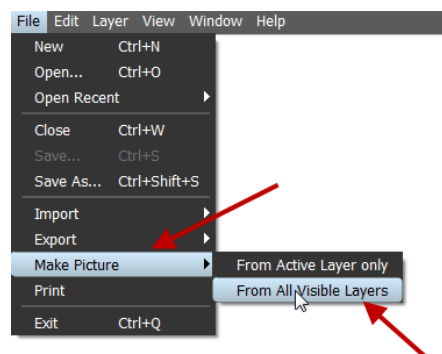
70. Another setting to play with to get the right look is opacity of the new label text layer. This will let the underline color of the label bleed into the text/ pixels some.



71. We now have a completed image for the new bottle design.



72. From here we can save off digital picture images using the make picture function under the file menu. This will save off standard image formats of the visible layers or just the active one. This is a great tool to make images with, so you can send them off quickly thru email to other team members.



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73. We can also export the vector items as an Autodesk standard dwg or dxf file under the export function also found under the file menu.

