SolidWorks Final Project:

Roman War Helmet and Sword

Engineering Design 100 Section 25

By: Andrew Cicconi

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These two pictures from Bing were what I used to guide me in the process of making my SolidWorks final project. There are clear differences in my project and the pictures shown like the neck protection offered in my design. I decided to add this as many of the other photos had this neck protection but I liked the aesthetics of this helmet the most. I used part of a YouTube video (3) to figure out how to make the eye and mouth cutout for the mask. I chose to produce these two items in SolidWorks because I am completely fascinated by the Roman Empire. I've read many books on the history behind the empire as well as seen many documentaries on the rise and fall of the Roman Empire. I specifically chose to make these because the Roman Empire was known for their military might, advances, and strategy.
**Figure 1** A side view of the assembly of the helmet and sword.

**Figure 2** A top view of the helmet
**Figure 3** A side view of the sword and front of the helmet

**Figure 4** A side view highlighting both the sword and helmet
I created the oval shape of the helmet by creating one fourth of an oval and revolving that to make the top of the helmet that would cover ones’ hair. Then I used the shell feature to hollow out the inside so it could actually be worn by someone. Next I made an extrude cut through both sides of the mask in the shape of a half circle right where the ears would be. This wasn’t a necessity but it looks aesthetically pleasing. I used the spline tool to draw in the tilted c shape extended down from the previously made part in the back of the helmet. After this I was able to use the sweep boss tool to create the neck protection part. After this I used the convert entities tool on the bottom of front of the helmet in order to make the front protection of the mask. After converting the entities I was able to make an extrude base downwards to create material for the front of the mask. I then made a sketch in the plane that would cut the mask through the middle. I converted the entities of the new extrude I just made and connected the bottom right to a point on the opposite side to make a triangle. I then made an arc on the
hypotenuse of the triangle that went from the top left down a bit of the hypotenuse. I then trimmed all of the entities that would not allow me to extrude cut the image through both sides of the mask. I then extrude cut the image through both sides of the mask. Next I made the image of half of the eye and mouth. Then I mirrored this and extrude cut the image through the front of the mask. Then I created a new plane a little bit in front of the mask and converted the entities of the eye and mouth cut. I used offset entities to offset this image. Finally I used the extrude boss feature but used extrude to face. I wanted the created piece extruding from the mask to look as if it molded around the mask. To do this I created a plane above the mask. I then used the spline tool to create a curved line over the part of the piece sticking out of the mask that I would like to cut off. I connected the ends of the spline and then extrude cut downwards. The last part of the mask was creating a new plane that touches the top of the mask with a small circle on it. I then extrude cut down a little through the mask so I could mate the topper with the mask. The topper was made by making the crescent shape and extruding it. Then a new plane was made below the crescent shape and making a circle that matched the one made on the top of the helmet. I then used extrude to face and extruded it to the crescent solid. Next I offset the top crescent line inwards and created a new plane over that offset entity. I then used the spline tool to create another crescent shape and connected both. Finally, I extruded that shape to create the red part of the topper. The blade of the sword was made through lofting two smaller versions of the sword shape to a bigger blade shape. On the bottom of the blade I drew a centered rectangle that extrudes downward. I filleted the edges of the extruded base. Finally I made the handle by using the revolve base. I then assembled the three parts. S
The new features to me were using spline, convert entities, offset entities, the mirror tool, and extrude to face. I ended up using these all a good amount of times. The hardest part of the project was figuring out how to make the piece that extends from the mask and curves with the mask. It was the hardest because I didn’t know where to start. After I figured out a plan it was much simpler. Overall the SolidWorks part of class has taught me specifically how to make detailed 3D solids through drawings. It has also taught me that making these can be very fun especially if you are interested in what you are making. Overall SolidWorks was a very exciting and fun part of EDSGN100!

References

1) http://www.bing.com/images/search?q=ancient+roman+helmet&view=detailv2&&id=D0AEF53CD94181CECE7BAADE2CC6641C620C541&selectedIndex=29&ccid=%2bp%2bBJBZa&simid=608027500029280919&thid=OIP.Mfa9f8124165a3667f1c69279fe0ea094H0&ajaxhist=0

2) http://www.bing.com/images/search?q=roman+sword&view=detailv2&&id=371B4243E8503D041A71ED249F8DAE48D5CFE97C&selectedIndex=29&ccid=DEMpcTBF&simid=608047514563446978&thid=OIP.M0c432971304501b70ff566cebc56fbeH0&ajaxhist=0

3) https://www.youtube.com/watch?v=Pj64dBcWPtE