Red Hot Lighting Bicycle

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When trying to decide what to create on SolidWorks for my personal project, I immediately thought of toys and activities I did as a child for inspiration. With summer just around the corner, and my mind on summer break, an image of myself as a child riding my bike around the neighborhood is what popped into my head. The Figure below (Figure 1) is the basic blue print I used to begin the process of building the bike ([https://www.pinterest.com/pin/483222234994162050/](https://www.pinterest.com/pin/483222234994162050/)). I primarily used this photo in the beginning to create the main structure of the bike, and then as I began creating small parts and accessories, I started coming up with my own dimensions. I thought about how many parts I could split the bike into. I would create and render each part by itself, and assemble them together at the end. I broke the bike up by it’s body, wheels, handlebars, peddles, and seat.

![Figure 1](https://www.pinterest.com/pin/483222234994162050/)

**Figure 1:** The dimensions I based some of my parts off of.
Some of the previous techniques I used in my design were the fillet and shell feature. These were crucial to how I created the bike seat. The fillets on the top face of the bike seat is what made the seat look realistic and something people would want to sit on. I shelled the inside so that I could make a bike seat lock as shown in Figure 2.

Figure 2: An up close look at the bike seat and bike seat lock.

Some other techniques I used is a extruded base and cut to make the body of the bike and the piece that connects the seat to the body of the bike includes a loft. I made circles on planes perpendicular to the sketches I wanted to make a bar with and then extruded the circle to the length I wanted it. The cuts were used to mate things like the peddles, handlebars, and seat to the body. To make the handle bars, I made one side and reflected it over a center line. Then, I
made a circle in a perpendicular plane with the center of the circle on the sketch. Then used the sweep tool and the sketch as the guiding path as shown in Figure 3 below. I added rubber grips to the metal handle bars to make them more realistic.

![Figure 3: A side look at the handle bars and rubber grips.](image)

I learned a lot of new tools in SolidWorks through my personal project- some that I probably should have known going in to the project. Some of the most basic tools I discovered was using construction lines. After creating a line I could check a box, “For Construction,” and it was only used in the sketch as a reference and not apart of the finished product. I used this tool in my handlebars as a reference line to mirror the design over to the other side so that the handle bars were symmetrical. I knew about the mirror tool before this project; However, I had no idea
how to utilize it. I think the most important thing this project did is make me more comfortable with the SolidWorks software.

After completing the Pattern Feature Tutorial, I figured out how a way to create the bicycle wheels as shown below in Figure 4. To create the wheel, I created a rectangular sketch with a half circle on the top and then used the revolve feature. At first I had created the wheel and stoke as separate parts and wanted to assemble/mate 30 stokes on to the wheel. Instead I made a circle on the smallest silver, cylinder extruded it up to the surface of the outer, silver ring. I then selected the first stoke, and used the pattern feature. I had SolidWorks create 27 more, equally spaced stokes.

**Figure 4:** An up close view of the wheel and stokes.
One of the hardest things for me to do during this project was to scale all of the parts so that they were proportional to each other. The first problem I ran into was that the bike seat was way too small, then it was way too big. I ran into this same problem with the peddles. I found that I can easily go into a part and scale the entire thing up without having to go in and redimension all aspects of the sketch.

Experiencing the SolidWorks portion of this class has helped me reroute my academic career here at Penn State. In high school I completed four years of fine art courses and thrived on creativity and design. However, I also excelled in Chemistry and Math courses and knew engineering was for me, not art school. I feel in the past two years, I have lost sight of my love for design and focused what I was good at, not what I loved. SolidWorks helped me realized that this is what I would like to pursue. I want to take more courses that include the design process and SolidWorks projects.
Works Cited