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EDSGN 100

Section 22

SolidWorks Personal Project

Kool Kids Playground

My project was inspired by photos I found online of various playground equipment as seen in Figures 1, 2 and 3. I wanted to replicate the equipment while also adding my own creativity to it. For this reason, I decided to do a tire swing instead of a traditional swing on the swing set. During my designing and assembling of the different parts of the playground equipment, I had to estimate the dimensions to ensure that the tire swing would look appropriate relative to the merry go round (and vice versa). I also did some trial and error testing (in hand with my estimations of the dimensions) when I assembled the playground equipment together to confirm they looked appropriate next to one another. I chose to design a playground because I love playgrounds, and I felt that it would be a fun design that would provide a balance between difficulty and creativity.

To complete my project, I created a merry go round assembly and a tire swing assembly, both of which were produced from two different parts. The first part of the merry go round, as seen in Figure 4, was the merry go round handle bar. To make this part, I drew and dimensioned an outline of the outside bar on the front plane using lines and tangent curves. Then, I drew and dimensioned the inside slanted section of the handle (again using lines and tangent curves) on a new plane created as a projection of the right plane to halfway through the front plane. After that,
I drew two circles on the top plane at the bottom of the bars to sweep and create a three dimensional handle bar.

For the second part of the merry go round, I created a merry go round base. As seen in Figure 5, the merry go round base was created by drawing and dimensioning a circle on the top plane. Then I extruded the entire circle to make a three dimensional base. After that, I sketched on the surface of the extruded circle a series of circles that would align to be the holes where the handle bars would fit into. I drew and dimensioned a hexagon and triangle to facilitate where I needed to place the circles. After I had drew and dimensioned the circles, I trimmed the hexagon and triangle and used an extruded cut to cut the circles down into the base to create holes for the handle bars.

To assemble the merry go round I inserted the merry go round base and three of the merry go round handle bars. Then, I mated the bottom faces of the handle bars to the face of the inside of the holes in the merry go round base. After the parts were mated and assembled, I added a fillet feature of the edges of the base to create a more circular appearance. The final assembly for the merry go round can be seen in Figure 6.

To create the tire swing, the first part I made was the swing set base, as seen in Figure 7. I drew and dimensioned this part on three different planes. The first plane was the front plane, the second plane was the front plane projected forward the length of the swing set base, and the third plane was the top plane projected up the height of the swing set base. On the front plane and its projection, I made an identical sketch (using lines and tangent circles) of the legs of the swing set base with circles drawn on the bottom of one leg on the top plane. Then, I drew a line connecting the two identical sketches of the swing set legs on the third plane (the top plane projected up the height of the drawing). Next, I lofted the drawings to create a three dimensional swing set base
and I extruded a hole from the center of the top bar of the base to serve as a location to be mated to the tire rope.

To create the tire for the tire swing, as seen in Figure 8, I began by sketching and dimensioning a circle inside a circle on the top plane. Then I extruded the circle to create a doughnut-like shape. Then I added a shell feature to the inside of the tire to make it hollow. Following that, I added a fillet feature to the outside edges of the tire to make it round. Next, I projected a new plane to the top of the tire and began to sketch and dimension the connections for the rope. I drew four circles that were then lofted up to the bottom of a square that had another circle at the top that was extruded to create the continuation of the rope. Lastly, I added another fillet to the end of the rope to round it near the top of the tire.

To assemble the tire swing, as seen in Figure 9, I inserted both the swing set base and the tire swing and mated the top of the end of the rope to the hole that was extruded from the top of bar of the swing set base.

Finally, I assembled both the assembled merry go round and the assembled tire swing set, as seen in Figure 10, by inserting both parts and reworking the placements to move them next to each other. I then finished my project by coloring the parts and adding a background scene as seen in Figure 12, and by creating a final drawing as seen in Figure 11.

The most difficult aspect of this project was creating a design that was as realistic as possible. Because I spent so much time and effort on this project, my goal was to have a realistic design that would display my hard work well. I wanted my design to look visually appealing and to accurately replicate playground equipment. For this reason, I was very particular about the appearance of my project, including both the features I used and the outside coloring and
appearances I added. The tire on the tire swing, for example, required this dual approach to create a realistic tire. I used a fillet feature on the edges of the tire and a shell feature to the inside of the tire to make it rounded and hollow, much like a real tire. Additionally, I added an appearance feature of tire tread to the outside of the part to make it appear as a real tire.

From this SolidWorks portion of the class, I learned the importance of keeping track of my work. Many times I began to draw a part only to realize halfway through that I was in MMGS when I wanted to be in IPS. This project taught me to be more meticulous and conscience about my work. Another lesson I learned from this SolidWorks project was to be adaptable when things did not go the way I envisioned. For example, I did not anticipate how difficult it would be to mate the merry go round handles with the base until I was actually doing it. I learned to adjust my thinking, and after multiple drafts of various merry go round handles, I resulted in a part that fit into the merry go round base.
Figure 1 Merry Go Round
(http://images.search.yahoo.com/images/view;_ylt=AwrB8pmFWjVd1QAM5Y2nIlQ;_ylu=X3oDMTlyNWczc2x0BNHNYwNzcRzbGsDaW1nBG9pZAM0OGVhY2NjZTVhYWI4ZDhhNNDdmNGE4MWU1NzM1N2JlOQRncG9zAzIEaXQDYmluZw==?origin=&back=http%3A%2F%2Fimages.search.yahoo.com)

Figure 2 Tire Swing
(http://images.search.yahoo.com/images/view;_ylt=AwrB8psBWzIVBRQAR4Y2nIlQ;_ylu=X3oDMTlzWmlyc2FqBHEyNzczRzbGSDaW1nBG9pZANmZDNkZTdjZGY4OWRmZmQ2MWUyMjhhZDBhNTA5ODk4MQRncG9zAzI0BGl0A2Jpbmc=?.origin=&back=http%3A%2F%2Fimages.search.yahoo.com%2Fy)
Figure 3 Swing Set
(https://images.search.yahoo.com/images/view;_ylt=AwrB8pr1XDIVHhsAHlo2nllQ;_ylu=X3oDMTiyNnRkYXhBHNlYwNzcgRzbGDaW1nBG9pZAM3ZjYyMDE3MDNINmVjYjuXVmlzZmJmMjU2ZnBzcG9zAzEEaXQDYmluZw--?origin=&back=http%3A%2F%2Fimages.search.yahoo.com%2Fyh
)

Figure 4 Merry Go Round Handle
Figure 3 Merry Go Round Assembly

Figure 4 Merry Go Round Base
Figure 5 Swing Set Base
Figure 6 Tire Swing
Figure 7 Tire Swing Set Assembly
Figure 8 Final Playground Assembly
Figure 9 Final Playground Assembly Drawing
Figure 10 Final Playground Assembly Colored