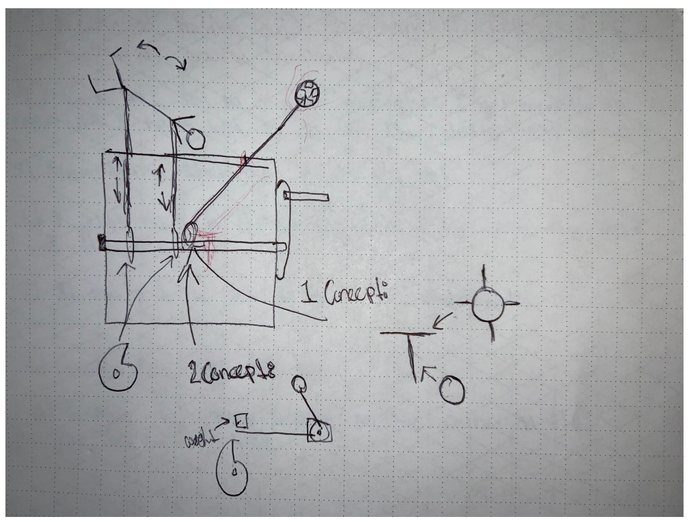
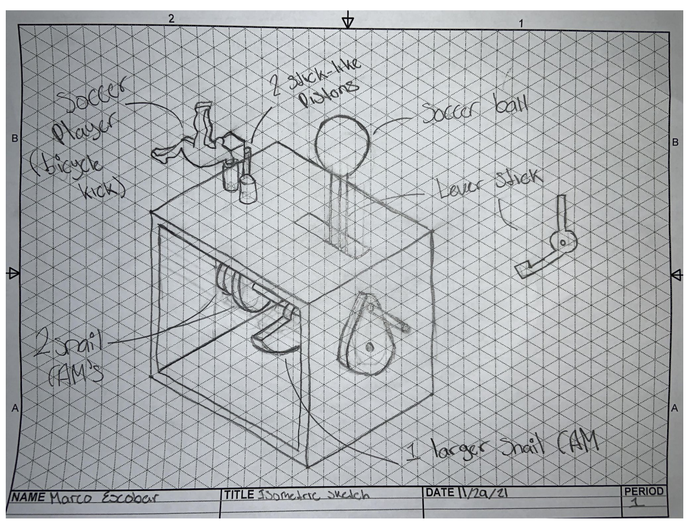
Art Of The Bicycle Kick
-Marco Escobar

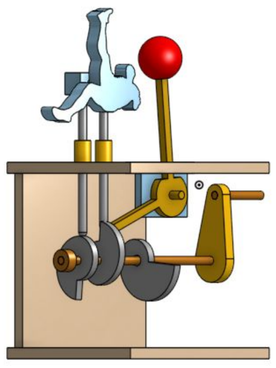
For my project I wanted to replicate the exact movement and concept of a bicycle kick. The idea was for the soccer player to move up and down in an alternating way, while the soccer ball is connected to a stick that moves the same way a lever does, all while on the same axle.



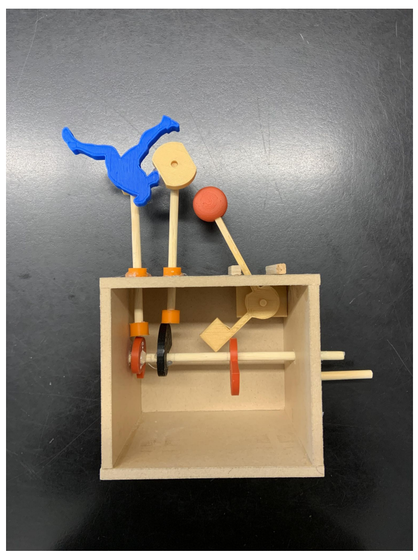
CONCEPT SKETCH: This was my concept sketch. I had already thought about all the pieces I would have needed and how I wanted it to look. Although there was a small piece I still had not figured out, I knew the cams that I would have needed and the measurements. When it came to the ball, it wasn't as simple as I thought it would've been in my head. Getting a lever to move the opposite way of the axle and cam was a very difficult challenge.

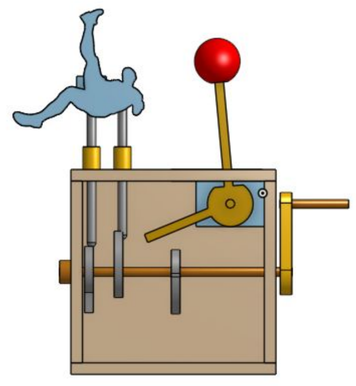


FINAL SKETCH: This sketch was made from the isometric view of the real life box using perspective and horizontal lines.

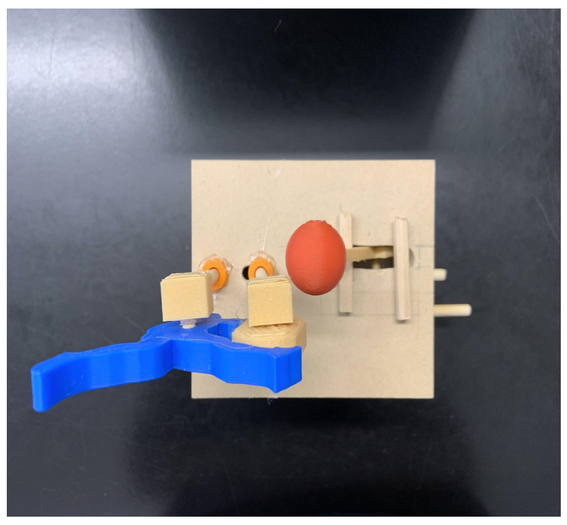


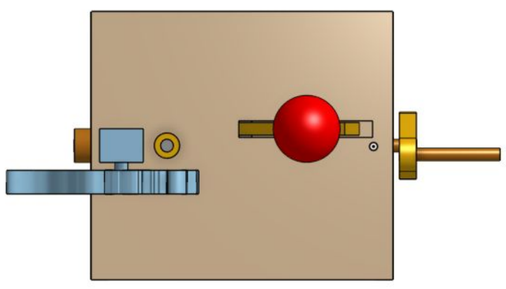
MECHANISM VIEW: The mechanics. The part of the project I am most proud of. Here we see how in the end after all the mates, tangent mates, and rotations, we are shown how the followers and lever line up almost perfectly to the cams. The dimensions, space, and position of each and every single cam was done purposely to get everything to move the way it was supposed to.



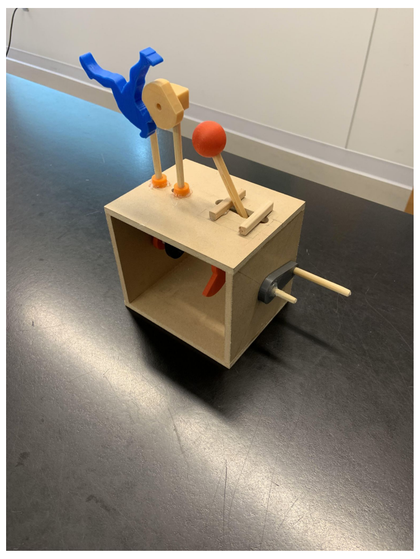


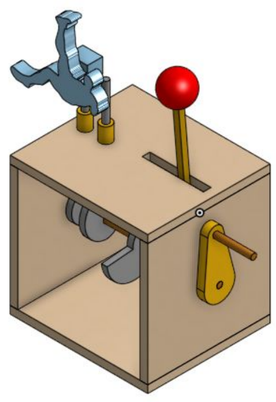
FRONT VIEW: In the front of the box we can see the 3 snail cams I used, 1 black and 2 red, and the distance between them and how offset they are from the middle of the smooth circle axle. In the top right corner there is a small golden box I added with a round hole where the"L" shaped lever/axle part is able to be connected and rotate, according to the weight of the ball and the end of the bottom stick. The 2 followers are being pushed down by the weight of the blue "soccer player" and the golden "connector" piece that it is connected to. There is a hole behind the Soccer player the causes it to be able to rotate as the circle followers move up and down.



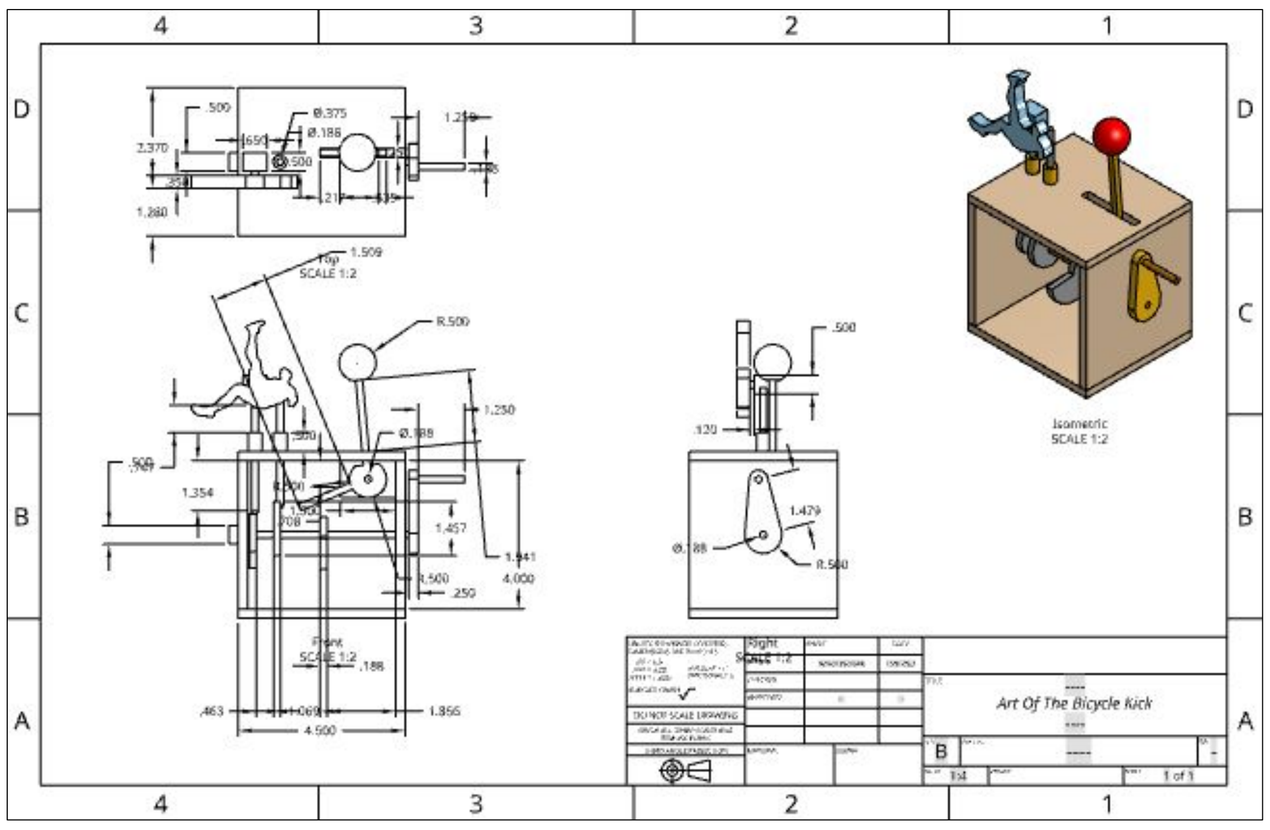


TOP VIEW: On the top we see how the "soccer player" and "connector" pieces are connected to the followers, through 2 small golden boxes, that help and make them be able to rotate and replicate the "bicycle kick" effect and make it look realistic. We can also see the amount of space needed for the "lever" and "ball" to move back and forth, in a contrasting motion with the snail cam, and 2 pieces of wood that act as barriers so the lever won't move back or forth to much to cause it to get stuck.





ISOMETRIC VIEW: In The isometric view we get a visual of all the dimensions and sizes and how all the distance in between all the pieces cause the entire box to look, move, and work exactly how it does on Onshape, and exactly the way it was pictured in my head and in the concept sketch.



SUMMARY: In the end the piece I was most proud of was the "L" shaped lever I created due to the fact that it was the piece I struggled most on. I also had to create another little round connector to stick to the body of the player in order to get it to move they way I wanted it to. It worked out because with 2 connectors the player and connector were moving up and down and rotating alternatively. I had the idea, I had the picture in my head, I knew how I needed it to move and the final part was to create it and I did it. The execution of the actual box was also tough; creating a picture and visual was nothing compared to putting the real life pieces together especially when gravity, friction, and weight come into play. The project was 100% successful and working in the end, and the struggle was definitely worth it.