The Complete Ski Set

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For my Solid Works personal project I decided to recreate a ski set. I chose this because I’ve recently switched over from snowboarding and have begun skiing. I bought a new pair of skis and bindings over the past fall. I decided to model my K2 Press skis and Marker Squire 11 bindings. For a fun twist, I chose to try to make ski poles that are retractable. For park skiers like myself ski poles can get in the way when going off jumps or riding on rails. However poles are necessary to overcome the flat parts of the mountain.

To begin the modeling, I decided to sketch the right view of the ski and simply extrude it back the correct width. The tips and edges of the ski were flat and not round. To fix this I filleted the sides to 1mm. The tips however didn’t satisfy my liking so I made a new plane tangent to the tips and created a semicircle to better represent the actual skis. Creating an angled plane was a feature in solid works that I hadn’t use before. I extruded the semicircles to the appropriate height and then filleted the edges to create the smooth sides. Then I colored the entire ski orange. All of the features of the ski can be seen in figure 1 below.
Next up were the poles. I assembled the poles by making three parts. The handle, the inside, and the outside. First I made the inner portion of the pole by making a circle and extruding it up about 70 cm. I then created a sketch on the poles surface of three smaller circles. These would be the pins that go through the slots of the outer pole. I then made them each 15cm away from each other and centered them on the pole. I then extruded them each about 2cm. For the outside portion of the pole, I used the same method and extruded a slightly larger circle. I then used an extruded cut to make a hole the same size of smaller pole. I then cut out three holes of the size of the smaller circle extrudes using an extruded cut that were each also 15cm apart. To make the ski pole look aesthetic I created a tip protector by using a loft and making it go 360 degrees. Then I made the tip pointed to look like a real pole. The handle was fairly easy to make. I made a circle the same size as the outer pole and extruded that about 20cm. Then I used a circle the same size as the inner portion of the pole to make a hole up to the surface of the handle. The finger grip on the handle I made by using the spline tool to create the finger placements on the handle. I then extruded the spline sketch to give the feature depth. All of which can be seen in figure 2.
The binding was by far the most intricate and difficult part to make overall. It required over three different components for it to be assembled into one functional part. I started the binding by creating a sketch in the top plane a roughly traced the shape of the Marker 11 Squire which can be found on Marker’s website markerusa.com. I then extruded the base about 5mm to give it an appropriate height. The base has two or three extruded cuts that serve as designs, one on each side of the base at the back end, and one in the middle of the base that serves as the area where the boot connects to the binding. All three of which were very simple to make by simply creating their distinctive shapes. The two extrudes each needed new planes to be created to make them, stemming from the right plane. This portion of the binding can be seen in figure 3 below.
The top portion of the front binding was made separately from the base. I sketched the basic right view design of the top portion and extruded it out. The binding has two parts that curl and wrap around to the back. I created a new plane to the height of the top of the binding and then made a sketch in the top view of what the part looked like stemming off the right side of the top. I extruded the part downward approximately halfway to the binding height. The new part to the binding had a small extrude cut on the top to produce a decal. I then used a feature that was completely new to me. I mirrored my new feature from the right side to the left side. This individual component of the binding can be seen in figure 4 below.

Figure 4: Front Component of Binding
Finally the back of the binding was created as a continuum of the front binding. I extrude cut a lane in the back of the front binding for the wires to connect the front and back. Then I made the wires inside the hole and extended them back towards the back part of the binding. I then made the back base the same way as the front base by drawing a top view sketch and extruding it to the same height as the front base. I then added the piece that is connected to the back base and the wires. I simply created the sketch of the shape in the top view and extruded the feature up. The wires connected to the front of the feature because in real life the wires come from the inside of the part. Next I went to a right side view and created a sketch of the back part of the binding that extends up (blue and black colored), where the heel of the boot would be located. I created a sketch that looked like the part in the right plane and then extruded in both directions to the edge of the binding. This part of the binding had two screws, each on different levels running across the back. I extrude cut a circle of 3mm diameter through the entire blue face to the other side. I then extruded a circle of 3mm diameter all the way through. I then changed the degree on the end and had the circle be extruded smaller to give it a realistic appearance. Small extrude cuts were made along the part to make the appearance more realistic, like the rectangle cut in the front face with the small screw running through it. I then filleted the edges of the bindings to give them a more round appearance. This concluded creating all of my parts. The additions made to the front binding can also be located in figure 3 above.

I then assembled the binding by mating the top face of the base with the bottom face mating them coincident. I then mated the vertex of the corner of the top part of the binding with the vertex of the corner of the base to lock it in place. To assemble the ski pole I mated the extrude cut of the handle with the outer face of the inner pole as concentric. Then I mated the extrude cut of the outer pole with the face of the inner pole as well making them concentric.
Then I mated the face of the small extrudes on the inner pole to the extrude cut of the outer pole making them coincident to lock it in place. To create the final assembly I imported the two assemblies of the bindings and the poles into an assembly with the skis. I mated the top face of the skis and bottom face of the bindings to be coincident. I then mated the back edge of the binding to the back line of the middle of the ski to be coincident as well. Then I mated the right edge of the binding with the right edge of the ski to lock it in place. The skis bottom face were made coincident with the bottom face of the skis as well.

Lastly I made a drawing to help layout the overall dimensions of the skis. I added the front, right and top view. Then I smart dimensioned the important dimensions for each view. I did a detail view of the binding because of its tiny size and how intricate it is. I lastly added a colored isometric view to the drawing in the top right corner, which can be seen in figure 5 below.

![Figure 5: Drawing Of Skis](image-url)
My overall takeaway from this portion of the class is very positive. I had a bunch of fun creating and modeling this project. Solid works can be very frustrating sometimes, but when it all comes together it is very gratifying. I learned to better my patience through the Solid works portion of the class. I also learned that anything can be modeled by Solid Works and that there are many different ways to do it. This has helped me throughout the rest of my schooling the semester to think critically and really experiment with every idea possible to come up with a solution.