



**CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY**

Name(s) Anna N. Dunn	Project Number J0310
Project Title Knee Kindness	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective is to determine which tennis and running surfaces have the least impact on your knee.</p> <p>Methods/Materials I will weigh unused and unopened tennis balls and record their weight. I will drop the tennis ball from the same height 20 times on each of the different surfaces and record the results. This will be done by dropping a tennis ball from the top of a yard stick. I will record this on a slow motion camera for accurate results.</p> <p>Results In this experiment potential energy was measured twice. The first potential energy before the ball was dropped and the second potential energy at rebound height. The difference is the amount of energy absorbed onto the surface. The higher the rebound the worst for the knees. In the case of the tennis surfaces, the artificial turf was the kindest to the knees. The hard surface tennis surfaces were the hardest on the knees as they had the greatest bounce. In the case of the running surfaces, the ground was the kindest on the knees, followed by the track surface, next came concrete and last was asphalt.</p> <p>Conclusions/Discussion The harder the surface the less energy is absorbed into the surface and thus has the greatest potential to cause knee injuries. Conversely, the softer the surface the more energy is absorbed and thus has the least potential for knee injuries.</p> <p>Knee injuries are the most common injuries for both tennis players and runners. The surface that athletes use has the potential to help prevent knee injuries.</p>	
Summary Statement By measuring the rebound height of a tennis ball on various tennis courts and running surfaces, I found that the higher the rebound height the less energy was absorbed into the surface and thus had the hardest impact on the knees.	
Help Received I designed and analyzed the experiment myself. I did have someone videotape the experiment using a slow motion camera.	