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### E-portfolio and Reflective Writing

The incorporation of spring vibration is wide-spread in life. I never imagined the depth, uses, and the potential to influence certain responses spring vibration had. Upon completing this project, I came to understand how the system works as well as the change that takes place regarding amplitude and period. When the system is set in motion, amplitude will be affected in terms of shifting higher or lower. As a result, the spring becomes displaced from its equilibrium and will oscillate back and forth within the period until it returns to its equilibrium state. This repeated back and forth action creates a periodic motion, independent of frequency.

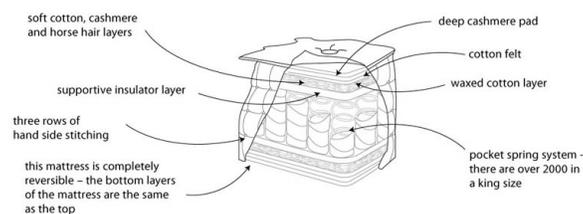
Spring vibration has constant application by everyday life activities we do. An example of this is the shock absorption system found in vehicles. This system works by attaching all four tires and assigning a constant rigidity to them. Making it so that the vehicle obtains ideal absorption and isolation from the outside (road noise, bumps, vibrations, etc.). Commuting to work would otherwise prove to be difficult if not for this system incorporation in vehicles.



Another application of spring vibration can be found in trampolines. Similar to the shock absorption system, it is the spring stiffness that allows for people to jump without hitting the

ground or being thrown off. However, this all varies depending on the size of the trampoline due to the stiffness on the springs being different. Trampolines are very fun to jump on but the application that I most enjoy of spring vibration is its contribution to mattresses.

Many mattresses incorporate a mass-spring system. It is the damping and spring's equilibrium that affects the type of mattress produced in terms of stiffness, which is what most individuals seek because it's what defines how comfortable the mattress will be. Mattress manufacturers must understand how the mass-spring system works because it's the foundation in mattresses, and once understood they can make and sale different types of mattresses. The system also helps people grasp what types of mattress will most be comfortable for them and why others aren't as much.



The last application of the mass-spring system I will discuss is bungee jumping. This activity is complex in terms of frequency of motion. Bungee jumping works by strapping an individual to a bungee cord and then letting them jump off a certain distance from the ground. By doing so they will experience free fall and at point in time will reach a point where the cord no longer gives slack, resulting in the motion of bouncing up and down. The period will be affected by the length of the bungee cord and initial height from where the jump took place. Following, the mass of the jumper will be taken into mind and once calculating the measurements, we will end with an accurate calculation of the bungee system and its frequency. Understanding how bungee jumping works is vital if considering trying this activity out in real life. If you commit

error in calculating the length of the bungee cord, then you can end up falling flat to the ground due to the displacement.

When I began this project I understood some of how trigonometry influenced life, but I never visualized the depths the mass-spring systems had on the world. This signature project exposed me to applications that had never crossed my mind. I was able to look at things through a different lens. I never realized how much we use and rely on the mass-spring systems in everyday life. I really enjoyed this project because it opened the doors to discovery.