MSET – DYNAMIC IMPACT

Purpose

Examine the effects of impacting materials of different composition, and how the impact force varies as a function of event duration.

Impacts

Dynamic impacts are a common result of daily activities. As an example a person walking or running experiences dynamic forces to their body. The weight of the person, and type of shoes worn will effect the magnitude of force generated.

Theory

The amount of potential energy "PE", that an object of mass "M" has is a function of height "H", and gravitational constant "G".

$$PE = MGH$$

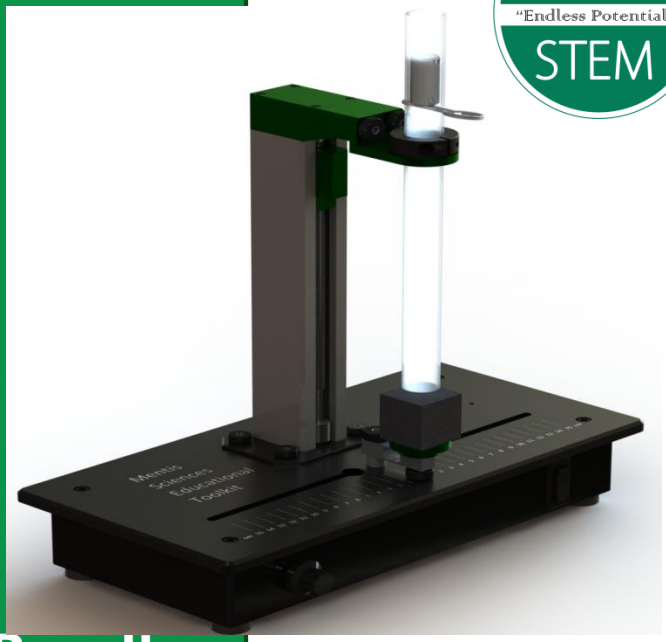
As it falls, the height decreases, and velocity "V" increases. The potential energy is converted to kinetic energy "KE".

$$KE = \sqrt{2GH}$$

The force of impact "F" is defined by Newton's second law with "A" being the deacceleration.

$$F = MA$$

Setup



Results

A number of materials with various energy absorbing characteristics will be measured and compared to each other. The impact magnitude, and duration time will be compared. Energy absorption of each will calculated and compared to the kinetic energy.