## LB-CUSHIT!

Purpose - To determine how the distance a mass is dropped from affects the force used to crush a soda can.
Supplies - a sewer pipe, a large nail, 4 empty soda cans, 1 kg mass and a ruler.
Procedures - 1- Use the ruler to measure the height of the uncrushed soda can and record here $\qquad$ cm .


2- Place the wood block on the floor to protect the floor, then place the empty soda can in the center of the wood block.
3- Lean the sewer pipe over, then place the large nail through the .5 meter mark. Drop the mass inside the pipe letting it gently slide down until it is stopped by the nail. (don't hold the nail or you may get pinched!!!)

4- Stand the sewer pipe up straight and place it over the soda can, make sure the sewer pipe is on the wooden block and that the soda can is still standing straight up and not tipped over. When you are ready, pull the nail out and let the mass fall onto the empty soda can.

5- Lift everything off the soda can and use a ruler to measure the height of the crushed can and record in the data table.
6- Repeat all of the steps dropping the mass from $1 \mathrm{~m}, 1.5 \mathrm{~m}$, and 2 m .
7- Gather data from the other stations and find the average. Record all data to 1 decimal place (ex. 11.5)

| Height mass is dropped from | Crushed Can Height Table 1 (cm) | Crushed Can Height Table 2 (cm) | Crushed Can Height Table 3 (cm) | Crushed Can Height Table 4 (cm) | Crushed Can Height Table 5 (cm) | Crushed Can Height Table 6 (cm) | Crushed Can Height Table 7 (cm) | Crushed Can Height Table 8 (cm) | Crushed Can Height Table 9 (cm) | Average Crushed can height (cm) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| .5m |  |  |  |  |  |  |  |  |  |  |
| 1 m |  |  |  |  |  |  |  |  |  |  |
| 1.5 m |  |  |  |  |  |  |  |  |  |  |
| 2 m |  |  |  |  |  |  |  |  |  |  |

Graph Data - Create a line graph using the average data from all of the tables. Include the height of the uncrushed can on the graph at 0 .

## Questions -

1. Describe the relationship between the height the mass is dropped from and the force that is applied to the can to crush it. Include how height and mass relate to potential and kinetic energy.
2. What do you think would happen to the can if the mass was 2 kg instead of 1 kg ?
3. Describe the kinetic energy in this experiment.
4. Describe the potential energy in this experiment.

