Name: _____ Period ___ **Popper Lab: Investigating Energy**

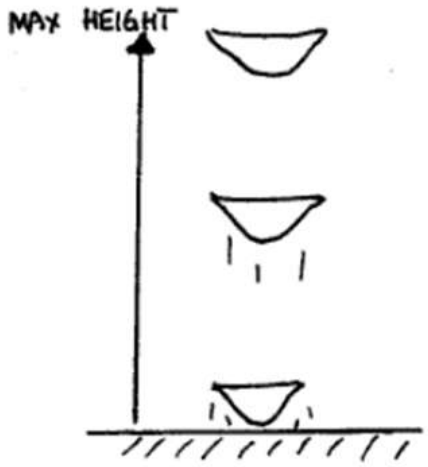
Instructions: Invert the rubber popper with your fingers and place it on the floor. The popper will launch itself upward. In this activity, you will measure the maximum height attained by the popper and will use this to calculate its potential energy. You will then use this information to consider how the energy is transformed at various points along the popper's motion.

Some helpful formulas:

CAUTION: Do not put your face directly over the popper or aim the popper at anyone else!

$$KE = \frac{1}{2}mV^2 \qquad PE = mgh$$

Consider the diagram below and select the energy that the popper has at each location.



C	**KE Only**	**PE Only**	**Both KE and PE**
B	**KE Only**	**PE Only**	**Both KE and PE**
A	**KE Only**	**PE Only**	**Both KE and PE**

The average mass of a popper is **1.7 grams**. Before we can use this mass in the equations above, it must be converted to kilograms. Do this in the space below. Show your work.

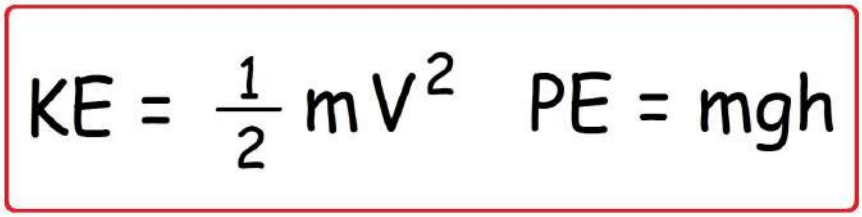
Use a meter stick to measure the maximum height that the popper rises to.

Perform 5 trials and calculate an average.

Trial #	
1	
2	
3	
4	

5	
Average	

Calculation and conclusion questions (Show all work and explain your reasoning)



1. Calculate the gravitational potential energy of your popper at its highest point. (Note: g = 9.81 m/s^2)

2. What is the total energy of your popper at any location? (Hint: Conservation of Energy)

3. Calculate the potential energy of your popper at position B. Assume position B is at half of its maximum height.

4. Calculate the kinetic energy of your popper at position B.

5. Calculate the speed of your popper at Position A, just after the launch.

6. What are some possible sources of error you may have encountered in this lab? How could this lab be improved in the future?