

## SLIDES FROM 2015 SPRING WORKSHOP AT LASALLE UNIVERSITY

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### Workshop on Energy/Thermodynamics

February 28 LaSalle University  
Hosts: Ling Liang, Greer Richardson  
Presenters: Jay Bagley, Bill Berner

Sponsored by PRNP, SEPS AAPT

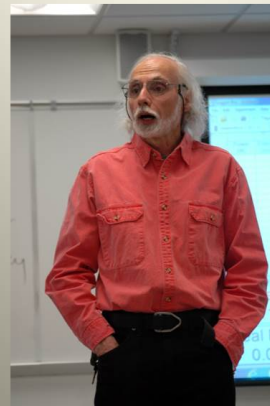
### Hosts: Greer and Ling



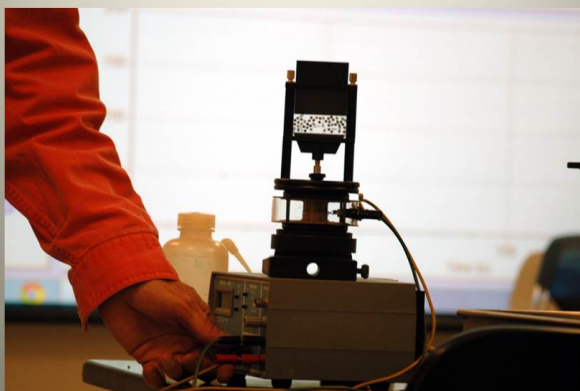
### Presenter Jay Bagley



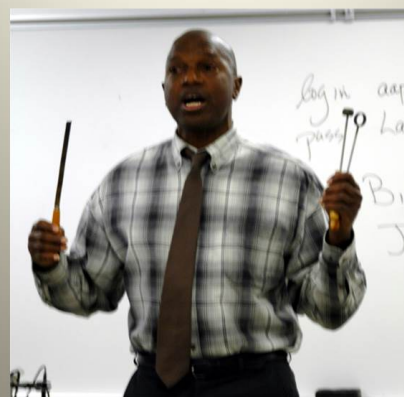
### Presenter Bill Berner



### Molecular Motion simulation



### Expansion of a solid



So what is Energy?



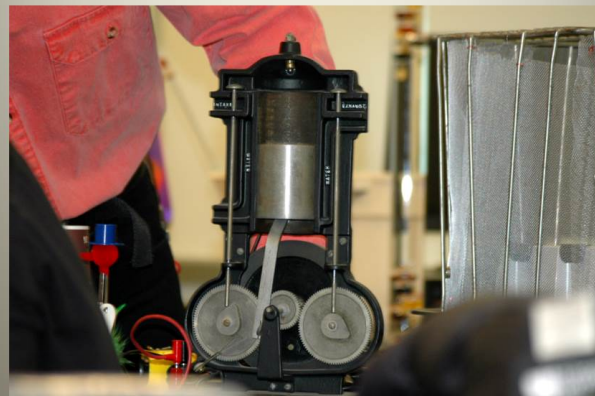
A simple thermometer



Is Energy Conserved?



Internal Combustion model



Measuring the rates of cooling with three Vernier temp probes



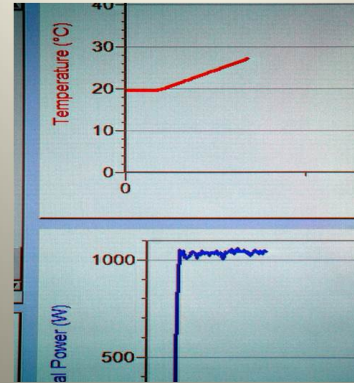
What Law can we test with a very expensive BLENDER?



How about: Joule's Law by measuring electrical energy INPUT and heat energy OUTPUT?



The temperature change of the water in the blender is directly proportional to the electrical energy input



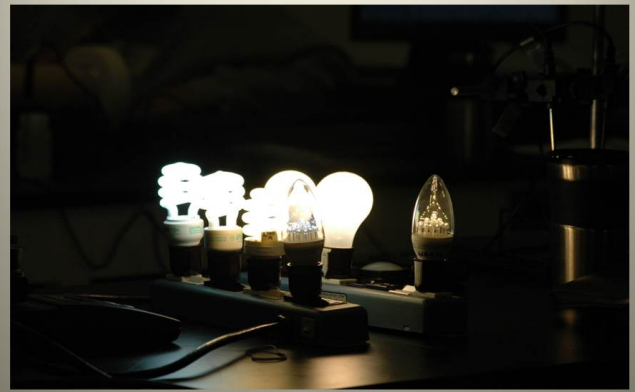
## Joule's Law

The temperature change of a known mass of water in the blender compared to the electrical energy input to the blender

$$4.2 \text{ joules} = 1 \text{ calorie}$$

## Efficiency of Light bulbs

Incandescent vs. Fluorescent vs. LED



How do car brakes dissipate heat energy?  
Drum vs. Disc brakes



## Energy at work



Convection: heat rises but why?

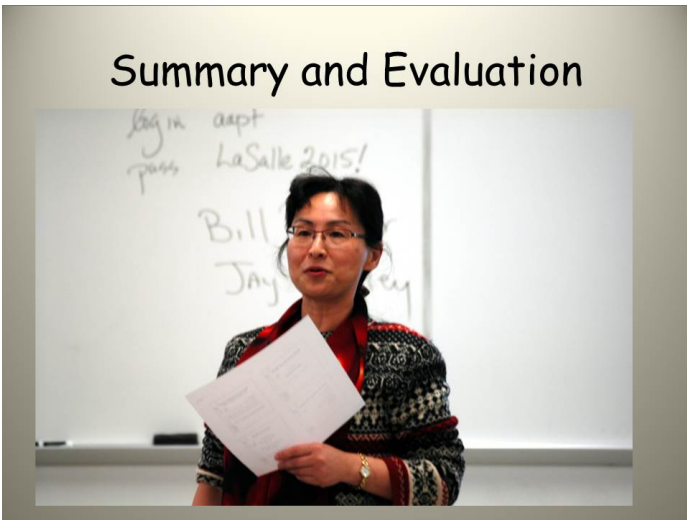


Working in groups





## Summary and Evaluation



Thank you hosts:  
LaSalle University