

name \_\_\_\_\_

ID# \_\_\_\_\_

**Experiment 8**

**Harmonic Motion of a Spring**

Spring mass	
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Unweighted spring length	
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Mass hanging on the spring	Weight hanging on the spring	Length of the spring	Time for 20 periods	Time for one period	Time for one period squared	Effective mass	Excess mass	Excess mass/spring mass

Mass on the spring	Displacement	Time for 20 cycles	Time for 1 cycle

(10 points)

Equations and sample calculations:

When you stretch or compress a spring you are storing elastic potential energy. This same idea applies to other elastic substances such as rubber bands and even the tendons in your body. For example, you can power a small model airplane propeller with a rubber band. Think of some other instances where you might use elastic potential energy.

### Questions

- 1 Look at the results of the part of the experiment where you changed the amplitude of the oscillations. Did the period change? What did change? How does this compare to the experiment last week where you changed the starting angle of the pendulum? **(4 points)**
  
2. What do you think might be a good use for a spring with a large value for  $k$ ? What do you think might be a good use for a spring with a small value for  $k$ ? **(2 points)**
  
3. A mattress company advertises that its beds are unusually comfortable because it uses special springs that exert more force under the heavier parts of your body. Should this statement alone convince you to buy their product? Why or why not? (Hint: What does Hooke's Law say about all springs?)**(4 points)**