**Hooke’s Law Notes**

**The Mass on a Spring**



The first spring \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_stretch because nothing is attached to it.

The second spring is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_since there is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 acting on the spring. The spring is stretched a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of \_\_\_\_\_\_\_.

The third spring is stretched even \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ when more\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ was added.

Let’s look at Hooke’s Law---

Hooke’s law states that the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_exerted by a spring is directly \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to the amount that the spring is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

The force exerted on a spring is equal to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ times the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the spring is compressed or stretched.

F stands for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and is measured in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

k stands for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_and is measured in \_\_\_\_\_\_\_\_

x stands for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and is measured in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Potential Energy in a Spring**

The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in a spring is equal to one-half times the product of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and the square of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



PEspring stands for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the spring and is measured in \_\_\_\_\_\_\_\_\_\_\_

k stands for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and is measured in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

x stands for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and is measured in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Examples:

1. You are weighing bananas at the grocery store on a spring scale. What is the force exerted on the banana if the spring is stretched a length of 0.5 m and the spring constant is 120 N/m?

Formula:

Plug in numbers:

Solve:

2. If a spring has a constant of 4 N/m and is stretched .5 m, what is the force of the spring?

Formula:

Plug in numbers:

Solve:

3. A spring is stretched .6m when a mass of 4kg is hung on it. Calculate the spring constant of this spring.

Formula:

Plug in numbers:

Solve:

4. A spring is stretched 0.4m from equilibrium. The spring constant of the spring is 2000 N/m. What is the potential energy of the spring?

Formula:

Plug in numbers:

Solve:

5. A compressed spring has 15,000 J of stored energy. If the spring constant is 1,000 N/m, how far is the spring compressed?

Formula:

Plug in numbers:

Solve: