# Springs, Hooke’s Law, and Simple Harmonic Motion

Experiment for Physics 225 Lab at CSUF

## What You Need to Know: The Spring

## What You Need to Do

### Part 1: Spring Constant of a Single Spring

Part 1: Graph with visible fit.

|  |  |
| --- | --- |
| $$k\_{static} (N/m)$$ | **standard errors (cell under k in sheet)** |
|  |  |

#### Dynamic Method to Measure k

|  |  |
| --- | --- |
| $$k (N/m)$$ | **standard errors (cell under k in sheet)** |
|  |  |

#### Comparing k values

Compute a % difference between your two values of k from the static method and the dynamic method. Which value of your measured spring constants do you have more confidence in? Explain your answer.

1.

See the spring box lid for the given value for your spring. What may have caused the deviation of your spring constant from the manufacturer’s given value and are you more confident in their value or the average of your measured values? Explain your answers.

## What You Need to Know: Series and Parallel Springs

## What You Need to Do: Series and Parallel Dynamic Measurements

The same color springs have the same Nominal spring constant. Do they seem identical according to the data you’ve taken so far? Justify your answer.

1.

Calculate an expected parallel $k\_{eff\_{parallel}}$ and series $k\_{eff\_{series}}$ using the equations given in this section’s Need to Know using your two experimental k values from the dynamic measurements.

#### Parallel Spring Constant

|  |  |
| --- | --- |
| $$k (N/m)$$ | $$\% Difference$$ |
|  |  |

#### Series Spring Constant

|  |  |
| --- | --- |
| $$k (N/m)$$ | $$\% Difference$$ |
|  |  |

## Conclusion

Follow the lab report guide to write a conclusion on this lab.

Submit any additional excel or graphical analysis data your instructor requests along with your report.

Conclusion