Vocabulary: Determining a Spring Constant

📖 Vocabulary

- Displacement – overall change in position.
    - For example, if the bottom of a *spring* begins at 5.0 cm and stretches to 6.4 cm, its displacement is 6.4 cm – 5.0 cm = 1.4 cm.

- Equilibrium – a state of balance in which there is little or no total change.
    - A stretched spring reaches equilibrium when the force pulling it is equal to the *restoring force* that pulls the spring back.

- Hooke's law – a law stating that, for an ideal spring, the displacement of the spring is directly proportional to the force on the spring.
    - Hooke's law is summarized by the equation $F_R = -kx$. In this equation, F_R is the restoring force, k is the *spring constant*, and x is the displacement.

- Restoring force – a force that pulls a system back toward equilibrium.
    - When a spring is stretched beyond its equilibrium length, the restoring force pulls it back.
    - When a spring is compressed to a shorter length than its equilibrium length, the restoring force causes it to stretch out.

- Slope – a measure of the steepness of a line.
    - You can calculate the slope between two points by dividing the vertical rise by the horizontal run.

- Spring – a coiled device that returns to its original shape after it is stretched or compressed.
    - Springs usually are made of metal or plastic.

- Spring constant – a measure of how much force is needed to stretch or compress a spring.
    - The symbol for the spring constant is k.
    - The greater the spring constant, the stiffer the spring.

- Weight – a measure of the gravitational force exerted on a mass.
    - Weight is represented by the symbol w.
    - The formula for weight is $w = mg$, where g is gravitational acceleration.
        - On Earth's surface, $g = 9.81$ m/s^2.