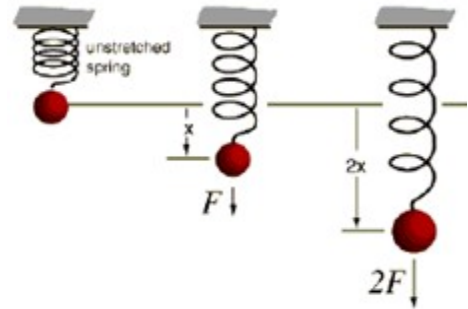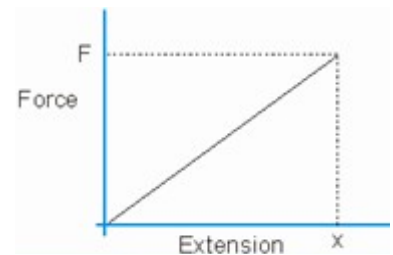# Elastic Potential Energy
SPH4C

Hooke's Law: The stretch or compression of an elastic

device (e.g. a spring) is _____

to the _____:

The constant _____ is called the _____ constant or

force constant. It has units of _____

and is the _____ of the line in a force-extension graph.

Example 1:
A student stretches a spring 1.5 cm horizontally by applying a force of magnitude 0.18 N.
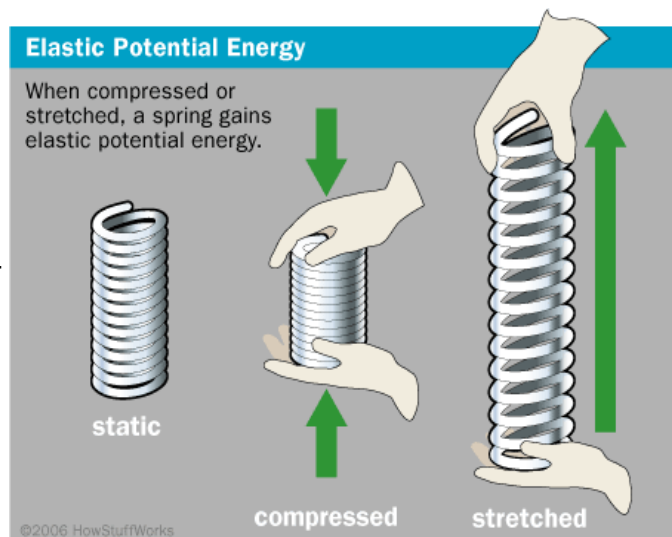Determine the force constant of the spring.

The force stretching or compressing a spring

is doing _____ on a spring, increasing

its _____ energy.

Note that this force is _____

but increases linearly from 0 to *kx*.

The average force on the spring is ½*kx*, so:

$W = F \Delta d$ **=**

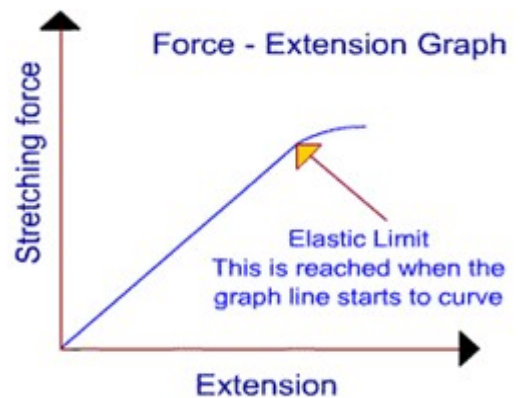This is the **elastic potential energy** _____.

Example 2:
An apple of mass 0.10 kg is suspended from a vertical spring with spring constant 9.6 N/m. How much elastic potential is stored in the spring if the apple stretches the spring 20.4 cm?

Example 2 Follow-Up: How much gravitational potential energy did the apple lose?

An _____ spring is one that obeys Hooke's Law –

within compression/stretching limits.

Beyond those limits the spring may _____ .

More Practice

A spring is stretched 0.20 cm by a force of 2.1 N.

(a) What is the spring constant of the spring?

(b) What is the elastic potential stored in the spring?

Force - Extension Graph

Stretching force

Extension

Elastic Limit
This is reached when the
graph line starts to curve

GUESS WHO WENT DOWN THE
STAIRS ALL BY HIMSELF TODAY?

PROUD SLINKY PARENTS

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