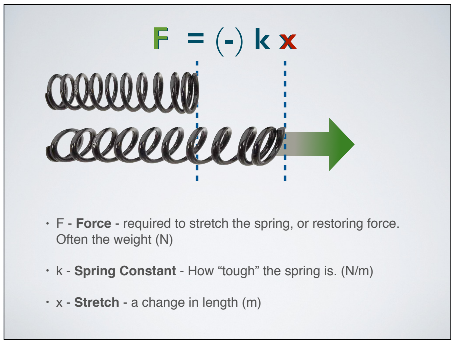
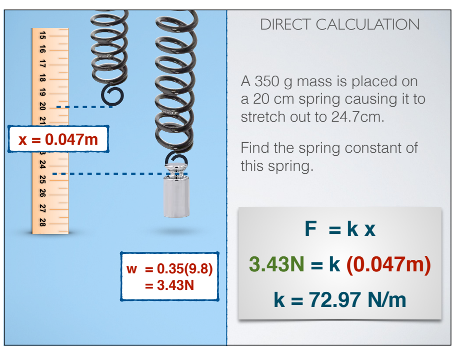
1


HOOKE'S
LAW

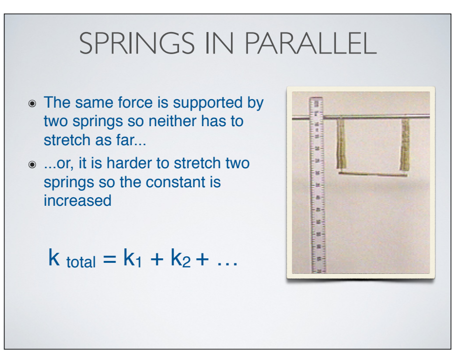
2


F = (-) k x
F - Force - required to stretch the spring, or restoring force. Often the weight (N)
k - Spring Constant - How "tough" the spring is. (N/m)
x - Stretch - a change in length (m)

3


DIRECT CALCULATION
A 350 g mass is placed on a 20 cm spring causing it to stretch out to 24.7cm.
Find the spring constant of this spring.
x = 0.047m
w = 0.35(9.8)
= 3.43N
F = k x
3.43N = k (0.047m)
k = 72.97 N/m

4


SPRINGS IN PARALLEL
The same force is supported by two springs so neither has to stretch as far...
...or, it is harder to stretch two springs so the constant is increased
k total = k1 + k2 + ...

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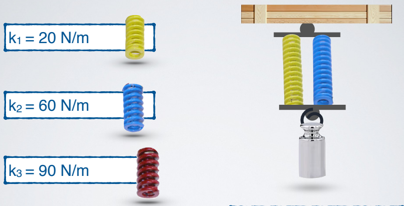
WHAT WOULD THE TOTAL CONSTANT BE FOR....



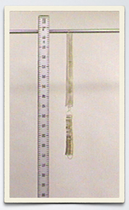
60 + 20 = 80

6

SPRINGS IN SERIES

- Both springs support the same amount of weight (not split in two like before)
- So... it is *easier* to stretch

$1/k = 1/k_1 + 1/k_2$



7

WHAT WOULD THE TOTAL CONSTANT BE FOR....

$1/60 + 1/90 = 1/k_{tot}$

on your calculator type:
60 (x^{-1}) + 90 (x^{-1}) =
then: (x^{-1}) =

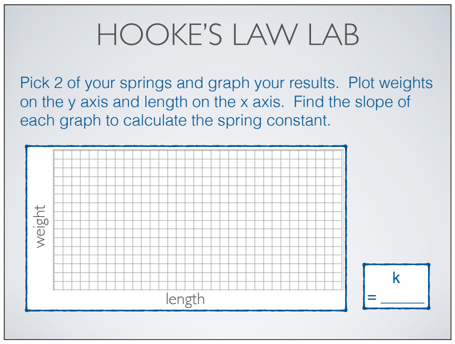
k_{tot} = 36 N/m

8

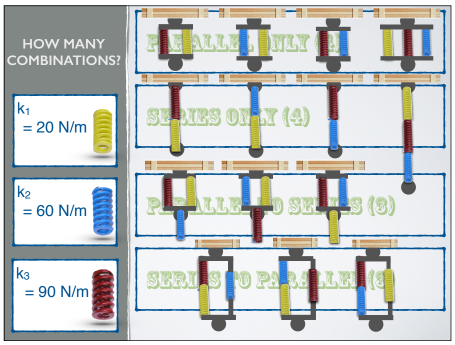
HOOKE'S LAW LAB

Which Spring:			
#	Mass	Weight	Length
1			
2			
3			
4			
5			
6			

4 TRIALS; 2 SPRINGS,
& SERIAL, & PARALLEL


HOOKE'S LAW LAB
Pick 2 of your springs and graph your results. Plot weights on the y axis and length on the x axis. Find the slope of each graph to calculate the spring constant.
weight
length
k
=

9


HOW MANY COMBINATIONS?
k1
= 20 N/m
k2
= 60 N/m
k3
= 90 N/m

10