

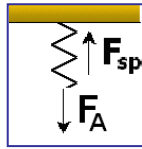
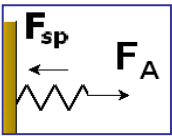
Spring Practice Problems

Hooke's Law

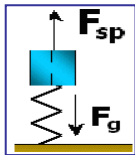
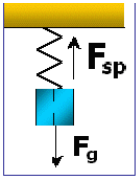
Name _____ hour _____

PSYW: Equation, substitute values, solution with label
WATCH YOUR LABELS!!!

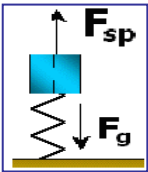
1. What force is necessary to stretch an ideal spring whose force constant is 120. N/m by an amount of 30. cm?
(36 N)



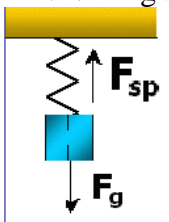
2. A spring with a force constant of 600. N/m is used on a scale for weighing fish. What is the mass of a fish that would stretch the spring by 7.5 cm from its normal length? (4.6 kg)



3. A spring in a pogo-stick is compressed 12 cm when a 40. kg girl stands on the stick. What is the force constant for the pogo-stick spring? (3300 N/m)



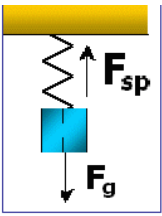
4. ****An elastic cord is **80. cm long when it is supporting a mass of 10. kg** hanging from it at rest at rest. When an additional **4.0 kg** is added, the cord is **82.5 cm** long.
HINT: 4 kg stretches the cord 2.5 cm!!



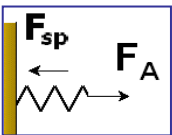
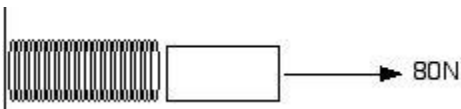
- (a) What is the spring constant of the cord? (1600 N/m)

(b) What is the length of cord when no mass is hanging from it? (74 cm)

HINT once you have the k value, work the equation for spring force backwards!! THINK: How much does 10.kg STRETCH the cord??

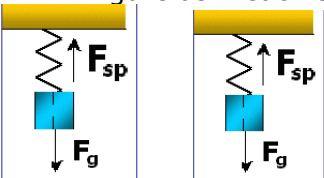


5. A spring is connected to a wall as shown below. A mass on a horizontal surface is connected to the spring and pulled to the right along the surface stretching the spring by 25 cm. If the pulling force exerted on the mass was 80.N, determine the spring constant of the spring. (ANSWER: 320 N/m)



6. ****EXTRA****A spring of spring constant 50. N/m is hanging from a retort **stand**. A second spring of spring constant 100. N/m is hanging from the bottom of the first spring. A mass of .50 kg is hung from the bottom of the lower spring at rest. Determine:

HINT: Figure as if each spring is stretched separately and add the displacements together.



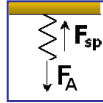
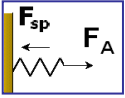
(a) the overall stretch of the spring combination (15 cm)

(b) the 'effective' spring constant of the spring combination (33 N/m)

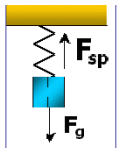
(c) a general expression for the spring constant of any combination of two springs connected in this manner

7. Consider a spring that is stretched 8.0 cm when a 13 N force is applied. How far will it be stretched when 26 Newton is applied? (ANSWER: 162.5 N/m and 16 cm)

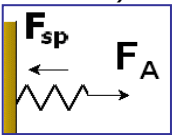
Hint spring constant is same for same spring!!!



8. A 7.3 kg mass is placed on a spring with a stiffness constant of 34 N/cm. How much does this stretch the spring? (ANSWER: 0.021 m)



9. Mel Adjusted, in a futile attempt to strengthen his pectoral muscles, stretches a spring exercise device 0.73 meters by exerting a force of 177 N. What is the stiffness constant of the device? (ANSWER: 240N/m)



10. A 0.050 kg mass is hanging from a spring whose unstretched length is 10. cm and whose spring constant is 2.5 N/m. What is the final length of the spring at rest.

