PENANG SANGAM HIGH SCHOOL
YEAR 11 PHYSICS
WEEK 12

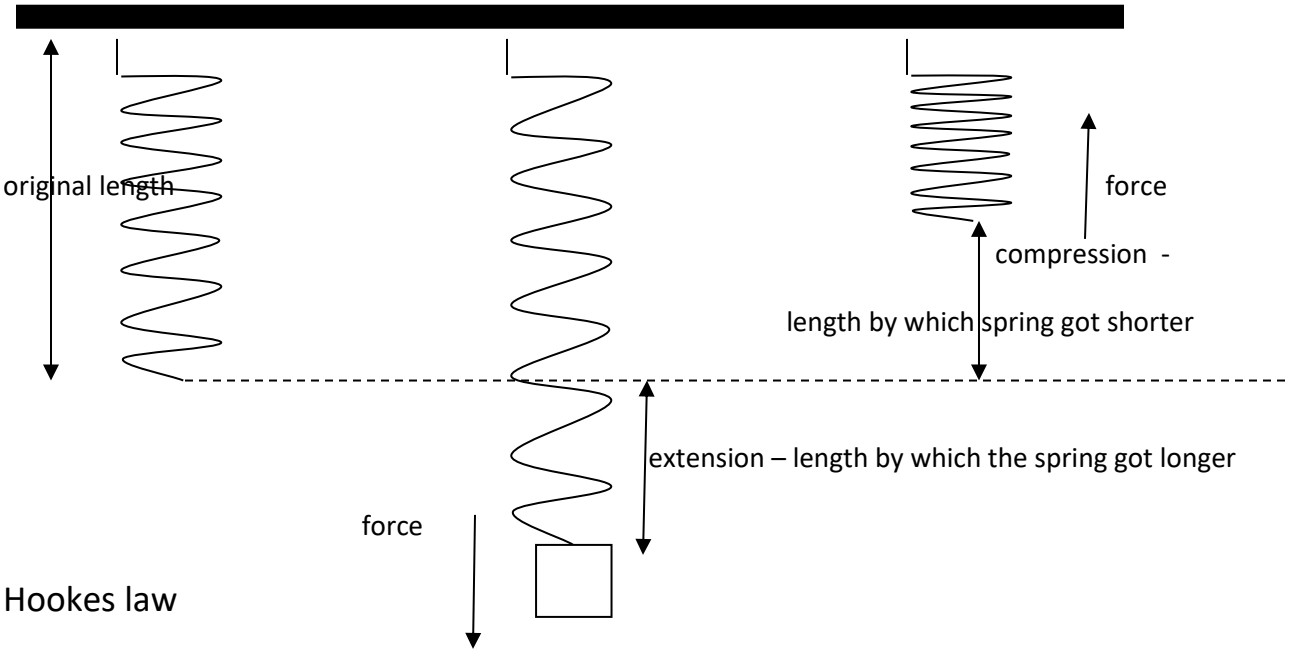
Strand	ENERGY
Sub Strand	Work Power And Energy.
Content Learning Outcome	At the end of the lesson students should be able to • demonstrate an understanding of the concept of momentum and its vector nature. • calculate the magnitude of the momentum of a moving mass. • demonstrate an understanding of the law of conservation of momentum in simple one dimensional collision.

Lesson Notes

Potential energy due to the shape of an object eg in stretched rubber band, bent stick, extended or compressed spring.

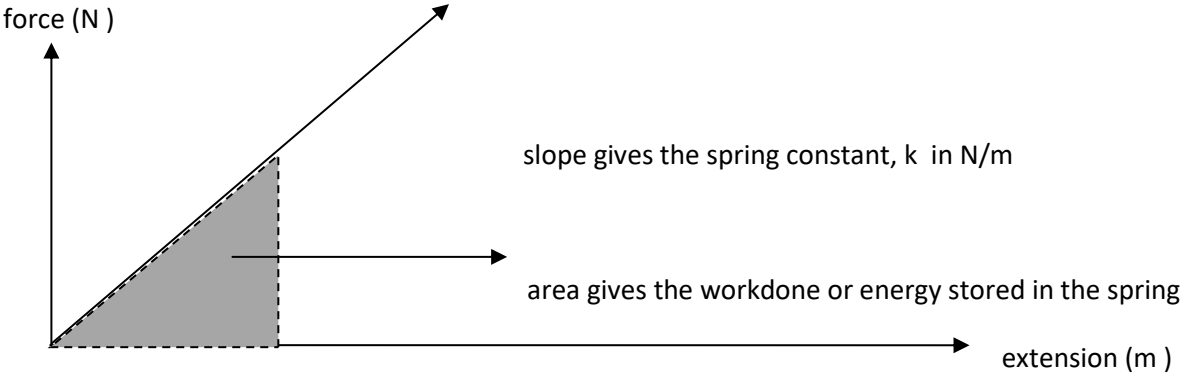
Springs

The energy stored in springs is in the form of elastic potential energy.



Hookes law

For a spring the force and extension (or compression) are directly proportional



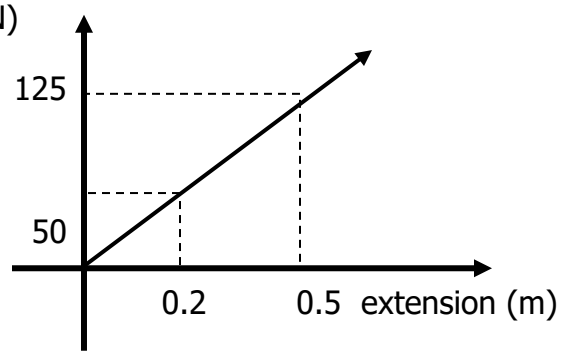
$F = kx$

F is the force, k is the spring constant or stiffness of the spring in N/m

x is either the extension or compression in m

the energy stored or the work done in a spring is $E_S = ½ k x^2$

eg Given below is a force/ extension graph of a spring



i. Find the spring constant of the spring.

Either a. find the slope or use $F = kx$

$50 = k (0.2)$

$K = 50/0.2$

$= 250 N/m$

ii. Find the force required to extend spring by 0.8m

$F = kx$

$= (250)(0.8)$

$= 200N$

iii. Find the energy stored in the spring when it is extended by 0.2m

either find the area under the graph uptil 0.2m or use $E_S = ½ k x^2$

$A = ½ b h$ or **$E_S = ½ k x^2$**

$= ½ (0.2)(50)$ $= ½ (250) (0.2)^2$

$= 5J$ $= 5J$