18 An object is displaced horizontally to the right in a uniform vertical gravitational field.

Which statement describes the change in the gravitational potential energy of the object?

A It decreases in direct proportion to the displacement.

B It does not change with the displacement.

C It increases in direct proportion to the displacement.

D It increases in direct proportion to the square of the displacement.

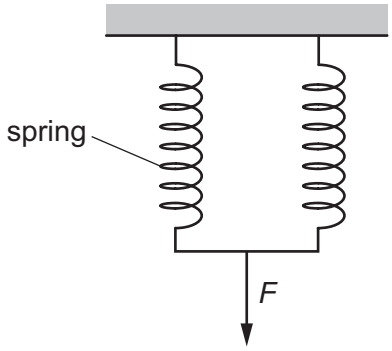
19 A copper wire of length 3.6 m and diameter 1.22 mm is stretched by a force of 37 N. The wire obeys Hooke's law. The Young modulus of copper is 1.17×10^{11} Pa.

Which extension is caused by this force?

A 0.24 mm **B** 0.76 mm **C** 0.97 mm **D** 3.1 mm

20 A spring has spring constant k. The spring obeys Hooke's law and experiences extension x when a force F is applied to it. The resulting elastic potential energy of the spring is E_P.

The diagram shows two of these springs joined together in parallel and hanging from a fixed beam.



What is the extension and total elastic potential energy of this arrangement when the same force F is applied?

	extension	total elastic potential energy
A	$\frac{1}{2}x$	$\frac{1}{2}E_P$
B	$\frac{1}{2}x$	$\frac{1}{4}E_P$
C	x	$\frac{1}{2}E_P$
D	x	$\frac{1}{4}E_P$