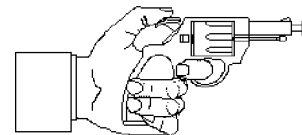


PhyzJob: Lethal Elastic PE Weapons



1. A dart gun has a spring of $k = 1000 \text{ N/m}$. To load the gun, the operator must push a 5 g dart into the barrel, compressing the spring by 3 cm .
 - a. How much elastic potential energy does the compressed spring have?
 - b. How much work did the operator do to load the gun?
 - c. What was the force the operator had to exert to load the gun?
 - d. How high could the dart go when released if fired straight upward (neglect air resistance)?

2. A dart gun similar to the one above uses a 3 g dart and requires that the operator compress the spring 2.5 cm . When the gun is fired from a height of 1 m , it lands 5 m downrange.
 - a. How long is the dart in the air (kinematics: how long does it take anything to fall 1 m)?



- b. If the dart traveled 5 m in the horizontal direction, what was its horizontal speed?
- c. What was the KE of the dart as it emerged from the barrel?
- d. What was the elastic PE of the spring before the trigger was pulled?
- e. What is the force constant of the spring?