OCR
Oxford Cambridge and RSA

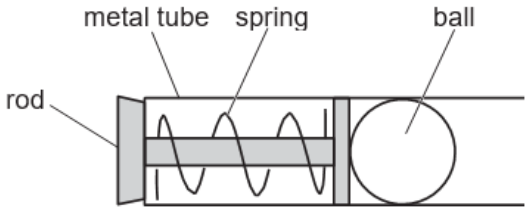
GCSE Physics B (Twenty First Century Science)

J259/01 Breadth in Physics (Foundation Tier)

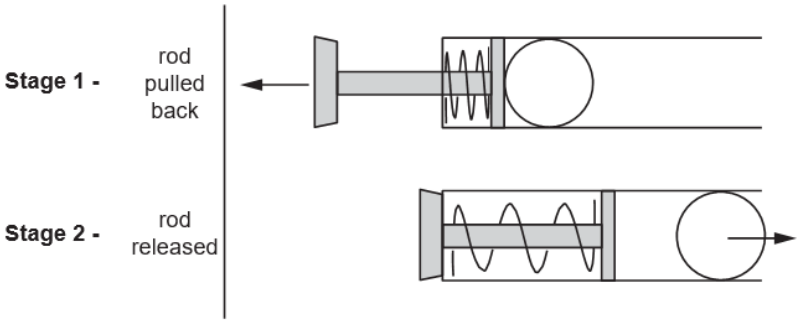
Question Set 35

1 In a pinball machine, a spring is used to push out a small metal ball at high speed.

The diagram shows the part of the machine that fires the ball, and the process of firing the ball.



To fire the ball, the rod is pulled back. When the rod is released, the ball moves off at a high speed.



(a) When the spring is compressed, its length changes by 4.6 cm.

Calculate the energy stored in the spring. Spring constant = 400 N/m.

The change of length of the spring is equivalent to its extension.

Use the equation:
energy stored in a stretched spring = ½ × spring constant × (extension)^2

Energy stored in spring = ... J **[3]**

(b) Energy is stored in the spring, the ball and the metal tube.

(i) Before the spring is released, the spring is a store of elastic energy.

Describe how this stored elastic energy changes when the spring is released. **[2]**

(ii) What happens to the total amount of energy in the spring, the ball and the metal tube when the spring is released? **[1]**

Total Marks for Question Set 35: 6