•A 20 kg child starts from rest at the top of a 5m long, 3m high slide. When she reaches the bottom, she is moving 4.0m/s.

a)How much does the child's potential energy change as she rides the slide?

b)How much work is done by non-conservative forces?

c)What is the size of the non-conservative forces?

d)How fast would she have been going without any friction of drag?

a) $\Delta U_g = ?$ $m = 20\,kg$ $y_0 = 3m$ $y_f = 0m$

$U_g = mgy$, so $\Delta U_g = mg(\Delta y)$

$\Delta U_g = (20)(9.8)(0-3)$

$\Delta U_g = -588J$

rest done tomorrow!

•A 100N/m coil spring is stood vertically on a level surface. A 0.5kg ball is used to compress the spring 10.0cm.

a)How much energy is stored in the spring?

b)If the ball is released, and zero work is done by friction and drag, how high from the release point will the ball rise before it stops?

a) $U_s = ?$ $k = 100\ N/m$ $x = 0.1m$

$$U_s = \frac{1}{2}kx^2$$

$$U_s = \frac{1}{2}(100)(0.1)^2$$

$$U_s = 0.5J$$

b) BOING! how high does it go? $Y_f = ?$

$$U_0 + K_0 + W_{NC} = U_f + K_f$$

$$\frac{1}{2}kx_0^2 + 0 + 0 = mgy_f + 0$$

$$0.5J = (0.5)(9.8)y_f$$

$$0.102m = Y_f$$