SCI 10   ENERGY CONVERSIONS: (E_g and E_k)

* For the following questions, assume $E_g = E_k$ (no energy lost as heat)

Practice problem:

Kayla stands on the roof of Cochrane High School and drops a 400 g water balloon on the first unsuspecting student to walk by. If the roof of CHS is 12.0 m high, how fast is the water balloon travelling when it hits the poor student?

Assignment questions:

1. A chairlift uses 34.5 KJ of energy to get Dylan to the top of a run. If Dylan snowboards down the hill, reaching an overall vertical drop of 50m, how fast is he travelling? (Dylan's mass is 72 kg).

2. An egg with a mass of 90 g reaches a speed of 5.77 m/s when it hits the ground after rolling off a shelf. How high was the shelf?

3. Chris and Jeff are pulling a toboggan up a hill. Their combined mass (with the toboggan) is 85.0 kg. The vertical height of the toboggan hill is 45.5 m. If the boys start at the top and toboggan down the hill, how fast will they be travelling right before impact?

4. Shantanu puts his Science textbook (mass = 2.3 kg) on the top shelf of his locker. If the locker shelf is 1.75 m off the ground, how fast would his book be travelling if it was to fall off the shelf?

5. Maria dives off the high diving board and reaches a speed of 5.1 m/s. If Maria's mass is 48 kg, how high was the diving board off the water?