Study the sample problem on pages 213 and 214 to understand how to use the two energy equations you learned in Topic 3.1. Then solve the extra practice problems below.

1. A 63.2 kg mountain climber, carrying a 16.4 kg backpack, hikes up to a base camp in preparation for a climb the next day. If she climbs a vertical distance of 1.75 km, how much gravitational potential energy has she gained?

2. A baseball pitcher throws a 142.5 g baseball with a speed of 39.2 m/s. What is the mechanical kinetic energy of the ball when it leaves his hand?

3. If the baseball pitcher in question 2 throws the ball straight up, how high would it go before it slowed to a stop and started back down?

4. a) A loaded box car has a total mass of 6.80×10^4 kg. If the train is travelling at a speed of 23.7 m/s, what is the mechanical kinetic energy of the box car?
b) If a family car has a mass of 1237 kg, how fast would it have to go to have the same mechanical kinetic energy as the box car in part a)?

5. You are working on the 7th floor of a highrise building. A window cleaner is working on windows 12 storeys above you. The average height of one storey is 3.5 m. If the window cleaner drops a squeegee that has a mass of 750 g, how fast will it be moving when it passes the window where you are working?