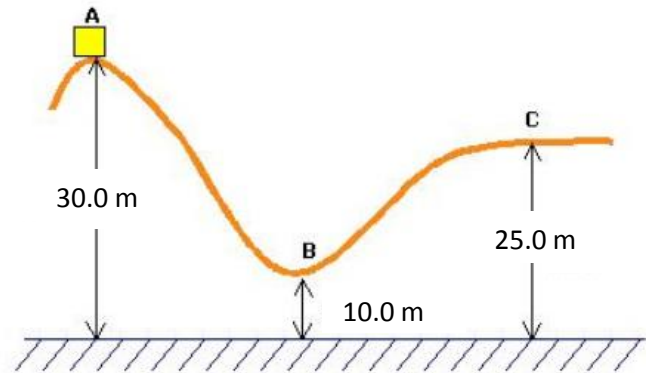


Worksheet: Work-Gravitational Potential Energy Theorems

1. A 1.00 kg toy roller coaster car moves from point A to B then C. Use 3SDs.

- a) What is the potential energy at B and C relative to A? (-196 J, -49.0 J)
- b) What is the change in potential energy as it goes from B to C? (147 J)
- c) What is the potential energy at B and C relative to point C? (-147 J, 0J)
- d) What is the change in potential energy as it goes from B to C? Use C as the reference. (147 J)



2. A shopper in a supermarket takes a box of sugar from a shelf that is 1.5 m high and places it into the bottom of his cart which is 0.48 m from the floor. The sugar has a weight of 5.0 N.
 - a) What potential energy, relative to the floor, did the sugar have before it was taken from the shelf? (7.5 J)
 - b) How much work was done to move the box of sugar from the shelf to the cart? (-5.1 J)
3.
 - a) If a child does 2.0 J of work in raising a 180 g red apple from the ground to his mouth to take a bite of the apple, how far is the apple lifted? (1.1 m)
 - b) If another 1.0 J of work is done on the apple, what will be the apple's potential energy relative to the ground? (3.0 J)
4. A baby carriage that is carrying twins is sitting at the top of a hill that is 21 m high. The mass of the carriage and the babies is 48 kg. What is the potential energy of the twins and the carriage relative to the ground when the carriage has moved 9.0 m down the hill? (5.6×10^3 J)
5. A snowball that will be used to build a snowman is at the top of the only hill in town and weighs 22 N. If the potential energy of the snowball is 520 J, what is the height of the snowy hill? (24 m)
6. The world record for pole vaulting is 6.15 m. If the pole vaulter's gravitational potential is 4942 J, what is his mass? (82.0 kg)