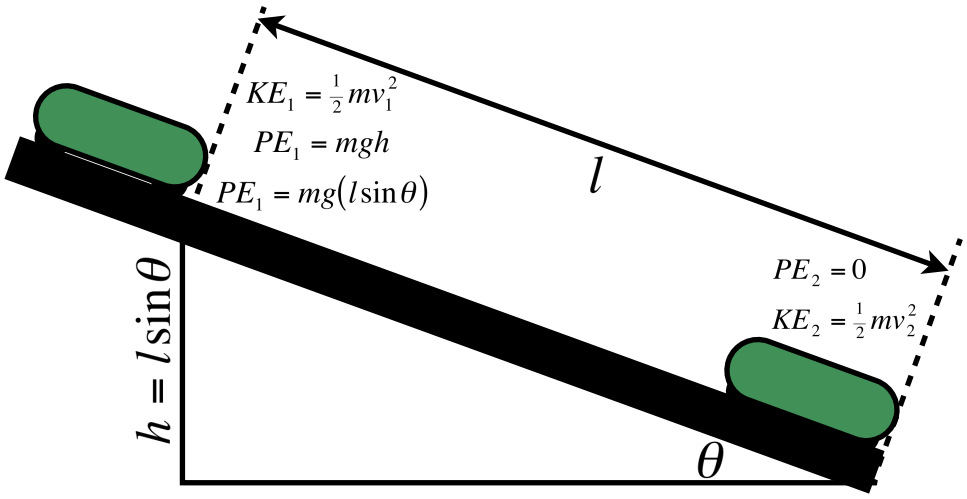
LAB QUIZ: WORK AND ENERGY

A 500g (**0.500 kg**) cart is released from rest on an **8° incline**. The length of the incline is 50 cm (**0.50 m**). The velocity at the first photogate is **v_1 = 0.409 m/s**, and the velocity at the second photogate is **v_2 = 1.215 m/s**.



1. Calculate the initial potential energy PE_1 of the cart. It is closest to
   A) 0 J.
   B) 0.0418 J.
   C) 0.214 J.
   D) 0.341 J.
   E) 0.369 J.
2. Calculate the initial kinetic energy KE_1 of the cart. It is closest to
   A) 0 J. B) 0.0418 J. C) 0.214 J. D) 0.341 J. E) 0.369 J.
3. Calculate the final kinetic energy KE_2 of the cart. It is closest to
   A) 0 J. B) 0.0418 J. C) 0.214 J. D) 0.341 J. E) 0.369 J.
4. True or false: The cart gains kinetic energy as it travels down the ramp.
5. True or false: The cart gains potential energy as it travels down the ramp.
6. True or false: The cart gains total energy as it travels down the ramp.
7. True or false: There is a force (other than gravity) which does negative work on the cart.
8. If we redefined the reference level for calculating potential energy (PE = 0 at the tabletop), what would happen?
   A) Nothing. All of the calculated values for potential and kinetic energy would remain unchanged.
   B) The values for the PE would not change, but both KE_1 and KE_2 would increase.
   C) The KE calculations do not change. Both calculated values for PE will change. PE_1 increases, PE_2 decreases.
   D) The KE calculations do not change. Both calculated values for PE will change. PE_1 decreases, PE_2 increases.
   E) The KE calculations do not change. Both calculated values for PE will change. PE_1 and PE_2 both increase.
9. Which external force is ***least likely*** to be doing work on the cart?
   A) Friction.
   B) Air resistance.
   C) Spring force.
   D) Trick question. *None* of these forces can do any work on the cart.
   E) Trick question. *All* of these forces are doing work on the cart.
10. Which external force is ***least likely*** to be doing work on the downhill skier?
    A) Friction.
    B) Air resistance.
    C) Spring force.
    D) Trick question. *None* of these forces can do any work on the cart.
    E) Trick question. *All* of these forces are doing work on the cart.