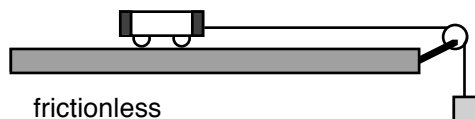


## Lab 8-3 Problems

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1. A 500 gram cart is attached to a 100 gram mass as shown in the picture above. The system is held at rest, and then released, and then the little mass “falls” 25 cm, pulling the cart along with it.
  - a. How much potential energy does the 100 gram mass lose while falling?
  - b. How much potential energy does the 500 gram cart lose while moving to the right?
  - c. What happens to the potential energy that is “lost?”
  - d. How fast are the cart and mass going at the end of the 25 cm?
  
2. A 500 gram cart is on a horizontal frictionless table and is attached through a pulley to a 150 gram mass. Everything is held at rest, and then released. After the little mass falls 0.35 meters, how fast are the cart and mass moving?
  
3. A 250 gram mass is hanging from a string that is connected via a pulley to a 400 gram cart which is itself on a horizontal frictionless table. The system is initially at rest. After the 250 gram mass falls a distance  $h$ , the cart and mass have a speed of 0.75 m/s.
  - a. How much kinetic energy did the little mass gain while falling?
  - b. How much kinetic energy did the cart gain while moving to the right?
  - c. Where did all this kinetic energy come from?
  - d. What was the distance  $h$ ?
  
4. If the cart was 1.5 kg and the little mass was 0.25 kg and the cart moved to the right 0.45 m after being released, how fast was the cart going at the end of the 0.45 m?
  
5. If the little mass was 0.3 kg and it had a speed of 1.2 m/s after “falling” a distance of 0.45 m, what was the mass of the cart?

*Answers:*      1. a) 0.25 J      b) 0 J      c) KE of both masses      d) 0.91 m/s      2) 1.27 m/s  
 3. a) 0.07 J      b) 0.11 J      c) PE “lost” by 0.25 kg mass      d) 0.072 m  
 4) 1.13 m/s      5) 1.58 kg