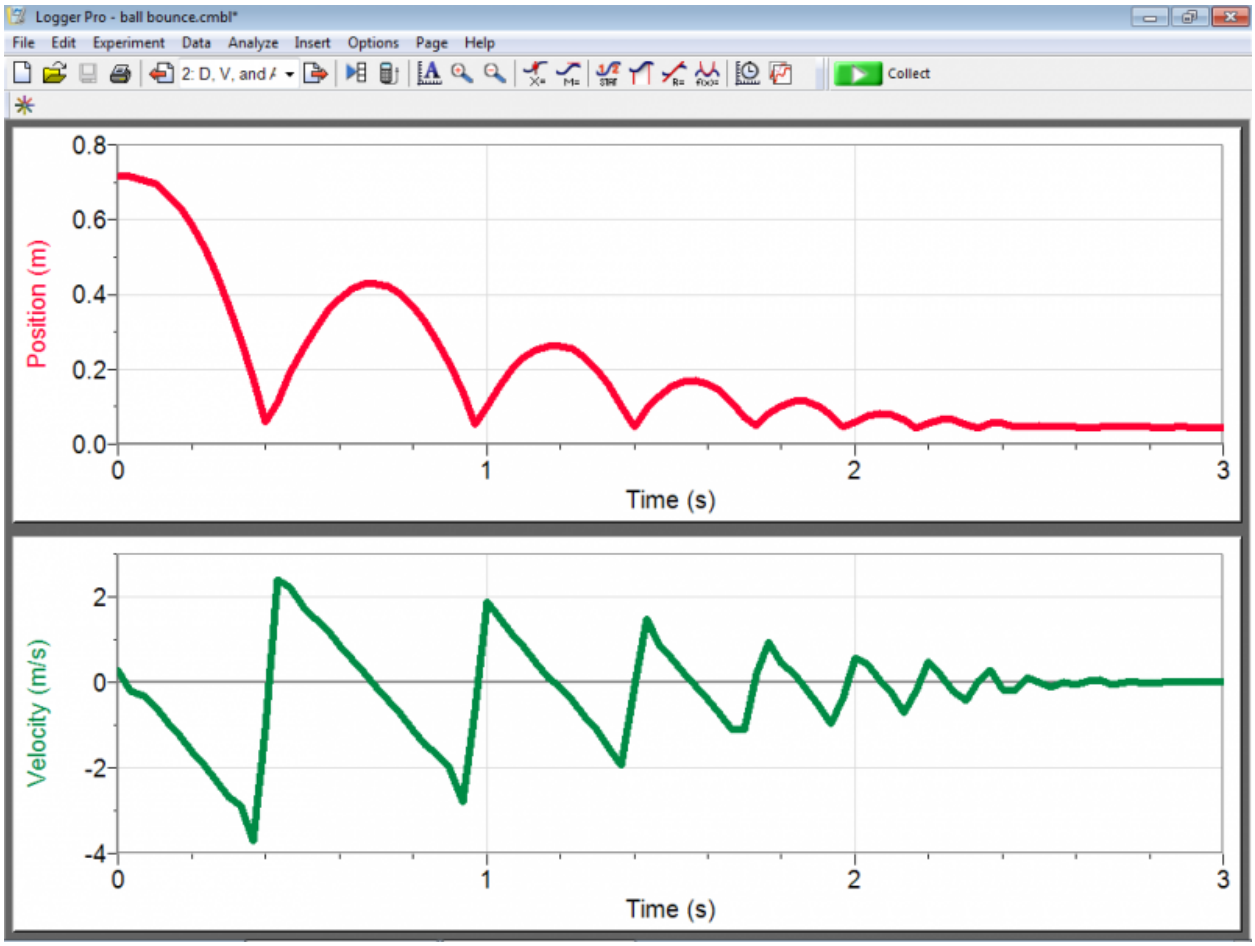
Chapter 4 Test Review Physical Science

Answer the following questions on a separate piece of paper. If you are working on a problem make sure to show your work to receive credit! If the answer requires units, make sure to include the unit.

1. What is the equation for kinetic energy?
2. What is the significance of the number 2 above the velocity in the kinetic energy equation?
3. If a baseball is moving at a speed of 20 m/s and has a mass of 0.15 kg, what is its kinetic energy?
    a. If the same ball gets thrown at an increased velocity of 40 m/s, what is the kinetic energy now?
    b. How many times did the velocity of the ball increase?
    c. How many times did the kinetic energy of the ball increase?
    d. If the mass of the ball doubles, instead, to 0.30 kg and the speed remains at 20 m/s, what is the kinetic energy of the ball?
    e. What had more of an effect on the ball…doubling the velocity or doubling the mass?
4. What is the equation for gravitational potential energy?
5. What is the significance of 9.8 in the equation for GPE?
6. If a book having a mass of 3.2 kg is sitting on a shelf that is 1.1 m above the ground, what is the GPE of the book?
    a. If the mass of the book were to double, what would be the GPE?
    b. If the height above the ground were to double, instead of the mass, what would be the GPE.
    c. What has more energy, doubling the height, or doubling the mass?
7. Compare J to kg x m/s/s.
8. What is another way to write m/s/s?
9. If a branch falls from a tree, explain what happens to the potential energy as the branch falls.
    a. What happens to the kinetic energy as it falls?
    b. What happens to the total amount of energy involved in the falling tree branch?
    c. What law explains this relationship?
10. Explain how the GPE of a ball (mass = 0.22 kg) bouncing upward at a position of 2 m above the ground compares to the same ball as it is falling back towards the ground at 2 m. The maximum height of the bouncing ball is 4.5 m.
    a. A split second later (after the 2 m mark), which ball would have a greater KE?
    b. Explain.
    c. What is the maximum total energy of the ball?

d. What is the change in GPE from the maximum height to the 2m mark?

11. What is the definition of work?
12. Use a diagram to show the energy conversions that would take place when using a car to drive to HyVee.
13. Explain the difference between fission and fusion.
    a. Give an example of fission.
    b. Give an example of fusion.
    c. Where do both fission and fusion occur at the same time?
14. What force eventually stops all moving objects on Earth?
    a. Give an example of how you could reduce this force, so that moving object could move greater distances before stopping.
15. What provides the energy to our bodies?
16. What allows us to live for several days without food?



17. The top graph shows the up and down motion of a bouncing ball. At what time does the ball have the most energy?

a. At what time is the KE of the ball the greatest?
b. What type of energy does the ball possess while it is bouncing (other than kinetic and potential)?

18. At 3 s on the above graph how much energy does the ball have?
    a. Did the energy of the moving ball turn into some new type of energy? If so, what?
19. How would the GPE of an object on a mountaintop compare to the same object at sea level? Assume the object is being held at eye level.
20. What are three subcategories of electromagnetic energy?
21. What are two examples of things that contain chemical energy?
22. Explain how heat energy is created.