

Name: \_\_\_\_\_

Date: \_\_\_\_\_ Block: \_\_\_\_\_

### **Post ACT Energy Recap**

1. When does an object have kinetic energy? What is the formula?
  
2. When does an object have gravitational potential energy? What is the formula?
  
3. When does an object have elastic potential energy? What is the formula?
  
4. What two things determine if work is being done on a system? What is the formula?
  
5. For each of the following, state whether the system contains primarily kinetic energy gravitational potential energy...
  - a. a stone in a stretched slingshot \_\_\_\_\_
  - b. a speeding race car \_\_\_\_\_
  - c. a basketball as it leaves your hand and goes towards the hoop \_\_\_\_\_
  - d. water above a hydroelectric dam \_\_\_\_\_
  
6. A 60.0 kg shell is shot from a cannon to a height of 400 meters.
  - a.) What is the gravitational potential energy of the shell when it is at this height?
  
  
  
  
  
  
  
  
  
  
  - b.) What is the change in potential energy of the shell when it falls to a height of 100 meters?

7. A ping-pong ball has a mass of about 2.45g. Suppose the ball hit across the table with a speed of about 4.0 m/s. What is its kinetic energy?

8. A person has a mass of 45 kg and is moving with a velocity of 10.0 m/s.

a.) Find the person's kinetic energy.

b.) The person's velocity becomes 5.0 m/s. What is the kinetic energy of the person?

**Use Figure 1 to answer questions 9-13**

9. At which point does the car have the greatest kinetic energy?

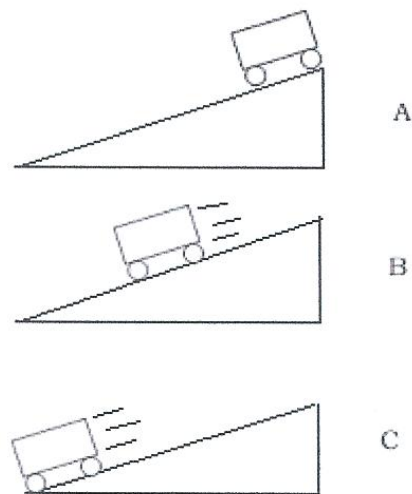
A    B    C

10. At which point does the car have the greatest potential energy?

A    B    C

11. The total energy of the car is...

- a) increasing
- b) decreasing
- c) always the same
- d) zero at point A
- e) negative at point C



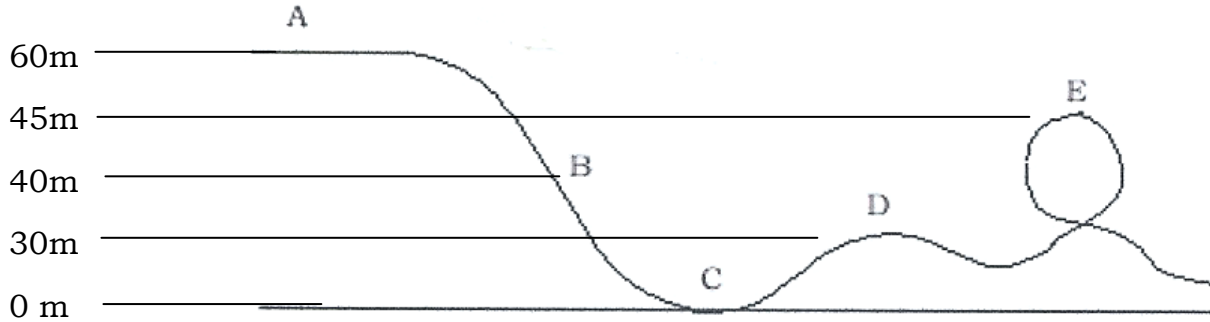
**Figure 1**

12. What would be the effect on the kinetic energy if friction was increased greatly? Explain your prediction.

13. How would greatly increasing friction change the final total energy of the system?

Use the diagram below for the following questions. Assume  $\mu = 0$  (frictionless) and the cart has a mass of 500kg.

## Roller Coaster



14. List the points in order from where the car has the greatest potential energy to the point where it would have the least potential energy.
15. List the points in order from where the car has the greatest kinetic energy to the point where it would have the least kinetic energy.
16. The total energy of the system is  
a) increasing   b) decreasing   c) remains the same   d) zero at point A   e) constantly changing
17. If  $v = 0$  at point A. What type of energy does it have at A?

What is the  $E_g$  at point A?

18. What is the kinetic energy at point C? What is the velocity at point C?
19. What is the gravitational potential energy at point D? What is the kinetic energy at point D? What is the velocity at point D?