

Kinetic and Potential Energy Worksheet

Name _____

Classify the following as a type of potential energy or kinetic energy (use the letters K or P)

- | | | | |
|--|-------|--|-------|
| 1. A bicyclist pedaling up a hill | _____ | 2. An archer with his bow drawn | _____ |
| 3. A volleyball player spiking a ball | _____ | 4. A baseball thrown to second base | _____ |
| 5. The chemical bonds in sugar | _____ | 6. The wind blowing through your hair | _____ |
| 7. Walking down the street | _____ | 8. Sitting in the top of a tree | _____ |
| 9. A bowling ball rolling down the alley | _____ | 10. A bowling ball sitting on the rack | _____ |

Formulas:

$$KE = 0.5 \cdot m \cdot v^2$$

OR

$$PE = m \cdot g \cdot h$$

v = velocity or speed m = mass in kg $g = 10 \text{ m/s/s}$ h = height in meters

For Questions 11-16, state the type of energy that is described as either kinetic or potential, then calculate its value.

11. You serve a volleyball with a mass of 2.1 kg. The ball leaves your hand with a speed of 30 m/s. The ball has _____ energy. Calculate it.

12. A baby carriage is sitting at the top of a hill that is 21 m high. The carriage with the baby has a mass of 1.5 kg. The carriage has _____ energy. Calculate it.

13. A car is traveling with a velocity of 40 m/s and has a mass of 1120 kg. The car has _____
Calculate it.

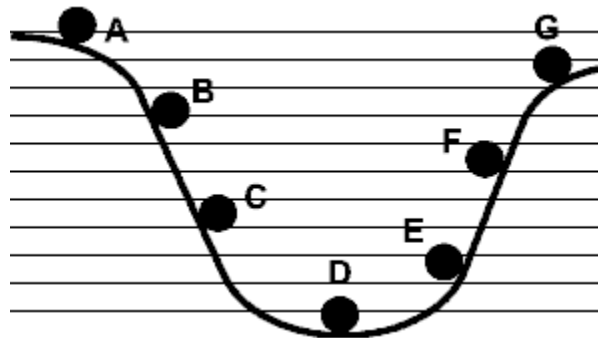
14. A cinder block is sitting on a platform 20 m high. It weighs 7.9 kg. The block has _____
Calculate it.

15. A roller coaster is at the top of a 72 m hill and weighs 134 kg. The coaster (at this moment) has _____ energy. Calculate it.

16. There is a bell at the top of a tower that is 45 m high. The bell weighs 19 kg. The bell has _____ energy. Calculate it.

17. Determine the **kinetic** energy of a 100-kg roller coaster car that is moving with a speed of 20.0 m/s.
18. If the roller coaster car in the above problem were moving with **twice the speed**, then what would be its new **kinetic** energy?
19. A cart is loaded with a brick and pulled at constant speed along an inclined plane to the height of a seat-top. If the mass of the loaded cart is 3.0 kg and the height of the seat top is 0.45 meters, then what is the **potential** energy of the loaded cart at the height of the seat-top?
20. A 75-kg refrigerator is located on the 70th floor of a skyscraper (300 meters above the ground) What is the **potential** energy of the refrigerator?
21. The potential energy of a 40-kg cannon ball is 14000 J. How high was the cannon ball to have this much **potential** energy?

22. This graph shows a ball rolling from A to G. The ball starts at point A and rolls to point G. Use the graph to answer the following questions.



- At what letter does the ball have the greatest kinetic energy? _____
- Which letter shows the ball when it has the maximum potential energy? _____
- Which letter shows the ball when it has the least potential energy? _____
- Why is point G slightly lower than point A? In other words, why couldn't the ball go back to the same height at which it started?