

**Use the gravitational potential energy and kinetic energy formulas to solve.**

1. What is the kinetic energy of a 25kg object moving at a velocity of 5m/s?
2. What is the gravitational potential energy of a 150kg object suspended 5m above the earth's surface?
3. What is the kinetic energy of a 25kg object moving at a velocity of 10m/s?
4. What is the gravitational potential energy of a 2.5kg object that is 300m above the surface of the earth?
5. An object with a kinetic energy of 2160J has a mass of 120kg. What is its velocity?
6. An object whose mass is 43kg is hanging on a thin wire. The object has a potential energy of 3160.5J. How high is the object above the ground?

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

**USE Guppies or Guess to show your work!!**

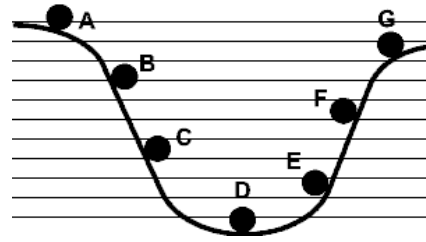
7. What is the kinetic energy of a 150gram (\* convert to kg) object moving at a velocity of 100m/s?
8. An object has a kinetic energy of 96J. Its velocity is 4m/s. What is its mass?
9. An object with a kinetic energy of 1125J has a mass of 250kg. What is its velocity?
10. What is the mass of an object that is hanging 12.6m above the surface of the earth and has a potential energy of 2778.3J?
11. An object has a potential energy that is 833 J. Its height above ground is 4.25 m. What is its mass?

12. An object with a kinetic energy of 16,000J has a velocity of 8m/s. What is its mass?

13. An object has a gravitational potential energy of 41772.5J and has a mass of 1550kg. How high is it above ground?

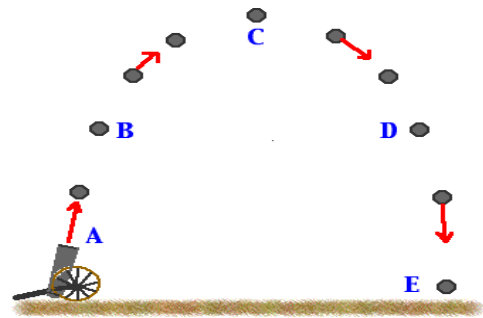
14. What is the kinetic energy of a 25kg object moving at a velocity of 2.5m/s?

16. This graph shows a ball rolling from A to G. The ball starts at point A and rolls to point G.



- 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?

17. Use the diagram below to answer the next set of 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? \_\_\_\_\_
- What can be said about the PE and KE at positions B and D? \_\_\_\_\_

---



---



---

Challenge: A+ level.

15. A 2.0kg object is dropped from a height of 30m. After it drops for 2.0 seconds, what is its kinetic energy and what is its potential energy? (Assume no air resistance.)