

+ 1 more question on K vs P.

Science 10 – Kinetic energy and velocity practise Name: \_\_\_\_\_

- 1) There once was a 550 gram squirrel sitting on a fence. The squirrel spotted an acorn hanging from a tree across the yard. Since it was May 4<sup>th</sup> the squirrel used the force to will the acorn to fall. The 35.0 gram acorn suddenly fell from the tree and just before it hit the ground it had a kinetic energy of 1.20 J. What was the velocity of the acorn just before it hit the ground?

(A: 8.28 m/s)

- 2) The squirrel was elated and jumped from the fence it was sitting on hitting the ground with a velocity of 4.85 m/s. What was the kinetic energy of the squirrel as it hit the ground?

(A: 6.46 J)

- 3) Once the squirrel was on the ground the nut was 5.42 meters away from the squirrel so the squirrel let'r buck and ran at full speed towards it. It took the squirrel 0.98 seconds to get to the nut. What was the average velocity of the squirrel running to the nut?

(A: 5.53 m/s)

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4) What was the average kinetic energy of the squirrel as it ran across the yard?

(A: 8.41 m/s)

5) The squirrel sat there and ate the nut and lounged in the sun... Suddenly there was a hungry cat! The squirrel ran back to the fence 5.42 meters away at an average velocity of 4.30 m/s, slower because the squirrel was full! How long did it take the squirrel?

(A: 1.26 s)

6) What was the average kinetic energy of the squirrel as it ran back to the fence full with an acorn?

(A: 5.41 J)



5) How fast would the average person have to run to have the same gravitational potential energy as the elephant in question 4)?

6) Mr. Armstrong jumps from the second last step on a ladder to a surface. The step is 0.750m for Mr. Armstrong from the surface and Mr. Armstrong weights 80kg. If Mr. Armstrong had 97.3J of potential energy before jumping where is Mr. Armstrong? Hint: this question is different from any we've ever done but still uses the same formulas.

7) A roller coaster on Earth with 3 elephants and 4 monkeys sits at rest at the top of the track. When the roller coaster reaches the bottom of the track it is moving 17.5 m/s. From what height did the roller coaster start?

8) What is the kinetic energy of a peregrine falcon moving at top speed? How high must a peregrine falcon fly to have an equivalent potential energy? Missing information can be googled.

$$\text{Kinetic Energy} = \frac{1}{2}mv^2$$

$$\text{Gravitational Potential Energy} = mg\Delta h$$