Name: Date: Period:

Energy #2

1. A 1.3-kg apple is hanging 2.5 m above the ground.
   (a) What is its potential energy?

   (b) What would be the work required to lift it from the ground to that height in the air? (*Hint:* Use $W = Fd$ and $F_G = mg$)

   (c) What do you notice about your answers to (a) and (b)? Why does this make sense?

2. What is the kinetic energy of a car with a mass of 1000 kg traveling with a velocity of
   (a) 15 m/s? (b) 30 m/s?

3. What is the speed of a 1500-kg airplane with 7,350,000 J of Kinetic Energy?

4. Calculate the *total energy* of a 0.56-kg football thrown. At the top of its flight, it has a speed of 22 m/s and it is 6.8 m off the ground.

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The following questions are *"Proportionality questions"*. They don't involve doing math. You just need to think "proportionally" about how the equations will respond when you change their variables.

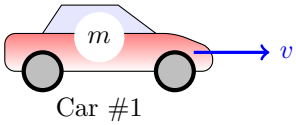
5. What would happen to the kinetic energy of a vehicle if its **speed** were **doubled**?

6. What would happen to the kinetic energy of a vehicle if its **mass** were **doubled**?

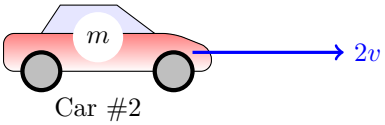
7. What would happen to the kinetic energy of a vehicle if its **speed** were **cut by 1/3**?

8. What would happen to the potential energy of a ball if its **height** were **quadrupled**?

9. Two cars are traveling down the highway. They have the *same mass*, but car #2 is traveling twice as fast as car #1. Which car has the larger kinetic energy, and by how much?

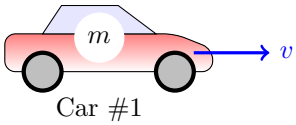


Car #1

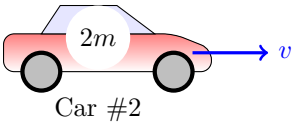


Car #2

10. Two cars are traveling down the highway. They have the *same speed*, but car #2 is traveling twice the mass of car #1. Which car has the larger kinetic energy, and by how much?

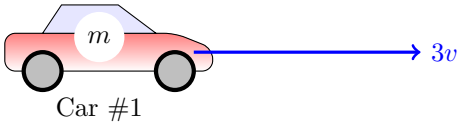


Car #1

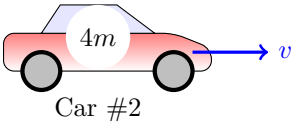


Car #2

11. Two cars are traveling down the highway. Car #1 has three times speed as Car #2, but Car #2 has four times the mass of Car #1. Which car has the larger kinetic energy, and by how much?



Car #1



Car #2