**Kinetic, potential and mechanical energy worksheet**

1. A car travels at a speed of 60.0 km/h and has a mass of 1 005 kg. What is its kinetic energy?
2. A quarterback throws a football weighing 205 g at a speed of 2.78 m/s at a height of 20.0 m. What is the football’s mechanical energy?
3. A truck weighing 12 000 kg has 91 000 J of kinetic energy. What speed it is travelling at?
4. A van travels at a speed of 40.0 km/h with a kinetic energy of 7 600 J. What is the van’s mass?
5. A hammer weighing 200.0 g is raised 3.0 m above the ground. What is its potential energy?
6. A four cylinder Toyota can reach a maximum of 150.0 km/h while a six cylinder Toyota can reach a maximum of 180 km/h. If they both weigh 1 500 kg, what is the maximum kinetic energy each car can have?
7. A ball is raised 5.0 m off the ground and weighs 750 g. What is its potential energy?
8. An electric toy car weighs 150.0 g and travels at 0.50 km/h. What is its kinetic energy?
9. You will attempt to ski for the first time. On a good day you weigh 50.0 kg. You are now at the top of a 15 m hill trying to get courage to go down. How fast will you be travelling when you reach the bottom of the hill?
10. A truck weighing 17 000 kg has 9 100 J of kinetic energy. What is the speed it is travelling at?
11. Tiger Woods is very upset about all his personal problems and he decides to go golfing to release his pent up anger. He hits a golf ball weighing 400.0 g at a speed of 4.0 km/h and reaches a height of 30.0 m. What is the ball’s mechanical energy?
12. A group of students are attempting to throw a 55 g ball as high as they can, vertically upwards. The record height that they have achieved so far is 6 meters. Jeremy wishes to break the record of 6 meters. He throws the 55 g ball vertically upwards with a speed of 11.2 m/s.

Will Jeremy exceed the record height of 6 meters? Explain your answer. *Neglect air resistance*

1. The special effects department of a Hollywood film company is working on a movie about pirates. They are testing the performance of their cannons. They fire a cannonball, with a mass of 2.5 kg, from the top of a cliff. The cannonball has a velocity of 25 m/s and is 15 m above the water when it leaves the cannon.



1. What is the total energy of the cannonball the moment it is fired?
2. Assuming complete transfer of energy, what is the speed of the cannonball right before entering the water? *Neglect resistance forces.*