

## Conservation of Energy

20. An object has 100 J of gravitational energy while sitting atop of a table (relative to the floor). If a student knocks the object off the table how much kinetic energy does the object have right before it hits the floor?
21. If the object mentioned above has a mass of 2 kg, what is its speed right before it hits the ground?
22. A 250 kg roller coaster goes over the first hill 30 meters high. How fast is it moving at the bottom of this hill (neglect friction)?
23. In the problem above how fast would the roller coaster be moving if it was pushed with a 5 N force for .25 meters at the top of the hill?
24. A 20 kg cart is moving at 10 m/s rolls up an incline. Neglecting friction, how high up the incline is the cart going to rise?
25. A 10 kg wood crate is slide across a wood floor with an initial velocity of 2 m/s. How far along the floor is the crate going to travel?
26. A 5 kg mass, starting 3 meters vertically above the ground, slides down an incline and compresses a spring a distance of .2 meters. Determine the spring constant of the spring.
27. A 2 kg mass, starting 5 meters vertically above the ground, slides down a frictionless incline. It hits a spring with a spring constant 2,000 N/m. Determine the maximum compression of the spring?