1. Define the following (conceptual definition and equation):
	1. Momentum
	2. Impulse
	3. Conservation of Momentum
	4. Kinetic Energy
	5. Potential Energy
	6. Mechanical Energy
	7. Conservation of Energy
	8. Elastic Collision
	9. Inelastic Collision
2. What is the kinetic energy for the following objects?
	1. A 65 kg runner moving with a speed of 7.0 $^{m}/\_{s}$
	2. A 2.0 million kg space shuttle with a launch speed of 44 $^{m}/\_{s}$
	3. A 5.0 kg bowling ball moving with a speed of 9.5 $^{m}/\_{s}$
	4. A 75 kg skier at rest
3. What is the potential energy for the following objects?
	1. A 0.50 kg orange sitting on a shelf 2.0 meters off the ground
	2. A 68 kg snowboarder sitting on a ramp 15 meters high
	3. A 1200 kg car parked in a garage 6 stories up (21 meters)
	4. A 16 kg box sitting on the floor
4. You decide to apply your vast knowledge of physics to baseball. You swing the bat and, oops, it’s a pop up. The .145 kg ball starts straight up off the bat at 35 m/s.
	1. How much kinetic energy does the ball have initially? At the top?
	2. At the top, what is the ball’s potential energy?
	3. The catcher catches the ball. Just before it hits, what is the ball’s kinetic energy? Potential energy?
5. You go next door from the baseball field and find the local pool. You climb up onto the 10 m platform to take a dive. If your mass is 50 kg:
	1. What is the change in potential energy when you climb up there?
	2. You jump. How fast are you going just before striking the water 10 m below?
6. A world-class Olympic athlete starts from rest on top of a 100-meter hill, skis down the incline and makes a world-record setting jump. If she has a mass of 55 kg, use the information given in the diagram to fill in the missing information.
	1.

 **KE = 22,000 J**

**h = \_\_\_\_\_\_\_\_\_\_ m**

**Point A**

**Point D**

**Point C**

**Point D**

**Point E**

* 1. Calculate her velocity at points B and C
1. Use the law of conservation of energy to fill in the blanks at the various marked positions for a 1000 kg roller coaster car.

