Momentum to Energy Conservation

1. A 5.2 g bullet fired at a velocity of 925 m/s hits and becomes imbedded in a block of wood with a mass of 2.5 kg that is sitting on top of a frictionless table top that is 1.5 m above the floor. How far will the block and bullet fly horizontally before they land?
2. If the same bullet were to strike a 1.75 kg block of wood that is suspended from light strings, how high would the bullet/block swing up before beginning to fall back toward the ground?
3. A 5.00 g bullet fired horizontally collides with a block of wood with mass 1.000 kg that is suspended by some massless strings. After the impact, the bullet is stuck inside the block and the system rises to a height of 5.00 cm before swinging back down. Determine the initial velocity of the bullet
4. An 8.00 g bullet is fired horizontally into a 250 g block of wood sitting on the edge of a table at a height of 1.0 m. The bullet remains in the block and after the impact the block lands on the floor 2.00 m from the bottom of the table. Determine the initial speed of the bullet.
5. Look at the three situations described below:
	1. A 15 g copper jacketed bullet moving at 700 m/s collides with and passes through a 3.5 kg block of wood that is sitting on a frictionless surface. When it leaves the block, the bullet has a velocity of 250 m/s, and the block is moving in the same direction at some speed.
	2. A 15 g lead bullet moving at 700 m/s collides and sticks inside a 3.5 kg block of wood on a frictionless surface.
	3. A 15 g rubber bullet travelling at 700 m/s collides with and bounces off of a 3.5 kg block sitting on a frictionless surface. The rubber bullet is travelling at 250 m/s in the opposite direction it was fired in.

Rank each of the above situations from greatest to least in terms of the impulse delivered to the 3.5 kg block of wood and determine the final velocity of the 3.5 kg block of wood in each case.