Name: _____ Block: _____

Creating Momentum Problems

Almost all momentum problems are based on two objects that collide. To solve them, you have to use the law of conservation of momentum to find the mass or velocity of one of the objects, either before or after the collision.

For a typical collision problem, you have two objects.

If the collision is *elastic*, then:

Before						**After**					
object 1			object 2			object 1			object 2		
(m_1)	$(v_{1,initial})$	+	(m_2)	$(v_{2,initial})$	=	(m_1)	$(v_{1,final})$	+	(m_2)	$(v_{2,final})$	

If the collision is *inelastic*, then the objects are joined together after the collision, which means:

Before						**After**	
object 1			object 2			objects 1 & 2	
(m_1)	$(v_{1,initial})$	+	(m_2)	$(v_{2,initial})$	=	(m_{total})	(v_{final})

To make up a momentum problem, you need to make up a story that involves two objects. Decide whether the collision is elastic or inelastic, and provide numbers for all but one of the variables. Ask the student to find the missing one.

If more than one of the objects is moving, be sure to indicate the directions for each of the velocities so the person solving the problem can get the positive and negative signs correct.

Assignment

1. Make up and write out your own momentum problem. Leave about 1/3 of a page of blank space for someone else to solve your problem.
2. Make up and write out a second problem that involves one of the equations $v - v_o = at$, $d = v_o t + \frac{1}{2}at^2$ or $v^2 - v_o^2 = 2ad$. Your problem should instruct the other student to use the velocity they found in the first problem as v_o in the second problem, and your problem should give numbers for all but one of the other variables. Again, leave about 1/3 of a page of blank space for someone else to solve the problem.
3. Write your solutions to your own problems on a separate sheet of paper. (This is your "answer key".)
4. Trade papers with another student (but keep your answer key). Solve each other's problems in the spaces provided. Be sure to write your own name on each other's papers to show that you worked on each other's problems..
5. Hand in both papers (your problems with the other student's solutions and your answer key) by the end of the period.