**Motion Exam Study Guide**

1. Relative Motion
	1. Distance vs. Displacement
		1. Displacement has direction
	2. Speed vs. Velocity
		1. Velocity has direction
	3. Vector Addition
	4. Speed = distance ÷ time
	5. Change in velocity = final velocity – initial velocity
	6. SI Units
2. Forces
	1. Force of Earth’s Gravity = 9.8 m/s2
	2. Air resistance (Fluid friction) motion against gravity
	3. Newton = kg \* m/s2
	4. Net force = unbalanced forces
3. Newton’s 1st Law
	1. Object at rest stays at rest, an object in motion stays in motion
	2. Inertia – dependent on an object’ mass
	3. Inertia is a resistance to change
4. Newton’s 2nd Law
	1. Force = (mass)(acceleration)
	2. Mass = Force ÷ acceleration
	3. Acceleration = Force ÷ mass
	4. An object accelerates when a unbalance force acts upon the object
5. Newton’s 3rd Law
	1. An action and a reaction (opposite but equal forces)
	2. Momentum – an unbalance force causes the speeding up or slowing down of an object in reference to its mass and change in velocity
	3. Momentum equation: p = mass (velocity)
	4. Impulse – the time an unbalance force is applied to an object
	5. Equation for impulse – J = Force (time)
	6. Force (time) = mass (final velocity – initial velocity)
	7. Change in momentum = Impulse