## Newton's Laws (1 and 2) Homework

Name\_

## NEWTON'S 1st LAW: INERTIA

- 1) Imagine that an astronaut in space throws a rock (and he is far away from any gravitational pulls, no friction, ect). Will the rock:
  - a) Slow to a stop eventuallyb) Continue in space at a constant velocityExplain how you know.



2) Imagine that you have a bowling ball and a tennis ball in the seats of a car going 100 Km/h. If the car slams on its brakes, which object is going to go farther? Explain.

3) Imagine that you are being chased by a giant elephant in the woods. Using the idea of inertia, explain why it would be better for you to run in a zig-zag pattern and not a straight line.



4). Imagine that you are swinging a ball around on a string in a circular motion. you release the ball and the string at the top of its loop (as shown). Which path will the ball take once you release it, 1, 2, or 3?



- 5) Two men are sliding down a volcano towards a pit of lava. One man has a mass of 100 kg, the second man has a mass of 75 kg. Which man is in more danger of burning in lava?
- 6) You are on a roller coaster next to someone cute. You're hoping that they will be thrown into you to start a conversation. If you are sitting on the left and they are on the right, what direction do you want the roller coaster to turn? Explain.



NEWTON'S 2nd LAW: F=ma

\*\*Do the following problems using the 4-step attack plan for word problems that we learned.

1) Imagine tha <sup>.</sup> accelerating at	t you are hit in the fac • a rate of 8 m/s², the	ce by a flying duck. If the n what force did the ducl	e duck weighs 3 kg and was < hit your face with?				
-	Equation	Work	Answer:				
F=			~				
m=			1 to a				
a=							
2) You are a movie stunt man, and you are doing a stunt where your car must run into a wall with a force of 8000 N. If you know your car has a mass of 750 Kg, how much should you accelerate the car?							
	Equation	Work	Answer:				
F=							
m=							
a=							

3) Mr. Schill loves his saws and knows everything about them. He knows that they can make a force of 100 N, and they can make saw blade accelerate at 35 m/s<sup>2</sup>. What is the largest mass Mr. Schill can have for his saws?

	Equation	Work	Answer:	
F=				
m=			5,	4
a=			_2	2
			* (* L	

4) Imagine that you are sitting next to two strollers with babies in them. Baby one is 5 Kg and Baby two is 7 Kg. If you push both babies with an equal force, and baby one accelerates at 4 m/s<sup>2</sup>, then how fast will baby two accelerate? (HINT: This is a 2-step problem)

F= m= a=	Equation	Work	Answer:
F= m= a=	Equation	Work	FINAL Answer: