Introduction to Newton’s Laws Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Newton’s 1st Law of Motion

* An object at \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_tends to stay at \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and an object in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ tends to stay in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ unless acted upon by an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_ force.
	+ This is called the Law of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
	+ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: The tendency of an object to resist change.
* Examples:
	+ The stapler is at rest. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
	+ A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_thrown in outer space will \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ forever in its current \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ at its current velocity.
* Which has greater inertia? Circle one.
	+ A bicycle or van? A plane or a car? A table or a chair?

Newton’s 2nd Law of Motion
Net Force = mass x acceleration
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* Force is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ quantity- it has \_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Units for FORCE
	+ Units of mass is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (kg)
	+ Units of acceleration is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (m/s²)
	+ F = \_\_\_\_\_\_\_\_\_\_\_\_\_\_ x \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	+ Kgm/s2 = N = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	+ Force is measured in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (N) which is the same as kgm/s²
* Examples:
	+ How much force is required to accelerate a 3 kg bowling ball by 2 m/s²?
		- F=ma
		- F= (\_\_\_\_\_\_\_\_\_\_\_)(\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)
		- F= \_\_\_\_\_\_\_\_\_\_\_kgm/s² = \_\_\_\_\_\_\_\_\_\_\_\_\_ N
	+ How much force is required to accelerate a 5 kg box by 3 m/s²?
		- F=ma
		- F=(\_\_\_\_\_\_\_\_\_\_\_\_\_kg)( \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ m/s²)
		- F= \_\_\_\_\_\_\_\_\_\_\_\_\_\_ N
	+ A 35 N force is being exerted on a 8 kg barrel. What is the acceleration of the barrel?
		- F=ma
		- \_\_\_\_\_\_\_\_\_\_N = (\_\_\_\_\_\_\_\_\_\_kg)(a)
		- Solve for a
		- a = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_m/s²
	+ A 70 N force is accelerating a cart at 12 m/s². What is the mass of the cart?
		- F=ma
		- \_\_\_\_\_\_\_\_\_\_\_\_\_\_N = (m)(\_\_\_\_\_\_\_\_\_\_\_\_\_\_m/s²)
		- Solve for m
		- m = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ kg
* Mass Vs. Weight
	+ Mass: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
		- SI Unit for mass: \_\_\_\_\_\_\_\_\_\_\_\_
	+ Weight: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
		- SI Unit for weight: \_\_\_\_\_\_\_\_\_\_\_\_\_\_
		- FIND YOUR WEIGHT (in Newtons) on Earth.
			* Convert your weight to mass.
			* 2.2 lbs = 1.0 kg
		- Example:

230 lbs/2.2lbs = 104.5 kg

F = ma

F = (104.5 kg)(9.8 m/s²)

F = 1,024 N

* + - Now find your weight in Newtons:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ lbs/2.2lbs = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_kg

F = ma

F = (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ kg)(9.8 m/s²)

F = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ N

* + - FIND YOUR WEIGHT ON THE SUN (in Newtons)
			* 2.2 lbs = 1.0 kg
			Example:
		- Convert your weight to mass.

230 lbs/2.2lbs = 104.5 kg

F = ma

Mass = 104.5 kg

Gravity on the sun = 274.13 m/s²

F = (104.5 kg)( 274.13 m/s²)

F = 28,646.56 N

Find your weight on the sun:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ lbs/2.2lbs = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ kg

F = ma

Mass = ­­­­­­­­­­­­­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ kg

Gravity on the sun = 274.13 m/s²

F = (­­­­­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ kg)( 274.13 m/s²)

F = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_