Name: _____

Calculating Weight and Mass

Mass is related to the amount of inertia an object has, which its its tendency to resist a change in motion. This is why Newton's first law of motion is also known as the Law of Inertia, since an object at rest tends to stay at rest and an object in motion tends to stay in motion unless acted on by an unbalanced (net) force. The weight of an object depends both on its mass and the acceleration due to gravity that is specific to the planet on which the object exist. Earth's acceleration due to gravity is 9.8 m/s^2. Below is the formula for weight. Use it to solve the following problems. Begin each problem by writing the formula, then make substitutions, and solve for the final answer with units.

Weight (N) = Mass (kg) x Acceleration due to gravity (m/s^2)
W = mg

1.) Calculate the weight of this lunchbox if its mass is 1.2 kg. 	2.) Jenny experiences an average downward force of 441 N anywhere she goes on Earth. Calculate her mass. 	3.) Calculate the acceleration due to gravity on the planet where this 80 kg astronaut weighs only 304 N. 
4.) This bird has a mass of 0.8 kg. Calculate the weight of the bird acting downward as it flies. 	5.) Joe is carrying a load of building supplies and likely injuring his back by supporting 882 N of weight. Calculate the mass of what he is carrying. 	6.) This armed rover weighs 1900 N and has a mass of 340 kg. What is the acceleration due to gravity on its current planet? 
7.) This feather experiences 0.075 N of downward force. Assuming it is on earth, what is its mass? 	8.) Java the alien has a mass of 50 kg. How much would he weigh on earth? 	9.) This 200 kg stag that weighs 1,960 N on earth would only weigh 324 N on the moon. Calculate the moon's acceleration due to gravity. 

Solve for the missing values in the following table using the formula for weight. W = mg

#	Weight (N)	Mass (kg)	Acceleration due to Gravity (m/s^2)	Show your work.
10.)	20		9.8	
11.)		500	9.8	
12.)	3600		9.8	
13.)		70	8.87 (Venus)	
14.)	540		9.8	
15.)	2300	65		
16.)		80	1.6 (Earth's moon)	
17.)	80	4		