

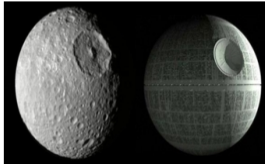
### Mass and Weight Worksheet

$$F_g = mg$$

$$g_{\text{earth}} = 9.8 \text{ m/s}^2$$

- 1) How many atoms are in something determines its \_\_\_\_\_.
- 2) How strongly the planet you're on pulls on you is your \_\_\_\_\_.
- 3) Your weight will change depending on \_\_\_\_\_.
- 4) Your \_\_\_\_\_ never changes despite what planet you go to.
- 5) Knowing that 1 kg = 2.2 lbs, find:
  - A) Your mass in kilograms.
  - B) Use this mass to solve for your weight on these other planets.

Planet / Moon	Your Mass Here (kg)	Gravitational Acceleration Here (m/s <sup>2</sup> )	Your Weight Here (N)
Earth		9.8	
Moon		1.6	
Sun		274	
Jupiter		25.9	
Pluto		0.61	
Mercury		3.73	
Neptune		11.28	
Saturn		11.19	
Mimas		0.8	



Saturn's moon Mimas is on the left, The Death Star is on the right.

- 6) The mass of your new motorcycle is 250 kg. What is:
  - A) Its weight on Earth in Newtons?
  - B) Its weight on the moon (in Newtons)?
  - C) The mass of your motorcycle on the moon?
- 7) Somewhere you place a 7.5 kg pumpkin on a spring scale. If the scale reads 78.4 N, what is the acceleration due to gravity at that location?
- 8) The weight of a pony standing still on Earth is 1025N.
  - A) What is the pony's mass?
  - B) What is the size of the normal force acting on the pony?
  - C) How strong is the attractive force between the pony and the Earth?
  - D) Where will the pony weigh less (Moon, Jupiter, impossible)?
  - E) Where will the pony have less mass (Moon, Jupiter, impossible)?
- 9) In the physics sense, when a person goes on a diet, do they really want to lose weight or mass?
- 10) The general rule is that you will weigh \_\_\_\_\_ on the bigger Planets (like Jupiter, Saturn etc) , and \_\_\_\_\_ on the smaller planets (like the moon).
- 11) What is a "really easy" way to lose weight without losing mass?