

### 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	

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

Decimeter (dm) = .1 meter = 3.937 in. = 3.281 ft. = 39.37 cm

Inch (in) = 2.54 cm = 0.0254 m = 0.0833 ft. = 0.02778 m

Centimeter (cm) = .01 meter = .3937 in. = .03281 ft. = .01094 yd.

Millimeter (mm) = .001 meter = .03937 in. = .003281 ft. = .001094 yd.

Kilometer (km) = 1.000 meters = .621 mile = 1.094 yd. = 1.094 ft.

Meter (m) = 1.094 yd. = 1.094 ft. = 3.281 ft. = 3.281 yd.

Yard (yd) = 3 feet = 36 inches = 0.9144 meters = 0.9144 meters

Foot (ft) = 12 inches = 0.3048 meters = 0.3048 meters

Acres = 43,560 sq ft. = 4,047 sq m. = 0.4047 hectares

Hectares = 10,000 sq m. = 2.471 acres = 2.471 acres

Square kilometer (km<sup>2</sup>) = 1,000,000 sq m. = 386,102 sq ft. = 386,102 sq ft.

Square meter (m<sup>2</sup>) = 10.764 sq ft. = 10.764 sq ft.

Square centimeter (cm<sup>2</sup>) = .0001 m<sup>2</sup> = .0001 m<sup>2</sup>

Square millimeter (mm<sup>2</sup>) = .000001 m<sup>2</sup> = .000001 m<sup>2</sup>