



Find out what you weigh anywhere in the Solar System!

Weight is the force produced when a mass experiences acceleration due to a gravitational field.

The acceleration due to the gravity here on Earth happens to be 32.2 ft/s^2 , or 9.8 m/s^2

A specific force can be calculated as: **Force = Mass x Acceleration.**

Since the force we're talking about is our weight, and we know the acceleration due to gravity, we can figure out our Mass!

Mass = Force ÷ Acceleration, or Your Weight ÷ Acceleration from Earth's Gravity

Remember! If your weight is in lb, use 32.2 as your acceleration. If your weight is in kg, use 9.8 as your acceleration.

Now you can substitute the acceleration due to gravity on other planets into a new force equation, and discover your new weight!

New Weight = Mass x New Acceleration

Wait! What is the Acceleration due to gravity on other planets? Acceleration due to gravity can be calculated as follows:

$$g = G \times (M / r^2)$$

where G is a universal gravitational constant calculated by scientists, M is the mass of the planet in mind, and r is the radius of the planet in mind.

$G = 6.673 \times 10^{-11} \text{ m}^3/\text{kg}/\text{s}^2$ in the Metric system

$G = 3.439 \times 10^{-8} \text{ ft}^3/\text{slug}/\text{s}^2$ in the English system

Below is a table of weight and radius values for various planets, along with their acceleration due to gravity. All values are metric.

Celestial Body	Mass (kg)	Radius (m)	Gravitational Acceleration (m/s^2)
Sun	1.99×10^{30}	6.96×10^8	274.13
Mercury	3.18×10^{23}	2.43×10^6	3.59
Venus	4.88×10^{24}	6.06×10^6	8.87
Earth	5.98×10^{24}	6.38×10^6	9.81
Moon	7.36×10^{22}	1.74×10^6	1.62
Mars	6.42×10^{23}	3.37×10^6	3.77
Jupiter	1.90×10^{27}	6.99×10^7	25.95
Saturn	5.68×10^{26}	5.85×10^7	11.08
Uranus	8.68×10^{25}	2.33×10^7	10.67
Neptune	1.03×10^{26}	2.21×10^7	14.07
Pluto	1.40×10^{22}	1.50×10^6	0.42