

## Answer on Question #43487, Chemistry, Other

### Question:

what is the mass of a box if its weight is 16.0N?

### Solution:

The weight of an object is the force on the object due to gravity. Its magnitude (a scalar quantity) is the product of the mass ( $m$ ) of the object and the magnitude of the local gravitational acceleration ( $g$ ); thus:

$$W = mg$$

At different points on Earth, objects fall with an acceleration between 9.78 and 9.82  $\text{m}\cdot\text{s}^{-2}$  depending on altitude, with a conventional standard value of exactly 9.80665  $\text{m}\cdot\text{s}^{-2}$ . Thereby:

$$m = W/g = 16.0 \text{ (N)}/9.80665 \text{ (m}\cdot\text{s}^{-2}) = 1.63 \text{ kg}$$

**Answer:** 1.63 kg