Mass vs. Weight

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Mass vs Weight

Mass

- Mass – A measure of how much inertia an object has.
- More mass = more inertia and harder to change the motion.
- Also measured by how much matter is in an object.
- Measured in Kg

Weight

- The force on an object due to gravity pulling the object down.
- Weight = m*g

$$F_w = m*g$$

- UNTIS
  - N in metric system.
  - lb in English units.

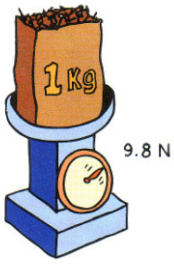
$$F_w = F_g$$

Weight (Earth)

- 1 kg of mass weighs 9.8 N on earth…
- How much does a person weigh if he has 65 kg of mass?

$$F_W = m\,g$$

- F_w = 65 kg * 9.8 m/s^2
- He "weighs" 637 N.

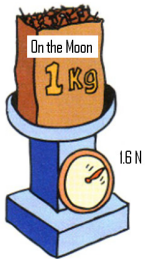


Weight on the moon

- On the moon gravity is 1.6m/s^2 not 9.8 m/s^2
- How much does THE SAME PERSON with 65 kg of mass weigh on the moon?

$$F_W = m\,g$$

- W = 65 kg * 1.6 m/s^2
- He "weighs" 104 N.



Calculating Weight

1) If you mass on the moon is 62.5 kg, what would your force of weight be in Earth?

$$F_W = m\,g$$

Calculating Weight

5) Find the mass of an object with a weight of 12 N.

$$m = \frac{F_W}{g}$$

Calculating Weight

8) What is the acceleration due to gravity of 17 kg of debris falling at a force of 63N from Pluto?

$$g = \frac{F_W}{m}$$