

## Chapter 4 - Introducing Forces

### §4-1 Inertia

Definition of Inertia → see p126

Galileo's Perception of Inertia → see p127

✶ INERTIA is NOT a FORCE !

See p129 | # 1

Path 1 - 7

Path 2 - 15 ✓

Path 3 - 1

Path 4 - 1

84-2 Common Forces

Weight is the force due to gravity. It depends on the location. ( $F_g$ ; units are Newtons (N); vector quantity.)

mass is the amount of matter in an object. It does not depend on location. ( $m$ ; units are kg; scalar quantity.)

	$F_g$ (N)	$m$ (kg)	$m$ (lb)
$J_e$	470	47.9	105
$L$	725	73.9	163
$J_a$	755	77.0	169

*Note: Conversion factors are shown above the table:  $\div 9.81 \text{ m/s}^2$  from  $F_g$  to  $m$  (kg), and  $\times 2.2$  from  $m$  (kg) to  $m$  (lb).*

$$\vec{F}_g = m \vec{g}$$

where  $F_g$  is the force of gravity (weight) (N)

$m$  is the mass (kg)

$g$  is the acceleration due to gravity ( $\text{m/s}^2$ )  
( $9.81 \text{ m/s}^2$  near the Earth's surface)

MP/135

$$\vec{g}_{\text{moon}} = 1.64 \text{ m/s}^2 \text{ [down]}$$

$$m = 4.0 \text{ kg}$$

$$\vec{F}_g = ?$$

units:

$$1 \text{ kg} \cdot \text{m/s}^2 = 1 \text{ N}$$

$$\vec{F}_g = m \vec{g}$$

$$\vec{F}_g = (4.0 \text{ kg})(1.64 \text{ m/s}^2 \text{ [down]})$$

$$\vec{F}_g = 6.6 \text{ N [down]}$$

To Do

• Look over MP/136

• PP/137