Chapters 4, 5 and 6 Force, Work and Power, and Momentum

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| Force: **F = ma****Fg = mg (g = 9.8 N/kg on earth)****Ff = μFn ( = μmg)***Fg**m**g**F*μmg*F**m**a* | Symbols and units:*F* - force (N)*m* - mass (kg) (g/1000 = kg)*a* - acceleration (m/s/s)*μ* - coefficient of friction  |
| Work and Power:*W**F**d***W = Fd = Fd(cosθ)****F = mg (lifting)****F = μmg (dragging)***W**P**t***P = Fv** | Symbols and units:P - Power (W)W - Work (J)F - Force (N)d - distance (m)t - time (s)m - mass (kg)μ - coefficient of friction1 HP = 745.7 W |
| Kinetic Energy:**KE = ½mv2**Potential Energy:**PE = mgh**Elastic (Spring) Potential Energy:**PEelastic = ½kx2***o**e**i* **Fd + mgh + ½mv2 = Fd + mgh + ½mv2** | KE - Kinetic Energy (J)m - Mass (kg)v - Velocity (m/s)PE - Potential Energy (J)m - Mass (kg)g - 9.8 N/kgh - Elevation (m)PE - Potential Energy (J) (Stored in a spring)k - Spring Constant (N/m)x - Stretch/Compression Distance (m) |
| Momentum:**p = mv****FΔt = impulse****FΔt = mΔv** | Symbols and units:*p* - momentum (kg m/s)m - mass (kg)*v* - velocity (m/s)*Δv* - change in velocity (m/s)*Δt* - elapsed time (s) |