**Physical Science Formulas**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Area** |  | |  | |  | |
| **Volume** |  |  | |  | |  |
| **Density** |  | | m = dv | |  | |
| **Concentration** |  | |  | | m = cv | |
| **Kinetic**  **Energy** |  | |  | |  | |
| **Potential**  **Energy** | PE = mgh | |  | |  | |
| **Conservation of Mechanical Energy** | (KE + PE)beginning = (KE + PE)end | | | |  | |
| **Work** | W = fd | |  | |  | |
| **Power** |  | | W = Pt | |  | |
| **Speed** |  | |  | | d = st | |
| **Acceleration** |  |  | | i | |  |
| **Newton’s**  **2nd Law** | F = ma | |  | |  | |
| **Velocity of**  **falling object** | v = t | |  | |  | |
| **Momentum** | p = mv | |  | |  | |
| **Speed of**  **wave** | v = λƒ | |  | |  | |

**Mechanical Advantage Equations** Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Period \_\_\_\_\_\_\_

**Ideal Mechanical Advantage (IMA)**

- The mechanical advantage based on the design of the machine

- See equations below

**Actual Mechanical Advantage (AMA)**

- The mechanical advantage based on the use of the machine.

- AMA = output force or resistance force/weight (Fr)/(W)

input force effort force (Fe)

|  |  |  |
| --- | --- | --- |
| **Machine** | **IMA** | **AMA** |
| Lever | length of lever arm  length of resistance arm | output force  input force |
| Ramp | length of ramp  height of ramp | output force  input force |
| Pulley | # of supporting ropes | weight  input force |
| Wheel & Axle | radius of wheel  radius of axle | output force  input force |
| Screw | Pitch (# threads/dist.) | output force  input force |

|  |  |  |  |
| --- | --- | --- | --- |
| **Efficiency** |  | Wo = Wi(Eff) |  |