AzSCI High School Reference Guide

This document is NOT intended to dictate information that should be taught as part of Arizona Science Standards or curriculum. This reference sheet is intended to cover a list of all potential HS symbols, equations, terminology, and formulas *students may encounter on the AzSCI assessment. It is intended to provide all needed information for the students to demonstrate their science knowledge and their ability to critically think while using the science engineering practices and crosscutting concepts within the three science content domains.*

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Equation

$\vec{v} = \lambda f$

$\vec{v} = \frac{\Delta \vec{x}}{\Delta t}$

$\vec{a} = \frac{\Delta \vec{v}}{\Delta t} = \frac{\vec{v}_f - \vec{v}_i}{\Delta t}$

$\vec{F}_{Net} = \vec{F}_1 + \vec{F}_2 + \vec{F}_3 + \cdots$

$\vec{F}_{Net} = m\vec{a}$

$\vec{F}_{Net} = \frac{m\vec{v}^2}{r}$

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

$\vec{F}_g = \frac{Gm_1m_2}{r^2}$

$\vec{F}_e = \frac{Kq_1q_2}{r^2}$

$\vec{F}_{sp} = -k\Delta \vec{x}$

$\vec{p} = m\vec{v}$

$\Delta \vec{p} = \vec{F}\Delta t$

$\vec{F}\Delta t = m\Delta \vec{v} = m\vec{v}_f - m\vec{v}_i$

$E_{tot} = E_1 + E_2 + E_3 + \cdots$

$PE_g = mgh$

$KE = \frac{1}{2}m\vec{v}^2$

$PE_E = \frac{1}{2}k\Delta \vec{x}^2$

$\Delta E = W = \vec{F}\Delta \vec{x}$

$P = \frac{\Delta E}{\Delta t}$

Constants

$c = Speed\ of\ light = 3.00x10^8\ \frac{m}{s}$
$g_{Earth} = 9.8\ \frac{m}{s^2}$
$G = 6.67x10^{-11}\ \frac{N \cdot m^2}{kg^2}$
$K = 9.00x10^9\ \frac{N \cdot m^2}{C^2}$

Symbol	Meaning	Unit of Measurement
$\vec{v}$	Average velocity	$\frac{m}{s}$
$\Delta \vec{v}$	Change in velocity	$\frac{m}{s}$
$\vec{v}_i$	Initial velocity	$\frac{m}{s}$
$\vec{v}_f$	Final velocity	$\frac{m}{s}$
λ	Wavelength	m
f	Frequency	Hz or $\frac{1}{s}$
$\Delta \vec{x}$	Horizontal displacement	m
Δt	Change in time	s
$\vec{a}$	Acceleration	$\frac{m}{s^2}$
$\vec{F}_{Net}$	Net force	N or $\frac{kg \cdot m}{s^2}$
$\vec{F}_g$	Gravitational force	N or $\frac{kg \cdot m}{s^2}$
$\vec{F}_e$	Electric force	N or $\frac{kg \cdot m}{s^2}$
$\vec{F}_{sp}$	Force applied by a spring	N or $\frac{kg \cdot m}{s^2}$
m	mass	kg
r	Distance between two objects	m
$\vec{g}$	Acceleration due to gravity	$\frac{m}{s^2}$
h	Height	m
q	Charge	C
k	Spring constant	$\frac{N}{m}$ or $\frac{kg}{s^2}$
K	Coulomb's constant	$\frac{N \cdot m^2}{C^2}$
$\vec{p}$	Momentum	$kg \cdot \frac{m}{s}$ or $N \cdot s$
E_{tot}	Total energy	J
PE_g	Gravitational potential energy	J
PE_E	Elastic potential energy	J
KE	Kinetic energy	J
ΔE	Change in energy	J
W	Work	J or $N \cdot m$
P	Power	W or $\frac{J}{s}$