

Greek Letter Reference Sheet

This handout lists the Greek alphabet and provides examples of how the letters might be used as symbols in science, engineering, and mathematics.

Letter Name	Uppercase Letter	Lowercase Letter	Example Usage with Units
Alpha	A	α	α = angular acceleration (rad/s ²)
Beta	B	β	β = probability of making Type II error (unitless)
Gamma	Γ	γ	γ = possible angle of a triangle (rad or °)
Delta	Δ	δ	Δ = change or difference in a quantity δ = partial charge ($\delta+$ or $\delta-$)
Epsilon	E	ϵ	ϵ = strain (unitless)
Zeta	Z	ζ	ζ = damping ratio (unitless)
Eta	H	η	η = viscosity (Pa·s)
Theta	Θ	θ	θ = angular position (rad)
Iota	I	ι	Few common uses
Kappa	K	κ	Few common uses
Lambda	Λ	λ	λ = wavelength (m)
Mu ("mew")	M	μ	μ = population mean (units vary)
Nu ("new")	N	ν	ν = frequency (Hz or s ⁻¹)
Xi ("ksigh")	Ξ	ξ	ξ = extent of a chemical reaction (mol)
Omicron	O	o	Few common uses
Pi ("pie")	Π	π	Π = osmotic pressure (atm); $\pi \approx 3.14$
Rho ("row")	P	ρ	ρ = density (g/cm ³)
Sigma	Σ	σ or ς	Σ = sum of numbers or expressions σ = population standard deviation (units vary)
Tau ("taow")	T	τ	τ = torque (N·m)
Upsilon	Y	υ	Few common uses
Phi ("figh")	Φ	ϕ or φ	ϕ = phase shift (rad)
Chi ("kigh")	X	χ	χ = mole fraction (unitless)
Psi ("sigh")	Ψ	ψ	ψ = wave function (unitless)
Omega	Ω	ω	ω = angular velocity (rad/s)