

Physics Formula Sheet

Project-Based Physics · Mr. Iserloth · All six units, one page

Unit 1 — Kinematics

Displacement	$\Delta x = x - x_0$
Average velocity	$\bar{v} = \Delta x / \Delta t$
Average acceleration	$\bar{a} = \Delta v / \Delta t$
Velocity, constant a	$v = v_0 + at$
Position, constant a	$\Delta x = v_0 t + \frac{1}{2}at^2$
Velocity-squared (no t)	$v^2 = v_0^2 + 2a\Delta x$
Position, avg. velocity form	$\Delta x = \frac{1}{2}(v_0 + v)t$

Unit 3 — Acoustics

Wave speed	$v = f\lambda$
Period	$T = 1 / f$

Unit 5 — Momentum

Momentum	$p = mv$
Impulse	$J = F\Delta t = \Delta p$
Conservation of momentum	$m_1v_{1i} + m_2v_{2i} = m_1v_{1f} + m_2v_{2f}$

Unit 2 — Dynamics

Newton's Second Law	$F_{\text{net}} = ma$
Weight	$F_g = mg$
Friction force	$F_f = \mu FN$
Newton's Third Law	$F(\text{A on B}) = -F(\text{B on A})$

Unit 4 — Work, Energy & Power

Work	$W = Fd \cos \theta$
Kinetic energy	$KE = \frac{1}{2}mv^2$
Gravitational PE	$PE = mgh$
Power	$P = W / t = Fv$
Conservation of energy	$KE_i + PE_i = KE_f + PE_f + \text{losses}$

Unit 6 — Optics

Law of reflection	$\theta_i = \theta_r$
Snell's Law	$n_1 \sin \theta_1 = n_2 \sin \theta_2$
Thin lens / mirror eq.	$1/f = 1/d_o + 1/d_i$
Magnification	$m = -d_i / d_o$

Constants Worth Memorizing

Acceleration due to gravity	$g \approx 10 \text{ m/s}^2$
Speed of sound (room temp, dry air)	$v \approx 343 \text{ m/s}$

Print this out. Annotate it. Bring it to every test.