For practical physics:

**Machines** must be used in the experiments to reduce human error.

**Video cameras** must be used in the experiments to reduce human error.

**Averaging many experiments reduces random error**.

**Relative error must be about the same for all measurements**.

**λD = ax** Young double-slit experiment (waves)

**d sinA = nλ** diffraction grating (waves)

$y=A\sin(\left(ω\left(t - \frac{x}{v}\right)\right)),$ **ω = 2πf,** $f= \frac{1}{T} $(waves)

$y\_{1}+ y\_{2}=2A\cos(\left(\frac{ωx}{v}\right))\sin(\left(ωt\right))$ standing waves.

$R=\frac{ρL}{A}$ (resistance, resistivity (electricity))

**F = Eq** (field and force (electricity))

$F=CρAv^{2}$ (resistance force (fluid mechanics))

$c=\frac{m\_{1}x\_{1}+m\_{2}x\_{2}}{m\_{1}+m\_{2}}$(center of mass (solid mechanics))

**Center of gravity** is the center of parallel forces, moment = 0.

**F = ma** (Newton Second Law (material point, solid mechanics))

**σ = Eε** (Hooks Law (deformed mechanics))

$T=2π\sqrt{\frac{m}{k}}$ (spring harmonic oscillator period (solid mechanics))

$T=2π\sqrt{\frac{L}{g}}$ (pendulum harmonic oscillator period (solid mechanics))

$T=2π\sqrt{\frac{J}{c}}$ (rotational harmonic oscillator period (solid mechanics))

$T=2π\sqrt{LC}$ (LC circuit harmonic oscillator period (electricity))