- A: cross-sectional area

- ℓ: length

- n: number of turns per unit length

- $N = n\ell$: total number of turns

- $B = \mu_0 n I$: magnetic field inside solenoid

- $\Phi_B = BA$: magnetic flux through each turn

- $\Rightarrow$ Inductance of solenoid: $L \equiv \dfrac{N\Phi_B}{I} = \mu_0 n^2 A\ell$