

# Physical Inductor

Inductor resists current change!

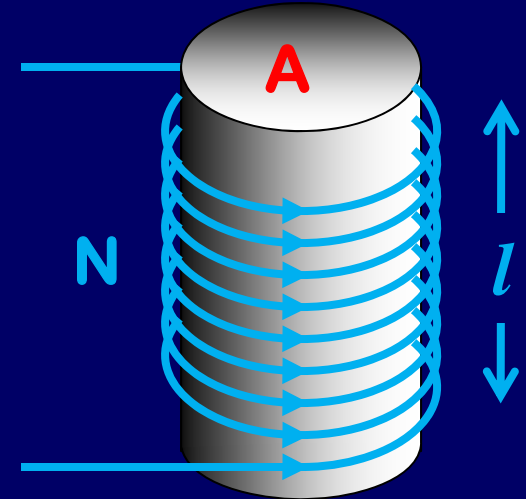
$$L \equiv \frac{\Phi}{I} \quad \text{Recall: } \Phi = NBA$$

$$L = \frac{NBA}{I} \quad \text{Recall: } B = \mu_0 n I$$

$$L = \frac{N \mu_0 n I A}{I}$$

$$L = N \mu_0 n A$$

$$L = \mu_0 n^2 l A$$



(# turns) = (# turns/meter) x (# meters)

$$N = n l$$

Energy stored:

$$U = \frac{1}{2} L I^2$$