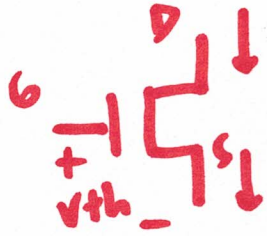
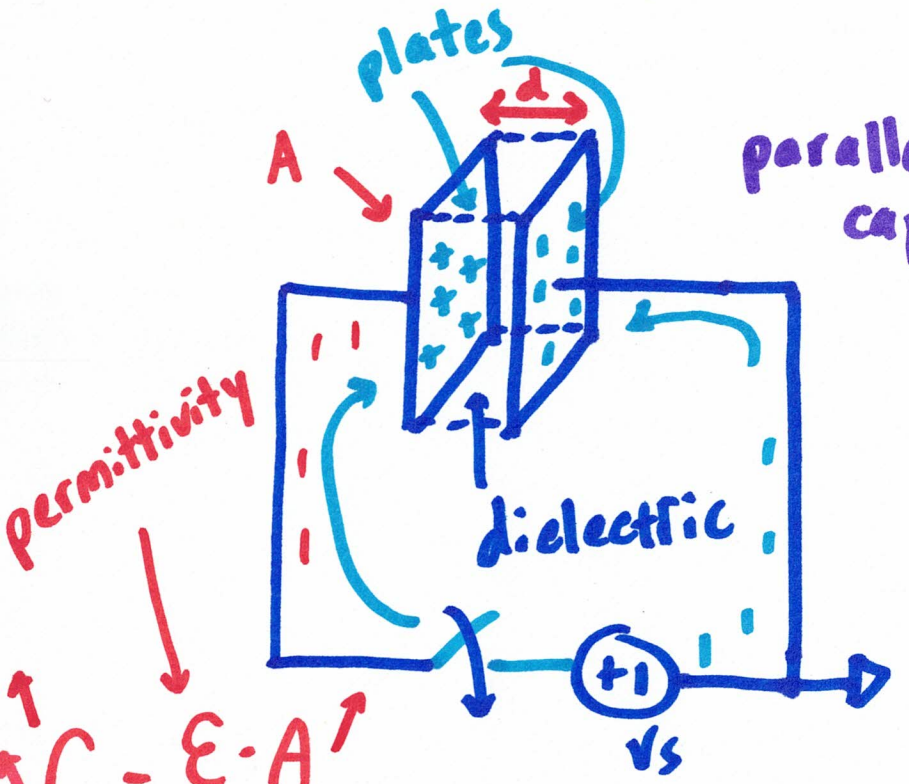
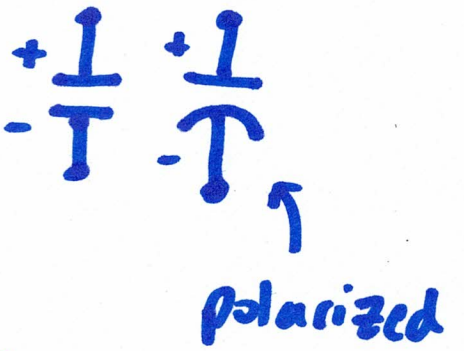
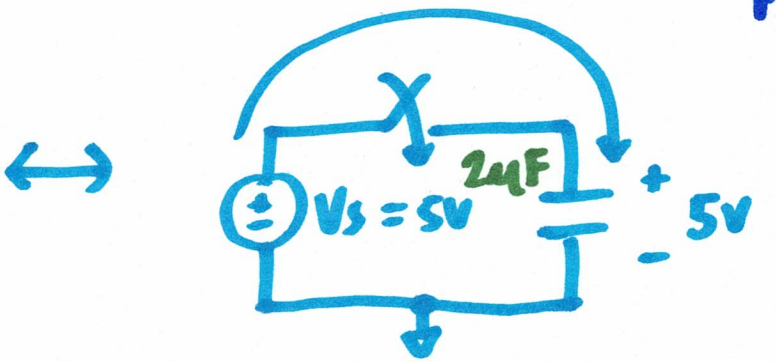


EE 220: Circuits I

capacitor: stores electrical energy in the form of an electric field.







$Q = 2\mu F \cdot 5V$

$\boxed{Q = (2 \cdot 5)\mu C = 10\mu C}$

$\boxed{C \cdot V = Q}$

charge stored

voltage across cap.

capacitance

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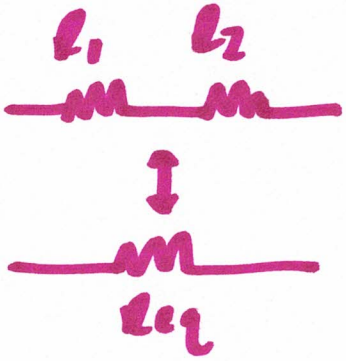
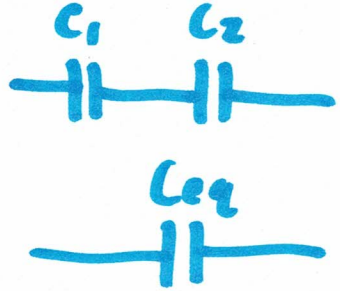
Capacitor Equivalents

Series



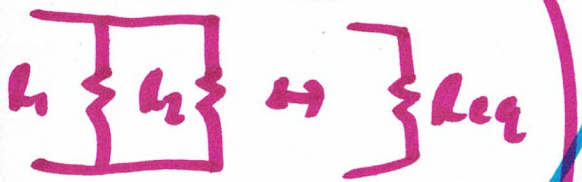
$$R_{eq} = R_1 + R_2$$

Series



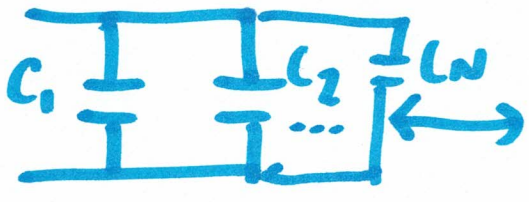
$$C_{eq} = \frac{C_1 \cdot C_2}{C_1 + C_2}$$

Parallel

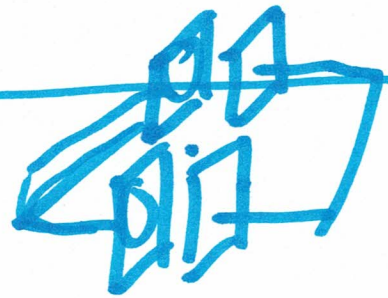


$$R_{eq} = \frac{R_1 \cdot R_2}{R_1 + R_2}$$

Parallel



$$C_{eq} = C_1 + C_2 + \ldots + C_N$$



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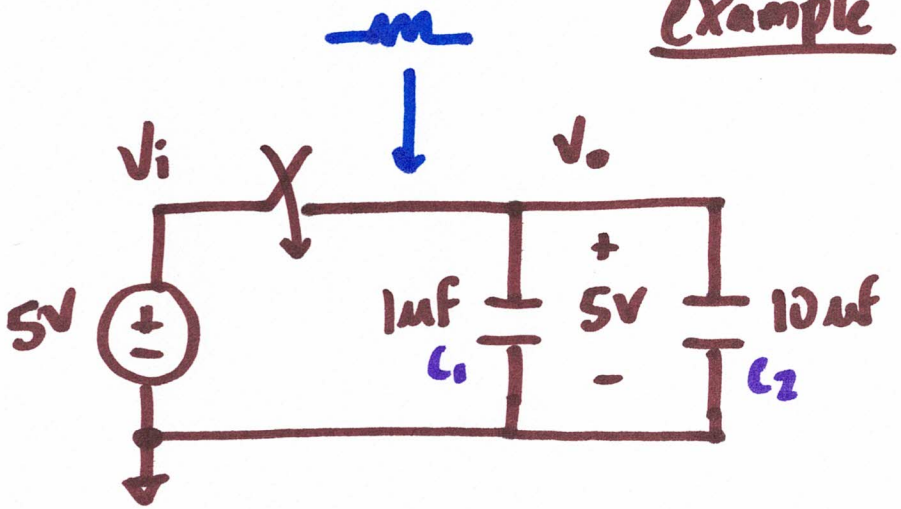
Example

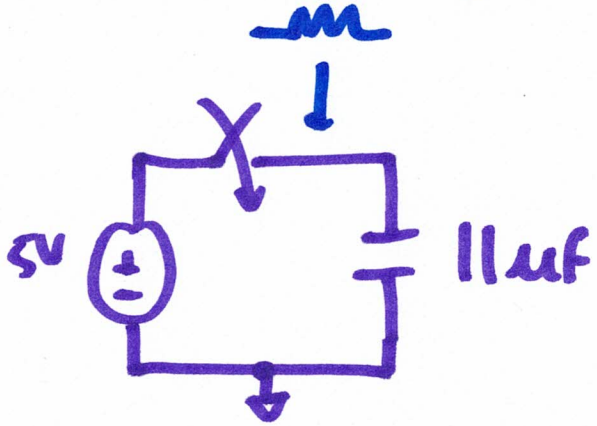
charge stored



① $CV = Q$

$$E(C_1) = \frac{1}{2} \cdot 1\mu F \cdot (5V)^2 = 12.5\mu J$$

$$Q(C_1) = 1\mu F \cdot 5V = 5\mu C$$
$$Q(C_2) = 10\mu F \cdot 5V = 50\mu C$$
$$\Big\} \boxed{55\mu C}$$



~~C×V~~

$5V \cdot 11\mu F = Q = \boxed{55\mu C}$

$V \cdot C = Q$

② $\boxed{E = \frac{1}{2} \cdot C \cdot V^2}$

Energy stored