

Electronics Workshop - March 31, 2016

Time & Location:

7:00 PM

Fire District 6 Training Room, 2123 Jackson Highway, Chehalis, WA

Topic:

AC Circuits

Bring:

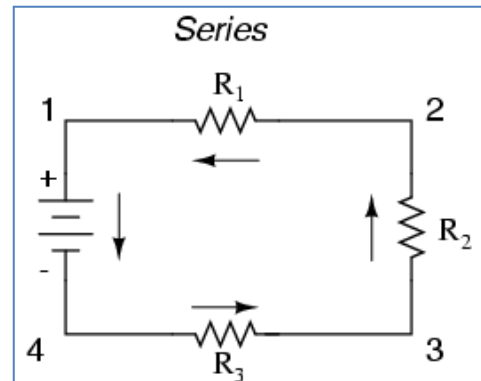
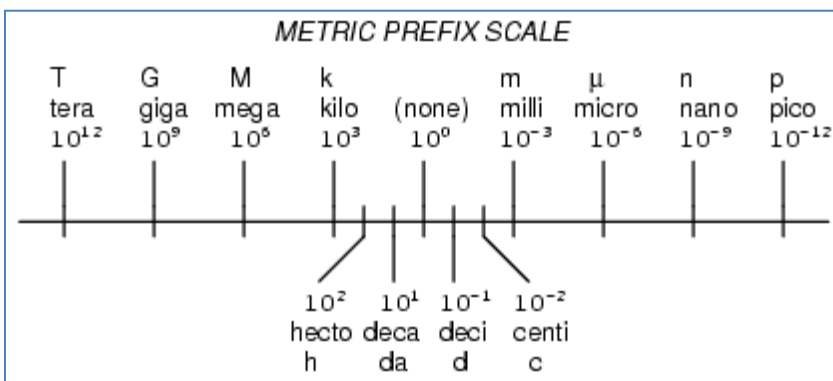
Oscilloscope

Signal Generator

Resistor, Capacitor, Inductor

Notes:

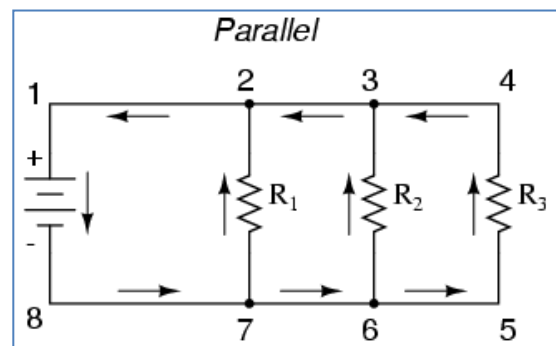
Reference: <http://www.allaboutcircuits.com/textbook/>



DC: $E(\text{volts}) = I(\text{current}) * R(\text{ohms})$

Series circuit: current through each component is the same

Parallel circuit: voltage across each component is the same



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AC:

$$\text{Frequency (in Hertz)} = \frac{1}{\text{Period (in seconds)}}$$

Waveform	RMS	Average	Peak-to-Peak
Sine Wave	0.707 * Peak	0.637 * Peak	2 * Peak
Square Wave	Peak	Peak	2 * Peak
Triangle Wave	0.577 * Peak	0.5 * Peak	2 * Peak

Inductive Reactance: $X_L(\text{ohms}) = 2 \pi f(\text{Hertz}) L(\text{Henries})$

Current lags voltage by 90° in an inductor

$$\text{Impedance} = R + j X_L$$

Capacitive Reactance: $X_C(\text{ohms}) = \frac{1}{2 \pi f(\text{Hertz}) C(\text{Farads})}$

Current leads voltage by 90° in a capacitor

$$\text{Impedance} = R - j X_C$$

Windows PC Oscilloscope:

<http://www.zen22142.zen.co.uk/Downloads/scope.zip> - Zipped Program

<http://www.zen22142.zen.co.uk/Prac/winscope.htm> - Manual