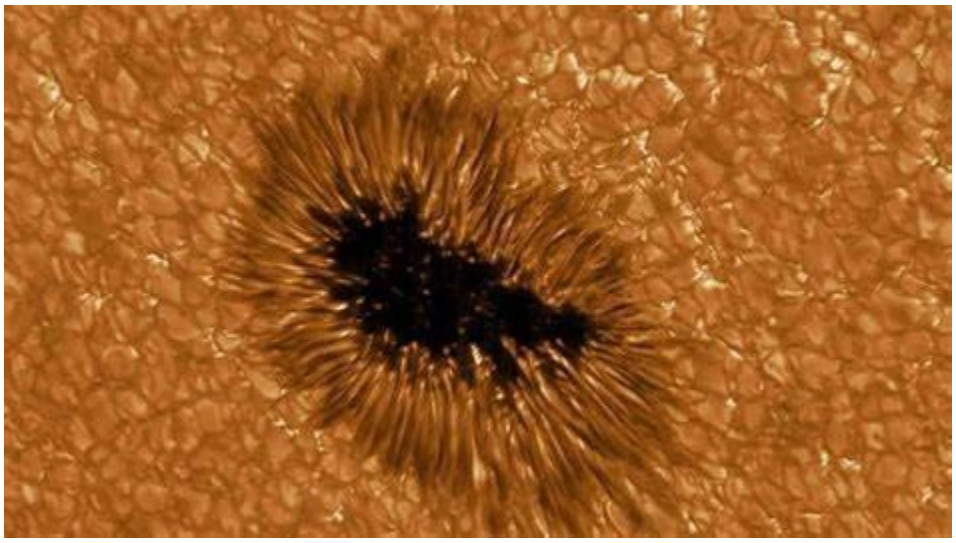
K9TRC is pleased to be affiliated with the American Radio Relay League (ARRL)

K9TRC –News



The Tipton County Indiana Amateur Radio Club is an exempt organization under Section 501(c) (3) of the Internal Revenue Code.

Above, a photo of the structure of the sun.

Ham News for Tipton County

You are invited to attend the July meeting of the Tipton Indiana Amateur Radio Club which meets the second Saturday of each month . The next meeting is Saturday, July 14 , 2024, at 8:30 am, at the Jim Dandy Restaurant on West Jefferson Street in Tipton.

Executive Board meets the first Thursday of each month Also at Jim Dandy at 8:30 AM. Unless otherwise noted.

Officers: Louie Wolford (k9qcb), President, Paul Kennedy (kd9iqh) Vice President, Larry Crowder, Treasurer(k9lwc), Ron Adamson (WA9YJZ) Secretary, John Ankrom (kg9ja) Trustee

Standard Stuff:

The beginning of each net starts with an attendance of sorts of the local RACES/ARES membership. Have you wondered about RACES/ ARES and how to learn more? The ARRL has these courses if you are interested:

EC-001: Introduction to Emergency Communication

EC-016: Public Service and Emergency Communications Management for Radio Amateurs
PR-101: Public Relations 101 for Radio Amateurs

Look into them, they can be helpful.

If you think it is an emergency call 911. Don't wait, don't think it will pass. It's better to look a little silly than to become dead.

Notes from the Editor:

Indiana Section ARES® Nets

The Indiana Section ARES® HF net is held on 7.272 +/- during the summer months, every Sunday at 5 PM EDT.

Net Manager: Jim Moehring, KB9WWM. Email: servo300@aol.com

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- ***Indiana ARES® HF Net Script***
- ***Indiana Section ARES® HF Net Log***

The Indiana ARES® HF Digital Net is held every Wednesday at 8:30 PM Eastern Time except the second Wednesday of the month on or about 3.583 MHz using Olivia 8/500.

Net Manager: Matthew Becdol, W9SOX

ARE YOU UPGRADING YOUR LICENSE THIS YEAR?

Learn More

- EXAM SESSION

07/16/2024 | ANDERSON IN 46016-2238
Sponsor: Anderson Repeater Club
Location: Madison County EMA EOC
Time: 7:00 PM (Walk-ins allowed)
Learn More

- EXAM SESSION

07/27/2024 | NOBLESVILLE IN 46060-1624
Sponsor: Central Indiana ARA/ HCRACES
Location: Sheriff's Training Room
Time: 10:30 AM (No Walk-ins / Register or Call ahead)
Learn More

- EXAM SESSION

08/20/2024 | ANDERSON IN 46016-2238
Sponsor: Anderson Repeater Club
Location: Madison County EMA EOC
Time: 7:00 PM (Walk-ins allowed)
Learn More

- EXAM SESSION

09/17/2024 | ANDERSON IN 46016-2238
Sponsor: Anderson Repeater Club
Location: Madison County EMA EOC
Time: 7:00 PM (Walk-ins allowed)
Learn More

- EXAM SESSION

10/15/2024 | ANDERSON IN 46016-2238
Sponsor: Anderson Repeater Club
Location: Madison County EMA EOC
Time: 7:00 PM (Walk-ins allowed)
Learn More

- EXAM SESSION

10/19/2024 | NOBLESVILLE IN 46060-1624

The Tipton County Indiana Amateur Radio Club is an exempt organization under Section 501(c) (3) of the Internal Revenue Code.

Sponsor: Central Indiana ARA/ HCRACES
Location: Sheriff's Training Room
Time: 10:30 AM (No Walk-ins / Register or Call ahead)
Learn More

- EXAM SESSION

  11/19/2024 | ANDERSON IN 46016-2238
  Sponsor: Anderson Repeater Club
  Location: Madison County EMA EOC
  Time: 7:00 PM (Walk-ins allowed)
  Learn More

- EXAM SESSION

  12/17/2024 | ANDERSON IN 46016-2238
  Sponsor: Anderson Repeater Club
  Location: Madison County EMA EOC
  Time: 7:00 PM (Walk-ins allowed)
  Learn More

Updaters Note: HamExam.org Amateur Radio Practice Exams

At: HamExam.org: Free Amateur Radio Practice Tests

Or for Technician Class: Ham Radio Technician Class Practice Test (updated 2020) (mometrix.com)

And General: Ham Radio General Class Practice Test (updated 2020) (mometrix.com)

OR: ON THE ARRL WEB SITE

Amateur Radio Websites that are supposed to be "Handy" From: H. Ward Silver: Part of the Ham Radio for Dummies Cheat Sheet.

ARRL- Many useful regulatory, educational, operating, and technical items and links

AC6V and DX Zone – General-interest websites with many links on all phases of Ham Radio

QRZ.com - Callsign lookup service and general-interest ham radio portal

eHam.net – News, articles, equipment swap and shop, product reviews, and mailing lists

Radiowave Propagation Center - Real-Time information on propagation and solar data

Space Weather Prediction Center - - Real-Time information on space weather and radio communications

TAPR (Information on Digital modes) - Information on Digital modes and software-defined radio (SDR)

AMSAT - Main site for information on amateur satellites

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WA7BNM Contest Calendar - Contest calendar and log due dates

YOTA (Youngsters on the Air) – World-wide group for student and young adult hams, based in Europe

DXMAPS.com - Collection of real time maps showing worldwide activity on any amateur band

DXSummit – Worldwide DX spotting network

You may or may not know, the ARRL works with several agencies in the public service area. Many of these groups accept volunteers. If you have some free time and would like to be more active in the community here is a partial list of agencies that may need volunteer help.

- **American Red Cross+**
- **Association of Public-Safety Communications Officials-International (APCO-International)+**
- **Boy Scouts of America+**
- **Citizen Corps (Department of Homeland Security)+**
- **Civil Air Patrol (CAP)+**
- **Federal Emergency Management Agency (FEMA)+**
- **National Volunteer Organizations Active in Disaster (NVOAD)+**
- **REACT International Inc.+**
- **Salvation Army & SATERN+**
- **SKYWARN (National Weather Service)+**
- **Society of Broadcast Engineers (SBE)+**
- **United States Power Squadrons+**
- **Quarter Century Wireless Association, Inc.**

Copied from the ARRL website

10 Handy HAM Radio Websites:

ARRL, AC6V, DX Zone, QRZ.com, eHam.com, Radio wave Propagation Center, Space Weather Prediction Center, TAPR(Tuscon Amateur Packet Radio), AMSAT, WA7BNM Contest Calendar, YOTA (Youngsters On The Air)

New Stuff:

The Tipton County Indiana Amateur Radio Club is an exempt organization under Section 501(c) (3) of the Internal Revenue Code.

Keep in mind Kirchhoff's Voltage Law where the sum of the potential rises and drops around a closed loop is zero.

Voltage divider rule: Vx = Rx * V/ Rt.

So, the voltage across any resistor (or combination of series resistors) is equal to the value of that resistor multiplied by the potential difference across the series circuit and divided by the total resistance of the circuit.

Voltage is always the same across parallel resistors.

Conductance: The total conductance of a parallel circuit is equal to the sum of the conductance's of the branches. Conductance is the reciprocal of resistance

Conductance "G" = 1 / R, $G_t = G_1 + G_2 + G_3 \ldots..G_n$

And Gt = G1 + G2 + G3 + …Gn or 1/Rt = 1/R1 + 1/R2 + 1/R3 + … 1/Rn

I have forgotten something: Current Divider: I1 = (Rt / R1) * I

In parallel circuits…

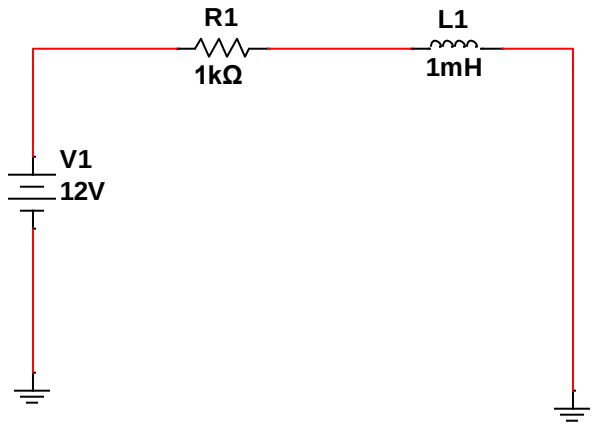
And: I1 = *(R2* * I) / R1 + R2 Note where R1 and R2 are in each formula.

And: I2 = (*R1* * I) /(R1 + R2)

So, the last few papers we have encountered a new alphabet. We found DC, now we have found AC. We have R for resistor, I for current and E or V for voltage. A new abbreviation is now appropriate… ABC… Always Be Careful. The circuits I have drawn for this exercise have been run on 9 volts. Just a small battery, no big thing BUT electricity comes in different voltages, and currents. Some of these can be huge and if you are not the one who should be messing with those circuits… Don't. Let someone else with more experience do it.

And just when you think you know something, along comes something else. Inductors: What pray tell is an Inductor? This little wiggly line that says L1 at 1mH is an inductor. And, the circuit drawn here is called and RL circuit. This is for

Resistance and Inductance. Capacitors and inductors do not exhibit resistance circuit can be confused with resistance anywhere in a circuit so in a capacitive and inductive circuit we have reactance. So why is it call and RL circuit when Inductor starts with I? I don't know. I think the term "Inductor" comes from the action the inductor does in the circuit… it induces a voltage in the circuit.



What does an Inductor do? How does an Inductor work? Hang on. First, an Inductor in a DC circuit does nothing. The DC sees the wire and just does along and does nothing but go down the wire.

If you have two magnets with N and S poles facing each other and between them you hang a conductor, you will induce a voltage in the conductor. The induced current passing through the coil will act to oppose any change in existing current. Now, in one cycle the field is expanding and the field that is induced acts to prevent a change (increase) in current. On the other cycle, as the current decreases the field acts to prevent also a change in current (decrease).

There was a guy named Lenz who had a law named after him and its of course called Lenz's Law, which goes like this, The direction of an induced voltage or current is such that it opposes the change that caused it.

Self-Inductance is the property of an electric circuit where a voltage is induced when the current flowing in a circuit changes.

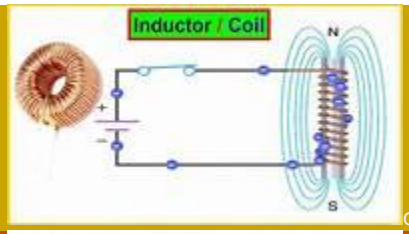
Inductance is measured in Henrys, mostly mH and uH.

Mutual Inductance is a measure of coupling between two inductors. If no flux lines cut through the other coil mutual inductance (Lm) is 0. If all flux lines cut through a coil, Lm is 1.

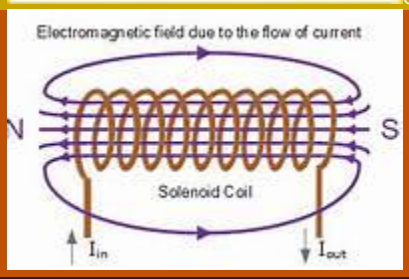
When you have inductors in a series they add like resistors: Lt = L1 + L2 + L3… Ln. This is true as long as there are no coupling of flux lines between inductors; Lm = 0.

Inductors in parallel are handled like resistors in parallel and the equations are the same format Lt = 1 / 1/L1 + 1 / L2 + 1 / L3 … When you only have two inductors in parallel, Lt = L1 * L2 / L1 + L2.

The energy in an inductor is stored in a magnetic field. The energy is returned to the circuit when the filed collapses. The indictor opposes instantaneous change in circuit current. An inductor charges and discharges similar to a capacitor. Last month I showed you a capacitor charging then discharging. It takes 5-time constants to charge or discharge an inductor. Be very careful if you have a switch in the line as an open switch will cause the resistance to approach infinity and the time constant becomes very small and the energy in the field will be returned very quickly. A large voltage can throw sparks…. Be careful.



cept of transformers



Save

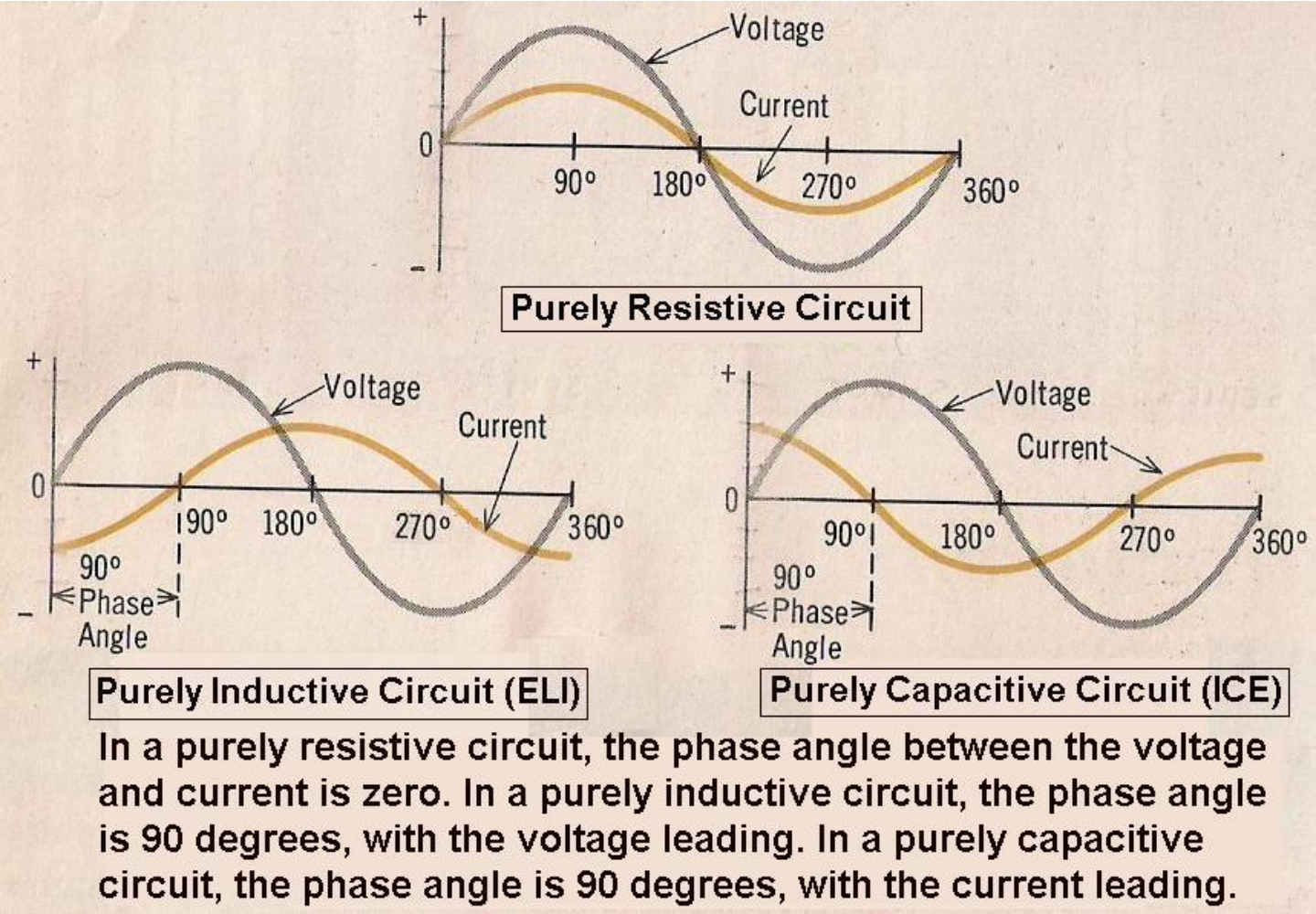
Lastly: Does anyone like to learn new things? The following is a list of places that offer classes. Most of these are I think college level. And, many of them are free. But if you go to these web sites you can get the full scope. Coursera, Ed-X, Harvard, Open Yale,

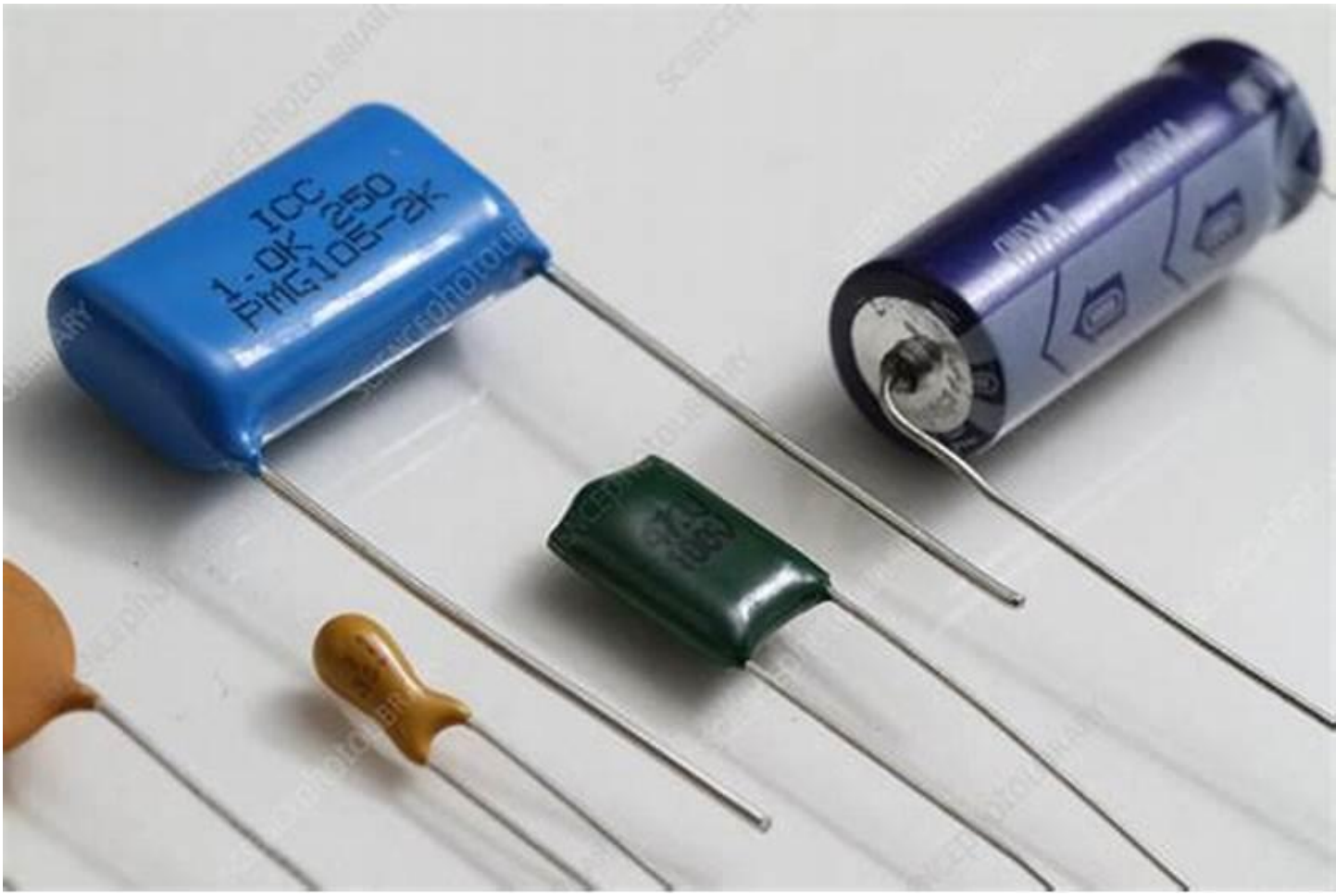
Stanford, Ted- ed, Code Academy. Udemy, LearnItLive, Libby-Library, MIT open Courseware, Udacity, Freecodecamp, TheOdinProject.

Look these up if you are interested in learning something new.

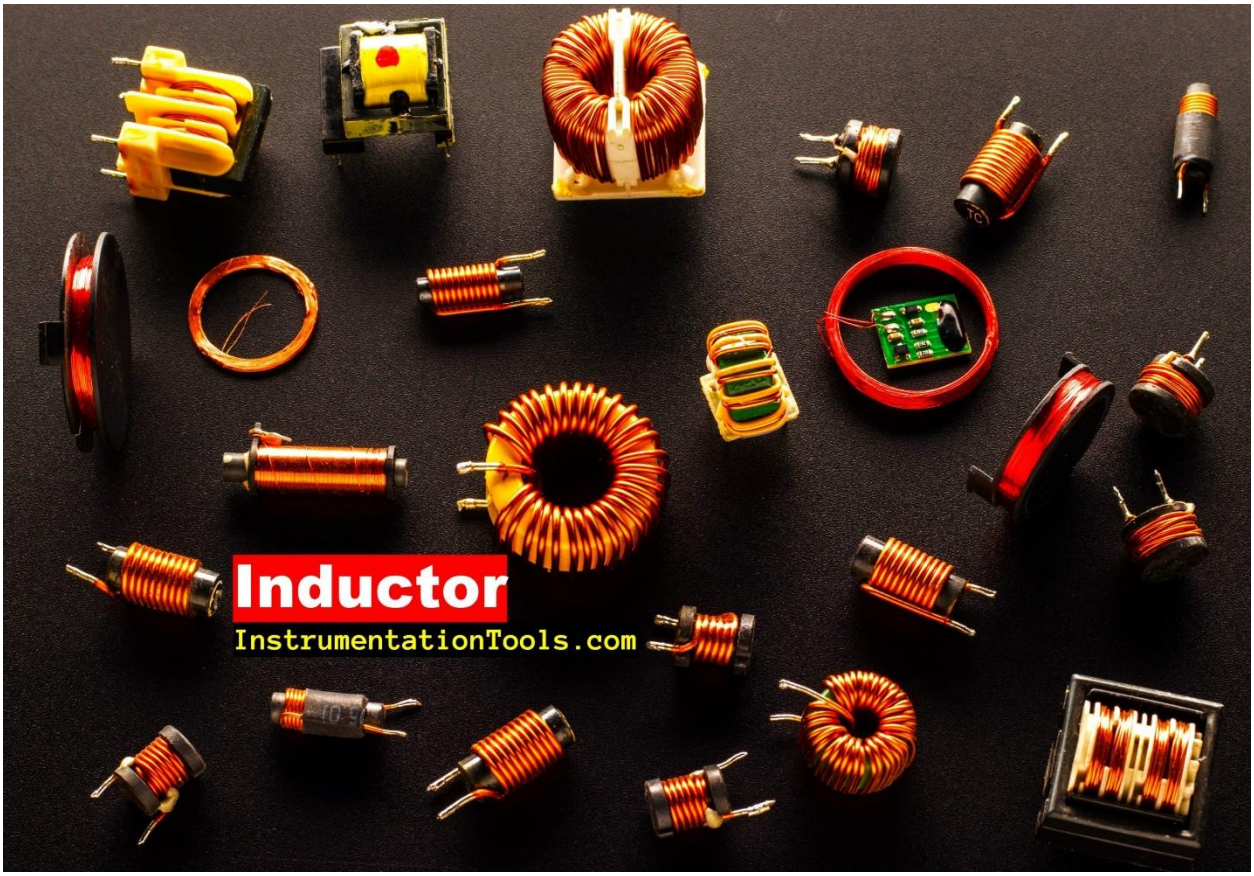
The first drawing shows the power source as a battery. I don't think batteries work very well as a power source for inductors. The second drawing shows the formation of the magnetic field around the inductor. This is where energy is stored.

So now you know a little about Capacitors and Inductors, let me introduce you to a new friend. His name is ELI and he is an ICE man. So, who is he… ELI says that in an inductor(L) circuit, Voltage (E) leads current (I) by 90 degrees. You can see that in the name ELI. Now, the ICE man says that in a capacitor(C) circuit, current(I) leads voltage(E) by 90 degrees. You can see that in ICE. I refer you to the video at the KHAN Academy for clarification. www.khanacademy.org/ELI the ICE man. You are about to be introduced to phase and phase shift.


+
Voltage
Current
0
90°
180°
270°
360°
–
Purely Resistive Circuit
+
Voltage
Current
0
90°
180°
270°
360°
90°
Phase
Angle
–
Purely Inductive Circuit (ELI)
+
Voltage
Current
0
90°
180°
270°
360°
90°
Phase
Angle
–
Purely Capacitive Circuit (ICE)
In a purely resistive circuit, the phase angle between the voltage and current is zero. In a purely inductive circuit, the phase angle is 90 degrees, with the voltage leading. In a purely capacitive circuit, the phase angle is 90 degrees, with the current leading.



A photograph of “some” capacitors.



Photographs of “some” inductors.

To calculate reactance in henrys, $X_l = 2\pi fL$. F = frequency, L = the value of the inductance in henrys of the device (printed on the device). Π = pi, 3.14159….. .

Congratulations, you have just completed Eds Electronics course number 100. DC Circuits.

“Everyone thinks of changing the world, but no one thinks of changing himself.”

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