Explaining Reactance:

Critical points to consider about Inductance and Capacitance:

- Inductors and Capacitors **Store Energy**.
- They do not Dissapate (Transform) Energy like Resistance does, like in the form of heat.
- In an antenna, they give it back to the XMTR, **rather than Radiating it as Power Transmitted**. In this case, the antenna looks like **pure resistance**.
- Inductors do not like CHANGES in current.
- Capacitors do not like CHANGES in voltage.
- In both cases the **RATE of CHANGE** is critical
  - This is why the formulas for Inductive Reactance and Capacitive Reactance have frequency as a primary component.
- Inductors oppose an increase in current by producing a **CEMF**
  - They also appear as an open circuit to the change, to the source.
- Capacitors oppose an increase in voltage by drawing current from the source
  - They look like a short circuit to the change, to the source.
- Inductors use the applied energy to store in an **Electromagnetic Field**, as current begins to flow.
- Capacitors use the applied energy to store in an **Electrostatic Field** as the voltage charge increases.
- As the "Rate of Change" increases, as in the frequency that is applied, an inductor will oppose the change in current more and more, therefore appearing as a higher ohms value.
  - Hence the formula XL = 2*(pi)*freq*Henry
- As the "Rate of Change" increases, as in the frequency that is applied, a capacitor will draw more and more current, therefore appearing as a lower ohms value.
  - Hence the formula XC = 1/(2*(pi)*frequency*Farads)
  - (with the reciprical relationship decreasing the Ohms as frequency increases)

Examples:

1. Automotive spark coil (and capacitor)
2. Power supply filter system
3. Low-Pass-Filter, High-Pass-Filter, BandPass-Filter, Notch-Filter (Band-Pass-Reject)
4. Oscillator-Tuned-Circuits
5. Windherst & VanDeGraph Systems to charge a home-made capacitor