Things you should know about resistors, capacitors, and inductors:

Resistors:

Wattage: The amount of power it can dissipate at room temp (note: it will be extremely hot)
Derating: Lowering the max power dissipation as the ambient temperature increases
TempCo: How the resistor changes with temperature (ppm/C)
Ex: 1K resistor at 25C with 500ppm/c would be 1.025K @ 75C
Tolerance: Initial accuracy of the resistor 0.1%, 1%, 5%, etc
Max Voltage: Above this voltage the resistor could arc, degrade, etc.
Composition: Carbon, metal film, wire wound, etc.
Note: metal film resistors have lower tempCo and thermal noise than carbon film
Note: for RF circuits the resistors inductance becomes important

Inductors:

DCR: DC resistance of the wire
Isat: Above this current the core is saturated and doesn't contribute much to the mag field
Irms: Rated current for a given temperature rise
Q: Quality factor = ratio of inductance to series resistance)
Q = wL / Rs (freq (rad/sec)*inductance/ internal resistance (the DCR))
Core material: Iron, ferrit (different permeability and frequency response)

Capacitors:

Max ripple current: Current at which internal resistance causes cap to be at max temp (freq dep)
Leakage current: DC current that flows in a fully charge capacitor
Polarized: Polarized caps short out if connected backwards (can explode)
ESR: Equivalent series resistance (internal resistance of capacitor)
ESL: Equivalent series inductance
Impedance@freq: Gives you an idea of how well the capacitor will work at high frequency
Tan delta: Dielectric loss factor. ESR divided by the capacitors impedance at some freq.
Ex: a cap has an ESR of 0.1ohm and its impedance is 1.3 ohms @ 100KHz
Tan delta is 0.1/1.25 = 0.8
Note: Tantalum and Electrolytic caps are polarized and can explode if put in backwards!!!
Note: Polypropylene, polyethylene, etc are more stable with temperature than Tantalum and Electrolytic
A capacitor comparison chart (which caps should be used for which purpose) is at:
http://www.phys.ufl.edu/~eshop/caps/caps.html

Note: Not all capacitors work equally well at high frequencies. This is why you'll see different size caps in parallel on some datasheets (usually decoupling caps). The larger cap handles lower frequencies and the smaller cap handles the high frequencies. Paralleling different size caps allows the cap cover a wider frequency range (i.e. lower ESR over a wider frequency range). Look at the following graphs that show capacitance vs. frequency for a few caps:
http://www.physics.unlv.edu/~bill/PHYS483/cap_imp_vs_freq.jpg
http://www.physics.unlv.edu/~bill/PHYS483/cap_imp_vs_freq_2.jpg

Decoupling caps:
Decoupling capacitors are placed across the power supply pins on individual IC's to help isolate that IC from other IC's on the same power bus. Each time the output of a digital IC changes state (low to high for example) the IC has to source current to charge the capacitance of the output pin and any load tied to that pin. Without a decoupling capacitor this current surge would have to come from the power supply through traces on the printed circuit board which has added resistance and inductance and could cause the power supply voltage at the IC to dip momentarily. A decoupling capacitor placed close to the IC power pins can supply this current surge without having the current flow through long power leads. Decoupling caps smooth out the ripple on the power supply and make a glitch less likely. A glitch could be caused by the ripple feeding through the logic and inadvertently trigger a gate to change from a 1 to a 0, prematurely clocking a counter, or just causing noise in a analog circuit).

Note: It's a good habit to put a small decoupling cap (maybe 0.01-0.1uf) across each IC on your breadboard. It's also a good idea to put a larger capacitor (maybe 10uF-100uF) across the power leads where the power supply connects to the breadboard.

Additional info on decoupling caps (not required):
Skim through the first half of this application note on decoupling capacitors. Don't worry about the equations. The main thing is to understand why you should use decoupling caps and have a rough idea of how different size caps respond and that putting them as close to the IC as possible is important.
http://www.analog.com/static/imported-files/tutorials/MT-101.pdf