IEEE's Hands on Practical Electronics (HOPE)

Week 6: PN Junctions, Diodes, Solar Cells

Definitions:

PN Junction: a piece of silicon having an interface of p-type and n-type doping.
Depletion region: in equilibrium the mobile charges leave the PN-junction creating a region depleted of charge carriers
Junction capacitance: capacitance formed from the depletion region
Diode: Made out of a PN Junction, used to block current one way and pass current the other
Solar Cell: Made out of a PN junction. Using the optical properties of silicon to utilize photons to generate current

Diodes:

Free electrons flow from the N side (which has an excess of electrons) to the P side (which has a lack of electrons, or excess of holes)
Electrons continue to flow until equilibrium is reached
Reverse biasing: Applying additional voltage to make the depletion region grow
Forward biasing: Applying voltage to shrink the depletion region allowing electrons to travel through almost without impedance

Note: Having too much voltage difference across a diode will burn it out. Better safe than sorry. Put a resistor in series.

To keep the diode on: Do not let diode reach equilibrium by forcing new electrons into n side and removing them from the p side