Acids and Bases Cheat Sheet
Version 3.0

Acids are substances with a pH lower than 7.
Bases are substances with a pH higher than 7.

Model		Details
Lewis		frequently-mentioned Lewis acids include boron trifluoride and aluminum trichloride, which is used as a catalyst in the Friedel-Crafts reaction
	acid	electron-pair acceptor
	base	electron-pair donor
Brønsted-Lowry		this model describes **conjugate** acids and bases; a base's conjugate acid is formed when the base has accepted a proton in a reaction, and an acid's conjugate base is formed when the acid has donated a proton in a reaction
	acid	proton donor
	base	proton acceptor
Arrhenius		first modern model of acids and bases; superseded by the above models since it's not very effective at describing non-aqueous solutions; typically, Arrhenius acids and bases that interact with each other in a neutralization reaction form water and a salt
	acid	dissociates in water to form H+ hydrogen ions (protonation of water), resulting in the formation of hydronium (H_3O^+)
	base	dissociates in water to form OH- hydroxide ions

Strong Acids are acids that completely dissociate into H+ and an anion in water.
Weak Acids are acids that do not completely dissociate in water.

Acid	Formula	Details
acetic acid	CH_3COOH	weak acid; a carboxylic acid (due to the -COOH functional group) found in vinegar
hydrochloric acid	HCl	strong acid; makes up a large portion of stomach acid; forms aqua regia (name means "royal water" because it can dissolve gold and other metals) with nitric acid; forms sodium chloride and water when combined with sodium hydroxide
nitric acid	HNO_3	strong acid; forms aqua regia (name means "royal water" because it can dissolve gold and other metals) with hydrochloric acid
sulfuric acid	H_2SO_4	strong acid; used in lead-acid batteries; created in the contact process with a vanadium (pent)oxide catalyst; only diprotic strong acid, meaning it donates two protons per molecule instead of one in water