# Worksheet 2.1: Acids and Bases KEY

**What is the definition for Bronsted Lowry acids and bases?**

Bronsted Lowry Acid: Substance that donates (loses) a proton.

Bronsted Lowry Base: Substance that can accept (receives) a proton.

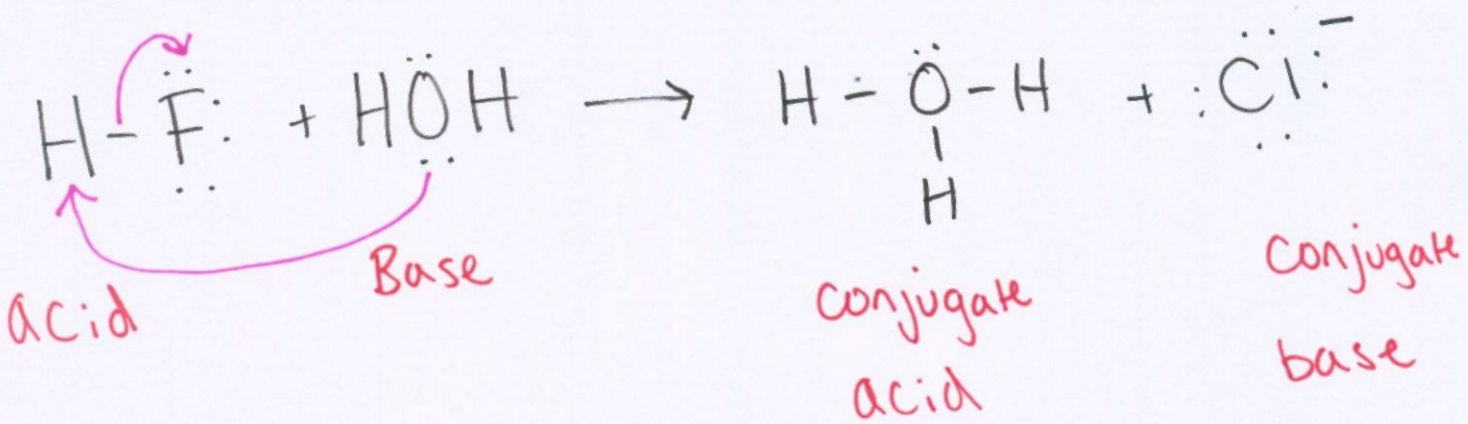
**What is the definition for Lewis acids and bases?**

Lewis Acid: Electron pair acceptor.

Lewis Base: Electron pair donor.

**Draw and complete the Acid Base reaction with curved arrows to show electron flow in this reaction:**

**HF + $H_2O$** ⟶ $H_3O^+ + Cl^-$



**What are the 7 strong acids?**

HI, HBr, HCl, $HNO_3$, $HClO_3$, $HClO_4$, $H_2SO_4$

**If you have a weak acid, what strength will it's conjugate base be?**

Strong Conjugate Base

**What is the trend between $K_a$ and $pK_a$, in reference to strong and weak acids and bases?** · The lower the pka the stronger the acid

· The higher the $K_a$ value the stronger the acid

pKa increasing ~~strength~~ acidity ←

low pka
strong acid

high pka
weaker acid

inversly related

low Ka — Ka increasing acidity → high Ka

weak acid — stronger acid

**Define a Nucleophile:**

A carbanion (Lewis base), a nucleophile seeks positive charge, wants to donate a pair of electrons.

**Explain Inductive Effects:**

- electron effects transmitted through bonds
- Inductive effects weaken as the distance from the group becomes larger

$C_2$ $C_1$

$H_3C - CH_2 - Cl$

$\delta^+$ $\delta^+$ $\delta^-$

The partial negative charge Cl imparts on $C_1$ makes $C_1$ have a greater (+) effect from Cl, because $C_1$ is closer to Cl then $C_2$, Carbon 2 has less of an inductive effect.