- What are acids and bases? —> the Brønsted–Lowry theory of acids and bases:
    - An acid is a chemical species that, in solution, donates a proton
        - Example in solution: HA —> A(-) + H(+)
        - H(+) is seen as a proton
    - Bases are chemical species that, in solution, accepts a proton (H+)
        - Example reaction: B(-) + H(+) —> BH
    - In solution, when acids and bases meet:
        - HA (acid species) + B(-) —> A(-) + BH
            - A(-) = acid species that has donated H(+)
            - BH = Base species that has accepted an H(+)
    - An example of an acid-base reaction:
        - The dissociation reaction of Hydrochloric acid (HCl)
            - HCl (aq) —> H(+) (aq) + Cl(-) (aq)
            - HCl (aq) + H2O (l) —> H3O(+) (aq) + Cl(-) (aq)
- Water as an acid and a base
    - Depending on the reaction, water can be an acid, base, or a product.
        - Water as a base —> Example: The dissociation reaction of Hydrochloric acid (HCl)
            - HCl (aq) + H2O (l) —> H3O(+) (aq) + Cl(-) (aq)
            - In this case, water accepts a proton from HCl to create Hydronium ions (H3O+)
        - Water as an acid
            - H2O (l) + NH3 (aq) —> NH4(+) (aq) + OH(-) (aq)
                - In this case, water donates a proton to ammonia (NH3) in order to create ammonium ions (NH4+)
        - Water as a product of a reaction —> created in some acid-base reactions
            - CH3COOH (aq) + OH(-) (aq) —> CH3COO (-) (aq) + H2O (l)
            - Acetic acid reacts with hydroxide to create acetate and water
- Conjugate acid-base pairs
    - Reactant acids become conjugate bases in products
    - Reactant bases become conjugate acids in products
    - In each acid-base reaction, there will be two conjugate pairs
    - These pairs are reversible
    - Example reaction:
        - Acid (A) + Base (B) —> Conjugate acid (C.A) + Conjugate base (C.B)
        - Dissociation of Hydrochloric acid:
            - HCl (aq) + H2O (l) —> H3O(+) (aq) + Cl(-) (aq)
                - HCl is the reactant acid
                - H2O is the reactant base
                - H3O(+) is the conjugate acid of H2O
                - Cl(-) is the conjugate base of HCl
- Amphiprotic species
    - An amphiprotic species have the ability to accept or donate protons (H+)
    - Water is an amphiprotic species since it has the ability to accept protons to become H3O+ or donate protons to become OH-
- Strong acids and strong bases
    - Strong acids completely dissociate into ions in solutions and all protons are donated to base
        - Some common strong acids:
            - HCl, HBr, H2SO4, HI, HClO4, HNO3
    - Strong bases completely dissociate into ions in solutions and generate OH- ions from reactant bases

- Some common strong bases:
  - NaOH, LiOH, KOH, Ca(OH)2, Ba(OH)2