CONCEPT: ELECTROPLATING

- The use of electrical current to _____ metal cations onto a metal electrode.
  - □ Electrical Current: the _____ at which electrons move from electrode to electrode in a closed complete circuit.
    - The SI unit for electrical current is _____ (A) with 1 A = ____ C/s

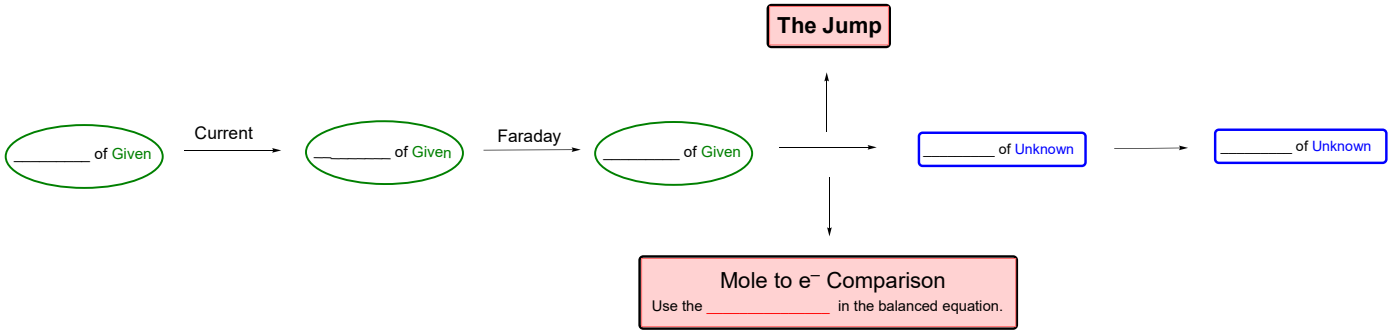
EXAMPLE: Determine the electrical current produced if a charge 4.14 x 10^3 C passes through a wire for 15 mins.

Electrochemical Stoichiometric Chart (Time)

- Electrochemical Stoichiometry deals with calculations in electrochemical cells that involve current and charge.

Electrochemical Stoichiometric Chart (Time)

This version is used when the **given amount** is in units of time.



EXAMPLE: Gold can be plated out of a solution containing Au^{3+} based on the following half reaction:

$$Au^{3+}(aq) + 3\,e^- \longrightarrow Au(s)$$

What mass of gold is plated by a 41 minute flow of 6.8 A current?

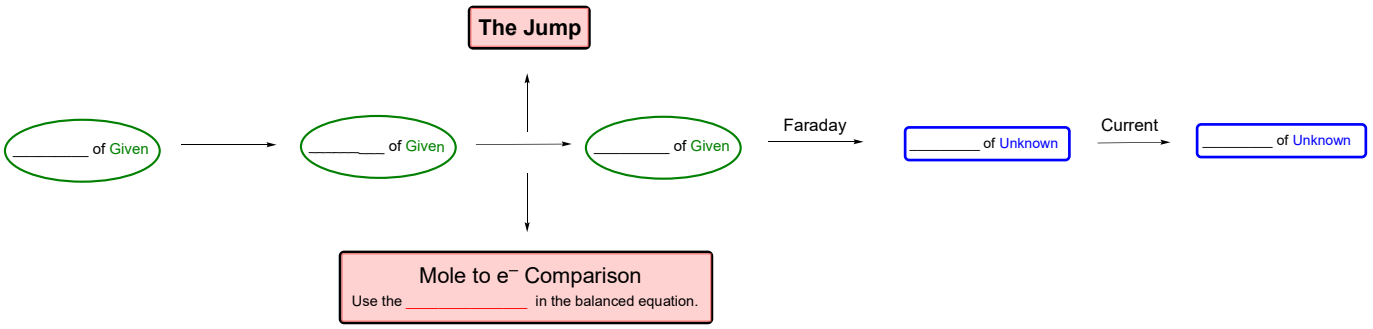
CONCEPT: ELECTROPLATING

Electrochemical Stoichiometric Chart (Mass)

- When the initial mass for a half reaction is given we can utilize the mass version of the stoichiometric chart to find time.

Electrochemical Stoichiometric Chart (Mass)

This version is used when the **given amount** is in units of mass.



EXAMPLE: How much time (in hours) would it take to plate out 42.1 g nickel using a current of 3.08 A?

$$Ni^{2+}\ (aq) + 2\ e^- \longrightarrow Ni\ (s)$$

PRACTICE: Cu^{2+} is reduced to Cu(s) at an electrode. If a current of 1.25 A is passed for 72 hours, what mass of copper is deposited at the electrode? (MW of Cu: 63.55 g/mol)

PRACITCE: A solution of Mn^{+5} is used to plate out Mn in an electrochemical cell. If a total of 1.13 g of Mn is plated out in a total time of 1600 seconds, what was the electrical current used? (MW of Mn is 54.94 g/mol)