Mineral Identification Flowchart

Start Here

- **NON-METALLIC**
  - Harder than glass
    - Poor/No cleavage
      - Glassy luster, any color can occur. Conchoidal fracture. Hexagonal crystals common. Hardness 7. → **Quartz**
      - Barrel shaped, hexagonal crystals. Hardness 9. Commonly brown, but various colors. → **Corundum**
      - **Dodecahedron crystal balls** → Color often dark red or reddish brown. Vitreous luster. Fracture may resemble poor cleavage. Hardness 7-7.5. Colorless streak. → **Garnet**
      - **Green sand grains** → Vitreous luster. Commonly in granular masses (looks like sand grains). Hardness 6.5-7. → **Olivine**
      - **Forms X-shaped crystals** → Vitreous, resinous, or dull luster. Red-brown to brownish-black. Prismatic and X or cross-shaped crystals. Hardness 7-7.5. → **Staurolite**
    - Cleavage
      - Perfect in 2 directions
        - **Blue blades** → Vitreous luster. Light blue. Hardness 4.5-5.5. Parallel to crystal, but 7 if tested against short length. Blade-shaped crystals. → **Kyanite**
        - **Cleavage difficult to determine** (imperfect) → Various, bluish green. Hardness 7.5-8. Elongated six-sided crystal prisms with flat ends common. → **Beryl**
      - 2 directions not at 90°
        - Vitreous luster. Dark green or black. Cleavage planes at 56 and 124 degrees. Hardness 5-6. → **Amphibole** (Hornblende)
        - Vitreous to dull luster. Black to dark green. Tends to look “blocky”. Hardness 5.5-6. → **Pyroxene** (Augite)
      - 2 directions at 90°
        - **Striations** → Vitreous luster. Darker colors. Hardness 6-6.5. Striations visible on cleavage face. → **Plagioclase Feldspar** (Ca-Plag, Anorthite)
        - **Dissolution lines** → Vitreous luster. Light colors often. Hardness 6-6.5. Dissolution lines visible. → **Plagioclase Feldspar** (Na-Plag, Albite)
        - Vitreous luster (glassy). Usually pink. Hardness 6. → **Potassium Feldspar** (K-Spar, Orthoclase)
  - Softer than glass
    - Cleavage next page
    - No cleavage
      - Red-brown Streak
        - **Strong red-brown streak** → Earthy luster and strong red color, silvery can be metallic. Hardness 5-6.5. → **Hematite**
      - Yellow/Light brown streak
        - Earthy luster. Found in earthy masses. Hardness 1-5, depending on weathering. → **Limonite**
      - Light yellow streak
        - **Bright yellow color** → Resinous or vitreous luster. Bright yellow color. Hardness 1.5-2.5. → **Sulfur**
      - Light green streak
        - **Some samples-** Perfect cleavage in only 1 direction → Bright blue-green/green. Hardness 3.5-4. Occurs usually as tiny crystals. Often associated with azurite (bright blue). → **Malachite**

Mineral Identification Flowchart (Continued)

- **NON-METALLIC**
  - Softer than glass
    - Cleavage
      - 1 direction
        - **Light flaky sheets** → Vitreous luster. Colorless to light shades of green. Hardness 2-3. White streak. → **Muscovite Mica**
        - **Dark flaky sheets** → Vitreous luster. Dark green, brown, and black. Hardness 2.5-3. White to gray streak. → **Biotite Mica**
        - Vitreous luster. Green to greenish black. White to pale green. May have slippery feel. Hardness 2-3. White streak. Perfect cleavage. → **Chlorite**
        - **Soapy feel** → Pearly to greasy luster. Pale shade of green and gray. Hardness 1. Greasy feel. White streak. Perfect cleavage. → **Talc**
      - **Can easily scratch with fingernail. Sometimes might have 3 cleavages.** → Vitreous to pearly luster. Colorless to white. Hardness 2. Crystals common. Found in columns and easy to scratch with fingernail. → **Gypsum**
      - 2 directions at 90°
        - Vitreous to pearly. White to gray. Hardness 4.5-5. → **Wollastonite**
      - 3 directions at 90°
        - **Tastes like salt** → Vitreous luster. Hardness 2-2.5. Perfect cubic cleavage. → **Halite**
      - 3 directions not at 90°
        - **Reacts with acid** → Vitreous luster. White to gray streak. Many colors possible. Hardness 3.
        - **Reacts with acid** → Vitreous to pearly luster. Many colors possible. White streak. Only reacts with acid when powdered. Hardness 3.5-4. → **Dolomite**
      - 4 directions
        - **Glows under fluorescent light** → Vitreous luster. Many colors possible. Hardness ≥ 4. → **Fluorite**

Start Here

- **METALLIC**
  - Black to gray streak
    - No cleavage
      - **Magnetic** → Black color. Hardness 5.5-6. Strongly magnetic. → **Magnetite**
    - 1 direction of cleavage, difficult to see.
      - **Smudges fingers** → Dark gray to black color. Greasy feel and smudges fingers. Hardness 1-2. → **Graphite**
    - 3 directions of cleavage at 90°
      - **Perfect cleavage (cubes)** → Bright metallic luster. Shiny lead-gray color. Hardness 2.5. Streak lead-gray. High specific gravity. → **Galena**
  - Green-black or dark green streak
    - No cleavage
      - **“Fool’s gold”** → Brass-yellow color. Hardness 6-6.5. No cleavage. Cubic crystals common with striated faces. → **Pyrite**
    - No cleavage
      - Brass-yellow color. Often tarnished to purple or bronze. Hardness 3.5-4. → **Chalcopyrite**
  - No cleavage
    - **Strong red-brown Streak** → Steel-gray or red-brown color. Hardness 5-6. Often breaks into thin sheets. Brittle. → **Hematite**
  - Yellow, brown, or black streak
    - No cleavage
      - Yellow-brown to dark brown color, also maybe black. Hardness 5.5-6. Brittle. → **Ilmenite**