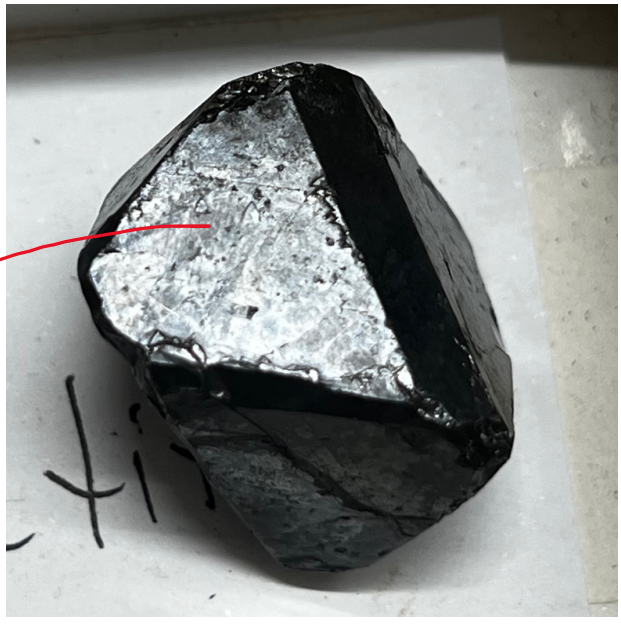
Mineral name: Magnetite

General Mineral formula: $FeFe_2O_4$
Mineral chemical class: Oxide

Specific Gravity: 5.18	**Crystal System:** Isometric
Hardness: 5.5-6.5	**Crystal Class:** 4/m 3bar 2/m
Cleavage: None , Brittle Fracture	**Crystal description (common forms, habit, etc.):** • Octahedral Crystals • Euhedral • Magnetic
Luster: Dull Metallic	
Streak: Black	
Characteristic Color(s): Black	

Environment (where you find the mineral): • accessory mineral in both igneous and metamorphic rocks • Biomineral • Clastic sediments	**Common Mineral Associations (in samples; also consult text, notes):** • ilmenite or hematite •

Scientific use/significance: • Using magnetite to control cells	**Industrial or societal use/significance:** • Iron Ore • High density concrete aggregate	**Environmental significance:** •



Mineral name: Hematite

General Mineral formula: Fe_2O_3
Mineral chemical class: Oxide

Specific Gravity: 5.25	**Crystal System:** Hexagonal (Trigonal)
Hardness: 5-6	**Crystal Class: 3bar 2/m**
Cleavage: None, Brittle fractures	**Crystal description (common forms, habit, etc.):** • Platy, almost micaceous • Anhedral
Luster: Metallic	
Streak: Red-Brown	
Characteristic Color(s): Steel Gray	

Environment (where you find the mineral): • Weathering or hydrothermal alteration of iron-bearing minerals • Major mineral in iron formations	**Common Mineral Associations (in samples; also consult text, notes):** • Magnetite, Quartz, Carbonates, Fe-silicates

Scientific use/significance: •	**Industrial or societal use/significance:** • Iron Ore • Abrasive and pigment • Dietary Iron	**Environmental significance:** • Banded iron precipitation in the past.

Steel Gray Color

Platy, Micaceous habit with flakes that break off easily

Mineral name: Goethite

General Mineral formula: FeO(OH)
Mineral chemical class: Hydroxide

Specific Gravity: 4.3	**Crystal System:** Orthorhombic
Hardness: 5-5.5	**Crystal Class: 2/m 2/m 2/m**
Cleavage: 2 planes of cleavage	**Crystal description (common forms, habit, etc.):** • Botryoidal • Radial fibers / columnar • Mostly anhedral
Luster: Metallic / Dull	
Streak: Brown	
Characteristic Color(s): Reddish-Brown, Grayish-Brown	

Environment (where you find the mineral): • Weathering and hydrothermal alterations	**Common Mineral Associations (in samples; also consult text, notes):** • Hematite, lepidocrocite

Scientific use/significance: • Soluble in HCL	**Industrial or societal use/significance:** • Iron Ore	**Environmental significance:** •

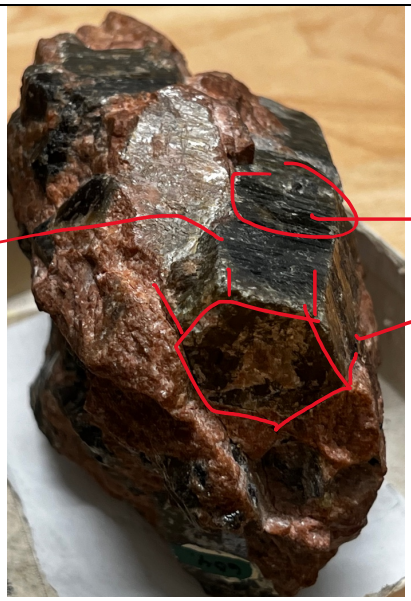
Mineral name: Corundum

General Mineral formula: Al_2O_3
Mineral chemical class: Oxide

Specific Gravity: 4	**Crystal System:** Hexagonal (Trigonal)
Hardness: 9	**Crystal Class: 3bar 2/m**
Cleavage: None	**Crystal description (common forms, habit, etc.):** • Hexagonal Prisms • Striations
Luster: Vitreous	
Streak: White	
Characteristic Color(s): Grayish Brown, red, blue	

Environment (where you find the mineral): • Al-rich si-poor environments, such as metapelites •	**Common Mineral Associations (in samples; also consult text, notes):** • muscovite, margarite, andalusite, sillimanite, kyanite, diaspore, gibbsite

Scientific use/significance: • Can be used for high strength optics	**Industrial or societal use/significance:** • Gemstone / Rubys / Saphhires • Historical Abrasive •	**Environmental significance:** •



Mineral name: Halite

General Mineral formula: NaCl
Mineral chemical class: Halide

Specific Gravity: 2.2	**Crystal System:** Isometric
Hardness: 2.5	**Crystal Class:** 4/m 3bar 2/m
Cleavage: Cubic Cleavage	**Crystal description (common forms, habit, etc.):** • Colorless Cubes • Euhedral
Luster: Vitreous	
Streak: White	
Characteristic Color(s): Colorless	

Environment (where you find the mineral): • Evaporite Deposits	**Common Mineral Associations (in samples; also consult text, notes):** • calcite, dolomite, gypsum, anhydrite, and sylvite

Scientific use/significance: • Rusting Metals	**Industrial or societal use/significance:** • Dietary Supplement • Preservative, metal processing • Paper Manufacturing	**Environmental significance:** • Obtained through underground mining, or evaporation

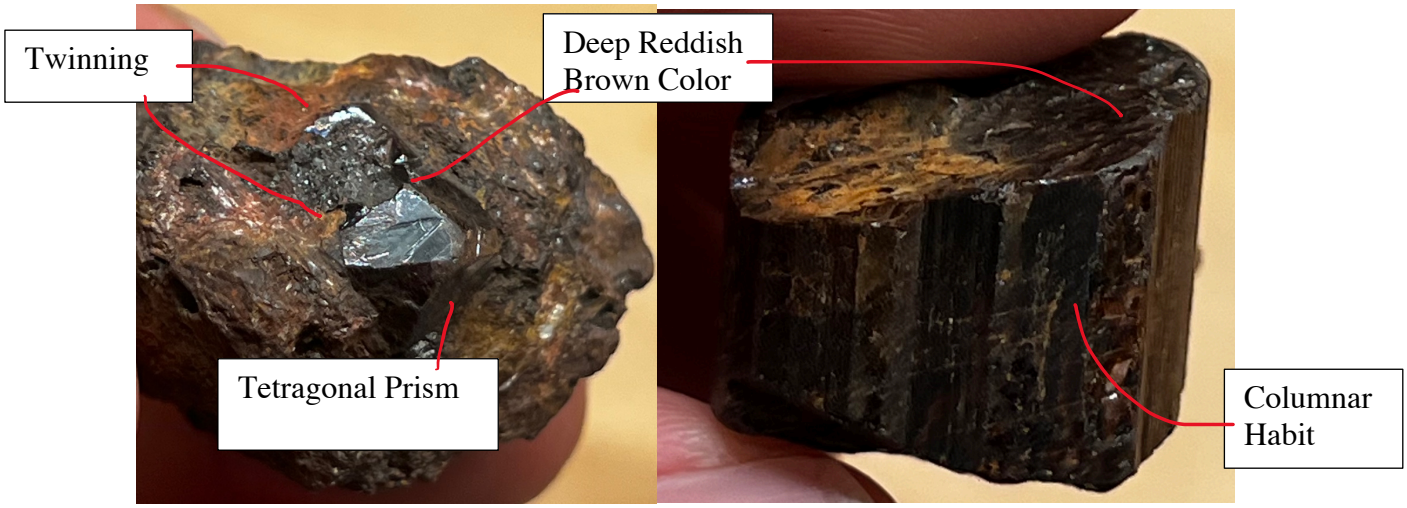
Mineral name: Rutile

General Mineral formula: TiO_2
Mineral chemical class: Oxide

Specific Gravity: 4.23-5.5	**Crystal System:** Tetragonal
Hardness: 6-6.5	**Crystal Class:** 4/m 2/m 2/m
Cleavage: {110} good, { 010} fair plane	**Crystal description (common forms, habit, etc.):** • Fibrous / Columnar Crystals or tetragonal prisms • Subhedral
Luster: Metallic to Adamantine (Can appear resinous)	
Streak: White	
Characteristic Color(s): Deep Reddish Brown	

Environment (where you find the mineral): • Accessory mineral in many igneous and metamorphic rocks • Placer Deposits	**Common Mineral Associations (in samples; also consult text, notes):** • Leucoxene • ilmenite

Scientific use/significance: • Zirconium in rutile can be used as a geothermometer	**Industrial or societal use/significance:** • Titanium Ore	**Environmental significance:** •



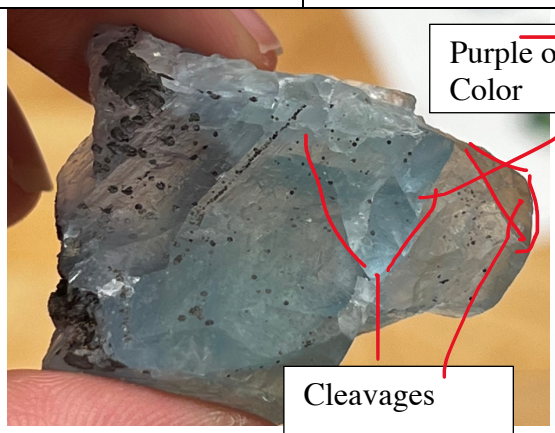
Mineral name: Fluorite

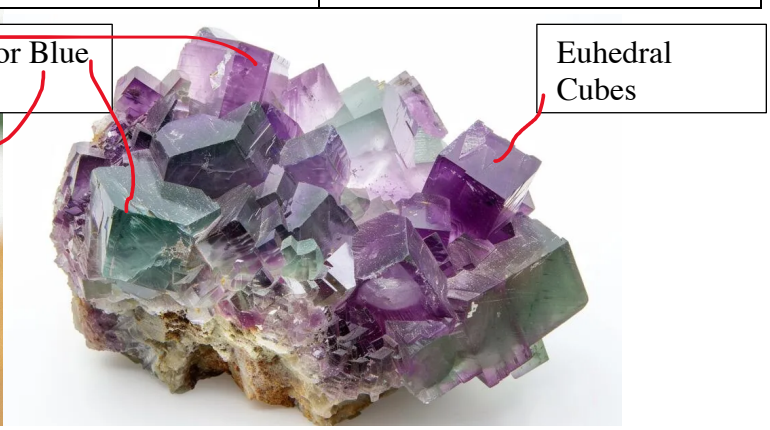
General Mineral formula: CaF_2
Mineral chemical class: Halide

Specific Gravity: 3.18	**Crystal System:** Isometric
Hardness: 4	**Crystal Class:** 4/m 3bar 2/m
Cleavage: Perfect {111} cleavage, 4 directions which turns into octahedrons	**Crystal description (common forms, habit, etc.):** • Cleavable Cubes, can also be anhedral mass • Euhedral
Luster: Vitreous	
Streak: White	
Characteristic Color(s): Blue/green or purple, can also be colorless	

Environment (where you find the mineral): • Hydrothermal Mineral Deposits • granite, pegmatites, syenite	**Common Mineral Associations (in samples; also consult text, notes):** • pyrite, galena, sphalerite, sulfides etc.

Scientific use/significance: •	**Industrial or societal use/significance:** • Drinking water, toothpastes for cavity prevention • Flux steelmaking •	**Environmental significance:** • Biomineral in gastropods • Chlorofluorocarbon which resulted in loss of ozone





Mineral name: Apatite

General Mineral formula: $Ca_5(PO_4)_3(F,Cl,OH)$
Mineral chemical class: Phosphate

Specific Gravity: 3.1-3.35	**Crystal System:** Hexagonal
Hardness: 5	**Crystal Class: 6/m**
Cleavage: No cleavage, brittle fracture,	**Crystal description (common forms, habit, etc.):** • Elongated Hexagonal Prisms ended with a dipyramid • Euhedral
Luster: Vitreous	
Streak: White	
Characteristic Color(s): Blue-Green, teal	

Environment (where you find the mineral): • accessory mineral in a wide variety of igneous and metamorphic rocks • detrital grains in elastic sedimentary rocks	**Common Mineral Associations (in samples; also consult text, notes):** • Endmembers - Fluorapatite [Ca5(PO4)3F], hydroxylapatite [Ca5(PO4)3OH], and chlorapatite [Ca5(PO4)3Cl] • turquoise, serpentine

Scientific use/significance: •	**Industrial or societal use/significance:** • Phosphates for Fertilizer • Flourine • Gemstone	**Environmental significance:** • Most common phosphate mineral