

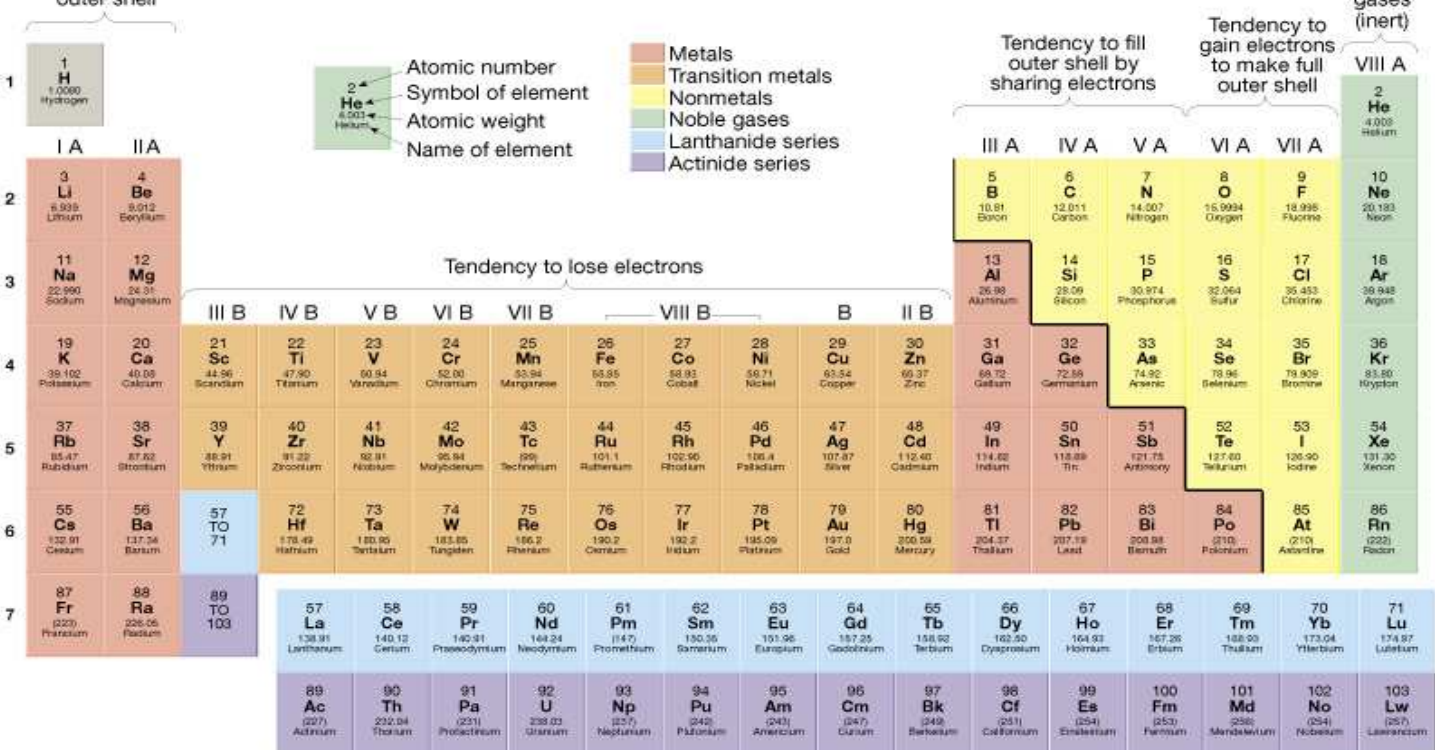
Mineral Classification Chart



Group 1 Metallic Luster

Harder than Glass	Black Streak	Magnetic ; black to dark grey; Sp. Gr. = 5.2; H = 6; commonly occurs in granular masses; single crystals are octahedral	MAGNETITE Fe ₃ O ₄
	Greenish black Streak	Brass Yellow ; may occur as well formed cubic crystals ; common in granular aggregates; H = 6–6.5; Sp. Gr. = 5; uneven fracture	PYRITE FeS ₂
	Reddish Brown Streak	Steel gray; red to red-brown streak; black to dark brown ; granular, can be fibrous (rare), micaceous; single crystals are thick plates; H = 5–6; Sp. Gr. = 5; uneven fracture	HEMATITE Fe ₂ O ₃
Softer than Glass	Greenish black Streak	Golden yellow color ; may tarnish purple or black; H = 4; Sp. Gr. = 4.3	CHALCOPYRITE CuFeS ₂
	Grey-Black Streak	Silvery gray ; hardness = 2.5; specific gravity = 7.6 (very heavy); good cubic cleavage.	GALENA PbS
	Yellow Brown Streak	Yellow, brown, or black ; hard structureless or radial (rarely fibrous) masses; H = varies from 1 to 6; Sp. Gr. = 3.5–4; often found in rounded masses; earthy appearance	LIMONITE (Yellow Ochre) Fe ₂ O ₃ · H ₂ O
	Copper	Generally tarnished to brown or green; H = 2.5; Sp. Gr. = 9; massive.	COPPER Cu
Softer than 2.5	Grey-Black Streak	Black to Bronze ; tarnishes to purple and greens; hardness = 3; specific gravity = 5; massive.	BORNITE Cu ₅ FeS ₄
	Grey to Black Streak	Steel gray ; soft, smudges fingers and marks paper, greasy feel; H = 1; Sp. Gr. = 2; luster may be <i>dull</i> or sub-metallic	GRAPHITE C

Tendency to lose outermost electrons to uncover full outer shell



Group 2



Nonmetallic Luster--Dark Color

Harder than glass	Cleavage Present	Cleavage--2 directions nearly at 90° ; dark green to black; H = 6; Sp. Gr. = 3.5	PEROXENE GROUP Complex Ca, Mg, Fe, Al silicates
		Cleavage--2 directions at approximately 60° and 120° ; dark green to black or brown; H = 6; Sp. Gr. = 3.5. Part of the AMPHIBOLE group.	HORNBLLENDE Complex Na, Ca, Mg, Fe, Al silicates
		Black to Greenish black ; hardness = 5-6; specific gravity = 3.4; fair cleavage in two directions at nearly 90 degrees	AUGITE Ca, Mg, Fe, Al Silicate
		Gray to blue-gray ; good cleavage in two directions at approximately 90°; striations on cleavage planes (Sometimes considered a light colored mineral).	PLGIOCLASE FELDSPAR NaAlSi ₃ O ₈ to CaAl ₂ Si ₂ O ₈
	Cleavage Absent	Various shades of green; sometimes yellowish ; commonly occurs in aggregates of small glassy grains; transparent to translucent; glassy luster; H = 6.5-7; Sp. Gr. = 3.5-4.5	OLIVINE (Fe, Mg) ₂ SiO ₄
		Gray to Brown ; hardness = 9; specific gravity = 4; hexagonal crystals common.	CORUNDUM Al ₂ O ₃
		Generally red, brown or yellow (can occur in all colors except blue); glassy luster , conchoidal fracture resembles poor cleavage; commonly occurs in well formed 12-sided crystals; H = 7-7.5; Sp. Gr. = 3.5-4.5	GARNET Fe, Mg, Ca, Al silicates
		Conchoidal fracture ; H = 7; gray to gray-black; vitreous luster; may occur as six-sided prisms topped by pyramids	QUARTZ SiO ₂
Softer than glass	Cleavage Present	Brown to black; 1 perfect cleavage ; thin, flexible, and elastic when in thin sheets; H = 2.5-3; Sp. Gr. = 2.5-3.5	BIOTITE (Black Mica) K(Mg, Fe) ₃ AlSi ₃ O ₁₀ (OH) ₂
		Green to very dark green; 1 cleavage direction ; commonly occurs in foliated or scaly masses; nonelastic plates; H = 2-2.5; Sp. Gr. = 2.5-3.5	CHLORITE (Green Mica) Hydrous Mg, Fe, Al silicate
		Yellowish brown; resinous luster ; cleavage in 6 directions; yellowish brown or nearly white streaks; may give off a sulphuric odor when broken; H = 3.5-4; Sp. Gr. = 4	SPHALERITE (Black Jack) ZnS
		Four perfect cleavage directions ; H = 4; Sp. Gr. = 3; green through purple (all colors), usually pastel; transparent to translucent; cubic crystals	FLUORITE CaF ₂
	Cleavage Absent	Azure blue--dark blue ; conchoidal fracture; brittle; often associated with Malichite, bornite and copper; H = 3.5-4; Sp. Gr. = 3.7-3.8	AZURITE Cu ₃ (CO ₃) ₂ (OH) ₂
		Varies in color from colorless to yellow, green, brown and occasionally red or blue; H = 5 ; Sp. Gr. = 3.2; appears as hexagonal crystals; greasy or vitreous luster; sometimes exhibits poor cleavage in one direction.	APATITE Ca ₅ (PO ₄) ₃ (F,Cl,OH)
		Shades of Green ; light green streak, silky dull luster; specific gravity = 3.9-4; hardness = 3.5-4; reaction to HCl; cleavage sometimes noticeable in one direction crosswise.	MALACHITE Cu ₂ CO ₃ (OH) ₂
		Generally tarnished to brown or green; H = 2.5; Sp. Gr. = 9; massive.	NATIVE COPPER Cu
Softer than 2.5	Cleavage Absent	Red, earthy appearance ; red streak; H = 1.5	HEMATITE (Red Ochre) Fe ₂ O ₃ (earth variety)
		Yellowish brown streak; yellowish brown to dark brown ; commonly in compacted earth masses; H = 1.5	LIMONITE Fe ₂ O ₃ · H ₂ O

Group 3 Nonmetallic Luster--Light Color



Harder than glass	Cleavage Present	Good Cleavage in 2 directions at approximately 90°; commonly salmon colored (pale to dark pink), pearly to vitreous luster; H = 6–6.5; Sp. Gr. = 2.6	Potassium Feldspars ORTHOCLASE KAlSi ₃ O ₈
		Good Cleavage in 2 directions at approximately 85° to 90°; white to gray (any color); striations on some cleavage planes (could also fall within the dark colored minerals).	Plagioclase feldspars: ALBITE NaAlSi ₃ O ₈ to ANORTHITE CaAl ₂ Si ₂ O ₈
	Cleavage Absent	Conchoidal fracture; H = 7; Sp. Gr. = 2.65; transparent to translucent; vitreous luster, 6-sided prismatic crystals terminated by 6-sided triangular faces in well developed crystals; vitreous to waxy; colors range from milky white, rose pink, violet, to smoky gray	QUARTZ SiO ₂ (silica) Varieties: Milky; Smoky; Rose; Amethyst
		Conchoidal fracture; H = 7; variable color; translucent to opaque; dull or clouded luster; colors range widely from white, grey, red, to black. Varieties: Agate; Flint; Chert; Jasper; Opal	CRYPTOCRYSTALLINE QUARTZ SiO ₂
Softer than Glass	Cleavage Present	Perfect cubic cleavage, but can occur from 75° to 105°, salty taste; any color, but generally colorless to white; soluble in water; H = 2–2.5; Sp. Gr. = 2	HALITE NaCl
		Perfect cleavage in 3 directions at approximately 75°; effervesces in HCl; H = 3; colorless, white, or pale yellow, rarely gray or blue; transparent to opaque; Sp. Gr. 2.7	CALCITE CaCO ₃ (fine-grained crystalline aggregates form limestone and marble)
		Three directions of cleavage as in calcite; effervesces in HCl only if powdered; H = 3.5–4; Sp. Gr. = 2.8; color variable but commonly white or pink; rhomb-faced crystals	DOLOMITE CaMg(CO ₃) ₂
		Good cleavage in four directions; H = 4; Sp. Gr. = 3; colorless, yellow, blue, green, or violet; transparent to translucent, cubic crystals	FLUORITE CaF ₂
Softer than 2.5	Cleavage Present	Perfect cleavage in 1 direction, producing thin, elastic sheets; H = 2–3; Sp. Gr. = 2.8; transparent and colorless in thin sheets	MUSCOVITE KAl ₃ AlSi ₃ O ₁₀ (OH) ₂ (White or colorless MICA)
		Perfect Cleavage in 1 direction; poor in two others; H = 2; white; transparent; nonelastic; Sp. Gr. = 2.3 Varieties: Selenite: colorless, transparent; Alabaster: Aggregates of small crystals; Satin spar: fibrous, silky luster	GYPSUM CaSO ₄ · 2H ₂ O
	No visible cleavage	Green to white; soapy feel; pearly luster; H = 1; Sp. Gr. = 2.8; foliated or compact masses; one direction of cleavage forms thin scales and shreds	TALC Mg ₃ Si ₄ O ₁₀ (OH) ₂
		Yellow; hardness = 1-2.5	SULFUR S
		Green to white; hardness = 2.5; fibrous	ASBESTOS (SERPENTINE) Mg, Al Silicate
		Pale to Dark Reddish Brown; hardness = 1-3; dull luster; earthy; often contains spheroidal shaped particles.	BAUXITE Al,
	Cleavage absent	White to red, but mostly white; earthy masses; crystals so small no cleavage is visible; soft, H = 1.2; becomes plastic when moistened; earthy odor	KAOLINITE Al ₄ Si ₄ O ₁₀ (OH) ₈

