




NONMETALLIC MINERALS

	Hardness	Streak	Other Properties	Mineral
Not scratched by steel nail, knife	9	White	gray, red, brown, blue; greasy luster, commonly in six-sided crystals with striated flat ends; no cleavage, S.G. = 3.9-4.1.	CORUNDUM Al_2O_3 aluminum oxide
	8	White	colorless, yellow, blue, or brown; one perfect cleavage, crystal faces often striated, S.G. = 3.5-3.6.	TOPAZ $Al_2SiO_5(OH,F)_2$ hydrous fluoro-aluminum silicate
	7.5-7	White	green, yellow, pink, blue, brown, or black slender crystals with rounded triangular cross sections; striated crystal faces, no cleavage, S.G. = 3.0-3.2.	TOURMALINE complex silicate
	7	White	any color to colorless, transparent to translucent, greasy luster, no cleavage, conchoidal fracture, S.G. = 2.7.	QUARTZ SiO_2 silicon dioxide
	7	White	white, light colors; waxy luster, translucent, often banded masses, cryptocrystalline, S.G. = 2.5-2.8.	CHALCEDONY SiO_2 cryptocrystalline quartz
	7	White	black, cryptocrystalline, waxy, conchoidal fracture, translucent to opaque, S.G. = 2.5-2.8.	FLINT SiO_2 cryptocrystalline quartz
	7	White	gray, brown, yellow; cryptocrystalline, waxy luster, opaque, conchoidal fracture, S.G. = 2.5-2.8.	CHERT SiO_2 cryptocrystalline quartz
	7	White	red, opaque, waxy luster, cryptocrystalline, conchoidal fracture, S.G. = 2.5-2.8.	JASPER SiO_2 cryptocrystalline quartz
	7	White	green, black, or yellow; conchoidal fracture, no cleavage, S.G. = 3.3-3.4.	OLIVINE $(Fe,Mg)_2SiO_4$ ferromagnesian silicate
	7	White	dark red, brown, pink, green, or yellow; transparent to translucent, no cleavage, S.G. = 3.4-4.3.	GARNET complex silicate

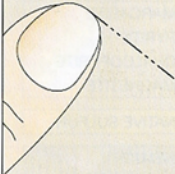
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Not scratched by steel nail, knife	7-6	White	green to yellow-green, striated crystals or dull granular masses, one cleavage, S.G. = 3.3-3.5.	EPIDOTE complex silicate
	6	White	blue-gray, black, or white; striations on some cleavage planes; two cleavages at nearly 90°; S.G. = 2.6-2.8.	PLAGIOCLASE FELDSPAR $\text{NaAlSi}_3\text{O}_8$ to $\text{CaAl}_2\text{Si}_2\text{O}_8$ calcium-sodium aluminum silicate
	6	White	white, pink, brown, green; exsolution lamellae are present and subparallel, two cleavages at 90°, S.G. = 2.6.	POTASSIUM FELDSPAR KAISi ₃ O ₈ potassium aluminum silicate
	6	White	colorless, white, orange, gray, yellow, green, red, blue; may have play of colors (opalescence), amorphous, greasy luster to earthy luster; conchoidal fracture, S.G. = 1.9-2.3.	OPAL SiO ₂ · nH ₂ O hydrated silicon dioxide
Scratched by steel nail, knife 	5.5	White	green to black, dull, stout crystals; two cleavage directions that intersect at about 87° and 93°; S.G. = 3.2-3.5.	PYROXENE (AUGITE) calcium ferromagnesian silicate
	5.5	White	green to black, opaque, two cleavage directions at 60° and 120°, slender crystals, may be splintery or fibrous, S.G. 3.0-3.3.	AMPHIBOLE (HORNBLÉNDE) calcium ferromagnesian aluminum silicate
	5	White	brown, green, blue, yellow, purple, or black; one poor cleavage, common as six-sided crystals, S.G. = 3.1-3.2.	APATITE Ca ₅ F(PO ₄) ₃ calcium fluorophosphate
	5-2	White	green, yellow, gray, or variegated green, gray, and brown; dull masses or asbestos fibrous crystals, no cleavage, S.G. = 2.2-2.6.	SERPENTINE Mg ₃ Si ₂ O ₇ (OH) ₂ hydrous magnesian silicate
	5.5-1.5	Red to red-brown	red, opaque, earthy luster, S.G. = 4.9-5.3.	HEMATITE Fe ₂ O ₃ iron oxide
	5.5-1.5	Yellow-brown	yellow-brown to dark brown, amorphous, but may be pseudomorphic after pyrite, S.G. = 3.6-4.0.	LIMONITE Fe ₂ O ₃ · nH ₂ O hydrous iron oxide

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<p>Scratched by wire nail</p> 	4	White	colorless purple, blue, yellow, or green; dioctahedral cleavage, crystals usually cubic, S.G. = 3.0-3.3.	FLUORITE CaF_2 calcium fluoride
	4-3.5	Light blue	vivid royal blue, earthy masses or tiny crystals, effervesces in dilute HCl, S.G. = 3.7-3.8.	AZURITE $\text{Cu}_3(\text{CO}_3)_2(\text{OH})_2$ hydrous copper carbonate
	4-3.5	Green	green to gray-green laminated crusts or masses of tiny, granular crystals; effervesces in dilute HCl, S.G. = 3.9-4.0.	MALACHITE $\text{Cu}_2\text{CO}_3(\text{OH})_2$ hydrous copper carbonate
	4-2.0	Very light blue	pale blue to blue-green crusts or massive, amorphous, conchoidal fracture, S.G. = 2.0-2.4.	CHRYSOCOLLA $\text{CuSiO}_3 \cdot 2\text{H}_2\text{O}$ hydrated copper silicate
	4-3.5	White	white, gray, pink, or brown; opaque; rhombohedral cleavage; effervesces in dilute HCl only if powdered, S.G. = 2.8-2.9.	DOLOMITE $\text{CaMg}(\text{CO}_3)_2$ magnesian calcium carbonate
<p>Scratched by penny</p> 	3	White	colorless, white, yellow, gray, green, brown, red, blue; transparent to translucent, rhombohedral cleavage; effervesces in dilute HCl, S.G. = 2.7.	CALCITE CaCO_3 calcium carbonate
	3	White	colorless, white, red, brown, yellow, blue; platy crystals, massive, or in rose-like shapes; three cleavages, one perfect and at right angles to others; very heavy, S.G. = 4.5.	BARITE BaSO_4 barium sulfate
	3-2.5	Gray-brown	very dark brown to black, one perfect cleavage; flexible, very thin sheets, S.G. 2.7-3.1.	BIOTITE MICA ferromagnesian potassium, hydrous aluminum silicate
	2.5	White	colorless, white, yellow, red, blue, brown; cubic crystals and cubic cleavage, salty taste, S.G. = 2.1-2.6.	HALITE NaCl sodium chloride

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Scratched by fingernail

Hardness	Streak	Other Properties	Mineral
2.5-1.5	Pale yellow	yellow to red, bright crystals or earthy masses, brittle, no cleavage, conchoidal fracture, S.G. = 2.1.	NATIVE SULFUR S sulfur
2.5-2	White	colorless, yellow, brown, red-brown; one perfect cleavage; flexible, elastic sheets, S.G. = 2.7-3.0.	MUSCOVITE MICA potassium hydrous aluminum silicate
2	White	dark green, one perfect cleavage; S.G. = 2.6-3.0.	CHLORITE ferromagnesian aluminum silicate
2	White	one good cleavage (two poor cleavages); nonelastic sheets, colorless to white; H = 2, easily scratched with fingernail, S.G. = 2.3.	GYPSUM $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ calcium sulfate
2-1	White	white to very light brown, one perfect cleavage, common as earthy, microcrystalline masses, S.G. = 2.6.	KAOLINITE $\text{Al}_2(\text{Si}_4\text{O}_{10})(\text{OH})_2$ hydrous aluminum silicate
1	White	white, gray, green, pink, brown, yellow; soapy feel, pearly to greasy luster, massive or foliated, S.G. 2.7-2.8.	TALC $\text{Mg}_3\text{Si}_4\text{O}_{10}(\text{OH})_2$ hydrous magnesian silicate