MINERAL IDENTIFICATION KEY

Minerals with Metallic Luster					
Hardness	Streak	Cleavage	Specific Gravity	Other Properties	Mineral Chemical Composition
1 - 5.5	Yellowish-brown	None	3.5 - 4	Massive, coatings, botryoidal crusts, earthy masses. Yellow, brown, black color.	Limonite Hydrous iron oxides
2.5	Dark gray	None. Conchoidal fracture.	5.7	Massive. Crystals are rare. Steel-gray to black color.	Chalcocite Cu_2S
2.5	Gray to gray-black	Three perfect at right angles	7.6	Cubic crystals. Lead-gray color	Galena PbS
2.5 - 3	Copper	None	9	Massive. Copper color but commonly stained green. Malleable.	Copper Cu
3.5 - 4	Dark green to black	None. Uneven fracture.	4.2	Massive or granular. Golden yellow to brassy yellow color.	Chalcopyrite $CuFeS_2$
3.5 - 4	White to yellowish-brown	Perfect in six directions	4	Fine to coarse granular masses. Tetrahedron shaped crystals. Yellowish-brown to black color. Resinous luster.	Sphalerite ZnS
5 - 6	Reddish-brown	None. Uneven fracture.	5	Massive, granular. Reddish-brown, gray to black color. Can have metallic luster or earthy red color.	Hematite Fe_2O_3
5.5	Dark brown	None. Uneven fracture.	4.6	Massive or granular. Golden yellow to brassy yellow color.	Chromite $FeCr_2O_4$
5.5 - 6	Brown-reddish	None. Uneven fracture.	4.7	Massive or irregular grains. Iron-black color.	Ilmenite $FeTiO_3$
5.5 - 6.5	Black	None. Uneven fracture.	5	Massive, granular. Crystals have octahedral shape. ***Strongly magnetic***. Black color.	Magnetite Fe_3O_4
6 - 6.5	Greenish-black	None. Uneven fracture.	5.2	Cubic crystals with striated faces. Massive. Pale brass-yellow color, darker if tarnished.	Pyrite FeS_2
6 - 6.5	Brownish	Good in one direction. Conchoidal fracture in other directions.	4.2	Slender, prismatic crystals or granular masses. Reddish-brown (common) or black (rare) color. Adamantine luster.	Rutile TiO_2
Minerals with Nonmetallic Luster					
1	White to greenish	One, perfect	2.6 - 2.8	Small scales, compact masses. Feels slippery. White to greenish color. Pearly luster.	Talc $Mg_3Si_4O_{10}(OH)_2$
1 - 2	Black	One, perfect	2.2	Scaly masses. Forms slippery flakes. Black color. Metallic to dull luster.	Graphite C
2	Colorless	One, perfect	2.3	Elongate or tabular crystals. Fibrous and earth masses. Colorless. Vitreous to pearly luster.	Gypsum $CaSO_4\,2H_2O$
2 - 2.5		One perfect, parallel to	2.6 - 2.9	Flaky masses of minute scales. Light to dark green	Chlorite

	Colorless	flakes		color. Greasy luster	$(Mg,Fe)_5(Al,Fe)_2Si_3O_{10}(OH)_8$
2 - 2.5	White	One, perfect	2.6	Soft, earth masses. Submicroscopic crystals. White, yellowish color. Plastic when wet. Emits clayey odor. Dull luster	Kaolinite $Al_2Si_2O_5(OH)_4$
2 - 2.5	Colorless	One, perfect	2.7	Thin flakes. Colorless, pale green or brown color	Muscovite $KAl_3Si_3O_{10}(OH)_2$
2.5	Colorless	Perfect to give cubes	2.2	Cubic. Colorless. Tastes salty	Halite NaCl
2.5 - 3	Black	One, perfect	2.8 - 3.2	Irregular masses of flakes. Black, brown, dark green color.	Biotite $K(Mg,Fe)_3AlSi_3O_{10}(OH)_2$
2.5 - 5	White	One, perfect	2.2 - 2.6	Platy or fibrous. Light to dark green. Smooth, greasy feel.	Serpentine $Mg_3Si_2O_5(OH)_4$
3	Colorless	Three perfect, give a rhomb-shaped fragment	2.7	Rhomb-shaped crystals and granular masses. Colorless or white. Effervesces with dilute HCl	Calcite $CaCO_3$
3.5	Colorless	Three perfect, give a rhomb-shaped fragment	2.8	Rhomb-shaped crystals and granular masses. White or gray color. Pearly luster. Similar to calcite but does not effervesce in cold, dilute HCl unless powdered.	Dolomite $CaMg(CO_3)_2$
4	Colorless	Perfect in four directions	3.2	Cubic crystals and granular masses. Colorless, bluish green.	Fluorite CaF_2
4.5	White	One perfect, one imperfect	3.6	Bladed crystals. Blue, white, gray color.	Kyanite Al_2SiO_5
5	White	Poor. One direction	3.2	Perfect six-sided crystals and granular masses. Green, brown, blue, or white color.	Apatite $Ca_5(PO_4)_3(OH,F,Cl)$
5 - 6	Green, greenish-black	Two, perfect, nearly at right angles	3.2 - 3.9	8-sided stubby crystals and granular masses. Dark green to black. Distinguished from hornblende on the basis of the nearly right-angle cleavage.	Augite $Ca(Mg,Fe)Si_2O_6$
5 - 6	Green, greenish-black	Two, intersecting at 56^o and 124^o	2.9 - 3.8	Long, six-sided crystals, fibers, irregular grains. Dark green to black. Distinguished from augite on the basis of the different cleavage	Hornblende Complex
6	White	Two perfect at right angles	2.6	Prism-shaped crystals and granular masses. Flesh-colored, pink, white, or gray color	Orthoclase $KAlSi_3O_8$
6 - 6.5	White	Two perfect, not quite at right angles	2.6 - 2.7	Tabular crystals and irregular grains. White to dark gray. Cleavage planes may show fine parallel striations.	Plagioclase $NaAlSi_3O_8$ to $CaAl_2Si_2O_8$
6 - 7	None	One perfect, one poor	3.4	Small elongate crystals. Fibrous. Yellowish-green to dark green color.	Epidote Complex
6 - 7	None	Breaks irregularly	3.2	Long, needle-like crystals and fibers. White or gray in color	Sillimanite Al_2SiO_5

6.5 - 7	None	None. Conchoidal fracture	3.2 - 4.3	Small grains and granular masses. Olive green to yellowish-green color.	Olivine $(Mg,Fe)_2SiO_4$
6.5 - 7	None	None. Uneven fracture	3.5 - 4.3	Perfect crystals with 12 or 24 sides and granular masses. Red, brown, yellowish-green, black color	Garnet Complex
7	None	None. Conchoidal fracture	2.6	6-sided crystals and granular masses. Colorless, white, gray but may have any color depending on impurities. Vitreous to greasy luster.	Quartz SiO_2
7 - 7.5	None	None	3 - 3.3	Elongate crystals commonly with triangular cross section. Black, brown, red, pink, green, blue, and yellow color.	Tourmaline Complex
7.5	None	Weak, parallel to length of crystal	3.2	Long crystals, often square in cross-section. Often flesh-colored.	Andalusite Al_2SiO_5
9	None	Poor	4	Hexagonal crystals common. Gray to brown color.	Corundum Al_2O_3