

Name: \_\_\_\_\_

## Understanding a Mineral Dichotomous Key

Moh's Scale of Mineral hardness: If a mineral can scratch your fingernail then it is harder than 2 or 2.5 on the scale. If you fingernail can scratch the mineral then it is less than 2.5 or 2 on the scale. The same goes for each common object.

Soft		Medium		Hard			
Fingernail	Copper	Iron Nail	Glass	Knife Blade	Steel File	Shank	Quartz
2 to 2.5	3	4	5.5	5 to 6.5	6.5	6.5 to 7	7

### Vocab worth knowing:

**Fracture:** Uneven breaks. Breaks like glass. Shattered looking.

**Translucent:** You can see into the mineral but not necessarily all the way through.

**Fibrous:** fiber looking substance

**Specific Gravity:** A fancy way of saying density of objects on Earth.

**Opaque:** Cannot see through or into the mineral.

**Conchoidal fracture:** breaks like glass. Not shattered looking. How obsidian breaks.

**Oolitic:** has spheres: round looking objects.

**Iridescent colors:** colors seem to change at different angles.

**Vitreous:** like glass in appearance

**Transparent:** Can see all the way through.

**Striations:** linear marks

**Adamantine:** Brilliant or sparkly

**Variegated:** Exhibiting different colors

**Rhombic:** Equilateral parallelogram

**Foliated:** One sheet laying on top of another.

**Isometric:** equal dimensions

**Pisolithic:** Spheres of calcium carbonate or other minerals.

Metallic or Nonmetallic	Hardness	Has cleavage	Streak	Mineral color	Luster	Other properties	Mineral Name
Non	Scratched fingernail	No	White	White	Earthy	Has round things	
Non	Scratched glass	Yes, good	White	Pink	Looks glassy	Transparent, a few striations,	
Non	It barely scratched a nail	Yes, Excellent	White	Green	Looks glassy	Translucent, Fluorescent	
Non	Fingernail easily scratched it	Yes, Excellent	White	White	Very white	Translucent, Fibrous	
Non	Fingernail barely scratched it	Yes, Excellent	White	White	Clear as glass	Tastes salty,	
Non	It can scratch a fingernail	Yes, Excellent	Hard to tell, gray or white	Black	Shiny	Breaks off in very thin sheets	
Metallic	Scratched glass		Black	Gold looking	Metallic	Found cubed crystals, feels hefty	
Non	Scratched glass	No	Really didn't streak a good color	Purple	Looks glassy	Transparent	

## Teacher notes, suggestions and reflection

1. I used to just explain to the students how to follow a dichotomous key and found that they really needed practice using one before identifying actual minerals, so I created this worksheet.
2. These example minerals have already gone through all of the ID tests such as luster, hardness, streak, color and other mineral properties.
3. All student have to do is use the table with the mineral characteristics and then use the dichotomous key to figure out which mineral was tested.
4. There is a list of vocab words that many dichotomous keys use so they are included in this assignment.
5. The misconception of a teacher might be that this is a relatively an easy assignment, but I have decided that students in general struggle following the path of a dichotomous key.
6. It is important to know that it is possible to get more than one correct answer. I just make my students justify their answer.
7. There is an online dichotomous key for this assignment at this link.  
<http://earthscience.xyz/mineral-dichotomous-key>

## Answer Key

<b>Metallic or Nonmetallic</b>	<b>Hardness</b>	<b>Has cleavage</b>	<b>Streak</b>	<b>Mineral Color</b>	<b>Luster</b>	<b>Other properties</b>	<b>Mineral Name</b>
Non	Scratched fingernail	No	White	Black	Earthy	Has round things	<b>Bauxite</b>
Non	Scratched glass	Yes, good	White	Pink	Looks glassy	Transparent, a few striations,	<b>Orthoclase</b>
Non	It barely scratched a nail	Yes, Excellent	White	Green	Looks glassy	Translucent, Fluorescent	<b>Fluorite</b>
Non	Fingernail easily scratched it	Yes, Excellent	White	White	Very white	Translucent, Fibrous	<b>Gypsum</b>
Non	Fingernail barely scratched it	Yes, Excellent	White	White	Clear as glass	Tastes salty,	<b>Halite</b>
Non	It can scratch a fingernail	Yes, Excellent	Hard to tell, gray or white	Black	Shiny	Breaks off in very thin sheets	<b>Biotite Mica</b>
Metallic	Scratched glass	No	Black	Gold looking	Metallic	Found cubed crystals, feels hefty	<b>Pyrite</b>
Non	Scratched glass	No	Really didn't streak a good color	Purple	Looks glassy	Transparent	<b>Quartz</b>

# Mineral Dichotomous Key

Luster	Hardness	Cleavage/ Fracture	Streak Color	Mineral Color	Unique Properties Test updated	Specific Gravity or density	Mineral Name
Metallic	Soft	Excellent	Black	Black, Silver, Gray	Leave black marks, opaque, slippery, sometimes cleavage is not apparent	2.23	Graphite
		No Cleavage	Greenish black, black	Brassy Yellow	Opaque, Brittle	4.1-4.3	Chalcopyrite
	Medium	No Cleavage	Reddish	Reddish brown, black, silver	Opaque, Sometimes magnetic, Sometimes oolitic	5.56	Hematite
			Black	Black or silver	Opaque, magnetic	5.18	Magnetite
	Hard	No Cleavage	Black	Brassy Yellow, Looks like gold	Conchoidal fracturing, opaque, sometimes has cubic crystals,	5.02 hefty	Pyrite
Nonmetallic	Soft	No Cleavage	white	White, gray, yellow, red, brown, orange	Dull and earthy luster, translucent, opaque, pisolitic	2.7-4.3	Bauxite
		Poor	white	Green, gray, white, silver, other colors	Cleavage is usually indistinct, pearly, greasy, opaque, translucent, tiny flakes when rubbed, very soft, powders	2.7-2.8	Talc
		Excellent	White	White, gray, green, yellow, clear	Perfect cleavage in three directions, rhombic, vitreous, pearly, effervescent, double refraction	2.71	Calcite
			Colorless	Dark green, dark brown, black	Cleavage in one direction breaking off in thin sheets, translucent, flexible, bendable	2.8-3.2	Biotite Mica
			Colorless	Clear, white, yellowish, silvery	Vitreous, pearly, transparent, excellent cleavage in one direction, breaks off into thin sheets,	2.7-3.0	Muscovite Mica

			White	White, gray, blue, red, clear	Excellent cleavage in 3 sides at 90° angles, tastes salty, vitreous, pearly, transparent, translucent, dissolves in water,	2.16	Halite
			white	White, gray, brown, red,	Vitreous or pearly luster, transparent, translucent, sometimes as fibrous masses	2.3-2.4	Gypsum
	Medium	Excellent	Colorless	Brown, dark green, black	Vitreous, translucent, opaque, appears fibrous, appears silky,	3-3.4	Hornblende
			white	Pink, white, gray, others	Cleavage in 3 direction, rhombic, vitreous, pearly, translucent, transparent, effervesces if powdered	2.85	Dolomite
			White	Any color, mostly clear, yellow, purple, blue	Perfect in 4 directions, vitreous, translucent, transparent, sometimes fluorescent	3.18	Fluorite
		Poor	white	Green, brown, yellow, pink, violet	Poor cleavage in one direction, vitreous, transparent, translucent, brittle, fractured masses	3.1-3.2	Apatite
		No Cleavage	reddish	Red-brown, silver, black	Dull luster, opaque, sometimes oolitic, sometimes magnetic	5.26	Hematite
	Hard	Excellent	White, colorless	White, gray, pink, clear, green, yellow	Vitreous, transparent, translucent, cleavage at 90° angles, few striations if any	2.5-2.6	Orthoclase
			White, Colorless	White, gray, clear, blue, green	Vitreous, transparent, translucent, striations on cleavage faces	2.6-2.8	Plagioclase
		No Cleavage	colorless	Olive, green, brown	Conchoidal fracturing, vitreous, transparent, translucent, usually granular masses	3.27-4.27	Olivine
			colorless	Any color	Conchoidal fracturing, vitreous, greasy, transparent, translucent, can have hexagonal crystals	2.65	Quartz