

Mohs' scale of mineral hardness characterizes the scratch resistance of various minerals through the ability of a harder material to scratch a softer material. It was created, in [1812](#), by the German mineralogist [Friedrich Mohs](#) and is one of several definitions of [hardness](#) in [materials science](#).

Mohs based the scale on ten [minerals](#) that are all readily available except the last one, [diamond](#). The hardness of a material is measured against the scale by finding the hardest material that the given material can scratch, and/or the softest material that can scratch the given material. For example, if some material is scratched by apatite but not by fluorite, its hardness on Mohs scale is 4.5.

The table below shows comparison with [absolute hardness](#) measured by a [sclerometer](#). Mohs' is a purely [ordinal](#) scale with, for example, [corundum](#) being twice as hard as [topaz](#), but [diamond](#) almost four times as hard as corundum. So, a diamond is the hardest naturally occurring substance known to man.

Hardness	Mineral	Absolute Hardness
1	Talc ($\text{Mg}_3\text{Si}_4\text{O}_{10}(\text{OH})_2$)	1
2	Gypsum ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$)	2
3	Calcite (CaCO_3)	9
4	Fluorite (CaF_2)	21
5	Apatite ($\text{Ca}_5(\text{PO}_4)_3(\text{OH}, \text{Cl}, \text{F})$)	48
6	Orthoclase Feldspar (KAlSi_3O_8)	72
7	Quartz (SiO_2)	100
8	Topaz ($\text{Al}_2\text{SiO}_4(\text{OH}, \text{F})_2$)	200
9	Corundum (Al_2O_3)	400
10	Diamond (C)	1500

On the Mohs scale, [fingernail](#) has hardness 2.5; copper penny, about 3.5; a knife blade, 5.5; window glass, 6.5; steel [file](#), 6.5. Using these ordinary materials of known hardness can be a simple way to approximate the position of a mineral on the scale.

Some [mnemonics](#) traditionally taught to geology students to remember this table are "The Girls Can Flirt And Other Queer Things Can Do" or "To Get Candy From Aunt Fanny, Quit Teasing Cousin Danny".

An alternative table is shown below which has been modified to incorporate additional substances that may fall in between two levels.

Source: [American Federation of Mineralogical Societies: Mohs Scale of Mineral Hardness](#)

Hardness Substance or Mineral

1	<u>Talc</u>
2	<u>Gypsum</u>
2.5 to 3	pure <u>Gold</u> , <u>Silver</u>
3	<u>Calcite</u> , <u>Copper penny</u>
4	<u>Fluorite</u>
4 to 4.5	<u>Platinum</u>
4 to 5	<u>Iron</u>
5	<u>Apatite</u>
6	<u>Orthoclase</u>
6.5	<u>Iron pyrite</u>
6 to 7	<u>Glass</u> , Vitreous pure <u>silica</u>
7	<u>Quartz</u>
7 to 7.5	<u>Garnet</u>
7 to 8	<u>Hardened steel</u>
8	<u>Topaz</u>
9	<u>Corundum</u>
11	Fused <u>zirconia</u>
12	Fused <u>alumina</u>
13	<u>Silicon carbide</u>
14	<u>Boron carbide</u>
15	<u>Diamond</u>