Mohs Scale

This is a **gauge** that uses the observable properties of different minerals and relates them to a number. It is similar in style to the surveys you sometimes fill out where you give your happiness with a product a rank from 1-5. They aren't actual measurements but rather **relative values**. Relative means that they are compared to each other to give an order, rather than being **classified** because of actual scientific values. Mohs scale takes common minerals or everyday objects and uses them to determine the hardness or scratch **resistance** of different minerals. While it isn't a precise measure, it is very useful because it can be done quickly, doesn't require expensive equipment, can easily be used in the field and gives an idea of the minerals present. Just remember, the numbers allocated to the hardness's are really just relative to each other, they give a rough order of hardness not an actual hardness measurement.

As this table shows, the number given on Mohs scale doesn't correspond to the actual hardness of the mineral nor does it fit with the differences between the minerals. The difference between calcite and fluorite on Mohs scale is 1 but in reality the difference is 12. These numbers really do just give us an idea of what is harder than what. Minerals can fall in between the whole numbers shown here in the table. For example, emerald has a hardness of 7.5 and lignite of 2.5.

Mohs Scale	Mineral	Actual Hardness*
1	talc	1
2	gypsum	3
3	calcite	9
4	fluorite	21
5	apatite	48
6	feldspar	72
7	quartz	100
8	topaz	200
9	corundum	400
10	diamond	1600

Common Object	Mohs Scale
metal file	6.5
copper coin	3.5
nail	6.5
glass	5.5
knife blade	5.0
fingernail	2.5

The best way to use the scale is by using samples of these minerals to scratch other unknown minerals. For example, if an unknown mineral can be scratched by topaz but not quartz, then it is likely to be 7.5 on the scale. If a second unknown mineral is tested with fluorite and no scratch is made, then apatite and still no mark is made but is scratched with feldspar, this unknown mineral is likely to be around 5.5. If minerals are the same hardness then a slight mark will be made. As samples of each mineral aren't always available, items such as copper coins, nails, glass or even a person's fingernail can be used. Special hardness picks can also be used, each one has a different tip with a range of hardness's, including plastic and copper.

This classification system was developed by the German **geologist** and **mineralogist** Friedrich Mohs in 1812. He was born in Germany and studied at the University of Halle and a mining academy. He had interests in Mathematics, Chemistry and Physics. Initially, Mohs worked in a mine but later used his mining skills and education to identify and classify minerals in an Austrian museum. Up until this point, minerals had been grouped according to their chemical makeup. Mohs began looking at the similarities in their **physical properties**. He took his idea for the Mohs scale from the ancient Greeks Pliny the Elder and Theophrastus. These two men had both made written reference to the physical properties of different stones and in particular their hardness's in 70AD and 200BC respectively. Mohs took the idea that diamond could scratch quartz (so therefore diamond must be harder than quartz) and created his scale. He ranked commonly found minerals in comparison to talc (very soft) and diamond (very hard) creating a range based on what scratched what.

In today's world, geologists tend to use the chemical **composition** of minerals (in a more advanced manner than what Mohs would have seen in his day) to group and classify them as it is much more accurate. However, Mohs scale is still very useful when scientists are working out in the field for a quick relative classification.

**Actual hardness is found using a sclerometer which measures the width of a scratch made with a diamond.*