

5.2 Minerals

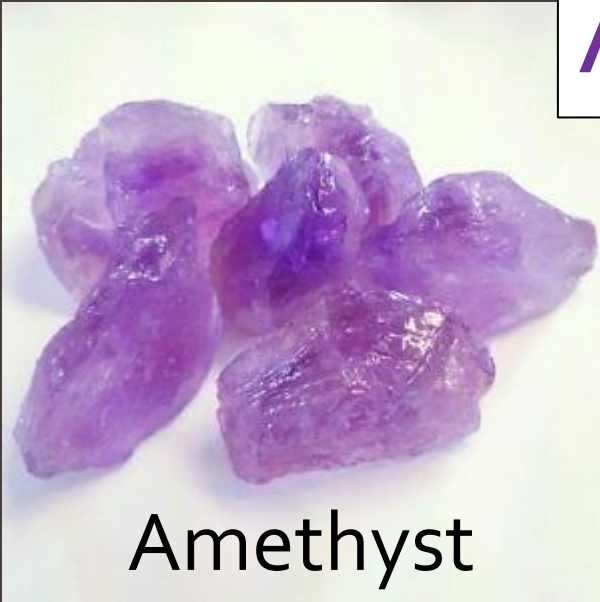


Recall: Rocks vs Minerals

Mineral: **naturally** occurring, **pure**, **inorganic** substance that usually has a crystalline form

Rock: a **mixture** of minerals

Are these all the same?



Amethyst



Kunzite



Fluorite?



Amethyst



Kunzite



Amethyst

Classifying Minerals

Distinguishing between different minerals is not always easy

However, there are a few laboratory tests that can be used to classify them

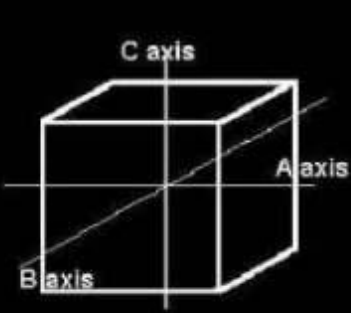
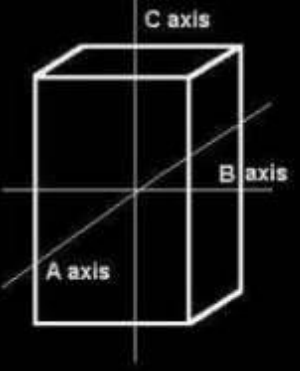
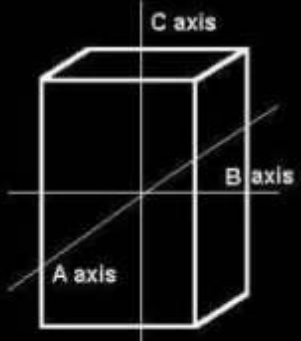
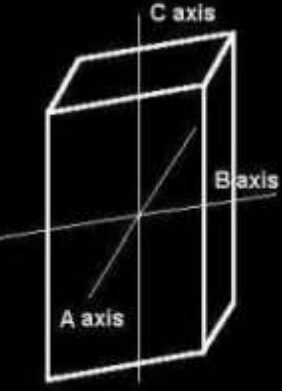
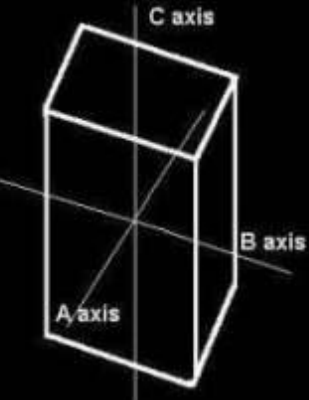
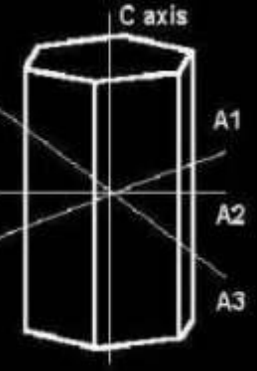
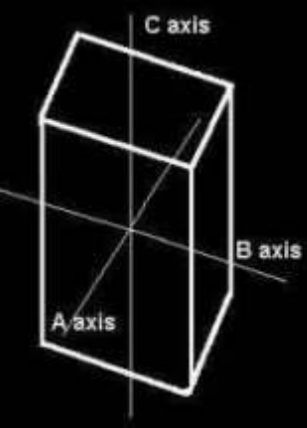







- These are both **time-effective** and **inexpensive**

1 – Crystal Structure

Refers to the **arrangement of the atoms**

Sometimes the crystal structure can be seen with the **naked eye** or a **microscope** but other times, **X-Ray diffraction** is needed

Crystal Systems

Isometric	Tetragonal	Orthorhombic	Monoclinic	Triclinic	Hexagonal	Trigonal
						
						
Fluorite	Wulfenite	Tanzanite	Azurite	Amazonite	Emerald	Rhodochrosite











2 – Hardness

Refers to how easy it is to **scratch** the mineral

It is measured using the **Mohs Hardness Scale**

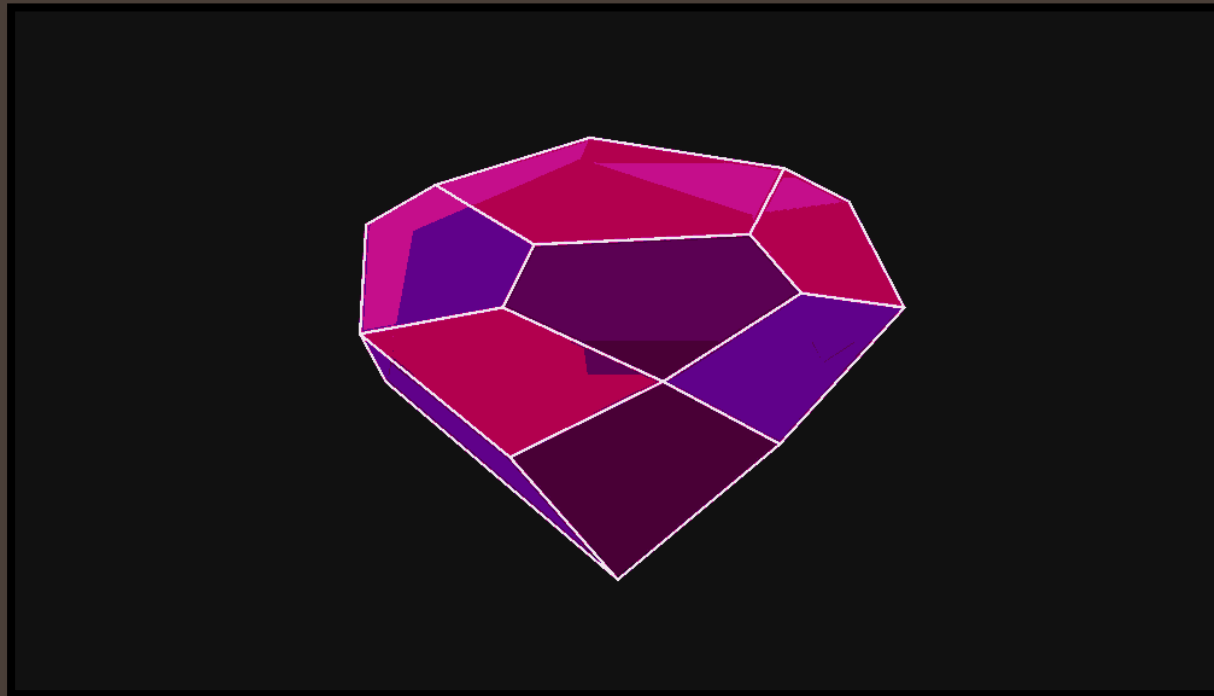
- The **higher** the number, the **harder** the substance

A harder substance can scratch a softer substance

	Mineral Name	Scale Number	Common Object
↑ Increasing Hardness	 → Diamond	10	
	 → Corundum	9	 Masonry Drill Bit (8.5)
	Topaz	8	
	 → Quartz	7	 Steel Nail (6.5)
	Orthoclase	6	
	Apatite	5	 Knife/Glass Plate (5.5)
	 → Fluorite	4	 Copper Penny (3.5)
	Calcite	3	
	Gypsum	2	 Fingernail (2.5)
	 → Talc	1	

3 – Lustre

Refers to the way that the surface of the mineral **reflects light**



Lustre

- **plastic, dull, metallic, waxy, pearly, glassy, silky**



waxy



pearly



metallic



metallic



dull



glassy, vitreous



resinous, plastic



silky, fibrous

4 – Colour

Refers to the **colour** the mineral has to the **naked eye**



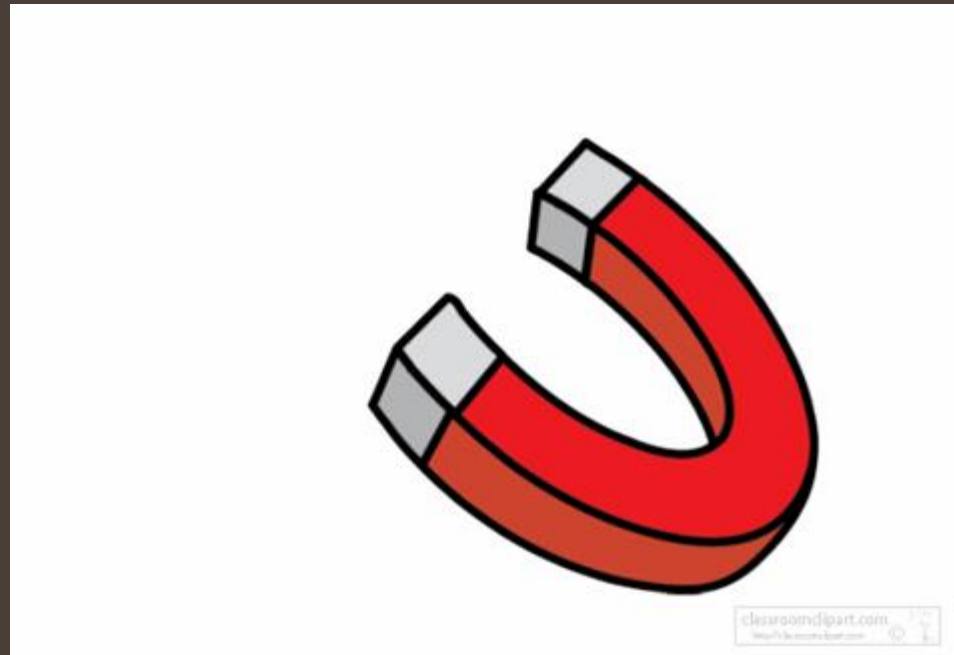
5 – Streak

Refers to the **colour of the powder** a mineral leaves after rubbing it on a **porcelain** plate



6 – Magnetism

Refers to whether or not the mineral is **attracted to a magnet**



7 – Reaction with an Acid

Refers to whether or not the mineral reacts (effervesces or bubbles) when mixed with an acid



8 – Specific Gravity

This is just another name for **density**!

$$D = \frac{m}{V}$$