

Mineral Properties



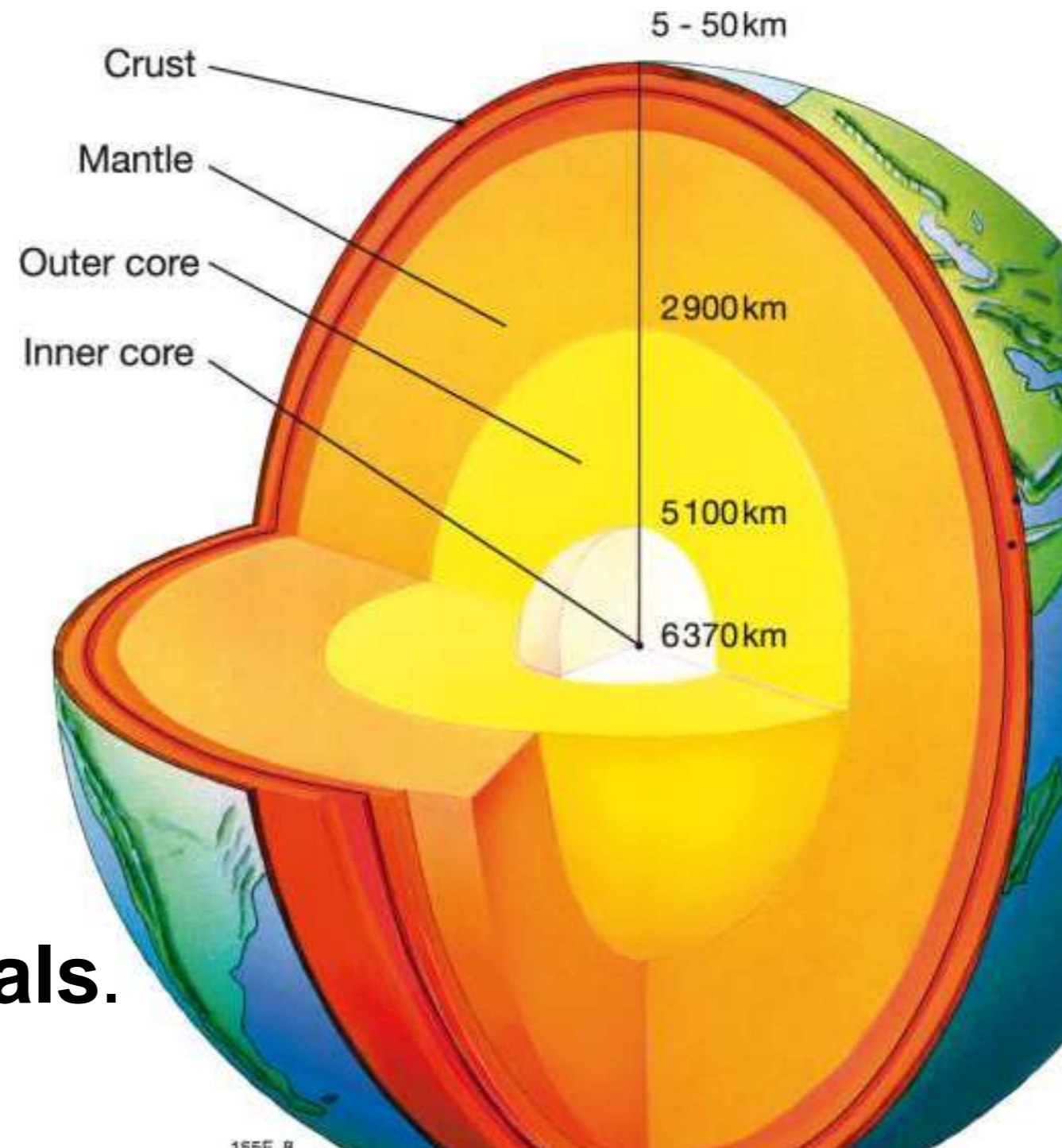
The Geosphere

- The surface to the Earth's centre.

- The 4 **layers of the Earth**

- **Layers** are made of **rocks**

- **Rocks** are made of **minerals**.

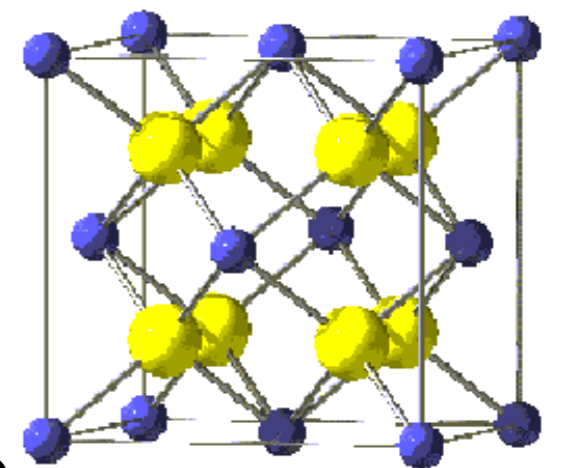


Mineral Properties



What are Minerals?

- A mineral is a
 - 1. **naturally-occurring,**
 - 2. **inorganic**
 - 3. **solid**
 - 4. **with a specific chemical composition**
 - 5. **definite crystal structure.**



- A rock is made of one or more minerals.



Evaporating Seawater



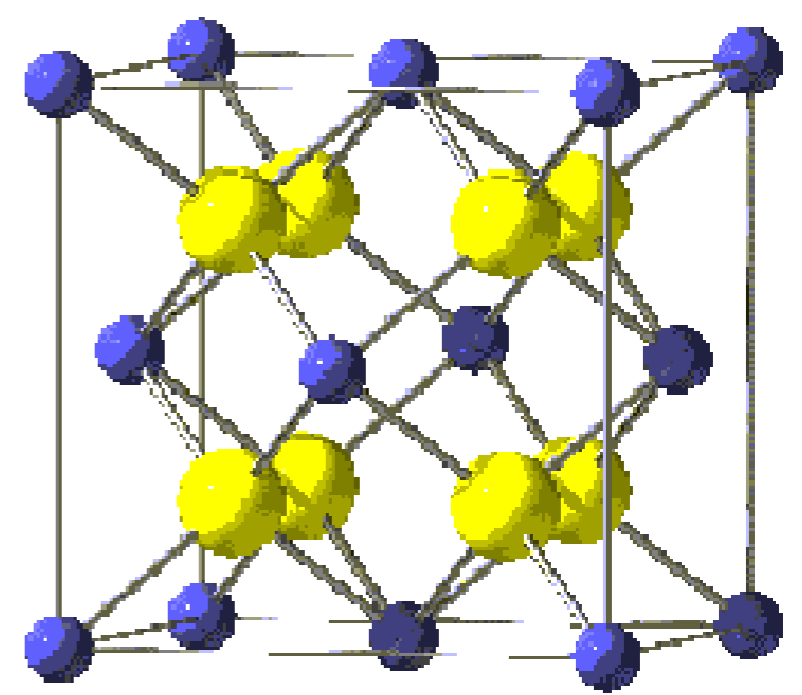
Rock Salt Mine



Halite



Salt



NaCl

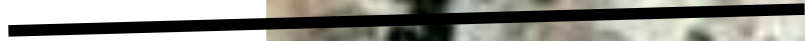
ROCK: Granite
MINERALS:



ROCK: Granite

MINERALS:

-Quartz

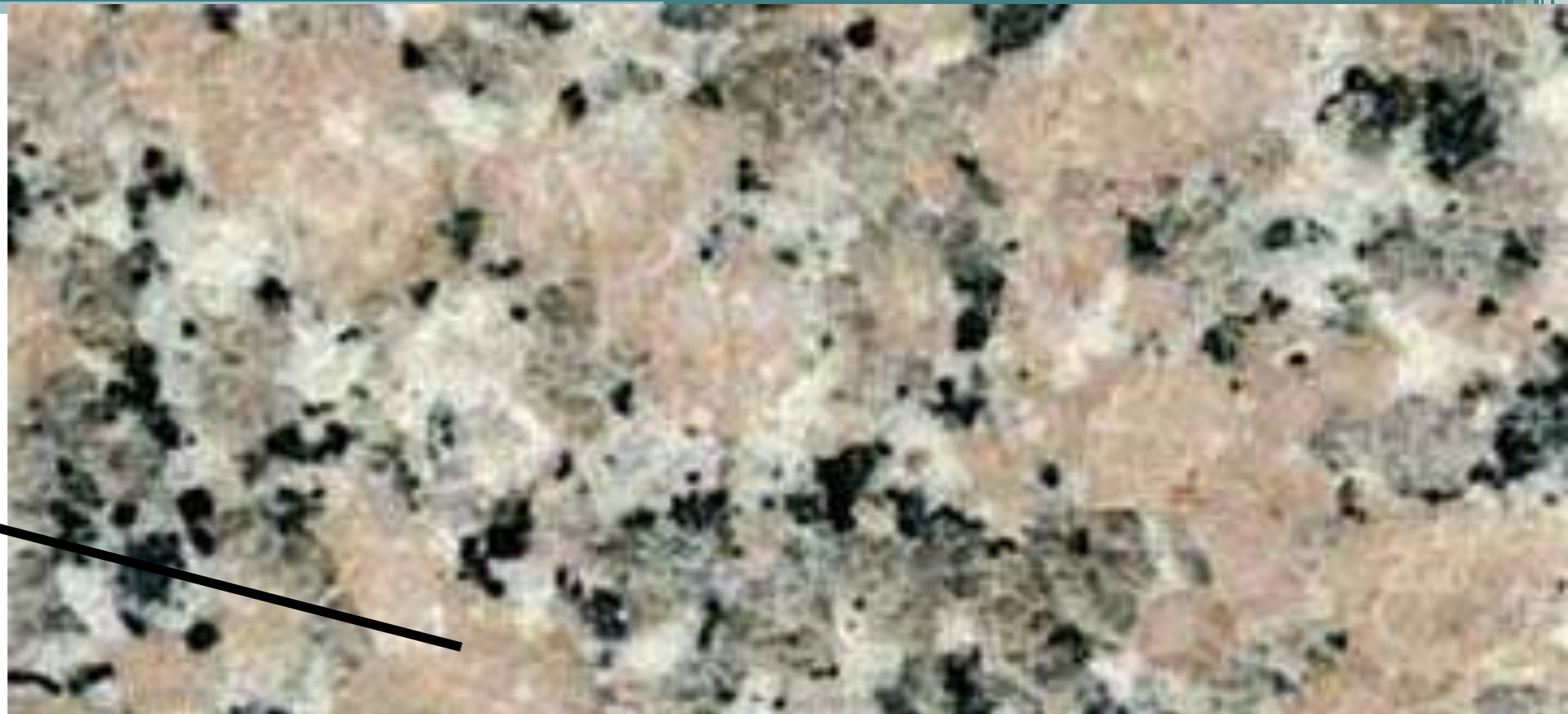


ROCK: Granite

MINERALS:

-Quartz

-Feldspar



ROCK: Granite

MINERALS:

-Quartz

-Feldspar

-Mica (Biotite)

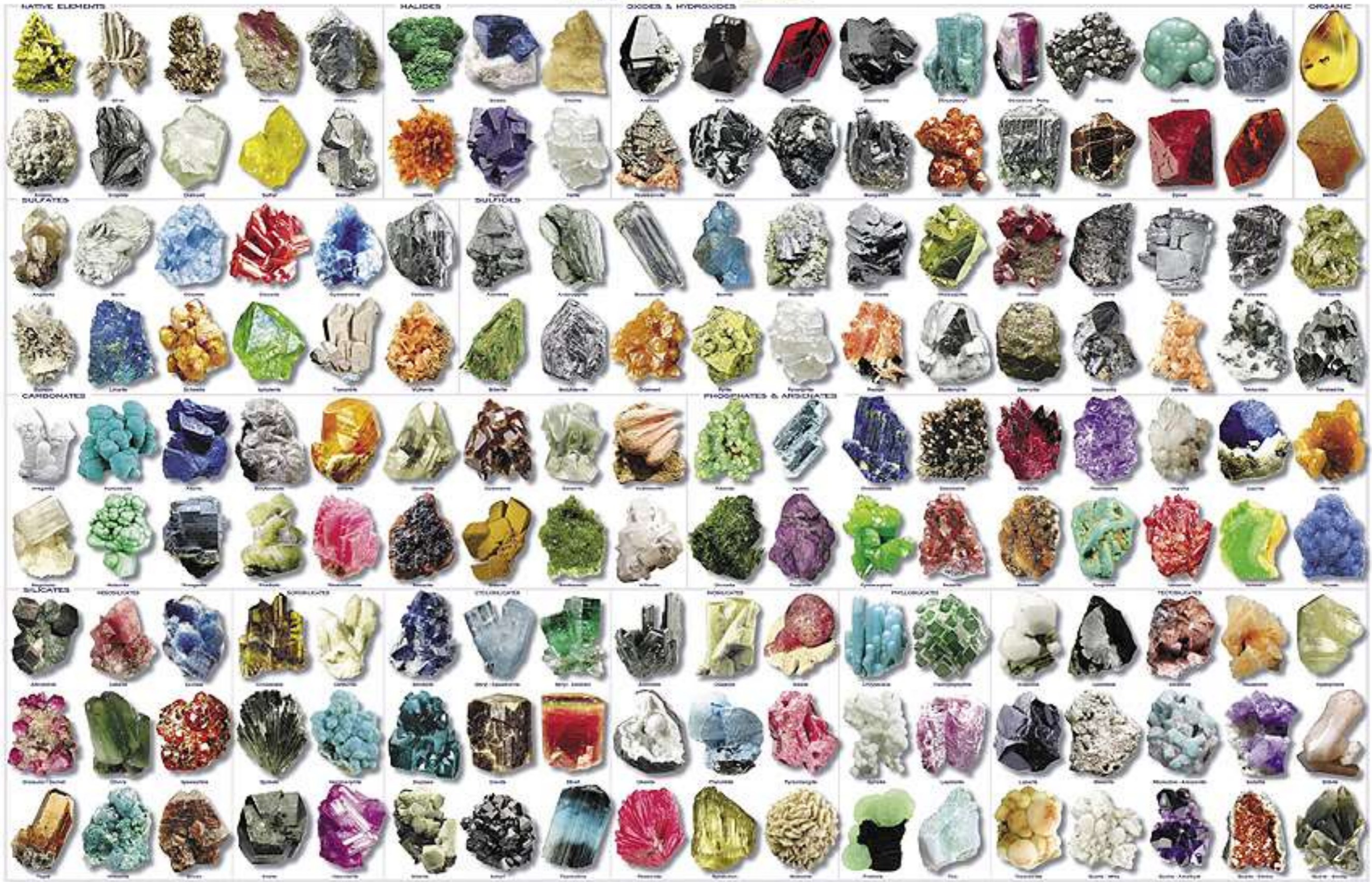


Identifying Minerals

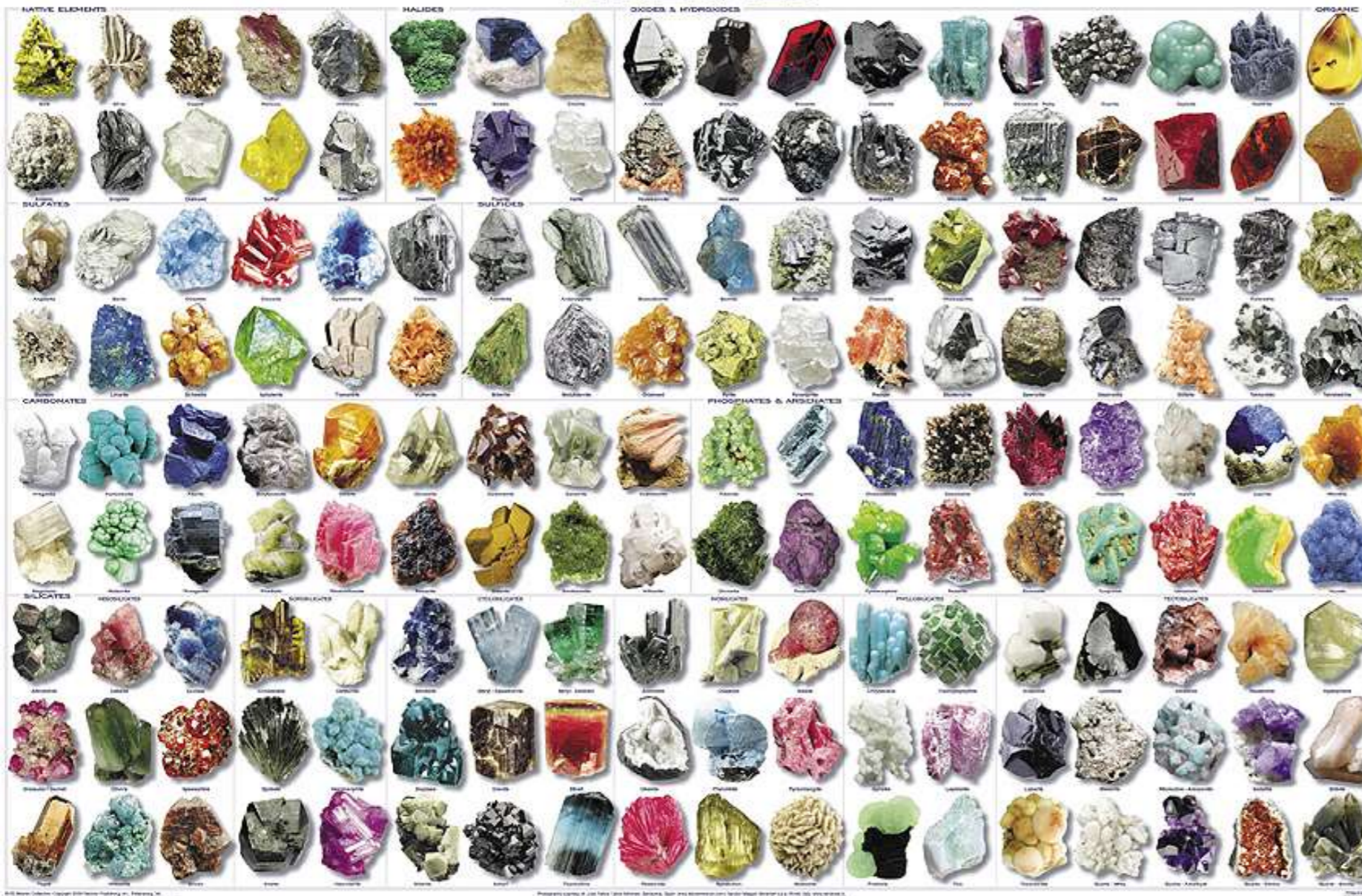
- Some common minerals are **quartz, feldspar, mica and calcite.**
- Some rare minerals are **gold and diamonds.**

- Rock-forming minerals are **common minerals found in the Earth's crust.**
- The study of minerals and their properties is called **mineralogy.**

MINERALS



MINERALS



What mineral is this?

Mineral Properties

How do we identify minerals?

Colour

Description

- Easy to observe but **not** **often useful** because:
 1. Many minerals have *similar colours*;
 2. *Impurities* can change a mineral's colour;
 3. Some minerals *change colour when exposed to the air*.

Examples

- Cinnabar is **red**



- Malachite is **green**



Lustre

Description

- The way a mineral shines in reflected light.
- Two types of lustre:
 1. **metallic**
 - shines like metal

Examples



- galena and pyrite



Lustre

Description

- Two types of luster:
 1. Metallic
 2. Non-metallic
 - Many different categories
 - *Pearly* – like a pearl
 - *Vitreous* – like glass
 - *Earthy* – dull like dirt
- and more

Examples

- mica has a *nearly luster*



- quartz has a *vitreous*



Crystal Shape

Description

- Sometimes useful if the crystals have had enough **time to grow**, but **perfect crystals are rare**.

Examples

- Quartz forms six-sided crystals.



Streak

Description

- The colour of a mineral's **powder**.
- It is obtained by rubbing the mineral on an unglazed white tile called a **streak plate**.

Examples

- Hematite always has a **red streak** but it can look either red or silver on the



Cleavage

Description

- The tendency to split **easily along flat**



Examples

- Minerals with good cleavage:
- **Mica** - 1 direction
- **Feldspar** – 2 directions

Cleavage



Mica (Biotite)



Calcite



Feldspar

Fracture

Description

- **Breaking** along other than cleavage surfaces.



Examples

- Types of fracture:
- Quartz has **conchoidal** fracture (like a shell).
- Cinnabar has uneven or **irregular** fracture (leaves a jagged edge).

Concordat Fracture



Hardness

Description

- A mineral's resistance to being **scratched**.
- It is determined by scratching the sample and comparing it to

Examples

- Talc **1**
- Calcite **3**
- Quartz **7**
- Diamond **10**
- See complete list on page 91

MOHS HARDNESS SCALE

INCREASING HARDNESS

-  1 TALC
-  2 GYPSUM
-  3 CALCITE
-  4 FLUORITE
-  5 APATITE
-  6 FELDSPAR
-  7 QUARTZ
-  8 TOPAZ
-  9 CORUNDUM
-  10 DIAMOND



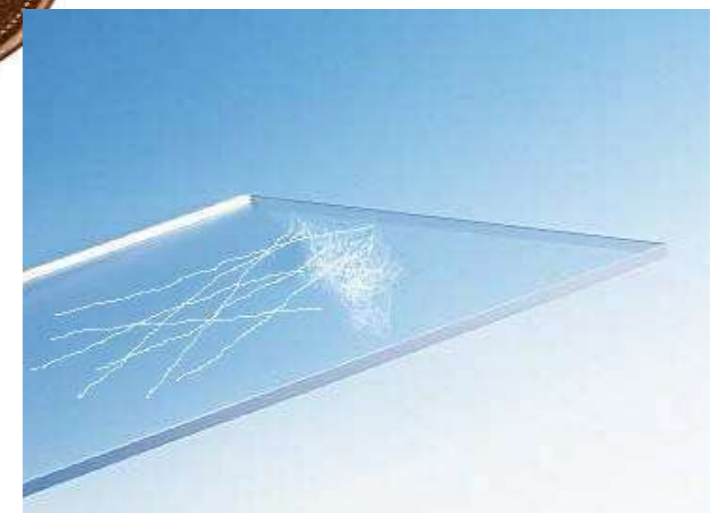
← *FINGERNAIL*



← *COPPER COIN*

← *KNIFE / GLASS*

← *STEEL*



STREAK PLATE

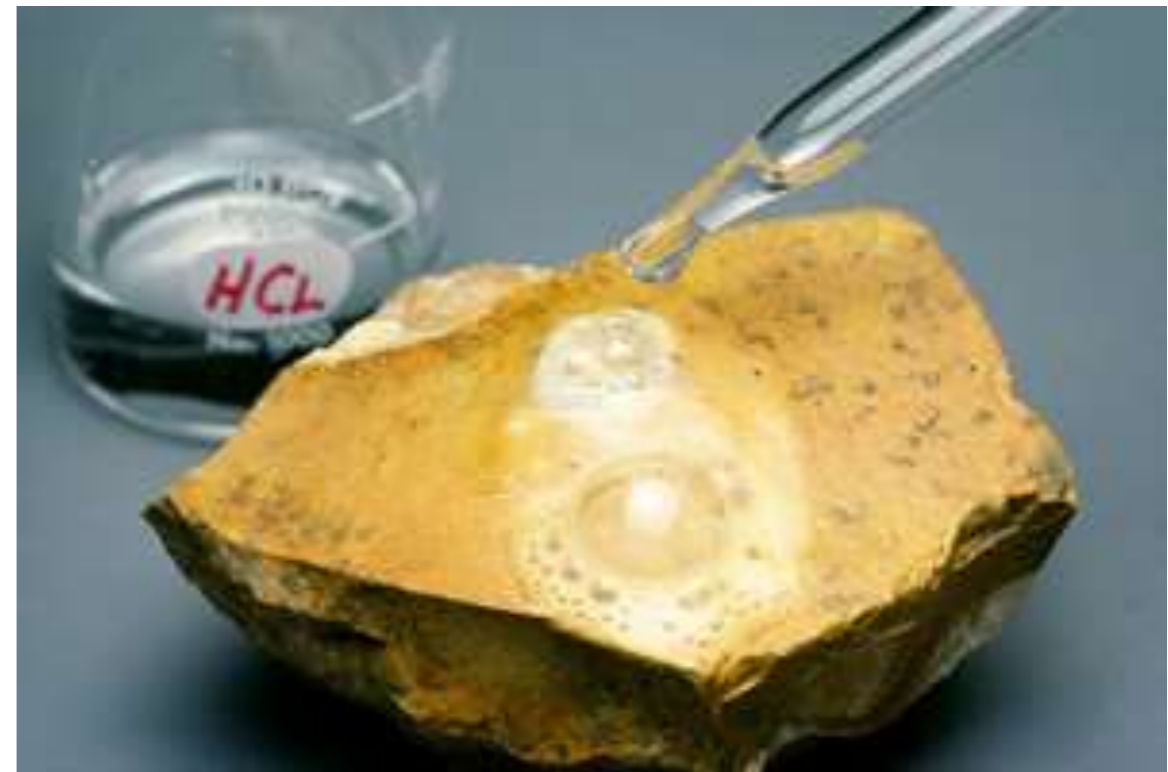
Acid Test

Description

- A drop of weak hydrochloric acid is placed on a sample.
- If it **bubbles** easily, the mineral is calcite

Examples

- **Calcite**



Review: Mineral Properties

Review: Mineral Properties

- Colour
- Lustre
- Crystal shape
- Streak
- Cleavage
- Fracture
- Hardness
- Acid test

Review: Mineral Properties

- Colour
- Lustre
- Crystal shape
- Streak
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- Hardness
- Acid test

Which is the most useful property?

Which is the least useful?

Your Task:

1. To investigate 10 different minerals. (worksheet) .
2. To create a short PuppetShow film about one mineral.
 - in partners
 - teaches others about your mineral

(Self and Peer assessed)

See ***The Adventures of Quartz*** example...

The Rock-Forming Minerals Worksheet

Read p. 53 – 57 (Chapter 4, Topics 7 to 9), to find the information to complete this worksheet.

Mineral Properties: colour, luster, crystal shape, streak, cleavage, fracture, hardness, and acid test.

<i>Mineral</i>	<i>Major Identifying Properties/ Information</i>		
	Property 1	Property 2	Property 3 or Information
Quartz			
Feldspar			
Mica <i>(Muscovite and Biotite)</i>			
Talc			
Hornblende <i>(an Amphibole)</i>			