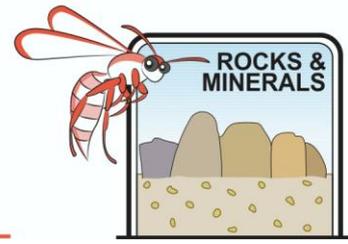


## Mineral Composition - Teacher Notes



Minerals are the building blocks of rocks. When a rock forms, the chemicals arrange themselves into a number of different minerals. Igneous rocks such as granite, basalt and dolerite are hard because their crystals interlocked when they crystallised. Sedimentary rocks are made from clasts, broken bits of other rock compacted and cemented together and therefore tend to be softer.

This search should give students the data to answer the question “Is the chemical composition of minerals found at the Earth’s crust a reflection of the chemical composition of the crust?” They should remember to always give the source of their data.



1. What is an element?

An element is a substance made of one kind of atom. It cannot be chemically broken into a simpler substance.

2. What are the six most common elements found in the Earth’s crust?

Most minerals and therefore rocks, at the Earth’s crust, are made of six elements:

Oxygen	46.6%
Silicon	27.7%
Aluminium	8.1%
Iron	5%
Calcium	3%
Sodium	2.8%

Potassium, magnesium and others form the remainder.

Rocks from the mantle and core contain a higher percentage of denser metallic elements.

3. Name two minerals that are made of only one element.

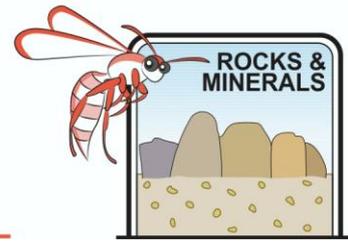
Diamond and graphite are made up of carbon (sometimes with miniscule amounts of other elements).

4. What are the two most common minerals in the Earth’s crust?

Feldspar and quartz.

5. Can we call iron ore a mineral? Explain your answer.

No. Iron ore is a rock made up of a high percentage of metallic iron, usually in the form of haematite or magnetite. Iron ore is not usually made up of a single mineral but several.



## Mineral Composition - Teacher Notes

6. What minerals are commonly found in granite?

Granite is one of the most common rocks of the Earth's crust. It is made up of quartz and feldspar with small amounts of mica and hornblende.

Using the data you have collected:

7. Granite is a common rock found in the crust of the earth. Does the composition of its minerals reflect the composition of the crust?



Quartz =  $\text{SiO}_2$

Feldspar =  $\text{KAlSi}_3\text{O}_8$  –  $\text{NaAlSi}_3\text{O}_8$  –  $\text{CaAl}_2\text{Si}_2\text{O}_8$  (is a group of minerals so will range in composition)

Mica = varying combinations of K, Na, Ca, Al, Mg, Fe, Si, Al, O, H and F.

Hornblende =  $(\text{Ca,Na})_2(\text{Mg,Fe,Al})_5(\text{Al,Si})_8\text{O}_{22}(\text{OH})_2$

Granite does reflect the composition of the earth's crust with high proportions of O, Si, Al, Fe, Ca and Na. Along with other minor elements.