**JAG01 Unit 6 Rocks**

**Task 1 Idioms: What does it mean when someone says:**

Do you live under a rock?

The relationship got off to *a rocky start.*

Prices have reached *rock bottom*.

**Task 2 Complete each gap with one word:**

Minerals and rocks are the basic building blocks of the …………….. Earth and form some of our most basic …………………. on which we rely heavily for our modern civilisation. Minerals and rocks also play an important role in many Earth surface processes, such as landslides, earthquakes, and …………….. activity. Finally, the study of minerals and rocks provides important information ………………… the history of Earth.

**Task 3 Work in groups. Each of you will read a different text and highlight the key information. Then you will collaborate on a mind map summarising the main points related to the topic.**

1. Rocks are *aggregates* of one or more minerals that are classified into three general types or families according to how they were formed in the rock cycle. These are igneous, sedimentary, and metamorphic. These three rock types are constantly being created and destroyed as part of the rock cycle. Igneous rocks are rocks that crystallised from magma. They can be either extrusive, meaning that they cooled at the surface of Earth, or intrusive, meaning that they cooled beneath Earth´s surface. They usually contain crystals that grew within this molten material as it cooled. Sedimentary rocks form at the surface from parts of other rocks by deposition or by precipitation from solution in water. Metamorphic rocks are rocks changed by heat, pressure, chemically active fluids, or some combination of those factors. The strength of a rock depends upon several factors, including composition, texture, structure, and where it is on Earth. Common rock structures include fractures, faults, and unconformities.
2. Rocks at the surface are exposed to the abrasive and grinding action of wind, water and ice. These are very effective agents of physical weathering. For example, if water repeatedly freezes and thaws in cracks and cavities, the expansion that happens when water turns to ice can prise away fragments of rock. Even in dry conditions, a rock face may flake away because of cracking caused by expansion and contraction of the rock itself, as its surface heats by day and cools by night. It may also be plucked away by roots of plants. Furthermore, fragments of rock embedded in a moving ice sheet (glacier) or carried along by flowing water or wind, will abrade any surface that they come into contact with and, in turn, be abraded themselves. When there is a steep rock face, such as a cliff undermined by waves, lumps of rock may fall and smash under gravity.
3. Industrial resources (minerals) are geological materials which are mined for their commercial value, which are not fuel (fuel minerals or [mineral fuels](https://en.wikipedia.org/wiki/Mineral_fuels)) and are not sources of metals ([metallic](https://en.wikipedia.org/wiki/Metal) minerals) but are used in the industries based on their physical and/or chemical properties. They are used in their natural state or after [beneficiation](https://en.wikipedia.org/wiki/Beneficiation) either as raw materials or as additives in a wide range of applications.

Typical examples of industrial rocks and minerals:

[limestone](https://en.wikipedia.org/wiki/Limestone), [clays](https://en.wikipedia.org/wiki/Clay), [sand](https://en.wikipedia.org/wiki/Sand), [gravel](https://en.wikipedia.org/wiki/Gravel), [kaolin](https://en.wikipedia.org/wiki/Kaolin), [silica](https://en.wikipedia.org/wiki/Silica), [barite](https://en.wikipedia.org/wiki/Barite), [gypsum](https://en.wikipedia.org/wiki/Gypsum), and [talc](https://en.wikipedia.org/wiki/Talc).

Some examples of applications for industrial minerals: [construction](https://en.wikipedia.org/wiki/Construction), [ceramics](https://en.wikipedia.org/wiki/Ceramic), [paints](https://en.wikipedia.org/wiki/Paints), [electronics](https://en.wikipedia.org/wiki/Electronics), [plastics](https://en.wikipedia.org/wiki/Plastics), [glass](https://en.wikipedia.org/wiki/Glass), [detergents](https://en.wikipedia.org/wiki/Detergents) and [paper](https://en.wikipedia.org/wiki/Paper).

(A and B adapted from Rothery, D. A. Geology. A Complete Introduction. McGraw-Hill, 2015.

C adapted from https://en.wikipedia.org/wiki/Industrial\_mineral)

**Task 4 Video: The Rock Cycle**

(<https://www.youtube.com/watch?v=BgJ74KKZyD4>)

**Watch the video. What is the main point the speaker makes?**

**Watch again. Match the words and phrases below.**

1. the rock forms from a) into a sedimentary one
2. the heat causes b) beneath the ground
3. the pieces are cemented c) of intergrown crystals
4. it can be lifted up from d) sediments
5. it is exposed e) into small pieces
6. the forces break the rock down f) to form a new rock
7. it´s made up g) to weathering and erosion
8. an igneous rock is converted/ turned h) the rock to melt

**Use the expressions below to sketch and describe the rock cycle.**

*IGNEOUS METAMORPHIC SEDIMENTARY SEDIMENT MAGMA*

*weathering cooling heat and pressure crystallisation deposition*

*cementation melting solidification uplift burial*

**Task 5 Classifying**

**Use the phrases below to classify rocks and other phenomena.**

**Words for classifying into groups and describing composition:**

 *General -> specific specific -> general*

 X is classified into/as A and B.

 X can be divided into A, B, and C.

 X is composed of A, B, and C.

 X is made up of A, B, and C. A, B, and C constitute X

 X consists of A, B, and C. A, B, and C make up X

 X comprises A, B, and C.

 X includes A, B, and C.

**Passive voice**

1. **Change these phrases from the active to the passive voice.**

*Present tense:* You heat the sample. *The sample …*

 *Present continuous:* You are heating the sample.

*With a modal verb:* You can heat the sample.

 You need to heat the sample.

*Past tense:* You heated the sample.

*Present perfect:* You have heated the sample.

*Future:* You will heat the sample.

**B) Transformations: Change the sentences into passive voice.**

1. We can classify matter as solid, liquid and gas.

Matter ………………………….…….….. as solid, liquid and gas.

1. You would need a considerable force to change the shape of an iron bar.

 A considerable force ……………………………. to change the shape of an iron bar.

1. If we pour water on the table, it will flow all over the surface.

 If water……………………………….… on the table, it will flow all over the surface.

1. When we heated the crystals, they melted.

When crystals……………………………….……………., they melted.

1. Now that you have heated the amorphous substance, you can see that it softens.

Now that the amorphous substance…………………………., you can see that it softens.

1. We find matter in solid, liquid or gaseous form.

Matter …………………………………………….. in solid, liquid or gaseous form.

**Task 6 Video: Rock and Minerals: Identifying Types of Rocks**

(<https://www.youtube.com/watch?v=tQUe9C40NEE>)

**Watch and take notes on rock identification. Are there any hard and fast rules?**

**Watch again and fill in the gaps with one word:**

1. Sedimentary rocks come from elements of pre-existing rocks, either actual ………. or dissolved materials.
2. Metamorphism means ………………….. .
3. It´s oftentimes difficult to ………… the type of rock.
4. You have a ………….., more compact form in igneous and metamorphic rocks.
5. Crystals are a good ……………… of igneous rocks.
6. Some igneous rocks are very ……………… like this basalt.
7. You will sometimes see …………….. of mineral grain in metamorphic rock.
8. There are …………… of fine clay minerals in shale.
9. If you put a little drop of ……………. acid on limestone, you´ll get bubbling.

**After you watch: How do we pronounce *gneiss?* What do you know about it?**