MASSEY UNIVERSITY
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UNIVERSITY OF NEW ZEALAND

Centre for Learner Success– Handout Series

STUDYUP: KNOWLEDGE TO GO

SCANNING AND NOTE TAKING EXERCISE

Rocks

1. Rocks are hard, natural masses of solid matter that make up the earth's crust. With a few exceptions (such as coal), rocks are composed of one or more minerals. Geologists classify rocks as igneous, sedimentary or metamorphic, depending on how they were formed.
2. Igneous rocks are formed from magma, the molten matter deep within the earth. There are two types of igneous rock. If magma rises towards the surface, it slowly cools and sometimes solidifies underground. The result is intrusive igneous rock. If magma reaches the earth's surface, it emerges from volcanoes or fissures (cracks) as lava. Lava cools rapidly above ground, solidifying into extrusive igneous rock. Intrusive igneous rock, such as granite, can be identified by its large, clearly visible mineral grains (crystals). Because extrusive rock solidifies more quickly than intrusive igneous rock, it is characterized by tiny crystals. Basalt, with its fine texture, high density and dark colour, is the most common extrusive igneous rock, lying beneath the vast ocean floor. Pumice, another common extrusive igneous rock used in some abrasives, acquires its rough porous texture from the explosive release of gas that often accompanies volcanic eruptions.
3. Virtually all sedimentary rocks are formed when particles, known as sediments, accumulate in strata (layers). Most sediments are created when rocks of any kind are broken down by erosion or weathering. When these particles cement or compact together and harden, they form sedimentary rock. Shale, the most common

sedimentary rock, is formed from mud and clay; sandstone, as its name suggests, is formed from sand. Some sediments, however, are created from animal or plant remains that have decayed or decomposed in water. Most limestone, for example, is formed from the minerals of decomposed shells or skeletons of marine organisms, while coal is formed from plants that have decayed in swamps. Sedimentary rock usually forms under water. It can frequently be identified by characteristic layers or particles of different sizes, and often contains fossils.

4. Metamorphic rocks are formed when rocks of any type are changed by long periods of intense heat or pressure within the earth. This process, known as metamorphism, alters the texture, structure and mineral composition of the existing rock, usually making it rougher and denser. Metamorphic rock can sometimes be identified by its distorted structure, or by wavy bands. When the sedimentary rock limestone undergoes metamorphism, it becomes marble. Shale, another sedimentary rock, becomes slate under metamorphism, while the igneous rock granite becomes gneiss. As hard as they are, rocks do not last forever. Rocks above ground are continuously exposed to weathering and erosion. Over thousands or even millions of years, they are broken down and worn away to sediments, which can later form new sedimentary rocks. Rocks below ground can also change. Any rock subjected to sufficient heat and pressure undergoes metamorphism and forms new metamorphic rock. And if the heat is great enough, any rock can be melted back into magma and later form new igneous rock. Thus, any type of rock can be transformed into one of the others. This dynamic, never- ending process of rock formation is known as the rock cycle.

Robinson, A. (1993). What smart students know. Crown Trade Paperbacks.

Exercise

Part A

Without reading the entire text on Rocks, try and find the answers to the following questions as quickly as possible.

1. What are the three classifications of rocks?
2. How many types of igneous rock are there?

3. What is the rock that is identified by its large, clearly visible mineral grains (crystals)?
4. When particles cement or compact together and harden, what do they form?
5. Shale is formed from what two materials?
6. Plants that have decayed in swamps create what?
7. When rocks of any type are changed by long periods of intense heat or pressure, they are classified as what?
8. When limestone undergoes metamorphism it becomes what?
9. The never-ending process of rock formation is known as what cycle?

Part B

Task: Read through the Rocks and use one of the note-taking skills discussed to create notes on Rocks.