**O3.2\_Lesson plan\_Geography\_Volcanic Rocks**

**Age group/class:** 15-16 years old/ Year 10

**Lesson title:** Volcanic rocks

**School Discipline:** Geography

**Key concepts:** types of rocks, igneous rock (formation, characteristics, types)

**Aims:**

* Experience a volcanic landscape
* Understand the formation and characteristics of different volcanic rocks
* Be able to distinguish between different types of volcanic rocks

**Skills developed**: observation, description, analysis, research and collaboration.

**Materials/Equipment needed**:

* Starter\_The\_Rock\_Cycle\_Diagram
* <https://www.youtube.com/watch?v=aCnAF1Opt8M> *(to be used in the introduction activity for learners to make the difference between intrusive and extrusive rocks)*
* VR headset
* VR video <https://eloquent-ramanujan-887aa5.netlify.app/roci-vulcanice.html>
* Handouts: Mental Imagery table, information cards on different rocks, coloured cards.

**Lesson plan:**

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| **Stages** | **Description of activity** | **Time** |
| **Preparation before the lesson** | Learners will have already learned about the rock cycle and the different types of rocks (sedimentary, metamorphic and igneous). This lesson focusses on igneous rocks.  If this is a first VR experience for students – go through the safety rules:   * Learners are to sit down whilst using the VR glasses and not hold anything in their hands, unless the experience is of such a nature that it requires you standing, in which case, ensure enough space is allowed around all students. * Learners will be told to expect a feeling of vertigo. If it gets worse, students must remove VR glasses. * Learners need to know how to adjust the viewing focus before using the headsets. * Learners must not use the headset when they are: tired, need sleep, under emotional stress or anxiety, when suffering from cold, flu, headaches, migraines as this can worsen their susceptibility to adverse reactions. * Learners should be given the choice to opt out of using VR. |  |
| **Introduction** | Share Learning Intentions with students.  **Question wall** – Ask learners to think and write any questions they have regarding the learning objectives on post it notes and put them on a flip chart paper in front of the classroom. (teacher ensures all questions are answered by the end of the lesson).  Bridge the learning:  Offer diagram of the rock cycle and ask learners to work in pairs to label it *(see resource Starter\_The\_Rock\_Cycle\_Diagram).*    *Copyright diagram: Pinterest*  **Differentiation**: for the least able learners, offer a word bank. The most able learners can draw their own diagram without any outline given.  Once completed, compare, discuss and correct any misunderstandings.    *Copyright diagram: Pinterest*  Focus discussion on the formation of igneous rocks. Learners watch the video on YouTube: <https://www.youtube.com/watch?v=aCnAF1Opt8M> to consolidate the difference between intrusive and extrusive rocks.  Mental imagery to help perceptual learning:  Teacher asks learners to imagine they are walking on a volcano. Their task is to create a word bank with words to describe what they see, smell, hear and feel. *(see mental imagery table below)* | 3 min.  5 min.  4 min.  5 min. |
| **Initial Immersive Experience** | Learners put on the VR headsets and explore the video at their own pace for about 2 minutes.  Turn the headsets off and bring students back into the classroom.  They return to the table completed previously. They circle the words which no longer apply and add new ones with a different colour.  Learners spend time finding partners around the room with different ideas/words and they ‘trade’ one of their ideas with a colleague who has a different idea. This should be written with a different colour in their tables. They do this until time runs out.  **Class discussion** on:   * What words no longer matched your initial mental imagery? Why? * What words matched and you encountered in your colleagues’ table most frequently? * What words you didn’t think of, but you agreed to and you traded off with a colleague? | 2-3min.  3 min.  5 min. |
| **Guided Immersive Experience** | **Deepening learning about igneous rocks**:  Learners are attributed colours (red, yellow, green, blue). Each learner has the task to explore 2 igneous rocks as follows:   * Learner 1 (red colour) – Granite and Rhyolite * Learner 2 (yellow colour) - Andesite and Dacite * Learner 3 (green colour) - Basalt and Volcanic Bomb * Learner 4 (blue colour) - Peridotite and Scoria Rock   Students put on the VR headsets and dive back into the immersive experience, but this time with the focus of finding more information about their specific rocks. Allow time for this guided exploration (3 – 4 min. or on and off for as long as it is needed for learners to get initial, basic information/exposure to the landscape typically formed by the rock, the uses and a close-up at the physical structure of the rocks they have been assigned.  Learners take initial notes. | 3 - 4min |
| **Follow up** | When the VR moment is over, learners gather in **rainbow groups** (groups of 4 where each learner is of a different colour) and share their ideas – this way, through collaboration, each learner is familiarised with all 8 igneous rocks presented in the VR material.  Learners compare notes and discuss across groups to complete their knowledge and understanding. The teacher facilitates the discussion and ensures there are no misunderstandings.  Learners use their research stations (laptops/tablets/phones) to add to the knowledge gained through the VR experience by completing their notes. Their research should follow the guideline below:   * Write a paragraph explaining how the rock is formed * Find at least 3 other uses for the rock than the one mentioned in the VR material. * Find at least 3 other images from Europe (if possible, from your country) where the rocks can be found.   When the research project is finished, learners share their findings and create for each rock an information poster to be displayed in the room as a testimony of their learning and to be used as a resource throughout the topic. | 10 min.  5 min.  10 min. |
| **Formative Assessment** | Teacher provides cards with information about the different types of rocks presented during this lesson. The example below is for Granite, but similar examples should be created for the other types of rocks.    Learners work in groups to sort the cards into the correct categories.  Teacher monitors students’ discussion to assess and correct understanding. | 5 min. |