



### 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.

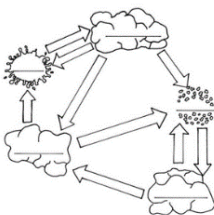
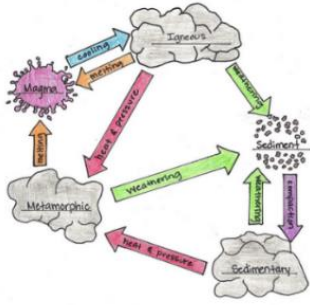
**Materials/Equipment needed:**

- 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:**

| Stages                               | Description of activity  | Time   |
|--------------------------------------|--|--------|
| <b>Preparation before the lesson</b> | <p>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.</p> <p>If this is a first VR experience for students – go through the safety rules:</p> <ul style="list-style-type: none"> <li>- 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.</li> <li>- Learners will be told to expect a feeling of vertigo. If it gets worse, students must remove VR glasses.</li> <li>- Learners need to know how to adjust the viewing focus before using the headsets.</li> <li>- 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.</li> <li>- Learners should be given the choice to opt out of using VR.</li> </ul> |        |
| <b>Introduction</b>                  | <p>Share Learning Intentions with students.</p> <p><b>Question wall</b> – 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).</p>  | 3 min. |
|                                      | <p><b>Bridge the learning:</b></p> <p>Offer diagram of the rock cycle and ask learners to work in pairs to label it (see resource Starter_The_Rock_Cycle_Diagram).</p>   | 5 min. |



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|----------------|--|-----------------|------------------|-----------------|-----------------|--|--|--|--|
|                | <div>Worksheet - The Rock Cycle</div> <div><div>Word bank:<br/>Cooling, heat &amp; pressure 2,<br/>metamorphic, igneous,<br/>sediment, sedimentary,<br/>weatheringx3, magma,<br/>meltingx2, compaction</div></div> <div>Copyright diagram: Pinterest</div> <div><b>Differentiation:</b> 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.</div> <div></div> <div>Copyright diagram: Pinterest</div> <div>Focus discussion on the formation of igneous rocks. Learners watch the video on YouTube: <a href="https://www.youtube.com/watch?v=aCnAF1Opt8M">https://www.youtube.com/watch?v=aCnAF1Opt8M</a> to consolidate the difference between intrusive and extrusive rocks.</div> <div><div>Mental imagery to help perceptual learning:</div><div>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)</div><div>Walking on a volcano</div><table><tr><td>What do I see?</td><td>What do I smell?</td><td>What do I hear?</td><td>What do I feel?</td></tr><tr><td></td><td></td><td></td><td></td></tr></table></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> 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| <b>Guided Immersive Experience</b>  | <p><b>Deepening learning about igneous rocks:</b></p> <p>Learners are attributed colours (red, yellow, green, blue). Each learner has the task to explore 2 igneous rocks as follows:</p> <ul style="list-style-type: none"> <li>- Learner 1 (red colour) – Granite and Rhyolite</li> <li>- Learner 2 (yellow colour) - Andesite and Dacite</li> <li>- Learner 3 (green colour) - Basalt and Volcanic Bomb</li> <li>- Learner 4 (blue colour) - Peridotite and Scoria Rock</li> </ul> <p>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.</p> <p>Learners take initial notes.</p>  | <p>3 - 4min</p>   |  |   |   |   |   |               |
| <b>Follow up</b>  | <p>When the VR moment is over, learners gather in <b>rainbow groups</b> (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.</p> <p>Learners compare notes and discuss across groups to complete their knowledge and understanding. The teacher facilitates the discussion and ensures there are no misunderstandings.</p> <p>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:</p> <ul style="list-style-type: none"> <li>- Write a paragraph explaining how the rock is formed</li> <li>- Find at least 3 other uses for the rock than the one mentioned in the VR material.</li> <li>- Find at least 3 other images from Europe (if possible, from your country) where the rocks can be found.</li> </ul> <p>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.</p>   | <p>10 min.</p> <p>5 min.</p> <p>10 min.</p>   |  |   |   |   |   |               |
| <b>Formative Assessment</b>   | <p>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.</p> <table border="1" data-bbox="454 1545 1220 1926"> <tr> <td data-bbox="454 1545 678 1691">           Light coloured igneous rock with grains large enough to be seen with the naked eye.         </td><td data-bbox="686 1545 909 1691">           It forms from slow crystallisation of magma below the surface.         </td><td data-bbox="917 1545 1220 1691">           It is mainly used for counter tops, floor tiling, paving stone, cemetery monuments.         </td></tr> <tr> <td data-bbox="454 1691 678 1926">           Yosemite Valley, in Yosemite National Park, USA, is a classical example of a place where this rock is evident in vertical cliffs.         </td><td data-bbox="686 1691 909 1926">           Mainly composed of quartz and feldspar with small amounts of mica and other minerals.         </td><td data-bbox="917 1691 1220 1926"> <br/> <i>Bahuslän West Coast of Sweden to the Baltic Sea.</i> </td></tr> </table> <p>Learners work in groups to sort the cards into the correct categories. Teacher monitors students' discussion to assess and correct understanding.</p> | Light coloured igneous rock with grains large enough to be seen with the naked eye.   | It forms from slow crystallisation of magma below the surface. | It is mainly used for counter tops, floor tiling, paving stone, cemetery monuments. | Yosemite Valley, in Yosemite National Park, USA, is a classical example of a place where this rock is evident in vertical cliffs. | Mainly composed of quartz and feldspar with small amounts of mica and other minerals. | <br><i>Bahuslän West Coast of Sweden to the Baltic Sea.</i> | <p>5 min.</p> |
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