**LEARNING ACTIVITY SHEET IN SCIENCE 9**

|  |  |  |  |
| --- | --- | --- | --- |
| Name of Learner; | John Russel A. Jandonero | Score: |  |
| Grade and Section: | GRADE – 9 TAE | Week & Date: |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Title of the Topic:** | **Volcanoes** | | |
| **Most Essential Learning Competency:** | | **Code:** | **S9ES –IIIa-d-28-29** |
| * Describe the different types of volcanoes and volcanic eruption * Explain what happens when volcanoes erupt * Illustrate how energy from volcanoes may be tapped for human use | | | |
| **I. Concept Notes: (30 points)** *(Contents needed for the learners to understand the topic. Brief discussion of the lesson, if possible cite examples)* | | | |
| Contains the following topics:   * Volcanoes: Types, parts   ***Shield volcano***  Where a volcano produces low viscosity, runny, lava it spreads far from the source forming a volcano with gentle slopes. This type is called a shield volcano. Most shield volcanoes are formed of fluid basaltic lava flows. Mauna Kea and Mauna Loa are shield volcanoes. They are the world’s largest active volcanoes, rising over 9 km above the sea floor around the island of Hawaii.  ***Stratovolcano***  Stratovolcanoes have relatively steep sides and are more cone-shaped than shield volcanoes. They are formed from viscous, or sticky, lava that does not flow easily. The lava therefore builds up around the vent forming a volcano with steep sides. Stratovolcanoes are more likely to produce explosive eruptions due to gas building up in the viscous magma.  ***Lava dome***  The Soufrière Hills volcano, on the Caribbean island of Montserrat, is well known for its lava dome complex at the summit of the volcano, which has gone through phases of growth and collapse. As viscous lava is not very fluid, it cannot flow away from the vent easily when it is extruded. Instead it piles up on top of the vent forming a large, dome-shaped mass of material.  ***Caldera***  Magma is stored beneath a volcano in a magma chamber. When a very large explosive eruption occurs which empties the magma chamber, the roof of the magma chamber can collapse forming a depression, or bowl on the surface which has very steep walls. These are calderas and can be tens of miles across. Calderas could be volcanoes formed during an eruption that removes the summit of a single stratovolcano. Caldera-forming eruptions can remove massive portions of a single stratovolcano. The top can literally be blown off!  What Happens When A Volcano Erupts? - WorldAtlas   * Active and inactive volcanoes in the Philippines      * Types of volcanic eruptions   Volcano - Six types of eruptions | Britannica  Different **types of volcanoes erupt** in different ways. Geologists usually group **volcanoes** into **four** main **types**: cinder cones, composite **volcanoes**, shield **volcanoes**, and lava domes.   * Precautionary measures for volcanic eruption   Emergency Procedures:  Before:   * Each one should be aware of the dangers that volcanic eruptions pose to lives and be prepared to face whatever circumstances. * Prepare all necessary things to bring once evacuation is needed. Those in danger zones are warned when to evacuate. Once given the signal refrain from saying you will be all right. Refusing to evacuate will pose more serious problems. the eruption may bring. * Prioritize the safety of kids before other things. If you have relatives or friends who are far from the volcano, take your children there until such time that your place is safe.   During:   * Avoid all low-lying places because lava flows and mudflows are more likely to pass here. * If you are inside a house; close all doors and windows to avoid ashes from getting inside. * Keep a watchful eye on the kids because they might be tempted to go out and see what’s going on outside.   After:   * Go back to your house but leave the kids behind someone who can take care of them while you check your house. * Use masks while cleaning ash and other debris. * Wait for further announcements related to the volcano activities. * Generate energy through volcano   **Volcanoes** are the main source of **geothermal energy**. ... The **geothermal energy** is a renewable resource, as it exploits the abundant Earth's interior heat and water, which once used and cooled, is then piped back to the reservoir. | | | |
| **II. Learning Activities:** | | | |
| 1. Learning Activity 1:   **1a: Short Answer (40points)**  **Objectives:** Describe the different types of volcanoes and volcanic eruption; Explain what happens when volcanoes erupt  **Instruction:** Answer the following questions:   1. Volcanoes are often called “windows” into the earth’s interior. Explain what this means. (5points)   Volcanoes are often called “windows” into the earth’s interior because the Earth's rigid outer shell, the crust and upper mantle, is broken into a mosaic of plates that are in constant motion. Volcanic eruptions bring up magma from inside the earth.   1. Discussed how gas content and magma viscosity influence volcanic eruptions. (3points)   Explosive eruptions are favored by high gas content and high viscosity (andesitic to rhyolitic magmas). Explosive bursting of bubbles will fragment the magma into clots of liquid that will cool as they fall through the air.   1. Most volcanoes in the Pacific Ring of Fire have an explosive nature. This is due to high concentrations of water in their magma. Obviously, this magma comes from several kilometers below the earth’s crust. How is it possible for magma to contain water at such depths? (3points)   While the magmas are pressurized at depths, they have water dissolved in them. This water is not separate liquid water or vapor flowing around the magma. It is inside the magma in one physical entity. Think of dissolving salt in water - you can't see salt grains but it's there. Anyway, once the magma rises it loses pressure. This causes the water to separate out from the magma into a distinct vapor phase that rises and expands rapidly, causing the explosive eruption.   1. How do you suppose did Mount Mayon in Albay acquire its majestic cone-shaped structure? (3points)   Mount Mayon acquired its majestic cone-shaped structure because of the pyroclastic and lava flows which layered from the past eruptions.   1. The main Hawaiian Islands are all shield volcanoes. What are shield volcanoes and why are they not particularly dangerous to inhabitants? (5points)   Shield volcanoes are built by many layers over time and the layers are usually of very similar composition. The low viscosity also means that shield eruptions are non-explosive. Eruptions tend to be mild in comparison to other volcanoes, but lava flows can destroy property and vegetation.   1. How and why volcano erupt? (5points)   Why:  Volcanoes erupt when molten rock called magma rises to the surface. Magma is formed when the earth's mantle melts. Melting may happen where tectonic plates are pulling apart or where one plate is pushed down under another. Magma is lighter than rock so rises towards the Earth's surface. As the magma rises, bubbles of gas form inside it.  How:  Runny magma erupts through openings or vents in the earth's crust before flowing onto its surface as lava. If magma is thick, gas bubbles cannot easily escape and pressure builds up as the magma rises. When the pressure is too much an explosive eruption can happen, which can be dangerous and destructive. Another way an eruption happens is when water underneath the surface interacts with hot magma and creates steam, this can build up enough pressure to cause an explosion.   1. Why should we be informed about volcanic activities? (3points)   It is important to be informed about volcanic activities so that we will be prepared before after and during the eruption. We can also protect ourselves from the dangerous ashes that is produces.   1. Why do we study the shapes of volcanoes? (3points)   We have to study the shapes of volcanoes to know what kind of eruption to expect.   1. When are volcanoes considered as threats to life and property? (5points)   Volcanoes are always destructive to life and property but it becomes more destructive when the case is of Active volcanoes because the active volcanoes continues to explode for a long time.   1. How does geothermal powerplant work? Describe its advantages and disadvantages. (5points)   They use heat from volcanic eruptions to boil water and create steam that can power a turbine. They actively move heat from underground into an overlying structure in order to remove or add heat to the structure. Advantages of geothermal power plant : A reliable source as its easier to predict the power output from a geothermal plant with a high degree of accuracy. Disadvantages of geothermal powerplant: energy fluid needs to be pumped back into the underground reservoirs faster than it is depleted. Management is required to maintain sustainability. | | | |
| 1. Learning Activity 2:   **2A: Group task (30 points)**  **Objective:** Identify the electronic configuration of an element.  **Direction:** Ask three people to talk about the most memorable volcanic eruptions that they know of, read about, or have experienced. *(If none, research in the internet)* Write down in the matrix below thir experience (e.g. felt an earthquake, was scared) and their observations during eruption (e.g. ash falling like rain, dark skies, etc.). Summarize in a short paragraph any commonalities in their answers. Validate their responses by researching on the volcanic events they cited.   |  |  |  |  | | --- | --- | --- | --- | | **Name of Interviewee** | **Volcanic Eruption** | **Experiences** | **Observations about the surroundings** | | Placeta | Mt. Pinatubo | There are large rock falling and our house is covered with mud, because of the mud our roof collapsed gladly we are not inside the house. | The area is very dark because of the ashes and smoke. | | Ponciano Tenorio | Taal Volcano | We saw a bright light from the eruption. The rumbling was so loud. | The surrounding area is very dark and covered in smoke. | | Lorna Ortiz | Taal Volcano | My mother was giving birth to my brother when the eruption happened | The sky was so dark and full of ash |   The interviewees answers have something in common,  **2B: Emergency Plan! (20 points)**  **Objectives:** Explain what happens when volcanoes erupt; Illustrate how energy from volcanoes may be tapped for human use.  **Directions:** Make an emergency procedure for before, during and after volcanic eruption occurs given if we are situated near an active volcano. Consider also how to help and save people affected when eruption occur.  ***Rubrics:***  ***Concept: 10 points***  ***Originality: 5 points***  ***Skills: 5 points***    The space for the magma to leave is very small and, as it travels, pressure builds, meaning it escapes violently when released. This escaping liquid rock becomes lava, which solidifies as it travels. Layers of lava build up over time, creating volcanoes.  Volcanoes are the main source of geothermal energy. The geothermal energy is a renewable resource, as it exploits the abundant Earth's interior heat and water, which once used and cooled, is then piped back to the reservoir.  Emergency Procedures:  Before:   * Each one should be aware of the dangers that volcanic eruptions pose to lives and be prepared to face whatever circumstances. * Prepare all necessary things to bring once evacuation is needed. Those in danger zones are warned when to evacuate. Once given the signal refrain from saying you will be all right. Refusing to evacuate will pose more serious problems. the eruption may bring. * Prioritize the safety of kids before other things. If you have relatives or friends who are far from the volcano, take your children there until such time that your place is safe.   During:   * Avoid all low-lying places because lava flows and mudflows are more likely to pass here. * If you are inside a house; close all doors and windows to avoid ashes from getting inside. * Keep a watchful eye on the kids because they might be tempted to go out and see what’s going on outside.   After:   * Go back to your house but leave the kids behind someone who can take care of them while you check your house. * Use masks while cleaning ash and other debris. * Wait for further announcements related to the volcano activities. | | | |
| 1. Learning Activity 3:   **3A: Research! (40 points)**  Instruction: Research on the effects of volcanic eruption in the Philippines. Write a minimum of 350-words essay that by finding out the advantages and disadvantages brought by the volcanic eruption to the residents in the area in terms of: culture, socioeconomic status, religion, environment, and livelihood. Moreover, describe how people who were affected were able to recover from the eruption.   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **RUBRIC FOR ESSAY** | | | | | | ***Criteria*** | ***Excellent (5)*** | ***Very Good (4)*** | ***Average (3)*** | ***Needs Improvement (2)*** | | **Ideas (x4)** | Clear and focused on the situation/problem/ theme. Catches the teacher’s interest with relevant details. | Mostly focused and had some good details. | Started to define the topic regardless of the generality of the ideas. Provided basic answer. | Not well-defined with too many ideas that confuses the main details. | | **Organization (x2)** | Enhances and showcases the main theme or ideas are well organized forming into a cohesive structure. Moves the teacher through the flow of the texts. | Mostly organized, in order and make sense to the teacher. | The organizational structure is strong enough to convince the teacher without too much confusion. | Sentences in between paragraphs make sense but not the order of the paragraph. | | **Sentence Fluency (x2)** | Essay has an easy flow, rhythm and cadence. Sentences are well-built with no grammatical errors. | Sentences flows with few grammatical errors. | Sentences are coherent but with 50% grammatical errors. | Most of the sentences were grammatically incorrect. |   **Volcanic ejections happen when magma and gas are released from a volcanic vent. The most well-known outcomes of this are populace developments as huge quantities of individuals are frequently compelled to escape the moving magma stream. Volcanic emissions frequently cause brief food deficiencies and volcanic debris avalanches called Lahar. In spite of the fact that there are a few components setting off a volcanic emission, three prevail: the lightness of the magma, the pressing factor from the exsolved gases in the magma and the infusion of another bunch of magma into a generally filled magma chamber. This lighter magma at that point ascends toward the surface by ethicalness of its lightness.**  **Well being worries after a volcanic ejection incorporate irresistible infection, respiratory sickness, consumes, wounds from falls, and vehicle mishaps identified with the elusive, foggy conditions brought about by debris. The emission of the Taal Volcano in the Philippines on January 12 caused far reaching harm and constrained the departure of a few towns in the Batangas and Cavite Provinces. Nonetheless, because of the low take-up of protection in the country, the occasion will be of insignificant impact to guarantors, as per a specialist.**  **At the point when a fountain of liquid magma ejects it tosses out a great deal of debris. At short notification this debris can be destructive to the climate, yet on the drawn out the debris layer, which contains numerous helpful minerals, will be changed over to an extremely fruitful soil. Almost wherever volcanoes are found individuals utilize the rich soil for cultivating. They assisted cool with offing the earth eliminating heat from its inside. Volcanic discharges have created the air and the water of the seas. Volcanoes make islands and add to the mainlands. Volcanic stores are additionally utilized as building materials.**  **Volcanic ejections can be amazingly harming to the climate, especially on account of various poisonous gases potentially present in pyroclastic material. Carbon dioxide transmitted from volcanoes adds to the characteristic nursery impact. Debris' grating particles can start to expose the skin and eyes, causing inconvenience and irritation. Whenever breathed in, volcanic debris can mess breathing up and harm the lungs. Breathing in a lot of debris and volcanic gases can make an individual choke.**  **Volcanic ejection have influenced the existences of individuals close to the region, it influenced their lungs and their way of life. Yet, that didn't prevent them from asking help from God.** | | | |
| **III. Reflection: (10 points)** | | | |
| I have learned a lot in this lesson especially the procedures on what to do before during and after the volcanic eruption. Volcanic eruptions happen when lava and gas are discharged from a volcanic vent. The most common consequences of this are population movements as large numbers of people are often forced to flee the moving lava flow. Volcanic eruptions often cause temporary food shortages and volcanic ash landslides called Lahar. Volcanic ejections can be amazingly harming to the climate, especially on account of various poisonous gases potentially present in pyroclastic material. Carbon dioxide transmitted from volcanoes adds to the characteristic nursery impact. | | | |

Prepared by: **REYNA MAY E. DOLERA / Science teacher III**