Upper Primary 2021

'My Outdoor Classroom' Lesson Plan

Erupting mud volcano

Activity 1

School Curriculum and Standards Authority (SCSA) Curriculum Links

- *Year 3 and 4 Science:* Planning and conducting. With guidance, plan and conduct scientific investigations to find answers to questions, considering the safe use of appropriate materials and equipment (ACSIS054)
- *Year 5 and 6 Science:* Communicating. Communicate ideas, explanations and processes using scientific representations in a variety of ways, including multi-modal texts (ACSIS093)
- *Year 6 Chemical Science:* Changes to materials can be reversible or irreversible (ACSSU095)

Resources (for each group of four children):

- Newspaper
- Large oval plastic platter
- Mud (dirt and water)
- Large bowl for mixing the mud
- Receptacle for water to add to the mud
- Small plastic container such as a cup
- Teaspoon
- Tablespoon
- Baking soda
- Red and yellow food colouring (or edicol dye)
- Dishwashing liquid
- Vinegar

Introduction

This activity allows students to observe a chemical reaction which causes irreversible change and is best done outside. Students build curiosity and enthusiasm for conducting experiments and develop observation skills and a questioning attitude. The students will prepare and create their own 'volcanic explosion' by making a chemical reaction.

Before You Head Out

Show your students some images of volcanoes and video footage of eruptions.

Explain that, the shape of volcanoes may be low and broad or conical and steep.

- Icelandic eruptions flood the earth's surface with massive amounts of very hot, runny lava
- Hawaiian eruptions pour out of the main vent at the volcano's summit
- Strombolian eruptions are more explosive and erupt regularly
- Plinian eruptions are tall, very fast and the most explosive

Explain to the students that they are going to create a reaction similar to a volcanic eruption and the shape of their volcano may impact what happens (the steeper the volcanic cone, the more violent the eruption).

Erupting Mud Volcano Activity Steps

1. Divide the class into groups of four students.
2. Students lay the newspaper on the place the experience will take place.
3. Two students gather some dirt and mix it with water in the large bowl until it turns clay-like and place the mud onto the paper or plastic plates.
4. The other two students decide on the form of the volcano and create the cone. They make a hole at the top and place the small plastic cup firmly inside.
5. One student adds two teaspoons of baking soda.
6. One student adds one teaspoon of dishwashing liquid.
7. One student adds a few drips of red and yellow food colouring.
8. Get ready! One student adds two tablespoons of vinegar!
9. What happens? Students share what they see as scientists and record their findings on the journal in words and pictures.

Reflection/Discussion

Ask the students to describe their observations and look closely at the 'lava'. Can the students see evidence of any of the individual ingredients of baking soda, dishwashing liquid, or vinegar? What changes took place? Were they irreversible?

After the experiment, challenge the students to research what new substance (carbon dioxide) was created when they combined vinegar (an acid) with baking soda (a base) or provide the following information: CO2 is an odourless and colourless gas. It occurs in animal respiration, volcanic outgassing, and oceanic evaporation.

Relate the experiment to the videos the students saw of real volcanic eruptions. What was the same? What was different? Was the eruption like an Icelandic eruption (lots of runny 'lava')? Was it like the 'lava' pouring out like a Hawaiian eruption? Or was it very fast and explosive like a Plinian eruption?

Elaboration/Extension

- For an extension, the experiment could be repeated using different amounts of the ingredients so that the students can observe any changes to the reaction or to improve the scientific investigation.
- Record the 'eruption' with videos or photos. Draw a picture of either the experiment or a volcanic scene with black permanent marker and complete as a painting in edicol dye colours.

Elaboration/Extension (continued)

- Research one of the famous volcanoes from around the world such as Mauna Loa in Hawaii (the largest volcano on Earth), or the eruptions of Mount St. Helens or Vesuvius. Present the research as a PowerPoint or poster.

Teacher Observations

What worked well:

What would I do differently next time:

Curriculum Links

Extra detail relevant to year groups can be found by following the Curriculum link to SCSA. Elaborate on, extend, and integrate this activity with other learning areas where possible.

- *School Curriculum and Standards Authority*
  https://k10outline.scsa.wa.edu.au/home/teaching/curriculum-browser/science-v8

Visit the website **app.naturepassport.org** (My Outdoor Classroom Activity Pack) to complete this activity and many more! Alternatively, download the free **Nature Passport** app from your **App Store.**

Visit **www.naturepassport.org** for more information and ideas.

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Print the Nature Passport Booklets for your students to use with this lesson!