



4-H Project Area

Reactions-Volcano

BACKGROUND

Youth will recreate a volcanic eruption using two different types of chemical reactions.

NOTE: THIS ACTIVITY SHOULD BE CONDUCTED OUTDOORS. IF YOU ARE NEAR THE VOLCANO, YOU WILL GET WET!

WHAT TO DO

Activities: Volcano Creation

Time: 90 minutes

Objective: Youth will understand 2 different types of chemical reactions and observe what results from a volcanic eruption.

Procedure:

1. Go over some background info about volcanoes from the Volcano Fact Sheet
2. Take empty 2-liter bottle and place on wood pieces that were laid out to form a base
 - a. The base is made by laying 2 or 3 of the 2 X 4" boards on the ground next to each other
3. Cut chicken wire and mold it around the bottle to form the shape of a volcano
4. Take flour and water and mix together in medium size bowl to make a paper mache mixture
 - a. To make paper mache paste, mix together 1 part flour to 2 parts water. You will want it to be the consistency of thick glue, but you also want it to be runny and not thick like paste. Add more water or flour as necessary. Mix well to remove any lumps
5. Cut the newspaper into strips about 2 inches thick and any length
6. Stick the newspaper strips into the mixture and once the strip is covered place it on the wire
7. Continue doing this until the wire is covered but leave a space in the top where the bottle top will stick out
8. Allow the mache to dry for a bit
9. Repeat steps 1-7 using the full 2 liter bottle of Diet Coke instead of the empty bottle.
10. Pour 1 ½ cups baking soda into the empty bottle.
11. Add a couple of drops of red food coloring to the vinegar
12. Pour 4 cups vinegar into the bottle
13. Watch the reaction
14. With the second volcano, Roll up a piece of paper (to make a cylinder shaper) and place 6 Mentos into it
15. Uncap the full bottle of Diet Coke
16. Put the piece of paper over the opening of the bottle of let the mentos fall out (Don't drop the paper into the soda bottle)
17. Get back quickly to watch the reaction

NOTE: THIS ACTIVITY SHOULD BE CONDUCTED OUTDOORS. IF YOU ARE NEAR THE VOLCANO, YOU WILL GET WET!

Project Skills:

Youth will come to understand two different forms of chemical reactions

Life Skills:

- Applying Science and Technology
- Communicating with others

Academic Standard:

Science D.4.1 Understand that objects are made of more than one substance, by observing, describing and measuring the properties of earth materials, including properties of size, weight, shape, color, temperature, and the ability to react with other substances

Grade Levels:

2nd – 5th grades

Time:

90 minutes

Supplies Needed:

- News paper
- Flour
- Water
- Medium size bowl
- Chicken wire (approximately 6 feet long by 18 inches high)
- Short wood pieces to make a base (Six 2 X 4" boards cut into pieces a foot in length)
- 2-liter bottle of Diet Coke
- Baking soda
- White Vinegar
- Original mint Mentos
- Wire cutters
- Empty 2-liter bottle
- Food coloring

Sources:

<http://www.worldatlas.com/aatlas/info/page/ringfire.htm>

www.stormthecastle.com

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TALK IT OVER**Reflect:**

1. What happened to each volcano?
2. Why do you think they are different?
3. What would happen if you put less or more mentos into the bottle? Do you think the reaction would change?
4. Do you think the amount of baking soda that you put in the empty bottle would make a difference? Why? How could you check this prediction?
5. Why did we use Diet Coke instead of another soda?
 - a. Answer: The sugar in regular coke leaves a sticky residue that attracts vermin and is hard to clean up
 - b. You will get a smaller reaction from using regular soda

Apply:

1. What are some other things that are around your house that can cause a reaction?
2. How are these reactions similar and different to real volcano reactions?

ENHANCE/SIMPLIFY

1. Instead of using wire for the mold, strips of cardboard could also be used
2. If small wood pieces are not available, a cookie sheet can be substituted
3. Make sure to be quick when putting the mentos into the Diet Coke bottle, it will react quickly

HELPFUL HINTS

It is a trial and error process. Before starting the paper mache phase, test to make sure the amount of baking soda and vinegar will give the reaction that you are expecting.

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Volcano Fact Sheet

- More than 80% of the Earth's surface was created by volcanic action.
- Someone who studies volcanoes is called a Volcanologist.
- Many Islands were created by volcanic action.
- There are more than 1500 active volcanoes on the earth
- The largest collection of volcanoes is called "The Ring of Fire" a series of over 450 volcanoes that encircles the Pacific Ocean.



<http://www.worldatlas.com/aatlas/infopage/ringfire.htm>

- Indonesia is the country with the most volcanoes.
- The biggest active volcano in the world is Mauna Loa in Hawaii.
- The oldest volcano in the world is Mount Etna. It is estimated to be 350,000 years old.
- Volcanoes are not always mountain shaped. Some volcanoes are depressions in the earth because the loss of magma and earth materials causes the earth to sag.
- There are volcanoes under the oceans. There are estimated to be as many as ten thousand of them.
- It is estimated that about 60 volcanoes erupt every year around the world, but the large majority of these are very weak.
- How is the size of an eruption determined? There is a scale that volcanologists use. It is called the Volcanic Explosivity Index or VEI and it is based on a number of things that are observed during an eruption.
- The largest volcano eruption in the last 600 years was the Tambora Volcano in Indonesia. It erupted in 1815.
- There are five types of volcano: The Shield volcano, The Cinder Cone, The Dome, The Stratovolcano and the Caldera.

www.stormthecastle.com

<http://www.stormthecastle.com/how-to-make-a/how-to-make-a-volcano.htm>