# Western Sengineering Outreach

Edible Igneous Rocks Grade SK-2

# Meet Today's ENG HERO!



Anand Prakash - Associate Professor at Western University

Dr. Prakash has been involved in the design and development of multiphase reactors for various applications especially in the area of clean and renewable fuels. His association with industry has allowed him to address the evolving needs of the industry. In his lab, two novel techniques have been developed, namely fast response heat transfer probe, and ultrasonic techniques for online characterization that has both academic and industrial applications. To find out more about Dr. Parkash:

https://www.eng.uwo.ca/chemical/faculty/prakash\_a/index.html

# Learning Goal:

Students will consider how rocks were formed and how to identify them. Curriculum Connections: Grade 1 - Materials, Objects, and Everyday Structures; Grade 2 - Properties of Liquids and Solids

# Materials Needed:

- 1/2 cup sugar
- 1/2 cup corn syrup
- 1/2 tablespoon vinegar
- 1/2 tablespoon baking soda
- 1 teaspoon vanilla or other flavoring
- Parchment paper
- Candy thermometer
- Pot
- Baking sheet
- Paint
- Paint brush
- 1 Rock









# Engineering and Science Connections:

Today we will be becoming civil engineers! Civil engineers design, construct, and maintain the physical and naturally built environment. This includes roads, bridges, canals, dams, airports, sewage systems, pipelines, structural components of buildings, and railways

Civil engineers use a lot of natural materials to construct a lot of these physical things, one of the main materials is a rock. So what is a rock?

A rock is a solid made up of a bunch of different minerals. Rocks are generally not made up of exact structures or materials throughout. Scientists generally classify rocks by how they were made or formed. There are three major types of rocks: Metamorphic, Igneous, and Sedimentary.

Metamorphic rocks are formed by great heat and pressure. They are generally found inside the Earth's crust where there is enough heat and pressure to form the rocks. Metamorphic rocks are often made from other types of rock. Some examples of metamorphic rocks are marble, anthracite, soapstone, diamond, and schist.

Igneous rocks are formed by volcanoes. When a volcano erupts, it spews out hot molten rock called magma or lava. Eventually the magma will cool down and harden, either when it reaches the Earth's surface or somewhere within the crust. This hardened magma or lava is called igneous rock. Examples of igneous rocks include basalt and granite.

Sedimentary rocks are formed by years and years of sediment compacting together and becoming hard. Generally, something like a stream or river will carry lots of small pieces of rocks and minerals to a larger body of water. These pieces will settle at the bottom and over a really long time (perhaps millions of years), they will form into solid rock. Some examples of sedimentary rocks are shale, limestone, and sandstone.

Video Recommendation: Types Of Rocks / The Dr. Binocs Show / Learn Videos For Kids https://www.youtube.com/watch?v=CeuYx-AbZdo

# Activity:

### **Rock Painting**

Today, we will paint rocks and hide them for other people to find, you will be able to track where they went. We will use Gorock.com.

STEP 1: Find a rock you would like to paint

STEP 2: Sign up at GoRock.com (it's free!)

STEP 3: Paint your rock as you normally would, then log in and get an ID

STEP 4: Add the ID to your rock, then hide anywhere

STEP 5: GoRock will let you know when your rock has been found - follow the link in the email to see where it has traveled, read stories from those who find your rock and to see how your rock is leading to donations to charity!

### Time to begin

Today's main activity we will be doing a slow chemical reaction with vinegar and baking soda to make crystals! Warning! We will be using a hot stove, please do this activity with adult supervision !

- 1. Line the bottom and sides of an 8x8 square pan with parchment paper and grease with vegetable oil.
- 2. Add sugar, corn syrup, and vinegar to a large, deep sauce pan. (The mixture will bubble up.)



3. Cook over medium heat stirring continuously until the sugar dissolves. Continue cooking until candy is around 300°F. Be patient. It will take a while. Stir occasionally.



4. As soon as it reaches 300°F, remove from heat and stir in the baking soda. The mixture will foam.



- 5. Pour into parchment lined pan and allow to cool completely.
- 6. Once candy has cooled, use parchment paper to pull it out of the pan. Cut or break the candy into bite sized pieces.

7. Observe the sponge like appearance of the candy. Discuss how it resembles pumice rock.

# Debrief

Pumice is created when super-heated, highly pressurized rock is violently shot out from a volcano. The unusual foamy configuration of pumice happens because of simultaneous rapid cooling and rapid depressurization. In our cookie the baking soda creates little bubbles in the cookie as it cools.

## What Did You Learn?

- What is Civil Engineering?
- Rock types
- Properties of rocks
- Igneous rocks

# Future Learning

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- Research vinegar and baking soda volcanoes
- What is a neutralization reaction?

# Share your creations!

We would love to see what you made. Email as at <u>discover@uwo.ca</u> or tag us on social media.

Instagram: @westernueng Twitter: @westernueng Facebook: @westernueng

Thanks for discovering with us!