

# Geo Science Challenge for Alberta Girl Guides



## INTRODUCTION

The Geo Science challenge is designed to allow the girls to explore more about Geo/Earth and other sciences. The activities are meant to be fun for the girls and the Guiders!

Thanks to the Guiders who contributed to the development of the challenge. Have fun!

## RESOURCES: (used to develop challenge)



### Websites:

- Canadian Society of Petroleum Geologists - <http://www.cspg.org>
- Earth Net - [http://www.earthnet-geonet.ca/index\\_e.php](http://www.earthnet-geonet.ca/index_e.php)
- The Association for Women Geoscientists - <http://www.awg.org/>
- Women in Science Resources - <http://www.wesleyan.edu/wis/resources.html>
- Geo Mysteries - <http://www.childrensmuseum.org/geomysteries/index2.html>
- Rocks for Kids - <http://www.rocksforkids.com/RFK/TableofContents.html>
- Earthquakes, for kids only - <http://earthquake.usgs.gov/4kids>
- California Geological Survey, Kid Zone-  
[http://www.consrv.ca.gov/cgs/information/kids\\_geozone/kid\\_links.htm](http://www.consrv.ca.gov/cgs/information/kids_geozone/kid_links.htm)
- Geological Survey of Canada - [http://gsc.nrcan.gc.ca/index\\_e.php](http://gsc.nrcan.gc.ca/index_e.php)
- PBS Savage Earth - <http://www.pbs.org/wnet/savageearth/>
- Canadian Rock hound -  
[http://www.canadianrockhound.com/junior/minerals\\_properties.html](http://www.canadianrockhound.com/junior/minerals_properties.html)
- Discovery School: Rocks Lesson Plan-  
<http://school.discovery.com/lessonplans/programs/rocks/>
- Stones at home - <http://www.bbc.co.uk/education/rocks/stones.shtml>
- Nevada Mining Association: Education Page -<http://www.nevadaminging.org/education/>
- The Stupid Page of Rocks - <http://www.geocities.com/RainForest/Canopy/1080/>
- GeoMysteries with Rex the Dino Detective -  
<http://www.childrensmuseum.org/geomysteries/mysteries.html>
- The rock cycle - <http://www.cof.edu/ete/modules/mse/earthsysflr/rock.html>
- The rocks & minerals quiz - <http://www.littleexplorers.com/classroom/quiz/rocks.shtml>
- The Dynamic earth - [http://www.mnh.si.edu/earth/main\\_frames.html](http://www.mnh.si.edu/earth/main_frames.html)
- <http://www.canadiangeographic.ca/cgKidsAtlas/rock.asp>
- <http://organizations.oneonta.edu/geology/geologyforkids.htm>
- [http://www.magma.ca/~syatabe/GC\\_Website/links/links\\_geology4kids.html](http://www.magma.ca/~syatabe/GC_Website/links/links_geology4kids.html)
- <http://eduref.org/cgi-bin/printlessons.cgi/Virtual/Lessons/Science/Geology/GLG0048.html>
- <http://eduref.org/cgi-bin/printlessons.cgi/Virtual/Lessons/Science/Geology/GLG0014.html>
- <http://www.col-ed.org/cur/sci/sci56.txt>
- <http://rockhoundingar.com/pebblepups/meritbadge.html>
- 

### Books:

- "Adventures with Rocks & Minerals, Geology Experiments for Young People." – Lloyd H. Barrow
- "Science for Kids, 39 Easy Geology Experiments." – Robert W. Wood

- “Geology Crafts for Kids, 50 Nifty Projects to Explore the Marvels of Planet Earth.” - Alan Anderson, Gwen Diehn & Terry Krautwurst
- “Science Smart Cool Projects for Exploring the Marvels of Planet Earth.” - Gwen Diehn, Terry Krautwurst, Alan Anderson, Joe Rhatigan, & Heather Smith.
- “A Guide to Field Identification, Rocks & minerals.” – Golden

Other:

- Geoscape Calgary poster - [http://www.geoscape.nrcan.gc.ca/index\\_e.php](http://www.geoscape.nrcan.gc.ca/index_e.php)

## ACIVITES: (Detailed Descriptions)

### Grow Your Own Rocks:

You will need the following:

- *String (kite string works well)*
- *A pot (medium to large size)*
- *Candy Thermometer*
- *Metal Bowl or Pan*
- *2 Cups Water*
- *5 Cups Sugar*
- *A Spoon*
- *Aluminum Foil*

Stretch the string across the top of the metal pan or bowl. You will need to let it droop into the liquid, but don't let it touch the bottom. Tape the ends to the outside of the pan or bowl to keep it from touching the bottom.

Put water and sugar in the pot and stir until the sugar dissolves. Place candy thermometer in water and cook until the liquid reaches 250°. DO NOT stir after you have started cooking the liquid.

Cerefully pour the VERY hot liquid into the pan or bowl that you have prepared with the string. Make sure that the string is at least  $\frac{3}{4}$  of an inch under the surface of the liquid. Cover the pan or bowl with foil and don't disturb it for a week. In 7 days, lift out the string and it will be covered with Rock Candy!

*Make sure to have an adult's help during the cooking and while working with the hot liquid!*

-----

**Grade Levels:** K, 1, 2, 3, 4, 5

**Lesson Submitted by:** Tammy Payton [tpayton@dmrtc.net](mailto:tpayton@dmrtc.net)

#### Objective

Students will have an understanding of how erosion happens and that this is part of the rock cycle.

#### Materials Needed:

- [Metamorphic Magic Cookie recipe](#)
- toothpicks
- paper plates

#### Activity Description:

Have the students measure, stir, and bake the [Metamorphic Cookie](#) recipe. Explain to the students that the ingredients they are adding represent sediments of material. As you add each

ingredient to the mixture, they are becoming compacted together. After all of the ingredients are added, you have something similar to a sedimentary rock formation. When you form the small, teaspoon size drops of dough on the cookie sheet, you have compacted the ingredients together to form a solid material.

You can discuss how this is similar to conglomerate rock. Conglomerate rocks are sedimentary rocks. They are made up of large sediments like sand and pebbles. The sediment is so large that pressure alone cannot hold the rock together, but are cemented together with dissolved minerals. The chips and nuts can represent the large sediments and the dough represents the dissolved minerals that cement the rock.

Next have the students predict what will happen to this dough when heat is added to this mixture. Tell the students that this is how sedimentary rock is changed, or morphed, into another kind of rock. Metamorphic rocks were once igneous or sedimentary. The rocks are under tons and tons of pressure, which fosters heat build up, and causes them to change. Although we are not adding pressure to the cookies, we are emulating the heat that causes the rocks to change with the oven.

Once the cookies are out of the oven, let the students mine for minerals. Give each student one cookie on a paper plate and a toothpick. Have students compare the size of their cookies with other students, then weigh the cookies to see if they all weigh the same. Query your students why they think all of the rocks/cookies do not weigh the same. Some cookies will weigh less than others, because some may have fewer "minerals" in their rock.

Next have the children mine for minerals by taking their toothpicks and excavating their rock. Have them sort the minerals they have and discuss whether or not the minerals changed their appearance since the heat was applied.

Have the students compare the number of minerals found in their rock to the rocks of the other students.

