



# EARTHQUAKE

*e-Newsletter about what's movin' and shakin' at the Earth Science Museum*

Earth Science Museum, 3215 W. Bethany Home Rd., Phoenix, AZ 85017  
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## ESM NEWS and EVENTS

Editors: Shirley Cote, Ray Grant and Harvey Jong

### **OUTREACH REPORT - June 2015**

By Mardy Zimmermann and Robin Evans

We had another very good year and the Outreach Program continues to serve more and more students, teachers, and the general public. Our program "Properties of Minerals" was a big hit last year. This summer we are working on expanding the upper grade program to include all areas of earth science covered in the standards. Currently, we are working to develop hands-on projects to teach earthquakes, volcanoes, and plate tectonics. In the fall, we will be expanding the number of presenters and are especially looking for those with a rock hound and teaching background.

Mardy and I were invited to partake in the City of Phoenix's Science week activities - our third year in a row. This year's theme was "Rock Art". The first thing that came to my mind was petroglyphs - the perfect combination of rock and art. I traveled to the Deer Valley Petroglyph Preserve in North Phoenix to photograph actual glyphs for our students. Mardy rounded up some sandstone slabs and printed hand-outs containing different types of petroglyphs and their meanings. We were ready to go.

On June 22<sup>nd</sup>, we presented our educational program to seven children, ages six to twelve and spoke about how early people told stories and recorded their history using petroglyphs and rocks. Mardy handed out the sheets on the meanings of the petroglyphs, multi-colored Sharpie® markers and sandstone while I handed out the sheets with the actual petroglyphs. We asked each child to create a story on the sandstone using the hand-outs and pictures we had given them. Mardy had brought enough sandstone so each student could create two story stones if they wanted.

Our second make and take project for the children to work on was to decorate a pinecone with crushed bits of minerals, and they really enjoyed this project also.



Participant creating rock art



Mineral decorated pinecone





## Arizona Rocks 25

Text and photos by Ray Grant

The foliated metamorphic rocks are named according to the texture of the rock, mainly the grain size. A very fine-grained foliated metamorphic rock where the individual minerals cannot be seen is called slate. I have not seen any samples of slate from Arizona. At Slate Creek on route 87 going to Payson the rock is really phyllite not slate. Phyllite differs from slate in that it is a little coarser-grained so it does not break clean like slate does. Also, in phyllite you can almost see the individual minerals and the rock may have a silver sheen.

Phyllites are common in Arizona. They are found in the Phoenix Mountains especially in the western portion and the area around North Mountain. Geologists working in the area have identified gray phyllite, tan phyllite, muscovite phyllite, and other phyllites from the area. These were originally mainly mudstones and volcanic ash. They also use the term greenstone for a phyllite that was originally a basalt or andesite before metamorphism. The original sedimentary and igneous rocks were buried up to six miles deep causing the change to metamorphic rocks.

For detailed information about the metamorphic rocks in the Phoenix Mountains go to the website - [arizonageologicalsoc.org](http://arizonageologicalsoc.org), click on the "about us" and then on "publications Archive", then on "1950 to 2005 Out-of-Print Guidebooks". In the out of print guidebooks go to 2000-2005 and find Johnson, J.K. and Reynolds, S.J., 2002, Geologic Field Guide to the Phoenix Mountains.



Phyllite, you can almost see individual minerals, but it is still very fine-grained. It does not break smooth like slate.



Greenstone (green phyllite) at North Mountain Park



A muscovite rich phyllite, mined in the Phoenix Mountains and used as flagstone

**ESM's Upcoming Meeting**

The Earth Science Museum's next scheduled Board meeting will be on August 12, 2015, at the Burton Barr Library, located near Central Ave. and McDowel in Phoenix at 6:30 p.m. in Rm. B. Everyone is welcome to attend.

**BECOME A MEMBER!**  
Join the Earth Science Museum's



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**ESM Earth Science Investigation  
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Membership benefits:

- ◆ Monthly e-newsletter *Earthquake*
- ◆ Official team membership card
- ◆ Knowledge that your contribution is making a difference in earth science education.

**MANY THANKS TO OUR MAJOR DONORS!**

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**Mission**

Our Mission is to excite and inspire all generations about earth sciences through educational outreach.

**Vision**

We envision a community where students and the general public have curiosity about, passion for, and understanding of the underlying principles of earth sciences.

For more information about the ESM, how to become a member or how to arrange for a school visit or Community function, go to: [www.earthsciencemuseum.org](http://www.earthsciencemuseum.org).

*We're on the Web!*

Visit us on  and at: [www.earthsciencemuseum.org](http://www.earthsciencemuseum.org)

Please join us at the next ESM Board meeting Wednesday, August 12, 2015, at the Burton Barr Library in Phoenix at 6:30 p.m. Rm. B.

**THANK YOU FOR YOUR CONTINUING INTEREST & SUPPORT!!!**

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