



Connecting FOSS to Northern Arizona

Materials needed:

Butcher paper
Rocks
Minerals
Fossils
Markers

Time: 45 minutes

Materials needed:

A variety of rocks

Time: 45 minutes

"Earth Materials" Investigation 1 page 10:

Activity 1: "Pet Rocks"

TEACHER PREPARATION: This activity requires a great assortment of rocks: shiny rocks, smooth rocks, rough rocks, colored rocks, rocks with fossils, rocks with cracks, rocks made of smaller rocks, etc. Collect rocks around the schoolyard, your house or in your neighborhood and bring them to school in a bucket.

PLACE-BASED ACTIVITIES:

•Center Activity:

1. "Rock properties"

How?: Set up a center for students to investigate at their leisure when they have some free time. Tape a large piece of butcher paper on a table or the floor. Place a bucket of rocks, minerals, fossils from around northern Arizona nearby. Divide the butcher paper into sections for shape, size, luster, color, texture, fossils, etc. Allow students to sort and classify, then have them place the rocks back in the bucket for the next student.

•Science/Memory:

2. "Know your rocks"

How?: Divide the class in half. Each student needs a partner. Half of the class stands with their backs to the classroom (this can be done outside), facing the wall or the chalkboard. The other half of the class members each pick a rock out of a pile of rocks. They take the rock up to the partner facing the wall. They place the rock behind their partner's back in their partner's hand without them looking at it. They wait just behind them while their partner gets acquainted with their rock by feel, only. When they think they can identify their rock in a pile with other rocks they let their partner know. The partner then takes the rock back to the pile and the partners trade places and repeat the process. After everyone has felt their rock and all the rocks are placed in a pile, the children come to the pile and try to find their rock, by sight. After re-finding their pet rock they could do some writing activities on pet rock care, as well as drawing a diagram and describing their pet rock's properties.



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References:

BSCS Science:
T.R.A.C.S. 1999.
Investigating Earth Materials. Dubuque, IO: Kendall/Hunt Publishing. Pg. 57-60. [SMC 28].

Materials needed:

A variety of rocks (local)

Time: 30 to 45 minutes

Materials needed:

A variety of rocks

Time: 20 to 30 minutes

"Earth Materials" Investigation 1 page 10:

Activity 2: "Rock Singers"

This activity was modified by Amy Lord, NAU

BACKGROUND INFORMATION: Rocks are classified according to various characteristics:

Hardness: a mineral's resistance to being scratched

Cleavage: a weakness along which a mineral can be broken

Color: a mineral's color in natural light

Streak: the color of a mineral when ground to a powder or scratched on a piece of porcelain

Transparency: the way in which light passes through a mineral

Luster: the way in which light reflects off the surface of a mineral.

TEACHER PREPARATION:

Have an assortment of rocks that come from, or could represent, different geological landmarks or landforms in your area, state or well-known site (i.e. Grand Canyon) Discuss with the class the different characteristics of rocks (i.e. color, shape, size, hardness, texture, and weight).

PLACE-BASED ACTIVITIES:

•**Writing:** Have students write a "rock" song about their favorite rock

1. "Rock Singers": Describe the characteristics of rocks through observation.

How?: Have students pick a rock out of a pile of rocks. This should only take a minute. Then let the students observe the rock for 5 minutes and describe its characteristics. Have students spend 20 minutes to write a short "rock" song or poem using all the characteristics of their rock.

•**Science:** Discuss the characteristics of rocks.

2. "Pebble Personalities"

How?: Discuss all of the different characteristics that the



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References:

BSCS Science:

T.R.A.C.S. 1999.

Investigating Earth
Materials. Dubuque,

IO: Kendall/Hunt

Publishing. Pg. 57-60.

[SMLC 28].

Materials needed:

None

Time: Determined by
students

"Pebble personalities" cont'd:

students came up with about their rocks, and include ones that they might have missed. Discuss how different characteristics can tell us how and where the rocks were formed.

•Inquiry:

How?: Ask some questions: Why do some rocks have swirls and others have jagged lines? Why are some rocks heavier or more porous? What causes rocks to have crystals? These might be good questions to have students talk about in groups and then discuss their answers. Get students to ask their own questions. This might lead to other questions about rocks...



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References:

Catherall, Ed. 1990.

Exploring soil and rocks. Wayland Ltd. Pg. 6-9 and 34-35.

Rawlins, Carol. 1995.

Grand Canyon. Raintree Steck-Vaughn Publishers. Pg. 18-25.

Snyder, Robert E. et al.

1991. Earth science: The challenge of discovery. Lexington, MA: D.C. Heath and Co. Pg. 342-345.

Wiebe, Arthur, et al. 1984.

Down to earth: Solutions for math and science. AIMS Education Foundation. Pg. 18-28.

Materials needed:

30-40 grams coarse-grain sand for each group
hand lenses per student

"Earth Materials" Investigation 1 page 10:

Activity 3: "What minerals lie in the sediments of Arizona"

This activity was modified by Jeffrey Hines, NAU.

BACKGROUND INFORMATION: Instructor needs to provide reference material for students to research different rocks and minerals. Sedimentary rock is composed of small mineral particles that have been deposited in the ocean by natural forces. The minerals settle on the ocean floor and forms layers of sediment beds. The instructor must illustrate the importance of the passage of time as a concept. The students must understand that this phenomenon did not occur over night.

TEACHER PREPARATION:

Key Question for students: What is sand made up of? How does this compare with what I have collected? What can we do with various minerals?

Management Suggestions: Have each student collect samples in a labeled ziplock bag. Have several geology reference books available for students to use as an informational resource.

Discussion: Have students answer the following questions:

1. What minerals could you identify in your own sample?
2. What minerals do we mine in Arizona?
What do we use these minerals for?

PLACE-BASED ACTIVITIES:

•**Science:** Have students collect soil samples from different locations in the Flagstaff area. These samples will be compared to sand.

How?: Use hand lenses to compare the grains of sand to the grains found in soil. What are the differences? What are the similarities?



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Materials needed cont'd:

1 magnet for each student
Tweezers
Toothpicks
Colored pencils
A large example of many minerals (Museum of NAZ)

Time: 1 hour or more

Materials needed:

A variety of different minerals (1 per student)

Time: 1 week to research and prepare report
2 hours for presentations

Materials needed:

Poster board
Construction paper
Magazines for clipping
Colored pencils, markers

Time: 1 hour

•**English/Public Speaking/Science:** "I speak for this mineral"

How?: Write two descriptive sentences describing each mineral. Each student will draw a mineral from a hat and research information for a formal presentation to the class. Each student will report on how the mineral formed, how the mineral is mined, what the mineral is mined for and any environmental concerns from mining the mineral. Students may create a poster to accompany their presentations. Students may work independently or in groups.

•**Art/Geology:** A sedimentary scene!

How?: Create a poster explaining how sedimentary rock layers are formed and what may be found in the layers.



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References:

Criswell, S. G. 1994.
Nature through science and art. Blue Ridge Summit, PA: TAB Books. Pg. 20-21.

Materials needed:

Paper sacks

Time: 30 minutes

Materials needed:

Pencils
 Drawing paper

Time: 1 hour

"Earth Materials" Investigation 1 page 18:

Activity 4: "Shapes and Textures"

This activity was modified by Kim Pomeroy, NAU.

TEACHER PREPARATION:

Gather supplies, which include paper sacks, pencils and drawing paper. Schedule a field trip to Sandy's Canyon (Lake Mary Rd). Give lessons covering sedimentary, metamorphic, and igneous rocks. Discuss erosion, glacial polishing, and other means by which rocks can change their shape and texture. Determine how long it will take to load the students on the bus, drive to Sandy's Canyon and unload them. Then add at least 2 hours for the field trip.

PLACE-BASED ACTIVITIES:

•**Geology:** Collect local rocks.

1. "Local Rocks"

How?: Visit Sandy's Canyon. Start at the trail that begins just off Lake Mary Road. There is a lot of basalt (igneous) here. Give each student a small paper sack. Encourage the students to collect small rocks that they find along the trail. While you are walking together as a class, discuss what caused the various rocks to look as they do. Pick up rocks and show examples of geologic terms previously covered in class.

•**Art/Writing:**

2. "Shapes and Textures"

How?: Follow the trail to the right and stop just before you get to I-40. Divide the students into groups of four. Have the students in the groups share their collections with the others in the group. Pass out a writing utensil and a piece of paper. Each student should reach into the paper sack and feel the shape of a rock and then draw it (without looking at it!). Once all of the rocks have been drawn, have the students take the rocks out and try to match up the rocks to the pictures that they drew. Back in the classroom, have the students explain why the rocks looked and felt as they did, using the terminology previously discussed in class. Have them present their pictures and explanations to the class.



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Materials needed:

Charts of the rock formations in the Grand Canyon

Time: 30 minutes

Materials needed:

None

Time: Determined by students

•Science:

How?: Discuss the layers in the Grand Canyon and the changes that have occurred throughout the years. Talk about where all the sand ends up at the end of the Colorado (or at the back of any of the many dams). Discuss the timeline of change as compared to the short amount of time that humans have been here.

•Inquiry:

How?: Start the students with some questions to answer: What changes have happened since we have been alive? What changes are currently occurring? What is the rock cycle? Pretty soon the students may start coming up with their own questions and answers.

•Arizona State Standards:

6SC-F1: Describe the basic earth materials (rocks, soils, water and gases) and their physical properties

PO 1. Identify physical properties of earth materials

PO 2. Describe physical properties of earth materials

6SC-F5: Identify major features of natural processes and forces that shape the earth's surface, including weathering and volcanic activity

PO 1. Identify natural forces (e.g., water, ice, wind) that shape the earth's surface

PO 2. Identify natural processes (e.g., weathering, erosion, global warming) that gradually shape the earth's surface

PO 3. Identify natural processes (e.g., earthquake, floods, volcanic eruptions) that rapidly shape the earth's surface

6SC-F6: Describe natural events and how humans are affected by them

PO 1. Identify natural events that affect humans

PO 2. Explain how natural events impact human life



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References:

Braus, Judy. (ed.) 1988.
Ranger Rick's Nature Scope: Geology-The Active Earth. National Wildlife Federation.
 Pg. 21.

Materials needed:

Chunks of granite
 Construction paper
 Bits of colored paper
 Bits of magazines
 Glue
 Hand lenses

Time: 1 hour

"Earth Materials" Investigation 1 page 21:

Activity 5: "Mineral Mosaics"

TEACHER PREPARATION:

Many rocks are made out of a variety of minerals. Geologists sometimes can identify the rock by figuring out what its mineral make-up is. Sedimentary rocks can look like they are aggregates of many small pebbles. Granite is a mixture of feldspar (gray, white or pink), quartz (clear, glassy) and either mica (shiny) or hornblende (dull). Sometimes different kinds of rocks can fuse during the process of metamorphosis (in making metamorphic rocks). Talk about different types of rock that could be the small pieces as well as the minerals and processes that can bind rocks together (mud, heat & pressure).

PLACE-BASED ACTIVITIES:

●**Art/Science:** Make a mosaic that represents an aggregate rock

1. "Mineral Mosaics"

How?: After studying minerals (granite, quartz, mica)-make a "Mineral Mosaic" using bits of colored paper. Have students observe a piece of granite closely with a hand lens. Have them try to pick out the minerals in the granite. Make a mineral mosaic that represents the piece of granite. Use pink rectangles of construction paper for feldspar, white triangles for quartz and black squares for mica and hornblende. Have them use the hand lenses to figure out a pattern to use for their pieces of paper. They might look nice with a construction paper frame! Display finished products and compare everyone's patterns.



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References:

Out of the Rock.

[NAEERC: GEO 008]

Materials needed:

Video Out of the Rock.

Time: 35 minutes for
video

30 minutes for discussion

“Earth Materials” Investigation 1 page 26:

Activity 6: “Out of the Rock”

Video NAEERC: GEO 008

TEACHER PREPARATION:

PLACE-BASED ACTIVITIES:

•**Science:** Watch a video on geology

1. “Out of the Rock”

How?: Watch this video. It discusses the beginnings of life on planet and volcanoes. It also discusses human uses of minerals as building materials and how mineral nutrients sustain life. Historically, it shows how minerals were used in ancient and modern art and cultures. It relates the importance of mining and how mining can never end unless human consumption is halted. Along with mining it shows how minerals are mass produced. Despite their prolific consumption, minerals are limited resources—minerals are finite. Then it talks about the international trade of minerals as components for electronics and fertilizers. It discusses the importance of recycling and hidden resources in landfills as well as corrosion losses. 29 minutes.

**This video has some useful information. A bit dated and may be a little too old for third graders.

•**Inquiry:** How does this video relate to us?

2. “Mining in Flagstaff?”

How?: After watching the video, have students inquire into HOW what they learned in the video applies to Flagstaff. What types of mining do they think happened around Flagstaff? (Moenkopi sandstone, Basalt, coal, copper). Try to find out more on the Internet or the Arizona Mining Association.



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References:

Simpson, Bessie W. and James R. Mitchell. 1989. Gem trails of Arizona. Baldwin Park, CA: Gem Guides Book Company. [NAEERC: AZ 18 R] 523-1651.

Materials needed:

Small paper bags
Small hammer (adults only)

Time: Class time for introduction (30 min)
Travel time, walking time, Discussion time in classroom (45 min).

"Earth Materials" Investigation 1 page 28:

Activity 7: "Gem Trails"

Use the book now located in this kit!

TEACHER PREPARATION:

The Gem Trails book gives detailed descriptions of how to find locations that have a rich supply of minerals. The book, however does not give you permission to collect minerals at all of these sites. Many pieces of land change hands and fall under different jurisdiction and different rules. Check into who owns the piece of land before you go there to collect. Going just to look around usually isn't a problem though!

PLACE-BASED ACTIVITIES:

•**Science:** Go on a Gem Trail to a location near Flagstaff.

How?: Some Gem Trails include:

Kingman: White Onyx

Oatman: Cuesta Fire Agate

Perkinsville: Agate

Camp Verde Salt Mine: Agate

Payson: Geodes

Diamond Point: Quartz Crystals

Maps are located in the book. So are descriptions of each of the minerals you might find!



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References:

Chronic, Halka. 1994.
Roadside Geology of
Arizona. Missoula,
MT: Mountain Press
Publishing Company.
Pg. 201-305.

Materials needed:

None

Time: Depends on how
fast your bus driver
drives!

"Earth Materials" Investigation 2 page 10:

Activity 8: "Roadside Geology"

Use the book now located in this kit!

BACKGROUND INFORMATION:

The desert Southwest with its exposed rock and interesting landforms provides an excellent classroom for learning the basics of geology. Some of these lessons can be learned on road trips from one place to another in northern Arizona. Teach students about what can be seen along the road on the way to another field trip site, or as a field trip in itself.

TEACHER PREPARATION:

Pg. 176-190 provides an excellent overview of the geology of the Colorado Plateau. A quick read that will get you ready for teaching about local geology.

PLACE-BASED ACTIVITIES:

•**Science:** Take a geology road trip

1. "Geology Road Trip"

How?: Load up a bus with your students and drive one of these routes. The book will provide you with accurate geology information the whole way!

Flagstaff to Winslow – p. 201-206: Cinder cones, Hopi Buttes, mesas, meteorites and elephant bones.

Flagstaff to Cameron – p. 217-222: Volcanoes, cinder cones, lava flows.

Flagstaff to Sedona – p. 233-236: Faults, canyons, lake beds, buttes, Mogollon Rim.

Grand Canyon – p. 279-286: Limestone, Sandstone, Schist, Granite, canyons.

Petrified Forest – p. 297-299: Silicification, bentonite, ash, volcanic eruption.

Sunset Crater – p. 302-305: cinder cones, lava flows, prehistoric peoples.



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References:

Ranger Rick's Nature Scope. Geology: The active earth. Washington, D.C.: National Wildlife Federation. Pg. 61-62.

Materials needed:

None

Time: 30 to 45 minutes

Materials needed:

Magazines
Glue
Construction paper
Pieces of products made from minerals

Time: 30 to 45 minutes

"Earth Materials" Investigation 2 page 10:

Activity 9: "What Comes From Rocks?"

This activity was modified by Corey Hoelz, NAU.

BACKGROUND INFORMATION:

The mineral products that can be used for this activity are: soda can (aluminum), aluminum foil, pencil (lead if old, graphite if new), metal toy (aluminum or steel which is made from iron), glass products (quartz or silica), metal scissors (steel), metal silverware (steel or silver), jewelry, key, copper wire, stapler, push pin, book, wooden spoon, paper, plant, table, paper bags, magazines and glue. Paper, book, plant and wooden spoon are not mineral products.

TEACHER PREPARATION:

Look around outside to see what items are in the area that are made of minerals. Then collect rock minerals that can be found in the area for the students to examine. Discuss with the students where rocks come from and what they are made of.

PLACE-BASED ACTIVITIES:

•**Science:** Determine what is made from a mineral
1. "What comes from rocks?"

How?: Take a trip into the schoolyard and have students identify all the items they see that are made from a mineral. Then look at the items outside the school area (buildings, sidewalks, railroad tracks, rocks, etc.) to see if they can find any more. Discuss all the items they discovered and did not discover.

•**Art:** Have the students create a collage of different minerals that can be found in the area they live.
2. "Mineral Mania"

How?: The students may look through a magazine and cut out pictures of landforms, jewels, homes made from mineral materials, cars and anything else they can see in the area made from minerals. Have them paste all pictures on a large piece of construction paper. When they are



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Materials needed:

Copies of scavenger hunt list
 Cans
 Aluminum foil
 Pencils
 Metal toys
 Mirrors
 Glass
 Metal wire
 Scissors
 Metal silverware
 Books
 Wooden spoons
 Paper
 Plants
 Tables
 Paper bags
 Local rocks

Time: 30 minutes

Materials needed:

None

Time: Determined by students

"Mineral Mania" cont'd:

finished the students can talk about what they found and why they chose those pictures.

●**Science:** Have a scavenger hunt

3. "Mineral scavenger hunt"

How?: The students will have several materials laid out on a table. They must decide which are minerals and which are not. Have them put the items into groups of mineral likeness. For example, a penny and copper wire might go together or foil and aluminum cans. Once they have completed the activity, hold a discussion about what each item is made of. Then look at the rocks that have been collected from the area so the students may see what minerals look like and which ones might be found in their area.

●**Inquiry:** Get the students to start asking and exploring their own questions

4. "Miner inquiry"

How?: Get them to start asking questions: Who finds minerals? What are minerals made of? How can minerals be reused? How do we use these minerals? Might be good discussion topics for the student. Let the students come up with answers to these questions and have them try to figure out the answers and have them try to figure out the answers to their own questions. Encourage the entire class to participate.

●**Arizona State Science Standards:**

3SC-F4: Identify and describe how technology contributes to solving problems

PO 2: Identify various technologies (i.e. zipper, paper clips, computers).



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References:

Ranger Rick's Nature Scope. Geology: The active earth. Washington, D.C.: National Wildlife Federation. Pg. 61-62.

"Earth Materials" Investigation 3 page 2:

Activity 10: "The Rock Cycle Story"

This activity was modified by Corey Hoelz, NAU.

BACKGROUND INFORMATION: Igneous rocks form after magma cools and hardens. They may form underground and be pushed up later in which case large crystals can form. Other igneous rocks form after reaching the earth's surface and cool rapidly. These rocks will not have crystals. Sedimentary rocks are generally formed through the processes of weathering and erosion. They start out as large rocks and are slowly broken down into small pieces that can be carried away by wind, water and ice. Eventually the small particles of rock build up and can be compacted by pressure to cement the layers together forming sedimentary rocks. Metamorphic rocks can be created from either igneous or sedimentary rocks. When a rock is placed under great heat and pressure, the composition and grain size can change. Some examples are that calcite in limestone can turn into marble and shale can be transformed into slate.

LOCAL ROCKS:

Igneous:

- Malpais basalt: formed during the eruption of San Francisco Peak (Catholic Church Downtown)
- Dacite: formed during the formation of Mt. Elden (David Babbitt Building on the south side of Aspen downtown—the short gray one across from Babbitt's)

Sedimentary:

- Moenkopi sandstone: also called Arizona Red Sandstone formed during sedimentation from an ancient river bed (County courthouse and Babbitt's sporting goods)
- Coconino sandstone: formed from petrified sand dunes of an ancient ocean that used to be here! (Federal building and Public Library)
- Kaibab limestone: formed from the sea floor of this ancient ocean—look for sea creature fossils! (Icehouse on Birch and Verde Downtown)



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References:

Ranger Rick's Nature Scope. Geology: The active earth. Washington, D.C.: National Wildlife Federation. Pg. 61-62.

Materials needed:

Local rocks
Rock collection

Time: 30 to 45 minutes

Materials needed:

Paper
Pencils
Colored pencils or markers
Blank index cards
Tape

Time: 45 minutes to 1 hour

TEACHER PREPARATION:

Go out into the schoolyard and examine the rocks that can be found. Try to figure out what the students will find. It would also be a good idea to examine the rocks in a rock collection or kit so you have something to compare the rocks to. Then see what other rocks you can find on local buildings. Have students do the activities and discuss anything you found that they might have not discovered.

PLACE-BASED ACTIVITIES:

•**Science:** Find rocks in the schoolyard to compare to a rock collection

1. "Local rocks"

How?: Go outside and have the students collect different types of rocks. Then go inside and have students compare the rocks they found with a rock collection. Discuss what the rocks they have found have in common with the rocks in the collection. Have the student talk about where the rocks were found and why they were found in those specific locations. For example, an igneous rock might have been found near a lava flow, or a large block of limestone may be part of an ancient ocean!

•**Writing:** Create a storybook

2. "Rock Stories"

How?: Have students create their own storybook about a rock and its travels over time. The story should include where the rock was formed, how it moved from place to place, and where it is today. The students should first write their story on a piece of paper, then they should draw a picture that describes each even of the story. The pictures should be drawn on one side of the index cards. Then the students should place the cards in order from first to last (and number them!). The book can then be put together by attaching all the pages with tape so that the final product looks like an accordion with pictures on each card. After they are done creating their books, have the students share their stories with a partner or with the class.



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References:

Ranger Rick's Nature Scope. Geology: The active earth. Washington, D.C.: National Wildlife Federation. Pg. 61-62.

Materials needed:

Samples of each type of rock (igneous, metamorphic & sedimentary)

Time: 30 minutes

Materials needed:

None

Time: Determined by students

●**Science:** Discuss the rock cycle

How?: Have the class talk about the rock cycle. Start with igneous rocks, then sedimentary, then metamorphic rocks. Talk about where each can be found and what the different kinds of rocks are made of. Have students look at samples of each type of rock and let them ask questions. Make sure the students understand how long it takes for a rock to go through the entire cycle...a REALLY long time!

●**Inquiry:** What is a cycle?

How?: Ask the students several questions about parts of the rock cycle. If they have questions try to get the students to help each other answer the questions. This should lead to more questions and conversations about how rocks are used, what will happen if humans use too many rocks, how difficult some rocks are to find, and which rocks are the most common? Guide the students in finding out the answers by using a computer or looking up some of the information in books.



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References:

McLerran, Alice. 1991.
Roxaboxen. New York,
NY: Penguin Group—
Puffin Books. ISBN: 0-
14-054475-5

Materials needed:

A pile of rocks

Time: 1 hour

"Earth Materials" Investigation 3 page 8:

Activity 11: "Roxaboxen"

McLerran, Alice. 1991. Roxaboxen. Penguin Group –
Puffin Books: New York, NY ISBN 0-14-054475-5

TEACHER PREPARATION:

PLACE-BASED ACTIVITIES:

•**Music/Rhythm:** Read a book then do a musical activity
1. "Roxaboxen"

How?: Read Roxaboxen to class, then do following
activity:

Sit in a circle on the floor
Legs crossed in front of you
Sit knee to knee next to fellow students
Begin with a pile of rocks in front of the teacher
Have students place left hand on left knee
Cross right arm over and place right hand in front
of left knee on the floor
Begin rhythm: pat the floor twice in front of left
knee with right hand and then move right hand
in front of right knee, patting the floor once;
then repeat over and over.

Once students get rhythm down, begin passing one rock at
a time, while staying in rhythm, until all the rocks have
been passed around the circle and are back in front of the
teacher.

This takes time and practice but students enjoy the
activity. Good indicator of coordination development of
students. Call Rebecca Cardon if you wish to learn the
song that goes with this or if you have any questions.



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References:

Jackson, M. 1995. Stone Landmarks.

Materials needed:

None

Time: 1 week to research,
2 hours to present

Materials needed:

None

Time: 2 to 3 hours

"Earth Materials" Investigation 3 page 24:

Activity 12: "Stone Dwellings"

Use the book now located in this kit!

BACKGROUND INFORMATION:

Almost every group of people that has lived on the Colorado Plateau throughout history has used stones as building materials.

TEACHER PREPARATION:

Do a little research yourself before presenting this to your class. The book Stone Landmarks will provide you with some great information.

PLACE-BASED ACTIVITIES:

•Science/Writing:

1. "Stone Dwellings"

How?: Have students research the many different ways that people used stone on the Colorado Plateau for dwellings or buildings. Have some students work with prehistoric peoples, some with Native American peoples and some with European settlers. Have students write a short report on their findings or have them write a story about what they found.

•Science/Culture:

2. "Dwelling Field Trip"

How?: Take a field trip to visit some older stone dwellings. Good places to visit would be Wupatki National Monument, Walnut Canyon National Monument, Montezuma's Well, or even Downtown Flagstaff! Learn about limestone, sandstone and basalt as building materials and also learn about fossils and dwelling styles. Social Studies activity: compare /contrast dwellings. Make dwellings. Set up like a science fair. Share projects with other classes.



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Materials needed:

Individually picked out
rocks per student
Art supplies
Shoeboxes for displays

Time: An hour a day for
about 3 days.

"Earth Materials" Investigation 4 page 2:

Activity 13: "Rock Museum"

TEACHER PREPARATION:

This activity should probably happen at the end of the unit on geology. You want your students to have a good understanding of the characteristics of rocks and how they are different and similar before you attempt this.

PLACE-BASED ACTIVITIES:

●**Science:** Have a Rock Museum (culminating activity).
How?: Have students pick out a rock that they really like from either their backyards, during a field trip or from the school grounds. Have students research their rock, identify it and determine its characteristics, strengths, uses, etc. Students then will orally share their knowledge and facts on the mineral or rock. Students will also create a display for their rock and create a whole-class "Rock Museum" for other classes to tour their projects. It resembles a Science Fair exhibit. Great for self-esteem!