

# 3<sup>rd</sup> Grade – Radical Rocks

Earth Materials; Rocks & Soil/Rock Cycle

## Class Description

Through games and exploration students will learn to look at rocks like geologists. They will discover how the three types of rocks form and change throughout the rock cycle.

**Location:** Saddlehorn Picnic Area

**Duration:** 1.5 hour

## Standards Addressed:

**Science 3.1** – *Earth's materials can be broken down and/or combined into different materials such as rocks, minerals, rock cycle, formation of soil, and sand – some of which are usable resources for humans.*

## Enduring Understandings/Essential Questions

Earth is Constantly Changing

What is the process by which Earth's materials are formed?

How is the Earth's surface changing?

## Vocabulary Addressed

Rock Cycle

Sedimentary

Igneous

Metamorphic

Weathering

Canyon

Monolith

Plateau

Earth's materials: minerals, rocks, soil, sand

Erosion

## Theme, Etc.

### Theme

By taking a closer look at the rocks of COLM and their dynamic stories, we can start to unfold the mystery behind how this place was formed.

### Major Concepts

-Rocks are made with minerals, glue and pressure.

-Rocks are broken down by weathering and erosion.

-Sandstone is made of sand and is broken down into sand.

-Three types of rocks; sedimentary, igneous, metamorphic

-Pressure, heat, and weathering and erosion can change rocks from one type to another (rock cycle)

### Objectives

-Students will be able to explain how the three types of rocks are formed.

-Students will be able to recognize one major characteristic of each type of rock.

-Students will be able to identify the steps of the sandstone cycle and know that rocks can be formed, broken and changed.

-Students will be able to identify a canyon, monolith, and plateau.

## Class Outline

*At Saddlehorn Picnic Area*

### Introduction

To engage the students and to get them to practice making observations, hand each student their own "special" rock. (Sandstone, mudstone, or igneous/metamorphic) Have them make observations about their rock to themselves. Collect each of their rocks and mix them up in a bin that is placed in the center of the circle. When you say so, have the students move to the bin and find their special rock. Allow a couple volunteers share out how they knew, without a doubt, that they found their special rock. Have the students look to the left and right at the other rocks to see if they look like theirs. Explain that you brought out more than one type of rock for them to look at.

### Rock station

**Theme:** Not all rocks are the same.

**Props:** igneous/metamorphic, sandstone, and mudstone rocks, large and small hand lenses.

**Tips:** Allow the students time to take a closer look not only at their "special" rock but at the others set out on the table. Encourage them to make further observations about the rocks that they see and try and figure out how many types of rocks you brought out. Have them sort the rocks into 3 piles. They can do this however they want, but need to be able to explain why they the rocks fit into the groups.

### Rock Cycle

**Theme:** Each type of rock has a unique story of how it was formed.

**Props:** Simplified rock formation chart, examples of each type of rock (igneous/metamorphic, sandstone, and mudstone), sandstone cycle chart

**Tips:** Explain that today they are going to be geologists and they had the chance to classify their rocks, have them share their 3 rock types and why they separated them how they did. Then go through each rock type with the students, have them tell you what they know about each type of rock. At the end ask the students to discuss how geologists classify rocks? For example what is common about all metamorphic rocks or all sedimentary rocks? (*rocks are classified based on how they were formed*) Look at the sandstone rock cycle in depth and teach the students the motions for sand, pressure & glue.

### Sandstone Cycle Game

**Theme:** Putting the sandstone cycle into motion.

**Props:** Sandstone Cycle chart

**Tips:** Split the class into 3 groups and secretly assign each group a role to play (sand, pressure, or glue). Their job will be to run around and create sandstone by linking arms together with one of each of the hand motions. Once they have formed their groupings, have them freeze while you pull 3 students out to be weathering and erosion. The weathering and erosion students must then run around tagging the groups to turn everyone back into sand.

### Saddlehorn Sandstone Example

**Theme:** We can see up-close examples of sandstone here at COLM.

**Tips:** Have the students make observations about the saddlehorn and guess as to which type of rock it might be. Be sure to point out the fact that sandstone has layers that can be seen and what happens if water is poured on it. Do they think this is a strong rock? Do you think all sandstone is the same? Think about what sandstone is made of and discuss with a partner why you think some sandstone could be weaker or stronger than other sandstone?

## *Canyon Rim Trail*

### **Stop #1: At the fenced overlook on Canyon Rim Trail**

**Theme:** The rocks of COLM can be found in different layers.

**Props:** The view of Wedding Canyon, color drawing of the different layers.

**Tips:** Have students make observations about what the canyon walls look like. Can they see any of the rocks that you showed them in the layers? (Have them pay close attention to the color etc.) After they have looked and discussed have them share with class where each of the rock types can be found. Have them observe the sandstone beneath their feet. Do they think this is strong or weak sandstone? (compare it to the sandstone we just looked at) Have them share with the class why they think some sandstone is stronger than others? (because some has stronger glue than others) Have them take note of the sparkles in this sandstone. Explain that this sandstone has really strong glue. (What mineral did you study in class that was REALLY strong/hard?...right quartz!)

**Transition:** To get a better look at the layers in sandstone, we are going to crawl through a tunnel in the rock! Follow me...

### **Stop #2: Just on the other side of the tunnel (find a good view of the monoliths)**

**Theme:** Weathering and erosion played a big part in creating what is now Wedding Canyon.

**Props:** Labeled monoliths picture, weathering & erosion, and flash floods picture

**Tips:** Ask the students where they think we are in the sandstone rock cycle today? Is sediment turning into rock or is rock breaking down into sediment? Why do you think that? Ask them to tell you how the rocks are breaking today what forces in nature are doing this? Do they see any evidence of rocks breaking? Explain to the group how weathering and erosion played a huge part in shaping this area. Show them the labeled picture of the monoliths and have them find them in the canyon. Spend a few minutes showing the students each one and how they got their names.

## **Conclusion**

Bring the group back together and review the types of rocks that they explored. Remind the students of the different landforms that they viewed in Wedding Canyon and play the "Rocks Are Falling!" game, if time allows.

## **Rocks Are Falling!**

Show the students the signs for each of the landforms

**Monolith**= arms above head

**Canyon**=two people standing next to each other with their opposite arms in the air to form a U-shape

**Cliff**=three people linking arms together

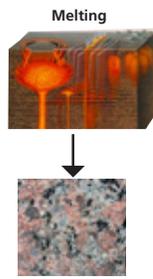
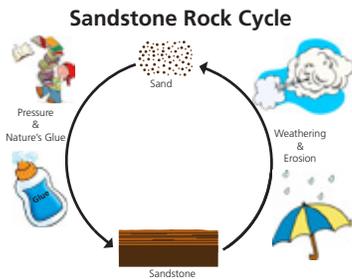
**Mesa**= four people putting their heads together to make a circle

Then review with the group which direction **north**, **south**, **east**, and **west** are in.

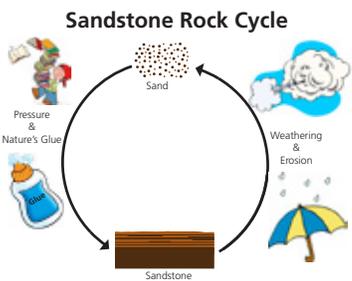
Last, explain to the group that when you say, "**Rocks are falling!**" they have to put their arms above their head in a protective stance until you say, "**The coast is clear!**"

Once the group understands all of the directions, practice for a couple rounds to make sure that everyone understands how to play and then have the real game start.

# 3rd Grade - Radical Rocks Props & Stops



## Rock Cycle Discussion



## Sandstone Cycle Game



### Stop #1

(at fenced overlook of wedding canyon)



### Weathering Rocks Breaking



### Erosion Rocks Moving

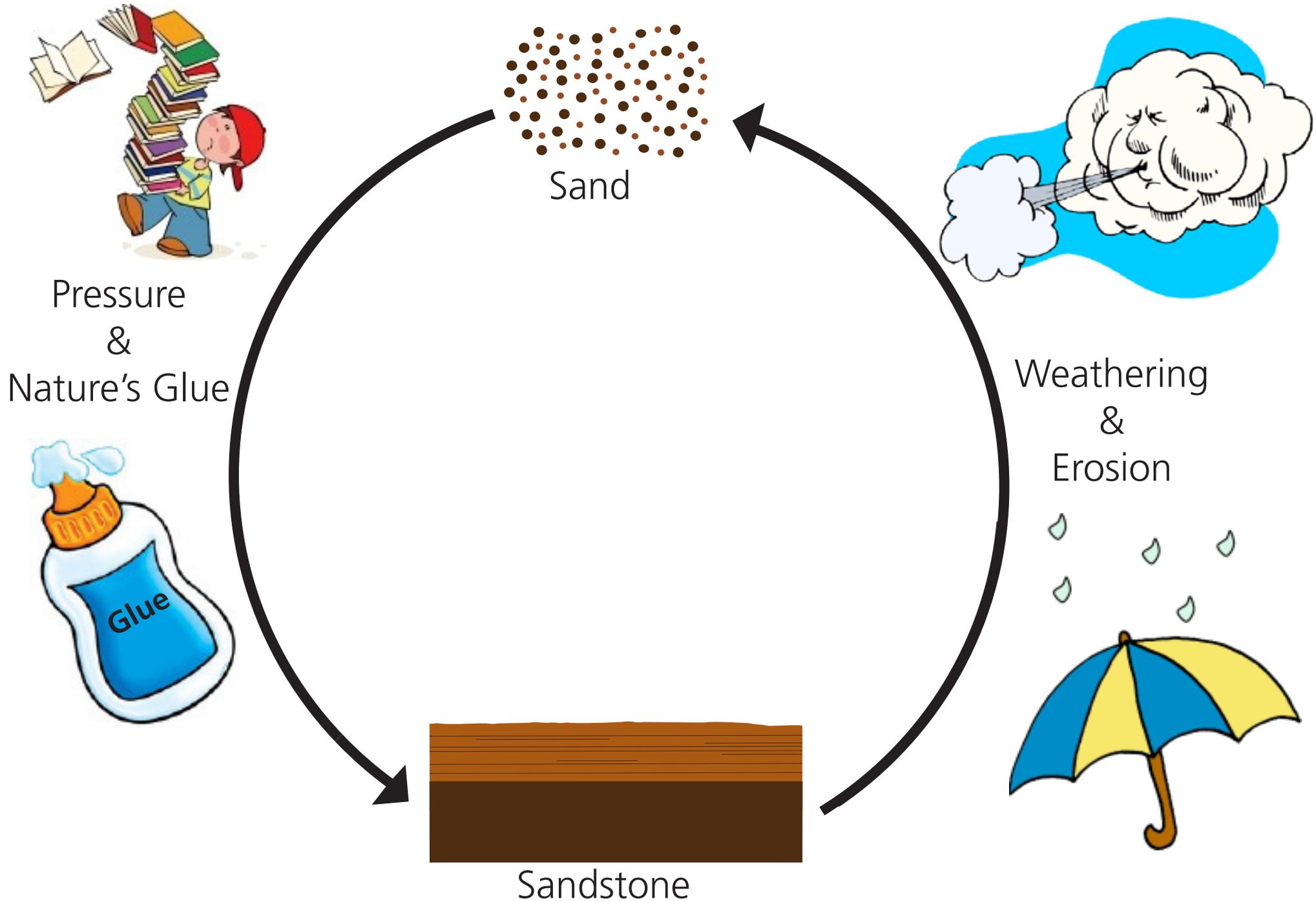


### Stop #2

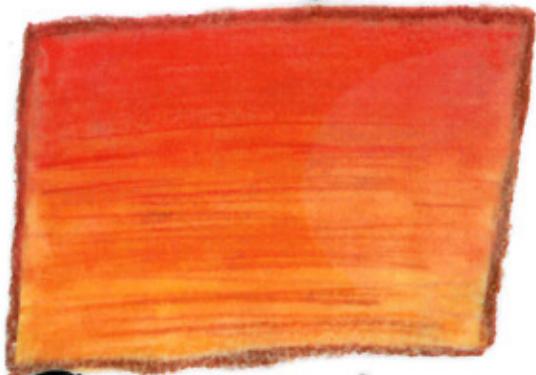
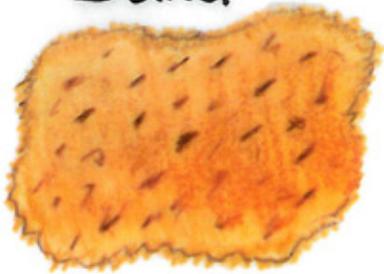
(at a good view of monoliths in Wedding Canyon)

# 3<sup>rd</sup> Grade Radical Rocks Props

# Sandstone Rock Cycle



Sand



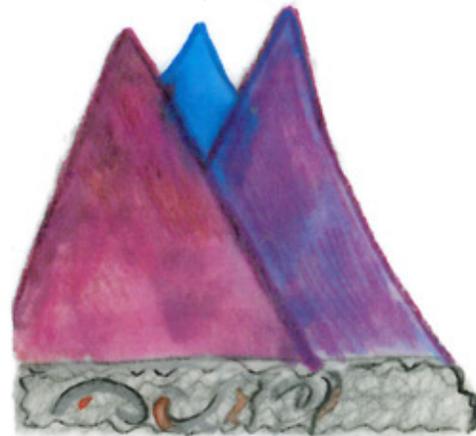
Sedimentary  
Rock

Magma



Igneous  
Rock

Rocks



Metamorphic  
Rock





River Sandstone

Desert  
Sandstone

Swampy Mudstone

Metamorphic + Igneous  
Rocks



The Island

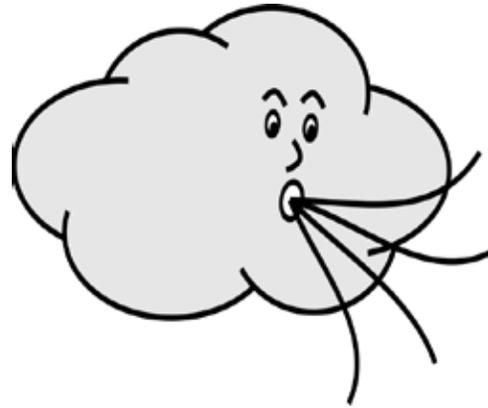
Independence Monument

Praying Hands

Pipe Organ

# Erosion

## Rocks Moving



# Weathering

## Rocks Breaking

