

My Rock Family

Summary

Students will understand the basic properties of minerals and rocks using observation, small and large group hands-on discovery and sorting activities. They will assess their knowledge by writing a short story about their rock family, use measurement to calculate the relative weight/mass of the sediment in creating sedimentary rock, and play a Jeopardy rock game through Microsoft PowerPoint.

Additional Core Ties

English Language Arts Grade 4

[Writing Standard 2 b.](#)

English Language Arts Grade 4

[Writing Standard 3 d.](#)

Mathematics Grade 4

[Strand: MEASUREMENT AND DATA \(4.MD\) Standard 4.MD.1](#)

Mathematics Grade 4

[Strand: MEASUREMENT AND DATA \(4.MD\) Standard 4.MD.2](#)

Time Frame

3 class periods of 45 minutes each

Group Size

Small Groups

Materials

10 Hand sample of rocks and minerals (not the tiny ones):
sedimentary (i.e. sandstone, conglomerate, shale)
igneous (i.e., basalt, granite, obsidian, pumice)
metamorphic (i.e. marble, gneiss, schist)

Atoms to Minerals PowerPoint presentation

10 Types of Rocks PDF

Igneous PowerPoint presentation

Metamorphic PowerPoint presentation

Starbursts (You need 4 different colors for EVERY participant for Day 1. Approximately 150 pieces to make sure you have different colors.)

3 or 4 crayons for each participant

Limestone Activity for Sedimentary (twigs, rocks, water, container)

Rock Classification Jeopardy PowerPoint

Natural History Museum and Commission of Oil and Mining

Background for Teachers

Delta Science Readers - "Minerals, Rocks and Fossils"

Student Prior Knowledge

Everything is created of atoms. When atoms are put together in an organized fashion they form minerals. When two or more minerals are combined, they form rocks.

Intended Learning Outcomes

1. Use Science Process and Thinking Skills

e. Use instruments to measure length, temperature, volume, and weight using appropriate units.

g. Develop and use simple classification systems.

4. Communicate Effectively Using Science Language and Reasoning

c. Use scientific language appropriate to grade level in oral and written communication.

Instructional Procedures

Day 1: 45 minutes

Standard 3 Objective 1a: describe the differences between rocks and minerals

Students each represent an atom and they organize themselves into any polygon or shape in groups. As each group is formed they will represent a different mineral. (You can also use color of clothing or paper to differentiate.)

Teacher will discuss 1 shape or 1 color = 1 mineral

Combine different groups MAINTAINING each organized group to form a rock.

Standard 3 Objective 1b: Observe rocks using a magnifying glass and draw shapes and colors of the mineral.

Standard 3 Objective 1c: Sort rocks by appearance according to three basic types: sedimentary, igneous and metamorphic.

Teacher provides a sample of mixed rocks and minerals and using the information learned about differences between rocks and minerals, sort into two categories: rock or mineral.

Students are encouraged to use concrete words and sensory detail.

Sensory vocabulary key bank:

Appearance: glossy dull speckled Colors

Texture: smooth rough sharp grainy

Form: square angular oval rectangular

Show Atoms to Minerals PowerPoint presentation. (See Attachments)

Day 2: 45 minutes

Activity demonstrating 3 different types of rocks

Standard 3 Objective 1b: Observe rocks using a magnifying glass and draw shapes and colors of the minerals.

Standard 3 Objective 1c: Sort rocks by appearance according to the three basic types: sedimentary, igneous and metamorphic

Melt: Igneous

Crayons

Layer: Sedimentary

Mason jar and lid

Leaves twigs

Epsom

Salt and water

Drain water off & harden

Compress and heat: Metamorphic

Starburst or Taffy ball

4 colors-combine them

Heat & pressure

How limestone forms: [http://www.visitvulcan.com/Enrichment Activities/Make Your Own Sedimentary Rock.pdf](http://www.visitvulcan.com/Enrichment%20Activities/Make%20Your%20Own%20Sedimentary%20Rock.pdf)

Using the hands on models match the rock samples according to melted crayons, limestone jar and starburst ball... Take 10 rocks according to the core and sort them into sedimentary, igneous, and

metamorphic based on the characteristics of the hands-on activity.

- Sedimentary
: (i.e. sandstone, conglomerate, shale)
- Igneous
: (i.e., basalt, granite, obsidian, pumice)
- Metamorphic
: (i.e. marble, gneiss, schist).

Provide 10 Types of Rocks PDF.

Share the Igneous Rock PowerPoint presentation and the Metamorphic PowerPoint presentation.

Math Connection - Sedimentary Rock: Calculate the Area $L \times W$ and weigh it with a standard and metric scale and calculate the area and how many pounds or grams there are per square inch.

Calculation of area and pressure in sedimentary rock forming situation:

Weigh the "rock" (brick or paver stone)

Calculate the area of the "rock"

Place the "rock" on top of the taffy, starburst, etc. Ask the class "Is this enough weight to affect the candy?"

Discuss the fact that sediment collects over millions of years, and great amount of pressure are created by the mass of the sediment.

Calculate the mass / weight of n inches of sediment to demonstrate the increase of mass over time.

Day 3: 45 minutes

Standard 3 Objective 1d: d. classify common rocks found in Utah as sedimentary (i.e., sandstone, conglomerate, shale), igneous (i.e., basalt, granite, obsidian, pumice) and metamorphic (i.e., marble, gneiss, schist).

Have students write a 3 paragraph story of the journey (process) of an atom. They will ask at the end "What Rock Am I?" Students share out and justify answers. Check for accuracy.

Final group assessment: Rock Classification Jeopardy PowerPoint presentation.

Strategies for Diverse Learners

English Language Learner Strategies

Hands-on activities

Visuals

Accommodations for students to tell a story or act it out instead of writing it.

Extensions

Students could create their own ppts and start their own rock collections.

Create a dichotomous key for rocks and minerals.

Take a rock cycle walk.

"Everybody Needs a Rock" Picture book

Pet Rock

Adopt a Rock

Assessment Plan

Day 1 and Day 2

: Informal assessments through sorting activities using key vocabulary bank describing and justifying their sorting.

Day 3: Write a Narrative Story of an atom in the rock cycle "My rock Family". Play Jeopardy for assessing types of rocks and which category they belong to.

Bibliography

USGS; visitvolcan.com; rockhounds

Delta Science Content Readers "Minerals, Rocks, and Fossils" School Specialty Science
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