

Promoting Oral Academic Language While Teaching Science

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Overview of the Session



1. Rationale for Teaching Language and Literacy During Science Instruction



Select Texts; Prepare Students for Reading and Writing Academic Texts



Explore Differentiated Reading and Writing Activities Tied to Standards



Share Family and Community Outreach Activities

Rationale for Teaching Language and Literacy During Science Instruction

Rock Unit
Earth Science
Third Grade Unit

STEM Education

GRADE 3

Lesson: Earth Rocks!

Contributed by: Integrated Teaching and Learning Program, College of Engineering, University of Colorado Boulder



Figure 1: A picture of an amethyst crystal. Amethyst is a type of quartz and is a mineral that is found in the Earth.

Contents

1. Learning Objectives
2. Introduction/Motivation
3. Background
4. Vocabulary
5. Associated Activities
6. Lesson Closure
7. Assessment
8. Extensions
9. References

Summary

The purpose of this lesson is to introduce students to the basic elements of our Earth's crust: rocks, soils and minerals. They learn how we categorize rocks, soils and minerals and how they are literally the foundation for our civilization. Students also explore how engineers use rocks, soils and minerals to create the buildings, roads, vehicles, electronics, chemicals, and other objects we use to enhance our lives.

Engineering Connection

● K-12 Applying science and/or math concepts to engineering

Engineers care about rocks, soils and minerals. One reason they are important is that they are the foundation for our buildings and roads. Engineers also get many of the materials they use for construction from rocks, soils, and minerals. Engineers must understand the properties of these rocks, soils, and minerals so that they can use the ideal material for a job that is efficient and cost effective.

engineers help
SHAPE THE FUTURE

http://www.teachengineering.org/view_lesson.php?url=collection/cub_lessons/cub_earth/cub_earth_lesson1.xml

Science Experiment:



http://www.teachengineering.org/view_lesson.php?url=collection/cub_/lessons/cub_earth/cub_earth_lesson1.xml

STEMWORKS

Dr. Kenneth Lacovara, Paleontologist and Geologist

Related cool jobs:

- When Dr. Lacovara, Paleontologist, became a Project Manager
- When Dr. Lacovara, Paleontologist, became a Project Manager
- When Dr. Lacovara, Paleontologist, became a Project Manager

Designed For Elementary Students

Careers in Science

Biographies
Memoirs
Essays
 Included in definition of "informational text" by CCSS

http://www.stem-works.com/subjects/21-other-stem-subjects/cool_jobs/141

STEM Vocabulary Development in ESL Students

<http://exclusive.multiplebriefs.com/content/fostering-stem-vocabulary-development-in-esl-students>

MULTIPLE BRIEFS: EXCLUSIVE

The leading source for targeted, industry-specific news briefs.

Fostering STEM vocabulary development in ESL students

Beth Crumpler
Thursday, October 17, 2013

Share this article

With the implementation of the Common Core State Standards, content-area literacy is a huge focus right now. The Common Core State Standards emphasize the literacy of math, science and technical subjects in English language arts.

Science, technology, engineering and math (STEM) content areas are difficult for ESL students. To meet the literacy objectives under the Common Core State Standards, ESL and content-area teachers must work together in teaching STEM content-area vocabulary.

ESL students will not be able to understand STEM subject area objectives or texts without understanding the technical vocabulary within each. This is why it is crucial for content-area teachers and ESL teachers to work together in teaching STEM vocabulary.

To effectively teach STEM vocabulary, use Sheltered Instruction Observation Protocol (SIOP) methods for English language development.

ESL teachers can teach content-area teachers second-language acquisition strategies. Content-area teachers can teach ESL teachers the technical language: phrases, terms, meanings, formulas, etc.

Strategies for STEM vocabulary development between ESL teachers and content-area teachers

- Generate a list of terms and phrases that ESL students will not know which need to be pretaught. Next preteach the terms and phrases before the lesson is taught in the content-area classrooms. Use methods and resources listed below for preteaching.
- Label classrooms with vocabulary labels to help ESL students have visual guides.
- Write all content demonstrations and directions out for students to see and reference. This can be on a clear board, interactive whiteboard presentation or classroom handout.
- Create content-area objectives and language learning objectives that correlate with lesson tasks.
- Practice vocabulary through modeling of real-life scenarios. Do mini experiments, virtual experiments, virtual field trips and the like to create real-life scenarios.
- Use graphic organizers that generate meaning and understanding. Have students practice labeling and making diagrams of vocabulary concepts. These tools can be used



development.

- Education Technology Guy has a list of STEM websites broken down according to discipline.
- NEA has provided a list of top 10 STEM teaching resources available online. These include NASA, the Exploratorium and Dream Up the Future.
- PBS's STEM Resource Center has a massive list of resources available for instructional uses. Resources are broken down by content area.
- The graduate STEM Fellows in K-12 Education also generated a list of STEM resources.
- Thomas Jefferson High School for Science and Technology has a list of Online STEM Resources.
- Here is a massive LiveBinder of STEM resources and web tools.
- Here is a list of strategies for engaging ELLs in the math classroom.
- Here is a list of ELL considerations for Common Core aligned math lessons by the NYC Department of Education.
- Colorin Colorado has a page full of resources to help grow ELLs into 21st Century Learners. The list contains ideas for teaching technology to ELLs.
- Teach.com has a list of top 10 strategies for technology instruction in the ELL classroom.
- Colorin Colorado has a page of ideas for teaching math to ELLs.
- Here is a list of strategies for teaching math to ELLs by Beatrice Moore-Harris.
- Here is a list for building ELL's Academic Language Proficiency in Math by Nancy Cloud.
- Learn to use verbal science acquisition strategies from The Science Teacher.
- Discovery Education Science has a list of strategies per language proficiency level for teaching ELLs science.
- Here is a list of 100+ SIOP Science classroom modifications for ELLs by Kristen Sweet.
- Here is a list of ideas for integrating science and vocabulary instruction by Stephanie Wessels.
- Here is a list of 40 STEM iPad apps for kids by Melissa Taylor.
- Here is a LiveBinder list of STEM iPad apps by Patricia Smeyers.
- Here is a list of must have app tools by Chris Beyerle.

STEM vocabulary instruction should be approached in an eclectic form with multiple approaches to facilitate comprehensible input for ELLs. The same content should be taught using different strategies to maximize student understanding since no ESL student learns in the same manner.

Using SIOP methods along with STEM resources will help ESL teachers and content-area teachers bring effective STEM vocabulary instruction and development to students. ESL teachers must work alongside STEM content-area teachers to meet the content-area literacy objectives under the Common Core State Standards.

Share this article

About the Author



Beth Crumpler is an ESL, freelance curriculum writer, e-learning content developer and instructor. She has developed written content for some big names in the education sector. She is the founder of the theadaptiveteacher.com website and blog, which both present ideas for using adaptive concepts in learning. She is a certified teacher of ESL and music. Beth enjoys studying technology for teaching ESL and in her spare time studies Spanish.

The Importance of Oral Language

Speaking and listening are facets of oral language. For decades, researchers have demonstrated that:

- there is a strong relationship between oral language and reading, writing, and thinking (Loban, 1963, Menyuk, 1984)
- oral language is the base on which the other language arts develop (Sticht & James, 1984)
- for this reason, it is very important to continuously support students in developing oral language throughout all grades (Pinnell & Jaggar, 1991)
- children develop oral language **by using it** (Halliday, 1975).

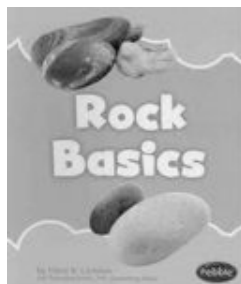
Preparing Students to Meet Common Core Standards

Advancing Our Students' Language and Literacy
The Challenge of Complex Text

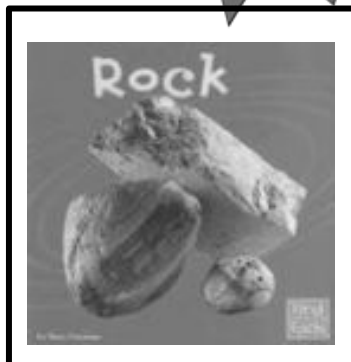
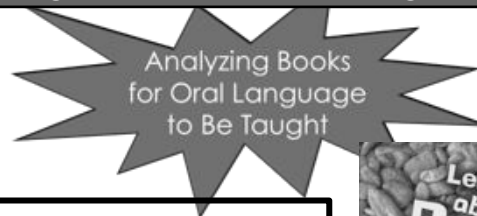


Selecting and Scaffolding Complex Informational Text

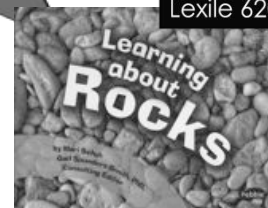
Determine the Best Near and On Grade Level Books for Language & Concept Teaching



Gr. 2.0;
GRL J
Lexile 300



Gr. 3.1;
GRL M



Gr. 2.7;
Lexile 620



Gr. 3.1;
Lexile 400

Why text sets?

- CCSS explicitly call for reading sets of related texts
- Within a grade level, there should be an adequate number of titles on a single topic that would allow children to study that topic for a sustained period (NGA + CCSSo, 2010)
- Standard 9 asks children to identify similarities in and differences between two texts on the same topic
- This includes informational text on children's websites like National Geographic's *Young Explorer!* (Cengage); recorded books and so forth (Nell Duke, *Educational Leadership* November, 2013)

Grade 3

**CCSS Levels:
J to Q
420 to 820**

www.nsta.org/publications/ostb.ostb2013.aspx

Outstanding Science Trade Books for Students K-12

Joint project of the National Science Teachers Association and the Children's Book Council

TextProject.org

Free downloadable informational texts for Beginning Readers

PERMA-BOUND
The Elementary Reading Texts Book

Text Leveling Correlation Guide
Grades K-6

| STAGES OF READING DEVELOPMENT | GRADE LEVEL | READING LEVEL | GRADE READING LEVEL | READING RECOGNITION LEVEL | ORF LEVEL | LEVEL RANGE | ORF LEVEL RANGE | LEVEL RANGE TO ORF |
|-------------------------------|-------------|--------------------------|---------------------|---------------------------|-----------|-------------|-----------------|--------------------|
| Emergent | K | Pre-Reader Pre-Reader | 1 | 1 | 1 | 1 | 1 | 1 |
| | | | 2 | 2 | 2 | 2 | 2 | 2 |
| | | | 3 | 3 | 3 | 3 | 3 | 3 |
| | | | 4 | 4 | 4 | 4 | 4 | 4 |
| | | | 5 | 5 | 5 | 5 | 5 | 5 |
| | | | 6 | 6 | 6 | 6 | 6 | 6 |
| | | | 7 | 7 | 7 | 7 | 7 | 7 |
| | | | 8 | 8 | 8 | 8 | 8 | 8 |
| | | | 9 | 9 | 9 | 9 | 9 | 9 |
| | | | 10 | 10 | 10 | 10 | 10 | 10 |
| Early | 1 | Pre-Reader Pre-Reader | 1 | 1 | 1 | 1 | 1 | 1 |
| | | | 2 | 2 | 2 | 2 | 2 | 2 |
| | | | 3 | 3 | 3 | 3 | 3 | 3 |
| | | | 4 | 4 | 4 | 4 | 4 | 4 |
| | | | 5 | 5 | 5 | 5 | 5 | 5 |
| | | | 6 | 6 | 6 | 6 | 6 | 6 |
| | | | 7 | 7 | 7 | 7 | 7 | 7 |
| | | | 8 | 8 | 8 | 8 | 8 | 8 |
| | | | 9 | 9 | 9 | 9 | 9 | 9 |
| | | | 10 | 10 | 10 | 10 | 10 | 10 |
| 2 | Grade 2 | Pre-Reader Pre-Reader | 1 | 1 | 1 | 1 | 1 | 1 |
| | | | 2 | 2 | 2 | 2 | 2 | 2 |
| | | | 3 | 3 | 3 | 3 | 3 | 3 |
| | | | 4 | 4 | 4 | 4 | 4 | 4 |
| | | | 5 | 5 | 5 | 5 | 5 | 5 |
| | | | 6 | 6 | 6 | 6 | 6 | 6 |
| | | | 7 | 7 | 7 | 7 | 7 | 7 |
| | | | 8 | 8 | 8 | 8 | 8 | 8 |
| | | | 9 | 9 | 9 | 9 | 9 | 9 |
| | | | 10 | 10 | 10 | 10 | 10 | 10 |
| 3 | Grade 3 | Pre-Reader Pre-Reader | 1 | 1 | 1 | 1 | 1 | 1 |
| | | | 2 | 2 | 2 | 2 | 2 | 2 |
| | | | 3 | 3 | 3 | 3 | 3 | 3 |
| | | | 4 | 4 | 4 | 4 | 4 | 4 |
| | | | 5 | 5 | 5 | 5 | 5 | 5 |
| | | | 6 | 6 | 6 | 6 | 6 | 6 |
| | | | 7 | 7 | 7 | 7 | 7 | 7 |
| | | | 8 | 8 | 8 | 8 | 8 | 8 |
| | | | 9 | 9 | 9 | 9 | 9 | 9 |
| | | | 10 | 10 | 10 | 10 | 10 | 10 |
| 4 | Grade 4 | Pre-Reader Pre-Reader | 1 | 1 | 1 | 1 | 1 | 1 |
| | | | 2 | 2 | 2 | 2 | 2 | 2 |
| | | | 3 | 3 | 3 | 3 | 3 | 3 |
| | | | 4 | 4 | 4 | 4 | 4 | 4 |
| | | | 5 | 5 | 5 | 5 | 5 | 5 |
| | | | 6 | 6 | 6 | 6 | 6 | 6 |
| | | | 7 | 7 | 7 | 7 | 7 | 7 |
| | | | 8 | 8 | 8 | 8 | 8 | 8 |
| | | | 9 | 9 | 9 | 9 | 9 | 9 |
| | | | 10 | 10 | 10 | 10 | 10 | 10 |
| 5 | Grade 5 | Pre-Reader Pre-Reader | 1 | 1 | 1 | 1 | 1 | 1 |
| | | | 2 | 2 | 2 | 2 | 2 | 2 |
| | | | 3 | 3 | 3 | 3 | 3 | 3 |
| | | | 4 | 4 | 4 | 4 | 4 | 4 |
| | | | 5 | 5 | 5 | 5 | 5 | 5 |
| | | | 6 | 6 | 6 | 6 | 6 | 6 |
| | | | 7 | 7 | 7 | 7 | 7 | 7 |
| | | | 8 | 8 | 8 | 8 | 8 | 8 |
| | | | 9 | 9 | 9 | 9 | 9 | 9 |
| | | | 10 | 10 | 10 | 10 | 10 | 10 |
| 6 | Grade 6 | Pre-Reader Pre-Reader | 1 | 1 | 1 | 1 | 1 | 1 |
| | | | 2 | 2 | 2 | 2 | 2 | 2 |
| | | | 3 | 3 | 3 | 3 | 3 | 3 |
| | | | 4 | 4 | 4 | 4 | 4 | 4 |
| | | | 5 | 5 | 5 | 5 | 5 | 5 |
| | | | 6 | 6 | 6 | 6 | 6 | 6 |
| | | | 7 | 7 | 7 | 7 | 7 | 7 |
| | | | 8 | 8 | 8 | 8 | 8 | 8 |
| | | | 9 | 9 | 9 | 9 | 9 | 9 |
| | | | 10 | 10 | 10 | 10 | 10 | 10 |

*These Levels Based on Word-Frequency

Use Text Sets

- Provide Students with opportunities to learn the same high-frequency vocabulary across a number of books, words that they can use in their own early writing.
- Permit Students to develop schema associate with a particular theme and build networks of related concepts to talk and write about.
- Help students build confidence and fluency in speaking and listening comprehension; they have encountered these words and phrases before!
- Give them a chance to hear words with the same sounds so they can create stable associations between sounds and symbols
- Develop comprehension strategies (using pictures and text features, predicting) so they can tackle new books

Research on Reading Comprehension

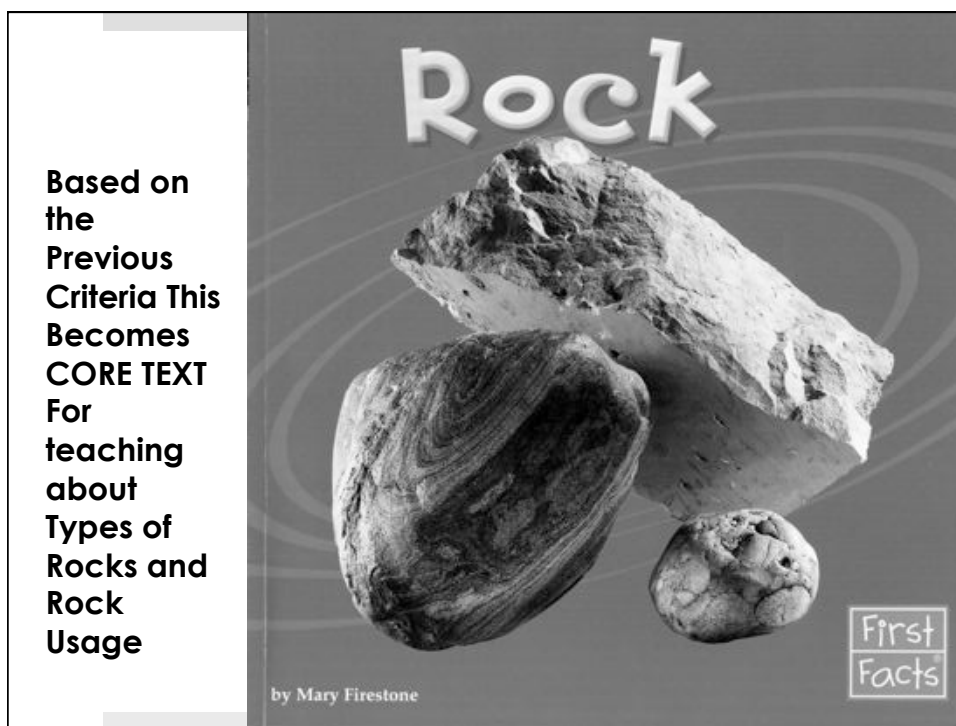
Selecting Texts:

- Interest Level
- Authentic Text
- Text Features
 - Page Length
 - Size and Layout of Print
 - Language Structures
 - Text Structure (comparison/contrast) and Genre (personal, factual, analytic)
 - Predictability and Pattern of Language
 - Illustration Support

"No single method, program, or book will help accelerate the needs of all children or any subset of children. Only knowledgeable, reflective teachers can respond to the diverse and ever changing need of individual students."
—Ivey, 2000



Educational Leadership, September 2000



Conduct a Read Aloud (or Watch an instructional video) to Get Language In



<http://www.youtube.com/watch?v=XxoSUglgQF0>

Use Leveled Questions

Entering

**Beginning/
Emerging**

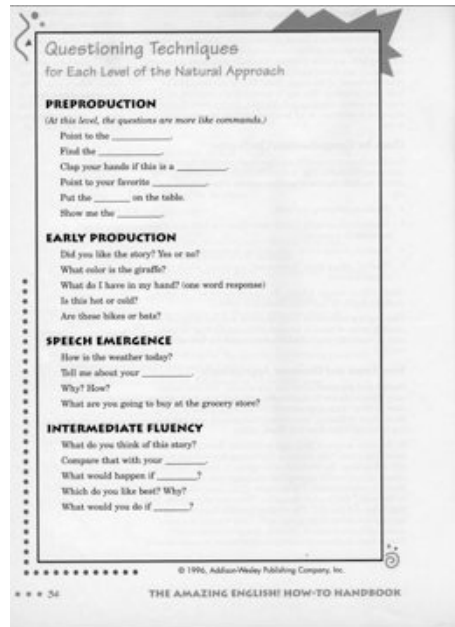
Developing

Expanding

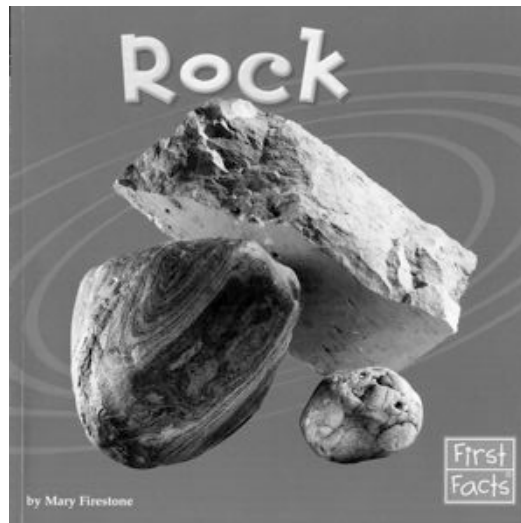
Beginning

Intermediate

Advanced

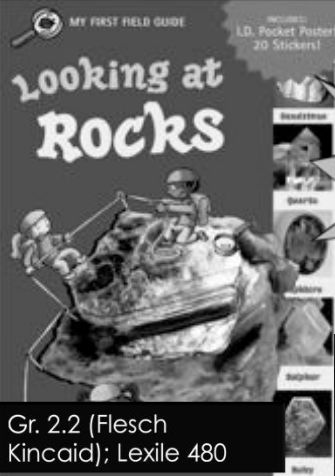


Conduct a Partner Read (Second Reading)




Work on
Vocabulary

Insist upon
academic
language use




Gr. 2.2 (Flesch Kincaid); Lexile 480

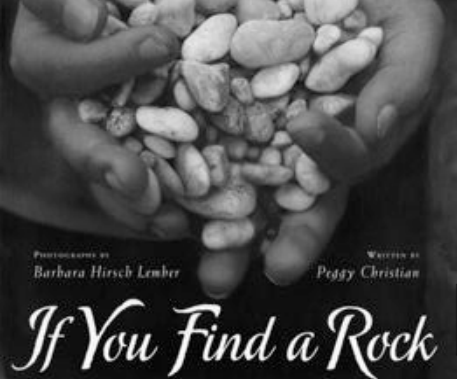
Find Books that Help You Build and Practice Key Vocabulary



Finding Books that Promote Speaking



Gr. 3.8; Lexile 930



Gr. 3.8; Lexile 930

Encourage Interaction



- ▣ Partners are best
- ▣ Provide cooperative learning tasks with task interdependence
- ▣ Plan good language learning partners--do not pair a native speaker with an ELL unless at the advanced proficiency stage

Song: Rocks and Gems and Minerals

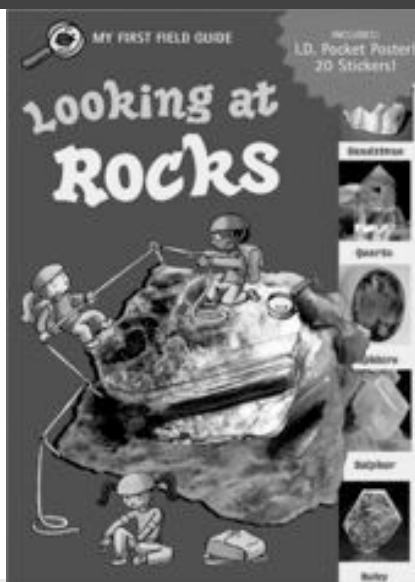
<http://www.kidsknowit.com/educational-songs/play-educational-song.php?song=Rocks%20And%20Gems%20And%20Minerals>

http://www.youtube.com/watch?v=IE3jR_RhxO4

Types of Rock- More of a rock/pop song

SONGS

Companion Scientist's Field Guide



Sorting, Classifying, and Naming Activities

You found your rocks.
Now show them off!
Egg cartons are good
for small rocks.
You can put one rock
in each "cup."
Make a label for the rocks you know.



Then put them in order.
You can group them by size.
You can group them by color.
You can put all the smooth ones together
and all the rough ones together.

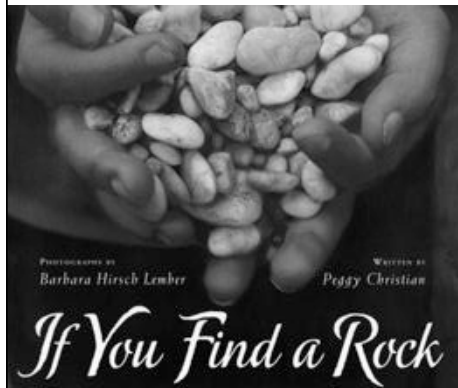


Let's Observe And Describe Our Rocks Using a Round Robin Cooperative Learning Activity

You have one minute to write words describing your rock: (colors, markings, features, size, shape):



Performance Poem: Create Actions



If you find a rock—
a rock that's not
a skipping rock,
or a chalk rock,
or a resting rock,
or a wishing rock—
that's not
a splashing rock,
or a sifting rock,
or a worry rock,
or a hiding rock—
that's not even
a climbing rock,
or a crossing rock,
or a fossil rock,
or a walking rock,


but you like it anyway,
because it reminds you
of a place,
or a feeling,
or someone important—
then you have found
a memory rock,
and sometimes
those are the best
rocks of all.

Preparing Students to Meet Common Core Standards

Advancing Our Students'
Language and Literacy

The Challenge of Complex Text






COMMON CORE
STATE STANDARDS INITIATIVE
PREPARING AMERICA'S STUDENTS FOR COLLEGE & CAREER

English Language Arts/Literacy Standards

COMPLEX TEXT Common Core Standard:

CCSS.ELA-Literacy.RI.3.10 By the end of the year, read and comprehend informational texts, including history/social studies, science, and technical texts, at the high end of the grades 2–3 text complexity band independently and proficiently.



COMMON CORE
STATE STANDARDS INITIATIVE
PREPARING AMERICA'S STUDENTS FOR COLLEGE & CAREER

English Language Arts/Literacy Standards

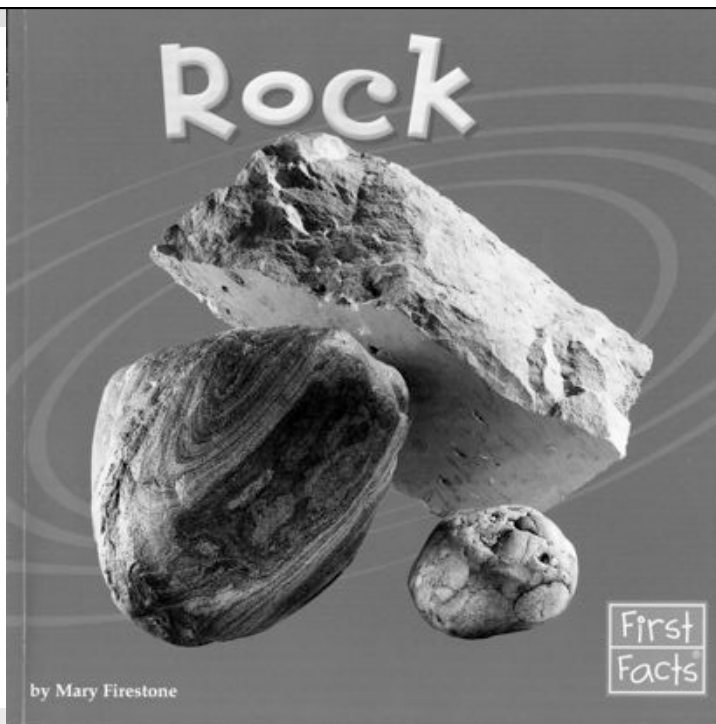
List SPEAKING AND LISTENING Common Core Standard:

CCSS.ELA-Literacy.SL.3.2 Determine the main ideas and supporting details of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.

CCSS.ELA-Literacy.SL.3.3 Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.

ANALYZING THE CORE TEXT

Study the
book for
Frontloading
Needs and
also for
Expanding
Expressive
Language
(Oral and
Written)



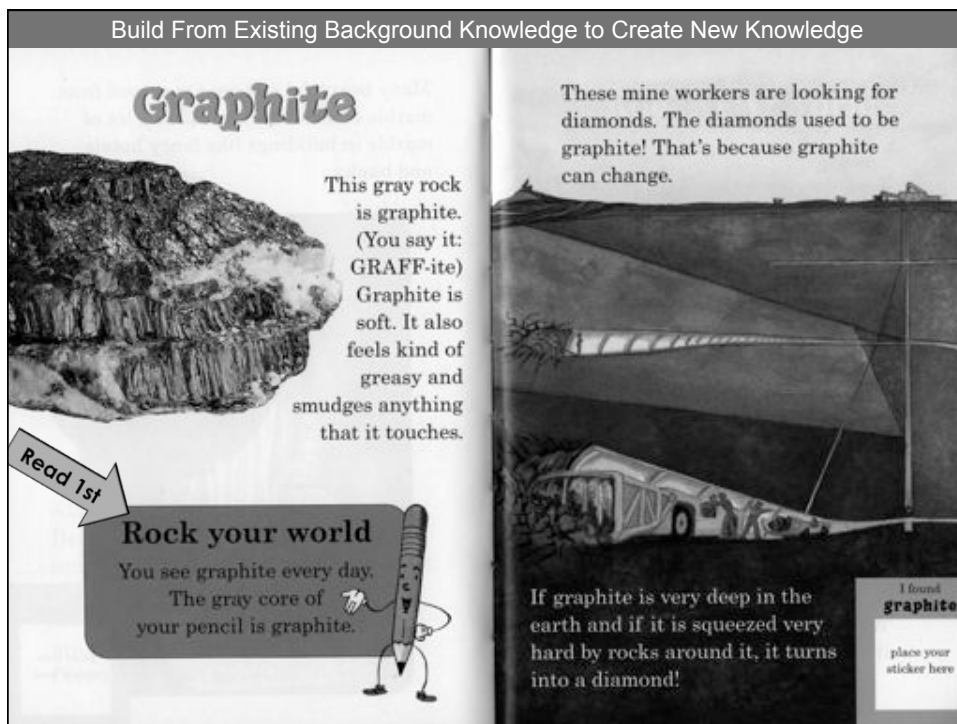
INTRO/CONNECTION WITH CHILDREN'S EXPERIENCE

Rock

Sam and Jessica play a game of chess. The marble piece feels cool to Sam's fingertips. A fire in the stone fireplace warms the room. Sam's cup sits nearby on a sandstone coaster. Rock makes up many of the things people use.

Close reading requires that students read closely to find all the ideas in a book (in this case uses of rocks; rock in daily life; rock types, rock formations, the rock cycle; rock transformations under heat and pressure, engineering to extract rock and byproducts of rock, etc.)
Mary Ehrenworth, *Educational Leadership*, November 2013, 16-21





Reading Graphics ("Not Just Pretty Pictures")

Norman & Roberts, *Educational Leadership*, November 2013)

Types of Graphics:

- ❑ Photographs (labeled or not labeled)
- ❑ Captioned Graphics
- ❑ Cross-sectional diagrams
- ❑ Flowcharts
- ❑ Insets
- ❑ Maps
- ❑ Surface diagrams
- ❑ Tables
- ❑ Timelines
- ❑ Speech bubbles

CCSS emphasize understanding and using graphical elements

- Alternate Route to Information (supplemental) or
- Visuals that Extend the Text


60% of graphics in Gr.2-3 info texts convey information not given in the text (Fingeret, 2012)

Name
Date

Compare/Contrast

Teach for example by giving a graphic organizer (Venn) to show what information was found in the text and what information was found in the graphics (or found in both)

Use Instructional Conversations:
 Do the illustrations match the words?
 What is the author trying to tell us with the graphics?



What Is Rock?

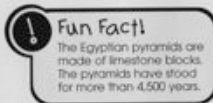
Rocks are made of **minerals**. Minerals are solids found in nature. Quartz, salt, and copper are minerals. Minerals often have crystal shapes. Crystals have shiny flat sides or pointed ends. People use rocks to make many things.

Fun Fact!
Most jewels are minerals. They are cut to have crystal shapes.

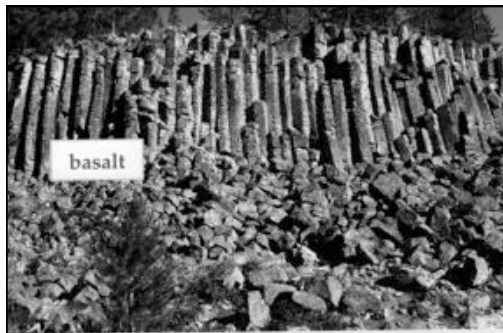
Teach kids how to study the graphics; second only in importance to vocabulary knowledge in terms of supporting comprehension (Duke, Roberts & Norman)

Sedimentary Rock

Most **sedimentary rock** is made from broken rock, sand, or clay. These things form layers on the bottom of rivers, lakes, and oceans. Rock forms when the top layers of sediment press down on the bottom layers. Sandstone and limestone are sedimentary rocks.



sandstone



basalt

Igneous and Metamorphic Rocks

Igneous rock forms above or below ground. Igneous rock forms when melted rock called **magma** cools. Granite, basalt, and obsidian are igneous rocks.

10

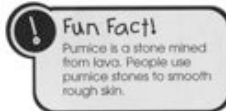
Metamorphic rock forms deep inside the earth. It forms when rock is changed by heat and pressure. Slate and marble are metamorphic rocks.



slate

Mining Rock

Workers dig large holes to remove rock from the earth. Workers drill and blast rock from the sides and bottoms of these holes. Large pieces of rock are loaded onto trucks. The trucks take the rock to be cut or crushed.



2



Cutting and Crushing Rock

Workers cut rock into smaller pieces. They use saws with diamond-tipped blades. These blades can cut rock into slabs or blocks.



Workers use machines to crush rock. Crushed limestone and clay are heated to make **cement**. Cement is mixed with water and rock to make concrete.

Subject Area Registers

- ▣ **Specific Technical Vocabulary**
- ▣ **Particular Grammatical Features**
- ▣ **Particular Phrasing**
- ▣ **Subject-Specific Writing Style**
- ▣ **Particular Text Structures**
(enumeration, description, sequential/chronological, comparison/contrast, etc.)



English Language Arts/Literacy Standards

READING INFORMATIONAL TEXT Common Core
Standard:

▣ **Craft and Structure**

- ▣ CCSS.ELA-Literacy.RI.3.4 Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a *grade 3 topic or subject area*.



Let's Analyze The Book for
Language Learning
Opportunities

Text Features

- ▣ Noun Phrases
- ▣ Adjectival Phrases
- ▣ Sentence Patterns
- ▣ Linking Words/Cohesive Devices
- ▣ Text Structures



ANALYZE THE BOOK TO SEE THE:

BACKGROUND KNOWLEDGE THAT IS NEEDED TO UNDERSTAND THE BOOK

DECODING/ENCODING SKILLS WE CAN TEACH WHILE TEACHING THE TOPIC USING THIS BOOK

READING/WRITING STRATEGIES WE CAN TEACH WHILE TEACHING THIS BOOK

OPPORTUNITIES TO TEACH COLLOQUIAL LANGUAGE

TESL/READ 507 Book Analysis Project

Name of Book: _____ Grade/Age Level: _____

Proficiency Level _____ Pages Analyzed: _____

For shaded boxes, scan entire book

Background Knowledge Required by this Book:

Best Decoding Encoding Skills to Teach:

Sight Words in this Book:

Best Reading Writing Strategies to Teach with This Book:

Rock – springboard to phonics

- ▣ /a/ sound in English spelled with /o/ (rock, block, clock, sock)
- ▣ Early onset and rhyme in English/rhyming words
- ▣ /k/ sound in English can be spelled with the digraph /ck/ (rock, clock, block, lock)

roca compared to “rock” —
very distinct use of letters

COMMON CORE
(FOUNDATIONAL READING
SKILLS)



ock

| | |
|-------|-------|
| lock | flock |
| rock | knock |
| sock | shock |
| block | smock |
| clock | stock |

8

Other phonics to teach:

- | | |
|--|--|
| <ul style="list-style-type: none"> ▣ Long /a/ Sound: <ul style="list-style-type: none"> ▣ a-e: Made, blade, shape, make, slate ▣ ay: Clay, layer | <ul style="list-style-type: none"> ▣ -ary <ul style="list-style-type: none"> ▣ Sediment-sedimentary ▣ Compound Words <ul style="list-style-type: none"> ▣ Sandstone ▣ Limestone |
|--|--|

Multisyllable words

- | | |
|-------------------------|--|
| ❑ Mineral | ❑ Igneous |
| ❑ Solid | ❑ Metamorphic |
| ❑ Crystal | ❑ Granite, basalt, obsidian; slate, marble |
| ❑ Many, shiny | ❑ Melted, magma |
| ❑ Sedimentary; sediment | ❑ Pressure |
| ❑ Broken, layer, bottom | ❑ Worker |
| ❑ Sandstone, limestone | ❑ Pieces, smaller, machine |
| | ❑ Cement |

Word Sorts

Word Sorts Based On:

- ❑ **Where It Was Found (mountain, road, stream, beach)**
- ❑ **Type of Rock (sedimentary, metamorphic, igneous)**
- ❑ **Properties (size, shape, weight)**
- ❑ **Characteristics (hardness)**
- ❑ **Colors**
- ❑ **Vowel Sounds/Rhymes**
- ❑ **First letters**

Skills and Strategies

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Glossary

cement (suh-MENT)—a gray powder made from crushed limestone and clay

igneous rock (IG-nee-uhss ROK)—rock that forms when magma cools

magma (MAG-muh)—melted rock deep below earth's surface; magma that flows out of volcanoes is called lava.

metamorphic rock (met-uh-MOR-fik ROK)—rock that is changed by heat and pressure

mineral (MIN-ur-uhl)—a solid found in nature that is not made by people, animals, or plants; minerals can be found on earth's surface or underground.

sedimentary rock (sed-uh-MEN-tuh-ree ROK)—rock formed by layers of rocks, sand, or clay that have been pressed together

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Read More

Oxlade, Chris. *Rock. Materials, Materials, Materials.* Chicago: Heinemann, 2002.

Rosinsky, Natalie M. *Rocks: Hard, Soft, Smooth, and Rough.* Amazing Science. Minneapolis: Picture Window Books, 2003.

Internet Sites

FactHound offers a safe, fun way to find Internet sites related to this book. All of the sites on FactHound have been researched by our staff.

Here's how:

1. Visit www.facthound.com
2. Type in this special code **0736826513** for age-appropriate sites. Or enter a search word related to this book for a more general search.
3. Click on the **Fetch It** button.

FactHound will fetch the best sites for you!





2

Cognates: rock/roca; mineral; solid/sólido, crystal/cristal, sedimenary/sedimentrio; igneous/igneo; metamorphic/metamórfico, etc.

| Oral Language | | | |
|---|---|--|--------------------------------------|
| People, Places, Things (Improper/Proper Nouns) | Actions (Include Phrasal Verbs Here) | Descriptive Language (Adjectives/Adverbs) | Other (Conjunctions/Prepositions) |
| Stone | | | |
| Marble | Is/are | Sedimentary | |
| Sandstone | Have | Igneous | |
| Limestone | Use | Metamorphic | |
| Rock | Make/ | | |
| Solid | made | | |
| Minerals | Form | Shiny | |
| Quartz | Change | Flat | |
| Salt | Take | Pointed | |
| Copper | Dig | Broken | |
| Crystals | Drill | Melted | |
| Sand | Blast | Large | |
| Clay | Load | Smaller | |
| Granite | Cut | Diamond- | |
| Basalt | Crush | tipped | |
| Obsidian | | | |
| Slate | | | |

| |
|--|
| Phrases/Sayings: |
| Other Observations: (e.g. visuals, size of print, etc.): |





COMMON CORE
STATE STANDARDS INITIATIVE
PREPARING AMERICA'S STUDENTS FOR COLLEGE & CAREER

English Language Arts/Literacy Standards


READING: FOUNDATIONAL SKILLS Common Core Standard:

PHONICS AND WORD RECOGNITION

■ CCSS.ELA-Literacy.RF.3.3 Know and apply grade-level phonics and word analysis skills in decoding words. (CCSS.ELA-Literacy.RF.3.3c Decode multisyllable words.)

FLUENCY

■ CCSS.ELA-Literacy.RF.3.4 Read with sufficient accuracy and fluency to support comprehension.
■ CCSS.ELA-Literacy.RF.3.4a Read grade-level text with purpose and understanding.




COMMON CORE
STATE STANDARDS INITIATIVE
PREPARING AMERICA'S STUDENTS FOR COLLEGE & CAREER

English Language Arts/Literacy Standards

LANGUAGE Common Core Standard

Vocabulary Acquisition and Use

- ▣ CCSS.ELA-Literacy.L.3.4 Determine or clarify the meaning of unknown and multiple-meaning word and phrases based on grade 3 reading and content, choosing flexibly from a range of strategies.
 - ▣ CCSS.ELA-Literacy.L.3.4a Use sentence-level context as a clue to the meaning of a word or phrase.



COMMON CORE
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English Language Arts/Literacy Standards

READING INFORMATIONAL TEXT Common Core Standard:


Craft and Structure

- ▣ CCSS.ELA-Literacy.RI.3.4 Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a *grade 3 topic or subject area*.
- ▣ CCSS.ELA-Literacy.RI.3.5 Use text features and search tools (e.g., key words, sidebars, hyperlinks) to locate information relevant to a given topic efficiently.

Support Academic
Listening
Comprehension

Reinforce with Videos

YouTube



Introduction: <http://www.manythings.org/b/e/2347>

www.makemegenius.com Learning about 3 Types of Rocks (Gr. 5)

<http://www.youtube.com/watch?v=Pwlr2uSSgcc>

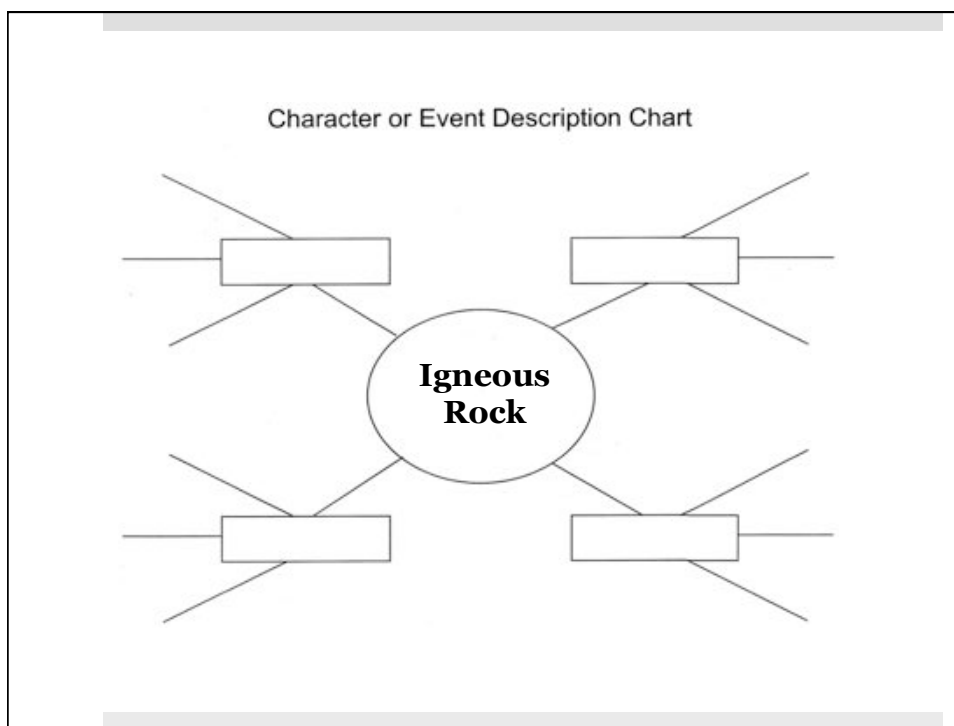
Ensure Active Listening!



SEMANTIC FEATURE ANALYSIS

| Features → | Fits in your hand | Found in the Mountains | Easy to Collect | Large In Size | Easy to Move |
|---------------|-------------------------|------------------------------|--------------------|------------------|-----------------|
| rock | +/- | | | | |
| pebble | + | | | | |
| sand | + | | | | |
| boulder | - | | | | |

Features Analysis



Preparing Students to Meet Common Core Standards

Advancing Our Students' Language and Literacy

The Challenge of Complex Text



What is Our Book's Discourse/Text Structure?

MATCH THE TEXT STRUCTURE

Support Reading Comprehension!

Chronological (Time Sequence)

Cause/Effect

Problem/Solution

Description

Enumeration

Comparison/Contrast



Graphic Organizer as Mediator

Text Features

▣ Noun Phrases

▣ Adjectival Phrases

▣ Sentence Patterns

▣ Linking Words/Cohesive Devices

▣ Text Structures

Cohesive Devices

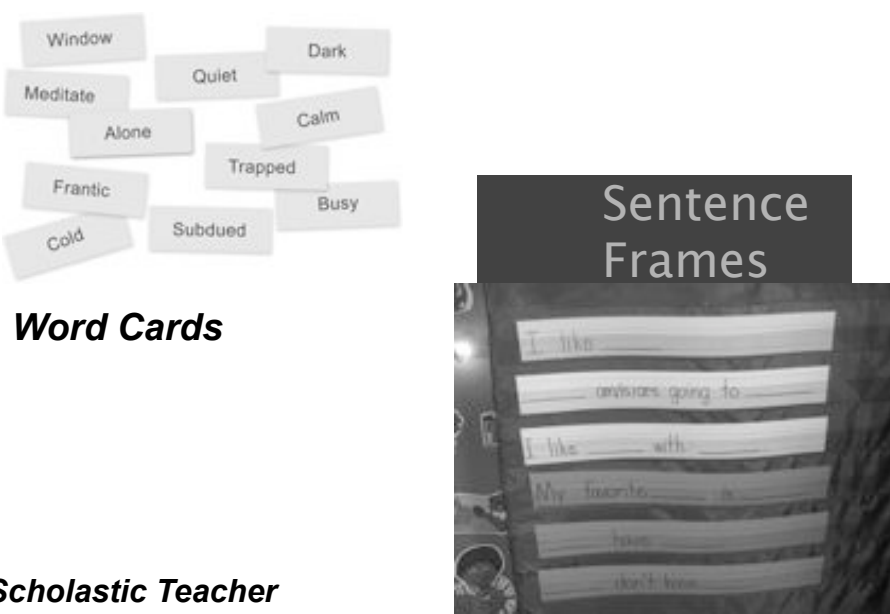
- ❑ Repetition of key words across sentences:
 - ❑ Rocks are made of minerals. Minerals are solids found in nature....
 - ❑ Most sedimentary rock is made from broken rock, sand, or clay.Rock forms when the top layers of sediment press down on the bottom layers. Sandstone and limestone are sedimentary rocks.
 (Rock is used everywhere repeatedly)
- ❑ Use of Pronouns
 - ❑ These things.... (demonstrative pronouns)
 - ❑ It..... (subject pronoun)

Sentence Patterns (Enumeration/Description Informational Text)

- ❑ Definitions: with is/are, have, use
 - ❑ Rocks are made of minerals
 - ❑ Minerals are solids found in nature.
 - ❑ Granite, basalt and obsidian are igneous rocks.
 - ❑ Crystals have shiny flat sides or pointed ends
 - ❑ People use stone floors in many buildings

Third person singular (S-V agreement)

- ❑ Passive voice:
 - ❑ Most sedimentary rock is made from...
 - ❑ Rocks are made of minerals.
 - ❑ Rock forms when...
 - ❑ Rock is also used for buildings.



The image shows two educational resources. On the left, a collection of word cards with terms like 'Window', 'Meditate', 'Alone', 'Frantic', 'Cold', 'Quiet', 'Dark', 'Calm', 'Trapped', 'Subdued', and 'Busy'. On the right, a set of sentence frames with prompts such as 'I like...', 'advisors going to...', 'I like... with...', 'My favorite... is...', 'have...', and 'don't know...'.

Word Cards

Sentence Frames

Scholastic Teacher Blogs

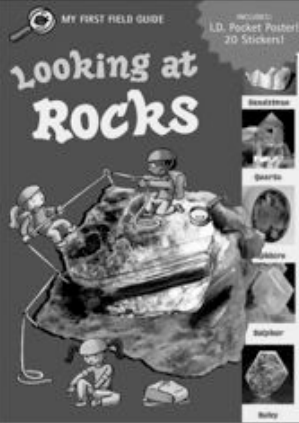


The image features the Common Core State Standards Initiative logo, which includes the text 'COMMON CORE STATE STANDARDS INITIATIVE' and 'PREPARING AMERICA'S STUDENTS FOR COLLEGE & CAREER'. The background is a grayscale photo of a student wearing glasses and looking down.

English Language Arts/Literacy Standards

LISTENING/SPEAKING Common Core Standard: Comprehension and Collaboration

CCSS.ELA-Literacy.SL.3.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 3 topics and texts*, building on others' ideas and expressing their own clearly.




Investigations

Support Language Use During Hands-On Activities

Be a Rock Artist!

All you need are some paints, paintbrushes, and a smooth oval rock. Wash and dry the rock, then follow the steps. (Let each coat of paint dry before adding another color!)





Rock Painting

1. Start with your clean, dry rock.
2. Paint the whole rock with red paint.
3. Using the black paint, paint the head, a stripe down the middle, and spots.
4. Paint 2 eyes with white paint.

You've painted a ladybug!

This is just one idea to get you started. You will have the most fun making your own creations! If the rock is large, you can use it as a paperweight. Use smaller painted rocks to decorate your desk or windowsill.






English Language Arts/Literacy Standards

WRITING Common Core Standard
Text Types and Purposes
CCSS.ELA-Literacy.W.3.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

- CCSS.ELA-Literacy.W.3.2a Introduce a topic and group related information together; include illustrations when useful to aiding comprehension.
- CCSS.ELA-Literacy.W.3.2b Develop the topic with facts, definitions, and details.
- CCSS.ELA-Literacy.W.3.2c Use linking words and phrases (e.g., *also*, *another*, *and*, *more*, *but*) to connect ideas within categories of information.
- CCSS.ELA-Literacy.W.3.2d Provide a concluding statement or section.

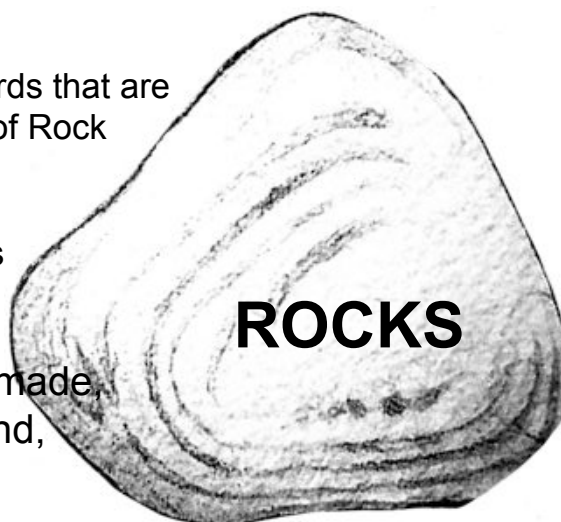
Early Recording/Drawing in English

| | | |
|---|-------------------|--------------------|
|  | Today's date: | You can draw here! |
| | Rock number: | |
| | Name of rock: | |
| | Color: | |
| | Shape: | |
| | Size: | |
| | Where I found it: | |
| | My notes: | |
| | | |
| | | |

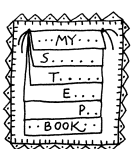
Shape Book Possibilities:

Rock Study:
 Paste Specific Rock Words that are
 Examples of Your Type of Rock
 (sedimentary, igneous,
 metamorphic)
 Paste Descriptive Words

Sight Words:
 Are, in, have, make, made,
 from, on, of, when, and,
 the....



Foldables

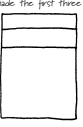


The step book can be held vertically or horizontally. Each step page flips up to reveal a section underneath which gets larger as you move down the pages. It's especially good for counting books. The directions are written for three pieces of paper which will give you six steps. You can use any number from two on.


You Need

- 3 (or more) pieces of paper, letter size or A5, works well or pieces cut from a brown grocery bag.
- 2 pieces of yarn, 12"/30.5" cm long.
- 1 hole punch.
- Beads are optional.

1. Take the three pieces of paper and hold them so that each piece of paper is about 1 1/2 inches lower than the one before. You have made the first three of six steps.




2. Holding the papers together, turn them over so that the steps are towards you and on the bottom. Fold the bottom over so that you now have six steps. Check to see if the steps are even. If not, adjust them and then crease.




3. Holding the papers together, open them part way along the fold. Fish the hole punch in as far as it will go along the fold from one side, and punch a hole. Do the same thing on the other side.

PUNCH HOLES




4. On each side, thread a piece of yarn through the hole, pull it to make the ends even, and tie a double knot against the edge of the paper. Tie beads on the ends of the yarn if you wish.



More bookmaking ideas are available at Susan's website, makingbooks.com, which has more projects and information about making books with children. Ebooks are available for purchase at the Bookstore including Multicultural Books To Make And Share which contains fifteen book-making projects from around the world.

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<http://www.makingbooks.com>



See Free Projects


Scaffolding Tools For Our Writing Teacher Toolbox to Use with ELLs

Sentence Frames; Sentence Starters

Word Boxes

Graphic Organizers

Paragraph/Essay Frames



Writing Scripts/Frames/Templates

**Stems to Get
Started**
**With or without
Word Boxes**

Scripts to Use

I found the second chapter
interesting for several reasons:

First....

Second....

Third....

I discovered that....

I also learned....

It was interesting that...

Finally.....

As you can see....



Bridging to Spanish



| CONTENIDO | |
|-----------------------------------|----|
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| Las rocas ígneas | 10 |
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| Las rocas metamórficas | 18 |
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Bridging to Spanish

Las rocas ígneas

Hay tres tipos de rocas, según como se forman. El primer tipo son las rocas ígneas. La roca derretida del interior de la Tierra sale a la superficie. Cuando se enfría, forma rocas ígneas.



Las rocas sedimentarias

El segundo tipo de rocas son las rocas sedimentarias. Se forman con presión. La arena y otros materiales naturales se compactan hasta que se endurecen. Las rocas sedimentarias son más blandas que las rocas ígneas.



En el fondo de los mares y ríos se acumulan plantas, esqueletos de animales, conchas, arena y trozos de roca. Esa mezcla se llama sedimento. A medida que se acumula, pesa más. El peso oprime las capas de abajo. El sedimento se va endureciendo hasta que se vuelve roca sedimentaria. Esto toma millones de años.



Dato curioso: En las acanidades de sedimento. Algunas capas

Las rocas metamórficas

El tercer tipo de rocas son las rocas metamórficas. Están formadas de otras rocas. El calor y la presión del interior de la Tierra pueden transformar una roca ígnea o sedimentaria a otro tipo: las rocas metamórficas. Con el tiempo, el calor y la presión pueden transformar una roca metamórfica en otra nueva roca metamórfica.



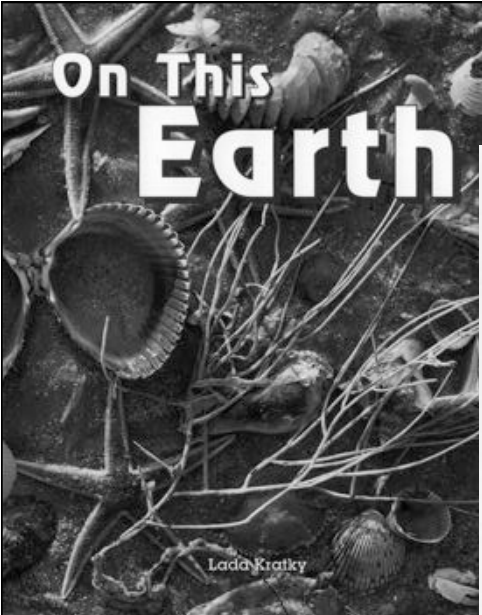
Tabla de rocas

| | Tipos de roca | Colores | Textura | Usos |
|---|---------------|---------------------------------------|--|-------------------------------|
|  | Ígnea | Negro brillante | Dura y vidriosa | Puntas de flecha |
|  | Ígnea | Mezcla de gris, blanco, rosado o rojo | Dura y áspera | Lápida, edificios, monumentos |
|  | Sedimentaria | Rojo, café, verde o amarillo | Granulada, se desmenuza | Edificios |
|  | Sedimentaria | Habano, gris o amarillo | Suave y terroso o duro y de grano grueso | Edificios, banquetas |



Personal Development—Building Self Esteem and Self Confidence

Celebrating Children's Cultural and Linguistic Identities

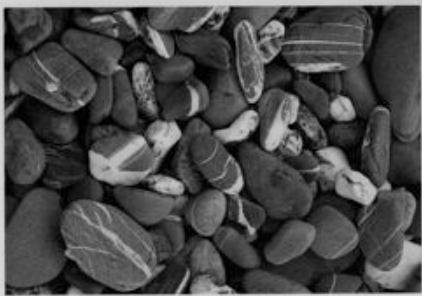


On This Earth


Lada Kratky

Self-Esteem

Preservation
Uniqueness of Each Living Being



On this Earth, there are millions of stones. But there's only one like this.



4