

Grade Third Rocks in Your Head

Duration: Approximately 16 days (2 hours per day)

Unit Overview

This unit focuses on the topics of rocks, soil, and habitats to teach the students about systems.

Key Concepts

1. There are 3 classes of rocks. There are vast numbers of rocks in each class. The rocks possess certain properties that distinguish the classes.
2. Rocks come in many forms.
3. Rocks follow a cycle to become the various forms.
4. Rocks are useful to man and animal.
5. Many animals live in rocks of one form or another.

Objectives

1. Students will demonstrate an understanding of the safety procedures required when rock collecting by reading information and completing quizzes on information studied.
2. Students will identify the characteristics of the three classes of rocks by collecting, mounting and labeling rocks.
3. Students will examine soil investigate the rock cycle.
4. Students will study rock habitats and depict through the creation of dioramas.
5. Students will utilize Internet research sites to learn about historical events.
6. Students will apply the rules of sentence structure, grammar, and mechanics to write report on historical research.
7. Students will utilize listening and speaking skills during reading and sharing of children's literature.

TEKS

Science:

- 3.1 Conducts field and laboratory investigations following safety procedures.
- 3.2 Uses scientific inquiry.
- 3.3 Knows that information, critical thinking, and problem solving are used in making decisions.

- 3.4 Knows how to use a variety of tools and methods to conduct science inquiry.
- 3.5 Knows that systems exist in the world.
- 3.9 Knows that species have different adaptations that help them survive and reproduce in the environment.

- 3.11 Knows that the natural world includes earth materials and objects in the sky.

Mathematics:

- 3.1 Uses place value to communicate large whole numbers.
- 3.2 Uses fraction names.
- 3.3 Adds and subtracts to solve problems.
- 3.5 Estimates to determine reasonable results.
- 3.6 Uses patterns to solve problems.
- 3.7 Uses charts to express patterns and relationships.
- 3.11 Uses appropriate unit and procedures to measure.
- 3.13 Applies measurement concepts.
- 3.15 Applies math to solve problems connected to everyday experiences.
- 3.16 Communicates math using informal language.
- 3.17 Uses logical reasoning to make sense of the world.

Language Arts:

- 3.1 Listens attentively and engages actively in various oral language experiences.
- 3.3 Speaks appropriately to different audiences.
- 3.4 Communicates clearly by putting thoughts and feelings into spoken words.
- 3.7 Reads widely for different purposes.
- 3.8 Develops an extensive vocabulary.
- 3.9 Uses a variety of strategies to comprehend.
- 3.10 Responds to various texts.
- 3.12 Generates questions and conducts research.
- 3.14 Writes for a variety of audiences and purposes.
- 3.15 Composes original texts using the conventions of written language.
- 3.16 Spells proficiently
- 3.17 Composes meaningful texts.
- 3.18 Selects and uses writing processes.
- 3.20 Uses writing as a tool for learning and research.

Materials

- Hurst, C. O., Rocks in His Head.
- Collections of items (by teachers, friends, students, etc.)
- Access to internet service and Encarta Encyclopedia
- Rock samples
- Shoe boxes with lids, one for each student
- Soil, small baggie for each pair of students
- Earthworms (can usually be found for low cost at bait shops)

Procedures: (Before the unit begins, ask to borrow friends', family members', and colleagues' collections or take pictures of the collections.)

ACTIVITY ONE (approximately 5 days, two hours per day)

A. Engage:

- 1) Share collections with students. Discuss the systems used to collect and display the objects.
- 2) Discuss other items that can be collected. Allow students to state what they would like to collect and why. Mention unique collections such as Jay Leno's collection of motorcycles and cars.
- 3) Have students speculate why people collect what they do. "Is collecting a waste of time? What do people do with their collections? Is there any way to earn money or get a job because of a collection?"
- 4) Read aloud *Rocks in His Head* by Carol Otis Hurst. Discuss.

B. Explore: Pass out samples of rocks and allow students to examine and compare.

C. Explain: Refer back to story and discuss how the collection turned out to be productive for the main character. Discuss the setting of the story (Depression Era.) Discuss the main character's job and the invention of the car. Discuss why hard times came (Stock Market Crash.)

D. Elaborate: In small groups, have students conduct internet research on these three topics: Depression Era, Model T, and the Stock Market Crash.

- E. Evaluation: Students create poster presentations of research findings. Discuss the formats in which the students chose to design their posters and the systems used.

ACTIVITY TWO (approximately 2 days, 2 hours per day)

A. Engage: Refer back to story. Discuss rock collecting as a serious endeavor. Show students tools or pictures of tools used to collect rocks. Have students predict how tools are used.

B. Explore: Allow students to experiment with tools outside if actual tools are available.

C. Explain: Have students get on the following website and go to the “Rock Hound Collection Safety” slide show.
<http://www.fi.edu/fellows/payton/rocks/>

D. Elaboration: Fill in KWL chart on rocks.

E. Evaluation: Have students take rock collection safety quiz from website.

ACTIVITY THREE (approximately 3 days, 2 hours per day)

A. Engage:

Hold up a rock and ask students if they have ever wondered where rocks came from. (Allow students to speculate.)
Read aloud *A Pebble in My Pocket* by Meredith Hooper.

B. Explore: Have students go back to website
<http://www.fi.edu/fellows/payton/rocks/> and go to the link on rock creation.

C. Explain: Discuss Key concept of the three classes of rocks and rock cycle.

Sedimentary rocks are rocks that have been created after thousands of years of pressure from layers upon layers of rock matter.

Metamorphic rocks are created when sedimentary and igneous rocks change due to pressure and heat. Igneous rocks are the rocks

made from magma. They are formed when volcanoes erupt and the molten rock solidifies. “Uplifting” occurs forming mountains made of rock. Weathering and erosion breaks rocks down into smaller grains resulting in soil. Soil is carried by wind and water and dropped as sediment (referred to as erosion.) Layers and layers of sediment become compacted and forming sedimentary rocks. Heat, pressure, and/or just the make-up of the rock can cause changes in igneous and sedimentary rocks to form metamorphic rocks. When exposed to higher temperatures, metamorphic rocks melts which once again creates igneous rocks starting the cycle all over again. (Use the graphics on <http://www.rocksandminerals.com/rockcycle.htm> website to help explain the rock cycle.) Discuss how the cycle is both internal (inside the earth) and external (requiring weathering, etc., from outside the earth.)

- D. Elaboration: Have the students take the quiz on the Rock Hound Site <http://www.fi.edu/fellows/payton/rocks/quiz/index.html>.
- E. Evaluation: Have students make rock collections with copies of rock pictures from the Rock Hound site. After they classify and identify the rocks using the Rock Hound website, they can glue them into shoebox lids to “mount” the rocks

ACTIVITY FOUR (approximately 2 day, 2 hours per day)

- A. Engage:
Read aloud *The Big Rock* by Bruce Hiscock.
Discuss what the next form of rock would be (soil.)
- B. Explore: Pass out a bag of soil to each pair of students. Allow them time to search through the soil and discover what makes up soil. Have students speculate as to why these items are in the soil.
- C. Explain:
Identify, list and categorize the elements in the soil.
Discuss the make up of soil. Good, easy to understand information can be found at <http://school.discovery.com/schooladventures/soil/index.htm>

l and
<http://homepages.which.net/~fred.moor/soil/formed/f01.htm>.

D. Elaborate: Have your students go on a “soil safari” at DiscoverySchool.com
<http://school.discovery.com/schooladventures/soil/index.html>.

E. Evaluation: Have students illustrate what the world looks like underground. They should include plant roots, microorganisms and other materials they discovered on their safaris.

ACTIVITY FIVE (approximately 1 day, 3 hours per day)

A. Engage: Play Twenty Questions with your students (see Appendix C.) They must guess what animal you are going to teach them about. The animal is a worm.

B. Explore: Give each student a worm to observe. Ask students to identify class of animal (invertebrate.) Have them speculate as to what worms have to do with rocks.

C. Explain: Connect earthworms to rocks by explaining how worms help in the process of changing rocks to soil. The following information comes directly from the website
http://mi.essortment.com/earthwormssoil_rmkf.htm.

”As the earthworm passes through the soil it eats, decomposes, and deposits the castings. The earthworm neutralizes the material by the secretions of calcium carbonate from glands near the earthworm's gizzard. The gizzard breaks the material down to a very fine texture and then it is digested by the earthworm. Continuing on through the earthworm's digestive tract, there are hormones, enzymes etc. that continue to breakdown the material. When it passes out in the form of castings, it is a rich and high quality humus material. These casts are not only high in nutrients but also high in beneficial bacteria for the soil.

Other good websites :

<http://www.mertus.org/gardening/worms.html> (facts about worms themselves and about soil.)

<http://www.uky.edu/Agriculture/Entomology/entfacts/trees/ef402.htm>.

<http://wildnetafrica.co.za/wildlifestuff/juniorpage/soil/earthworm.html>.

www.ag.usask.ca/cofa/departments/hort/hortinfo/yards/earthworm.html.

- D. Elaborate: Watch video on worms. Some videos that are available are *Wormania* from http://www.wormwoman.com/acatalog/Wormwoman_catalog_Wormania_39.html and *Turning Garbage into Gold* available from <http://www.wormdigest.org/library/videos.html>. If desired, students can create own compost heap and add worms to it. (See Appendix C for information about composting.)
- E. Evaluation: Students illustrate and explain the system used by worms to enrich soil.

ACTIVITY SIX (approximately 3 days, 2 hours per day)

A. Engage:

Review what was learned about worms.

Have students pick an animal (all live in or use rocks for their habitats) out of a hat. (See Appendix C)

- B. Explore: Have the students list animals and speculate what the animals have in common.

C. Explain:

Define habitat and the physical characteristics needed by animals to

survive in habitats. A habitat is the environment in which an animal lives. Types of habitats include rainforest, desert, mountain, ocean, and forest. Within a habitat, animals will find food, mates, homes, and protection. Some animals use rocks for their homes within a habitat. A great site that fully describes the habitats of earth is

<http://www.ups.edu/biology/museum/worldbiomes.html>.

Provide examples of various habitats and the animals that live there and why. Discuss the adaptations of these animals that allow them to survive (for example, reptiles can survive in a desert setting but amphibians need a wet environment because of their skin types.)

D. Elaborate: Discuss the many ways that rocks can be used within a habitat to create a home for an animal.

E. Evaluation: The students will use the box part of a shoe box to create a diorama of a rock habitat for the animal (drawn out of the hat) and explain in a report how it uses the physical environment to survive. Have them use Encarta to discover the animal's habitat and then learn more about the habitat.

CULMINATING ACTIVITY – fill in KWL chart. Display projects in classroom Museum of Natural History

APPENDIX C

Resources for Activities Third Grade Unit

Rocks in Your Head

ACTIVITY FIVE:

How to play Twenty Questions :

The students may only ask questions that can be answered with “yes” or “no.” Examples of such questions may be “Does the animal have 4 legs?” or “Can the animal fly?” Students may not ask “How many legs does the animal have?” as that question cannot be answered “yes” or “no.”

Information on composting:

A teaching slide show can be made from <http://aggie-horticulture.tamu.edu/earthknd/compost/compost.html>. Another great informational site is <http://www.boldweb.com/greenweb/compost.htm>.

Materials needed to make compost:

grass cuttings and leaves
coffee grounds
food scraps
worms
see websites listed above for more materials

ACTIVITY SIX:

Animals that have rocks as habitats:

*snakes	*pikas
*various insects (beetles, ladybugs, ants)	*peregrine falcons
*eels	*bats
*hyrax	*mountain lion
*sea lions	*big horn sheep
*penguins	*jackrabbit
*rock sparrows	*roadrunner
*mountain goats	
*rock wallaby	
*termites	
*chinchillas	
*wolf spider	
*scorpions	
*mountainsnail	
*millipede	
*banded rock lizard	
*alpine marmots	
*flounder	

