Tanya Wimer
Grade Level: 4th
Title: Life Rocks! (With The Right Tools)

GLEs Addressed
Science Content GLE [4] SD 1.1 The student demonstrates an understanding of geochemical cycles by describing that smaller rocks come from the breaking and weathering of larger rocks as part of the rock cycle.

Science Process GLE [4] SA1.1 The student demonstrates an understanding of the processes of science by asking questions, predicting, observing, describing, measuring, classifying, making generalizations, inferring, and communicating.

Writing GLE [4] W2.2.2 The student writes for a variety of purposes and audiences by writing in a variety of nonfiction forms using appropriate information and structure (i.e., personal letters, recounts, descriptions or observations.)

Cultural Standard B. Culturally-knowledgeable students are able to build on the knowledge and skills of the local cultural community as a foundation from which to achieve personal and academic success throughout life.
Students who meet this cultural standard are able to identify appropriate forms of technology and anticipate the consequences of their use for improving the quality of life in the community.

Science Concept
Rocks have been broken down and used through history to make life easier or more enjoyable, and they continue to be used in similar ways today.

*****The scoring guide and assessment task are located at the end of the lesson. Please share them with your students before beginning the lesson.**

Materials
Chart Paper
Photos of early uses of rocks as tools
Photos of rocks as jewelry in history
Actual artifacts of rocks used as tools or jewelry
(It is important to have at least SOME actual rough stone tools so that students may have the opportunity to touch them to feel hardness, sharpness, etc.)
Photos or actual artifacts of specific tools or objects from the local area
Access to You Tube or other resource for videos on Flintknapping/rock carving/tool making.
Cards with pictures of modern day tools/objects made of rocks and minerals
Cards with pictures of historic tools/objects made of rocks and minerals
3 pieces of paper per student to make Venn diagrams

Resources:
"Rocks & Minerals", DK Eyewitness Books, Dorling Kindersley Limited, 2008
"Rocks & Minerals", DK Eye Wonder, Dorling Kindersley, 2004
"1000 Facts on Rocks and Minerals", Miles Kelly Publishing Ltd., 2005

Vocabulary-
Mortar - bowl for grinding: a hard heavy bowl designed to hold substances to be ground into small pieces or powder by means of a club-shaped tool pestle
Pestle - object for crushing or grinding: a rod-shaped object made from hard material with a rounded end that is used for crushing or grinding substances in a mortar
Flintknapping - shaping flint into tools: the method, mainly used by prehistoric people, of chipping and splitting flint to make tools (Encarta® World English Dictionary)
Ulu - a knife with a broad, almost semicircular blade, used traditionally by Eskimo women
Physical Weathering - disintegration of rocks and minerals by a physical or mechanical process.
Mohs Scale – a classification that determines which rocks will scratch other rocks.

*** Students must have basic knowledge of Moh's hardness scale to complete the Assessment Task.**

Gear Up Process Skills: communicating, classifying
Ask students to think about tools or objects they use today which they believe makes life easier or more enjoyable. Accept all answers and record them on chart paper.
Use the list to categorize the items into groups by material composition. Help the students to identify which items are rock/mineral and which of those may be naturally made, handcrafted or machine made. Discuss a specific process they think may be used to make each item.

Explore Process Skills: communicating, observing, inferring
•As a class view video clips about flintknapping, carving, or tool making.

•Ask students to think about explorations they have done to learn about rock hardness (Mohs scale) and how this would make a difference in the use of rocks.

•Working in small groups, share photos or actual artifacts of rocks used in history as tools specific to the area (ie. Arrow/spearheads, scrapers, knives, ulus, mortar & pestle, carvings, jewelry, etc) and discuss their possible uses. Allow students to come up with as many ideas as possible for each tool. Ask them to share information they may already know about these tools or others they have seen or heard about.

•Students will create a chart to identify each tool and its uses. They will draw lines on either chart paper or regular letter sized paper with three boxes. In one box they should identify the item, in one box they should describe the rock or mineral, and in one box they should describe the use of the item.

•Ask groups to share conclusions with the class.

Generalize Process Skills: communicating, inferring
How are the tools of today the same or different from those in history?
How are the methods in which we make tools today the same/different from those in history?
Which kinds of rock would be the most useful for different types of tools?
How have people learned from the tools in history?
Which tools/objects have you not seen before?

Apply **Process Skills: observing, inferring, classifying**

Using a two-circle Venn diagram, students will classify the tool cards in at least three ways. Remind them to use the information learned to do the classifying (not JUST by appearance.) Students may work in groups to classify, but each student should turn in three separate Venn diagrams.

Extensions:

Invite an elder from the community to come to the classroom and talk about tools he/she used as a young person and perhaps today.

Take the class to a local museum with artifacts of the area.

Scoring Guide

GLE/Standard	Below Proficient	Proficient	Advanced
Science Concept GLE [4] SD1.1	Student describes fewer than two features (from list in assessment task) of rocks that can be formed into useable objects, does not reference Mohs hardness scale or name the rock chosen.	Student describes 2-3 features of rocks (from list in assessment task) that can be formed into useable tools/objects, references Mohs hardness scale, and names a type of rock that might work.	Student describes 4 or more features (from list in assessment task) of rocks which can be formed into useable objects, references Mohs hardness scale, and names a type of rock that might work.
Science Process GLE [4] SA1.1	Student does not draw a picture or does not label the picture of the tool/object designed.	Student describes by drawing a picture of the tool/object designed and labels 4 parts of the picture.	Student describes by drawing a picture of the tool/object designed and labels 5 or more parts.
Writing GLE [4] W2.2.2	Student does not complete more than one paragraph or does not describe the tool/object designed.	Student writes 2 paragraphs, using details to describe the tool/object designed.	Student writes 3 or more paragraphs, using details to describe the tool/object designed.
Cultural Standard B.4	Student does not reference any specific use of rocks in history.	Student references at least one specific use of rocks in history.	Student references two or more specific uses of rocks in history.

Assessment Task

Students will write at least two paragraphs about a useable tool they would design with rocks. Direct them to include information and details about the type of rock they would use, reference Mohs hardness scale, how they might fashion/form it, what it would look like when completed, how it would be used, and tools that may have been similar in history. A drawing with at least 4 labels will be included with the paragraphs.