Rocks, Rocks Everywhere

Summary

The students will be able to sort rocks based upon color, hardness, texture, layering and particle size.

Materials

Sand
- KWL Chart (pdf)

Book: *Sylvester and the Magic Pebble*
Empty egg carton for each student (students can bring these from home)
Old toothbrush for cleaning rocks
Marker for labeling rocks with students' initials
Extra rocks
Magnifying glasses
Paper
- *Rocks: Let's Take a Closer Look* paper (pdf)
- Sorting Challenge paper (pdf)

Writing paper
Pennies
Nails
Sandpaper
Small metal cans (soup cans)
Camera
Several decks of playing cards

Books:
- *The Nature and Science of Rocks*
  , by Jane Burton and Kim Taylor, ISBN:0836819454
- *If You Find a Rock*
  , by Peggy Christian, ISBN: 0152393390
- *Rock Collecting*
  , by Roma Gans, ISBN: 0690042655
- *The Pebble First Guide to Rocks and Minerals*
  , by Zachary Pitts, ISBN: 142961711X
- *Rocks, Rocks, Rocks*
  by Nancy Elizabeth Wallace, ISBN: 9780761455288
- *Sylvester and the Magic Pebble*
  , by William Steig, ISBN: 0671662694
- *Everybody Needs a Rock*
  , by Byrd Baylor, ISBN 068971058

Intended Learning Outcomes

(P) When science investigation is done the way it was done before, we expect to get a very similar result.
(N) Sometimes people aren't sure what will happen because they don't know everything that might be having an effect.
(C) In doing science, it is often helpful to work with a team and to share findings with others. All team members should reach their own individual conclusions, however, about what the findings mean.

Instructional Procedures

Invitation to Learn:

Provide the students with either a rock or a picture of a rock, and have them write about that they see. This can either be done in a paragraph or as a list. Once students are finished writing, have them compare their information with the neighbor. This information can then be used as a bulletin board being displayed throughout the unit of study.

Ask students, "What is sand?" Give students the opportunity to look at sand through hand lenses and notice that sand is ittybitty rocks. Discuss some of the attributes that students know rocks have. Have some rocks on hand for students to look at.

Instructional Procedures:

Rock Collection:

- Give each student a copy of a KWL chart (see KWL). Explain how this chart can be used to organize information.
- Have students record things they already know about rocks on the KWL chart.
- Ask: "What do you know about rocks? What do they look like? What are some of their characteristics? Where do they come from?"
- Instruct students to write questions about rocks on the KWL chart.
- Ask: "What else would you like to know about rocks?"
- Read the book, *Sylvester and the Magic Pebble*.
- As a class, make a list on the board of the various attributes of Sylvester's pebble.
- Explain to students that together you are going to start a classroom rock collection and look at the characteristics of rocks.
- Each student will need an empty egg carton to collect rocks in. These can be collected and brought to school by students prior to collecting rocks.
- Encourage students to bring in at least 10 different rocks. Assign a day when their rock collections need to be completed.
- Have extra rocks on hand for students who don't bring in their rocks on the appointed day.
- General rules of rock collecting:
  - Rocks should not be purchased from the store.
  - Each rock should fit into a section of an egg carton.
  - Ask permission before taking rocks from private property.
  - Try to get rocks from different locations.
- When students bring in their rocks, allow them to clean them with an old toothbrush and water. They need to write their initials on them with a Sharpie marker and put them in a section of their egg carton.
- On the appointed day, have students get their rock collections and get together with a partner.
- Give each student a magnifying glass and a piece of paper.
- Have students observe and discuss the characteristics of their rock collections.
- Students should make a list of characteristics on their paper.
- After students have had time to observe their own rocks and make their list of characteristics, have students share their information and make a combined class list of characteristics of the class rock collection.

Rock Sorting:

- Have students get their individual rock collections and get in groups of 34 students.
- Give each student a copy of the *Rocks: Let's Take a Look* page (see Rocks: Let's Take a Look).
- Allow students time to sort their individual rock collections according to the information on the *Rocks: Let's Take a Look* paper.
- Have students share their individual rock sort with the other members in their group.
- Now, as a group have students make a collective sort of all of their rocks using the *Sorting*

Challenge page (see Sorting Challenge).
Explain to the students how they can test for certain characteristics in their rocks. Show examples of what these characteristics will look like when students see them.
Hardness: Students can use their fingernail, a penny and a nail to scratch on their rock. Students then compare the hardness of their rock to the object that left a scratch on their rock. "My rock is harder than a penny but not as hard as a nail."
Texture: Students can compare the texture of their rocks to the textures of different grits of sandpaper. Gather samples of different grits of sandpaper. Label the sandpaper samples so students can best describe the texture.
Color: Students can sort according to colors.
Particle Size: Students can test this by shaking their rocks in a small metal can for a couple of minutes. The small bits of rock left in the can shows the particle size.
Layering: Students sorts rocks according to the visible layers seen on the rocks.
Give students time to test and sort their group rock collection in any way that their group chooses. They should only sort by one characteristic at a time.
Each group should then explain how they sorted their rocks to the rest of the class.
If time allows, let student groups sort their rocks again using a different characteristic.
Take pictures of the groups; sorts so that students can see other's work and further class discussion can be made. These pictures can then be put on a bulletin board or in a PowerPoint to share with parents.
Have each student make an illustration of one of his/her rocks that shows two different characteristics. Students should put as much detail and color in their pictures as they can. Have the students write a description of the rock they drew. Encourage students to share their illustrations and written descriptions with their partners or with the class if time allows.

Lesson and Activity Time Schedule

Each lesson is 55 minutes.
Each activity is 30 minutes.
Total lesson and activity time is 85 minutes.

Activity Connected to Lesson:

Rock Hounds:

Give each student or group of students a deck of playing cards. Face cards can be removed.
Have students sort the cards however their group decides.
They need to be able to explain how their cards were sorted and share with the class. Point out that there are different ways to sort the cards.
Read the book *Everybody Needs a Rock*. Discuss some of the attributes presented in the book.
Choose a rock from the class collection and study it. Have students describe it. Make a list of their responses on the board.
Put students into small groups of three or four. Have them select a rock. They need to create a written description of their rock on a piece of paper. You may have each group do two rocks, depending on the number of groups you have. Each rock should have its own description paper.
When their descriptions are finished, collect all of the descriptions and rocks.
Redistribute the rocks and descriptions and see if the groups can find the rock that is described on their paper.

<u>Extensions</u>

- <u>Movement:</u>
  Take a walk outdoors with children. Have children stop by a large rock. Ask children: "If this rock could talk, what do you think it might say? How do you think it would feel about where it lives and how it spends each day? How do you think it would feel about having visitors?" When you return

to the classroom, have children write or dictate stories about the magic rock that came to life. Later, have children illustrate their stories and share them with their classmates.

- Math:
  Using the pebbles and stones your child collected in the science lesson, have children make a bar graph of rocks by color, texture (smooth, rough), size, etc. Have them group the rocks in different ways, and look for their input as to how they would graph each one. This can be done in groups so that students have more rocks to use as data. Have each student create his/her own graph.
- Art:
  Have the students bring in a rock that they could decorate. They may even want to bring in several rocks and make a person or object using their rocks. Finished projects can be displayed in the classroom or school library or shared with parents.
- Writing:
  Cut out a red, shiny pebble for the students to glue on their picture. Use red cellophane or scrapbook paper. Give them a piece of paper with the following directions: Draw a picture of what you would wish for if you had a magic pebble. Glue your magic pebble onto your picture. Write what you would wish for below the picture.

Family Connections:

Rock collecting is a great family activity. There are many places in Utah to collect a variety of rocks.

Rocks are used for so many things. Have students go on a rock hunt for homework and list the uses of rocks in and around their homes. Add the use of a digital cameral and they could make a great poster.

Assessment Plan

Observation during group work.
Student list of attributes for their rock collections.
Student work in group sorting activities.
Student drawing and written description of their rock.

Bibliography

Woods, Robin, (1994). "A closeup look at how children learn science." *Educational Leadership.* Feb.1994, 3335.
Building on her desire to understand how children learn science, the author designed a science lesson that uses the "Conceptual Change" idea. It was that the students will revise their theories of the natural world once they see and learn new evidence based on their investigations.
Kirch, S. (2007). "Re/Production of science process skills and a scientific ethos in an early childhood classroom." *Cultural Studies of Science Education* 2, 785--845. SpringerLink.
Kirch examines early elementary students' learning of and engagement in science process skills and the establishment of a scientific ethos in the classroom, including questioning, forming, and critiquing hypotheses and identifying evidence, abilities sometimes considered to be beyond the capabilities of young learners. Kirch concludes with an essay on concerns about students' understanding of their engagement in science processes and the significance of the scientific ethos they generate.

Authors

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