

ROCKS, FOSSILS AND SOILS

SECTION 1: WHAT IS A ROCK?

From *Hands on Science* by Linda Poore, 2003



Westminster College

STANDARDS:

Students know how to compare the physical properties of different kinds of rocks and that rock is composed of different combinations of minerals.

Students know rock, water, plants and soil provide many resources including food, fuel, and building materials that humans use.

Students will compare and sort common objects based on two or more physical attributes (including color, shape, texture, size, and weight.)

Students will measure weight and length with appropriate tools and express measurements in standard metric units.

IN ADVANCE:

REUSE-SAVE OUR EARTH:

By reusing 2 liter bottles, we save the resources and energy necessary to make plastic.

- Have students bring in 18 clear, plastic, 2-liter bottles.
- Purchase earthworms or nightcrawlers (6" earthworms)
- Get a decaying log from the forest. (for making soil, Section 3.)

KEY WORDS:

ROCKS:

Contain one or more minerals. Thus, every mineral is a rock, including salt!

PRETEST:

Have students: Describe rocks. How do they feel? What color are they? How can you tell an object is a rock?

MATERIALS:

For each Pair

2 magnifiers

sets of rocks, granite, graphite, chalk, talc, pumice

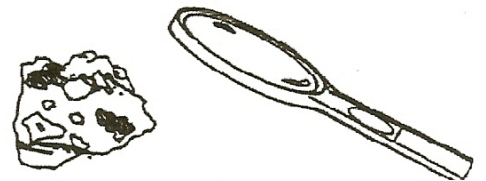
1 tray

cup of water

1 penny

1 spring scale

1 paper cup



EXPLORE:

1. LEARNING TO USE A MAGNIFIER

Pass out magnifiers in bags, with bags cut open on one end. Have students hold the magnifier close to an object and pull back slowly until the object is clear (focused).

Observe and help students.

Students place magnifier in the bag when they finish using it.

Have students look at their fingerprint using magnifiers.

Which lens makes objects appear biggest? (smallest lens)

Practice using magnifiers by looking at clothing, shoes, Velcro on shoes, carpets, etc., until all students can use the magnifier. Never touch an object with the magnifier or it will scratch.

2. OBSERVE ROCKS

Pass out trays of rocks.

Always pass out magnifiers separately, in their bags, so they aren't scratched in the rock tray. Observe rocks with magnifiers.

3. Have students:

Sort the rocks by one property. Discuss how they are sorted: light/dark, spotted/plain, smooth/rough, shiny/dull, etc.

Use Venn diagrams to indicate groupings. Within each group, sort by a second property. For instance, the smooth rocks could be sorted by shiny or dull. Venn Diagram



4. SOFT ROCKS

Which rocks are soft?

Can you scratch a rock with your fingernail?

Which rocks will the penny scratch. (graphite, talc, chalk)

These soft rocks write on paper or cement because they are soft and the rocks rub off.

Chalk: (light color) Chalk, calcium carbonate, is made of shells of tiny marine animals. Your teacher writes with a rock! *Do Not* try this rock on the chalkboard as it may scratch it.

Graphite: (a dark or black rock) Your pencil point is probably graphite.

Write your name on your paper with this rock.

Talc: (a greenish or grayish rock)

Your mom put talc on you when you were a baby.

This rock is ground up into fine pieces to become talcum powder.

How does it feel when you rub it? (soft, cold?)

5. **HARDNESS**

Which rocks are hard?

A rock that is harder than metal will scratch it.

Scratch each rock on your penny.

Can you rub off the rock mark?

Which rocks scratched the penny, leaving a mark?

Granite scratches the penny. It is a hard, pin, speckled rock.

How many different parts make up granite? (3)

These parts are called minerals.

Describe the 3 minerals in granite.

(The shiny black mineral is mica, the pink is feldspar, and the white or crystal pieces are quartz.)



6. Predict what will happen if you place rocks in a cup of water.

Try each rock. One rock is lighter (less dense) than water.

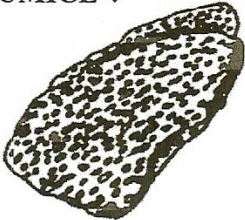
It comes from a volcano. It is called pumice.

Pumice is full of holes. The air in the holes makes it light.

These holes were filled with gases when it was thrown from a volcano.

Pumice is used for cleaning (scouring) and can be bought at a hardware store.

PUMICE ↓



7. **WEIGHIN IN GRAMS**

Teaching students how to use and read the spring scale.

Make a transparency of the worksheet *How many grams does it weigh?* to teach students how to read the scale.

Use the numbers to the left to weigh in grams.

Cut the sticky strip from a 3-inch Post-It™ and cover the Newton numbers to hide them.

Each line is worth 5 grams. Practice by counting by 5's. Place a rock in a paper cup hung from the scale. Adjust the scale with cup to '0' using the top metal piece. Do not use this scale with rocks weighing over 250 grams.

Instruct students not to pull on the scale or use it to weigh any heavy object.

Since the rocks are light, have students find the total weight of all 5 rocks on their tray, using the spring scale.

ASSESSMENT:

NAME THAT ROCK: Have a student give three properties of a rock hidden in their hand and have others guess the rock's name.

MATERIALS:

For Each Student

1 rock (from home)

My Rock worksheet

magnifier

For the Teacher

10 spring scales

10 paper cups

string

EXPLORE:

1. EXPLORING AND MEASURING

Pass out a worksheet (end of section) and a magnifier to each student. Students should have their own rock. (or students can use their favorite rock from the kit) Explain the worksheet *My Rock*.

Have students: Observe rocks and record information.

2. WEIGH IN GRAMS:

Use the spring scales to weigh objects in the room. List objects on the board that *you* have tested to be sure they are less than 250 grams. (box of crayons, scissors, workbook, etc.)

Students record weights on the worksheet, *How much does it Weigh?* by drawing the object next to the weight on the worksheet. Check each student's work for accuracy in using the spring scale.

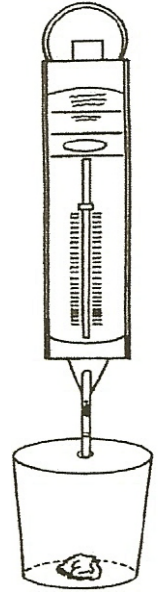
3. MEASURE CIRCUMFERENCE AND LENGTH:

Have students wrap a string around their rock, then measure the string to see how long it is.

Length: Lay the rock on the worksheet rules to see how long it is.

POSTTEST:

ROCKS: What is a rock? Place words on the board to include in their report: mineral, hard, soft, color, weight.

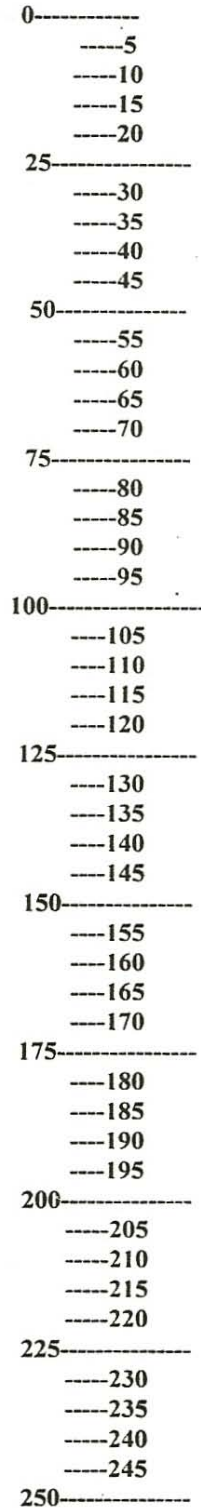


How many grams does it weigh?

Put a rock in the cup. How much does it weigh?

Every line on the scale is worth 5 grams.

Draw the rock on this sheet next to the line that shows how much it weighs.



Resources from Our Earth Help Us

Complete the chart below showing how rocks, water, soil, and plants help us.

	rocks	water	plants	soil
food				
fuel				
building materials				
Other uses				