



ROCKS, EROSION AND WEATHERING

SECTION 2-TESTING ROCKS FOR HARDNESS

THE SCRATCH TEST

From *Hands on Elementary School Science* by Linda Poore, 2003.

STANDARDS:

Students will formulate and justify predictions based on cause-and-effect relationships.

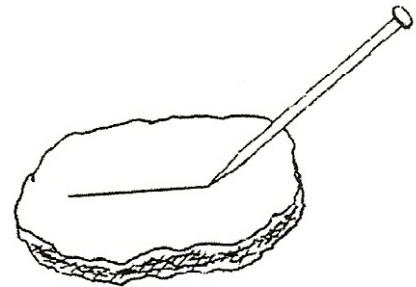
Students will follow a set of written instructions for a scientific investigation.

MATERIALS:

For Each Pair:

tray with rocks:

- | | |
|--------------------------------|-------------|
| 1 quartz | 1 limestone |
| 1 shale rock | 1 rock salt |
| 1 granite | 1 sandstone |
| 1 feldspar | 1 nail |
| chalk from chalkboard | 1 penny |
| glass jar | |
| rocks students bring from home | |
| student work sheet | |



NOTE:

MINERAL HARDNESS SCALE:

- | | |
|-------------------------------------|----------|
| 1. rubs off on fingers | talc |
| 2. can be scratched by fingernail | gypsum |
| 3. can be scratched by a penny | calcite |
| 4. can be scratched by a steel nail | fluorite |
| 5. can be scratched by a steel nail | apatite |
| 6. scratches glass | feldspar |
| 7. scratches steel or glass | quartz |
| 8. scratches quartz | topaz |
| 9. scratches topaz | corundum |
| 10. scratches all materials | diamond |

You can copy this scale on a transparency to use during the class discussion. Harder minerals scratch softer ones. The scale goes from one to ten. (soft to hard)

Do Not test a diamond as it may crack on a flaw.

Tiny diamonds imbedded in steel are used in industry to cut other materials.

EXPLORE:

WHICH ROCKS ARE SOFT?

[S, instructions]

1. Use the work sheet at the end of this section to test rocks and record results.
Pass out trays of rocks.
Place all the rocks on the desk.
List the names of all the rocks on the board.
Have students identify each rock they recognize.
Name each rock. Write a description on the board for each rock. Record descriptions on the work sheet, *Testing Rock Hardness*.

MAKING PREDICTIONS:

[S, predict]

2. *Have students:* Observe rocks. Predict which are harder.
Sort rocks into 2 groups: harder/softer.
Compare student ideas and discuss.

FINGERNAIL TEST:

3. First try to scratch each rock with your fingernail. (chalk, shale)
Hardness scale: 1 or 2 – The scratch mark does not rub off.) Record these rocks on your chart. Return these rocks to the tray. Only experiment on the remaining rocks, which are harder. Emphasize for students to try each rock only once, so rocks are not destroyed.

PENNY TEST:

4. Which rocks will a penny scratch?
Record answers on work sheet. (rock salt-hardness is 2.5)

NAIL TEST:

5. Test the remaining rocks to see if a nail scratches them. Rocks that were not scratched by the nail are the hardest.

GLASS TEST:

6. Test the hardest rocks only. Turn a jar upside down on your desk. Try scratching the bottom of the jar. Remember, if the rock scratches the jar, the scratch won't rub off. (Hardness scale: 6 or 7-feldspar, quartz)
Safety: Do not break the jar. Hold the jar with one hand when testing a rock.
7. Compare results and discuss. Identify the rocks by name.
Compare predictions with results. Collect all rocks. **[S, predict]**

Testing Rock Hardness

Write the name or describe each rock and tell what will scratch it. (put an X in the box)
Please scratch each rock only 1 time, so the rocks won't be destroyed.

DESCRIBE THE ROCK	FINGERNAIL Scratches rock	PENNY Scratches rock	NAIL Scratches rock	GLASS Rock scratches glass
name _____				
name _____				
name _____				
name _____				
name _____				

hardest rock: _____

softest rock _____