

Granite Grain Detectives

Use mineral evidence to explain what makes up a rock.

S6E5.b "Plan and carry out an investigation of the characteristics of minerals and how minerals contribute to rock composition."

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline each observation or test result, circle each action that makes the test fair, and number the three grain groups 1, 2, and 3 to track how evidence identifies minerals in granite.

Investigating Granite

- ① A class investigated a hand-sized piece of granite to learn how minerals make up a rock. They first used a hand lens to find three kinds of grains. Some grains were clear to milky and glassy. Others were pink or white and duller. A third group was black, shiny, and flaky. The class predicted that the grains were different minerals because they had different observable characteristics. They planned to compare each grain group before deciding what the rock contained.
- ② To make a fair test, students used loose grains from the same rock and labeled them A, B, and C. They observed luster and cleavage with a hand lens, then tested whether each grain could scratch a glass plate. They used equal-sized grains, the same glass plate, and the same amount of pressure. They recorded results in a data table instead of trusting one observation. Grain A was glassy, had no cleavage, and scratched glass. Grain B had flat cleavage surfaces and scratched glass. Grain C split into thin sheets and did not scratch glass.
- ③ Using several characteristics, the class matched Grain A to quartz, Grain B to feldspar, and Grain C to mica. They then counted 100 visible grains across several areas of the granite sample. About 35 were quartz, 55 were feldspar, and 10 were mica. These minerals, combined in different amounts, give granite its overall composition. The count also showed why a rock is not usually one pure mineral. A different rock can contain other minerals or different proportions, so its appearance and properties can differ.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 Which three characteristics or tests did the class use to compare the grain groups?

2 Name two actions that made the glass-scratch test fair. Why is a fair test important?

3 How did the glass-scratch test separate Grain C from Grains A and B?

4 Use the grain counts to explain why the granite sample was not one pure mineral.

3 YOUR TURN _____ Your own words

Write 5 or 6 sentences that plan a fair investigation of an unknown coarse-grained rock. Include a question, the characteristics and test you would use, the conditions you would keep the same, how you would record results, and how your results would show the rock's mineral composition.

PART 1 • READ AND MARK

Underline each observation or test result, circle each action that makes the test fair, and number the three grain groups 1, 2, and 3 to track how evidence identifies minerals in granite. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	Which three characteristics or tests did the class use to compare the grain groups?	They compared luster, cleavage, and whether a grain could scratch glass.
2	Name two actions that made the glass-scratch test fair. Why is a fair test important?	Students used equal-sized grains, the same glass plate, and the same pressure. A fair test helps make differences in results come from the minerals rather than changing test conditions.
3	How did the glass-scratch test separate Grain C from Grains A and B?	Grain C did not scratch glass, while Grains A and B did scratch glass.
4	Use the grain counts to explain why the granite sample was not one pure mineral.	The sample contained about 35 quartz grains, 55 feldspar grains, and 10 mica grains. Because it had more than one mineral, it was not a pure mineral.

PART 3 • YOUR TURN (SAMPLE ANSWER)

My question is, which minerals are in an unknown coarse-grained rock and how much of each mineral is present? I will use a hand lens to sort its grains by luster, color, and cleavage. I will test loose grains from each group to see whether they scratch glass. I will use equal-sized grains, one type of glass, and the same pressure for every scratch test. I will record each group's characteristics and count 100 visible grains in several areas of the rock. I will compare the results with mineral reference samples and use the counts to describe the rock's mineral composition.

Accept equivalent characteristics and fair-test controls that are supported by the passage. For the open task, accept reasonable mineral tests and controls if the student explains how evidence and grain counts would be used to identify minerals and describe composition.