

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

Plan, investigate, and explain. Teacher provides an intact coarse-grained rock, labeled mineral reference specimens from that rock type, a hand lens, and a recording sheet. Use only approved clean specimens; do not break rocks or scratch glass. Write 5 or 6 sentences planning how to compare grain color, luster and visible flat surfaces with the references, keep lighting and magnification the same, and count 30 grains across several areas.

Then actually carry out your approved observations with a partner. On extra paper record each grain group's observed characteristics, reference comparison, tentative identity, and count. Total the 30 counts and explain how the evidence supports more than one mineral in the rock. State any uncertain identifications; color alone is not enough.

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)

Example plan: I will ask which mineral groups make up the supplied rock. I will compare grain color, luster and visible flat surfaces with the teacher's reference specimens. I will use the same lens and lighting for each group. My partner and I will count 30 grains across several areas. I will record characteristics and tentative identities before explaining composition.

Illustrative completed record, not required results: Group A: glassy, clear, no visible flat cleavage surfaces, quartz reference match, 10 grains. Group B: pale, flatter surfaces, feldspar reference match, 16 grains. Group C: dark, shiny flakes, mica reference match, 4 grains. The counts total 30; the three observed groups support a rock made of several minerals, with identity uncertainty where features are unclear.

Preserve the passage-supported answers and equivalent fair-test explanations. Teacher supplies approved intact rock and appropriate mineral references before the task. Observe students carrying out their plan and inspect actual characteristic/reference/count records and a composition conclusion. Accept uncertainty and different counts; $10 + 16 + 4 = 30$ is illustrative only. Do not accept a future plan alone or require glass scratching, hammering, exact mineral percentages or identifications based only on color.