The Mystery Chip

Use observations to identify an unknown mineral.

5.2 "Analyze data collected through observations and measurements to identify materials based on their properties, including color, hardness, and reflectivity."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Circle each color in the table, underline each scratch result, and box each reflected-light result. Use your marks to find the labeled chip that matches the mystery chip on all three properties.

A Clue at the Rock Fair

1. At a school rock fair, a student found an unmarked white mineral chip. Three labeled chips nearby might help identify it. The student compared color, hardness, and how much light each chip reflected. For a fair test, she shone the same flashlight on one flat side of each chip from the same distance.

2. She tested hardness by gently dragging a fingernail across each chip. Then she tried the tip of a steel nail on a fresh spot. A scratch counted only if it left a clear groove after loose dust was brushed away. Her observations and scratch results are recorded in the table.

MINERAL CHIP TEST RESULTS

Chip	Color	Fingernail groove?	Steel nail groove?	Reflected light
Gypsum	White	Yes	Yes	Dull
Calcite	White	No	Yes	Bright
Quartz	White	No	No	Bright
Mystery	White	No	Yes	Bright

3. The chips did not have to match in size to compare these test results. A single matching property might point to several minerals, so the student looked for a match across all three properties. She also knew that a rough spot can look less shiny than a smooth spot, which is why she checked flat sides.

2 ANSWER WITH EVIDENCE

Use the passage

1. Which labeled chip matches the mystery chip? Give two test results that support your choice.

2. Quartz and the mystery chip have the same color and reflected-light result. Which test result shows they are different?

3. Can color alone identify the mystery chip? Use the table to explain.

4. Which labeled chip is soft enough for a fingernail to scratch? What result tells you?

3 YOUR TURN

Your own words

Invent results for two labeled samples and one mystery sample using color, a gentle fingernail scratch test, and reflected light. Make the mystery match just one labeled sample, then explain which one it matches using at least two results.

ANSWER KEY

The Mystery Chip

GRADE 5 · 5.2

PART 1 · READ AND MARK

Circle each color in the table, underline each scratch result, and box each reflected-light result. Use your marks to find the labeled chip that matches the mystery chip on all three properties. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Which labeled chip matches the mystery chip? Give two test results that support your choice.	**Calcite. Neither chip has a fingernail groove, and both have a steel nail groove. Both also reflect light brightly.**
2	Quartz and the mystery chip have the same color and reflected-light result. Which test result shows they are different?	**The steel nail left a groove in the mystery chip but not in the quartz chip.**
3	Can color alone identify the mystery chip? Use the table to explain.	**No. All four chips are white, so color does not tell them apart.**
4	Which labeled chip is soft enough for a fingernail to scratch? What result tells you?	**Gypsum. It is the only labeled chip with a fingernail groove.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Sample A is red, has a fingernail groove, and looks dull. Sample B is blue, has no fingernail groove, and looks bright. The mystery sample is blue, has no fingernail groove, and looks bright. It matches sample B because both are blue and neither has a fingernail groove. Both also reflect light brightly.

For the questions, accept equivalent wording that accurately uses the table. For Your Turn, accept invented results when the mystery matches exactly one labeled sample on all three properties and the explanation cites at least two matching results.