Harbor Material Mystery

Use observations to investigate burning and rusting.

P.7.5A.2 "Analyze and interpret qualitative data to describe substances using chemical properties (the ability to burn or rust)."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline observations from the damp-box tests and circle observations from the flame tests. Write the number 1 beside the observation that shows rusting.

Materials for a Harbor Shelter

1. A city science crew is choosing materials for a cooking shelter by the harbor. Salt spray and rain keep the site damp, and a nearby stove brings a fire risk. To compare chemical properties, the crew records what happens when small samples meet moisture or a flame in a supervised lab. They inspect each sample before and after testing. A chemical property describes how a substance can change into different substances. Rusting is one kind of change involving iron, oxygen, and water. Burning is a reaction with oxygen that releases energy.

2. The crew leaves an iron mesh, a cedar strip, and a glazed ceramic tile in a damp box for two weeks. Reddish brown flakes appear on the iron mesh and rub off on a cloth. The cedar strip and tile show no reddish brown flakes during that time. In a separate flame test, the cedar strip catches fire and leaves gray ash. The ceramic tile does not catch fire or leave ash. These descriptions are qualitative data: they tell what the crew noticed, not how much each sample changed.

3. A copper strip adds a puzzle. After two weeks in the damp box, it develops a green coating, not reddish brown flakes. Copper can react with substances in air, but that green coating is not iron rust. In the flame test, the copper strip does not catch fire. The iron mesh also stays intact during a brief flame test, but very thin iron strands can burn under other conditions. A result from one test describes what happened under those conditions; it cannot prove a substance will never burn or rust.

2 ANSWER WITH EVIDENCE

Use the passage

1. Which sample showed evidence of rusting? Describe the observation that supports your answer.

2. Compare the flame-test results for the cedar strip and the ceramic tile. What does each result suggest about its ability to burn?

3. Why is the copper strip's green coating not evidence that it rusted?

4. The iron mesh stayed intact in a brief flame test. Why does that result not prove iron can never burn?

3 YOUR TURN

Your own words

A report on a new woven sheet says it left black ash in a flame test but showed no reddish brown flakes after two damp weeks. Write three sentences recommending whether to use it near a stove. Use both observations and explain one limit of the evidence.

ANSWER KEY

Harbor Material Mystery

GRADE 7 · P.7.5A.2

PART 1 · READ AND MARK

Underline observations from the damp-box tests and circle observations from the flame tests. Write the number 1 beside the observation that shows rusting. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Which sample showed evidence of rusting? Describe the observation that supports your answer.	**The iron mesh showed evidence of rusting because reddish brown flakes appeared on it and rubbed off on a cloth.**
2	Compare the flame-test results for the cedar strip and the ceramic tile. What does each result suggest about its ability to burn?	**The cedar strip caught fire and left ash, so it can burn. The ceramic tile did not catch fire or leave ash in that test, so it did not burn under those conditions.**
3	Why is the copper strip's green coating not evidence that it rusted?	**Rusting involves iron, and the passage identifies the copper strip's green coating as a different change, not iron rust.**
4	The iron mesh stayed intact in a brief flame test. Why does that result not prove iron can never burn?	**The result applies to that brief test. The passage says very thin iron strands can burn under other conditions.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

I would not use the woven sheet near a stove because it burned and left black ash in the flame test. It showed no reddish brown flakes after two damp weeks, so that test did not show rusting. Two weeks without rust does not prove the sheet can never rust.

Accept conclusions that connect observed ash to burning and treat the lack of reddish brown flakes as a limited observation, not proof that rusting is impossible. A recommendation must address the risk of using a material that burned near a stove.