Matter Evidence File

Use observations to connect particle structure and material properties.

S8P1 "Obtain, evaluate, and communicate information about the structure and properties of matter."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline each observation or measurement used as evidence, circle each conclusion about particles, and draw an arrow from one piece of evidence to the conclusion it supports.

What Properties Reveal

1. Scientists can learn about matter by connecting observations to particle structure. Consider two white solids, table salt and sugar. Both dissolve in water, so appearance and solubility alone cannot identify their particles. When table salt melts, its moving ions can carry electric current. Sugar is made of neutral molecules and does not conduct when melted. Evidence from a test is stronger than a guess based only on appearance or a familiar name of the substance.

2. The difference begins at a tiny scale. In sodium chloride, positive sodium ions and negative chloride ions form a repeating crystal lattice. Strong attractions hold the ions in place, which helps explain salt's high melting point. In solid salt, ions cannot travel through the lattice. After melting or dissolving, ions can move, so the substance can conduct electricity. A scientific explanation links a property, such as conductivity, to a particle model and names the evidence that supports it.

3. Not every observation gives the same kind of information. A balance can measure mass, while a melting-point test can compare how strongly particles attract. Scientists also check whether a test is fair: samples should have the same amount, and only one condition should change. If results disagree, scientists repeat measurements and examine possible errors. Clear communication separates evidence from a conclusion. For example, a measured melting point is evidence, while a claim about bonding is a conclusion supported by that evidence.

2 ANSWER WITH EVIDENCE

Use the passage

1. Why are appearance and solubility alone not enough to identify the particles in table salt and sugar?

2. State one observation about table salt and the particle conclusion that observation supports.

3. What two conditions should scientists control to make a comparison test fair?

4. How does the passage distinguish evidence from a conclusion? Use the melting-point example.

3 YOUR TURN

Your own words

Material X is a brittle solid that melts at 801 °C and conducts electricity only after it melts. Write two sentences: make a claim about its particle structure, then cite two observations that support your claim.

ANSWER KEY # Matter Evidence File

GRADE 8 · S8P1

PART 1 · READ AND MARK

Underline each observation or measurement used as evidence, circle each conclusion about particles, and draw an arrow from one piece of evidence to the conclusion it supports. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Why are appearance and solubility alone not enough to identify the particles in table salt and sugar?	**Both substances are white solids and dissolve in water, so those shared properties do not show what particles each substance contains.**
2	State one observation about table salt and the particle conclusion that observation supports.	**Observation: molten table salt conducts electric current. Conclusion: its ions can move when the salt is melted.**
3	What two conditions should scientists control to make a comparison test fair?	**Use samples with the same amount, and change only one condition.**
4	How does the passage distinguish evidence from a conclusion? Use the melting-point example.	**A measured melting point is evidence. A claim about bonding is a conclusion supported by that measurement.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Material X is likely an ionic compound with ions arranged in a crystal lattice. Its melting point of 801 °C and its ability to conduct electricity only when melted support this claim.

Accept a reasonable claim that Material X is ionic or contains ions in a lattice, supported by both the high melting point and conduction when molten. Students should distinguish the claim from the observations.