

Matter Mix-Up

Use particle evidence to distinguish pure substances from mixtures.

SC.8.P.8.9 "Distinguish among mixtures (including solutions) and pure substances."

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline each sentence that gives a clue about particles or composition, then circle every example of a pure substance or mixture and write P or M beside it.

What Is in the Sample?

- ① Materials can be sorted by what their particles are. A pure substance has only one kind of particle and a fixed composition. An element, such as copper, contains one type of atom. A compound, such as pure water, has particles made from atoms joined in a fixed ratio. Every sample of pure water has H₂O molecules. Pure substances may be solid, liquid, or gas, but changing their state does not create a new kind of particle.
- ② A mixture contains two or more substances physically combined, so each substance keeps its own identity. Its composition can vary from sample to sample. Trail mix is a heterogeneous mixture because its nuts, raisins, and chocolate pieces remain separate and can be seen. Iron filings mixed with sulfur are also a mixture, even when the particles are small. A magnet can remove the iron, showing that physical methods can separate some mixtures without changing the substances.
- ③ Some mixtures look the same throughout. A solution is a homogeneous mixture in which one substance is evenly distributed in another. In salt water, dissolved salt is spread among water molecules, so a sample taken from any part has the same visible appearance. The salt and water are still separate substances, and evaporation can recover the salt. Air and brass are also mixtures, although they may look uniform. Air contains several gases, while brass contains copper and zinc.

2 ANSWER WITH EVIDENCE Use the passage

1 Why is copper classified as a pure substance?

2 Classify trail mix as a pure substance or a mixture. What detail from the passage supports your answer?

3 Why is salt water a solution even though it looks the same throughout?

4 How is pure water different from brass in the kinds of particles or substances present?

3 YOUR TURN Your own words

Choose a pure substance and a mixture that are not named in the reading. In 3 or 4 sentences, classify each, describe the particles or substances present, and explain what makes the mixture different from the pure substance.

PART 1 • READ AND MARK

Underline each sentence that gives a clue about particles or composition, then circle every example of a pure substance or mixture and write P or M beside it. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	Why is copper classified as a pure substance?	Copper contains only one type of atom, so it has one kind of particle and a fixed composition.
2	Classify trail mix as a pure substance or a mixture. What detail from the passage supports your answer?	Trail mix is a heterogeneous mixture because its nuts, raisins, and chocolate pieces remain separate and can be seen.
3	Why is salt water a solution even though it looks the same throughout?	Salt water is a homogeneous mixture because dissolved salt is evenly distributed in water. The salt and water are still separate substances.
4	How is pure water different from brass in the kinds of particles or substances present?	Pure water has only H₂O molecules in a fixed composition. Brass is a mixture that contains copper and zinc.

PART 3 • YOUR TURN (SAMPLE ANSWER)

A sample of pure aluminum is a pure substance because it contains only aluminum atoms. Sugar water is a solution because sugar is evenly distributed in water. Aluminum has one type of particle, while sugar water contains two substances that can be mixed in different proportions.

Accept any accurate examples not named in the reading. The response should identify one pure substance and one mixture and use particle type, number of substances, or variable composition as evidence.