

Mixtures and Separation

Student Worksheet | g09_u02_w07

Today I can: distinguish pure substances from mixtures, classify homogeneous/heterogeneous samples, and choose a separation based on properties.

Time/use: 100 minutes; class, homework, club, tutoring, or independent study.

Vocabulary: element, compound, mixture, homogeneous, heterogeneous, solution, solute, solvent, filtration, distillation, chromatography, decanting.

A. Quick checks

1. Is distilled water a pure substance or mixture?

2. Is air a pure substance or mixture?

3. Classify muddy water as homogeneous or heterogeneous.

4. Classify saltwater with all salt dissolved.

5. Which property allows a magnet to remove iron filings?

6. Which property makes filtration useful?

7. Does dissolving salt create a new compound? Explain.

B. Guided application

8. Sort: brass, oxygen gas, carbon dioxide, salad dressing.

9. Choose a method to separate sand from water and explain.

10. Choose a method to recover dissolved salt from saltwater without claiming water is destroyed.

11. Explain why a filter cannot separate sugar dissolved in water.

12. A dye spot separates into three colors on paper. What can be concluded?

13. Plan a sequence for iron filings, sand, and salt in water.

14. State one limitation of using boiling to separate an unknown liquid mixture.

C. Curiosity / application

15. Why can chromatography help compare inks but not prove a person's identity by itself?

16. A recycling facility receives aluminum, steel, plastic, and glass. Match a property to one first sorting method.

17. Give a safe, low-cost home/data alternative for a separation investigation.

Competition Corner

18. A clear sports drink is called "pure" because it has no visible particles. Critique the claim and propose evidence.

19. A student filters saltwater and reports "the salt disappeared." Diagnose the conclusion and propose a recovery method.

20. Two liquids boil at similar temperatures. Why is a single boiling observation weak identity evidence? Propose a better evidence set.
