

Fair Comparisons

Student Worksheet | g09_u01_w02

Name: _____

Date: _____

Today I can: identify variables, controls, and trials; recognize confounding; and plan a fair, safe comparison.

Time and use: 95 minutes; class, homework, tutoring, club, or independent practice.

Vocabulary and prior knowledge: independent variable, dependent variable, constant, control/comparison, trial, confounding, reliability.

Week 1 evidence language.

A. Quick checks

1. Identify IV and DV: Does water temperature change dissolve time?

2. List two constants for that test.

3. Why repeat trials?

4. Identify the confound: one group stirs warm water and another does not stir cold water.

5. Which is a measurable DV: “works better” or “time to endpoint in seconds”?

6. In a paper-towel test, what comparison is needed to claim brand matters?

7. A control means: a person in charge, a matched comparison, or a result you like? Explain.

B. Guided application

8. Improve “Does light affect plants?” into a testable question with IV and DV.

9. For a cup-insulation test, list IV, DV, and four constants.

10. A group changes tablet size, water volume, and temperature. Explain why its conclusion fails.

11. Make a five-column trial table for temperature, time, endpoint rule, and notes.

12. Write a prediction and distinguish it from evidence.

13. Identify an appropriate baseline for a water-filter material claim.

14. Explain how randomly assigning labeled cups can reduce a fair-test problem.

C. Apply to evidence

15. A video claims a “new battery” charges faster. Name two conditions that must match in a comparison.

16. Design a no-chemical test of whether surface area changes ice-melting time; include safety and a DV.

17. Give one reason a result may be reliable but not valid.

Competition Corner

18. Team A uses 100 mL water and one tablet; Team B uses 200 mL and two tablets. Both report time. Can tablet amount be compared? Redesign.

19. Three trials are 42, 44, 43 s; a fourth is 80 s after the timer was started late. State an ethical data decision rule.

20. A study finds darker cups warm faster in sunlight. Give two alternative explanations and one control for each.
