

Ratios: teach the existing pack

Grade 7 | Math | 5E | 45 minutes | Teacher supplement

Keep the published resource

Use [grade-7-ratios-investigation.pdf](#), the restyled two-page edition of the published exercise. The original is included separately for reference. Page 1 is the student investigation; page 2 is its answer key. Print page 1 only for students. This supplement supplies a consolidated lesson sequence and explicit assessment criteria; it does not replace the verified questions or answers.

Target and materials

Students decide whether a table represents a proportional relationship and justify using constant ratios. Prerequisites: division, equivalent fractions and units. Have a pencil, one student handout per learner and optional calculators. No ingredients or tasting are required. Success: correct classification plus calculations, not an unsupported yes/no.

45-minute sequence

Engage | 5 min. Compare 2 cups milk with 3 tablespoons cocoa against 4 cups with 5 tablespoons. Ask whether the second keeps the first recipe after doubling. Elicit predictions before naming proportionality.

Explore | 15 min. In pairs, compare all three ratios in each of A–D. Ask "What stays the same?" and "Does each table keep its own recipe?" In the first 5 minutes allow informal reasoning, then use the handout's division prompt. Record one misconception to discuss.

Explain | 10 min. Groups defend contrasting answers. Define constant of proportionality with units. A has 1.5 tablespoons/cup; C has 2. They are each proportional but are different recipes. B and D are useful counterexamples to "both numbers increase."

Elaborate | 12 min. Learners independently solve the truck task, then compare methods. Ask what assumption allows extension to 10 gallons. If ready, represent Table A with $y = 1.5x$, where x is cups and y is tablespoons.

Evaluate | 3 min. Learners complete the pay question independently. Collect it with their table calculations; score using the next page.

Access and extension

Allow calculators when arithmetic obscures reasoning. Prelabel numerator/denominator with units, use a double number line or read the task aloud. Accept fractions instead of decimals. Extension: construct a table that passes two rows and fails the third, then write and critique a proportional model.

Verification and assessment

Grade 7 | Teacher copy

Published answers checked

A ratios: $3/2$, $6/4$, $9/6 = 1.5$. B: 1.5, 1.25, $7/6$; not constant. C: 2, 2, 2. D: 2, 2, 1.75. A and C are both proportional with different constants. Table A at 8 cups: 12 tablespoons. Both columns increasing is insufficient.

Truck: $90/4 = 135/6 = 22.5$ miles/gallon; 10 gallons gives 225 miles assuming that rate stays constant. Two matching observations fit this model; they do not prove real fuel consumption is always constant. Pay: $12/1 = 36/3 = 12$, while $65/5 = 13$; not proportional. Five hours would give \$60 at \$12/hour.

A compact 8-point assessment

Explore A-D: 1 point per correct classification supported by comparisons of all three rows (4 total). Truck: 1 point for 22.5 miles/gallon, 1 for 225 miles under the constant-rate assumption (2). Exit: 1 point for the non-proportional verdict, 1 for a valid numerical counterexample (2). Use the recipe comparison as an additional discussion check.

Ready to extend: 7-8/8 and both exit points. 4-6: revisit units and justify with all rows. 0-3 or "both increase": compare A with B using equivalent ratios. If computations are wrong but reasoning is coherent, repeat with a calculator before assigning conceptual remediation.

Alignment verified

The lesson directly addresses CCSS 7.RP.A.2a (testing proportionality from tables) and 2b (identifying a constant). Writing $y = kx$ is an optional bridge to 2c. The pack does not assess graph interpretation in 2d; do not claim coverage of every part of 7.RP.A.2.

The 5E sequence is an adaptation to mathematical inquiry. Keep Grade 7 as the grade field and 5E as the method field. The published questions, numerical data and answers are preserved in the restyled edition; the original remains available separately.

References checked September 23, 2026

CCSS7: <https://www.thecorestandards.org/Math/Content/7/RP/>

BSCS: <https://bscs.org/reports/the-bscs-5e-instructional-model-origins-and-effectiveness/>