

Grade 6 • Unit 2 • Assessment Guide

Introducing Ratios

For the Parent or Teacher — What to look for

Unit 2 introduces ratios as a NEW idea distinct from fractions and from addition. Look for whether the student treats ratios multiplicatively (the heart of the unit) or whether they still rely on additive thinking.

Problem 1 — Ratio language and direction

- (a) 8 to 12, 8:12, 8/12 — all acceptable. (Some may simplify to 2:3.)
- (b) 12 to 20, 12:20 (or 3:5).
- (c) $8/20 = 2/5$.
- (d) NOT the same. Order matters in ratios. 'Apples to oranges' (8:12) describes a different relationship than 'oranges to apples' (12:8).
- Strong: writes ratios in multiple notations AND clearly distinguishes order.
- Weak: writes only one notation; says order doesn't matter.

Problem 2 — Scaling up a recipe (3:2)

- (a) 15 cups of juice. (Multiply both parts by 5.)
- (b) Table or double number line should show 3:2, 6:4, 9:6, 12:8, 15:10 — equivalent ratios.
- (c) 10 cups of soda water (multiply by 5 the OTHER way).
- Strong: uses multiplication to scale, not repeated addition.
- Weak: adds 3 to one side and 2 to the other instead of multiplying both.

Problem 3 — Comparing color mixtures

- Mix A (4:6) = ratio 2:3. Mix B (6:9) = ratio 2:3. Same shade. ✓
- Mix C (3:5) — NOT equivalent to 2:3. Different shade.
- Strong: simplifies all three ratios to their unit form OR multiplies to compare.
- Weak: says Mix C is same because 'it's all bigger numbers' or compares only the differences.

Problem 4 — Constant speed table

- Unit rate: 50 miles/hour.
- Table: 1→50, 3→150, 5→250, 8→400.
- Strong: identifies unit rate first, then multiplies. Or scales 3:150 strategically ($\times 5/3$ etc.).
- Weak: skip-counts or adds 50 over and over; gets to 8 by adding three 1-hour rows.
- ★ Multiplicative reasoning is the goal.

Problem 5 — Part-part-whole (trail mix)

- Total parts: $5 + 3 = 8$. Each 'part' is $40 \div 8 = 5$ cups.
- Peanuts: $5 \times 5 = 25$ cups. Raisins: $3 \times 5 = 15$ cups.
- Strong: draws a tape diagram with 8 equal segments (5 shaded as peanuts, 3 as raisins) and labels TOTAL = 40.
- Weak: tries to scale ONLY one side (peanuts to 40 cups would give 24 raisins — but then total is 64); or splits 40 in half ($20 + 20$).
- ★ The tape diagram is the key Unit 2 representation for part-part-whole.

Problem 6 — Additive vs multiplicative thinking

- Mai is WRONG. $6:8$ simplifies to $3:4$, but $7:9$ doesn't reduce. They're not equivalent.
- Strong: shows that $6 \times (7/6) \neq 7$ AND $8 \times (7/6) \neq 9$; or just simplifies both and shows they differ.
- Weak: agrees with Mai; can't articulate the multiplicative nature of ratio equivalence.
- ★ THIS IS THE SINGLE MOST IMPORTANT DIAGNOSTIC OF THE UNIT. Catching additive thinking is the central goal.

Problem 7 — Boy:girl ratio with given total

- Han is right ($3+5=8$ parts; $24 \div 8=3$ per part; 9 boys, 15 girls).
- Diego is wrong — $8:16$ simplifies to $1:2$, not $3:5$.
- Strong: explains that Diego only checked the TOTAL but ignored the RATIO.
- Weak: agrees with Diego because $8+16=24$.

Problem 8 — Two ways to check $9:12$ vs $15:20$

- Way 1: simplify both. $9:12 = 3:4$. $15:20 = 3:4$. ✓ Equivalent.
- Way 2: find unit rate. $9/12 = 3/4 = 0.75$. $15/20 = 3/4 = 0.75$. ✓
- Way 3: scale up. $9 \times (5/3) = 15$ and $12 \times (5/3) = 20$. ✓
- Strong: two genuinely different methods AND articulates which is easier in this case (simplifying).
- Weak: same method twice; or one method doesn't actually check equivalence.

Problem 9 — Scaling recipe to 18 muffins

- Scale factor: $18/4 = 4.5$.
- Flour: 4.5 cups. Sugar: $4.5 \times 0.5 = 2.25$ cups.
- Strong: handles the non-integer scale factor; uses multiplication.
- Weak: only scales by whole numbers; gives up because 18 isn't a multiple of 4.

Problem 10 — Write your own ratio story

- Look for: a meaningful context, two quantities related by $4:7$, a question that genuinely requires scaling.
- Strong: realistic situation ('4 servings cost \$7'), specific question ('how much for 12 servings?'), answer key provided.
- Weak: numbers don't form a ratio; story is vague; the question doesn't actually use the ratio.

— end —