

Grade 3 • Unit 6 • Assessment Guide

Measuring Length, Time, Liquid Volume, and Weight

For the Parent or Teacher — What to look for

Unit 6 builds measurement sense across length (in halves and fourths of an inch), weight (grams and kilograms), liquid volume (liters), and time (to the minute). The key diagnostic across all four is whether the student has SCALE SENSE — can they pick the right unit, estimate sensibly, and reason about quantities they can't see directly?

Problem 1 — Worm at 3 1/2 inches

- Worm is 3 1/2 inches (or 3 2/4 inches — equivalent).
- ★ Strong: writes BOTH 3 1/2 and 3 2/4 and recognizes them as equivalent.
- ★ Diagnostic: do they understand that 'halfway between 3 and 4' = $3.5 = 3 \frac{1}{2} = 3 \frac{2}{4}$? Equivalent fractions are back!
- Weak: writes '3 and a half' but can't formalize it as 3 1/2; OR writes 3 and doesn't capture the half.

Problem 2 — Locate 2 3/4 on a ruler

- Strong: 'Past the 2-inch mark, then 3 of the 4 quarter-inch marks past 2 — so right before 3 inches.'
- Weak: confuses 2 3/4 with 3 (since 'almost 3') or places it between 2 and 2 1/2.

Problem 3 — Line plot with fraction lengths

- Tallies: 3 → 2 dots, 3 1/2 → 4 dots, 4 → 2 dots, 4 1/4 → 2 dots.
- Most common: 3 1/2 inches.
- Less than 4: $3(2) + 3 \frac{1}{2}(4) = 6$ pencils.
- ★ Watch: does the student plot at the FRACTIONAL ticks, not just at whole-number ticks? This is the unit's central new skill.
- Common error: plotting 3 1/2 at the '4' mark or rounding to nearest whole.

Problem 4 — g vs kg

- (a) paperclip → g (small, very light)
- (b) watermelon → kg (a few kilograms)
- (c) dictionary → kg (likely 1-2 kg) — accept g if reasoned
- (d) small dog → kg (typically 5-10 kg)
- ★ Strong: explains WHY (grams for very light objects, kg for objects you'd lift two-handed). Weak: random unit choice.

Problem 5 — 2 L pitcher minus 750 mL

- 2 L = 2000 mL. $2000 - 750 = 1250$ mL. (Or 1 L 250 mL, or 1 1/4 L.)
- ★ Strong: converts liters to mL cleanly, then subtracts. Reveals understanding of unit conversion.
- Weak: $2 - 750 = ???$ (doesn't realize the units don't match).

Problem 6 — 5-gram backpack?

- 5 grams is NOT reasonable. A backpack is more like 2-5 kg (= 2,000-5,000 g). 5 g is the weight of a few raisins.
- ★ Strong: 'A backpack weighs about 2 to 5 kilograms — that's 2,000 to 5,000 grams. 5 grams would be like nothing.'

- ★ Reveals SCALE SENSE — do they have benchmarks for what a gram and a kilogram feel like?
- Weak: 'no, it weighs more than that' without giving a sensible estimate.

Problem 7 — Read clock times

- (a) 4:45 (minute hand on 9 = 45 minutes; hour hand just past 4)
- (b) 8:37 AM
- (c) 5:57 PM (3 minutes before 6:00)
- ★ The (c) requires backward reasoning ('3 before 6' = '5:57', NOT '6:57' or '6:03').
- Common error on (a): writing 4:09 (reading the 9 directly as 9 minutes).

Problem 8 — 4:15 + 45 min

- Ends at 5:00 PM. Strong: '4:15 + 45 min = 4:15 + 15 min (= 4:30) + 30 min (= 5:00).'
- Watch: do they cross the hour boundary correctly?
- Weak: writes 4:60 PM (doesn't roll over to 5:00) — classic error.

Problem 9 — Bus: 7:48 to 8:23

- 35 minutes. Strong: count up. $7:48 + 12 \text{ min} = 8:00$. $8:00 + 23 \text{ min} = 8:23$. Total: $12 + 23 = 35$.
- Alternate: $8:23 - 7:48 = 35 \text{ min}$ directly (harder mentally).
- ★ Watch: $8:23 - 7:48 = 75$ (subtracting digit-wise without accounting for 60 min/hour) is a classic mistake.

Problem 10 — Pumpkin 24kg / Potatoes 6kg, how many times?

- $24 \div 6 = 4$. The pumpkin is 4 times heavier.
- ★ This is multiplicative comparison — uses division to compare two quantities.
- Strong: 'I divided 24 by 6 because I wanted to know how many groups of 6 fit into 24.'
- Weak: subtracts ($24 - 6 = 18$) instead of dividing — treats it as 'how much more' (additive) rather than 'how many times more' (multiplicative).

Problem 11 — Lin 5 in, Sara 5 1/4 in: both right?

- Both can be right depending on what level of precision they used. Lin rounded to nearest inch; Sara to nearest 1/4 inch.
- ★ Strong: 'Yes — Lin measured to the nearest whole inch, and 5 1/4 rounds down to 5. Sara measured more precisely.'
- ★ Reveals understanding of measurement precision — every measurement is an approximation at some level.
- Weak: 'no, only one of them is right' (misses the precision idea).

Problem 12 — 1 L vs 8 students $\times$ 100 mL

- $8 \times 100 = 800 \text{ mL}$ needed. $1 \text{ L} = 1,000 \text{ mL} > 800 \text{ mL}$. YES, there is enough (with 200 mL to spare).
- ★ Strong: shows BOTH the calculation ($8 \times 100 = 800$) AND the comparison ($1000 > 800$).
- Weak: 'no, you only have 1 liter' (compares the number 1 to the number 8 without unit-converting); OR 'yes' without showing reasoning.