

Answer Key: Fractions and Decimals: Compare and Combine

Grade: 4 **Subject:** Mathematics **For teacher use only** Math

How to use this key

Answers are grouped by section and question number, with full worked steps. Accept any correct method that reaches the right value — a picture, a number line, or a decimal check are all fine where they apply. Watch-for notes flag common misconceptions. A basic calculator is allowed, so grade the **reasoning and steps**, not just the arithmetic. This is a Grade 4 packet, so every add/subtract uses the **same (like) denominator**. Estimated grading time: ~4–6 min per packet.

Start Warm-Up ~1 min

1 Name the shaded fraction of the bar.

3/4. The bar has 4 equal parts and 3 are shaded. Accept an equivalent that is clearly justified, but 3/4 is the intended reading. *Alternate:* a student who also writes 0.75 has connected 3/4 to its decimal — that is beyond the required answer, so give full credit as long as 3/4 is shown.

2 Which is bigger, 3/4 or 1/4?

3/4 is bigger. Both are fourths (same size parts), and 3 shaded parts is more than 1 shaded part, so $3/4 > 1/4$. Full credit for choosing 3/4 **and** a same-size-parts reason. *Watch-for:* a student who thinks the bottom "4" makes it big should be reminded that when the bottoms match, the bigger **top** wins.

Build Study the Math ~1 min

3 Add $1/5 + 3/5$.

Same bottom (fifths). Add the tops: $1 + 3 = 4$. Keep the bottom: 5. So $1/5 + 3/5 = 4/5$. *Alternate:* a number line from 0 to 1 in fifths landing on 4/5, or a bar of 5 parts with 4 shaded. As a decimal, $4/5 = 8/10 = 0.8$ (beyond the required answer — do not deduct if omitted).

4 Equal fraction: $1/2 = ?/4$.

$1/2 = 2/4$. Multiply top and bottom by 2 ($1 \times 2 = 2$, $2 \times 2 = 4$). The missing number is **2**. *Alternate:* a picture — cut a half-bar into two equal pieces and you see 2 of 4 parts. Full credit for 2 with any correct reason.

Apply Use What You Know ~2–3 min

5 Compare 2/8 and 5/8.

$2/8 < 5/8$. Both are eighths (same size parts), so compare the tops: $2 < 5$, so $2/8 < 5/8$. Full credit for the correct symbol **and** a same-bottom reason. *Watch-for:* the $</>$ symbol pointed the wrong way — the small end points to

the smaller number, $2/8$.

6 Ribbon: $7/8$ m – $3/8$ m cut off.

Same bottom (eighths). Subtract the tops: $7 - 3 = 4$. Keep the bottom: 8. So $7/8 - 3/8 = 4/8$ of a meter is left. *Alternate:* $4/8$ also equals $1/2$ — accept either $4/8$ or the simplified $1/2$. *Note:* simplifying is not required in Grade 4, so do not deduct for leaving $4/8$.

7 Match fraction to decimal.

$3/10 = 0.3$ (three tenths); $7/10 = 0.7$ (seven tenths); $3/100 = 0.03$ (three hundredths).

Watch-for: a student who matches $3/100$ to 0.3 has misread the place value — $3/100$ is three **hundredths**, written 0.03. Full credit for all three correct matches.

8 Error analysis: $2/5 + 1/5 = 3/10$ (student added the bottoms).

The mistake: The student **added the denominators** ($5 + 5 = 10$). When the bottoms are already the same, you do **not** add them — the bottom tells the **size** of the parts, and that size does not change. You add only the tops and keep the bottom.

Correct work: Same bottom (fifths). Add the tops: $2 + 1 = 3$. Keep the bottom: 5. So $2/5 + 1/5 = 3/5$.

Sanity check: $3/10$ (the student's answer) is smaller than $2/5$ alone, which cannot be right when you add a positive amount. Full credit requires (1) naming the "added the bottoms" error and (2) the correct $3/5$.

Explain Justify Your Thinking (Q9) ~1–2 min

9 Why keep the bottom the same ($2/5 + 1/5$).

Model answer. Answer: the correct sum is $3/5$. Model or numbers: the bottoms are both 5, so the parts are the same size; add the tops $2 + 1 = 3$ and keep the bottom 5. Why: The denominator names the **size** of each part (fifths). Both fractions are already fifths, so joining them just counts how many fifths there are in all — the size of a fifth does not change. Adding the bottoms would change the parts to tenths, which is why $3/10$ is wrong. Full credit requires the correct sum ($3/5$) and a reason that the bottom stays the same because the parts are already the same size.

Justification scoring rubric (3 points)

Score	Answer	Model or numbers used	Why (reasoning)
3	Correct sum $3/5$.	Shows the bottoms are the same and adds the tops ($2 + 1 = 3$, keep 5).	Clearly explains the bottom stays the same because the parts are already the same size.
2	Correct sum $3/5$.	Some work shown, or a minor slip.	Reasoning present but incomplete (e.g., "keep the bottom" without saying why).
1	Answer attempted, may be incorrect.	Little or no work shown.	Weak or missing reasoning.
0	No/incorrect answer.	No work.	No reasoning.

Close ACE ~1 min

ACE Articulate / Connect / Extend.

Articulate: Accept any plain-language version of: "the bottom number stays the same; you add only the tops."

Connect: Valid items where a like-denominator add/subtract happened include Q3, Q6, or Q8 (and the worked example). Any correctly named item earns credit.

Extend: Any correct fraction–decimal pair not in the packet — e.g., $1/10 = 0.1$, $6/10 = 0.6$, $9/10 = 0.9$, $25/100 = 0.25$, $50/100 = 0.5$. More than one answer is defensible; check the pair is truly equal (tenths → one decimal place, hundredths → two decimal places).

Challenge Early Finisher (optional)

EF Draw a model for $4/6$.

A correct area model shows a bar split into **6 equal parts** with **4 shaded**, labeled $4/6$; or a number line from 0 to 1 in sixths with a point/jump at $4/6$. Full credit for a labeled model that clearly shows 4 of 6 equal parts.

Alternate: a student who notices $4/6 = 2/3$ (each pair of sixths grouped) has gone beyond the task — accept it if the picture still shows 4 of 6 parts.

Watch Common misconceptions

- **Adding the denominators.** The Q8 error: $2/5 + 1/5 = 3/10$. Students add both tops and both bottoms. Reinforce that with a like denominator you add only the tops and **keep the bottom** — the size of the part does not change. A quick sanity check helps: the sum must be bigger than $2/5$, but $3/10$ is smaller.
- **Bigger denominator = bigger fraction.** In Q2 and Q5, some students think a bigger bottom number means a bigger fraction, or compare only the bottoms. When the bottoms match, the bigger **top** wins ($3/4 > 1/4$; $5/8 > 2/8$). A quick bar picture makes the same-size parts visible.
- **0.3 vs 0.03.** In Q7, students may match $3/100$ to 0.3. Three tenths ($3/10 = 0.3$) is ten times larger than three hundredths ($3/100 = 0.03$). Anchor the place-value names: tenths fill one decimal place, hundredths fill two.
- **Forgetting the fraction is "how many equal parts are shaded."** In Q1, a student who writes $3/1$ or counts only shaded-vs-unshaded ($3/1$ or 3 to 1) needs the reminder that the bottom is the **total** equal parts (4) and the top is the shaded parts (3).

Teacher follow-up based on likely errors

If many students miss Q8, do a quick 5-minute bar picture of $2/5 + 1/5$ so they see the parts stay the same size and you just count more fifths. If Q2 or Q5 show "bigger bottom = bigger," compare two same-bottom bars side by side and count shaded parts. If Q7 shows 0.3/0.03 mix-ups, practice reading tenths and hundredths aloud with a place-value chart. The Q9 justifications reveal who understands *why* the bottom stays the same — a good discussion starter next class. The separate student packet has all methods printed; this key is for the teacher only.

G04_MATH_FractionsDecimals_01 — Fractions and Decimals: Compare and Combine Teacher Answer Key