

Grade 4 • Unit 2 • Assessment Guide

Fraction Equivalence and Comparison

For the Parent or Teacher — What to look for

Unit 2 is the foundational fraction reasoning of Grade 4. Students must see equivalence as same point on a number line / same shaded amount (not 'a number trick'), and comparison as reasoning about both numerator and denominator together.

Problem 1 — Read fraction strip (3 shaded of 5)

- Shaded: $\frac{3}{5}$. Not shaded: $\frac{2}{5}$. Together: $\frac{5}{5}$ or 1 whole.
- Strong: writes the whole as $\frac{5}{5}$ OR 1 — both show fluency.
- Weak: writes $\frac{3}{2}$ (shaded over not shaded) — confuses part/whole.

Problem 2 — Draw $\frac{6}{8}$ and write equivalent

- $\frac{6}{8} = \frac{3}{4}$. Other accepts: $\frac{12}{16}$.
- Strong: shading clearly matches 6 of 8 equal parts; gives $\frac{3}{4}$ as equivalent.
- Weak: parts visibly unequal — reveals the 'equal parts' concept hasn't fully formed.

Problem 3 — Two equivalents of $\frac{3}{4}$

- Examples: $\frac{6}{8}$, $\frac{9}{12}$, $\frac{12}{16}$, $\frac{75}{100}$.
- ★ Strong: shows on a number line that both fractions land at the SAME point OR splits a fraction strip to show how the partitions match.
- Weak: just multiplies top and bottom by 2 with no explanation of WHY this works.

Problem 4 — Why does dividing top and bottom work?

- Strong: 'You're grouping the small parts together — instead of looking at 6 out of 10 tiny pieces, you group every 2 tiny pieces into 1 piece, so you have 3 out of 5 bigger pieces. Same total area.'
- Weak: 'Because the rule says so' or 'because both go in by 2.'
- ★ Central concept of the unit. A weak answer here predicts trouble with comparison and operations.

Problem 5 — Fill in equivalent fractions

- $\frac{2}{3} = \frac{8}{12}$; $\frac{4}{5} = \frac{80}{100}$; $\frac{9}{12} = \frac{3}{4}$ (denominator 4); $\frac{4}{8} = \frac{1}{2}$.
- ★ Diagnostic on $\frac{4}{5} = \frac{80}{100}$: requires recognizing $5 \times 20 = 100$ and applying $\times 20$ to the numerator.
- Weak: writes $\frac{4}{5} = \frac{20}{100}$ (multiplied 4 by 5, ignored the $5 \rightarrow 100$ relationship).

Problem 6 — Compare 5 pairs

- $\frac{3}{5} > \frac{3}{8}$ (same numerator, smaller denom is bigger).
- $\frac{7}{10} > \frac{7}{12}$ (same numerator, smaller denom is bigger).
- $\frac{2}{3} = \frac{4}{6}$ (equivalent).
- $\frac{5}{8} > \frac{1}{2}$ ($\frac{5}{8}$ vs $\frac{4}{8}$).
- $\frac{3}{4} > \frac{7}{10}$ ($\frac{3}{4} = \frac{15}{20}$; $\frac{7}{10} = \frac{14}{20}$).
- ★ Strong: uses different STRATEGIES depending on the pair. Weak: tries to convert every pair to decimals.

Problem 7 — Order $\frac{5}{12}$, $\frac{3}{4}$, $\frac{1}{3}$, $\frac{7}{8}$, $\frac{1}{2}$

- Compared to $\frac{1}{2}$: $\frac{1}{3} < \frac{1}{2}$; $\frac{5}{12} < \frac{1}{2}$ (since $\frac{6}{12} = \frac{1}{2}$); $\frac{1}{2} = \frac{1}{2}$; $\frac{3}{4} > \frac{1}{2}$; $\frac{7}{8} > \frac{1}{2}$.

- Order: $1/3$, $5/12$, $1/2$, $3/4$, $7/8$.
- ★ Strong: uses benchmark ($1/2$ and 1) reasoning, articulated.
- Weak: tries to convert all to a common denominator and gets bogged down.

Problem 8 — Pat says $4/5 > 4/3$

- Pat is WRONG. $4/3 > 1 > 4/5$.
- Pat's reasoning has a partial truth: ONE fifth IS smaller than ONE third. But 4 fifths $<$ 4 thirds because $4/3$ is already more than 1.
- ★ Strong: identifies the half-truth. 'When numerators are the same, the smaller denominator gives the bigger fraction. But $4/3 > 1$ and $4/5 < 1$, so $4/3$ is bigger.'
- Weak: agrees with Pat (very common error).

Problem 9 — Sara's reasoning for $2/4 = 3/6$

- Diego is right. $2/4$ and $3/6$ ARE both equal to $1/2$.
- Sara's reasoning (' $2+2=4$ and $3+3=6$ ') is WRONG even though her conclusion is right.
- ★ Strong: 'Sara is right by luck. The correct reason: in both fractions the numerator is half of the denominator.'
- Weak: agrees with Sara — accepts her reasoning.

Problem 10 — Pizza: $5/6$ vs $7/8$

- Mai ($7/8$) ate more. $5/6$ is $1/6$ less than a whole; $7/8$ is $1/8$ less than a whole. $1/8 < 1/6$.
- ★ Strong: compares by 'distance from 1' — sophisticated benchmark reasoning.
- Other strong: common denominator $5/6 = 20/24$, $7/8 = 21/24$.
- Weak: 'Han ate more because $5 < 7$ means he had fewer pieces.'

Problem 11 — Story for $3/4$

- Many valid problems. Example: 'I had 4 cookies and ate 3 of them. What fraction did I eat?'
- Strong: coherent story; answer is clearly $3/4$.
- Weak: just writes 'shade $3/4$ of a square.'

Problem 12 — Why can't compare by numerator OR denominator alone?

- Strong: 'The size of the fraction depends on BOTH — how many parts and how big each part is.'
- Common methods: find common denominator ($8/12$ vs $9/12$), benchmark (both $> 1/2$), or convert to equivalents.
- ★ Deepest test of conceptual understanding.