

Fraction Understanding and Retention Audit

Teacher and administrator overview | Pilot grades 3 5 6 and 8

Purpose. This brief, low-stakes audit is designed to show where fraction understanding is secure, where it is fragile, and where it may be lost across grade transitions. It is a curriculum-alignment tool, not an evaluation of individual teachers or programs.

What the audit measures

Strand	What the audit looks for
Meaning	Whole and equal parts; unit fractions; fraction as one number
Magnitude	Number lines; benchmarks; comparison; estimation
Structure	Equivalence; composition; fractions greater than one
Operations	Accurate procedures connected to units and quantities
Connections	Decimals, percents, ratios, division, and algebraic transfer

Pilot design

Form A is administered in Grades 3, 5, 6, and 8 in approximately 25-35 minutes. Common anchor items allow comparisons across the Grade 5-to-6 transition and into Grade 8. A parallel Form B, given 6-8 weeks later without immediate reteaching of every item, distinguishes short-term performance from durable retention.

Administration conditions

Use ordinary student accommodations, but avoid prompting a method or correcting work during the check. Students may show thinking in any clear form. Collect all pages so omissions and unfinished items remain visible evidence.

Evidence collected

- Accuracy: Is the answer mathematically correct?
- Magnitude: Does the student understand size and reasonableness?
- Representation: Can the student connect symbols to models, number lines, or contexts?
- Explanation and transfer: Can the student justify a method and use the idea in a less familiar setting?

How results will be used

Results will be summarized by grade and construct as **secure, developing, fragile, or not yet evident**. The cross-grade pattern can confirm current strengths, identify a small number of high-leverage breakpoints, and guide shared language, representations, retrieval practice, or targeted intervention. Individual student information remains private; faculty discussion focuses on aggregate patterns.

Interpretation guardrail. No single item should drive a curriculum decision. Act on patterns that recur across students, representations, and the delayed check.

Research basis. Gersten et al., *Developing Effective Fractions Instruction for Kindergarten Through 8th Grade* (IES, 2010); Siegler et al., *Early Predictors of High School Mathematics Achievement* (Psychological Science, 2012); Jaciw et al., *Math in Focus: A Singapore Math Program efficacy study* (2016).