

Fractions That Make Sense: Session 2
Well-Trained Mind Academy
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- Equivalent fractions: fractions that mean the same amount but are expressed with different numbers ($1/2$, $2/4$, $10/20$, etc.)
 - New idea for children: different names for the same amount
 - Use concrete → pictorial → abstract progression
 - Concrete
 - Begin with hands-on explorations with simple numbers
 - Start with finding many names for $\frac{1}{2}$ and then move on to other simple fractions.
 - Pictorial: Partition squares horizontally and vertically
 - Abstract: Transition to all numbers, but have children imagine (or draw) squares if they have trouble
- Common denominators: finding a denominator that “works” for both fractions
 - 3 methods for finding a common denominator
 - 1. Multiply the two denominators
 - 2. Find the least common multiple of each denominator by listing them out and looking for a common multiple
 - 3. List multiples of the larger denominator and consider whether it is a multiple of the smaller denominator
 - Usually the most convenient method, although it depends on the pair of denominators
 - May need to practice finding common multiples separately from fraction work
 - Children need excellent multiplication skills for this
 - Common denominators can help compare fractions
 - Achieves same result as cross-multiplying, but helps kids make more sense of the procedure
- Simplest form: expressing fractions with the smallest numbers possible (for example, $2/3$ rather than $8/12$)

- Avoid phrase “lowest terms” since children sometimes assume that fractions in lowest terms are actually smaller than the original fraction
- 2 methods:
 - 1. List all of the factors of both the numerator and denominator. Look for the greatest common factor of both numbers and divide both by this factor.
 - 2. (Simpler method) Divide both numerator and denominator by common factors until you can’t find another common factor.
- Adding and subtracting fractions and mixed numbers
 - Prerequisite skills
 - Finding common denominators and equivalent fractions
 - Converting improper fractions to mixed numbers and vice versa.
 - Incremental teaching progression (Teach addition and subtraction for each subskill before going on to the next one.)
 - Fractions with like denominators
 - Should be obvious to children if they understand meaning of numerator and denominator
 - Fractions with unlike denominators
 - Mixed numbers with like denominators and no regrouping
 - Mixed numbers with unlike denominators and no regrouping
 - Mixed numbers with like denominators and regrouping
 - Mixed numbers with unlike denominators and regrouping
 - Teaching tips
 - Concepts should be relatively easy for kids to understand at this point, but it still takes a lot of practice to master all the steps and bookkeeping
 - May want to write out three steps for adding or subtracting fractions with unlike denominators
 - 1. Find common denominator
 - 2. Find equivalent fractions with common denominator.
 - 3. Add or subtract.
 - For mixed numbers:

- Estimate first to keep kids' focus on meaning of numbers
- Warm up with whole number problems and point out similarities with whole number addition and subtraction.
- Start at the right. Add or subtract fractional parts before whole numbers.
- Simplify number (or convert to mixed number) as final step.
- Word problems
 - Use strategies similar to those for whole numbers (draw a picture, imagine the situation)
 - Sometimes help to substitute whole numbers for the fractions in the problems to better understand what operation is required.

Activities

[Equivalent Fraction Matching Cards](#)

[Common Denominator War](#) (Another variation on this game would be to have both players turn over two cards. Whoever has the lowest common denominator wins.)

[Simplifying Fractions Bingo](#) (The author suggests calling out the fractions for the gameboard and having children write them on their game boards. I'd suggest instead preparing the game boards by having children look at the "unsimplified" fractions and figuring out the simplest form before writing it on their game boards.)

[Subtracting Mixed Numbers Game](#) (Fun game for introducing the concept, uses pattern blocks as manipulatives.)

[Adding Fractions Bump](#) and [Subtracting Fractions Bump](#) (Come in both like denominator and unlike denominator versions.)