

BUILDING A STAGE

OPERATION D

Add and subtract fractions with friendly but unlike denominators (e.g., 2 and 10), using models and symbols

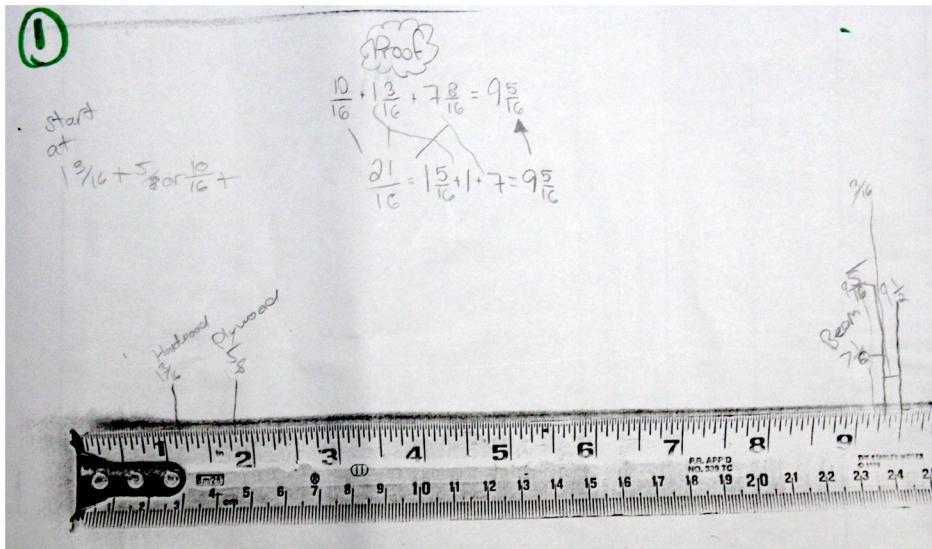
SAMPLE 1

This student used common denominators to solve the problem. They ended up making a small error in the final subtraction because they weren't as comfortable with improper fractions. If they had converted the improper fraction into a mixed number then it might have been much easier to subtract the final numbers.

Handwritten work showing various calculations for adding and subtracting fractions with a common denominator of 16:

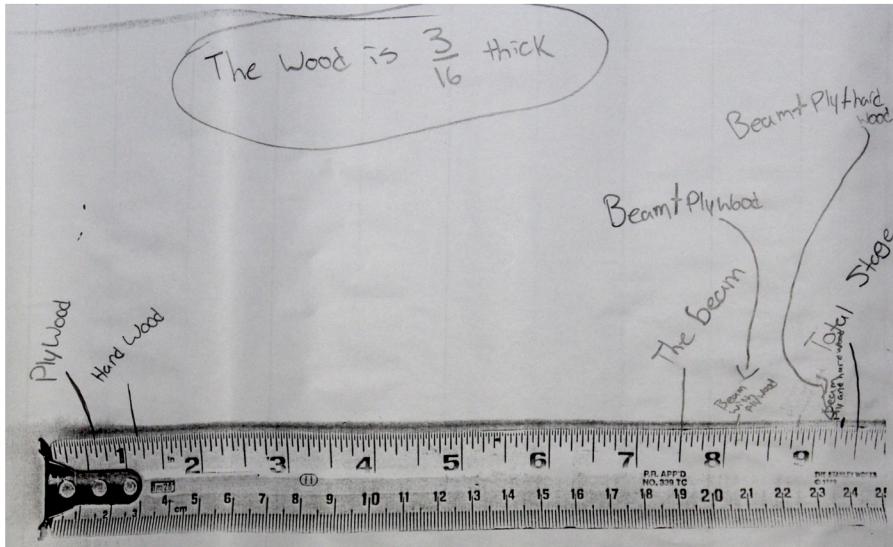
- $\frac{5}{8} + \frac{3}{16} + \frac{8}{16} = \frac{21}{16}$ + 8 wholes = $8\frac{21}{16}$
- $\frac{13}{16}$ (circled)
- $\frac{821}{16} - \frac{9}{16} = \frac{812}{16}$ (circled)
- $\frac{821}{16} - \frac{13}{16} = \frac{808}{16}$ (circled)
- $\frac{7}{16} + \frac{8}{16} + \frac{10}{16} + \frac{12}{16} + \frac{14}{16} = \frac{54}{16}$ (circled)
- $\frac{10}{16} + \frac{12}{16} + \frac{8}{16} = \frac{30}{16}$ (circled)
- $\frac{21}{16} = \frac{15}{16} + \frac{1}{16} + \frac{7}{16} = \frac{9}{16}$ (circled)
- $\frac{5}{16} + \frac{4}{16} = \frac{9}{16}$ (circled)

SAMPLE 2



Students used both the number line and common denominators for their proof. They used mixed, improper, and proper fractions interchangeably and were able to correctly place the thicknesses additively onto the number line, using the smaller thicknesses first and finishing with the largest thickness.

SAMPLE 3



These students were successfully able to place the various thicknesses on the number line and find the unknown thickness without finding common denominators. They moved fluently between fractions with friendly but unlike denominators. They started with the largest thickness first and moved to the smaller thicknesses.