Fractions Learning Pathways Part 2

Please note:

1. The most appropriate models for multiplication and division of fractions are number lines and rectangular area models (array models).
2. Mixed, improper and proper fractions should be interspersed throughout fractions teaching and learning.
3. Students will use their understanding of the inverse relationship between multiplication and division to solve tasks. This may mean that they solve division questions using multiplication.
4. Prior to commencing learning about multiplication and division of fractions, students should have a solid understanding of:
   - the multiple meanings of multiplication and division with whole numbers;
   - unit fractions;
   - number lines and area models for representing, comparing and adding/ subtracting fractions.

OP -H
Use models to decompose fractions using unit fractions as a form of division
(e.g., How many $\frac{1}{4}$ in $\frac{7}{4}$?)

OP -K
Divide a fraction by a like-denominator fraction with a whole number result
(e.g. $\frac{9}{4} \div \frac{3}{4} = 3$)

OP -G
Recognize division is the inverse of multiplication and vise versa ($\div 4$ is the same as $\times \frac{1}{4}$)

OP -J
Divide a fraction by a like-denominator unit fraction using models and symbols
(e.g., $\frac{3}{8} \div \frac{1}{8}$)

OP -M
Divide a fraction by a smaller friendly denominator fraction with a whole number result
(e.g., $\frac{6}{4} \div \frac{3}{8} = 4$)

OP -O
Divide a fraction by a like-denominator fraction with a whole number remainder
(e.g., $\frac{10}{4} \div \frac{3}{4} = 3\frac{1}{3}$)

OP -Q
Divide fractions using models and symbols

OP -F
Use models to recognize that any fraction is a multiple of its unit fraction
(e.g., $\frac{3}{4}$ is $3 \times \frac{1}{4}$)

OP -I
Multiply any fraction by a whole number using models and symbols
(e.g., $2 \times \frac{4}{5}$)

OP -L
Multiply fractions where the numerator of one is the denominator of the other using models
(e.g., $\frac{4}{5} \times \frac{1}{4}$)

OP -N
Multiply fractions using models and symbols

OP -P
Divide a fraction by an unlike-denominator fraction with a non-whole number remainder
(e.g., such as a remainder of $\frac{3}{8} \div \frac{1}{2} = \frac{3}{4}$)

OPERATIONS WITH FRACTIONS: MULTIPLICATION AND DIVISION

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Fractions Learning Pathways are inspired by Dr. Jere Confrey's work, based on international and Ontario classroom research, and informed by feedback from classroom teachers and student thinking.