

# Math Connections for Parents

Grade 5 Module 4

## Multiplication and Division of Fractions and Decimal Fractions

Welcome to Fifth Grade Module 4! Newark City Schools is using the EngageNY curriculum, which is aligned with Ohio's New Learning Standards. In Module 4, students learn to multiply fractions and decimal fractions and begin work with fraction division. Using their understanding of multiplication and division, students will apply that to multiplying and dividing fractions. Students will then work on solving word problems.

### Important Words and Concepts

- Simplify: using the largest fractional unit possible to express an equivalent fraction, e.g.  $\frac{2}{4}$  simplifies to  $\frac{1}{2}$
- Denominator: bottom number in a fraction, shows the fractional unit (fifths in  $\frac{3}{5}$ )
- Numerator: top number in a fraction, shows the count of fractional units (3 in  $\frac{3}{5}$ )
- Mixed number: whole number and fraction,  $3\frac{1}{2}$
- Parentheses: symbols ( ) used around a fact or numbers within an equation
- Quotient: answer one gets from dividing
- Factors: numbers that are multiplied to get a product

### Multiplication and Division

Students will need to have a strong base of multiplication and division facts in order to multiply and divide fractions. Continue to practice and master multiplication and division facts at home. Look for real world examples of multiplying and dividing fractions. Ask "What is  $\frac{1}{5}$  of 40? or What is  $\frac{2}{3}$  of 60?"

### KEY STANDARDS

- Write and interpret numerical expressions; e.g. write "add 8 and 7, then multiply by 2" as  $2 \times (8 + 7)$
- Add, subtract, multiply and divide whole numbers and decimals to the hundredths place.
- Apply knowledge of multiplication and division to multiplying and dividing fractions
- Convert like measurements (e.g. convert 5 cm to 0.05m)
- Represent and interpret data, such as making a line plot to display fractions

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## Graphics and Strategies you may see...

Students show division with tape diagrams and with division problems.

Five tons of gravel is equally divided between 4 dump trucks. How much gravel is in one dump truck?

$$\begin{array}{r} 4 \overline{) 5} \\ \underline{-4} \\ 1 \end{array}$$

$$\begin{array}{l} 4 \text{ units} = 5 \\ 1 \text{ unit} = 5 \div 4 \\ = \frac{5}{4} \\ = 1 \frac{1}{4} \end{array}$$

$$\begin{array}{l} \text{check: } 4 \times 1 \frac{1}{4} \\ = 1 \frac{1}{4} + 1 \frac{1}{4} + 1 \frac{1}{4} + 1 \frac{1}{4} \\ = 4 + \frac{4}{4} \\ = 5 \end{array}$$

$1 \frac{1}{4}$  is between 1 and 2.

Each dump truck held  $1 \frac{1}{4}$  tons of gravel.

Problems begin to get more complex with more than one operation and many steps.

A baseball team played 32 games and lost 8. Katy was the catcher in  $\frac{5}{8}$  of the winning games and  $\frac{1}{4}$  of the losing games. What fraction of the games did the team win? In how many games did Katy play catcher?

2a).

$$32 - 8 = 24$$

$$\frac{24}{32} = \frac{3}{4}$$

$$\text{Won: } \frac{5}{8} \text{ of } 24 = \frac{5 \times 24}{8} = 15$$

$$\text{lost } \frac{1}{4} \text{ of } 8 = \frac{1 \times 8}{4} = 2$$

$$15 + 2 = 17 \text{ games}$$

The team won  $\frac{3}{4}$  of the games.

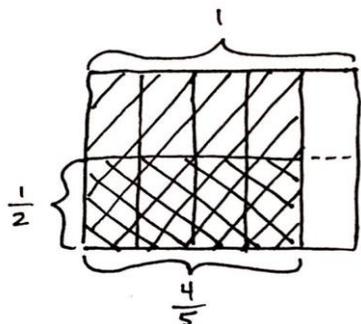
Katy played catcher for 17 games.

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Students model multiplication of fractions with area models before learning the algorithm.



$\frac{1}{2}$  of 4 fifths = 2 fifths

$$\frac{1}{2} \times \frac{4}{5} = \frac{4}{10}$$

$$= \frac{2}{5}$$

Students relate multiplying decimals to multiplying fractions:

A stick figure with a speech bubble containing the following calculations:

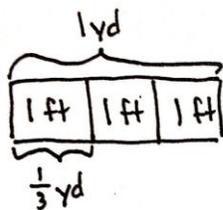
$$\begin{aligned} 7 \times 0.2 &= 7 \times \frac{2}{10} \\ &= \frac{7 \times 2}{10} \\ &= \frac{14}{10} \\ &= 1.4 \end{aligned}$$

A stick figure with a speech bubble containing the following calculations:

$$\begin{aligned} 0.7 \times 0.2 &= \frac{7}{10} \times \frac{2}{10} \\ &= \frac{7 \times 2}{100} \\ &= \frac{14}{100} \\ &= 0.14 \end{aligned}$$

Students will work on conversion of units:

11 feet = \_\_\_\_\_ yards



$$11 \text{ ft} = \text{---} \text{ yd}$$

$$11 \text{ ft} = 11 \times 1 \text{ ft}$$

$$= 11 \times \frac{1}{3} \text{ yd}$$

$$= \frac{11 \times 1}{3} \text{ yd}$$

$$= \frac{11}{3} \text{ yd}$$

$$= 3 \frac{2}{3} \text{ yd}$$



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