

10. $\frac{28}{3}$

9. $\frac{30}{4}$

8. $\frac{20}{1}$

7. $\frac{7}{6}$

6. $\frac{21}{1}$

5. $\frac{7}{5}$

4. $\frac{3}{1}$

3. 16

2. $\frac{3}{2}$

1. $\frac{3}{28}$

BASIC MATH

The Complete Course
Lesson Seven

Multiplying Fractions

KA8407

Teaching Guide & Worksheet

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HOW TO USE THE VIDEO AND TEACHING GUIDE

1. The "STOP TO THINK" signal means pause to think.
2. The "STOP TO WORK" signal means work the problem(s).
3. Rewind the tape and watch the lesson again if the concept is not clear.
4. Use "Learning Strategies" section of the Teachers Guide as memory aids and topics for classroom discussion.
5. Students should complete the exercises on the worksheet to confirm their understanding of this lesson.

Instructors may duplicate the worksheets as needed

LEARNING STRATEGIES

A REVIEW OF MULTIPLICATION

- A. When we multiply we always multiply "digit times digit" and "place value times place value"
- B. Applying the rules of multiplication to fractions
 - 1. Multiply the numerators (digits)
 - 2. Multiply the denominators (place values)
 - 3. $2/5 \times 3/7 = 2 \times 3 / 5 \times 7 = 6/35$

CANCELING

- A. Use the commutative property of multiplication to verify that canceling works
 - 1. $6/25 \times 10/21 = 6/21 \times 10/25$
 - 2. $6/21 \times 10/25 = 2/7 \times 2/5 = 4/35$
- B. Various examples of canceling are provided
- C. Note that multiplying a fraction by a fraction always gives an answer that is a smaller fraction

MULTIPLYING MIXED NUMBERS

- A. What is wrong with simply multiplying the whole numbers and the fractions? This process does not multiply each "digit" in one number by each "digit" in the other number
- B. Multiplying each part of the first mixed number by each part of the second mixed number is an alternative method of multiplication; this method is inefficient
- C. Changing mixed numbers to improper fractions provides a more efficient method of multiplying mixed numbers
- D. After changing the mixed numbers to improper fractions:
 - 1. Cancel
 - 2. Multiply
 - 3. Simplify the improper fraction to a mixed number
- 4. Check that the answer is reasonable

MULTIPLYING A FRACTION AND A MIXED NUMBER

- A. Change the mixed number to an improper fraction
 - 1. $5/8 \times 3 \frac{1}{3}$
 - 2. $3 \frac{1}{3} = 10/3$
- B. The fraction, $5/8$, is already a fraction
- C. Cancel
 - 1. $5/8 \times 10/3$
 - 2. $5/4 \times 5/3$
- D. Multiply the fractions: $5/4 \times 5/3 = 25/12$
- E. Simplify the answer
 - 1. $25/12 = 2 \frac{1}{12}$
 - 2. $1/12$ cannot be reduced
- F. Check that the answer is reasonable
 - 1. A fraction times $3 \frac{1}{3}$ should be less than $3 \frac{1}{3}$
 - 2. $2 \frac{1}{12}$ is less than $3 \frac{1}{3}$

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MULTIPLYING A MIXED NUMBER AND A WHOLE NUMBER

- A. Change the whole number to a fraction by using 1 as the denominator
 - 1. $6 \times 4 \frac{3}{8}$
 - 2. $6 = 6/1$
- B. Change the mixed number to an improper fraction
 - 1. $4 \frac{3}{8} = 35/8$
 - 2. $6/1 \times 35/8$
- C. Cancel: $3/1 \times 35/4$
- D. Multiply: $3/1 \times 35/4 = 105/4$
- E. Simplify the answer
 - 1. $105/4 = 26 \frac{1}{4}$
 - 2. $1/4$ cannot be simplified
- F. Check that the answer is reasonable
 - 1. $6 \times 4 = 24$
 - 2. Answer should be greater than 24
 - 3. $26 \frac{1}{4}$ is greater than 24
- G. An alternate approach: multiply both parts of the mixed number by the whole number

MULTIPLYING MORE THAN TWO MIXED NUMBERS

- A. This is the same process as with two numbers except you may be able to cancel more than once

WORKSHEET STRATEGIES

Solve the following.

- 1. $3 \frac{5}{8} \times \frac{6}{7}$
- 2. $4 \frac{1}{6} \times 1 \frac{3}{5}$
- 3. $7 \frac{1}{9} \times 2 \frac{1}{4}$
- 4. $\frac{5}{6} \times \frac{3}{4} \times \frac{8}{15}$
- 5. $2 \frac{1}{7} \times 3 \frac{1}{3} \times 6 \frac{2}{5}$
- 6. $4 \times 5 \frac{3}{8}$
- 7. $7 \frac{1}{7} \times \frac{2}{5}$
- 8. $4 \frac{1}{2} \times 4 \frac{1}{2}$
- 9. $3 \frac{2}{3} \times 4 \frac{1}{5} \times 2$
- 10. $6 \frac{7}{8} \times 4 \frac{2}{11}$