Multiplying Fractions by Whole Numbers

**Lesson 5-6**

**Why?** Some practical problems require multiplying fractions by whole numbers.

If Jo and Helena each ate \( \frac{3}{8} \) of a pizza, how much of the pizza did they eat altogether?

\[
2 \cdot \frac{3}{8} = \frac{2 \cdot 3}{1 \cdot 8} = \frac{6}{8} = \frac{3}{4}
\]

Together, Jo and Helena ate \( \frac{3}{4} \) of the pizza.

---

Multiplying and Dividing Fractions and Mixed Numbers

**Lessons 5-7, 5-8, 5-9**

**Why?** Solving real-world problems often involves multiplying or dividing fractions and mixed numbers.

Joe ran two-thirds as far as Adam. If Adam ran \( 1 \frac{4}{5} \) miles, how far did Joe run?

\[
\frac{2}{3} \cdot \frac{9}{5} = \frac{18}{15} = \frac{6}{5}, \text{ or } 1 \frac{1}{5}
\]

Joe ran \( 1 \frac{1}{5} \) miles.

Mary has \( 2 \frac{1}{2} \) yards of ribbon. How many \( \frac{1}{4} \) yard lengths of ribbon can she make?

\[
2 \frac{1}{2} \div \frac{1}{4} = \frac{5}{2} \cdot \frac{4}{1} \quad \text{Write the division as multiplication by the reciprocal.}
\]

\[
= \frac{10}{1}, \text{ or } 10
\]

Mary can make 10 lengths of ribbon.

---

Fraction Equations with Addition and Subtraction

**Lesson 5-10**

**Why?** Many application problems can be solved using fraction equations.

Cathy uses 3 cans of paint to paint \( \frac{3}{4} \) of her room. How many cans of paint will she use to paint the whole room?

\[
\frac{2}{3}r = 3 \quad \text{Write the solution as a mixed number to represent cans of paint.}
\]

\[
\frac{3}{2} \cdot \frac{2}{3}r = \frac{3}{2} \cdot \frac{3}{1}
\]

\[
r = \frac{9}{2}, \text{ or } 4 \frac{1}{2}
\]

Cathy will use \( 4 \frac{1}{2} \) cans of paint.