



**Core Focus**

- Division involving common fractions, mixed numbers, and improper fractions
- Solving word problems involving multiplication and division with these numbers
- Relating multiplication and division involving fractions
- Measurement conversions and problem solving involving customary measures of liquid volume or capacity (fluid ounces, quarts, and gallons)

**Division with Common Fractions**

- Students learn different ways to think about any fraction. For example,  $\frac{3}{4}$  can represent 3 equal parts out of 4 parts in total;  $\frac{1}{4}$  repeated three times; or 3 divided by 4. In this last case, the numerator tells the number of objects to be shared and the denominator tells the number of shares. The fraction tells how much will be in each share.
- Students use an area model to show how to divide a fraction by a whole number.

**II.4 Relating Division of a Unit Fraction to Multiplication**

These diagrams were used to figure out  $\frac{1}{3}$  divided by 4.

There is a way to figure out the answers without drawing all the diagrams.

The last diagram is like multiplying fractions. It is the same as  $\frac{1}{3} \times \frac{1}{4}$ .

Use these diagrams to help you complete the equations.

$\frac{1}{5} \div 4 = \frac{\quad}{\quad}$   
 $\frac{1}{5} \times \frac{1}{4} = \frac{\quad}{\quad}$

In this lesson, students consider how dividing a unit fraction by a whole number yields the same result as multiplying by the related unit fraction.

- Students use area models to represent the sharing model of division of a whole number by a unit fraction. For example, they find the number of one-third size shares in four whole pieces.

**II.7 Relating Division by a Unit Fraction to Multiplication**

Julia baked 4 large trays of granola bars. She will cut each tray into thirds to sell in separate packages at a bake sale. This diagram was used to figure out the number of packages she would make.

The diagram shows 4 groups of 3 thirds. That's 4 x 3 thirds.

Corey baked 5 large loaves of banana bread and cut each into fourths to sell at the bake sale. Complete the equations to figure out the number of packages he made.

$5 \div \frac{1}{4} = \square$        $5 \times \square = \square$

Look at the equations. Why do the answers make sense?

In this lesson, students connect division situations involving unit fractions to multiplication.

**Ideas for Home**

- We use division with fractions in our everyday life more than we realize. A fraction can be used to represent division. E.g. sharing 3 pizzas among 4 people results in each person getting  $\frac{3}{4}$  of 1 whole pizza. Notice occasions when fewer items than people are shared. Ask your child to tell you the fraction of one whole that each person will get.
- Baking a pie is a situation that involves division with fractions. Ask your child to find the number of  $\frac{1}{8}$  shares of pie if there are three whole pies in total. Ask them to write the related equation ( $3 \div \frac{1}{8} = 24$ ).

**Glossary**

- Division with **unit fractions** can be restated using multiplication.

$4 \div \frac{1}{3} = \underline{\quad}$   
 $4 \times 3 = \underline{\quad}$

$\frac{1}{3} \div 4 = \underline{\quad}$   
 $\frac{1}{3} \times \frac{1}{4} = \underline{\quad}$

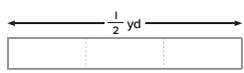
$\frac{1}{3} \div \frac{1}{4} = \underline{\quad}$   
 $\frac{1}{3} \times 4 = \underline{\quad}$

- Students solve real-world word problems involving unit fractions. By drawing pictures or diagrams and thinking about the type of situation, students decide which operation to use to solve the problem (e.g. multiplication or division).

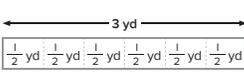
**II.8 Solving Word Problems Involving Unit Fractions**

Look at these two word problems.

**1** Lora cuts  $\frac{1}{2}$  yd of wood into 3 equal lengths. How long is each piece?



**2** How many half-yard lengths of wood can be cut from a piece that is 3 yards long?



How are they the same? How are they different?

Both problems sound like division.



The first problem is like sharing among 3.

The second problem is finding the number of halves in 3 so each of these equations should match one of the problems.

$\frac{1}{2} \div 3 = \square$   
 $3 \div \frac{1}{2} = \square$

How would you solve each problem?

Remember, when you divide with fractions, you can change the problem to multiplication if needed.



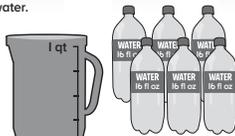
In this lesson, students solve division word problems involving unit fractions.

### Customary Measurement: Capacity

- Students review fluid ounces, quarts, and gallons, and practice converting between the different measures.
- Students solve problems and think of different ways to write the same measure (e.g. 48 fluid ounces is the same as  $1\frac{1}{2}$  quarts).

**II.10 Converting Between Quarts and Fluid Ounces**

Imagine this pitcher is used to fill the empty bottles with water.  
How many bottles can be filled from one full pitcher?



I know there are 32 fl oz in 1 quart.

How many pitchers of water are needed to fill six of these bottles?

Complete these statements.

<input type="text"/>	fluid ounces	is the same as	1	quart.
<input type="text"/>	fluid ounces	is the same as	$\frac{1}{2}$	quart or 0.5 quart.
<input type="text"/>	fluid ounces	is the same as	$\frac{1}{4}$	quart or 0.25 quart.
<input type="text"/>	fluid ounces	is the same as	$\frac{3}{4}$	quart or 0.75 quart.

How could you use the statements to figure out the number of fluid ounces in 3 quarts?  
What number sentence would you write?

In this lesson, students convert quarts to fluid ounces (big to small) and fluid ounces to quarts (small to big).

### Ideas for Home

- Ask your child to describe the amount of fluid ounces written on different beverage containers in relation to quarts or gallons. E.g. they could describe a 20 fluid ounce bottle of juice as being a little more than  $\frac{1}{2}$  a quart, or a 64 fluid ounce bottle of juice as exactly two quarts or a half-gallon.
- At the grocery store, ask your child to find items other than beverages that are labeled with fluid ounces (e.g. liquid laundry detergent).
- If there is  $\frac{1}{3}$  of the cake left on a plate and two people want to share it equally, ask your child to tell you what fraction of the whole cake each person gets. Have them write the related equation ( $\frac{1}{3} \div 2 = \frac{1}{6}$ ). Discuss the strategies your child used.
- Have your child look at the labels on beverage items or other liquids to begin making comparisons between customary units of capacity (fluid ounces and quarts) and metric units of capacity (milliliters and liters). A liter is just a little bigger than a quart. A 500 milliliter bottle of water is a little more than 16 fluid ounces (think of a single serving size water or soda bottle).

### Glossary

- ▶ 1 gallon = 4 quarts
- ▶ 1 quart = 32 fluid ounces