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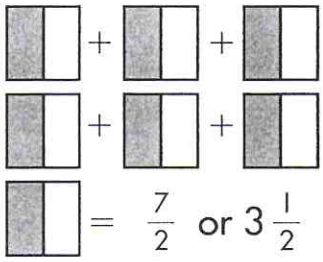
Lesson 6.1 Multiplying Fractions Using Models

You can use visual models to multiply fractions.

$7 \times \frac{1}{2}$



$= \frac{7}{2}$ or $3\frac{1}{2}$

or

Or, you can follow the mathmatical procedure.

$$7 \times \frac{1}{2}$$

$$\frac{7}{1} \times \frac{1}{2}$$

$$\frac{7 \times 1}{1 \times 2} = \frac{7}{2} \text{ or } 3\frac{1}{2}$$

Use visual models to solve each problem. Write answers in simplest form.

	a	b	c
1.	$3 \times \frac{1}{8} =$ ____	$5 \times \frac{2}{3} =$ ____	$\frac{2}{9} \times 8 =$ ____

Multiply. Write answers in simplest form.

	a	b	c	d
2.	$\frac{8}{9} \times 4 =$ ____	$\frac{1}{8} \times 8 =$ ____	$\frac{4}{5} \times 6 =$ ____	$9 \times \frac{1}{3} =$ ____
3.	$5 \times \frac{3}{10} =$ ____	$\frac{2}{3} \times 3 =$ ____	$9 \times \frac{7}{8} =$ ____	$\frac{6}{11} \times 7 =$ ____

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Lesson 6.2 Multiplying Fractions Using Rules

$\frac{3}{4} \times \frac{1}{6} = \frac{3 \times 1}{4 \times 6}$ ← Multiply the numerators. → $\frac{2}{7} \times \frac{7}{10} = \frac{2 \times 7}{7 \times 10}$

Multiply the denominators.

$= \frac{3}{24}$ $= \frac{14}{70}$

$= \frac{1}{8}$ ← Reduce to simplest form. → $= \frac{1}{5}$

Multiply. Write answers in simplest form.

	a	b	c
1.	$\frac{1}{3} \times \frac{2}{9} =$ ____	$\frac{1}{8} \times \frac{2}{5} =$ ____	$\frac{3}{7} \times \frac{3}{4} =$ ____
2.	$\frac{5}{6} \times \frac{3}{8} =$ ____	$\frac{5}{9} \times \frac{3}{7} =$ ____	$\frac{6}{11} \times \frac{1}{6} =$ ____
3.	$\frac{3}{5} \times \frac{2}{3} =$ ____	$\frac{3}{7} \times \frac{1}{3} =$ ____	$\frac{1}{6} \times \frac{8}{9} =$ ____
4.	$\frac{7}{10} \times \frac{4}{5} =$ ____	$\frac{7}{8} \times \frac{2}{7} =$ ____	$\frac{1}{2} \times \frac{5}{11} =$ ____
5.	$\frac{5}{7} \times \frac{7}{9} =$ ____	$\frac{3}{4} \times \frac{9}{10} =$ ____	$\frac{7}{12} \times \frac{7}{11} =$ ____

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Lesson 6.3 Multiplying Mixed Numbers

$2\frac{1}{5} \times 1\frac{1}{4} = \frac{11}{5} \times \frac{5}{4}$ Rewrite the mixed numbers as improper fractions.

$= \frac{55}{20}$ Multiply the fractions.

$= 2\frac{15}{20} = 2\frac{3}{4}$ Write the answer in simplest form.

Multiply. Write answers in simplest form.

	a	b	c	d
1.	$2\frac{1}{4} \times 2\frac{1}{3} =$ ____	$5\frac{1}{2} \times 1\frac{1}{6} =$ ____	$3\frac{1}{4} \times 4\frac{2}{3} =$ ____	$1\frac{6}{7} \times 2\frac{2}{3} =$ ____
2.	$1\frac{7}{10} \times 4\frac{3}{4} =$ ____	$3\frac{3}{5} \times 4\frac{1}{7} =$ ____	$1\frac{5}{9} \times 3\frac{1}{2} =$ ____	$6\frac{2}{3} \times 2\frac{1}{9} =$ ____
3.	$5\frac{3}{5} \times 2\frac{1}{4} =$ ____	$6\frac{1}{3} \times 1\frac{2}{5} =$ ____	$9\frac{1}{2} \times 2\frac{2}{7} =$ ____	$2\frac{6}{7} \times 5\frac{1}{7} =$ ____
4.	$8\frac{1}{6} \times 2\frac{1}{2} =$ ____	$3\frac{1}{8} \times 1\frac{5}{8} =$ ____	$7\frac{1}{2} \times 1\frac{1}{5} =$ ____	$3\frac{5}{6} \times 3\frac{1}{5} =$ ____
5.	$1\frac{7}{12} \times 2\frac{5}{6} =$ ____	$2\frac{1}{6} \times 7\frac{1}{2} =$ ____	$2\frac{1}{8} \times 3\frac{1}{4} =$ ____	$8\frac{2}{3} \times 4\frac{1}{2} =$ ____

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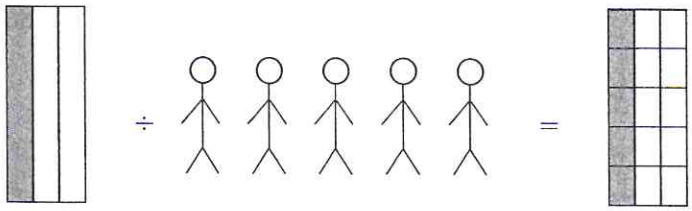
Lesson 6.4 Dividing Fractions by Whole Numbers Using Models

When dividing fractions, you are splitting one fraction into smaller pieces.

If 5 people evenly split $\frac{1}{3}$ of a pan of brownies, how much will each person receive?



$\frac{1}{3}$ pan of brownies

Divide the third into 5 pieces.

Each person receives $\frac{1}{15}$ of the original pan of brownies.

Use drawings to solve each problem.

	a	b
1.	$\frac{1}{4} \div 7 =$	$\frac{1}{3} \div 3 =$
2.	$\frac{1}{5} \div 9 =$	$\frac{1}{2} \div 6 =$
3.	$\frac{1}{2} \div 7 =$	$\frac{1}{6} \div 2 =$

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Lesson 6.5 Dividing Fractions by Whole Numbers Using Rules

To divide a fraction by a whole number, first write the whole number as a fraction. Then, multiply by the reciprocal of the divisor.

divisor ↓ reciprocal ↓

$\frac{1}{5} \div 8 = \frac{1}{5} \div \frac{8}{1} = \frac{1}{5} \times \frac{1}{8}$

$= \frac{1 \times 1}{5 \times 8}$ Multiply across the numerators and denominators.

$= \frac{1}{40}$ Write the answer in simplest form.

Divide. Write answers in simplest form.

	a	b	c	d
1.	$\frac{1}{3} \div 3 =$ ____	$\frac{1}{5} \div 8 =$ ____	$\frac{1}{6} \div 5 =$ ____	$\frac{1}{8} \div 3 =$ ____
2.	$\frac{1}{3} \div 12 =$ ____	$\frac{1}{7} \div 2 =$ ____	$\frac{1}{9} \div 10 =$ ____	$\frac{1}{6} \div 6 =$ ____
3.	$\frac{1}{4} \div 12 =$ ____	$\frac{1}{8} \div 5 =$ ____	$\frac{1}{8} \div 6 =$ ____	$\frac{1}{10} \div 4 =$ ____
4.	$\frac{1}{5} \div 12 =$ ____	$\frac{1}{7} \div 7 =$ ____	$\frac{1}{6} \div 8 =$ ____	$\frac{1}{12} \div 5 =$ ____

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Lesson 6.6 Dividing Whole Numbers by Fractions

To divide a whole number by a fraction, first write the whole number as a fraction. Then, multiply by the reciprocal of the divisor.

divisor reciprocal

$$6 \div \frac{1}{8} = \frac{6}{1} \times \frac{8}{1}$$

$$= \frac{6 \times 8}{1 \times 1}$$

Multiply across the numerators and denominators.

$$= \frac{48}{1} = 48$$

Write the answer in simplest form.

Divide. Write answers in simplest form.

	a	b	c	d
1.	$5 \div \frac{1}{3} =$ ____	$6 \div \frac{1}{8} =$ ____	$2 \div \frac{1}{5} =$ ____	$8 \div \frac{1}{7} =$ ____
2.	$9 \div \frac{1}{4} =$ ____	$10 \div \frac{1}{6} =$ ____	$15 \div \frac{1}{5} =$ ____	$4 \div \frac{1}{8} =$ ____
3.	$4 \div \frac{1}{5} =$ ____	$5 \div \frac{1}{9} =$ ____	$5 \div \frac{1}{5} =$ ____	$10 \div \frac{1}{11} =$ ____
4.	$4 \div \frac{1}{12} =$ ____	$6 \div \frac{1}{9} =$ ____	$3 \div \frac{1}{7} =$ ____	$5 \div \frac{1}{12} =$ ____

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Lesson 6.6 Dividing Whole Numbers by Fractions

Divide. Write answers in simplest form.

	a	b	c	d
1.	$4 \div \frac{1}{3} =$ ____	$12 \div \frac{1}{5} =$ ____	$19 \div \frac{1}{6} =$ ____	$10 \div \frac{1}{6} =$ ____
2.	$17 \div \frac{1}{4} =$ ____	$16 \div \frac{1}{9} =$ ____	$9 \div \frac{1}{6} =$ ____	$7 \div \frac{1}{2} =$ ____
3.	$2 \div \frac{1}{5} =$ ____	$14 \div \frac{1}{5} =$ ____	$4 \div \frac{1}{10} =$ ____	$8 \div \frac{1}{8} =$ ____
4.	$2 \div \frac{1}{7} =$ ____	$16 \div \frac{1}{5} =$ ____	$13 \div \frac{1}{5} =$ ____	$12 \div \frac{1}{3} =$ ____
5.	$5 \div \frac{1}{7} =$ ____	$3 \div \frac{1}{9} =$ ____	$15 \div \frac{1}{8} =$ ____	$6 \div \frac{1}{7} =$ ____
6.	$11 \div \frac{1}{2} =$ ____	$19 \div \frac{1}{3} =$ ____	$8 \div \frac{1}{9} =$ ____	$18 \div \frac{1}{5} =$ ____

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Lesson 6.7 Problem Solving

SHOW YOUR WORK

Solve each problem. Write answers in simplest form.

1. Simon bought $\frac{2}{3}$ pounds of cookies. He ate $\frac{4}{5}$ of the cookies he bought. What was the weight of the cookies that Simon ate?

Simon ate _____ pounds of cookies.

2. Students must take their tests home to be signed. Two-thirds of the class took home their tests. Only $\frac{1}{8}$ of the students who took their tests home got them signed. What fraction of the entire class got their tests signed?

_____ of the class got their tests signed.

3. One serving of pancakes calls for $\frac{1}{3}$ cups of milk. How many cups of milk are needed for 4 servings of pancakes?

_____ cups of milk are needed for four servings of pancakes.

4. If Carlos works $\frac{5}{12}$ of a day every day, how much will Carlos have worked after 5 days?

After five days, Carlos worked _____ days.

5. Tony had $1\frac{1}{2}$ gallons of orange juice. He drank $\frac{2}{7}$ of the orange juice he had. How much orange juice did Tony drink?

Tony drank _____ gallons of orange juice.

6. Miranda has 3 kites. Each kite needs $4\frac{2}{3}$ yards of string. How much string does Miranda need for all 3 kites?

Miranda needs _____ yards of string.

1.	2.
3.	4.
5.	6.

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Lesson 6.7 Problem Solving

SHOW YOUR WORK

Solve each problem. Write answers in simplest form.

1. Howard read $\frac{1}{16}$ of a book each day until he finished two books. How many days did it take Howard to read both books?

Howard read his books for _____ days.

1.

2. The school day is 7 hours long. If recess lasts $\frac{1}{4}$ hour, what fraction of the school day does recess make up?

Recess is _____ of a school day.

2.

3. Janet has 8 ounces of coffee beans. If each cup of coffee requires $\frac{1}{9}$ ounce of coffee beans, how many cups of coffee can Janet make?

Janet can make _____ cups of coffee.

3.

4. A recipe for one dozen cookies requires $\frac{1}{2}$ cup of flour. How much flour is needed for each cookie?

Each cookie requires _____ cup of flour.

4.

5. Keith has 7 yards of string. He needs $\frac{1}{3}$ yard of string for each of his puppets. How many puppets can Keith make with his string?

Keith can make _____ puppets.

5.

6. Mr. Garcia worked 4 hours on Wednesday. He took a quick break every $\frac{1}{2}$ hour. How many breaks did Mr. Garcia take?

Mr. Garcia took _____ breaks on Wednesday.

6.