

SADLIER

## Progress in Mathematics

Correlated to the

## Common Core

 State Standards for Mathematics

## S Sadlier

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## Operations and Algebraic Thinking

Represent and solve problems involving multiplication and division.

## Common Core State Standards for Mathematics

1. Interpret products of whole numbers, e.g., interpret $5 \times 7$ as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as $5 \times 7$.
2. Interpret whole-number quotients of whole numbers, e.g., interpret $56 \div 8$ as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each.

For example, describe a context in which a number of shares or a number of groups can be expressed as $56 \div 8$.
3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. 1

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## Instruction

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*Online at progressinmathematics.com.

Represent and solve problems involving multiplication and division.

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4. Determine the unknown whole number in a multiplication or division equation relating three whole numbers.

For example, determine the unknown number that makes the equation true in each of the equations $8 \times ?=48,5=? ? \div 3,6 \times$ $6=$ ?

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## Instruction

4-10 Missing Factors—pp. 150-151
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## Understand properties of multiplication and the relationship between multiplication and division.

## Common Core State Standards for Mathematics

5. Apply properties of operations as strategies to multiply and divide. ${ }^{2}$

Examples: If $6 \times 4=24$ is known, then $4 \times 6=24$ is also known. (Commutative property of multiplication.) $3 \times 5 \times 2$ can be found by $3 \times 5=15$, then $15 \times 2=30$, or by $5 \times 2=10$, then $3 \times$ $10=30$. (Associative property of multiplication.) Knowing that $8 \times 5=40$ and $8 \times 2=16$, one can find $8 \times 7$ as $8 \times(5+2)=(8 \times$
5) $+(8 \times 2)=40+16=56$. (Distributive property.)
${ }^{2}$ Students need not use formal terms for these properties.
6. Understand division as an unknown-factor problem.

For example, find $32 \div 8$ by finding the number that makes 32 when multiplied by 8. Multiply and divide within 100.

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## Instruction

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## Readiness

4-10 Missing Factors-pp. 150-151
Instruction
5-7 Relate Multiplication and Division—pp. 174-175
6-13 Fact Families—pp. 212-213
*Online at progressinmathematics.com.

## Multiply and divide within 100.

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Common Core State Standards for Mathematics
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7. Fluently multiply and divide within 100 , using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5=40$, one knows $40 \div 5=$ 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers. Solve problems involving the four operations, and identify and explain patterns in arithmetic.

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## Instruction

5-7 Relate Multiplication and Division—pp. 174-175
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Solve problems involving the four operations, and identify and explain patterns in arithmetic.

## Common Core State Standards for Mathematics

8. Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. ${ }^{3}$
${ }^{3}$ This standard is limited to problems posed with whole numbers and having whole-number answers; students should know how to perform operations in the conventional order when there are no parentheses to specify a particular order (Order of Operations).
9. Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations.

For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.

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## Readiness

Skills Update: Patterns—p. 7

## Instruction

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*Online at progressinmathematics.com.

Solve problems involving the four operations, and identify and explain patterns in arithmetic.

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|  | 6-2 Multiply Sixes-p. 191 |
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Use place value understanding and properties of operations to perform multi-digit arithmetic.

## Common Core State Standards for Mathematics

1. Use place value understanding to round whole numbers to the nearest 10 or 100 .

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## Instruction

1-9 Round Numbers-pp. 46-47

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3-3 Estimate Differences—pp. 104-105
10-2 Estimate Products—pp. 338-339
*Online at progressinmathematics.com.

Use place value understanding and properties of operations to perform multi-digit arithmetic.

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Common Core State Standards for Mathematics
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2. Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.
[See below.]
Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.
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## Application

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Teacher's Edition
English Language Learners: Round Numbers-TE p. 29H
Strategic Intervention: 3. Round three-digit numbers to the nearest 100-TE p. 335G

## Readiness

Skills Update: Addition Facts Through 18—p. 4

## Instruction

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2-8 Add Regroup Twice-pp. 76-77
*2-8A Addition Properties-Online
2-9 Three-Digit Addition-pp. 78-79
2-10 More Regrouping in Addition-pp. 80-81
2-11 Mental Math-pp. 82-83
*Online at progressinmathematics.com.

## Use place value understanding and properties of operations to perform multi-digit arithmetic.

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Common Core State Standards for Mathematics
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Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

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## Readiness

Skills Update: Subtraction Facts Through 18-p. 5
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3-3 Estimate Differences-pp. 104-105
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3-6 Regroup Once in Subtraction-pp. 110-111
3-7 Regroup Twice in Subtraction-pp. 112-113
3-8 Regroup with Zeros-pp. 114-115
*3-12A Missing Operands-Online

## Instruction

10-1 Multiplication Patterns—pp. 336-337
*10-1A Multiply with Multiples-Online
10-2 Estimate Products—pp. 338-339

## Number and Operations-Fractions

## Develop understanding of fractions as numbers.

## Common Core State Standards for Mathematics

1. Understand a fraction $1 / b$ as the quantity formed by 1 part when a whole is partitioned into $b$ equal parts; understand a fraction $a / b$ as the quantity formed by $a$ parts of size $1 / b$.
2. Understand a fraction as a number on the number line; represent fractions on a number line diagram.
a. Represent a fraction $1 / b$ on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into $b$ equal parts. Recognize that each part has size $1 / b$ and that the endpoint of the part based at 0 locates the number $1 / b$ on the number line.
b. Represent a fraction $a / b$ on a number line diagram by marking off a lengths $1 / b$ from 0 . Recognize that the resulting interval has size $a / b$ and that its endpoint locates the number $a / b$ on the number line.

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## Readiness

Skills Update: Fractions: Part of a Whole—p. 8

## Instruction

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*12-1C Fractions on a Number Line-Online
12-4 Compare Fractions-pp. 392-393
12-5 Order Fractions-pp. 394-395

## Instruction

*12-1B Unit Fractions on a Number Line-Online
12-4 Compare Fractions-pp. 392-393

## Instruction

*12-1C Fractions on a Number Line-Online
12-4 Compare Fractions-pp. 392-393
Application
12-11 Problem Solving Strategy: Use a Drawing/Model—pp. 406-407
*Online at progressinmathematics.com.

## Develop understanding of fractions as numbers.

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Common Core State Standards for Mathematics
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3. Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.
a. Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.
b. Recognize and generate simple equivalent fractions, e.g., $1 / 2=2 / 4,4 / 6=2 / 3$ ). Explain why the fractions are equivalent, e.g., by using a visual fraction model.

> c. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. Examples: Express 3 in the form $3=3 / 1$; recognize that $6 / 1=6$; locate $4 / 4$ and 1 at the same point of a number line diagram.
d. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols $>,=$, or $<$, and justify the conclusions, e.g., by using a visual fraction model.

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## Instruction

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*12-2A Model Equivalent Fractions-Online

## Instruction

12-2 Equivalent Fractions-pp. 388-389
*12-2A Model Equivalent Fractions-Online

## Application

12-11 Problem Solving Strategy: Use a Drawing/Model—p. 407

## Instruction

*12-2A Model Equivalent Fractions-Online

## Instruction

12-2 Equivalent Fractions-pp. 388-389
*12-3A Compare Like Fractions Using Models-Online
12-4 Compare Fractions-pp. 392-393
*12-4A Compare Unlike Fractions Using Fraction Strips-Online
*12-4B Fraction Sense-Online
12-5 Order Fractions—pp. 394-395

## Measurement and Data

Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.

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Common Core State Standards for Mathematics
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1. Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.
2. Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (I). Add, subtract, multiply, or divide to solve one-

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## Readiness

Skills Update: Hour, Half Hour-p. 14

## Instruction

8-15 Minutes—pp. 288-289
8-16 Elapsed Time-pp. 290-291
*8-16A Time on a Number Line-Online

## Teacher's Edition

Strategic Intervention: 5-6. Understand how to tell time to the hour and half hour on an analog clock-TE p. 259G

## Readiness

Skills Update: Cup, Pint, Quart-p. 12
Skills Update: Liter—p. 13
*Online at progressinmathematics.com.

Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.

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Common Core State Standards for Mathematics
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step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.

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## Instruction

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8-10 Gram, Kilogram—pp. 278-279
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8-11 Rename Units of Measure-pp. 280-281
8-19 Problem Solving Applications: Mixed Review—pp. 296-297
9-12 Volume-pp. 324-325
*9-12A Estimate and Measure Volume-Online
*9-12B Measurement Problems-Online

## Represent and interpret data.

## Common Core State Standards for Mathematics

3. Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs.
For example, draw a bar graph in which each square in the bar graph might represent 5 pets.
4. Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units-whole numbers, halves, or quarters.

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## Instruction

7-1 Pictographs—pp. 226-227
7-2 Bar Graphs—pp. 228-229
*7-2A Data and Two-Step Problems-Online
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7-8 Compare Data—pp. 240-241
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## Application

7-14 Problem Solving Applications: Mixed Review—pp. 252-253

## Instruction

7-5 Line Plots—pp. 234-235
8-1 Quarter Inch, Half Inch, Inch—pp. 260-261
*8-12A Collect and Represent Data-Online

## Geometric measurement: understand concepts of area and relate area to multiplication and to addition.

## Common Core State Standards for Mathematics

5. Recognize area as an attribute of plane figures and understand concepts of area measurement.
a. A square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and can be used to measure area.
b. A plane figure which can be covered without gaps or overlaps by $n$ unit squares is said to have an area of $n$ square units. $\qquad$
$\square$
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*Online at progressinmathematics.com.

Geometric measurement: understand concepts of area and relate area to multiplication and to addition.

## Common Core State Standards for Mathematics

6. Measure areas by counting unit squares (square cm , square m , square in, square ft , and improvised units).
7. Relate area to the operations of multiplication and addition.
a. Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.
b. Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.
c. Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths $a$ and $b$ $+c$ is the sum of $a \times b$ and $a \times c$. Use area models to represent the distributive property in mathematical reasoning.
d. Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the nonoverlapping parts, applying this technique to solve real world problems.

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## Instruction

9-11 Area-pp. 322-323
*9-11A Area of a Rectangle-Online

## Instruction

9-11 Area-pp. 322-323
*9-11A Area of a Rectangle—Online

## Instruction

*9-11A Area of a Rectangle-Online
*9-11B Area of Composite Shapes-Online

## Instruction

*9-11B Area of Composite Shapes-Online

## Instruction

*9-11B Area of Composite Shapes-Online
9-13 Problem Solving Strategy: Solve a Simpler Problem—pp. 326-327

Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.

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Common Core State StandardS for Mathematics
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8. Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.

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## Instruction

9-10 Perimeter-pp. 320-321
9-11 Area-pp. 322-323
*9-11A Area of a Rectangle-Online
*9-11B Area of Composite Shapes-Online
*9-11C Perimeter and Area-Online
*9-11D Missing Dimensions-Online

## Application

14-7 Problem Solving Strategy: Use More Than One Step—p. 453

## Teacher's Edition

Strategic Intervention: 5-6. Find the perimeter of a plane figure-TE p. 303G
Differentiated Instruction: At Risk: Perimeter-TE p. 303J
*Online at progressinmathematics.com.

## Geometry

## Reason with shapes and their attributes.

## Common Core State Standards for Mathematics

1. Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.
2. Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole.

For example, partition a shape into 4 parts with equal area, and describe the area of each part as $1 / 4$ of the area of the shape.

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## Instruction

9-3 Polygons and Circles-pp. 308-309
9-4 Triangles-pp. 310-311
*9-4A Quadrilaterals-Online
9-14 Problem Solving Applications: Mixed Review—pp. 328-329

## Teacher's Edition

Strategic Intervention: 1. Recognize, name, and count the number of sides and vertices for a given plane figure-TE $p$. 303F

## Readiness

Skills Update: Fractions: Part of a Whole—p. 8
9-7 Symmetry—p. 316

## Instruction

12-1 Fractions—pp. 386-387
*12-1A Use Fractions-Online

