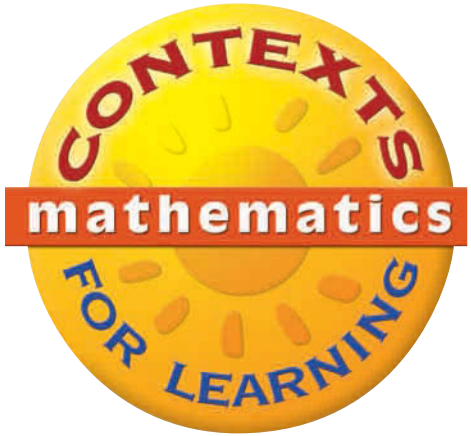
Crosswalk Between

Common Core State Standards for Mathematics

and

Contexts for Learning Mathematics

by Catherine Twomey Fosnot and Colleagues
from Mathematics in the City and the Freudenthal Institute



Investigating Number Sense, Addition, and Subtraction • GRADES K–3

Investigating Multiplication and Division • GRADES 3–5

Investigating Fractions, Decimals, and Percents • GRADES 4–6

firsthand
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About the *Contexts for Learning Mathematics* Series

The new ***Contexts for Learning Mathematics*** series by **Catherine Fosnot** and her colleagues from Mathematics in the City and the Freudenthal Institute uses carefully crafted math situations to foster a deep conceptual understanding of essential mathematical ideas, strategies, and models. The series' 18 classroom-tested units are organized into 3 age-appropriate packages and are supported by resource guides, read-aloud books and posters, an overview book, and a resources CD-ROM.

Investigating Number Sense, Addition, and Subtraction (Grades K–3) supports the development of such fundamental topics as place value, compensation and equivalence, addition and subtraction on the open number line, and the efficient use of 5- and 10-structures.

Investigating Multiplication and Division (Grades 3–5) explores with increasing sophistication big ideas in multiplication and division, including systematic factoring and the distributive, associative, and commutative properties and their use in computation.

Investigating Fractions, Decimals, and Percents (Grades 4–6) examines fundamental topics such as equivalence of fractions, operations with fractions, proportional reasoning, rates, and the ordering of decimals.

Contexts for Learning Mathematics: Individual Titles

Because some teachers may want to mix and match units to fit the needs of their students, all of the unit books are available for purchase individually. The yearlong resource guides can also be purchased individually. To learn more about contents of individual titles, go to **ContextsForLearning.com.**

Resource Guides

Each resource guide is progressively structured, moving from fundamental strategies to more sophisticated operations. Together, these minilessons provide strings of related problems that develop students' deep number sense and expand their repertoire of strategies for mental arithmetic.

Unit Books

Unit books comprise a 2-week sequence of investigations, games, and minilessons that foster a deep conceptual understanding of essential mathematical ideas, strategies, and models. The context-setting texts, images, and teaching tools are provided in a reproducible format in the appendix of each book.

See page 21 for ordering information.

Kindergarten

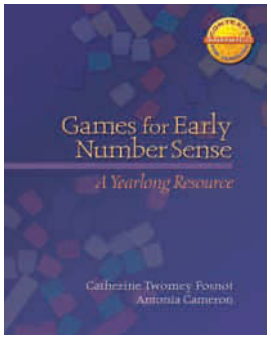
Common Core State Standards for Mathematics	*Contexts for Learning Mathematics*
Counting and Cardinality	

Count to tell the number of objects.

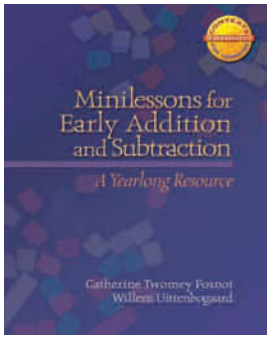
Understand the relationship between numbers and quantities; connect counting to cardinality.

- When counting objects, says the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.
- Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.
- Understand that each successive number name refers to a quantity that is one larger.

Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1–20, count out that many objects.



Games for Early Number Sense: A Yearlong Resource



Minilessons for Early Addition and Subtraction: A Yearlong Resource

Resource units of games and brief minilessons can be used throughout the year as an integral part of math workshop and for differentiation as needed.

Compare numbers.

Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies.

Compare two numbers between 1 and 10 presented as written numerals.

Kindergarten

Common Core State Standards for Mathematics	*Contexts for Learning Mathematics*

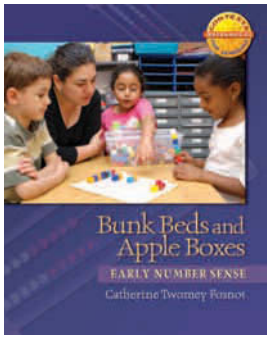
Operations & Algebraic Thinking

Understand addition as putting together and adding to, and subtraction as taking apart and taking from.

Decompose numbers less than or equal to 10 into pairs in more than one way, e.g. by using objects or drawings, and recording each decomposition by a drawing or equation (e.g. 5 = 2 + 3 and 5 = 4 + 1).

For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.

Fluently add and subtract within 5.

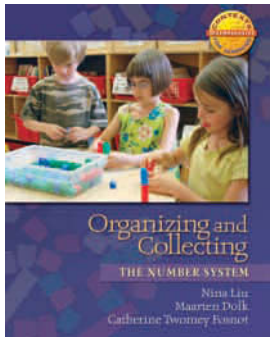


Bunk Beds and Apple Boxes: Early Number Sense

Number and Operations in Base Ten

Work with numbers 11–19 to gain foundations for place value.

Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g. by using objects or drawings, and record each composition or decomposition by a drawing or equation (such as 18 = 10 + 8); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.



Organizing and Collecting: The Number System

Grade 1

Common Core State Standards for Mathematics	*Contexts for Learning Mathematics*
Operations and Algebraic Thinking	

Represent and solve problems involving addition and subtraction.

Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

Understand and apply properties of operations and the relationship between addition and subtraction.

Apply properties of operations as strategies to add and subtract. *Examples:* If 8 + 3 = 11 is known, then 3 + 8 = 11 is also known. (Commutative property of addition.) To add 2 + 6 + 4, the second two numbers can be added to make a ten, so 2 + 6 + 4 = 2 + 10 = 12. (Associative property of addition.)

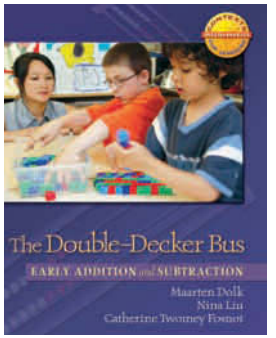
Understand subtraction as an unknown-addend problem. *For example,* subtract 10 – 8 by finding the number that makes 10 when added to 8.

Add and subtract within 20.

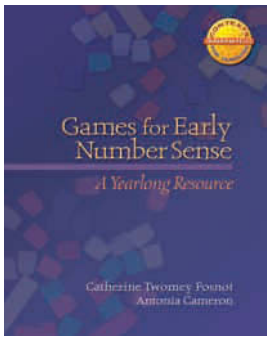
Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14); decomposing a number leading to a ten (e.g., 13 – 4 = 13 – 3 – 1 = 10 – 1 = 9); using the relationship between addition and subtraction (e.g., knowing that 8 + 4 = 12, one knows 12 – 8 = 4); and creating equivalent but easier or known sums (e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13).

Work with addition and subtraction equations.

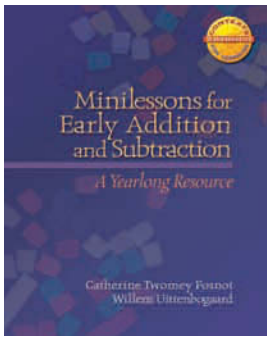
Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. For example, which of the following equations are true and which are false? 6 = 6, 7 = 8 – 1, 5 + 2 = 2 + 5, 4 + 1 = 5 + 2.



The Double-Decker Bus: Early Addition and Subtraction



Games for Early Number Sense: A Yearlong Resource



Minilessons for Early Addition and Subtraction: A Yearlong Resource

Resource units of games and brief minilessons can be used throughout the year as an integral part of math workshop and for differentiation as needed.

Grade 1

Common Core State Standards for Mathematics	*Contexts for Learning Mathematics*
Number and Operations in Base Ten	

Extend the counting sequence.

Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.

Understand place value.

Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases:

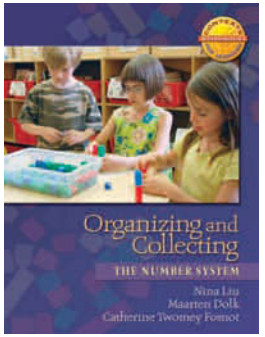
- 10 can be thought of as a bundle of ten ones—called a "ten."
- The numbers from 11-19 are composed of a ten and a one, two, three, four, five, six, seven, eight, or nine ones.
- The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).

Use place value understanding and properties of operations to add and subtract.

Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.

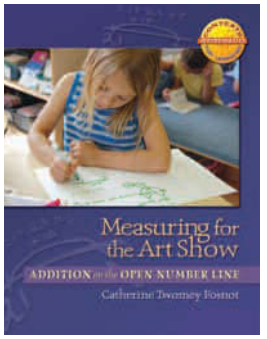
Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.

Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.



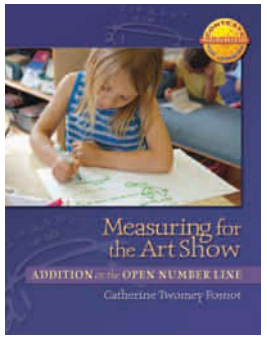
Organizing and Collecting: The Number System

Note: Can be used in K and repeated in 1 because the inventory this time is of a new classroom and the numbers provided of objects can be larger and differentiated to support development of individual learners.



Measuring for the Art Show: Addition on the Open Number Line

Grade 1

Common Core State Standards for Mathematics	*Contexts for Learning Mathematics*
Measurement and Data	
Measure lengths indirectly and by iterating length units. Order three objects by length; compare the lengths of two objects indirectly by using a third object. Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps.	 *Measuring for the Art Show: Addition on the Open Number Line*

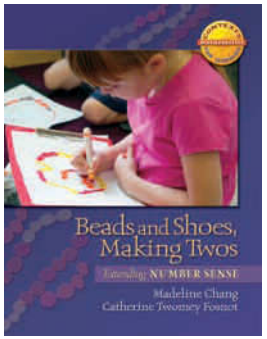
Grade 2

Common Core State Standards for Mathematics	*Contexts for Learning Mathematics*

Operations and Algebraic Thinking

Work with equal groups of objects to gain foundations for multiplication.

Determine whether a group of objects (up to 20) has an odd or even number of members, e.g. by pairing objects or counting by twos; write an equation to express an even number as the sum of two equal addends.



Beads and Shoes, Making Twos: Extending Number Sense

Number and Operations in Base Ten

Use place value understanding and properties of operations to add and subtract.

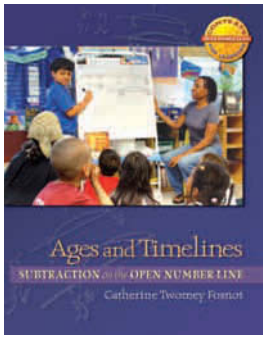
Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.

Add up to four two-digit numbers using strategies based on place value and properties of operations.

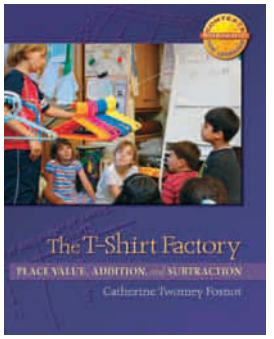
Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.

Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900.

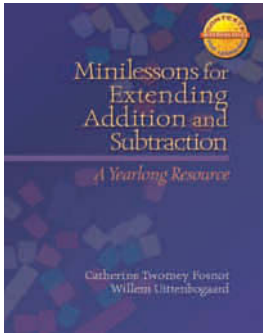
Explain why addition and subtraction strategies work, using place value and the properties of operations.



Ages and Timelines: Subtraction on the Open Number Line

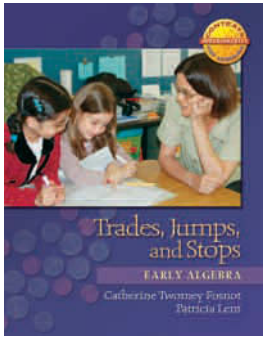


The T-Shirt Factory: Place Value Addition, and Subtraction



Minilessons for Extending Addition and Subtraction: A Yearlong Resource

Grade 2

Common Core State Standards for Mathematics	*Contexts for Learning Mathematics*
Measurement and Data	
Work with time and money. Solve word problems involving dollar bills, quarters, dimes, nickels and pennies, using $ and ¢ symbols appropriately. Example: If you have 2 dimes and 3 pennies, how many cents do you have?	 *Trades, Jumps, and Stops: Early Algebra*

Grade 3

Common Core State Standards for Mathematics	*Contexts for Learning Mathematics*
Operations and Algebraic Thinking	

Represent and solve problems involving multiplication and division.

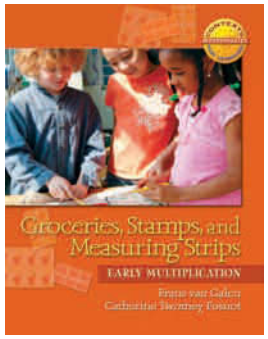
Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as 5 × 7.

Understand properties of multiplication and the relationship between multiplication and division.

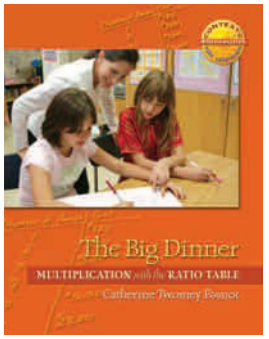
Apply properties of operations as strategies to multiply and divide. *Examples:* If 6 × 4 = 24 is known, then 4 × 6 = 24 is also known. (Commutative property of multiplication.) 3 × 5 × 2 can be found by 3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2 = 10, then 3 × 10 = 30. (Associative property of multiplication.) Knowing that 8 × 5 = 40 and 8 × 2 = 16, one can find 8 × 7 as 8 × (5 + 2) = (8 × 5) + (8 × 2) = 40 + 16 = 56. (Distributive property.)

Multiply and divide within 100.

Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations.

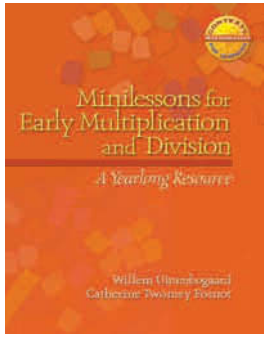


Groceries, Stamps, and Measuring Strips : Early Multiplication



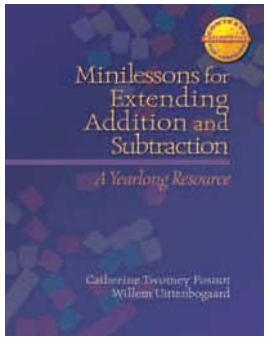
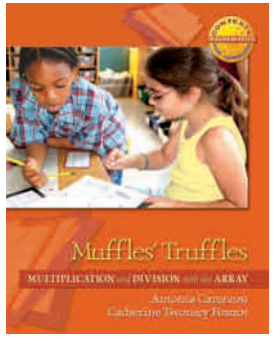
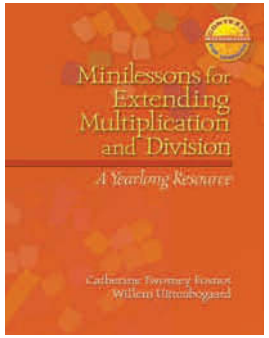
The Big Dinner: Multiplication with the Ratio Table

Follow with *Minilessons for Early Multiplication and Division* and use throughout the year.



Minilessons for Early Multiplication and Division: A Yearlong Resource

Grade 3

Common Core State Standards for Mathematics	*Contexts for Learning Mathematics*
Number and Operations in Base Ten	
Use place value understanding and properties of operations to perform multi-digit arithmetic. 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. Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., $9 \times 80, 5 \times 60$) using strategies based on place value and properties of operations.	 *Minilessons for Extending Addition and Subtraction: A Yearlong Resource*  *Muffles' Truffles: Multiplication and Division with the Array* Follow with *Minilessons for Extending Multiplication and Division* and use throughout the year.  *Minilessons for Extending Multiplication and Division: A Yearlong Resource*

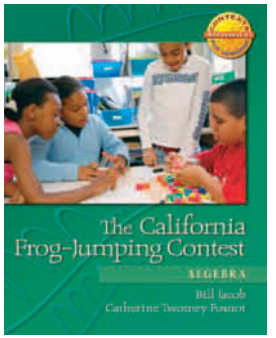
Grade 4

Common Core State Standards for Mathematics	*Contexts for Learning Mathematics*

Operations and Algebraic Thinking

Use the four operations with whole numbers to solve problems.

Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. 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.



The California Frog-Jumping Contest: Algebra

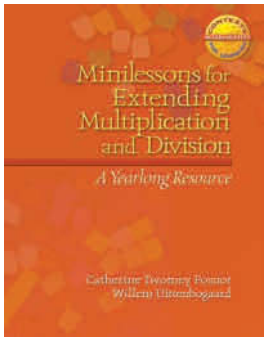
Gain familiarity with factors and multiples.

Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.

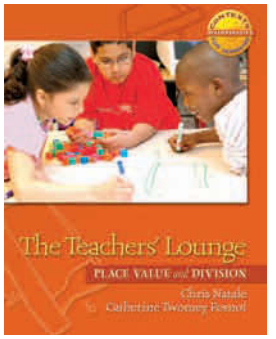
Number and Operations in Base Ten

Generalize place value understanding for multi-digit whole numbers.

Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division.



Minilessons for Extending Multiplication and Division: A Yearlong Resource



The Teachers' Lounge: Place Value and Division

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

Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

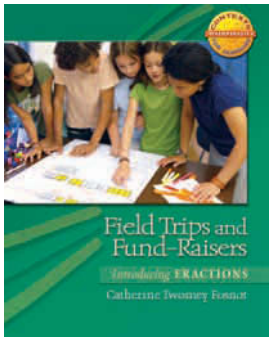
Grade 4

Common Core State Standards for Mathematics	*Contexts for Learning Mathematics*
Number and Operations — Fractions	

Extend understanding of fraction equivalence and ordering.

Explain why a fraction a/b is equivalent to a fraction (n × a)/(n × b) by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.

Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.



Field Trips and Fund-Raisers: Introducing Fractions

Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.

Understand a fraction ***a/b*** with ***a*** > 1 as a sum of fractions 1/***b***.

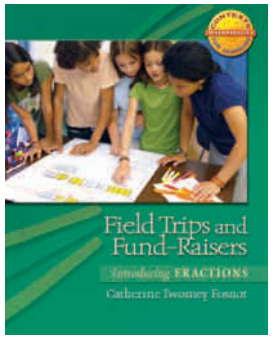
- Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
- Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. *Examples:* 3/8 = 1/8 + 1/8 + 1/8 ; 3/8 = 1/8 + 2/8 ; 2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8.
- Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.
- Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.

Grade 4

Common Core State Standards for Mathematics	*Contexts for Learning Mathematics*
Number and Operations — Fractions, con't.	

Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.

- Understand a fraction ***a/b*** as a multiple of 1/***b***. *For example,* use a visual fraction model to represent 5/4 as the product 5 × (1/4), recording the conclusion by the equation 5/4 = 5 × (1/4).
- Understand a multiple of ***a/b*** as a multiple of 1/***b***, and use this understanding to multiply a fraction by a whole number. *For example*, use a visual fraction model to express 3 × (2/5) as 6 × (1/5), recognizing this product as 6/5. (In general, n × (a/b) = (n × a)/b.)
- Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. *For example,* if each person at a party will eat 3/8 of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?



Field Trips and Fund-Raisers: Introducing Fractions

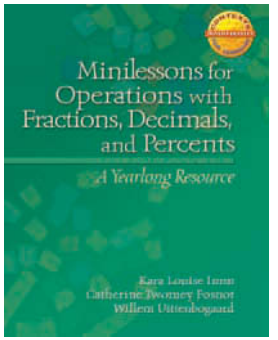
Follow with coin fractions in *Minilessons for Operations with Fractions, Decimals, and Percents,* pgs. 13–22.

Understand decimal notation for fractions, and compare decimal fractions.

Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. For example, express 3/10 as 30/100, and add 3/10 + 4/100 = 34/100.

Use decimal notation for fractions with denominators 10 or 100. For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.

Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model.



Minilessons for Operations with Fractions, Decimals, and Percents: A Yearlong Resource

Grade 5

Common Core State Standards for Mathematics	*Contexts for Learning Mathematics*
Number and Operations in Base Ten	

Understand the place value system.

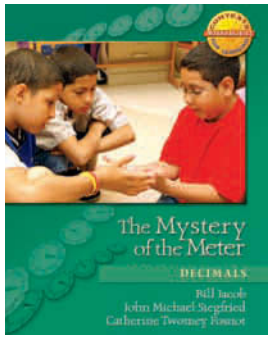
Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.

Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.

Read, write, and compare decimals to thousandths.

- Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (1/10) + 9 \times (1/100) + 2 \times (1/1000)$.
- Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.

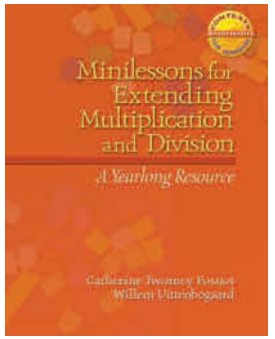
Use place value understanding to round decimals to any place.



The Mystery of the Meter: Decimals

Perform operations with multi-digit whole numbers and with decimals to hundredths.

Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.



Minilessons for Extending Multiplication and Division: A Yearlong Resource

Continue with this as needed throughout the year and with small groups to get multiplication and division fluent, including the standard algorithms.

Grade 5

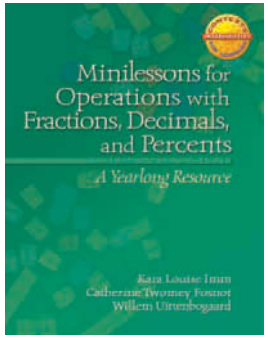
Common Core State Standards for Mathematics	*Contexts for Learning Mathematics*

Number and Operations — Fractions

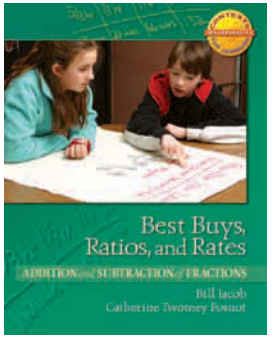
Use equivalent fractions as a strategy to add and subtract fractions.

Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. *For example*, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.)

Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. *For example*, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.



Minilessons for Operations with Fractions, Decimals, and Percents: A Yearlong Resource



Best Buys, Ratios, and Rates: Addition and Subtraction of Fractions

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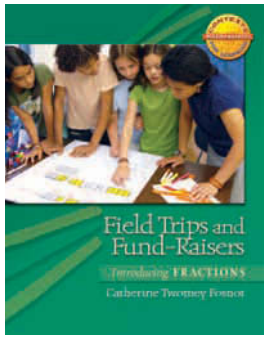
Apply and extend previous understandings of multiplication and division to multiply and divide fractions.

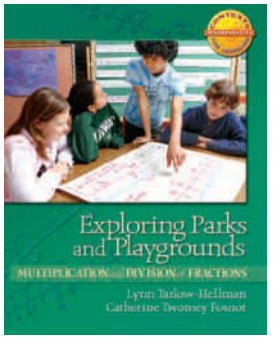
Interpret a fraction as division of the numerator by the denominator (***a/b*** = ***a*** ÷ ***b***). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers.

Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.

- Interpret the product (***a/b***) × ***q*** as a parts of a partition of ***q*** into ***b*** equal parts; equivalently, as the result of a sequence of operations ***a*** × ***q*** ÷ ***b***. *For example*, use a visual fraction model to show (2/3) × 4 = 8/3, and create a story context for this equation. Do the same with (2/3) × (4/5) = 8/15. (In general, (a/b) × (c/d) = ac/bd.)
- Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.



Field Trips and Fund-Raisers Introducing Fractions



Exploring Parks and Playgrounds: Multiplication and Division of Fractions

Grade 5

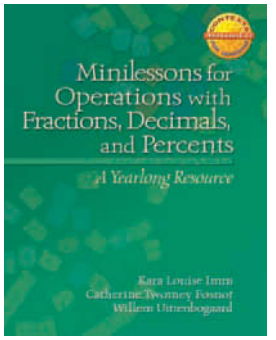
Common Core State Standards for Mathematics	*Contexts for Learning Mathematics*

Number and Operations — Fractions, con't.

Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.

Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.

- Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. *For example*, create a story context for (1/3) ÷ 4, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that (1/3) ÷ 4 = 1/12 because (1/12) × 4 = 1/3.
- Interpret division of a whole number by a unit fraction, and compute such quotients. *For example*, create a story context for 4 ÷ (1/5), and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that 4 ÷ (1/5) = 20 because 20 × (1/5) = 4.



Minilessons for Operations with Fractions, Decimals, and Percents: A Yearlong Resource

(from pg. 57 to end of book)

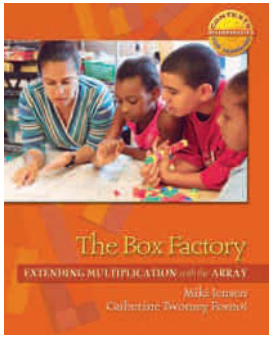
Measurement and Data

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

Recognize volume as an attribute of solid figures and understand concepts of volume measurement.

- A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume.
- A solid figure which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units.

Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.



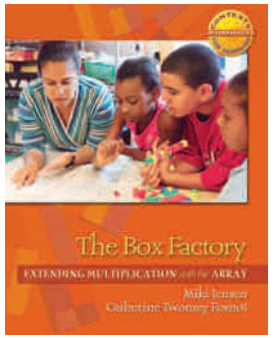
The Box Factory: Extending Multiplication with the Array

Grade 5

Common Core State Standards for Mathematics	*Contexts for Learning Mathematics*
Measurement and Data, con't.	

Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.

- Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.
- Apply the formulas $V = l \times w \times h$ and $V = b \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.
- Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.



The Box Factory: Extending Multiplication with the Array

Grade 6

Common Core State Standards for Mathematics	*Contexts for Learning Mathematics*
Ratios and Proportional Relationships	

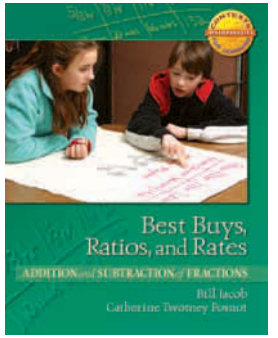
Understand ratio concepts and use ratio reasoning to solve problems.

Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. *For example*, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."

Understand the concept of a unit rate a/b associated with a ratio a:b with b ≠ 0, and use rate language in the context of a ratio relationship. *For example*, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."

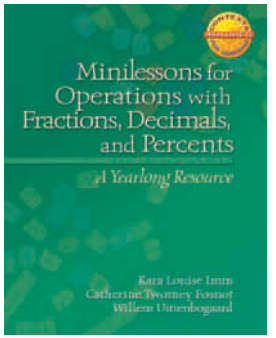
Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.

- Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.
- Solve unit rate problems including those involving unit pricing and constant speed. *For example* if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?
- Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.



Best Buys, Ratios, and Rates: Addition and Subtraction of Fractions

Follow with *Minilessons for Operations with Fractions, Decimals and Percents* to pg. 57.



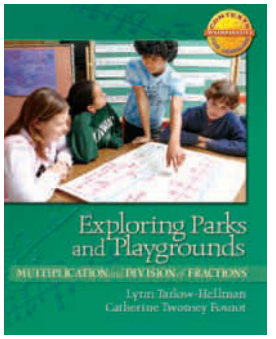
Minilessons for Operations with Fractions, Decimals, and Percents: A Yearlong Resource

Grade 6

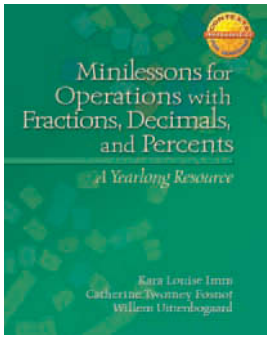
Common Core State Standards for Mathematics	*Contexts for Learning Mathematics*
The Number System	

Apply and extend previous understandings of multiplication and division to divide fractions by fractions.

Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. *For example*, create a story context for (2/3) ÷ (3/4) and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that (2/3) ÷ (3/4) = 8/9 because 3/4 of 8/9 is 2/3. (In general, (a/b) ÷ (c/d) = ad/bc.) How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 3/4-cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi?



Exploring Parks and Playgrounds: Multiplication and Division of Fractions



Minilessons for Operations with Fractions, Decimals, and Percents: A Yearlong Resource

(from pg. 57 to end of book)

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