

Teacher: Core Math Grade 4 Common Core Year: 2013-14
 Course: Math Grade 4 PA Core Month: All Months

S Number and Operations in Base Ten ~ Topic 1 Numeration

Essential Questions	Content	Skills	Assessments	Lessons	Reporting Category	Standards
How can numbers be expressed, ordered, and compared?	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.	1-1 Students will represent numbers with place value blocks and number lines. They will write numbers in standard form, expanded form, and word form. 1-2 Represent numbers in the millions using a place-value chart. Write numbers in expanded form, using periods to help write numbers in word form. 1-3 Apply knowledge of place value to compare and order numbers. 1-4 Show how to use place value to round whole numbers. 1-5 Use place-value charts to read, write and compare decimals in tenths, and hundredths using	End of September Addition Time Test 9/30/2013 Topic Pre-test 9/30/2014 Topic Test 9/30/2013		Number and Operations in Base Ten	
What strategies can we use to continue a sequence? How does the position of a digit in a number affect its value? How can place value properties aid computation?						

money.

1-6 Convert a collection of coins and bills into a total amount and make change.

1-7 Problem Solving: Make an Organized List.

2-1 Apply a variety of methods to add and subtract whole numbers mentally.

2-2 Round whole numbers to estimate sums and differences.

2-3 Identify what information in a problem is not needed or not present.

2-4 Add numbers to hundred thousands with and without regrouping.

CC-1 Place Value Relationships

CC-2 Solving Problems Involving Money

Topic 16: Measurement, Time and Temperature ~ This unit is intended to be presented later in the school year per the math series --however, due to the fact that our FOSS Science Series begins the year with measurement, and we have limited math lesson time prior to the state tests, it would make sense to cover this material in the fall. Any math computation that is beyond the skills of students could be completed via calculators, after the calculator tutorial lesson. Thus promoting quality calculator practice that is also necessary for the state test.

Essential Questions	Content	Skills	Assessments	Lessons	Reporting Category	Standards
16-1 How do you estimate and measure length?	16-1 Using Customary Units of Length	16-1 Students will estimate and measure length by choosing the most appropriate unit of length	Measurement 10/15/2014		Measurement and Data	
16-2 How do you measure capacity in customary units? What can you measure using a cup? A pint? A quart? A gallon?	16-2 Customary Units of Capacity 16-3 Units of Weight 16-4 Changing Customary Units 16-5 Using Metric Units of Length	16-2 Students will estimate fluently with customary capacity units (cups, pints, quarts, and gallons). They will compare the relative sizes of capacity measurements.				
16-3 How do you measure weight? What objects do you know or that might weigh about 1 ounce? 1 pound? 1 ton? Would an adult be measure in pounds or tons?	16-6 Metric Units of Capacity 16-7 Units of Mass 16-8 Changing Metric Units 16-9 Units of Time 16-10 Elapsed Time	16-3 Students will estimate fluently and measure with units of weight. 16-4 Students will be able to convert between customary units. 16-5 Students will estimate and measure length to the nearest centimeter, and choose the most appropriate metric unit for measuring length. 16-6 Students will estimate fluently with milliliters and liters. They will measure capacity				
16-4 How do you change customary units from one to another?						
16-5 How do you estimate and measure length? How can you select the right unit of measure?						
16-6 How do you measure capacity with metric units? Why wouldn't you use a milliliter eyedropper to measure the amount						

of water in a lake?
 16-7 What are the metric units of mass? How many grams are in one kilogram?
 16-8 How do you change metric units? How many millimeters are in 1 centimeter?
 16-9 How do you compare units of time? What does convert mean? Why do you need to convert units of time in order to add and subtract them?
 16-10 How can you find and use elapsed time?

using these metric units.
 16-7 Students will estimate and measure with units of mass - grams and kilograms.
 16-8 Students will be able to convert between metric units.
 16-9 Students will compare several different units of time and freely convert from one unit of time to another.
 16-10 Students will find the difference in time using a beginning and an end time. They will use elapsed time to find a beginning and an end time.

16-11 How can you solve problems involving changes in temperature?
 16-12 How can you solve a problem by working backward and using what you know?

16-11 Temperature CC-24 Solving Measurement Problems
 CC-25 Solving Measurement Problems using Line Plots
 16-12 Problem Solving: Working Backward

16-11 Students will measure temperature in degrees Fahrenheit or degrees Celsius.
 16-12 Students will solve problems that require finding the original times, measurements, or quantities that led to a result that is given.

	Essential Questions	Content	Skills	Assessments	Lessons	Reporting Category	Standards
t o b e r	3-1 How can multiplication be used when equal groups are combined?	3-1 Meanings of Multiplication	3-1 Recognize multiplication as repeated addition of equal groups used in arrays and comparisons.	Topic Tests 10/31/2014		Operations and Algebraic Thinking	CC.2.2.4.A.1- Operations and Algebraic Thinking ~
	3-2 What are the patterns for multiples of 2, 5, and 9?	3-2 Patterns for Facts 3-3 Multiplication Properties 3-4 3&4 as Factors 3-5 6, 7 & 8 as Factors	3-2 Students will use patterns to find products with factors of 2, 5, and 9.	Topic Pre-test 10/31/2014 End of October Subtraction Fact Time Test 10/31/2014		Number and Operations in Base Ten	Represent and solve problems involving the four operations. CC.2.2.4.A.2- Operations and Algebraic Thinking ~
	3-3 How can properties help you multiply?	3-6 10, 11 & 12 as Factors	3-3 Students will use multiplication properties to simplify computations.				Develop and/or apply number theory concepts to find factors and multiples. CC.2.2.4.A.4- Operations and Algebraic Thinking ~
	3-4 How can you break apart facts?	3-7 Problem Solving: Draw a Picture and Write an Equation	3-4 Use the Distributive Property to simplify multiplication problems by rewriting one of the factors as a sum of two numbers.				Generate and analyze patterns using one rule.
	3-5 Are there different ways to break apart a fact?	4-1 Meanings of Division	3-5 Use the Distributive Property and other regrouping properties to simplify multiplication involving 6s, 7s, and 8s by rewriting one of the factors.				
	3-6 What are the patterns for multiples of 10, 11, & 12?	4-2 Relating Multiplication and Division 4-3 Special Quotients 4-4 Using Multiplication Facts to Find Division Facts 4-5 Problem Solving: Draw a Picture and write an Equation	3-6 Use patterns as aids to mastery of facts and multiples of 10, 11, and 12. 3-7 Draw Pictures to				

solve multiplication situations and use their pictures to write number sentences.

- 4-1 Use and draw models to solve division problems.
- 4-2 Use arrays to write and complete multiplication and division fact families.
- 4-3 Use the multiplication facts with 0 and 1 to learn about special division rules with 0 and 1.
- 4-4 Identify multiplication facts related to division facts in order to solve division problems.
- 4-5 Draw pictures and write related number sentences to solve problems.

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Numbers and Operations - Multiplication & Variables

Essential Questions	Content	Skills	Assessments	Lessons	Reporting Category	Standards
5-1 What is the rule when you multiply by multiples of 10 and 100?	5-1 Multiplying by Multiples of 10 and 100. 5-2 Using Mental Math to Multiply	5-1 Use basic multiplication facts and number patterns to multiply by multiples of 10 and 100.	Topic Tests 11/30/2014 Topic Pre-test 11/30/2014		Number and Operations in Base Ten	
5-2 What are some ways to multiply	5-3 Using Rounding		Topic Pre-test 11/30/2014		Operations and Algebraic Thinking	

mentally?	to Estimate	5-2 Use compatible	Topic Pre-test
5-3 How can you use	5-4 Problem Solving:	numbers with	11/30/2014
rounding to estimate	Reasonableness	adjustment, breaking	
when you multiply?	5-5 Using an	apart, and other	
5-4 Are your	Expanded Algorithm	strategies to multiply	
solutions reasonable	5-6 Multiply 2 Digits	numbers mentally.	
mathematically?	by 1 Digit Numbers	5-3 Use compatible	
5-5 How can you	5-7 Multiplying 3	numbers and	
record	Digit by 1 Digit	rounding to estimate	
multiplication?	Numbers	solutions to	
5-6 What is a	5-8 Problem Solving:	multiplication	
common way to	Draw a Picture and	problems.	
record	Write an Equation	5-4 Check for	
multiplication?	6-1 Variables and	reasonableness by	
5-7 How do you	Expressions	making sure their	
multiply larger	6-2 Addition and	calculations answer the	
numbers?	Subtraction	questions asked and	
5-8 How can you	Expressions	by using estimation	
draw a picture to help	6-3 Multiplication	to make sure the	
you solve a math	and Division	calculation was	
problem?	Expressions	performed correctly.	
6-1 How can you use	6-4 Problem Solving:	5-5 Record	
expressions with	Use Objects and	multiplication using	
variables?	Reasoning	an expanded	
6-2 How can you		algorithm.	
find a rule with an		5-6 Multiply 2 digit-	
expression?		numbers by 1-digit	
6-3 How can you		numbers using paper	
find a rule and write		and pencil methods.	
an expression?			
6-4 How can you use			
objects and reasoning			
to problem solve?			

D Numbers and Operations in Base 10- Multiplying by 2 Digit Numbers

e	Essential Questions	Content	Skills	Assessments	Lessons	Reporting Category	Standards
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e m b e r	How can you multiply by multiples of 10 and 100? 7-2 What are some ways to estimate? 7-3 How can you multiply using an array? 7-4 How can you find the product? 7-5 What is a common way to record multiplication? 7-6 How do you multiply greater numbers? 7-7 How can you solve multiple step problems?	7-1 Using Mental Math to Multiply 2-Digit Numbers 7-2 Estimating Products CC-4 Using Compatible Numbers to Estimate 7-3 Arrays and an Expanded Algorithm CC-5 Arrays and using an Expanded Notation CC-6 Connecting the Expanded and Standard Algorithms 7-4 Multiplying 2-Digit by 2-Digit Numbers 7-5 Multiplying 2-Digit by 2-Digit Numbers 7-6 Special Cases 7-7 Problem Solving: Two-Question Problems	7-1 Discover and understand patterns used to multiply by 10 and 100. They use these patterns to solve problems involving multiples of 10 and 100. 7-2 Use rounding and compatible numbers to estimate solutions to multiplication problems. 7-3 Use arrays and expanded algorithms to multiply two-digit numbers by two-digit numbers to find the product. 7-4 Use grids and patterns to multiply 2-digit numbers and multiples of 10. 7-5 Use partial products to multiply two-digit numbers by two-digit numbers and find the products. 7-6 Learn to multiply greater numbers. 7-7 Solve two-question problems.	Topic Tests 12/23/2014 Topic Pre-Tests 12/23/2014 Mid-December Multiplication Time Test 12/23/2014	Operations and Algebraic Thinking	CC.2.2.4.A.1- Operations and Algebraic Thinking ~ Represent and solve problems involving the four operations.
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Dividing by 1 Digit Divisors

Essential Questions	Content	Skills	Assessments	Lessons	Reporting Category	Standards
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u	How can you use patterns to help you divide mentally?	Dividing by 1-Digit divisors	Students will use basic fact and patterns of zeros to solve division problems with 3-digit dividends and 1-digit divisors.	Topic Tests 1/31/2015	Operations and Algebraic Thinking Number and Operations in Base Ten
a	When and how do you estimate quotients to solve problems?	8-1 Using mental math to divide 8-2 Estimating Quotients 8-3 Dividing with remainders	Students will use compatible numbers and rounding to estimate quotients.	Topic Pre-Tests 1/31/2015	
r	What happens when some are left after you divide?	8-4 Connecting Models and Symbols	Students will use compatible numbers and rounding to estimate quotients.		
y	How can place value help you divide?	8-5 Dividing 2-Digit by 1-Digit numbers	Students will divide whole numbers by 1-digit divisors resulting in quotients with remainders.		
	What is a common way to record division?	8-6 Dividing 3-Digit by 1-Digit numbers 8-7 Deciding where to start dividing	Students will use place value to understand the algorithm of long division.		
	How can you divide numbers in the hundreds?	8-8 Factors 8-9 Prime and Composite Numbers	Students will use the standard algorithm to divide two-digit numbers by a one-digit number.		
	What do you do when there aren't enough hundreds to divide?	8-10 Problem Solving: Multiple-Step Problems	Students will use the standard algorithm to divide 3-digit numbers by 1-digit numbers.		
	How can you use multiplication to find all of the factors of a number?		Students will use the standard algorithm to divide 3-digit numbers by 1-digit numbers and properly decided		
	What is the difference between a number that has many factors and a number that only has two factors, one and itself?				

where to begin dividing.
 Students will learn how to factor whole numbers.
 Students will learn to identify prime and composite numbers.
 Students will identify the hidden question in a multistep problem. They use the answer to that hidden question to solve the original problem.

Topic 14: Area and Perimeter ~

This unit is slightly out of the recommended order due to the necessity of fitting it in before the testing window. It can be placed before or after adjacent units.

Essential Questions	Content	Skills	Assessments	Lessons	Reporting Category	Standards
14-1 How do you measure area? How does area differ from perimeter? 14-2 How can you find the area of a figure? 14-6 How can you find the distance around an object? 14-7 Can rectangles have the same perimeter but different areas? 14-9 Can you problem solve by	14-1 Understanding Area 14-2 Area of Squares and Rectangles 14-6 Perimeter 14-7 Same perimeter, different area 14-9 Solve a Simpler Problem and Make a Table	14-1 Students will measure the area of a figure by counting the number of square units that cover a region. 14-2 Students will find the area of rectangles by counting square units or by using a formula. 14-6 Students will find the perimeter of a polygon by adding the lengths of the				

making a simpler problem and/or making a table?

sides or by using the formula.

14-7 Students will compare different rectangles with the same perimeter to discover the change in area.

14-9 Students will break a problem into smaller, more manageable pieces and find a pattern to fit.

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Topic 9: Lines, Angles & Shapes AND
Topic 10: Understanding Fractions ~

In order to fit all topics in before state testing, these units may need to be done concurrently, but that is entirely feasible due to their differing nature, as well as the natural progression from division to fractions.

Essential Questions	Content	Skills	Assessments	Lessons	Reporting Category	Standards
What are some important geometric terms?	9-1 Points, Lines, and Planes	9-1 Students will identify and describe points, lines, and planes.	Topic Pre-tests 2/28/2015		Number and Operations - Fractions	CC.2.3.4.A.3-Geometry ~ Recognize symmetric shapes and draw lines of symmetry.
What geometric terms are used to describe parts of lines and types of angles?	9-2 Line Segments, Rays, and Angles	9-2 Students will learn geometric terms to describe parts of lines and types of angles.	Topic Tests 2/28/2015		Measurement and Data Geometry	
How do you measure and draw angles?	9-3 Measuring Angles	9-3 Students will be able to measure and draw angles.	End of February Division Fact Time			
How do you identify polygons?	9-4 Polygons	9-4 Students will learn to identify polygons.	Test 2/28/2015			
How can you classify triangles?	9-5 Triangles	9-5 Students will learn to identify and classify triangles.				
How can you classify quadrilaterals?	9-6 Quadrilaterals					
What are some of the characteristics of the	9-7 Make and Test Generalizations					
	10-1 Regions and Sets					
	10-2 Fractions and Division					
	10-3 Estimating Fractional Amounts					

shapes that you can compare?

How can you name and show parts of a region and parts of a set?

How can you share items?

How can you estimate parts?

Students will estimate fractional parts of regions and sets. They will estimate fractions for the points on the number line.

How can you find two fractions that name the same part of a whole?

How do you write a fraction in simplest form?

How can you name an amount in two different ways?

How can you compare fractions?

How can you order fractions?

What does a word problem ask you to explain?

10-4 Equivalent Fractions

10-5 Fractions in Simplest Form

Students will identify and write mixed numbers as improper fractions and

improper fractions as mixed numbers.

10-7 Comparing Fractions

10-8 Ordering Fractions

10-9 Writing to Explain - Fraction word problems

9-6 Students will learn to identify

quadrilaterals.

9-7 Students will solve problems by making and testing generalizations.

10-1 Students will identify and draw fractional parts of a region and a set, and divided sets to show fractional parts.

10-2 Students will describe and compare fractional parts of whole objects and sets.

10-4 Students will use models and objects to show equivalent fractions.

10-5 Students will express equivalent fractions in simplest form.

10-6 Improper Fractions and Mixed Numbers

10-7 Students will use benchmark fractions to compare fractions with unlike denominators.

10-8 Students will use common

denominators and equivalent fractions to order fractions with unlike denominators. 10-9 Students will write to explain whether an answer is correct or not.

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Topic 11: Adding and Subtracting Fractions & Topic 12: Understanding Decimals

Essential Questions	Content	Skills	Assessments	Lessons	Reporting Category	Standards
What does composing and decomposing fractions mean?	CC-15 Composing and Decomposing Fractions	Students will add and subtract fractions with like denominators using models and paper and pencil.	Topic Pre-tests 3/31/2015 Topic Tests 3/31/2015		Measurement and Data	
How can you add and subtract fractions with like denominators?	11-1 Adding and Subtracting Fractions with Like Denominators	Students will draw a picture and write an equation to solve a problem.			Number and Operations - Fractions	
What kind of picture would help you solve a fraction word problem?	11- 4 Draw a picture and write an equation	Students will use models and place-value charts to represent decimals to hundredths. They will read and write decimals in expanded, standard, and word form.				
What are some ways to represent decimals?	CC-16 Modeling Addition and Subtraction of Mixed Numbers	Students will use models and place-value charts to represent decimals to hundredths. They will read and write decimals in expanded, standard, and word form.				
How do you compare decimals?	CC-17 Adding Mixed Numbers	Students will use models and place-value charts to compare decimals to				
How can you write a fraction as a decimal and a decimal as a fraction?	CC-18 Subtracting Mixed Numbers	Students will use models and place-value charts to compare decimals to				
How can you locate points on a number line?	CC-19 Fractions as Multiples of Unit Fractions: Using Models	Students will use models and place-value charts to compare decimals to				
	CC-20 Multiplying a Fraction by a Whole Number: Using					

How can you locate mixed numbers and decimals on a number line? 12-5 Mixed Numbers and Decimals on the Number Line	Models CC-21 Multiplying a Fractions by a Whole Number: Using symbols 12-1 Decimal Place Value 12-2 Comparing and Ordering Decimals 12-3 Fractions and Decimals 12-4 Fractions and Decimals on the Number Line	the hundredths. They will use greater-than and less-than symbols to order decimal numbers. Students will understand how to write fractions as decimals and decimals as fractions. Students will learn to locate and name fractions and decimals on a number line. Students will understand how to graph decimals and mixed numbers on the number line.
How can you draw a number line picture and mark it to correctly show true distances?	CC-22 Equivalent Fractions & Decimals (to be taught after 12-4 & before 12-5) 12-6 Draw a Picture with a Number Line	Students will solve problems using the strategy Draw a Picture.

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Topic :17 Data and Graphs ~ This unit will need to be done before PSSA tests for the school year 2011-2012, but after the switch to the Common Core Standards, it will no longer be tested at the fourth grade level.

Essential Questions	Content	Skills	Assessments	Lessons	Reporting Category	Standards
17-1 How do you take a survey and record the results? 17-2 How can you read a bar graph?	17-1 Data from Surveys 17-2 Interpreting Graphs 17-3 Line Plots	17-1 Students will design and use a survey with a sample size that allows accurate predictions	Topic Pre-tests 4/30/2015 Topic Tests 4/30/2015		Statistics and Data Analysis	CC.2.4.4.A.2- Measurement and Data ~ Translate information from one type of data display to another.

17-3 How can you organize data using a line plot?	17-4 Ordered Pairs	to be made about a larger population.
17-4 How do you name a point located on a coordinate grid?	17-5 Line Graphs	17-2 Students will use bar graphs to display data.
17-5 How do you interpret line graphs?	17-6 Mean	17-3 Students will learn and understand how to draw line plots, interpret points, and recognize outliers.
What does the horizontal axis show?	17-7 Median, mode, and range.	17-4 Students will learn to locate points on a coordinate plane using ordered pairs.
What does the vertical axis show?	17-8 Stem-and-Leaf Plots	17-5 Students will use line graphs to see changes in data over time.
17-6 How can you find the mean?	17-9 Circle Graphs	17-6 Students will calculate the mean of a collections of values.
17-7 How do you find and use median, mode, and range?		17-7 Students will identify the mode, median, and range for numerical data sets.
17-8 How do you read stem-and-leaf plots?		17-8 Students will use stem-and-leaf plots to organize data by place value.
17-9 How do you read and interpret circle graphs?		17-9 Students will use circle graphs to show parts of a whole.
17-10 How can you create your own graph to represent data?		
17-10 Make a Graph		
17-10 Students will make and use graphs to display data and solve problems.		

May Topic 13: Operations with Decimals ~ These are common core standards aligned for 5th grade math.

Essential Questions	Content	Skills	Assessments	Lessons	Reporting Category	Standards
13-1 How can you round decimals?	13-1 Rounding Decimals	13-1 Students will round two-place decimal numbers to one place or the nearest whole number.	Topic Pre-tests 5/31/2015		Measurement and Data	
13-2 How do you estimate when you add and subtract decimals?	13-2 Estimating Sums and Differences Decimals		Topic Test 5/31/2015			
13-3 How do you add decimals using grids as visuals?	13-3 Modeling Addition and Subtraction of Decimals	13-2 Students will round decimal numbers to estimate sums and differences.				
13-4 How can you add or subtract decimals?	13-4 Adding and Subtracting Decimals	13-3 Students will add and subtract decimals in tenths and hundredths using models.				
13-5 How do you multiply whole numbers by decimals?		13-4 Students will estimate and compute the sum or difference of whole numbers and positive decimals to two places.				
13-6 How do you divide decimals by whole numbers?		13-5 Students will multiply a decimal number by a whole number.				
		13-6 Students will divide a decimal number by a whole number.				
		13-7 Students will try a solution, check the				

solution, and, if not correct, revise the solution, following the same method until the correct solution is determined via checking.

Topic 15: Solids ~ These are aligned to the 5th & 6th grade Common Core Standards.

Essential Questions	Content	Skills	Assessments	Lessons	Reporting Category	Standards
15-1 How can you describe and classify solids? 15-2 How can you use a two dimensional shape to represent a three-dimensional object?	15-1 Solids 15-2 Views of Solids: Nets	15-1 Students will learn to describe and classify solids. 15-2 Students will use a two-dimensional shape to represent a three-dimensional object.			Geometry	

Topic 19: Transformations, Congruence and Symmetry

Essential Questions	Content	Skills	Assessments	Lessons	Reporting Category	Standards
19-1, 19-2, 19-3 What is one way to move a figure? 19-4 When are figures congruent? 19-5 What is a line of symmetry? 19-6 What is rotational symmetry? 19-7 How can you	19-1 Translations 19-2 Reflections 19-3 Rotations 19-4 Congruent Figures 19-5 Line Symmetry 19-6 Rotational Symmetry 19-7 Problem Solving: Draw a Picture	19-1 Students will identify translations of plane figures. 19-2 Students will identify reflections of plane figures. 19-3 Students will identify rotations of plane figures. 19-4 Students will use transformations to see if two plane	Topic Pre-tests 5/31/2014 Topic Test 5/31/2014		Geometry	

solve a problem by
drawing a picture?

figures are
congruent.

19-5 Students will
determine if a plane
figure has line
symmetry and, if so,
how many lines of
symmetry it has.

19-6 Students will
identify rotational
symmetry and
determine an angle
measure to describe a
rotation.

19-7 Students will
determine when two
shapes are similar
and use pictures to
visualize symmetry.