Rock View Elementary School's Math Workshop for Parents

Grade k – 5

Math MP1 & MP2 10.15.13

It's not that I'm so smart, it's just that I stay with problems longer.

- Albert Einstein

Outcomes
By the end of this meeting participants will have:

Investigated and discussed the Stands of Mathematical Proficiency (UCARE)and how they fit into Math instruction.

Explored Grades k – 5 Curriculum 2.0 Math Measurement Topics and corresponding content areas for Marking Period 1 and Marking Period 2 Mathematical Proficiency Statements to determine the key concepts students will learn in Grades k – 5.

Referenced and defined key vocabulary words and concepts in Grades k – 5 within the first two Marking Periods.

Engaged in Grade – level activities that are aligned to MP1 & MP2 Math Curriculum and can be done at home to help build a greater understanding of concepts.

Agenda

- Strands and Standards
- Measurement Topics & Key Concepts
- Vocabulary
- At-home Activities

:

Building a Stronger Foundation

Curriculum 2.0 Framework for Mathematical Instruction

Mathematical Proficiency Statements

THE CCSS provide the opportunity to refocus the balance among procedure, conceptual understanding, and problem solving because they provide more time in building a stronger foundation in number.

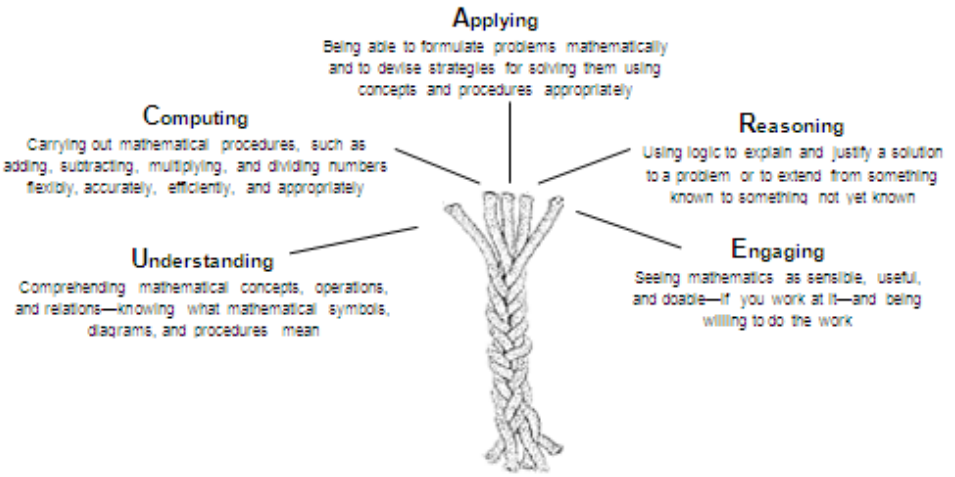
Mathematical Proficiency and Common Core State Standards Mathematical Practices

The goal of the Montgomery County Public Schools Pre-K—12 mathematics program is for all students to achieve mathematical proficiency by developing both conceptual understanding and procedural fluency. The end result is the ability to think and reason mathematically and use mathematics to solve problems in authentic contexts.

—Elementary Integrated Curriculum Pre-K—12 Mathematics Curriculum Framework (Original Approval: July 2001)

What is mathematical proficiency?

Strands of Mathematical Proficiency



What do mathematically proficient students do?

Common Core State Standards Mathematical Practices

Practices *Mathematically proficient students:*	Examples *Mathematically proficient students:*
Make sense of problems and persevere in solving them	Plan a solution pathway rather than simply jumping into a solution attempt
Reason abstractly and quantitatively	Attend to the meaning of quantities, not just how to compute them
Construct viable arguments and critique the reasoning of others	Justify their conclusions, communicate them to others, and respond to the arguments of others
Model with mathematics	Apply the mathematics they know to solve problems arising in everyday life
Use appropriate tools strategically	Consider the available tools when solving a mathematical problem, and make sound decisions about when each of these tools might be helpful
Attend to precision	Calculate accurately and efficiently; give carefully formulated explanations
Look for and make use of structure	Notice, for example, that 3 and 7 more is the same amount as 7 and 3 more or sort a collection of shapes according to how many sides the shapes have
Look for and express regularity in repeated reasoning	Look both for general methods and for shortcuts; evaluate the reasonableness of their intermediate results

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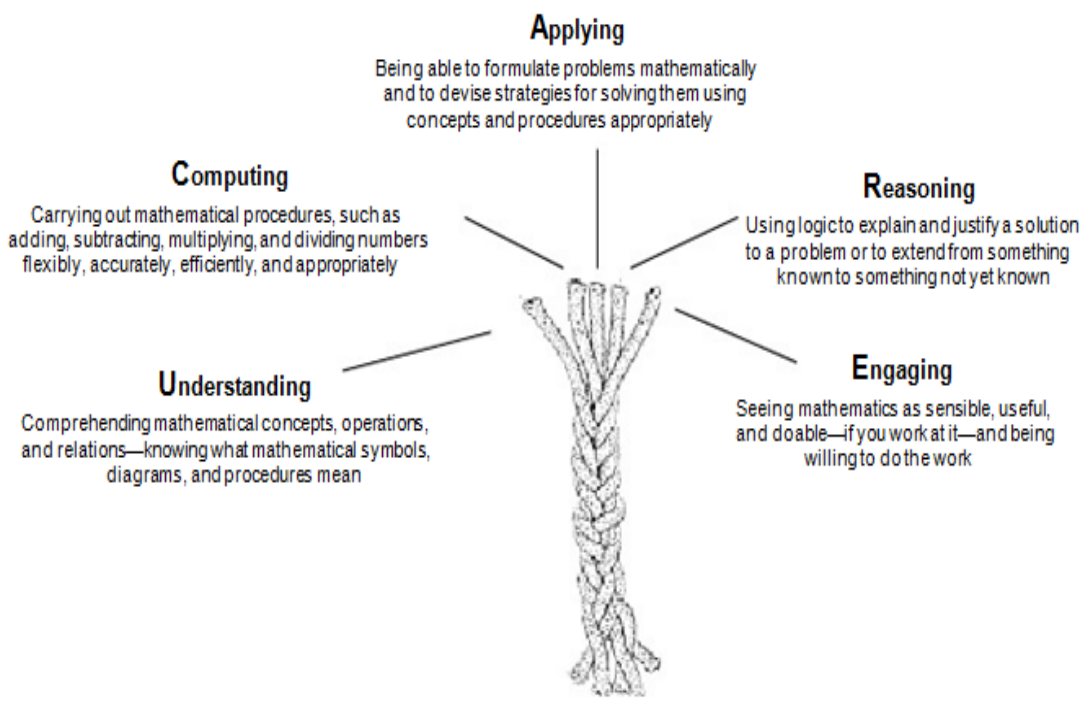
Strands of Mathematical Proficiency



Reasoning

Using logic to explain and justify a solution to a problem or to extend from something known to something not yet known

Engaging

Seeing mathematics as sensible, useful, and doable—if you work at it—and being willing to do the work

Practices

What do mathematically proficient students:

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Strands of Mathematical Proficiency

Applying

Common Core State Standards Mathematical Practices

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Kindergarten Math Summary

Measurement Topics

Measurement Topics are categories of content and processes in a subject. What a child needs to know and be able to do changes (gets more complex) at each grade level.

Counting and Cardinality
Geometry
Measurement and Data
Operations and Algebraic Thinking

"MEA SUREMENT TOPICS"

TÓPICOS DE MEDICIÓN son categorías relacionadas al contenido y procesos dentro de una materia. Lo que el estudiante necesita saber y debe poder hacer cambia (y es más complejo) en cada nivel de grado

Contar y Cardinalidad.
Geometri´a
Medicio´n y Datos
Operaciones y Razonamiento Algebraico

Marking Period 1

Primer Período de Calificaciones

Mathematics

- Math routines
- Directional and positional words
- Attributes: sorting, explaining the sorting rule
- Data collection: bar graphs, pictographs
- Repeating patterns
- Counting and numerals

Matemáticas

- Rutinas de matemáticas
- Palabras que denotan dirección y posición
- Atributos: clasificar, explicando la regla de clasificación
- Recolección de datos: gráficos de barra, pictogramas
- Patrones que se repiten
- Contar y los números

Marking Period 2

Segundo Período de Calificaciones

Mathematics

- Number concepts: counting up to 20 objects, writing numerals (0–20), counting to 100 by 1s and 10s
- Comparison of sets of objects: more, less/ fewer, or equal
- Representation of numbers to 10 in a variety of ways
- Ordinal numbers (first through fifth)

Matemáticas

- Conceptos numéricos: contando hasta 20 objetos, escribiendo números (0–20), contando hasta 100 de a 1 y de a 10
- Comparación de un conjunto de objetos: más, menos o igual
- Representación de números hasta 10 de diversas maneras
- Números ordinales (primero al quinto)

Grade 1 Math Summary

Measurement Topics

Measurement Topics are categories of content and processes in a subject. What a child needs to know and be able to do changes (gets more complex) at each grade level.

Measurement and Data

Numbers and Operations in Base Ten

Operations and Algebraic Thinking

"MEA SUREMENT TOPICS"

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Medicio'n y Datos de informacio'n

Nu'meros y Operaciones en el Sistema Decimal

Operaciones y Razonamiento Algebraico

Marking Period 1

Primer Período de Calificaciones

Mathematics

- Math routines
- Counting to 120, starting at any number less than 120
- Place Value: tens and ones
- Comparison: 2-digit numbers
- Ten more, ten less
- Part-whole concepts (1-digit numbers): decomposing
- Addition and subtraction situations for 1-digit numbers
- Categorical data: bar graphs, pictographs

Matemáticas

- Rutinas de matemáticas
- Contando hasta 120, comenzando con cualquier número menor de 120
- Valor Posicional: posición de los 10 y de los 1
- Comparación: números de 2 dígitos
- 10 más, 10 menos
- Conceptos de parte-entero (números de 1 dígito): descomposición de números
- Situaciones de suma y resta para números de 1 dígito
- Datos categóricos: gráficos de barra, pictogramas

Marking Period 2

Segundo Período de Calificaciones

Mathematics

- Place value and representation: decomposing and composing 2-digit numbers
- Meaning of equal sign
- Problem-solving strategies: 1- and 2-digit addition and subtraction
- Adding three numbers: sums to 20

Matemáticas

- Valor posicional y representación: descomponiendo y componiendo números de 2 dígitos
- Significado del signo igual
- Estrategias para solucionar problemas: suma y resta de 1 y 2 dígitos
- Sumando tres números: sumas hasta 20

Grade 2 Math Summary

Measurement Topics

Measurement Topics are categories of content and processes in a subject. What a child needs to know and be able to do changes (gets more complex) at each grade level.

Measurement and Data

Numbers and Operations in Base Ten

Operations and Algebraic Thinking

"MEA SUREMENT TOPICS"

TÓPICOS DE MEDICIÓN son categorías relacionadas al contenido y procesos dentro de una materia. Lo que el estudiante necesita saber y debe poder hacer cambia (y es más complejo) en cada nivel de grado

Medicio'n y Datos de informacio'n

Nu'meros y Operaciones en el Sistema Decimal

Operaciones y Razonamiento Algebraico

Marking Period 1

Primer Período de Calificaciones

Mathematics

- Addition and subtraction within 100 (concrete models, drawings, number lines, place value strategies, written methods)
- Money (coins and bills)
- Addition and subtraction situations involving money (within 100)
- Skip counting by 5s
- Odd and even (up to 20)
- Mental strategies (addition and subtraction within 20)

Matemáticas

- Rutinas de matemáticas
- Contar hasta 1,000
- Valor posicional (posiciones de los 100, 10 y 1)
- Números hasta 1,000
- Forma ampliada
- Comparación de números de 3 dígitos (<, >, =)
- Situaciones de suma y resta con un elemento desconocido en todas las posiciones (hasta 100)
- Datos categóricos (gráficos de barra, pictogramas)
- Estrategias mentales (sumas hasta 20)

Marking Period 2

Segundo Período de Calificaciones

Mathematics

- Math routines
- Counting within 1000
- Place value (hundreds, tens, and ones)
- Numerals to 1000
- Expanded form
- Comparison of 3-digit numbers (<, >, =)
- Addition and subtraction situations with unknown in all positions (within 100)
- Categorical data (bar graphs and picture graphs)
- Mental strategies (sums to 20)

Matemáticas

- Suma y resta hasta 100 (modelos concretos, dibujos, líneas de números, estrategias de valor posicional, métodos escritos)
- Dinero (monedas y billetes)
- Situaciones de suma y resta implicando dinero (hasta 100)
- Contar salteado de 5 en 5
- Pares e impares (hasta 20)
- Estrategias mentales (suma y resta hasta 20)

Grade 3 Math Summary

Measurement Topics

Measurement Topics are categories of content and processes in a subject. What a child needs to know and be able to do changes (gets more complex) at each grade level.

Measurement and Data

Numbers and Operations in Base Ten

Operations and Algebraic Thinking

"MEASUREMENT TOPICS"

TOPICOS DE MEDICION son categorias relacionadas al contenido y procesos dentro de una materia. Lo que el estudiante necesita saber y debe poder hacer cambia (y es más complejo) en cada nivel de grado

Medicio'n y Datos de informacio'n

Nu'meros y Operaciones en el Sistema Decimal

Operaciones y Razonamiento Algebraico

Marking Period 1

Primer Período de Calificaciones

Mathematics

- Addition and multiplication table patterns: properties of operations
- Rounding (within 1000): nearest 100, nearest 10
- Addition fluency within 1000 (composing a 10 and a 100): place value strategies, properties of operations
- Subtraction fluency within 1000 (decomposing a 10 and a 100): place value strategies, properties of operations
- Addition and subtraction word problems (2-step)
- Area of rectangles: tiling, relationship to multiplication and addition
- Multiplication (within 100): equal groups
- Division (within 100): equal shares
- Multiplication and division models and fluency (within 100): facts with 0, 1, 2, 5, 10
- Multiplication and division word problems (1-step): drawings and equations

Matemáticas

- Patrones de las tablas de suma y multiplicación: propiedades de operaciones
- Redondear (máximo de 1,000): más cercano a 100, más cercano a 10
- Fluidez para sumar dentro de 1,000 (componiendo un 10 y un 100): estrategias para valor de posición, propiedades de operaciones
- Fluidez para restar máximo de 1,000 (separar un 10 y un 100): estrategias para valor de posición, propiedades de operaciones
- Problemas escritos de suma y resta (2 pasos)
- Área de rectángulos: sobreposiciones, relación con multiplicación y suma
- Multiplicación (máximo de 100): grupos iguales
- División (máximo de 100): partes iguales
- Modelos de multiplicación y división y fluidez (máximo de 100): conceptos con 0, 1, 2, 5, 10
- Problemas escritos de multiplicación y división (1 paso): dibujos y ecuaciones

Marking Period 2

Segundo Período de Calificaciones

Mathematics

- Multiplication and division models and fluency (within 100): facts with 0 to 10
- Multiplication table patterns: properties of operations
- Multiplication and division word problems (1-step): drawings, equations
- Area: rectangles, rectilinear figures
- Distributive property of multiplication
- Equal groups of objects, arrays of objects
- 1-step word problems (all operations)
- Partition shapes: equal areas
- Unit fractions* (numerator of 1): equal parts of a whole
- Fractions: building fractions from unit fractions*

**Grade 3 limited to denominators of 2, 3, 4, 6, 8*

Matemáticas

- Modelos de multiplicación y división y fluidez (máximo de 100): operaciones de 0 a 10
- Patrones de tablas de multiplicación: propiedades de operaciones
- Problemas escritos de multiplicación y división (1 paso): dibujos, ecuaciones
- Área: rectángulos, figuras rectilíneas
- Propiedad distributiva de multiplicación
- Grupos iguales de objetos, matriz de objetos
- Problemas escritos de 1 paso (todas las operaciones)
- Formas de partición: áreas iguales
- Fracciones de unidad* (numerador de 1): partes iguales de un entero
- Fracciones: construyendo fracciones de unidades de fracciones*

**Grado 3 limitado a denominadores de 2, 3, 4, 6, 8*

Grade 4 Math Summary

El Resumen de Matemáticas Para el Grado 4

Marking Period 1

Primer Período de Calificaciones

Measurement Topics

Measurement Topics are categories of content and processes in a subject. What a child needs to know and be able to do changes (gets more complex) at each grade level.

Numbers and Operations in Base Ten

Operations and Algebraic Thinking

MATHEMATICS

Number and Operations in Base Ten (to 1 million)

- Read, write, compare, and round numbers
- Identify and apply relationships among places in the base ten system
- Fluently add and subtract, including standard algorithms.

Operations and Algebraic Thinking:

- Solve multistep word problems with four operations and assess reasonableness of solutions
- Distinguish multiplicative comparison from additive comparison.

Marking Period 2

Segundo Período de Calificaciones

Measurement Topics

Measurement Topics are categories of content and processes in a subject. What a child needs to know and be able to do changes (gets more complex) at each grade level.

Numbers and Operations in Base Ten

Measurement and Data

MATHEMATICS

Number and Operations in Base Ten:

- Use equations, rectangular arrays, area models, place-value strategies, and properties of operations to multiply and divide up to 4-digit by 1-digit numbers
- Solve multistep word problems with four operations, including problems in which remainders must be interpreted

Measurement and Data

- Develop and apply area and perimeter formulas for rectangles
- Convert larger measurement units to smaller units
- Solve multistep word problems with four operations involving intervals of time, masses of objects, and money.

Grade 5 Math Summary

El Resumen de Matemáticas Para el Grado 5

Marking Period 1

Primer Período de Calificaciones

Measurement Topics

Measurement Topics are categories of content and processes in a subject. What a child needs to know and be able to do changes (gets more complex) at each grade level.

Measurement and Data

Numbers and Operations in Base Ten

Operations and Algebraic Thinking

MATHEMATICS

Measurement and Data

- Develop and apply volume formulas for rectangular prisms.

Number and Operations in Base Ten

- Fluently multiply multi-digit whole numbers using the standard algorithm
- Use rectangular arrays, area models, equations, place value strategies, and properties of operations to divide a 2- or 3-digit number by a 2-digit multiple of 10
- Identify and apply patterns among places in the base ten system including decimals to thousandths
- Read, write, round, and compare decimals to thousandths
- Use concrete models, drawings, written methods, place value strategies, and properties of operations to add and subtract decimals to hundredths

Operations and Algebraic Thinking

- Write, interpret, and evaluate numerical expressions with grouping symbols.

Marking Period 2

Segundo Período de Calificaciones

Measurement Topics

Measurement Topics are categories of content and processes in a subject. What a child needs to know and be able to do changes (gets more complex) at each grade level.

Numbers and Operations in Base Ten

Numbers and Operations - Fractions

MATHEMATICS

Number and Operations in Base Ten

- Use rectangular arrays, area models, equations, place value strategies, and properties of operations to divide up to a 4-digit number by a 2-digit number

Number and Operations–Fractions

- Use equivalent fractions as a strategy to add and subtract fractions
- Solve word problems involving addition and subtraction of fractions
- Solve word problems involving multiplication of fractions and whole numbers with whole number products

Curriculum 2.0 Vocabulary

"Vocabulary words are the building blocks of the internal learning structure. Vocabulary is also the tool to better define a problem, seek more accurate solutions, etc."

— Ruby K. Payne, *Bridges Out of Poverty: Strategies for Professionals and Communities*

Kindergarten
Marking Periods 1 & 2 Vocabulary

Highlighted Words

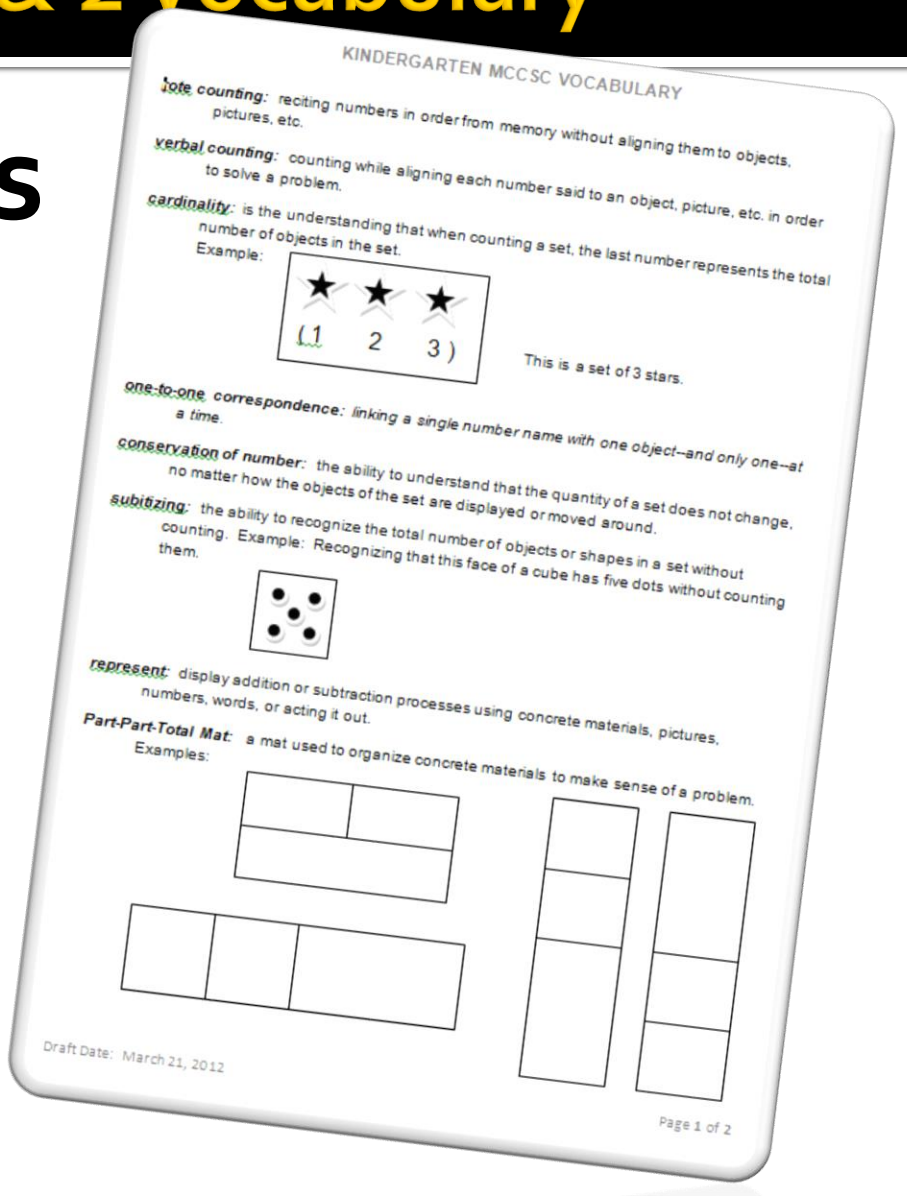
Rote counting

Verbal Counting

Cardinality

Part-part- whole

Comparing quantities



KINDERGARTEN MCCSC VOCABULARY

Rote counting: reciting numbers in order from memory without aligning them to objects, pictures, etc.

verbal counting: counting while aligning each number said to an object, picture, etc. in order to solve a problem.

cardinality: is the understanding that when counting a set, the last number represents the total number of objects in the set.
Example:

(1 2 3)

This is a set of 3 stars.

one-to-one correspondence: *linking a single number name with one object--and only one--at a time.*

conservation of number: the ability to understand that the quantity of a set does not change, no matter how the objects of the set are displayed or moved around.

subitizing: the ability to recognize the total number of objects or shapes in a set without counting. Example: Recognizing that this face of a cube has five dots without counting them.

represent: display addition or subtraction processes using concrete materials, pictures, numbers, words, or acting it out.

Part-Part-Total Mat: a mat used to organize concrete materials to make sense of a problem.
Examples:

Draft Date: March 21, 2012

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Grade 1

Marking Periods 1 & 2 Vocabulary

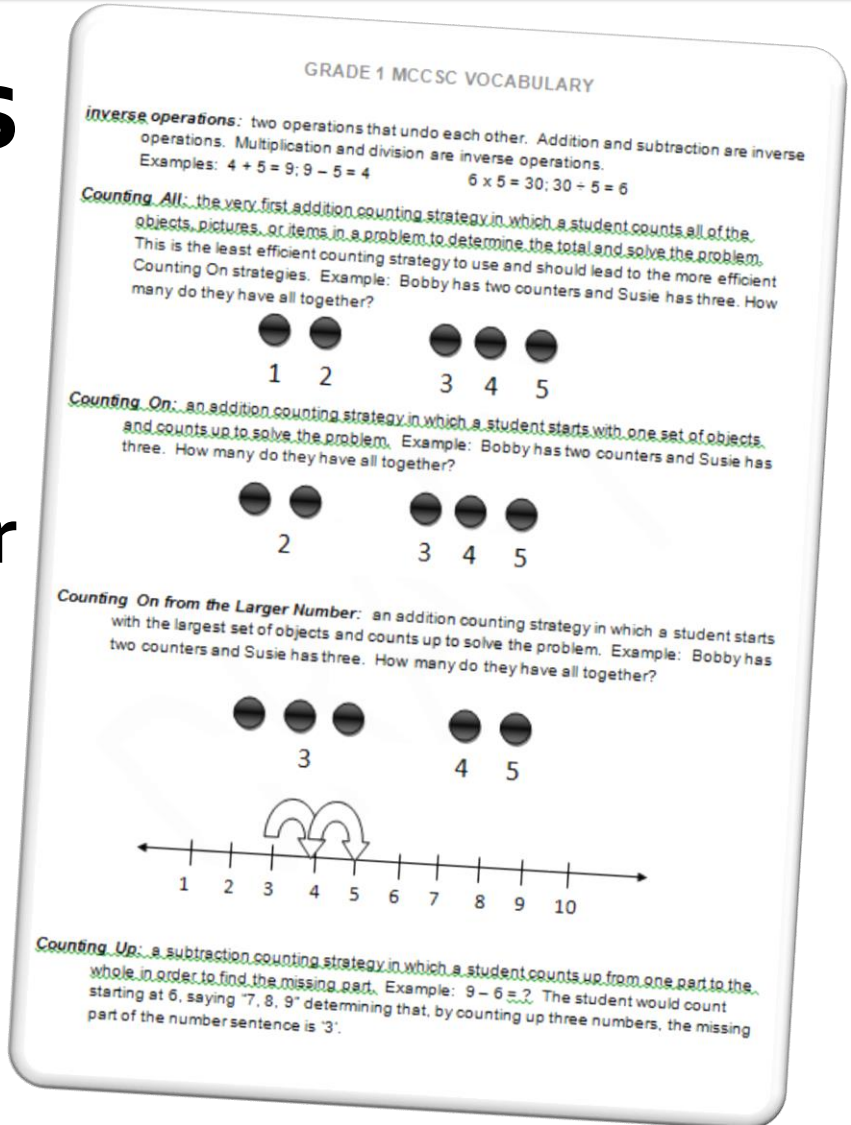
Highlighted Words

Counting on

Counting on from the larger number

Counting up

Counting back



GRADE 1 MCCSC VOCABULARY

inverse operations: two operations that undo each other. Addition and subtraction are inverse operations. Multiplication and division are inverse operations.
Examples: 4 + 5 = 9; 9 – 5 = 4 6 x 5 = 30; 30 ÷ 5 = 6

Counting All: the very first addition counting strategy in which a student counts all of the objects, pictures, or items in a problem to determine the total and solve the problem. This is the least efficient counting strategy to use and should lead to the more efficient Counting On strategies. Example: Bobby has two counters and Susie has three. How many do they have all together?

1 2 3 4 5

Counting On: an addition counting strategy in which a student starts with one set of objects and counts up to solve the problem. Example: Bobby has two counters and Susie has three. How many do they have all together?

2 3 4 5

Counting On from the Larger Number: an addition counting strategy in which a student starts with the largest set of objects and counts up to solve the problem. Example: Bobby has two counters and Susie has three. How many do they have all together?

3 4 5

1 2 3 4 5 6 7 8 9 10

Counting Up: a subtraction counting strategy in which a student counts up from one part to the whole in order to find the missing part. Example: 9 – 6 = ? The student would count starting at 6, saying "7, 8, 9" determining that, by counting up three numbers, the missing part of the number sentence is '3'.

Grade 2

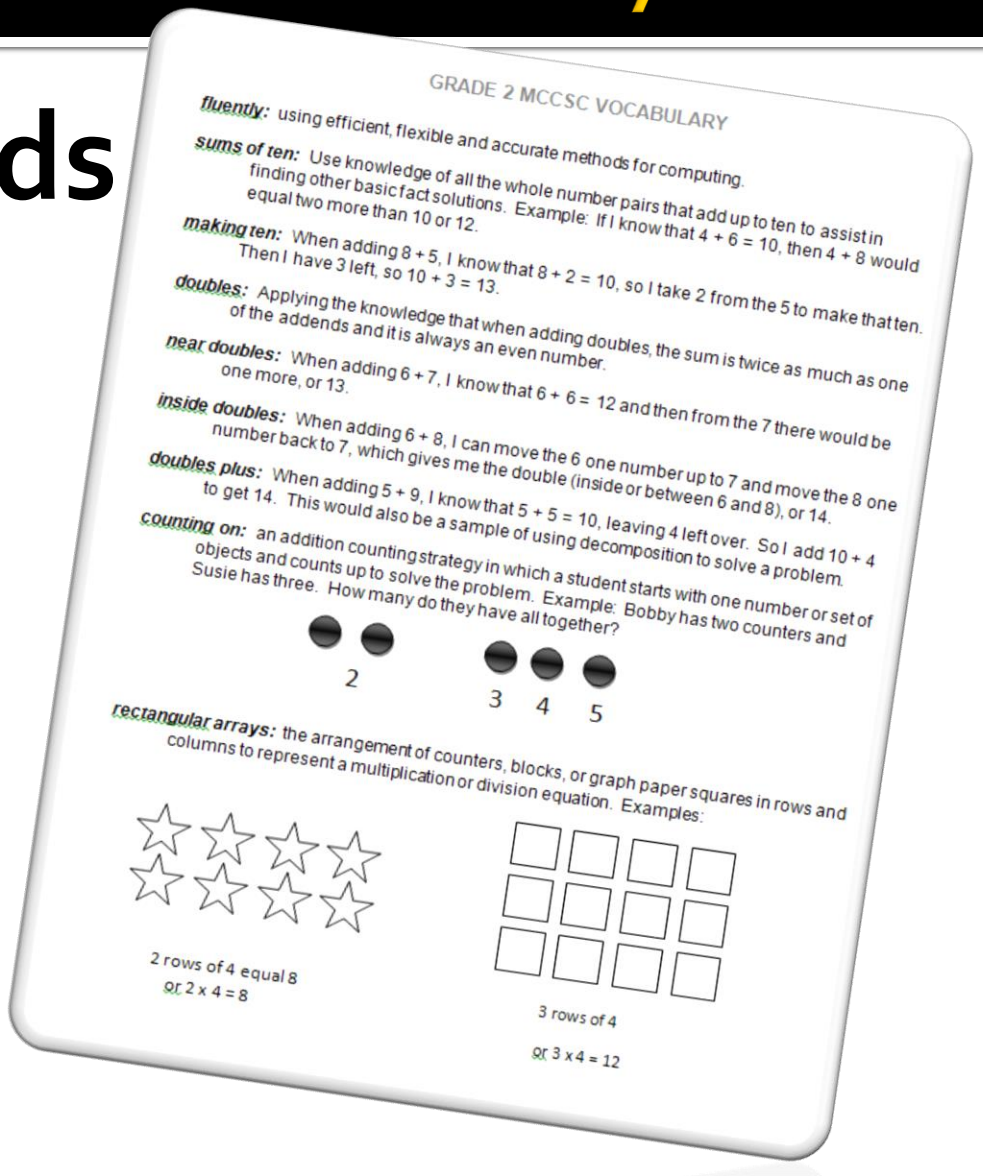
Marking Periods 1 & 2 Vocabulary

Highlighted Words

Fluently

Doubles

Graph (picture/bar)



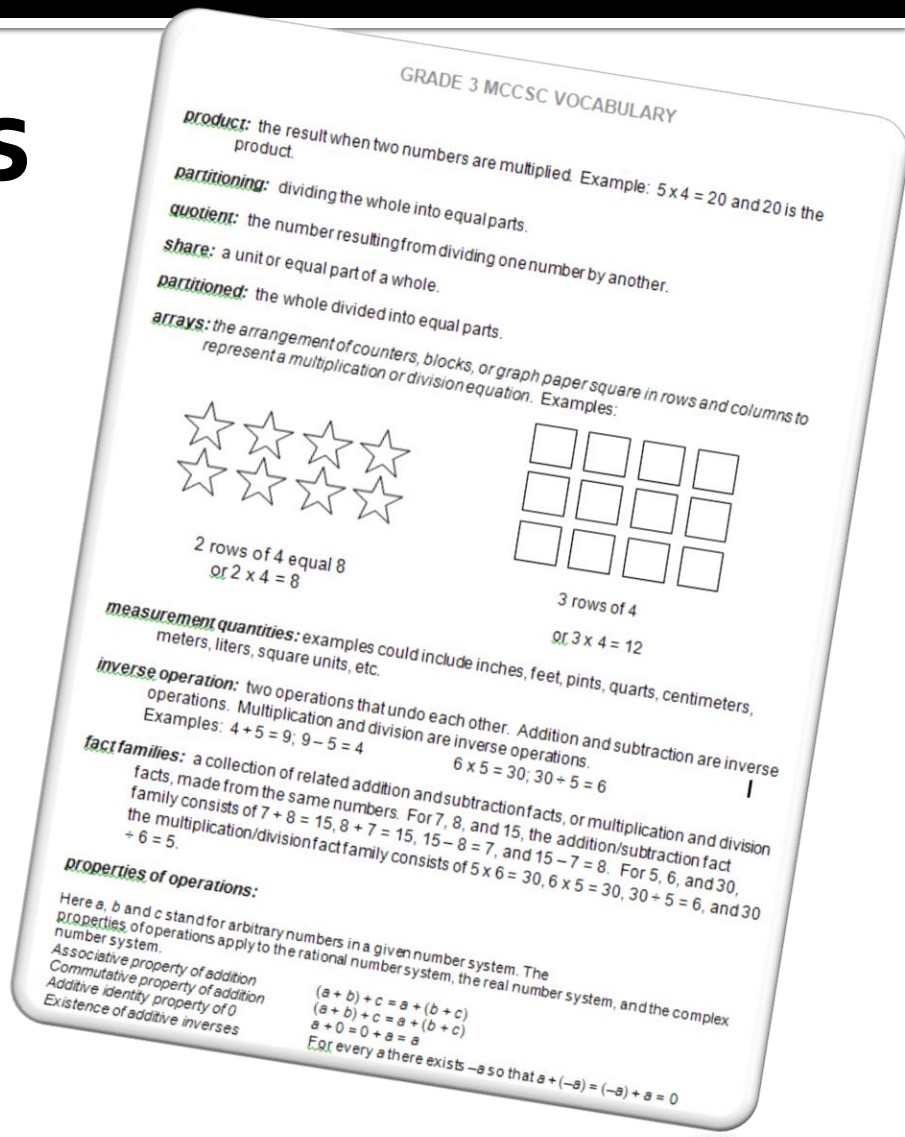
Grade 3
Marking Periods 1 & 2 Vocabulary

Highlighted Words

Inverse operations

Decomposing

Composing



GRADE 3 MCCSC VOCABULARY

product: the result when two numbers are multiplied. Example: 5 x 4 = 20 and 20 is the product.

partitioning: dividing the whole into equal parts.

quotient: the number resulting from dividing one number by another.

share: a unit or equal part of a whole.

partitioned: the whole divided into equal parts.

arrays: the arrangement of counters, blocks, or graph paper square in rows and columns to represent a multiplication or division equation. Examples:

2 rows of 4 equal 8
or 2 x 4 = 8

3 rows of 4
or 3 x 4 = 12

measurement quantities: examples could include inches, feet, pints, quarts, centimeters, meters, liters, square units, etc.

inverse operation: two operations that undo each other. Addition and subtraction are inverse operations. Multiplication and division are inverse operations.
Examples: 4 + 5 = 9; 9 – 5 = 4 6 x 5 = 30; 30 ÷ 5 = 6

fact families: a collection of related addition and subtraction facts, or multiplication and division facts, made from the same numbers. For 7, 8, and 15, the addition/subtraction fact family consists of 7 + 8 = 15, 8 + 7 = 15, 15 – 8 = 7, and 15 – 7 = 8. For 5, 6, and 30, the multiplication/division fact family consists of 5 x 6 = 30, 6 x 5 = 30, 30 ÷ 5 = 6, and 30 ÷ 6 = 5.

properties of operations:

Here *a*, *b* and *c* stand for arbitrary numbers in a given number system. The properties of operations apply to the rational number system, the real number system, and the complex number system.

Associative property of addition	$(a + b) + c = a + (b + c)$
Commutative property of addition	$(a + b) + c = a + (b + c)$
Additive identity property of 0	$a + 0 = 0 + a = a$
Existence of additive inverses	For every a there exists $-a$ so that $a + (-a) = (-a) + a = 0$

Grade 4
Marking Periods 1 & 2 Vocabulary

Highlighted Words

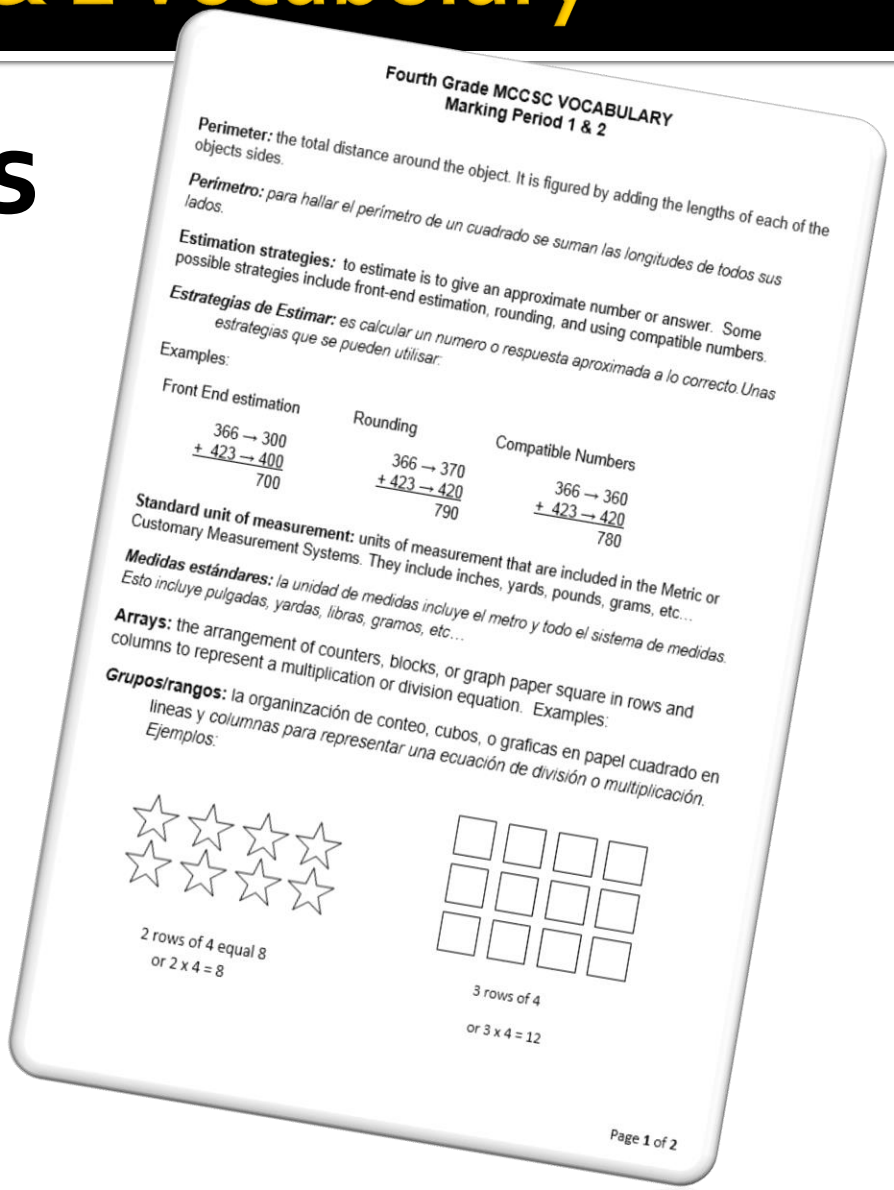
Variable

Place Value

Standard Algorithm

Customary systems

Metric systems



Fourth Grade MCCSC VOCABULARY
Marking Period 1 & 2

Perimeter: the total distance around the object. It is figured by adding the lengths of each of the objects sides.

Perímetro: *para hallar el perímetro de un cuadrado se suman las longitudes de todos sus lados.*

Estimation strategies: to estimate is to give an approximate number or answer. Some possible strategies include front-end estimation, rounding, and using compatible numbers.

Estrategias de Estimar: *es calcular un numero o respuesta aproximada a lo correcto.Unas estrategias que se pueden utilisar:*

Examples:

Front End estimation

366 → 300
+ 423 → 400
700

Rounding

366 → 370
+ 423 → 420
790

Compatible Numbers

366 → 360
+ 423 → 420
780

Standard unit of measurement: units of measurement that are included in the Metric or Customary Measurement Systems. They include inches, yards, pounds, grams, etc…

Medidas estándares: *la unidad de medidas incluye el metro y todo el sistema de medidas. Esto incluye pulgadas, yardas, libras, gramos, etc…*

Arrays: the arrangement of counters, blocks, or graph paper square in rows and columns to represent a multiplication or division equation. Examples:

Grupos/rangos: la organinzación de conteo, cubos, o graficas en papel cuadrado en lineas y columnas para representar una ecuación de división o multiplicación. *Ejemplos:*

2 rows of 4 equal 8
or 2 x 4 = 8

3 rows of 4
or 3 x 4 = 12

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Grade 5
Marking Periods 1 & 2 Vocabulary

Highlighted Words

Powers of 10

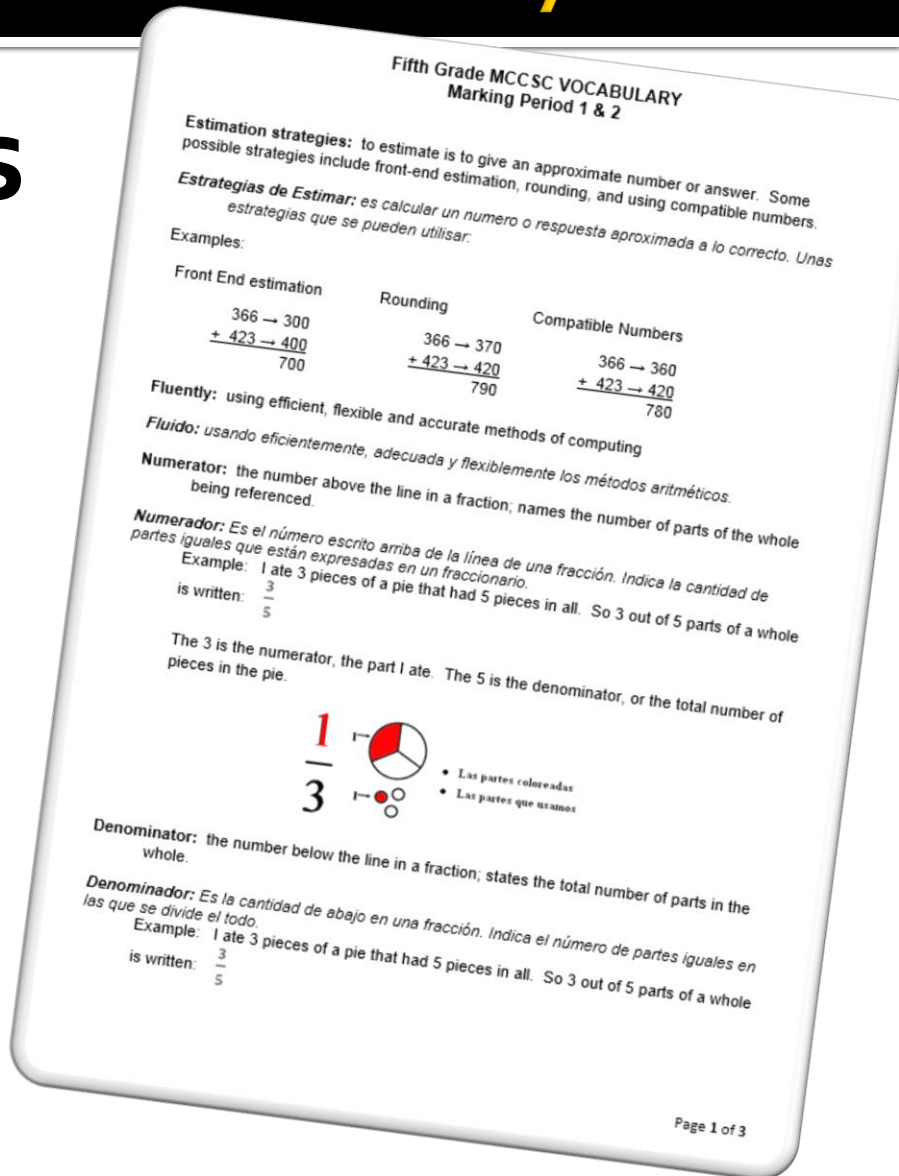
Fluently

Expressions

Factor

Quotient/divisor/dividend

Equivalent Fraction



Fifth Grade MCCSC VOCABULARY
Marking Period 1 & 2

Estimation strategies: to estimate is to give an approximate number or answer. Some possible strategies include front-end estimation, rounding, and using compatible numbers.

Estrategias de Estimar: *es calcular un numero o respuesta aproximada a lo correcto. Unas estrategias que se pueden utilisar:*

Examples:

Front End estimation

366 → 300
+ 423 → 400
700

Rounding

366 → 370
+ 423 → 420
790

Compatible Numbers

366 → 360
+ 423 → 420
780

Fluently: using efficient, flexible and accurate methods of computing

Fluido: *usando eficientemente, adecuada y flexiblemente los métodos aritméticos.*

Numerator: the number above the line in a fraction; names the number of parts of the whole being referenced.

Numerador: *Es el número escrito arriba de la línea de una fracción. Indica la cantidad de partes iguales que están expresadas en un fraccionario.*

Example: I ate 3 pieces of a pie that had 5 pieces in all. So 3 out of 5 parts of a whole is written: $\frac{3}{5}$

The 3 is the numerator, the part I ate. The 5 is the denominator, or the total number of pieces in the pie.

$\frac{1}{3}$

- Las partes coloreadas
- Las partes que usamos

Denominator: the number below the line in a fraction; states the total number of parts in the whole.

Denominador: *Es la cantidad de abajo en una fracción. Indica el número de partes iguales en las que se divide el todo.*

Example: I ate 3 pieces of a pie that had 5 pieces in all. So 3 out of 5 parts of a whole is written: $\frac{3}{5}$

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Grade Level Activities

- Grade K – *Fruit Loop Patterns & More and Less/Before and After*
- Grade 1 – *Spill the Beans* & Show *One More*
- Grade 2 –*Get Close to 100 & Race around +/-10*

Grade Level Activities

- Grade 3 – *Shake, Rattle, and Roll* and *Multiples*
- Grade 4 – *Toss and Talk*
- Grade 5 – *Closest to 25, Comparing Decimals & Rounding Decimals to the Nearest Hundredth*

Closure & Feedback

- Please complete and return the 3/2/1 Feedback Form
- Make sure to pick up any documents from today's information session
- Look for information for Marking Period 3 & 4 Parent Workshops

Thank you

Thank You