Sacramento City Unified School District

Mathematics Grade 4

Curriculum Map

Sacramento City Unified School District

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Grade 4 - Year-at-a-Glance			
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Unit #1: Computation with Whole Numbers, Place Value, and Rounding
(Approx. # Days)
Content Standards: **4.NBT.1, 4.NBT.2, 4.NBT.3, 4.NBT.4**

Math Common Core Content Standards:

Domain: Numbers in Base Ten   4.NBT[1]

Generalize place value understanding for multi-digit whole numbers.

1. 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.*

2. Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.

3. Use place value understanding to round multi-digit whole numbers to any place.

4. Fluently add and subtract multi-digit whole numbers using the standard algorithm.

[1]Students need the opportunity to practice adding and subtracting multi-digit whole numbers to build fluency for numbers up to 1,000,000 throughout the school year.

Standards for Mathematical Practice:
SMP 1 Make sense of problems and persevere in solving them
SMP 2 Reason abstractly and quantitatively
SMP 3 Construct viable argument and critique the reasoning of others
SMP 6 Attend to precision
SMP 7 Look for and make use of structure
SMP 8 Look for and express regularity in repeated reasoning

SEL Competencies
Self-awareness, Self-management, Social awareness, Relationship skills, Responsible decision making

ELD Standards to Support Unit
Part I: Interacting in Meaningful Ways
   A. Collaborative
      1. Exchanging information and ideas with others through oral collaborative conversations on a range of social and academic topics
      2. Interacting with others in written English in various communicative forms (print, communicative technology, and multimedia
      3. Offering and supporting opinions and negotiating with others in communicative exchanges
      4. Adapting language choices to various contexts (based on task, purpose, audience, and text type)
   B. Interpretive
      5. Listening actively to spoken English in a range of social and academic contexts
      6. Reading closely literary and informational texts and viewing multimedia to determine how meaning is conveyed explicitly and implicitly through language

7. Evaluating how well writers and speakers use language to support ideas and opinions with details or reasons depending on modality, text type, purpose, audience, topic, and content area
8. Analyzing how writers and speakers use vocabulary and other language resources for specific purposes (to explain, persuade, entertain, etc.) depending on modality, text type, purpose, audience, topic, and content area
C. Productive
9. Expressing information and ideas in formal oral presentations on academic topics
11. Supporting own opinions and evaluating others' opinions in speaking and writing
12. Selecting and applying varied and precise vocabulary and language structures to effectively convey ideas

Part II. Learning About How English Works
A. Structuring Cohesive Texts
1. Understanding text structure
2. Understanding cohesion
B. Expanding and Enriching Ideas
5. Modifying to add details
C. Connecting and Condensing Ideas
6. Connecting ideas
7. Condensing ideas

Unit #1: Computation with Whole Numbers, Place Value, and Rounding					
Essential Questions	**Suggested Assessments for Learning**	**Sequence of Learning Outcomes**	**Strategies for Teaching and Learning**	**Differentiation e.g. EL/SpEd/GATE**	**Resources**

• How does understanding place value help you solve addition and subtraction problems?
 	
• How are place value patterns repeated in large numbers?
 	
• When is estimation more appropriate than finding the exact answer?
 	
• How can I use place value to decompose numbers to solve addition and subtraction problems?
 	
• How does knowing the properties of operations help you solve problems?
	Assessments/Tasks aligned to learning experiences:
	
	"Millions and Billions of People"
	https://www.illustrativemathematics.org/illustrations/1808
		Students will be able to…
		
		1. Reason that the magnitude of a number is based on the place value, where a number is ten times larger than the digit to the left and ten times smaller than the digit to the right. Students will make the connection by describing the pattern of the original number and the products from multiplying by 10, 100, and 1,000.
			For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division.
			Students can build larger numbers by using graph paper with very small squares and labeling examples of each place with digits and words.
			See North Carolina Unpacked Standards 4th grade pg. 13
				Use of math journals for differentiation and formative assessment (use link below)
				https://www.teachingchannel.org/videos/math-journals
				
				Flexible grouping:
				• Content
				• Interest
				• Project/product
				• Level (Heterogeneous/ Homogeneous)
				
				Tiered:
				• Independent Management Plan (Must Do/May Do)
				• Grouping
				  ○ Content
				  ○ Rigor w/in the concept
				  ○ Project-based learning
					CCSS Support:
					• CA *Mathematics Frameworks*
					  ○ Grade 4, pp.13-15 http://www.cde.ca.gov/ci/ma/cf/documents/aug2013gradefour.pdf
					  ○ "Instructional Strategies" http://www.cde.ca.gov/ci/ma/cf/documents/aug2013instructstrat.pdf
					  ○ "Supporting High Quality Common Core Instruction" http://www.cde.ca.gov/ci/ma/cf/documents/aug2013supportinghqccm.pdf
					
					• *Kansas Association of Teachers of Mathematics (KATM) 4th Flipbook*, pp.19-26 http://katm.org/wp/

		2. Read and write multi-digit numbers using base-ten numerals, number names, and expanded form.			
	"Ordering 4-digit Numbers" https://www.illustrativemathematics.org/illustrations/459	3. Compare and contrast multi-digit numbers to identify which number is larger than, smaller than, or equal to another number, by using expanded form of numerals, words, a combination of both numerals and words (7 hundreds, 6 tens, and 3 ones = 763), and graphic representations (number lines, hundred charts, etc.). Students read and record the comparisons from left to right with the correct symbols (<, >, and =).	Students need to have opportunities to compare numbers with the same number of digits, numbers that have the same number in the leading digit position, and numbers that have different numbers of digits and different leading digits; i.e. the concept of magnitude (of the digits in the number). Students use layered place value cards such as those		

Unit #1: Computation with Whole Numbers, Place Value, and Rounding					
Essential Questions	**Suggested Assessments for Learning**	**Sequence of Learning Outcomes**	**Strategies for Teaching and Learning**	**Differentiation e.g. EL/SpEd/GATE**	**Resources**

			used in earlier grades.	o Homework
				o Grouping
				o Formative Assessment
				
				Anchor Activities:
				• Content-related
				• Tasks for early finishers
				  o Game
				  o Investigation
				  o Partner Activity
				  o Stations
				
				Depth and Complexity Prompts/Icons:
				• Depth
				  o Language of the Discipline
				  o Patterns
				  o Unanswered Questions
				  o Rules
				  o Trends
				  o Big Ideas
				  o Complexity
					wp-content/uploads/flipbooks/4FlipBookedited.pdf
					
					• North Carolina Unpacked Standards 4th Grade http://www.ncpublicschools.org/docs/acre/standards/common-core-tools/unpacking/math/4th.pdf
					
					• *Progression for the Common Core State Standards in Mathematics: K-5, Number and Operations in Base Ten*, pp.2-4, 12-13 http://commoncoretools.me/wp-content/uploads/2011/04/ccss_progression_nbt_2011_04_073_corrected2.pdf
					
					• *engageNY* http://www.engageny.org/resource/grade-4

		4. Understand the role of commas in reading numerals in groups of threes (appropriate base-thousand unit – placing commas from right to left - first comma means thousands and second comma means millions or a thousand thousands).			
	"Rounding to the Nearest 1000" https://www.illustrativemathematics.org/illustrations/1807	5. Apply understanding of place value and number sense to explain and reason about the answers they get when they round to solve problems in real-world situations.	Students can use number lines (utilizing the halfway point), hundred number charts, rulers, etc. to measure the distance (closer to, further than, same distance from) to determine the value of the rounded number. Students round a 6 digit number to the nearest hundred thousand, ten thousand, one thousand, hundred, and ten.		
		6. Fluently add and subtract multi-digit whole numbers (up to 1,000) using various methods, such as decomposition and the distributive property of addition.	Students may continue to use concrete models to explain their reasoning. Solving Addition and Subtraction Word Problems with Tape Diagrams http://www.engageny.org/resource/common-core-instr		

Unit #1: Computation with Whole Numbers, Place Value, and Rounding					
Essential Questions	**Suggested Assessments for Learning**	**Sequence of Learning Outcomes**	**Strategies for Teaching and Learning**	**Differentiation e.g. EL/SpEd/GATE**	**Resources**
-1			uction-solving-addition-and-subtraction-word-problems-with-tape-diagrams Students may use decomposition, expanded form, the distributive property of addition, or opposite operation to solve addition and subtraction problems fluently. Ideally decomposition and the distributive property would lead to conceptual understanding to the standard algorithm.		-mathematics-module -1 **Strategies and Tasks:** • engageNY http://www.engageny .org/resource/commo n-core-instruction-solv ing-addition-and-subtr action-word-problems -with-tape-diagrams **Differentiation:** • http://scusd-math.wik ispaces.com/home
	Mid-point Check and Post Assessment - engageNY, Module 1 Tasks 1-3 Gr 4_Unit 1_Mid & Post Assessment.pdf				• Universal Design for Learning

Unit #2: Whole Numbers: Multiplication and Division
(Approx. # Days)
Content Standards: **4.OA.1, 4.OA.2, 4.OA.3, 4.OA.4, 4.OA.5, 4.NBT.5, 4.NBT.6, 4.MD.3**

Math Common Core Content Standards:

Domain: Operations and Algebraic Thinking   4.OA

Use the four operations with whole numbers to solve problems.

1. Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 x 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.

2. Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.

3. 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.**

Gain familiarity with factors and multiples.

4. 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.

Generate and analyze patterns.

5. Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. *For example, given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.*

Domain: Numbers in Base Ten   4.NBT

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

5. 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.

6. 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.

Domain: Measurement and Data   4.MD

Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.

3. Apply the area perimeter formulas for rectangles in real-world and mathematical problems. *For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.*

Standards for Mathematical Practice:

SMP 1 Make sense of problems and persevere in solving them

SMP 2 Reason abstractly and quantitatively

SMP 4 Model with mathematics

SMP 6 Attend to precision

SMP 7 Look for and make use of structure

SMP 8 Look for and express regularity in repeated reasoning

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Self-awareness, Self-management, Social awareness, Relationship skills, Responsible decision making

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- B. Interpretive
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    6. Reading closely literary and informational texts and viewing multimedia to determine how meaning is conveyed explicitly and implicitly through language
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- A. Structuring Cohesive Texts
    1. Understanding text structure
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    6. Connecting ideas
    7. Condensing ideas

Unit #2: Whole Numbers: Multiplication and Division					
Essential Questions	**Suggested Assessments for Learning**	**Sequence of Learning Outcomes**	**Strategies for Teaching and Learning**	**Differentiation e.g., EL/SpEd/GATE**	**Resources**

• How can I relate what I know about multiples to solve multiplication problems?
 	
• Why does knowing fair shares and equal groups help you explain multiplication and division problems?
 	
• How can the same area model represent multiplication and division?
 	
• When is it more efficient to use multiplication and division to solve problems?
	Assessments/Tasks aligned to learning experiences:	Students will be able to…
		
		1. Visualize and interpret multiplicative comparison word problems using tape or bar diagrams to represent the **"unknown product."** Students are not solving these problems just yet.
			Refer to *Mathematics Framework*, p.7-9 for examples of multiplicative comparison problems. Students can use numbers, words, pictures, physical objects, or equations to represent the problem. Avoid telling students that when multiplying, the answer is always bigger – as this will create a misconception carrying into fractions (refer to "Common Misconception" from *Mathematics Framework,* pp.10-11).	*Use of math journals for differentiation and formative assessment (use link below)* https://www.teachingchannel.org/videos/math-journals
				
				Flexible grouping:
				• Content
				• Interest
				• Project/product
				• Level (Heterogeneous/ Homogeneous)
				
				Tiered:
				• Independent Management Plan (Must Do/May Do)
				• Grouping
				  ○ Content
				  ○ Rigor w/in the concept
				  ○ Project-based learning
				  ○ Homework
				  ○ Grouping
					CCSS Support:
					• CA *Mathematics Frameworks*
					  ○ Grade 4, pp.6-13, 16-19, 35-36 http://www.cde.ca.gov/ci/ma/cf/documents/aug2013gradefour.pdf
					  ○ "Instructional Strategies" http://www.cde.ca.gov/ci/ma/cf/documents/aug2013instructstrat.pdf
					  ○ "Supporting High Quality Common Core Instruction" http://www.cde.ca.gov/ci/ma/cf/documents/aug2013supportinghqccm.pdf
					
					• *Kansas Association of Teachers of Mathematics (KATM) 4th Flipbook*, pp.5-18,

	"Three Times As Much" 4.OA.1 Task 2.doc	2. Visualize and interpret multiplicative comparison word problems using tape or bar diagrams to represent the **"group size unknown"** and **"number of group unknown."** Students are not solving these problems just yet.	Present students with a problem then choose from between two or more tape diagrams that would model the problem. As students become familiar and confident with this, give students a tape diagram with information and then they write a variety of word problems that could be solved using the tape diagrams, otherwise, save		

Unit #2: Whole Numbers: Multiplication and Division					
Essential Questions	**Suggested Assessments for Learning**	**Sequence of Learning Outcomes**	**Strategies for Teaching and Learning**	**Differentiation e.g., EL/SpEd/GATE**	**Resources**
			this part mid to end of the unit.	○ Formative Assessment	27-31, 53 http://katm.org/wp/wp-content/uploads/flipbooks/4FlipBookedited.pdf

		3. Solve multiplicative comparison word problems using a letter to represent the **"unknown product."** Using the tape or bar diagrams to represent the unknown quantity will continue to help students visualize what is happening in the problem with an equation that represents the problem. Students use mental computation and rounding to assess the reasonableness of their solutions.		**Anchor Activities:**
				• Content-related
				• Tasks for early finishers
				  ○ Game
				  ○ Investigation
				  ○ Partner Activity
				  ○ Stations
					• *Progression for the Common Core State Standards in Mathematics: K, Counting and Cardinality; K-5, Operations and Algebraic Thinking,* pp.2-3, 29-31, 33, 36-39

	"Fund Raiser" 4.OA.2 Task 3.doc
	
	"Fund Raiser" 4.OA.2 Task 4.doc
		4. Solve multiplicative comparison word problems using a letter to represent the **"group size unknown"** and **"number of group unknown."** Using the tape or bar diagrams to represent the unknown quantity will continue to help students visualize what is happening in the problem with an equation that represents the problem. Students use mental computation and rounding to assess the reasonableness of their solutions.		**Depth and Complexity Prompts/Icons:**
				• **Depth**
				  ○ Language of the Discipline
				  ○ Patterns
				  ○ Unanswered Questions
				  ○ Rules
				  ○ Trends
				  ○ Big Ideas
				  ○ Complexity
					http://commoncoretools.files.wordpress.com/2011/05/ccss_progression_cc_oa_k5_2011_05_302.pdf
					
					• *Progression for the Common Core State Standards in Mathematics: K-5, Number and Operations in Base Ten*, pp.13-15

		5. Multiply single-digit numbers and two-digit numbers by 10, 100, and 1,000. Recognize patterns when multiplying by multiples of 10. Students compare their patterns with a calculator and analyze the patterns for any number multiplied by 10, 100, and 1,000.	Use area model or partial product as a visual to help students discern the pattern when multiplying multiples of 10.		http://commoncoret

Unit #2: Whole Numbers: Multiplication and Division					
Essential Questions	**Suggested Assessments for Learning**	**Sequence of Learning Outcomes**	**Strategies for Teaching and Learning**	**Differentiation e.g., EL/SpEd/GATE**	**Resources**
	"Multiplication Strategies" 4.NBT.5 Task 1.doc "College Basketball Attendance" 4.NBT.5 Task 3.doc "Mental Division Strategies" https://www.illustrativemathematics.org/illustrations/1774	6. Multiply two-digit by single-digit numbers progressing up to four-digit by single-digit numbers using contextual problems. Students use mental computation and rounding to assess the reasonableness of their solutions.	Draw/use array/area model or partial product as a visual.		ools.me/wp-content/uploads/2011/04/ccss_progression_nbt_2011_04_073_corrected2.pdf • *Progression for the Common Core State Standards in Mathematics: K-5, Geometric Measurement,* pp.2-5, 22 http://commoncoretools.files.wordpress.com/2012/07/ccss_progression_gm_k5_2012_07_21.pdf
	"Area and Perimeter Exploration" 4.MD.3 Task 1.doc http://sampleitems.smarterbalanced.org/itempreview/sbac/index.htm	7. Determine the area and perimeter of rectangles in real-world mathematical problems. Students will begin using the area formula ($\ell \times w$) in square units and perimeter formula ($2\ell + 2w$, or $2[\ell + w]$) in linear units.	A real-world project on the teaching channel: https://www.teachingchannel.org/videos/real-world-geometry-lesson		• *Engageny* **http://www.engageny.org/resource/grade-4-mathematics-module-3**
		8. Use the area model to develop division strategies. Relate division back to multiplication with the area model.	Reasoning about division https://www.teachingchannel.org/videos/common-core-teaching-division		
		9. Decompose larger dividends into smaller like base-ten units, related to distributive property (refer to CA Framework, p.20).			**Strategies and Tasks:**
		10. Solve division word problems and interpret the meaning of remainders. Students interpret the remainders as something leftover and write the appropriate way to write the results (for example, $200 \div 9 = 22$ with 2 leftover in the context of if there were 200 pencils are equally distributed among 9 classrooms, then each			• engageNY o http://www.engageny.org/resource/common-core-instruction-solvin

Unit #2: Whole Numbers: Multiplication and Division					
Essential Questions	**Suggested Assessments for Learning**	**Sequence of Learning Outcomes**	**Strategies for Teaching and Learning**	**Differentiation e.g., EL/SpEd/GATE**	**Resources**
		classroom receives 22 pencils with 2 leftover).			g-addition-and-subtraction-word-problems-with-tape-diagrams o Tape Diagrams: 4.OA.3 & 4.NBT.4 http://www.engageny.org/resource/common-core-instruction-solving-addition-and-subtraction-word-problems-with-tape-diagrams
	https://www.illustrativemathematics.org/illustrations/1774	11. Solve division word problems involving multiplicative comparison. Students use mental computation and rounding to assess the reasonableness of their solutions.			
		12. Solve multi-step word problems using the four operations, representing the unknown quantity with a letter symbol in equations. Students use mental computation and rounding to assess the reasonableness of their solutions.	Solving Addition & Subtraction Problems with Tape Diagram http://www.engageny.org/resource/common-core-instruction-solving-addition-and-subtraction-word-problems-with-tape-diagrams		• For Learning Outcome #14, refer to "Double Plus One" http://illustrativemathematics.org/standards/k8# (Illustrative Mathematics 2013) and "Patterns that Grow" http://illuminations.nctm.org/LessonDetail.aspx?ID=U103 (National Council of Teachers of Mathematics [NCTM] Illuminations 2013)
	http://sampleitems.smarterbalanced.org/itempreview/sbac/index.htm	13. Multiplicatively decompose any whole number (up to 100) into equal groups and express as a product of two factors, called factor pairs. Explain whether the whole number is prime or composite.	Refer to "Common Misconception" from *Mathematics Framework,* pp.11-12.		
	"Fences" 4.NF.3 Fraction Problem Solving.docx "John the Jeweler" MARS2010-04 John the Jeweller.pdf	14. Analyze a number or shape pattern based on a given rule. Then use that rule to determine and explain the next unknown sequence in the pattern. Students generate their own number patterns based on an identify rule.	A pattern is a sequence that repeats or evolves in a predictable process over and over. A rule dictates what that process will look like.		

Unit #2: Whole Numbers: Multiplication and Division					
Essential Questions	**Suggested Assessments for Learning**	**Sequence of Learning Outcomes**	**Strategies for Teaching and Learning**	**Differentiation e.g., EL/SpEd/GATE**	**Resources**
	"Math Rules!" MARS2012-04 Math Rules.pdf		This type of investigation will reinforce students' fact knowledge and develop their fluency with operations. Students could examine a sequence of dot designs where each design has 4 more dots than the previous one.		• North Carolina Wikispaces http://3-5cctask.ncdpi.wikispaces.net/ **Differentiation:** • http://scusd-math.wikispaces.com/home • Universal Design for Learning
	Mid-point Check and Post Assessment - engageNY, Module 3 – All Tasks Gr 4_Unit 2_Mid & Post Assessments.pdf				