SD38 K-7 Mathematics Essential Learning Standards

suggestions to support planning, instruction and assessment

created by Janice Novakowski for the Richmond School District.
updated September 2020

RICHMOND
SCHOOL DISTRICT NO.38

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All mathematics curricular content and competencies are important and connected, but when having to prioritize learning standards, such as during times of uncertainty, the idea of what is essential, foundational or core has emerged. In the period of remote learning in Spring 2020, this became significant as we came to the end of the school year as we needed to be mindful of what mathematics learning was essential for students to continue their learning at the next grade level.

As we begin the school year in September 2020, here are some considerations for planning, instruction and assessment:
-What can you do to welcome students to mathematics this year? Accept and acknowledge that students will all be in different places in their math learning, more so than usual due the circumstances of the spring
-How can you informally collect assessment information while student are engage in instructional routines as a whole class? For example, what information can you find out about students' mental math strategies and understanding of number operations while doing a whole class Number Talk.
-How can you build mathematical discourse and community as you begin the school year? What instructional routines help to develop math language, listening to each other and building on others' ideas?
-What mathematics curricular content and curricular competencies should you prioritize at the beginning of the school year to set students up for success with the possibility of a student or a class moving to remote learning due to illness or exposure?
-How can I use indicators of student proficiency to inform my planning, instruction and assessment?

If you are providing transitional learning for students are not yet returning to school, along with communicating with the school and classroom teacher about content and competencies to focus on, consider the essential learning standards as your priorities.

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How are we prioritizing and determining what learning standards are essential during this time?

The following questions can be considered in prioritizing essential learning standards:

- What is new curricular content at the grade level?
  - *Look at the previous grade levels to see what new curricular content is being introduced at the grade level. For examples, fractions, multiplication and division are all new concepts introduced in grade 3.*
- What curricular content is necessary to review, practice and enhance knowledge of, that is essential for continuous mathematics learning?
  - *Some curricular topics need ongoing review and practice, such as number operations. Other content area knowledge can be enhanced by connecting or applying that mathematics in a project or connected to another area of math.*
- What curricular competencies are best developed at the beginning of the year and would be a priority for students if they moved to learning from home?
  - *Some curricular competencies like justifying and explaining thinking, mental math strategies and representing learning in different ways need to be developed with support from early in the year.*
- What curricular competencies are connected to your prioritized curricular content learning standards?
  - *Is it possible to include one curricular competency from each of the four curricular competency areas?*
- What curricular competencies are connected to your core competencies area/s of focus?
  - *Many teachers have chosen one or two core competencies to focus on each term. What curricular competencies are aligned with that focus?*

The following pages include suggested essential learning standards for each grade level.

Kindergarten

Essential Curricular Content	Essential Curricular Competencies	Indicators of Proficiency	Instructional and Assessment Practices
Number concepts to 10 Ways to make 5 Decomposing numbers to 10	Develop mental math strategies Problem-solving Explain and justify mathematical ideas and decisions Represent mathematical ideas in concrete, pictorial and symbolic forms Connect mathematical ideas to each other, other areas and personal interests	Represent quantities to 10 with materials, pictures and numbers Match sets of materials or pictures to corresponding numerals Count to 10 in sequence and with one-to-one correspondence Subitize to 5 with dot images Build five in many ways (ie. 2 and 3, 4 and 1, 2 and 2 and 1) using concrete materials Compose and decompose numbers to 10 in many ways using materials, pictures and numbers	Number Talks (dot images, rekenreks, ten frames) *contributions during number talks and discussions* Counting Collections *task-based interviews including observations while solving problems, engaging in tasks and working with materials* Math Games *conferring – listening and observing* Open Questions *products involving representing mathematical ideas with concrete, pictorial and symbolic forms*

Grade 1

Essential Curricular Content	Essential Curricular Competencies	Indicators of Proficiency	Instructional and Assessment Practices
Number concepts to 20 Ways to make 10 Addition and subtraction of numbers to/within 20	Develop mental math strategies Problem-solving Explain and justify mathematical ideas and decisions Represent mathematical ideas in concrete, pictorial and symbolic forms Connect mathematical ideas to each other, other areas and personal interests	Represent, compare, order numbers to 20 Demonstrate understanding of teen numbers as ten and ones Count in various ways (by 1s, 2s, 5s, ascending and descending, counting on from a number) Compose and decompose 10 in many ways using concrete, pictorial and symbolic forms (ie 5+5, 5+3+2, 6+3+1) Demonstrate understanding of the processes of addition and subtraction using materials, pictures and numbers/symbols Use more than one strategy to add and subtract (ie. counting all, counting on or back, making and bridging 10, decomposing, using doubles)	Number Talks *contributions during number talks and discussions* Counting Collections *task-based interviews including observations while solving problems, engaging in tasks and working with materials* Math Games *conferring – listening and observing* Open Questions *products involving representing mathematical ideas with concrete, pictorial and symbolic forms*

Grade 2

Essential Curricular Content	Essential Curricular Competencies	Indicators of Proficiency	Instructional and Assessment Practices
Place value understanding to 100 Developing fluency with +/- facts to 20 Addition and subtraction of two-digit numbers	Develop mental math strategies Problem-solving Explain and justify mathematical ideas and decisions Represent mathematical ideas in concrete, pictorial and symbolic forms Connect mathematical ideas to each other, other areas and personal interests	Represent, compare, order and decompose numbers to 100 Count in various ways (by 2s, 5s, 10s from different starting points, ascending and descending) Developing fluency and strategies for addition facts to 20 and related subtraction facts (making and bridging 10, decomposing, using doubles, counting on) Add and subtract numbers two-digit numbers using decomposing, compensating, finding the difference and regrouping strategies and with using tools such as ten frames, hundred charts and numberlines	Number Talks *contributions during number talks and discussions* Counting Collections *task-based interviews including observations while solving problems, engaging in tasks and working with materials* Math Games *conferring – listening and observing* Open Questions *products involving representing mathematical ideas with concrete, pictorial and symbolic forms*

Grade 3

Essential Curricular Content	Essential Curricular Competencies	Indicators of Proficiency	Instructional and Assessment Practices
Place value understanding to 1000 Fluency with +/- facts Addition and subtraction of two and three-digit numbers Introduction to multiplication, division and fraction concepts	Develop mental math strategies Problem-solving Explain and justify mathematical ideas and decisions Represent mathematical ideas in concrete, pictorial and symbolic forms Connect mathematical ideas to each other, other areas and personal interests	Represent, compare, order and decompose numbers to 1000 and count in various ways Recall of most addition facts to 20 Add and subtract numbers within 1000 using decomposing, compensating and regrouping strategies Demonstrate an understanding of the processes of multiplication and division and what fractions are, using concrete and pictorial forms and symbols	Number Talks *contributions during number talks and discussions* Counting Collections *task-based interviews including observations while solving problems, engaging in tasks and working with materials* Math Games *conferring – listening and observing* Open Questions *products involving representing mathematical ideas with concrete, pictorial and symbolic forms*

Grade 4

Essential Curricular Content	Essential Curricular Competencies	Indicators of Proficiency	Instructional and Assessment Practices
Place value understanding to 10 000 Fluency with +/- and x/÷ facts Addition and subtraction to within 10 000 Comparing and ordering fractions Introduction to decimals – tenths and hundredths	Develop mental math strategies Problem-solving Explain and justify mathematical ideas and decisions Represent mathematical ideas in concrete, pictorial and symbolic forms Connect mathematical ideas to each other, other areas and personal interests	Represent, compare, order and decompose numbers to 10 000 and count in various ways (by various multiples, starting points, increasing/decreasing) Recall of addition facts and related subtraction facts to 20 Recall of 2x, 5x and 10x multiplication facts to 100 with developing fluency of other multiples Add and subtract numbers within 10000 using decomposing, compensating and regrouping strategies Compare and order fractions with common denominators, using benchmarks of 0, ½ and 1 on a numberline Represent decimal tenths and hundredths with concrete materials, pictures and symbols; show equivalence between fraction and decimal notation; add and subtract decimals numbers (tenths and hundredths)	Number Talks *contributions during number talks and discussions* Ways to Represent Fractions & Decimals *task-based interviews including observations engaging in tasks and working with materials* Math Games *conferring – listening and observing* Open Questions *products involving solving problems and representing mathematical ideas with concrete, pictorial and symbolic forms*

Grade 5

Essential Curricular Content	Essential Curricular Competencies	Indicators of Proficiency	Instructional and Assessment Practices
Place value understanding to 1 000 000 Fluency with +/- and x/÷ facts Addition and subtraction within 1 000 000 Multiplication and division with three digits Equivalent fractions Decimals – to thousandths	Develop mental math strategies Problem-solving Explain and justify mathematical ideas and decisions Represent mathematical ideas in concrete, pictorial and symbolic forms Connect mathematical ideas to each other, other areas and personal interests	Represent, compare, order and decompose numbers to 1 000 000 and count in various ways (by various multiples, starting points, increasing/decreasing) Recall of addition facts and related subtraction facts to 20 Recall of many multiplication facts to 100 such as 2s, 3s, 4s, 5s and 10s Add and subtract numbers within 1 000 000 using decomposing, compensating and regrouping strategies Multiply and divide numbers with three digits, using more than one strategy - decomposing, distributive property, commutative property, repeated addition or subtraction (including division with remainders) Represent equivalent fractions (1/2=3/6=5/10) using concrete materials, pictures and symbols Add and subtract decimals numbers to the thousandths using related strategies used for whole numbers	Number Talks (whole numbers and decimal numbers) *contributions during number talks and discussions* Ways to Represent Equivalent Fractions *task-based interviews including observations engaging in tasks and working with materials* Math Games *conferring – listening and observing* Open Questions *products involving solving problems and representing mathematical ideas with concrete, pictorial and symbolic forms*

Grade 6

Essential Curricular Content	Essential Curricular Competencies	Indicators of Proficiency	Instructional and Assessment Practices
Place value understanding from thousandths to billions Fluency with x and ÷ facts Factors and multiples Multiplication and division of decimal numbers Order of operations Improper fractions and mixed numbers Introduction to ratios and percents Patterns – algebraic relationships One-step equations	Develop mental math strategies Problem-solving Explain and justify mathematical ideas and decisions Represent mathematical ideas in concrete, pictorial and symbolic forms Connect mathematical ideas to each other, other areas and personal interests	Represent, compare, order and decompose numbers from thousandths to billions and count in various ways (by various multiples, starting points, increasing/decreasing) Recall of most multiplication facts and related division facts Identify common factors and multiples Multiply and divide decimal numbers using related strategies used for whole numbers Solve equations including multiple operations and brackets/parentheses, applying order of operations Use materials, pictures and symbols to compare and order fractions, including improper fractions and mixed numbers, using benchmarks such as 0, ½ and 1 along a numberline Represent ratios and percents in different forms and relate to fractions and decimal numbers Describe visual patterns with words, numbers, expressions, tables, and graphs Solve one-step equations with whole number co-efficients such as 3x=12 or x+5=11	Number Talks (whole numbers and decimal numbers) *contributions during number talks and discussions* Visual Patterns *observations engaging in tasks and working with symbols, pictures and materials* Math Games *conferring – listening and observing* Open Questions *products involving solving problems and representing mathematical ideas with concrete, pictorial and symbolic forms*

Grade 7

Essential Curricular Content	Essential Curricular Competencies	Indicators of Proficiency	Instructional and Assessment Practices
Place value understanding and number operations with whole numbers Fluency with x and ÷ facts Operations with decimal numbers Integers Relationship between fractions, decimals, ratios and percents Two-step equations Cartesian coordinates and graphing Circle properties and measurement	Develop mental math strategies Problem-solving Explain and justify mathematical ideas and decisions Represent mathematical ideas in concrete, pictorial and symbolic forms Connect mathematical ideas to each other, other areas and personal interests	Apply place value understanding and fluency with all number operations to problem-solving contexts, numeracy tasks and interdisciplinary projects Recall of multiplication facts and related division facts and application of this facts when multiplying and dividing greater numbers Fluency with all operations using decimal numbers, including order of operations Represent positive and negative integers using concrete, pictorial and symbolic forms; add, subtract, multiply and divide with integers and represent these processes Demonstrate understanding of relationship between fractions, decimals, ratios and percents through equivalency; represent in different forms (concrete, pictorial, symbolic) Solve two-step equations with whole number co-efficients and constants such as $3x + 4 = 19$ Graph coordinate pairs from an expression on a Cartesian grid and predict and explain the resulting graph Identify and calculate properties of circle (radius, diameter, area and perimeter)	Number Talks (whole numbers and decimal numbers) *contributions during number talks and discussions* Math Tasks *observations engaging in tasks and representing with symbols, pictures and materials* Math Games *conferring – listening and observing* Open Questions *products involving solving problems and representing mathematical ideas with concrete, pictorial and symbolic forms*

Grade/s:_____

Essential Curricular Content	Essential Curricular Competencies	Indicators of Proficiency	Instructional and Assessment Practices