2022-2023 3rd Grade Assessment Guide

Day of Unit Cycle	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37
Unit 1							CFA								SA																						
Unit 2						CFA								CFA									SA														
Unit 3a																																					
Unit 3b											CFA										MBM	RBM						CFA									
Unit 4					CFA					SA																											
Unit 5a																																					
Unit 5b									CFA							CFA							SA														
Unit 6					CFA							SA																									
Unit 7						MBM	RBM																														
Unit 8a				CFA																																	
Unit 8b										SA																											
Unit 9																																					
Unit 10					CFA					CFA					R					CFA					M												SA

Assessments Windows KEY			
	Common Formative Assessments	Summative Assessments	Benchmarks and STAAR Testing

Updated 06/06/2022

Unit 0: Our Math World

Creating Mathematicians Every Day
Daily Fact Fluency/ Number Talks TEKSas Target Practice as warm-up Daily problem solving Utilize literature connections when introducing a new concept Utilize real world connections/ investigations Centers/Stations should include all concepts for the year for early exploration Keep math journals current and organized Keep problem solving journals current and organized Track progress in Education Galaxy Track progress with student goal setting Connect graphing to student goal setting using Education Galaxy, classroom goals, individual student goals, etc.. Concrete items and tools should be utilized daily Refer to daily schedule and add in natural discussions about elapsed time (within your day, month, school year)

Creating Your Math Environment
Create math journals (including problem solving journals) Revisit problem solving model and expectations Introduce Education Galaxy Establish and learn about center/station expectations and procedures (including use of manipulatives/tools) Establish TEKSas Target Practice routines Graph transportation, birthdays, etc.. Create class goals and individual student goals Classroom jobs could be tied to financial literacy (income) Review problem solving strategies/tools (i.e. strip diagrams/part-part-whole, writing to justify, number sentences, etc..)

Updated 06/06/2022

Unit 01: Place Value

Unit Misconceptions & Underdeveloped Concepts

Misconceptions:
Some students may think if two numbers are composed of the same digits, they have the same value even if the digits' place value locations within the two numbers are different.
Some students may think if the same digit is in the tens place of the units period and is in the tens place of the thousands period, the value of the digit is the same, not realizing that the value of each place increases by multiples of ten.
Some students may think a number can only be decomposed one way, when the number can actually be decomposed multiple ways.
Some students may think the total value of a number changes when the number is represented using different decompositions, not realizing that the sum of the addends in each decomposition remains the same.
Some students may think, when comparing numbers, a number value is only dependent on the largest digit regardless of the place value location within the number (e.g., when comparing 13,769 and 24,053, the student may think 13,769 is larger because the digit 6, 7, and/or 9 are/is larger than any of the digits in the number 24,053).
When ordering numbers, some students may incorrectly select the largest number based on the first digit of each number rather than considering the place value location of the first digit (e.g., 9,632 is smaller than 13,498 even though the digit 9 is larger than the digit 1).

Vertical Alignment- 3.2A

K	1	2	3	4
K.2I Compose and decompose numbers up to 10 with objects and pictures.	1.2B Use concrete and pictorial models to compose and decompose numbers up to 120 in more than one way as so many hundreds, so many tens, and so many ones.	2.2A Use concrete and pictorial models to compose and decompose numbers up to 1,200 in more than one way as a sum of so many thousands, hundreds, tens, and ones.	**3.2A Compose and decompose numbers up to 100,000 as a sum of so many ten thousands, so many thousands, so many hundreds, so many tens, and so many ones using objects, pictorial models, and numbers, including expanded notation as appropriate.**	

Vertical Alignment- 3.2D

K	1	2	3	4
K.2G Compare sets of objects up to at least 20 in each set using comparative language. K.2H Use comparative language to describe two numbers up to 20 presented as written numerals.	1.2E Use place value to compare whole numbers up to 120 using comparative language. 1.2 F Order whole numbers up to 120 using place value and open number lines. 1.2G Represent the comparison of two numbers to 100 using the symbols >, <, or =.	2.2D Use place value to compare and order whole numbers up to 1,200 using comparative language, numbers, and symbols (>, <, or =).	**3.2D Compare and order whole numbers up to 100,000 and represent comparisons using the symbols >, <, or =.**	4.2C Compare and order whole numbers to 1,000,000,000 and represent comparisons using the symbols >, <, or =.

Supporting Information

3.2A	3.2B	3.2C	3.2D	
This SE builds on 2(2)(A), where students are expected to use concrete and pictorial models to compose and decompose numbers up to 1,200 in more than one way and builds to 4(2)(B), where students are expected to represent the value of the digit in whole numbers through 1,000,000,000 and decimals to the hundredths. Composing and decomposing whole numbers may focus on place value such as the relationship between standard notation and expanded notation. The number 789 may be decomposed into the sum of 500, 200, 50, 30, and 9 to prepare for work with compatible numbers when adding whole numbers with fluency. Please note: Expanded notation for 12,905 is (1 × 10,000) + (2 × 1,000) + (9 × 100) + (5 × 1), while expanded form is 10,000 + 2,000 + 900 + 5. Decomposition of whole numbers does not involve carrying digits to the next place holder. Each addend of the decomposition should only have one non-zero digit. For example, 789 may not be decomposed into the sum of 600, 90, 90, and 9 or the sum of 600, 180 and 9.	The mathematical relationships include interpreting the value of each place-value position as ten times the position to the right. For example, 3,000 is 10 times 300 or 100,000 is 100 times 1,000. This SE builds to 4(2)(A), where students are expected to interpret the value of each place-value position as 10 times the position to its right and as one tenth the value of the place to its left.	This builds on number line understandings from grade 2 with 2(2)(E), where students are expected to locate the position of a given whole number on an open number line, and 2(2)(F), where students are expected to name the whole number that corresponds to a specific point on a number line and builds to 4(2)(H), where students are expected to determine the corresponding decimal to the tenths or hundredths place of a specified point on a number line. Words may include phrases such as "closer to," "is about," or "is nearly." For example, 18,352 is between 10,000 and 20,000 on the number line. 18,352 is closer to 20,000.	This SE builds on 2(2)(D), where students are expected to use place value to compare and order whole numbers up to 1,200 using comparative language, numbers, and symbols and builds to 4(2)(C), where students are expected to compare and order whole numbers to 1,000,000,000 and represent comparisons using the symbols >, <, or =.	

Student CFA Exemplar

CFA #1	

Suggested Manipulatives

HISD Problem Solving Model	Number Lines	Place Value Charts	Place Value Disks	Place Value Dice
Dice	Hundreds Chart	Base 10 Blocks		

Additional Resources

Literature Connections:	Literature [listed in alpha order by author]	
Implementing TRS:	Place Value	
TexGuide:	Place Value	

Ongoing Concepts & Instructional Connections

Begin with Base 10 blocks
--Unit cubes, ten longs/rods, flats and thousands cubes
Emphasize the difference between the place and the value
Utilize tools such as hundreds/120 charts, centimeter grid paper & number lines
--Teach students how to utilize centimeter grid paper for multiplication charts, place value charts, etc...
Vocabulary such as ten more, ten less, one hundred more, one hundred less, 10 times greater, 10 times less
Focus on common place value sums in all forms (i.e. 300+10+30+2)
Discuss money and how it connects to base ten blocks

Updated 06/06/2022

Unit 02: Addition and Subtraction [Perimeter]

Unit Misconceptions & Underdeveloped Concepts

Misconceptions:
Some students may think they must add or subtract in the order that the numbers are presented in the problem rather than performing the operation based on the meaning and action(s) of the problem situation.
Some students may think subtraction is commutative rather than recognizing the minuend as the total amount and the subtrahend as the amount being subtracted (e.g., 5 – 3 is not the same as 3 – 5, etc.).
Some students may interpret the equal sign to mean that an operation must be performed on the numbers on one side and the result of this operation is recorded on the other side of the equal sign rather than understanding the equal sign as representing equivalent values (e.g., 10 + 8 = 13 + 5).
Some students may think when the ones digit is a 5, they do not need to round to the nearest ten, rather than rounding to the next highest multiple of ten.
Some students may think they should always use the digit in the ones place to round a number rather than using the digit to the right of the place to which they are rounding (e.g., consider the digit in the ones place when rounding to the nearest 10; consider the digit in the tens place when rounding to the nearest 100; etc.).
Some students may think when estimating the sum or difference of a problem, they should find the exact answer first and then estimate the solution, rather than understanding that estimation is meant to be a quick way to solve a problem when an exact sum/difference is not needed.
Some students may think you can use the dollar symbol, decimal, and cent symbol in the same representation because the labels “dollars” and “cents” are both stated when describing the value of coins and bills rather than either using the dollar symbol with a decimal or using the cent symbol.
Some students may think a given amount of money can be represented only one way rather than recognizing that the value of coins and bills may be represented with different combinations of coins as long as the total value remains the same.
Some students may confuse the terms and problem situations involving area and perimeter.

Underdeveloped Concepts:
Some students may struggle with regrouping due to weakness with the concept that 10 in any place value position makes “one group” in the next place value position or vice versa (10 tens is equivalent to 1 hundred).
Some students may view addition and subtraction as discrete and separate operations due to not recognizing the inverse relationship between the operations.
Some students may recognize the traditional views of coins and bills but not recognize new or commemorative views (e.g., state quarters, buffalo nickels, new paper money, etc.).

Vertical Alignment- 3.4A

K	1	2	3	4
K.3A Model the action of joining to represent addition and the action of separating to represent subtraction.	1.3B Use objects and pictorial models to solve word problems involving joining, separating, and comparing sets within 20 and unknowns as any one of the terms in the problem such as 2 + 4 = [ ]; 3 + [ ] = 7; and 5 = [ ] – 3.		**3.4A Solve with fluency one-step and two-step problems involving addition and subtraction within 1,000 using strategies based on place value, properties of operations, and the relationship between addition and subtraction.**	4.4A Add and subtract whole numbers and decimals to the hundredths place using the standard algorithm.
k.3B Solve word problems using objects and drawings to find sums up to 10 and differences within 10.	1.3C Compose 10 with two or more addends with and without concrete objects.			
K.3C Explain the strategies used to solve problems involving adding and subtracting within 10 using spoken words, concrete and pictorial models, and number sentences.	1.3E Explain strategies used to solve addition and subtraction problems up to 20 using spoken words, objects, pictorial models, and number sentences.	2.4B Add up to four two-digit numbers and subtract two-digit numbers using mental strategies and algorithms based on knowledge of place value and properties of operations.		
	1.3A Use concrete and pictorial models to determine the sum of a multiple of 10 and a one-digit number in problems up to 99.	2.4C Solve one-step and multi-step word problems involving addition and subtraction within 1,000 using a variety of strategies based on place value, including algorithms.		
	1.3D Apply basic fact strategies to add and subtract within 20, including making 10 and decomposing a number leading to a 10.	2.4A Recall basic facts to add and subtract within 20 with automaticity.		
	1.3F Generate and solve problem situations when given a number sentence involving addition or subtraction of numbers within 20.	2.4D Generate and solve problem situations for a given mathematical number sentence involving addition and subtraction of whole numbers within 1,000.		

Vertical Alignment- 3.5A

K	1	2	3	4
	1.5D Represent word problems involving addition and subtraction of whole numbers up to 20 using concrete and pictorial models and number sentences.	2.7C Represent and solve addition and subtraction word problems where unknowns may be any one of the terms in the problem.	**3.5A Represent one- and two-step problems involving addition and subtraction of whole numbers to 1,000 using pictorial models, number lines, and equations.**	4.5A Represent multi-step problems involving the four operations with whole numbers using strip diagrams and equations with a letter standing for the unknown quantity.
	1.5E Understand that the equal sign represents a relationship where expressions on each side of the equal sign represent the same value(s).			

Vertical Alignment- 3.5E

K	1	2	3	4
			3.5E Represent real-world relationships using number pairs in a table and verbal descriptions.	4.5B Represent problems using an input-output table and numerical expressions to generate a number pattern that follows a given rule representing the relationship of the values in the resulting sequence and their position in the sequence.

Vertical Alignment- 3.7B

K	1	2	3	4
		2.9E Determine a solution to a problem involving length, including estimating lengths.	**3.7B Determine the perimeter of a polygon or a missing length when given perimeter and remaining side lengths in problems.**	4.8C Solve problems that deal with measurements of length, intervals of time, liquid volumes, mass, and money using addition, subtraction, multiplication, or division as appropriate.

Supporting Information

3.4A	3.4B	3.4C	3.5A	3.5E

Unit 02: Addition and Subtraction [Perimeter]				
Two-step problems may include addition, subtraction, or a combination of the two. The SE specifies that the numbers to be added or subtracted must be "whole numbers within 1,000." The SE includes specific approaches to solving the one-step and two-step problems: strategies based on place value, properties of operations, and the relationship between addition and subtraction. The one-step problem prompts students to add numbers such as 237 and 547. If using strategies based on place value, a student might add the hundreds to get 700, the tens to get 70, and the ones to get 14 and then combine 700, 70, and 14 to have a sum of 784. If using a strategy based on properties of operations, a student may consider that 237 + 547 is equivalent to 237 + (500 + 47) = (237 + 500) + 47 = 737 + 47 = 784. If using a strategy based on the relationship between addition and subtraction, a student might subtract 63 from 547 and add it to 237 to have 300 and 484, which add to 784. "Procedural fluency refers to knowledge of procedures, knowledge of when and how to use them appropriately, and skill in performing them flexibly, accurately, and efficiently" (National Research Council, 2001, pg. 121).	The choice of rounding or using compatible numbers belongs to the student	Building upon 2(5)(A) and 2(5)(B), students may be asked to record the value of a collection of coins using a cent symbol or a dollar sign with a decimal.	The SE includes the use of number lines and equations to represent the problems	When paired with 3(1)(A), the expectation is that students apply this skill in a problem arising in everyday life, society, and the workplace. When paired with 3(1)(D), the expectation is that students extend the relationship represented in a table to explore and communicate the implications of the relationship. This SE builds to 4(5)(B) where students represent problems using an input-output table and numerical expressions to generate a number pattern that follows a given rule representing the relationship of the values in the resulting sequence and their position in the sequence. Real-world relationships include situations such as the following: 1 insect has 6 legs, 2 insects have 12 legs, 3 insects have 18 legs, 4 insects have 24 legs, etc.
3.7B				
For example, students may measure the side lengths of a polygon to determine its perimeter using inches or centimeters. Side lengths should be whole numbers. Students may also be expected to determine a missing side length of a polygon when given the perimeter of the polygon and the remaining side lengths.				

Student CFA Exemplar			
CFA #1	CFA #2	CFA #3	

Suggested Manipulatives				
HISD Problem Solving Model	Number Lines	Base 10 Blocks	Snap Cubes	Part/Part/Whole Mat
Strip Diagrams	Money			

Additional Resources				
Literature Connections:	Literature [listed in alpha order by author]			
Implementing TRS:	Estimation	Coins & Bills	All Operations #1	Tables
	Perimeter #1	Perimeter #2	Measurable Attributes of Geometric Figures (Area & Perimeter)	
TExGuide:	Addition & Subtraction	All Operations	Perimeter	Measurable Attributes of Geometric Figures (Area & Perimeter)

Ongoing Concepts & Instructional Connections

Embed perimeter
Regrouping should be revisited using base ten blocks first
Utilize centimeter grid paper to teach students how to line up problems
Utilize tools such as 120 charts and number lines to teach addition and subtraction with smaller numbers
Utilize play money when teaching how to add a collection of coins and bills
Daily fact fluency
Use strip diagrams and number sentences

Updated 06/06/2022

Unit 03: Multiplication and Division [Area]

Unit Misconceptions & Underdeveloped Concepts
Building an understanding of multiplication **Misconceptions:** Some students may think the word “total” in a problem situation always indicates addition rather than recognizing a multiplication situation as finding the total number of objects in equal-sized groups. Some students may think properties of operations used in addition situations can be applied the same way to multiplication problems rather than recognizing the differences between properties of addition and properties of multiplication (e.g., adjustments are made to a factor such as the 9 in the expression 8 × 9 calculated as 8 × 10, and then a single value of 1 is subtracted to accommodate for the adjustment rather than 8 groups of 1). ***Relating Multiplication to Division*** **Misconceptions:** Some students may think any division equation represents the same type of solution rather than recognizing the difference in the division problem types that could be represented by the same equation (e.g., 12 ÷ 3 = 4 could represent 12 separated into 3 groups with 4 in each group or 12 separated into groups of 3 creating 4 groups). Some students may think math facts refer to multiplying or dividing numbers in isolation rather that recognizing the operation presented within context and being able to apply multiplication or division facts to the actions within the problem. **Underdeveloped Concepts:** Some students may be able to describe the commutative property of multiplication out of context but fail to apply it in order to simplify finding the solution to a contextual multiplication situation (e.g., the student states that 4 × 12 = 48 with ease, but struggles to find the product of 12 × 4). Although some students may know how to multiply numbers in isolation, when the operation is presented within context, they are not able to connect multiplication to the actions within the problem. ***Application of Multiplication and Division*** **Misconceptions:** Some students may confuse the terms and problem situations involving area and perimeter. Some students may not understand that there is more than one way to decompose a composite figure to create rectangles with areas that are easier to determine. **Underdeveloped Concepts:** Although some students may know how to multiply or divide numbers in isolation, when the operation is presented within context, they have difficulty connecting multiplication or division to the actions within the problem. Although some students may recognize the relationship between multiplication and division when using basic facts, they do not apply this knowledge beyond the basic facts. Some students may be able to perform a symbolic procedure for division with limited understanding of the division concepts or problem types involved (e.g., 12 ÷ 3 = 4 could represent 12 separated into 3 groups with 4 in each group or 12 separated into groups of 3 creating 4 groups). Some students may have limited or no experience with strip diagrams and their relationship to equations that represent problem situations.

Vertical Alignment- 3.4K

K	1	2	3	4
			3.4K Solve one-step and two-step problems involving multiplication and division within 100 using strategies based on objects; pictorial models, including arrays, area models, and equal groups; properties of operations; or recall of facts.	4.4E Represent the quotient of up to a four-digit whole number divided by a one-digit whole number using arrays, area models, or equations.

Vertical Alignment- 3.5B

K	1	2	3	4
			3.5B Represent and solve one- and two-step multiplication and division problems within 100 using arrays, strip diagrams, and equations.	4.5A Represent multi-step problems involving the four operations with whole numbers using strip diagrams and equations with a letter standing for the unknown quantity.

Vertical Alignment- 3.5E

K	1	2	3	4
			3.5E Represent real-world relationships using number pairs in a table and verbal descriptions.	4.5B Represent problems using an input-output table and numerical expressions to generate a number pattern that follows a given rule representing the relationship of the values in the resulting sequence and their position in the sequence.

Vertical Alignment- 3.6C

K	1	2	3	4
			3.6C Determine the area of rectangles with whole number side lengths in problems using multiplication related to the number of rows times the number of unit squares in each row.	

Supporting Information

3.4D	3.4E	3.4F	3.4G	3.4H
Arrays should reflect the combination of equally-sized groups of objects. An example of a group of objects might include 2 groups of pizza slices with 7 slices in each group. When paired with 3(1)(D) or 3(1)(E), students may be expected to represent the solution using a number sentence. For example, 2 × 7 = 14.	Examples of 5 × 4 using the listed strategies: Area Models, Repeated Addition: 4 + 4 + 4 + 4 + 4, Equal-sized groups, Equal jumps on a number line, Arrays, Skip counting: 4, 8, 12, 16, 20. An array is used to organize objects enabling student to link skip-counting and multiplication. There is no mathematical requirement for 5 x 4 to be modelled as 5 rows and 4 columns.	The level of skill with “automaticity” requires recall of basic multiplication facts up to 10 × 10 with speed and accuracy at an unconscious level. Automaticity is part of procedural fluency. As such, it should not be overly emphasized as an isolated skill. When paired with 3(1)(A), students may be asked to recall these facts when solving problems. The unknown may be determined using the relationship between multiplication and division.	Strategies and algorithms include mental math; partial products; the commutative, associative, and distributive properties; and the standard algorithm. For example, when prompted to multiply 97 x 3, a student may determine the product by multiplying 90 x 3 and 7 x 3 and adding 270 and 21 for an answer of 291. A student may also think of 97 x 3 as (100-3) x 3, multiplying 100 x 3 to get 300 and then subtracting 3 x 3 or 9 for an answer of 291.	Students are expected to think with both forms of division: partitioning into equal shares (determining the number of groups with a given number of objects in each group) and sharing equally (determining the number of items in each group when the objects are shared equally among a given number). When paired with 3(1)(D) and 3(1)(E), students may be asked to use number sentences to record the solutions.
3.4I	**3.4J**	**3.4K**	**3.5B**	**3.5C**
To determine if a number is even, one may apply the divisibility rule for 2: A number is divisible by 2 if the ones digit is even (0, 2, 4, 6, or 8). This SE builds on 2(7)(A) where students determine whether a number up to 40 is even or odd using pairings of objects to represent the number.	The identification of the relationship between multiplication and division lays the foundation for determining a quotient based on this relationship. For example, the quotient of 40 ÷ 8 can be found by determining what factor makes 40 when multiplied by 8.	This SE builds to 3(5)(B). The focus of 3(4)(K) is on developing number-based strategies to solve multiplication and division problems within 100. This may include multiplying a two-digit number by a one-digit number. As this SE lists "properties of operations" and "recall of facts" as potential strategies, a model is not necessarily required. The product and dividend may be less 100, but no operand (i.e. factor, divisor, or quotient) is limited to the multiplication/division facts. This may include addition or subtraction, but any problem doing so should clearly indicate the order in which the operations should be performed.	This SE is an extension of 3(4)(K). The focus of 3(5)(B) is on developing representations that build to numeric equations for multiplication and division situations by connecting arrays to strip diagrams.	This SE builds on 2(6)(A) where multiplication is represented as repeated addition, 3 x 24 may be described as 3 groups of 24. The focus of this SE is on the numerical relationship between 24 and the product of 3 x 24. The product of 3 x 24 will be 3 times as much as 24. This lays the foundation for future work in grade 5 with fraction multiplication and determining part of a number.

Unit 03: Multiplication and Division [Area]				
3.5D	3.5E	3.6C		
If the multiplication or division equation relates to multiplication facts up to 10 x 10, students may apply their knowledge of facts and the relationship between multiplication and division to determine the unknown number. Students may be expected to use the relationship between multiplication and division for a problem such as 12 = [] ÷ 6. The student knows that if 12 = [] ÷ 6, then 12 x 6= [], so [] = 72. Students may also be expected to solve problems where they state that the value 4 makes 3 x [] = 12 a true equation.	When paired with 3(1)(A), the expectation is that students apply this skill in a problem arising in everyday life, society, and the workplace. When paired with 3(1)(D), the expectation is that students extend the relationship represented in a table to explore and communicate the implications of the relationship. This SE builds to 4(5)(B) where students represent problems using an input-output table and numerical expressions to generate a number pattern that follows a given rule representing the relationship of the values in the resulting sequence and their position in the sequence. Real-world relationships include situations such as the following: 1 insect has 6 legs, 2 insects have 12 legs, 3 insects have 18 legs, 4 insects have 24 legs, etc.	The SE limits the two-dimensional surfaces to rectangles with whole-number side lengths. Students may use concrete or pictorial models of square units to represent the number of rows and the number of unit squares in each row. Units of area may be square inches, square centimeters, square feet, square meters, etc. To build on 2(9)(F), students may be expected to use multiplication to determine the area of a rectangle instead of counting squares.		

Student CFA Exemplar				
Building an Understanding of Multiplication CFA #1	Building an Understanding of Multiplication CFA #2	Relating Multiplication to Division CFA #1	Application of Multiplication and Division CFA #1	Application of Multiplication and Division CFA #2
Measurable Attributes of Measurement CFA #1				

Suggested Manipulatives				
HISD Problem Solving Model	Centimeter Grid Paper	Color Tiles	Dice	Dominoes
Hundreds Chart	Strip Diagrams	Base 10 Blocks	Counters	Flash Cards

Additional Resources				
Literature Connections:	Literature [listed in alpha order by author]			
Implementing TRS:	Building An Understanding of Multiplication #1	Building An Understanding of Multiplication #2	Relating Multiplication to Division	Application of Multiplication & Division
	Area #1	Area #2	All Operations #1	Tables
	Measurable Attributes of Geometric Figures (Area & Perimeter)			
TExGuide:	Building An Understanding of Multiplication	Relating Multiplication to Division	Application of Multiplication & Division	All Operations
	Area	Measurable Attributes of Geometric Figures (Area & Perimeter)		

Ongoing Concepts & Instructional Connections
Embed area Daily fact fluency Use vocabulary such as equal groups of, rows, columns, array, square unit, area model, factors, product, quotient, dividend, divisor Use strip diagrams and number sentences --Relate strip diagrams as part-part-whole and how fractions could also be represented

Unit 04: Mixed Skills- SEE PREVIOUS UNITS				
				Updated 06/06/2022

Unit 05: Fractions

Unit Misconceptions & Underdeveloped Concepts
Representing Fractions **Misconceptions:** Some students may think a fraction is recorded as a part over the other part rather than a part over the whole. Some students may think when representing fractions of amounts, lengths, and areas the parts can vary in size rather than realizing the parts must be equal in size even though the equal-sized parts may not be the same shape. Some students think fractions can only represent the part/whole relationship of concrete or pictorial models of objects and shapes rather than recognizing the part/whole relationship in other models such as the points on a number line. Some students may think when representing fractions using sets of objects, the equal sized sets must look the same, rather than realizing the objects in the set can vary (e.g., a set of color tiles where color is irrelevant, a set of toy cars where the type of car is irrelevant, etc.) Some students may think mixed numbers are always greater in quantity than an improper fraction because the mix number contains a whole number component and in their eyes a whole number is larger than a fraction rather than determining the number of wholes represented in the mixed number **Underdeveloped Concepts:** Some students may have limited their definition of fractions by thinking a fraction must always be less than 1. ***Fractions-Equivalency and Comparisons*** **Misconceptions:** Some students may think of equivalency and comparison of fractions as strictly a numerical consideration rather than realizing equivalency and comparison of fractions is only valid when referring to the same size whole. **Underdeveloped Concepts:** Some students may struggle recording the denominator as the number of parts in the whole regardless of the number of parts being considered in the numerator. Some students may continue to struggle with the inverse relationship between the number of fractional pieces in a whole (the denominator) and the size of each piece (e.g., the larger the denominator the smaller the fractional piece; the smaller the denominator the larger the fractional piece). ***Essential Fractional Understandings*** **Misconceptions:** Some students may think of equivalency and comparison of fractions as strictly a numerical consideration rather than realizing equivalency and comparison of fractions is only valid when referring to the same size whole. **Underveloped Concepts:** Some students may continue to struggle recording the denominator as the number of parts in the whole regardless of the number of parts being considered in the numerator. Some students may continue to struggle with the inverse relationship between the number of fractional pieces in a whole (the denominator) and the size of each piece (e.g., the larger the denominator the smaller the fractional piece; the smaller the denominator the larger the fractional piece).

Vertical Alignment- 3.3F				
K	1	2	3	4
			3.3F Represent equivalent fractions with denominators of 2, 3, 4, 6, and 8 using a variety of objects and pictorial models, including number lines.	

Vertical Alignment- 3.3H				
K	1	2	3	4
			3.3H Compare two fractions having the same numerator or denominator in problems by reasoning about their sizes and justifying the conclusion using symbols, words, objects, and pictorial models.	4.3D Compare two fractions with different numerators and different denominators and represent the comparison using the symbols >, =, or <.

Supporting Information				
3.3A	**3.3B**	**3.3C**	**3.3D**	**3.3E**
The denominators may be 2, 3, 4, 6, or 8. The limitation of denominators in this SE does not limit denominators of other SEs. Concrete models may include linear models to build to the use of strip diagrams and number lines.	The limitations placed on denominators in this SE do not limit the denominators in other SEs. The focus of this SE is on the part to whole representations using tick marks on a number line.	This SE focuses on unit fractions. Fractions may have denominators of 2, 3, 4, 6, or 8 and are not limited to these values. Students are expected to describe or explain the fraction 1/b. For example, 1/4 is the quantity formed by one part of a whole that has been partitioned, or divided, into 4 equal parts. A fraction may be part of a whole object or part of a whole set of objects	This SE focuses on non-unit fractions greater than zero and less than or equivalent to one. Students may be expected to describe fractional parts of whole objects. Students are expected to compose and decompose fractions. For example, 3/5 = 1/5 + 1/5 + 1/5. Fractions may have denominators of 2, 3, 4, 6, or 8 and are not limited to these values. A fraction may be part of a whole object or part of a set of objects to build to 3(3)(E). This SE builds to 4(3)(A), where students represent a fraction a/b as a sum of fractions 1/b, where a and b are whole numbers and b > 0, including when a > b.	This SE focuses on solving problems with fractional parts of whole objects or sets of objects. Fractions should have denominators of 2, 3, 4, 6, or 8. The limitation of denominators in this SE does not limit denominators of other SEs. A fraction may be a part of a whole object or part of a whole set of objects. Fractions are not limited to being between 0 and 1. In this way, the SE is an extension of 2(3)(C), where students are expected to count beyond one whole. Examples of problems include situations such as 2 children sharing 5 cookies.
3.3F	**3.3G**	**3.3H**	**3.6E**	**3.7A**
Fractions are greater than zero and less than or equal to one. The limitation of denominators in this SE does not limit denominators of other SEs.	The emphasis with this SE is on the understanding that equivalent fractions must be describing the same whole. 6/8 does not equal 3/4 when the 6/8 is part of a candy bar and the 3/4 is part of a pizza. While they both describe 3/4 of their respective wholes, the amounts described by 6/8 and 3/4 are not the same.	Fractions may have denominators of 2, 3, 4, 6, or 8 and are not limited to these values. Examples include situations such as comparing the size of one piece when sharing a candy bar equally among four people or equally among three people.	Students may be expected to separate two congruent squares in half in two different ways. Students may be expected to identify that the smaller parts represent one half of each of the original squares even though the halves from one square are not congruent to the halves in the other square.	The focus of this SE is on the length of the portion of a number between 0 and the location of the point. This SE builds to 4(3)(G) where any fraction or decimals to tenths or hundredths may be represented as distances from zero on a number line. This SE extends 2(3)(C), where students use words and concrete models to count fractional parts beyond one whole and recognize how many parts it takes to equal one whole, including fractions greater than one.

Student CFA Exemplar				
Representing Fractions CFA #1	Fractions-Equivalency and Comparisons CFA #1 [parts 1&2]	Fractions-Equivalency and Comparisons CFA #2 [parts 3&4]	Essential Fractional Understandings CFA #1	Essential Fractional Understandings CFA #2

Suggested Manipulatives				
HISD Problem Solving Model	Fraction Bars	Fraction Circles	Snap Cubes	2-Color Counters
Color Tiles	Pattern Blocks	Number Lines	Rulers	

Additional Resources				
Literature Connections:	Literature [listed in alpha order by author]			
Implementing TRS:	Representing Fractions #1	Representing Fractions #2	Equivalency & Comparisons #1	Equivalency & Comparisons #2
	Essential Fractional Understanding #1	Essential Fractional Understanding #2		
TexGuide:	Representing Fractions	Fractions- Equivalency & Comparisons	Essential Fractional Understandings	

Ongoing Concepts & Instructional Connections

Unit 05: Fractions
Utilize centimeter grid paper to show fractions Use concrete items to explore how the smaller the fractional part, the bigger the denominator (introduce terms numerator and denominator) Relate clocks to fractions --Half an hour= half the clock Relate to the real world by bringing in recipes, objects from home, etc.. Utilize rulers to compare fractions Explain to students how you can use multiplication facts and multiplication charts to simplify fractions Utilize concrete items to teach students that parts of a whole do not always look the same within the same polygon

Updated 06/06/2022

Unit 06: Geometry

Unit Misconceptions & Underdeveloped Concepts

Misconceptions:
Some students may think a quadrilateral must fall into one of the subcategories of trapezoids, rectangles, rhombuses, or squares rather that recognizing any four-sided figure as a quadrilateral.
Some students may think figures with equal area must look the same rather than recognizing various combinations of length and width that equal the same area.

Underdeveloped Concepts:
Although some students may be able to identify regular figures, they may not be able to identify irregular figures due to limited exposure to a variety of images and lack of understanding regarding the attributes of a given figure (e.g., a student may be able to identify a regular hexagon from exposure to pattern blocks, but fail to recognize any six-sided figure as a hexagon).
Some students may have difficulty recognizing geometric figures if the figures have been transformed by orientation or size.
Some students may list attributes of a figure separately but not see the interrelationships between figures (e.g., a square and rectangle as the only examples of quadrilaterals).
Some students may categorize two-dimensional figures incorrectly based on only a few attributes of the figure rather than considering all of the figure's defining attributes (e.g., a student may say, "If the shape has four sides, it is a square," although this may not be true because a four-sided figure could also be a rectangle or rhombus).
Some students may call a three-dimensional figure by the name of one of its two-dimensional faces (e.g., a student may refer to a cube as a square, etc.).

Vertical Alignment- 3.6A

K	1	2	3	4
K.6E Classify and sort a variety of regular and irregular two- and three-dimensional figures regardless of orientation or size.	1.6A Classify and sort regular and irregular two-dimensional shapes based on attributes using informal geometric language.	2.8C Classify and sort polygons with 12 or fewer sides according to attributes, including identifying the number of sides and number of vertices.	**3.6A Classify and sort two- and three-dimensional figures, including cones, cylinders, spheres, triangular and rectangular prisms, and cubes, based on attributes using formal geometric language.**	4.6D Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines or the presence or absence of angles of a specified size.
		2.8B Classify and sort three-dimensional solids, including spheres, cones, cylinders, rectangular prisms (including cubes as special rectangular prisms), and triangular prisms, based on attributes using formal geometric language.		

Supporting Information

3.6A	3.6B			
Formal geometric language includes terms such as "base," "vertex," "edge," and "face." Figures may be classified by either attributes or their names. Scalene, Isosceles, and equilateral triangles may be included here or left to grade 4 [4(6)(D)]. Pyramids and other forms of prisms may also be included.	This SE includes the identification or recognition of quadrilaterals as a subcategory of 2-D figures. This SE builds on 2(8)(C) where students were expected to classify and sort polygons. Parallel may be defined with this student expectation or may be left to grade 4 [4(6)(A) and (D)]. Similarly, right angles may be formally defined here or left to grade 4 [4(6)(C)]. Additionally, the symbols for parallel (||), perpendicular (⊥), angle (∠), and right angle may be introduced here or left to grade 4 [4(6)(A), (C), and (D)].			

Student CFA Exemplar

CFA #1	CFA #2	

Suggested Manipulatives

HISD Problem Solving Model	Geometric Solids	Anglegs	Translucent Geometric Shapes	Polygons

Additional Resources

Literature Connections:	Literature [listed in alpha order by author]		
Implementing TRS:	2D & 3D Figures #1	2D & 3D Figures #2	
TexGuide:	2D & 3D Figures		

Ongoing Concepts & Instructional Connections

Identify 2D and 3D figures outside and around the classroom
Create "Geometry Book"
Create models of 3D shapes (i.e. pretzels and marshmallows, 3D model of community/buildings)

Updated 06/06/2022

Unit 07: Measurement

Unit Misconceptions & Underdeveloped Concepts

Misconceptions:
Some students may think a composite figure can be decomposed only one way rather than realizing the figure can be decomposed multiple ways.
Some students may think any measurement described using the label ounce refers to the weight of the object rather than realizing fluid ounces are sometimes referred to as simply ounces.
Some students may think base-10 regrouping strategies apply to converting minutes to hours rather than realizing the conversion between minutes and hours is based on groups of 60 (e.g., some students may think 115 minutes is 1 hour 15 minutes rather than correctly converting 115 minutes into 1 group of 60 with 55 left or 1 hour 55 minutes).

Underdeveloped Concepts:
Some students may confuse the terms area and perimeter.
Some students may struggle aligning the starting point of the distance being measured with the zero mark on a ruler, thinking the starting point should be aligned with the end of the ruler or the number 1 on the ruler.
Some students may confuse counting the marked intervals on a ruler with measuring the space or distance between the marked units.

Vertical Alignment- 3.6C

K	1	2	3	4
			3.6C Determine the area of rectangles with whole number side lengths in problems using multiplication related to the number of rows times the number of unit squares in each row.	

Vertical Alignment- 3.7B

K	1	2	3	4
		2.9E Determine a solution to a problem involving length, including estimating lengths.	**3.7B Determine the perimeter of a polygon or a missing length when given perimeter and remaining side lengths in problems.**	4.8C Solve problems that deal with measurements of length, intervals of time, liquid volumes, mass, and money using addition, subtraction, multiplication, or division as appropriate.

Supporting Information

3.6C	3.6D	3.7B	3.7C	3.7D
The SE limits the two-dimensional surfaces to rectangles with whole-number side lengths. Students may use concrete or pictorial models of square units to represent the number of rows and the number of unit squares in each row. Units of area may be square inches, square centimeters, square feet, square meters, etc. To build on 2(9)(F), students may be expected to use multiplication to determine the area of a rectangle instead of counting squares.	Composite figures should be comprised of rectangles, including squares as special cases of rectangles.	For example, students may measure the side lengths of a polygon to determine its perimeter using inches or centimeters. Side lengths should be whole numbers. Students may also be expected to determine a missing side length of a polygon when given the perimeter of the polygon and the remaining side lengths.	When paired with 3(1)(C), students may be asked to use tools such as analog and digital clocks to solve problems related to the addition and subtraction of intervals of time in minutes. This SE builds to 4(8)(C), where students solve problems that deal with measurements of length, intervals of time, liquid volumes, mass, and money using addition, subtraction, multiplication, or division as appropriate. Problems may include a start time with an interval or end time with an interval. Intervals may be less than or greater than 1 hour. For example, "Gia has practiced soccer for the last 45 minutes. She will practice for another half hour before going inside. How long will Gia practice?" As a second example, "Larry starts studying at 5:30 each day and studies for 45 minutes. When does Larry stop?" Problems may not include a start time and an end time as elapsed time is addressed in 4(8)(C).	In addition to metric units, students are expected to distinguish between liquid ounces and ounces that measure weight. The metric units for mass (kilograms and grams) are not included in this SE as mass is not the same as weight (pounds and ounces).
3.7E				
Students are expected to use appropriate units and tools to determine liquid volume (capacity) in the customary and metric systems. Students may measure liquid volume (capacity). Students may measure weight. Students are expected to use appropriate units and tools to determine weight in the customary system. The metric units for mass (kilograms and grams) are not included in this SE as mass is not the same as weight (pounds and ounces).				

Student CFA Exemplar

CFA #1	CFA #2	CFA #3	

Suggested Manipulatives

HISD Problem Solving Model	Measuring Tape	Capacity Containers	Centimeter Cubes	Weights
Rulers	Clocks	Balance Scales	Centimeter Grid Paper	

Additional Resources

Literature Connections:	Literature [listed in alpha order by author]			
Implementing TRS:	Area & Perimeter	Time	Capacity & Weight	Measurable Attributes of Geometric Figures (Area & Perimeter)
	Perimeter	Application of Multiplication & Division (Area)		
TexGuide:	Measurement	Measurable Attributes of Geometric Figures		

Ongoing Concepts & Instructional Connections

Relate to the real world by bringing in recipes, objects from home, etc..
--Explore the Metric and Customary systems of measurement
Revisit perimeter and area
--Number sentences for finding the unknown
Measure items around the classroom and graph them
Revisit how clocks relate to fractions in relationship to the whole hour

Unit 08: Data Analysis

Unit Misconceptions & Underdeveloped Concepts

Misconceptions:
Some students may think any type of display can be used for a set of data rather than recognizing that different types of graphs communicate different aspects of the data.
Some students may incorrectly analyze the data on a graph by interpreting a graph based on the size of the representations rather than what is revealed using the scale or the length of the axis.

Underdeveloped Concepts:
Some students may not understand that the type of graph they choose can impact the visual message of their data.
Some students may have difficulty with pictographs or other graphs in which each picture or symbol stands for more than one object.

Vertical Alignment- 3.8A

K	1	2	3	4
K.8B Use data to create real-object and picture graphs.	1.8B Use data to create picture and bar-type graphs.	2.10B Organize a collection of data with up to four categories using pictographs and bar graphs with intervals of one or more.	**3.8A Summarize a data set with multiple categories using a frequency table, dot plot, pictograph, or bar graph with scaled intervals.**	4.9A Represent data on a frequency table, dot plot, or stem-and-leaf plot marked with whole numbers and fractions.

Supporting Information

3.8A	3.8B			
A frequency table shows how often an item, a number, or a range of numbers occurs. Tally marks and counts may be used to record frequencies. Students begin work with frequency tables in grade 3. This builds upon 1(8)(A) where students collect, sort, and organize data in up to three categories using models/representations such as tally marks or T-charts. A dot plot may be used to represent frequencies. A number line may be used for counts related numbers. A line labeled with categories may be used as well if the context requires. Dots are recorded vertically above the number line to indicate frequencies. Dots may represent one count or multiple counts if so noted.	Students begin work with pictographs in grade K and bar graphs in grade 1. Students begin work with frequency tables and dot plots in grade 3. This SE builds upon 2(10)(C), where students solve one-step problems with intervals of one.			

Student CFA Exemplar

CFA #1	

Suggested Manipulatives

HISD Problem Solving Model	Color Tiles	Snap Cubes	Centimeter Grid Paper	

Additional Resources

Literature Connections:	Literature [listed in alpha order by author]			
Implementing TRS:	Data Analysis	All Operations- Data Focus	Essential Operational Understandings #1	
TexGuide:	Data Analysis			

Ongoing Concepts & Instructional Connections

Have students sort 2D & 3D shapes and then graph
Connect graphing to the real world (weather, voting, surveys, etc..)
Revisit any graphs created with students

Updated 06/06/2022

Unit 09: Personal Financial Literacy - NO ESSENTIAL STANDARDS in this unit

Unit Misconceptions & Underdeveloped Concepts
None identified

Supporting Information				
3.4C	**3.9A**	**3.9B**	**3.9C**	**3.9D**
Building upon 2(5)(A) and 2(5)(B), students may be asked to record the value of a collection of coins using a cent symbol or a dollar sign with a decimal.	This SE relates work with income, including the relationship of both education and effort to income on the individual level and the relationship between the number of people working together and the amount of product/income created. Human capital can be on the individual level, including the skills, abilities, and characteristics in which an individual can provide benefit to his employer or the marketplace at large.	This SE relates a fundamental rule of economics: The rarer an object is, the more expensive it tends to be. The more common an object is, the less expensive it is.	This SE builds upon 2(11)(B), where students are expected to explain that saving is an alternative to spending.	This SE builds to 4(10)(C), where students compare the advantages and disadvantages of various saving options; 5(10)(C), where students identify advantages and disadvantages of different methods of payment; and the discussion of credit in grade 6.
3.9E	**3.9F**			
Specificity is expected through a list of reasons to save and students being able to explain the benefits of saving. This can be used in conjunction with 3(9)(A) as saving for college may improve an individual's skills, abilities, and characteristics. Students are not expected to calculate the savings at this level.	This SE builds upon 1(9)(D) where students are first asked to consider charitable giving.			

Suggested Manipulatives		
HISD Problem Solving Model	Play Money	

Additional Resources		
Literature Connections:	Literature [listed in alpha order by author]	
Implementing TRS:	Personal Financial Literacy	
TexGuide:	Personal Financial Literacy	

Ongoing Concepts & Instructional Connections
Ongoing classroom economy tied to activities Classroom store

Updated 06/06/2022

Unit 10: Putting It All Together- SEE PREVIOUS UNITS				
				Updated 06/06/2022