

 PRINCETON <small>INDEPENDENT SCHOOL DISTRICT</small>		Campus: Harper/Smith/Lacy/Godwin/Lowe	
Author(s): Elsbury, Garlington, Stovall, Eaton, Warren, Venters		Date Created / Revised: July 30, 2020	
Six Weeks Period: 3rd		Grade Level & Course: 5 th grade math	
Timeline: 5 days		Unit Title: Dividing decimal	Week 4
Stated Objectives: TEK # and SE	<p style="text-align: center;">Problem Solving/Processing Standards</p> <p>5.1 (A) apply mathematics to problems arising in everyday life, society, and the workplace; 5.1(B) use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution; 5.1(C) select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems; 5.1(D) communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate; 5.1(E) create and use representations to organize, record, and communicate mathematical ideas; 5.1(F) analyze mathematical relationships to connect and communicate mathematical ideas; and 5.1(G) display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.</p> <p style="text-align: center;">Skills</p> <p>5.4(C) generate a numerical pattern when given a rule in the form $y = ax$ or $y = x + a$ and graph 5.4(D) recognize the difference between additive and multiplicative numerical patterns given in a table or graph</p> <p style="text-align: center;">Review</p> <p>5.4(F) simplify numerical expressions that do not involve exponents, including up to two levels of grouping 5.4(E) describe the meaning of parentheses and brackets in a numeric expression</p> <p style="text-align: center;">Concept</p> <p>5.3(G) Solve for the quotients of decimals to the hundredths up to four digit dividends and two digit whole number divisors, using strategies and algorithms, including the standard algorithm 5.3(F) Represent quotients of decimals to the hundredths, up to four digit dividends and two digit whole number divisors, using objects and pictorial models including area models.</p>		
See Instructional Focus Document (IFD) for TEK Specificity			
Key Understandings	<p>Students develop understanding of why division procedures work based on the meaning of base-ten numerals and properties of operations. They finalize fluency with multi-digit addition, subtraction, multiplication, and division. They apply their understandings of models for decimals, decimal notation, and properties of operations to add and subtract decimals to hundredths. They develop fluency in these computations, and make reasonable estimates of their results. Students use the relationship between decimals and fractions, as well as the relationship between finite decimals and whole numbers (i.e., a finite decimal multiplied by an appropriate power of 10 is a whole number), to understand and explain why the procedures for multiplying and dividing finite decimals make sense. They compute products and quotients of decimals to hundredths efficiently and accurately.</p>		

<p>Misconceptions</p>	<ul style="list-style-type: none"> • Some students may oversimplify dividing by 10 to mean “move the decimal point to the left” rather than understand the multiplicative nature of 10s in the place value system or the magnitude of making a number 10 times smaller. • When using the standard algorithm for multiplying, some students may forget to place a zero in the second partial product to hold the number of tens by simply using the digits and not paying attention to place value (e.g., when multiplying 35 and 26, students correctly multiply 6 and 35 to make a partial product of 210, then use the 2 instead of 20 to multiply by 35 to make a partial product of 70 and not 700.). • When students work through the standard algorithm procedures, students may use whole number concepts to multiply, but then not know where to place the decimal (e.g., 2.7×15 becomes $27 \times 15 = 405$ and now student is not sure where the decimal should be placed to compensate for thinking 2.7 as a whole number). • Some students may think that area models are not related to standard algorithms rather than realizing that area models are a visual representation of multiplication and division and can be used to show the partial products or quotients produced through standard algorithms. • Some students may think that the most efficient way to break up an area model into chunks (distributive property) is to break it up by place value rather than thinking about the numbers and then determining the most efficient way to solve from a variety of strategies (e.g., when multiplying 1.25 by 13 by place value using an area model, the dimensions would become $(1 + 0.2 + 0.05)$ and $(10 + 3)$ which would create six partial products $(1 \times 10) + (0.20 \times 10) + (0.05 \times 10) + (1 \times 3) + (0.20 \times 3) + (0.05 \times 3) = 10 + 2 + 0.5 + 3 + 0.60 + 0.15 = 16.25$; rather than possibly breaking it up in fewer partial products such as $(1.25 \times 10) + (1.25 \times 3) = 12.50 + 3.75 = 16.25$ or $(10 \times 0.25) + (3 \times 0.25) + (13 \times 1) = 2.50 + 0.75 + 13 = 16.25$). • Some students may think that the standard algorithm is always the most efficient way to solve a multiplication or division problem rather than thinking about the numbers and then determining the most efficient way to solve from a variety of strategies (e.g. when multiplying 3.5 by 12 a student could think about multiplying $(3.5 \times 10) + (3.5 \times 2) = 35 + 7 = 42$, or using the associative property to double and half, such as doubling 3.5 to make 7 and halving 12 to make 6, then using a basic fact to solve 7 times; $6 \times 7 = 42$). • Some students may think the dividend always goes on the left side of a division sentence rather than understanding where to place the dividend and divisor based on the symbol being used. • Some students may think that rounding is the only way to make an estimate rather than understanding that there are multiple ways to determine an estimate. • Some students may think that rounding and estimating are the same skill rather than rounding as one way to make the numbers friendly in order to compute and determine a reasonable estimate. • Some students may be able to perform a symbolic procedure for decimal multiplication or division with limited understanding of the multiplication or division concepts involved.
<p>Key Vocabulary</p>	<ul style="list-style-type: none"> • Associative property of multiplication – if three or more factors are multiplied, they can be grouped in any order, and the product will remain the same; $a \times b \times c = (a \times b) \times c = a \times (b \times c)$ • Commutative property of multiplication – if the order of the factors are changed, the product will remain the same; $a \times b = c$; therefore, $b \times a = c$ • Compatible numbers – a method for estimating a group of numbers by slightly adjusting some or all of the numbers to allow for easy mental computation • Compensation – a method for adjusting an estimate to draw closer to an exact calculation • Counting (natural) numbers – the set of positive numbers that begins at one and increases by increments of one each time $\{1, 2, 3, \dots, n\}$

	<ul style="list-style-type: none"> • Decimal number – a number in the base-10 place value system used to represent a quantity that may include part of a whole and is recorded with a decimal point separating the whole from the part • Distributive property of multiplication – if multiplying a number by a sum of numbers, the product will be the same as multiplying the number by each addend and then adding the products together; $a \times (b + c) = (a \times b) + (a \times c)$ • Dividend – the number that is being divided • Divisor – the number the dividend is being divided by • Estimation – reasoning to determine an approximate value • Expression – a mathematical phrase, with no equal sign or comparison symbol, that may contain a number(s), an unknown(s), and/or an operator(s) • Factor – a number multiplied by another number to find a product • Front-end method – a method for estimating a number in which the first digit of a number is retained and all remaining digits are changed to zero • Grouping symbols – symbols to show a group of terms and/or expressions within a mathematical expression • Order of operations – the rules of which calculations are performed first when simplifying an expression • Product – the total when two or more factors are multiplied • Quotient – the size or measure of each group or the number of groups when the dividend is divided by the divisor • Rounding – a method for estimating a number by increasing or retaining a specific place value digit according to specific rules and changing all trailing digits to zero • Whole numbers – the set of counting (natural) numbers and zero $\{0, 1, 2, 3, \dots, n\}$ 	
Suggested Day 5E Model	Instructional Procedures (Engage, Explore, Explain, Extend/Elaborate, Evaluate)	Materials, Resources, Notes
<i>Day 1- Engage/ Explore</i>	Warm-Up (2 problem solving problems) Skills: numerical relationships – number pairs Review: interpreting expressions Concept: decimals divided whole number	From Sharon Wells Curriculum <ul style="list-style-type: none"> • Warm up • Skills • Review • Fraction Division
<i>Day 2 – Explain/ Extend</i>	Warm-Up (2 problem solving problems) Skills: practice Review: numerical expressions practice Concept: decimal dividing decimal	From Sharon Wells Curriculum <ul style="list-style-type: none"> • Warm up • Skills • Review Concept: decimal dividing decimal
<i>Day 3 - Extend</i>	Warm-Up (2 problem solving problems) Skills: numerical tables/expressions Review: solving numerical expressions Concept: : dividing decimals	From Sharon Wells Curriculum <ul style="list-style-type: none"> • Warm up • Skills • Review • Concept: dividing decimals
<i>Day 4 –Extend</i>	Warm-Up (2 problem solving problems)	From Sharon Wells Curriculum

	Skills: relationships/tables Review: practice Concept: dividing decimals	<ul style="list-style-type: none"> ● Warm up ● Skills ● Review ● Concept: dividing decimals
Day 5 - Evaluate	<p>The teacher and students will go over the Week Two test taking skills questions with students and answer any student's questions. The students will then be given an assessment to complete independently to check their mastery of the skills taught throughout the week.</p>	<ul style="list-style-type: none"> ● Week 4 Assessment

Accommodations for Special Populations	Accommodations for instruction will be provided as stated on each student's (IEP) Individual Education Plan for special education, 504, at risk, and ESL/Bilingual.
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