**UNIT TITLE:** Multi-Digit Whole Number and Decimal Fraction Operations  
**Grade:** 5  
**Time:** 6 wks

**Common Core Standards:** OA.1, OA.2, NBT.1, NBT.2, NBT.5, NBT.6, NBT.7, MD.1

**Mathematical Practices:** MP1, MP2, MP7, MP8

<table>
<thead>
<tr>
<th>CCSS Unpacked</th>
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<tbody>
<tr>
<td><strong>Know (Level 2)</strong></td>
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</table>
| **Vocabulary & terms** | -expressions  
-product, quotient, divisor, dividend, remainder,  
multiple factor, thousandths, exponents,  
millimeter, equations,  
bundling/unbundling, renaming, braces,  
brackets  
Known terms:  
-cm, tenths, hundredths, place value, base 10 units, standard form, digit, expanded form, unit form, word form, greater/less than, regrouping, trading, exchange, estimate, decimal,  
-equations  
-order of operations  
-place value, exponents, decimals  
-patterns in the placement of decimal point  
-relative sizes of measurement units including distances, intervals of time, liquid volumes, masses of objects and money  
-addition, subtraction, multiplication and division of whole numbers |  
| **Assessments** | **Assessments** | **Assessments** |
| Vocabulary graphic organizer  
Vocabulary quiz  
Speaking/listening checklist  
Fluency check/sprint | Concept Development worksheet  
Exit tickets  
Homework (formative) | Pre/post unit assessment  
Mid-module assessment |

### Multi-Digit Whole Number and Decimal Operations

| 4 | I can...  
Apply multi-digit whole number and decimal operations to the real world |
|---|---|

| 3 | I can....  
A. Write and interpret numerical expressions  
B. Understand the place value system, including using whole number exponents to denote powers of 10  
C. Perform operations with multi-digit whole numbers and explain the reasoning used  
D. Perform operations with decimals to hundredths and explain the reasoning used  
E. Use conversions to solve multi-step word problems |
|---|---|

CCSS Mathematics Unit
<table>
<thead>
<tr>
<th></th>
<th>I can....</th>
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<tbody>
<tr>
<td>2</td>
<td>A. Evaluate expressions</td>
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<td></td>
<td>B. Describe the value of digits in a multi-digit number</td>
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<td>C. Perform operations with multi-digit whole numbers</td>
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<td>D. Perform operations with decimals to hundredths</td>
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<td>E. Convert among different sized measurement units</td>
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<thead>
<tr>
<th></th>
<th>With teacher help, I can....</th>
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<tbody>
<tr>
<td>1</td>
<td>A. Evaluate expressions</td>
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**Major Unit Objectives**
1. Write and interpret numerical expressions
2. Understand the place value system
3. Perform operations with multi-digit whole numbers and with decimals to hundredths
4. Convert like measurement units within a given measurement system

**Models/Tools:** Area models (array), number bond (fact family), number disks (base ten blocks)
<table>
<thead>
<tr>
<th>Instruction</th>
<th>Strategies Addressing Content (how will you help students):</th>
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</table>
| **Mental Strategies for Multi-Digit Whole Number Multiplication**  
Lesson 1: Multiply multi-digit whole numbers and multiples of 10 using place value patterns and the distributive and associative properties.  
Lesson 2: Estimate multi-digit products by rounding factors to a basic fact and using place value patterns.  
**The Standard Algorithm for Multi-Digit Whole Number Multiplication**  
Lesson 3: Write and interpret numerical expressions and compare expressions using a visual model.  
Lesson 4: Convert numerical expressions into unit form as a mental strategy for multi-digit multiplications.  
Lesson 5: Connect visual models and the distributive property to partial products of the standard algorithm without renaming.  
Lesson 6: Connect area diagrams and the distributive property to partial products of the standard algorithm without renaming.  
Lesson 7: Connect area diagrams and the distributive property to partial products of the standard algorithm without renaming.  
Lesson 8: Fluently multiply multi-digit whole numbers using the standard algorithm and using estimation to check for reasonableness of the product.  
Lesson 9: Fluently multiply multi-digit whole numbers using the standard algorithm to solve multi-step word problems.  
**Decimal Multi-Digit Multiplication**  
Lesson 10: Multiply decimal fractions with tenths by multi-digit whole numbers using place value understanding to record partial products.  
Lesson 11: Multiply decimal fractions by multi-digit whole numbers through conversion to a whole number problem and reasoning about the placement of the decimal.  
Lesson 12: Reason about the product of a whole number and a decimal with hundredths using place value understanding and estimation.  
**Measurement Word Problems with Whole Number and Decimal Multiplication**  
Lesson 13: Use whole number multiplication to express equivalent measurements.  
Lesson 14: Use decimal multiplication to express equivalent measurements.  
Lesson 15: Solve two-step word problems involving measurement and multi-digit multiplication.  
**Mental Strategies for Multi-Digit Whole Number Division**  
Lesson 16: Use divide by 10 patterns for multi-digit whole number division.  
Lesson 17-18: Use basic facts to approximate quotients with two-digit divisors.  
**Partial Quotients and Multi-Digit Whole Number Division**  
Lesson 19: Divide two- and three-digit dividends by multiples of 10 with single-digit quotients and make connections to a written method.  
Lesson 20: Divide two- and three-digit dividends with single-digit quotients and make connections to a written method.  
Lesson 21: Divide two- and three-digit dividends by two-digit divisors with single-digit quotients and make connections to a written method.  
Lesson 22-23: Divide three- and four-digit dividends by two-digit divisors resulting in two- and three-digit quotients, reasoning about the decomposition of successive remainders in each place value.  
**Partial Quotients and Multi-Digit Division**  
Lesson 24: Divide decimal dividends by multiples of 10, reasoning about the placement of the decimal point and making connections to a written method. |

**DQ2**  
Process – turn and talk, act out  
Elaborate – “what do you think if ____ happened” (it’s not important to be correct here)  
Record – recording their thinking (numbers, words, and pictures) – share with each other  
Reflect – spend time thinking about what they still have questions about (exit slip)  

**DQ3**  
Introduction Similarities & Differences- Students describe how elements are similar and different and what new information they have learned as a result of their comparison.  
Examine errors- students can look at what they have learned and find their errors in their reasoning.  
Practice – with fluency opportunities  

**DQ4**  
Generate hypotheses- Engage in complex tasks – real world applications, problem solving, decision making, investigating, inquiring (make a guess, act, draw conclusions, compare to original thinking/guess).
| **Lesson 25:** Use basic facts to approximate decimal quotients with two-digit divisors, reasoning about the placement of the decimal point. |
| **Lessons 26-27:** Divide decimal dividends by two-digit divisors, estimating quotients, reasoning about the placement of the decimal point, and making connections to a written method. |

**Measurement Word Problems with Multi-Digit Division**

Lessons 28-29: Solve division word problems involving multi-digit division with group size unknown and the number of groups unknown.

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**Subject to change per teacher discretion**