Winchester Math Curriculum Grade 2

Subject	Mathematics
Grade/Course	Grade Two
Unit of Study	Unit 5- Place Value to One Thousand
Pacing	February
Unit Summary	Second graders will solidify their understanding of place value to 1,000. Using a variety of manipulatives, students create and count bundles in 10s and 100s. They practice adding and subtracting in multiples of 10 and 100, both on and off the decade. The sessions that focus explicitly on money contents provide opportunities for students to count by 5s, 10s, and consider 25 cents or a quarter as a unit. The final module in the unit is algebraic by nature, encouraging the students to observe and describe sequence as they search for patterns and generalizations that will enable them to build and represent succeeding arguments in those sequences.

Overarching Mathematical Practices

2.MP.1 Make sense of problems and persevere in solving them.
2.MP.2 Reason abstractly and quantitatively.
2.MP.3 Construct viable arguments and critique the reasoning of others.
2.MP.4 Model with mathematics.
2.MP.5 Use appropriate tools strategically.
2.MP.6 Attend to precision.
2.MP.7 Look for and make use of structure.
2.MP.8 Look for and express regularity in repeated reasoning.

Unit CT Core Content Standards

2.OA.C.3- Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.
2.NBT.A.1- Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones.
2.NBT.A.1.A
100 can be thought of as a bundle of ten tens — called a "hundred."
2.NBT.A.1.B
The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).
2.NBT.A.2- Count within 1000; skip-count by 5s, 10s, and 100s.
2.NBT.A.3- Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.
2.NBT.A.4- Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, =, and < symbols to record the results of comparisons.
2.NBT.B.7- Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.

2.NBT.B.8- Mentally add 10 or 100 to a given number 100-900, and mentally subtract 10 or 100 from a given number 100-900.
2.MD.A.4- Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.
2.MD.B.5- Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem.
2.MD.B.6- Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, ..., and represent whole-number sums and differences within 100 on a number line diagram.
2.MD.C.8- Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately. Example: if you have 2 dimes and 3 pennies, how many cents do you have?
2.MD.D..10- Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph.

"Unwrapped" Standards	
Skills	**Content**
Determine	whether a group of objects is odd or even by pairing objects and counting by 2s.
Understand	● that three digits of a three-digit number represent amounts of hundreds, tens, and ones ● 100 can be thought of as a bundle of ten tens ● 100, 200, 300, 400, 500, 600, 700, 800, 900 as a hundreds with 0 tens and 0 ones ● adding or subtracting three-digit numbers, one adds and subtracts hundreds and hundreds, tens and tens, and ones and ones ● it is sometimes necessary to compose and decompose when adding or subtracting multi-digit numbers
Count	within 1000, by 5s, 10s, and 100s
Read and write	numbers to 1000
Compare	two three-digit numbers using >, =, <
Add and subtract	within 1000 using concrete models and strategies
Relate	strategies to written method of computation
Mentally add or subtract	10 or 100 from a given number 100 - 900
Measure	to determine how much longer one object is than another
Express	length difference in terms of standard length units
Use	addition and subtraction within 100 to solve word problems involving lengths
Represent	● whole numbers as lengths from 0 on a number line with equally spaced points

	● whole number sums and differences within 100 on a number line
Essential Questions	**Corresponding Big Ideas**
1. How does the place value system work?	1. A place value system is one in which the position of a digit in a number determines its value. In the standard system, called base ten, each place represents ten times the value of the place to its right. You can think of this as making groups of ten of the smaller unit and combining them to make a new unit.
2. How does understanding place value help us to compare, order, and compute whole numbers?	2. Place value is the basis for our entire base ten number system and important to all mathematics. Understanding the meaning of place value and its appropriate use promotes accurate understanding of the position of digits, their value and how to manipulate them appropriately for accurate and efficient computation.
3. How do we measure money?	3. Money is measured in standard units of cents and dollars. The increments are made up of pennies, nickels, dimes, quarters, dollars, five dollars, ten dollars, etc..

Evidence of Learning - Assessment

Pre/Post Assessment	Interim Assessment	Additional Evidence of Learning
● Unit 5 Pre-Assessment - Module 1, Session 1 ● Unit 5 Post-Assessment - Module 3, Session 5	● Three-Digit Numbers Checkpoint - M1, S5 ● Money Checkpoint - M2, S6	Options Exit tickets Observational Assessments ● Jump A Ten - M1, S5 ● Close to 25¢ - M2, S2 ● Beat You to $1.00 - M2, S3 ● Three Spins to Win - M2, S6 ● Jump A Hundred - M3, S5

Smarter Balanced Interim Assessment

Smarter Balanced General Scoring Rubrics - 4 Rubrics included - Score Pt 4 to Score Pt 1

· **Smarter Balanced Interim Blocks**

· Interim assessment blocks may be used for a variety of assessment purposes, including: pre/post, interim and formative (additional evidence of learning).

· The Style Guide, which aligns with the expectations of Smarter Balanced Assessments, will support the creation of unit- and standard-aligned items for instructional use.

Interim Assessment Block - access through CSDE Assessment Portal

· The items on the interim assessments are developed under the same conditions, protocols, and review procedures as those used in the summative assessments. Therefore, they assess the same Common Core State Standards, adhere to the same principles of Universal Design in order to be accessible to all students, and provide evidence to support Smarter Balanced claims in mathematics and ELA/literacy. The interim assessment items are non-secure but non-public. This means that educators may view the items, however, they should not be made public outside of classroom, school or district.

Learning Plan

Researched-based Instructional Resources and Methods

Sequence of Instruction:
Number Talk/Number Corner⟶ Problem + Investigations⟶Work Places⟶Home Connections

Bridges Number Corner: The focus areas for Number Corner aligned to Unit 5 are:
Fractions
- half
- more than half
- less than half
- story problems

Measurement
- Telling time to the nearest 5 minutes

Addition
- Two-digit numbers
- Using base ten area pieces
- Sharing strategies and solutions
- Facts to 20

Bridges- Whole Group, Small Group, and Independent Problem Center Activities

Module 1	Module 2	Module 3	Module 4
Problem + Investigation ● Sessions 1-4 Work Place ● Sessions 1, 2, 4, 5 Assessment ● Sessions 1, 5 Home Connection	Problem + Investigation ● Sessions 1, 4, 5 Work Place ● Sessions 2-6 Assessment ● Session 6 Home Connection ● Sessions 2, 4, 6	Problem + Investigation ● Sessions 1-4 Work Place ● Sessions 2-5 Assessment ● Session 5 Home Connection ● Session 2, 4	Problem + Investigation ● Sessions 1-4 Work Place ● Sessions 1-4 Home Connection ● Session 1, 3

• Session 1, 3, 5			

Possible Misconceptions	Teacher Moves
1. Watch for students who reverse digits.	1. These students need additional opportunities to decompose numbers into groups of hundreds, tens and ones and put them in the correct place on a place value chart. Describing the number in terms of hundreds, tens and ones should be followed by writing the numeral below the concrete representation.
2. Some students may count hundreds, tens, and ones separately. For example, 100, 200, 300… 10, 20…, 1, 2,3… rather than counting as 300, 20, 3...323.	2. These students need additional practice relating the representation or picture to the accurate word name for the number.
3. Students having trouble counting within 1,000.	3. Provide more experiences counting on with concrete, pictorial, and number line representations. Begin with lesser numbers in the range of 100 - 200. Point out the patterns in the ones and tens places. Watch for students who confuse the next number in the tens place. For example, counting 127, 128, 129,...1?? An extended hundreds chart with counts from 100 - 200 will also be helpful.
4. Watch for students who do not have the conceptual understanding that the place in which a digit is located determines the value of that digit. For example, a student reads 134 as one hundred thirty four, but when writing it in expanded for writes 1 + 3 + 4, or when asked the value of each digit responds that the values are 1, 3, and 4.	4. Provide these students with expanded numeral cards, including hundreds, tens and ones, and place those cards in appropriate places under the physical models on the place value chart.
5. Some students may become confused with 0 as a place that contains no objects such as 408 or 480.	5. These students need more experience placing numeral cards below the appropriate place using physical models on the place value chart. Be sure to include multiple examples that have 0 items in the tens and/or ones place.
6. Student who do not know basic facts may be inaccurate in computation.	6. Although those students should continue to work on facts, physical models will help in accurate addition and subtraction. Be sure that all students have ample experience with adding physical models on

	place value charts, using benchmark numbers (hundreds, tens, ones) on an open number line. Make explicit connections from physical models and strategies to written formats.
7. Although regrouping (composing hundreds from tens and tens from ones) when adding two three-digit numbers and (decomposing from hundreds to tens and from tens to ones) when subtracting two three-digit numbers.	7. It is appropriate for students to use physical models for these examples and explain their reasoning. Explicit connections to written equations will help students make the transition from concrete to pictorial representations to symbolic notations.
8. Second graders should see the pattern of adding (or subtracting) 1 to the digit in the tens place when adding (or subtracting) 10. A similar pattern of adding (or subtracting) 1 to the digit in the hundreds place occurs when adding (or subtracting) 100. Students may find this confusing when they are adding 10 to numbers that have the digit 9 in the tens place or subtracting 10 from numbers that have the digit 0 in the tens place.	8. Using a number line or portions of a hundreds chart will help students to visualize what happens when they are working with these numbers. If necessary, composing (to add) and decomposing (to subtract) with concrete materials will also help students to understand the concept.
9. When counting coins, some second graders may ignore the coins' values and want to count each coin as an individual object, such as a dime and a penny are two coins. These students may not think about the coins value of 11 cents. Some students may believe the value of a coin is directly related to size, such as the nickel is bigger than the dime and is worth more, or a penny is bigger than a dime, so it must be worth more.	9. To address these misconceptions, students may use a hundreds chart and coins. For example, using and penny and a dime, have the students place a dime on the ten spot of a hundreds chart and the penny next to the dime on the chart to represent one more than a dime or 11 cents.
10. Another misconception occurs when some students may inappropriately use the $ symbol such as 39$.	10. Through discussion about the symbols, students can learn to use the symbols correctly.

Vocabulary and Representations	
Tier 2 (Academic Vocabulary)	**Tier 3 (Domain Specific Vocabulary)**
arrangement cent (¢) compare digit* dime distance	decimal point equation* even hundred (s*) odd number ones*

dollar equal fair greater than* growing pattern height length* less than* measure* nickel pattern* penny quarter repeating pattern sequence weight*	place value ten (s)* thousand (s)* *Smarter Balanced Vocabulary is focused on major mathematical concepts. (Not all possible words have been identified by SBAC) + Students are not responsible for these vocabulary words at this grade level, however they should have some understanding of the mathematical concept.

Mathematics Teaching Practice Resources

1. **Bridges** - Reference Math Practices in Action Notes - The notes identify how particular mathematical practice is employed in a specific activity.
2. Select additional instructional resources from the resources tab in Bridges units.
3. **Math Practices Teacher Question Starters**
4. **Implementing the Standards of Mathematics Practice**
5. Illustrating the Standards of Mathematical Practice
6. Grade 2 - Standards + Practices - Explanations and Examples
7. Exploring the Math Practice Standard: Precision
8. Number Talks Matter - Number Talks at a Glance and Fluency without Fear
9. Illustrative Math – Grade 2 - Resources and activities for grade 2 aligned by standard.
10. Journal Prompts for Math
11. Bridges Interactive Math Manipulatives
12. The Progression of Addition and Subtraction
13. Accountable Talk Moves
14. Contribution Checklist
15. Sentence Frames that Can Build Metacognitive Thinking
16. Sample Language Frames for Mathematics
17. Teacher/Student Actions
18. Fletcher Three Act Tasks
19. Learn Zillion Grade 2:
    - Understand the Value of Digits using Pictures
    - Model and Write Numbers using Base Ten Blocks
    - Write Three-Digit Numbers in Expanded Form by Understanding the Value of Each Digit
    - Convert Expanded Form into Standard Form by Understanding the Value of Each Digit
    - Lots of Candy: Connected Solution Paths
    - Add Three-Digit Numbers with Base Ten Blocks
    - Count Money by Drawing Pictures
20. K-5 Math Teaching Resources
    - What Has The Greater Value?
    - A Quarter From the Tooth Fairy

- Three-Digit Addition Split

Suggestions for Differentiation, Scaffolding and Intervention

Differentiation or Intervention

Any teacher moves/strategies that address misconceptions can be used in differentiation or as interventions.

Math Teaching Practice Resources contain resources that provide opportunities for differentiation, intervention, or extension aligned to the strategies below.

- How to Select Math Intervention Content
- Coherence Map in Math – The coherence map shows how standards within and across grades build upon each other. You can use the map to assist you in to build student understanding by linking together concepts within and across grades and identify gaps in a student's knowledge by tracing a standard back through its logical prerequisites.
- CT Dept. of Education Evidence-based Practice Guides – These guides provide links to "evidence-based activities, strategies and interventions (collectively referred to as 'interventions')."
- Evidenced-based strategies for supporting struggling students (U.S. Dept. of Education – What Works Clearinghouse)
- Ensure instructional materials are systematic and explicit. In particular, they should include numerous clear models of easy and difficult problems, with accompanying teacher think alouds.
- Provide students with opportunities to solve problems in a group and communicate problem-solving strategies.
- Teach students about the structures of various problem types, how to categorize problems based on structure, and how to determine appropriate solutions for each problem type.
- Students should work with visual representations of mathematical ideas.
- If visual representations are not sufficient for developing accurate abstract thought and answers, use concrete manipulative first. (Include the next line for middle school and older students only) Although this can also be done with students in upper elementary and middle school grades, use of manipulatives with older students should be expeditious because the goal is to move toward understanding of and facility with visual representations and finally to the abstract.
- Provide carefully constructed questions to help direct students in determining what to do to solve problems, but they shouldn't be told how to reach the solution.
- Instruction during the intervention should be explicit and systematic. This includes providing models of proficient problem solving, verbalization of thought processes, guided practice, corrective feedback, and frequent cumulative review.

Intervention for facts

- Provide about 10 minutes per session of instruction to build quick retrieval of basic arithmetic facts. Consider using technology, flashcards, and other materials for extensive practice to facilitate automatic retrieval.
- For students in K -2 explicitly teach strategies for efficient counting to improve the retrieval of mathematics facts.
- Teach students in grade 2-8 how to use their knowledge of properties, such as commutative, associative, and distributive to derive facts in their heads.
- How to Promote Acquisition of Math Facts – Intervention for struggling students
- National Center on Intensive Intervention - Basic Facts

- Once a strategy has been taught, it is important to reinforce it. The reinforcement or practice exercises should be varied in type and focus as much on the discussion of how students obtained their answers as on the answers themselves.
- Having students work in groups (as opposed to handing your bright students a workbook to work on when the classroom material isn't challenging enough) with other children ready for advanced material shows them that mathematics is not a solitary discipline -- mathematics is exciting and vibrant and creative and fun.
- Concrete, Representational, Abstract Progression

EL Strategies

- Colorin Colorado – A Bilingual site for educators and families of English learners
- Stanford University - Principles for Mathematics Instruction of ELs
- CT State Dept. Of Education English Learner Standards and Resources
- Nonverbal responses, such as thumbs up, will help you check for understanding without requiring students to produce language. ELLs can participate and show that they understand a concept, or agree or disagree with an idea, without having to talk. This is especially important for students whose comprehension of English is more advanced than their ability to speak the language.
- Pre-teach vocabulary in ways that connect to students' prior knowledge.
- Display posters of graphic representations of vocabulary words.
- http://www.cal.org/siop/lesson-plans/
- Provide support to assist in explaining thinking with sentence starters and work banks.
- Use Work Place Sentence Frames or other sentence frames to assist students in math discourse.
- Speak slowly and use clear articulation. Reduce the amount of teacher talk and use a variety of words for the same idea. Exaggerate intonation and place more stress on important new concepts or questions. After asking a question, wait for a few moments before calling on a volunteer. Writing the question on the board will also help.
- English language learners are not always able to answer the questions posed to them, especially when the questions are open-ended. Provide support for and improve the participation of students with lower levels of English proficiency by using a prompt that requires a physical response, like "Show me a half, a third, etc.." or "Touch the larger number."
- Increase academic language knowledge for English learner success.

Extensions

- Extension activities aligned with Bridges lessons are included in each module
- Explanations Simply Stated - Students choose a three digit addition or subtraction problem to solve and develop and share an explanation about their process.
- Students who have developed their understanding of the amount of coins and counting coins can be provided given written amounts of money and make collections of coins and dollars that total to given amounts.

Interdisciplinary Connections

Children's Literature * Bridges recommended titles - # Titles embedded in Bridges Units

#*How Much, How Many, How Far, How Heavy, How Long, How Tall is 1000?* by Helen Nolan

**Pigs Will Be Pigs* by Amy Axelrod *A Quarter from the Tooth Fairy* by Carol Holtzman

Social Studies

*Wake Up, World! A Day in the Life of Children Around the World by Beatrice Hollyer (Number Corner)

- Provide historical background knowledge on the development of money in early America.

ELA

CCSS.ELA-LITERACY.SL.2.1

Participate in collaborative conversations with diverse partners about *grade 2 topics and texts* with peers and adults in small and larger groups.

CCSS.ELA-LITERACY.SL.2.1.A

Follow agreed-upon rules for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).

CCSS.ELA-LITERACY.SL.2.1.B

Build on others' talk in conversations by linking their comments to the remarks of others.

CCSS.ELA-LITERACY.SL.2.1.C

Ask for clarification and further explanation as needed about the topics and texts under discussion