Winchester Math Curriculum Grade 2

Subject	Mathematics
Grade/Course	Grade Two
Unit of Study	Unit 2- Place Value & Measurement with Jack's Beanstalks
Pacing	October
Unit Summary	Second graders move through counting and grouping discrete objects by place value, to measuring length with trains of unifix cubes, to creating their own measuring tapes marked in intervals of 5 and 10 cubes, and finally to adding double digit numbers on an open number line. Jack in the Beanstalk, with a few twists and turns, serves as a springboard for this mathematical journey.

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.A.1- Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

2.OA.B.2- Fluently add and subtract within 20 using mental strategies.2 By end of Grade 2, know from memory all sums of two one-digit numbers.

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.OA.C.4- Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of 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. Understand the following as special cases in 1a and 1b below.

2.NBT.A.1a - One hundred can be thought of as a bundle of ten tens - called a hundred.

2.NBT.A.1b - 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.5- Fluently add and subtract within 100 using strategies based on place value, properties of

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operations, and/or the relationship between addition and subtraction.
2.NBT.B.6- Add up to four two-digit numbers using strategies based on place value and properties of operations.
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.7- Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.

"Unwrapped" Standards	
Skills	**Content**
Use	- addition and subtraction within 100 to solve word problems, including those involving length. - a symbol to represent unknown number - addition to find the total number of objects in rectangular arrays >, =, < to record results of comparisons - strategies, including concrete models and drawings to add and subtract within 1000
Fluently add and subtract	- within 20 using mental strategies - within 100 using strategies
Determine	whether groups of objects have an odd or even number
Write	equations to express the total as a sum of equal addends that represent objects in arrays
Understand	- the three digits in a three digit number represent amounts of hundreds, tens and ones. 100 is a bundle of ten tens 100-900 are one - nine hundreds and 0 tens and 0 ones - adding and subtracting three-digit numbers, one adds or subtracts hundreds and

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	hundreds, tens and tens, and ones and ones ● sometimes it is necessary to compose and decompose tens or hundreds
Count	● within 1000 ● by 5's, 10's and 100's
Read and Write	numbers to 1000 using base ten numerals, number names, and expanded form
Compare	● two three-digit numbers based on meanings of the hundreds, tens, and ones digits
Relate	strategies used to add and subtract to a written method
Mentally add or subtract	10 or 100 to or from a given number 100 - 900
Measure	to determine how much longer one object is than another
Express	length in standard length unit
Represent	● whole numbers as lengths from 0 on a number line with equally spaced points ● whole-number sums and differences with in 100 on a number line
Tell and Write	time from analog and digital clocks to the nearest five minutes with a.m. and p.m.

Essential Questions	Corresponding Big Ideas
1. What are efficient methods for finding sums and differences? 2. How does the position of a digit in a number affect its value? 3. What types of problems are solved with measurement?	1. Flexible methods of computation involving grouping numbers in efficient and strategic ways. 2. Our numeric system is made up of ten digits 0-9. The value of each digit depends on its place in a number. In the base-10 number system, each place has a value that's 10 times the value of the place immediately to its right. For example, ones, tens, hundreds. 3. Measurement problems involving length, width, height, weight, etc. is used to solve problems in order to communicate precisely.

Evidence of Learning - Assessment		
Pre/Post Assessment	**Interim Assessment**	**Additional Evidence of Learning**
● Unit 2 Pre-Assessment - Module 1, Session 2 ● Unit 2 Post-Assessment - Module 3, Session 7 ● Number Corner Checkup 1	● Place Value Checkpoint - M2, S1 ● Measuring Checkpoint - M2, S4	Options: Exit tickets Observational Assessments ● Subtraction Wheel - M1, S5

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		● Number Line Race - M2, S1 ● Pick Two , Roll, and Subtract - M2, S4 ● Steps and Leaps - M3, S3

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 Blocks - 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 Corner→ Problem + Investigations→Work Places→Home Connections

Bridges Number Corner: The focus areas for Number Corner aligned to Unit 2 are:
Computation
- Review addition combinations for 10 and related subtraction facts
- Read, write, compare, and compute with 2- and 3-digit numbers
Number Sense
- Multiples of three and four - discover and describe patterns
- Make as many different rectangular arrays as possible with tiles
- Read, write, and compare numbers within 1000.
- Represent whole numbers on a number line
Measurement
- Telling time to 5-minute increments and reinforce the relationship between minutes and hours

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

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Module 1	Module 2	Module 3	Module 4
Problem + Investigation ● Sessions 1, 3, 4, 5, 6 Work Place ● Sessions 1-6 Assessment ● Session 2 Home Connection ● Sessions 1, 3, 5	Problem + Investigation ● Sessions 2, 3 Work Place ● Sessions 1-4 Assessment ● Sessions 2, 4 Home Connection ● Sessions 1, 3	Problem + Investigation ● Sessions 1-6 Work Place ● Sessions 1-7 Assessment ● Session 7 Home Connection ● Sessions 1, 3, 5, 7	Problem + Investigation ● Session 1 Work Place ● Sessions 1-3 Assessment ● Sessions 2, 3 Home Connection ● Session 2

Instructional Support

Possible Misconceptions	Teacher Moves
1. Watch for students who are making errors when working with concrete materials or objects as they begin to use more sophisticated strategies. Students may double count a number when adding or subtracting. Students may decompose a number to make a ten and then incorrectly add the original addend on to the 10.	1. The sooner such misconceptions are addressed through questions and use of concrete examples, the more likely the student is to self-correct with similar examples.
2. Students do not have to be fluent with all the mental strategies.	2. They should have many opportunities to practice, explain, and compare strategies. Using the strategies that make sense to them will help them to be ready for drill and practice opportunities to become fluent with facts.
3. Students may miscount the number of objects in the array.	3. Use arrays with smaller numbers (less than 10) gradually increasing the total number of items in the array.
4. Student may not think of a configuration with 1 row or 1 column as an array.	4. Be certain they have some experiences seeing and constructing arrays with 1 row and 1 column.
5. Some students may have difficulty with repeated addition.	5. Give students practice with skip counting and make connections to repeated addition.
6. Although students may correctly place concrete representations on the hundreds chart and be able to read the number represented accurately, they may become confused when writing the numeral since there are no objects in the tens or ones place, as in the number 405 or 450.	6. Provide students with numeral cards that include the digit 0 so that students can put the 0 in the tens place and ones place to represent that there are no objects in those places. This should help them transition between the concrete representation and the written numeral.

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7. Watch for students who reverse digits.	7. 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.
8. Observe students who may be counting hundreds, tens, and ones separately. For example, 100, 200, 300, then 10, 20, then 1, 2, 3, rather than counting as 300, 20,3...323.	8. These students need additional practice relating the representation or picture to the accurate word name for the number.
9. Students who have difficulty counting within 1,000.	9. These students need more experience counting with concrete, pictorial, and number line representations. Begin with lesser numbers in the range of 100-200. Point out patterns in the ones and tens places.
10. Watch for students who confuse the next number in the tens place. For example, counting 127, 128, 129….1?	10. An extended hundreds chart with counts from 100 to 200 will be helpful.
11. Watch for students who do not have conceptual understanding that the place in which a digit is located determines the value of that digit. For example, a student reads 134 correctly but when writing it in expanded form writes 1+3+4, or when asked the value of each digit, responds that the values are 1, 3, and 4.	11. 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.
12. Second grade students **do not need to have facility using the standard algorithm** adding and subtracting. Although some students may be ready to write equations, composing tens when regrouping in addition and decomposing tens when regrouping in subtracting may be challenging to other students.	12. They should focus their work on developing and using efficient strategies that make sense. Concrete representations, number lines, and hundreds charts will help students develop a deeper understanding of the process of regrouping than only following procedures.
13. Some students may think that the numbers of a ruler or yardstick are for counting the marks instead of the units or spaces between the marks. Some students might think that they can only measure lengths with a ruler starting at the left edge.	13. To address this engage students in discussions about measuring devices and demonstrate how to measure. Provide additional experiences for the students to use measuring devices correctly. Observe as students measure objects to determine specific measurement errors that may occur.
14. Some students may solve the problems by	14. To help them, provide additional work

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modeling the jumps by ones on the number line, which is a tedious process.	using a hundreds chart to show groups of objects by fives and tens. Model and provide experiences for students to jump, or hop, on the number lines by fives and/or tens.

Vocabulary and Representations

Tier 2 (Academic Vocabulary)	Tier 3 (Domain Specific Vocabulary)
add* compare estimate* greater than* hundreds* length less than* (fewer than)* pattern* ones* regroup* skip-jump tens*	addend* addition* array* equal* equation* number line* perimeter + subtract* subtraction* *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. **Math Practices Teacher Question Starters**
3. **Implementing the Standards of Mathematics Practice**
4. Illustrating the Standards of Mathematical Practice
5. Grade 2 - Standards + Practices - Explanations and Examples
6. Teacher/Student Actions
7. Exploring the Math Practice Standard: Precision
8. Number Talks Matter - Number Talks at a Glance and Fluency without Fear
9. How to Promote Acquisition of Math Facts – Intervention for struggling students
10. Beginning to Problem Solve with I Notice, I Wonder
11. The Progression of Addition and Subtraction
12. Addition and Subtraction Problem Types
13. Bridges Interactive Math Manipulatives
14. National Center on Intensive Intervention - Basic Facts
15. Accountable Talk Moves
16. Contribution Checklist

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17. [Sentence Frames that Can Build Metacognitive Thinking](#)
18. [Sample Language Frames for Mathematics](#)
19. [Illustrative Math – Grade 2](#) -Resources and activities for the grade aligned by standard.
20. [Fletcher Three Act Tasks](#)
21. Learn Zillion Grade 2:
    - [Understand the Value of Digits Using Pictures](#)
    - [Use Doubles to Add and Subtract within 20](#)
    - [Subtract within 20 using Ten-Frames](#)
    - [Model and Write Numbers using Base-Ten Blocks](#)
    - [Understanding the Value of Digits using Pictures](#)
    - [Identify and Extend a Pattern with Skip Counting](#)
    - [Write Three-Digit Numbers in Expanded Form by Understanding the Value of the Digits](#)
    - [Lots of Candy: Connected Solution Paths](#)
    - [Subtract Numbers within 100 using Base Ten Blocks](#)
    - [Decompose and Compose Numbers](#)

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.
- 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.

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- 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.
- Concrete, Representational, Abstract Progression

Intervention for facts
- How to Promote Acquisition of Math 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.
- 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.

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.

Extension
- Base Ten Riddles

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- Use Card Games, to Write Numbers in Standard, Expanded and Word Form
- Tell Time to the Nearest Five Minutes to Solve Problems
- Guinea Pig Homes: Find Length Differences by Adding and Subtracting
- Students can develop a number journal using various ways to record the numbers they find in their everyday lives.
- Students can figure out how many ways they can break up or decompose numbers.

Interdisciplinary Connections

Children's Literature - * Bridges recommended titles - # Titles embedded in Bridges Units
Great Estimations by Bruce Goldstone   *Inch by Inch* by Leo Lionni
Sir Cumference and All the King's Tens: A Math Adventure by Cindy Neuschwander
Is a Blue Whale the Biggest Thing There Is? by Robert E. Wells
Even Steven and Odd Todd by Kathryn Cristaldi   *Place Value* by David A. Adler
Equal Shmequal by Virginia Kroll

Science

Use counting and numbers to identify and describe patterns in the natural and designed world(s).

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