Winchester Math Curriculum Grade 1

Subject	Mathematics
Grade/Course	Grade One
Unit of Study	Unit 7 - One Hundred and Beyond
Pacing	April
Unit Summary	First graders continue to develop deep understandings of numbers to 120 as they estimate, count, compare, add, and subtract two-digit quantities using familiar models.

Overarching Mathematical Practices

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

Unit CT Core Content Standards

1.0A.A.2- Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

1.NBT.A.1- Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.

1.NBT.B.2- Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases:

1.NBT.B.2.a-

10 can be thought of as a bundle of ten ones — called a "ten."

1.NBT.B.2.b-

The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.

1.NBT.B.2.c-

The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).

1.NBT.A.3- Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.

1.NBT.C.4- Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, 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 and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.

1.NBT.C.5- Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.

1.NBT.C.6- Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), 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 and explain the reasoning used.

"Unwrapped" Standards

Skills	Content
Solve	Word problems - Table 1 - Problem Types
Use	● Objects, drawings, and equations ● Symbols for unknown number
Count	To 120 starting at any number less than 120
Read and write	Numerals to 120
Represent	Numbers of objects with a written numeral
Understand	● Two-digit numbers represent amounts of tens and ones ● Adding tens and tens and ones and ones ● Composing a ten when adding
Compare	● Two-digit numbers
Record	Results with symbols <, =, and >
Add	● Within 100 ● a two-digit and a one-digit number ● a two-digit number and a multiple of 10 ● using concrete models, drawing and strategies
Relate	Strategies to written method
Explain	Reasoning
Find	Mentally 10 more or 10 less than a two-digit number (without counting)
Subtract	Multiples of 10 in the range of 10-90

Essential Questions	Corresponding Big Ideas
1. How do models, pictures, and drawings help us understand numbers and values?	1. Physical tools/models and representations help to visualize, clarify and make meaning of numbers and values.
2. How does the place value system work?	2. 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.
3. How can numbers be expressed, ordered and compared?	3. Numbers can be expressed, ordered and compared by mathematical principles, properties, and/or models.

Evidence of Learning - Assessment

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Pre/Post Assessment	Interim Assessment	Additional Evidence of Learning
● Unit 7 Post-Assessment, Module 3, Session 5	● Numbers to 120 Checkpoint - Module 2, Session 5	Options ● Exit Tickets Observational Assessments ● Two Turns to Win - M1, S4 ● Race to Zero - M1, 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.

- 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.

  - **Unit-aligned Smarter Balanced Interim Assessment Block (IAB)*:**

- **Some interim blocks show clear, strong alignment to priority standards within the unit. Other blocks have been placed in one specific unit but could be aligned to the priority standards of several units. Blocks have been spread out over the course of all units for a more balanced approach to assessment throughout the school year. These interim blocks, used in partnership with the Style Guide, will support the creation of unit- and standard-aligned items for instructional use.*

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 7 are:

- Number Sense
  - Read and write numerals to 120 and beyond
  - Demonstrate an understanding that 10 can be thought of a bundle or group of 10 ones called a ten

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- Count to 120 and beyond
- Count by 5s and 10s to 100 and beyond
- Demonstrate an understanding that the digits in a 2-digit number represent amounts of tens and ones

- Addition and Subtraction
  - Add and subtract within 20
  - Using mental strategies add and subtract within 20
  - Use concrete models or drawings to add with sums to 100 and beyond
  - Use strategies based on place value, properties of operations, or the relationship between additions and subtraction to add with sums to 100
  - Add a multiple of 10 and another 2-digit number
  - Subtract a 2-digit multiple of 10 from an equal or greater 2-digit multiple of 10, and explain the reasoning behind a strategy used to do so.
- Fractions
  - Partition a figure into 2 or 4 equal parts
  - Use terms halves and half of to talk about 2 equal parts
  - Use terms fourths, quarters, fourth of, and quarter of to talk about 4 equal parts
  - Describe a whole circle or rectangle as 2 of two or 4 of four equal parts
  - Demonstrate an understanding that as a shape is partitioned into a greater number of equal parts the size of the parts gets smaller
- Measurement
  - Order objects by length and compare the lengths of two objects
- Geometry
  - Identify, name, describe, and compare two-dimensional shapes, including circles, ovals, triangles, rectangles, squares, rhombuses, trapezoids, parallelograms, pentagons, hexagons, and decagons
- Math Practices
  - Attend to precision
  - Look for and make use of structure

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

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

Instructional Supports	
Possible Misconceptions	**Teacher Moves**

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1. Students can reverse digits in writing the numeral or do not demonstrate understanding that 21 does not have the same place value as 12.	1. When reversals occur, have students model each number, using straws or linking cubes to reinforce the place value of digits and to help students differentiation between numbers.
2. Continue to watch for students who reverse digits.	2. These students need more opportunities to decompose numbers into groups of tens and ones using concrete materials and then to put the items in the correct places on a place value chart. They describe the number in terms of tens and ones and the write the numeral below the concrete representation.
3. Students who recognize two-digit numbers but do not understand that the position of the digit determines its value.	3. This requires additional work with concrete representations. Give each student a number and ask them to represent that number on their place value chart. The work with a partner to determine who has the greater number. Students then place the correct sign<,=, and > between their place value charts. Only when students show understanding with materials and pictorial representations should they begin to connect those representations to using numerals.
4. Students need to associate < and > with their real meaning.	4. Rather than use aids such as alligators or Pac-Man, it may help students who confuse the symbols to think that the open end of the symbol is always closest to the greater number and the closed end is always pointed as the lesser symbol. It is important to give students opportunities to change the order of the numbers to see how it impacts the symbols and their meaning.
5. Students who do not know basic facts may be inaccurate in computing with two-digit numbers.	5. Continue to work on facts, physical models will help in the development of adding accurately.
6. Confusion adding two-digit numbers.	6. Be sure that all students have ample experience with adding physical models on place value charts, counting on by benchmark numbers (tens and ones), using a hundreds chart, and using ten frames as appropriate. Make explicit connections among written physical models, strategies, and written formats.

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7. Students can struggle with regrouping (composing tens from ones) when adding two-digit numbers. 8. Students who cannot determine 10 more or 10 less than a number from 1 to 100. 9. Some students may subtract the digits in the tens place but ignore the digits in the ones place.	7. It is appropriate for students to use physical models for these problems and explain their reasoning, explicitly connecting physical models with symbolic notation (written equations). 8. Provide more experience using concrete materials, such as linking cubes or bundles of straws. Finding patterns on the hundreds chart is also helpful, but the language can be confusing for some students (i.e. I go up a row to find 10 less and down a row to find 10 more). 9. Ask them to describe what they are subtracting in terms of place value. For example, in subtracting 70 - 40 students should say they are taking 4 tens from 7 tens or 7 tens minus 4 tens. Have them put concrete models on the place value chart and then subtract or physically remove the 4 tens from the 7 tens. They describe the difference as 3 tens. Ask them how to write 3 tens (30) and how many ones are in that number. They should be able to explain there are 0 ones and why it is necessary to put the digit 0 in the ones place.

Vocabulary and Representations

Tier 2 (Academic Vocabulary)	Tier 3 (Domain Specific Vocabulary)
add* addition beginning coin(s) combination compare count back difference* digit* dime distance equal parts* estimate* first fives forward fourth greater/greater than*	coordinate grid coordinates* equation* subtract* subtraction sum* two-digit number *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.

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hundred(s)* less than* nickel penny quarter (one-fourth) reasonable section square steps strategies total tens* twos zero	

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.
    - additional resources will be able to be linked with the purchase of Bridges.
2. **Math Practices Teacher Question Starters**
3. **Implementing the Standards of Mathematics Practice**
4. Illustrating the Standards of Mathematical Practice
5. Math Practice Standards Posters - Gr. K -1
6. Grade 1 - Standards + Practice Explanations and Examples
7. Modeling with Mathematics
8. Implementing Tasks that Promote Reasoning and Problem Solving
9. Number Sense Trajectory
10. Three Act Math Tasks
11. Teaching Math to Young Children Practice Guide - The Teaching Math to Young Children practice guide presents five recommendations designed to capitalize on children's natural interest in math to make their preschool and early elementary school experience more engaging and beneficial.
12. Number Talks Matter - Number Talks at a Glance and Fluency without Fear
13. NYC Grade 1 Math Task - Nina's Numbers
14. K-5 Math Resources
    - Three addend Math Problems - 1.OA.A.2
    - Missing Number Grids - 1.NBT.A.1
    - Comparing Two Digit Numbers - 1.NBT.A.3
    - Sums to 90 - 1.NBT.C.4
    - Subtracting Ten on a Number Line - 1.NBT.C.4
    - Ten More - 1.NBT.C.5
    - Race Around - 1.NBT.C.5
15. The Progression of Addition and Subtraction
16. Bridges Interactive Math Manipulatives
17. Journal Prompts for Math
18. Illustrative Math – Grade 1 - Resources and activities for the grade aligned by standard.
19. Accountable Talk Moves

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20. Contribution Checklist
21. Sentence Frames that Can Build Metacognitive Thinking
22. Sample Language Frames for Mathematics
23. Building a Mathematical Mindset Community
24. Teacher/Student Actions
25. Fletcher Three Act Tasks
26. Vocabulary Development Frayer Model – Elementary and secondary video and resources.
27. Fluency without Fear - Jo Boaler

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.
- Struggles with basic facts - need more experience with concrete and pictorial representations, including describing what their models represent to make connection to basic facts. Time and experience with developing strategies that are based on patterns and properties will help support learning the facts. It is important to give students time to learn and understand these concepts before procedural skill practice takes place.
- 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.

Extension

- Ask students to write about place value. Ask, "If you had a choice to have some tens and some ones, how many would you choose of each and how many would you have altogether? Why? "

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- Create higher order thinking questions that fit with the big concepts of the unit. Limit to a couple of questions. Ex. What would happen if _____? How would you explain _____? Use the higher order questions to challenge students thinking. For example; How would you explain to someone how many addition facts there are that equal only one sum? How many equal 6, 10, 100?
- Have the child count a collect of at least 120 objects. As the child to model how the collection was counted using interlocking cubes and explain why that method was chosen. Have the child demonstrate another possible way to count the same collection.
- Have child take as many counting objects as they can handle to model and make as many addition and subtraction equations as possible. The child should then model (write a contextual situation) for one or more of the equations.

Interdisciplinary Connections

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

*A Fair Bear Share, Stuart J. Murphy
*Arthur's Funny Money, Lillian Hoban
*More or Less, Stuart J. Murphy
Rooster's Off to See the World, Eric Carle
The Grapes of Math, Greg Tang
Double Those Wheels, Nancy Raines Day
Pigs Will Be Pigs, Amy Axelrod
You Can't Buy a Dinosaur with a Dime, Harriet Ziefert
*Alexander Who Used to be Rich Last Sunday, Judith Viorst
Panda Math: Learning About Subtraction from Hua Mei, Ann Whitehead Nagda
The Penny Pot, Stuart J. Murphy (optional)
*All About Money, Erin Roberson
Each Orange Had 8 Slices, Paul Giganti Jr.
Centipede's 100 Shoes, Tony Ross
Twenty is Too Many, by Kate Duke
The King's Commissioner, Marilyn Burns

Connected ELA to Math Class

Participate in collaborative conversations with diverse partners about *grade 1 math topics* with peers and adults in small and larger groups.

Science

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