

Winchester Math Curriculum Grade 1

Subject	Mathematics
Grade/Course	Grade One
Unit of Study	Unit 8- Changes, Changes
Pacing	May / June
Unit Summary	During Unit 8, students consider the content of change from several different angles. The activities in Module 1 help first graders make the link between time and change as they investigate some of the changes they can make to materials such a paper, craft sticks, and ice cubes in a second, a minute, and an hour. In Module 2, they explore predictable changes in numbers, using a very simple function machine made of a half gallon milk carton and specially designed set of change cards. In Module 3, students consider changes in location as they learn to fold and launch paper gliders through the air. After making and testing an initial set of gliders, students modify their original gliders or fold new ones in an attempt to better their flight distances. In Module 4, they explore some of the ways they've grown and changed since they were born. All in all, Unit 8 offers a satisfying end to the school year, blending math and science in ways sure to engage young learners.
<u>Overarching Mathematical Practices</u>	
<p>1.MP.1 Make sense of problems and persevere in solving them.</p> <p>1.MP.2 Reason abstractly and quantitatively.</p> <p>1.MP.3 Construct viable arguments and critique the reasoning of others.</p> <p>1.MP.4 Model with mathematics.</p> <p>1.MP.5 Use appropriate tools strategically</p> <p>1.MP.6 Attend to precision</p> <p>1.MP.7 Look for and make use of structure</p> <p>1.MP.8 Look for and express regularity in repeated reasoning.</p>	
<u>Unit CT Core Content Standards</u>	
<p><u>1.G.A.3-</u> Partition circles and rectangles into two and four equal shares, describe the shares using the words <i>halves</i>, <i>fourths</i>, and <i>quarters</i>, and use the phrases <i>half of</i>, <i>fourth of</i>, and <i>quarter of</i>. Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares.</p> <p><u>1.MD.A.1-</u> Order three objects by length; compare the lengths of two objects indirectly by using a third object.</p> <p><u>1.MD.A.2-</u> Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps.</p> <p><u>1.MD.B.3-</u> Tell and write time in hours and half-hours using analog and digital clocks.</p> <p><u>1.MD.C.4-</u> Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.</p> <p><u>1.NBT.A.1-</u> 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.</p> <p><u>1.NBT.B.2-</u> Understand that the two digits of a two-digit number represent amounts of tens and ones.</p>	

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1.NBT.B.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.

1.OA.C.6- Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., $8 + 6 = 8 + 2 + 4 = 10 + 4 = 14$); decomposing a number leading to a ten (e.g., $13 - 4 = 13 - 3 - 1 = 10 - 1 = 9$); using the relationship between addition and subtraction (e.g., knowing that $8 + 4 = 12$, one knows $12 - 8 = 4$); and creating equivalent but easier or known sums (e.g., adding $6 + 7$ by creating the known equivalent $6 + 6 + 1 = 12 + 1 = 13$).

“Unwrapped” Standards

Skills	Content
Order	objects by length
Compare	lengths
Express	length as a whole number of length units
Understand	<ul style="list-style-type: none"> • length measurement is the number of same size unit lengths with no gaps or overlaps • two digit numbers represent amounts of ten and one
Organize	data with up to three categories
Represent	<ul style="list-style-type: none"> • data with up to three categories • number of objects with a written numeral
Interpret	data with up to three categories
Ask and Answer	questions about data
Count	to 120
Read and Write	numerals
Compare	two-digit numbers
Record	comparing numbers results using $<$, $>$, $=$
Find (mentally)	10 more or 10 less of a two digit number without having to count
Explain	reasoning
Subtract	multiples of 10 from multiples of 10 (10 - 90)
Use	models, drawings, and strategies to subtract multiples of 10
Relate	strategy to a written method
Essential Questions	Corresponding Big Ideas

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<ol style="list-style-type: none"> 1. How do I represent and solve problems involving addition and subtraction? 2. Why is it important to select the appropriate tools for measurement? 3. How is organized data useful? 	<ol style="list-style-type: none"> 1. I represent and solve problems with objects, drawings, strategies and equations. 2. Using the appropriate tools makes measurements of attributes accurate, easy to understand and can be replicated by others. 3. Data is useful after it is organized in an appropriate format to analyze and interpret the results and to be able to ask and answer questions about the data.
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Evidence of Learning - Assessment

Pre/Post Assessment	Interim Assessment	Additional Evidence of Learning
Unit 8 - Post Assessment - Module 3, Session 6 May - Number Checkup 4 June- Comprehensive Growth Assessment	Time and Change Checkpoint - Module 2, Session 4	Options <ul style="list-style-type: none"> • Exit Tickets Observational Assessments:- <ul style="list-style-type: none"> ○ An Hour or Bust - Module 1, Session 5 ○ Change Cards - Module 2, Session 4

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*

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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 8 are:

Number Sense

- Numbers to 120
- Place Value Patterns 1-120
- Number Patterns
- Writing two-digit numbers
- Expanded and standard form of numbers
- Fractions to quarters
- Counting by 10s on a number line

Measurement and Data

- Money - dime and pennies

Computational Fluency

- Adding and subtracting to 120 on a number grid
- Adding and subtracting by 10

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

Module 1	Module 2	Module 3	Module 4
Problem + Investigation <ul style="list-style-type: none"> ● Sessions 1-5 Work Place <ul style="list-style-type: none"> ● Sessions 1-5 Home Connection <ul style="list-style-type: none"> ● Sessions 2, 5 	Problem + Investigation <ul style="list-style-type: none"> ● Sessions 1-3 Work Place <ul style="list-style-type: none"> ● Sessions 1-4 Assessment <ul style="list-style-type: none"> ● Session 4 Home Connection <ul style="list-style-type: none"> ● Session 2 	Problem + Investigation <ul style="list-style-type: none"> ● Sessions 1-6 Work Place <ul style="list-style-type: none"> ● Sessions 1-6 Assessment <ul style="list-style-type: none"> ● Session 6 Home Connection <ul style="list-style-type: none"> ● Session 2, 5 	Problem + Investigation <ul style="list-style-type: none"> ● Session 1-5 Work Place <ul style="list-style-type: none"> ● Sessions 1-5 Home Connection <ul style="list-style-type: none"> ● Session 2

Possible Misconceptions

1. Watch for students who may double count a number when adding or subtracting. This may occur with physical objects, pictures, or using a hundreds chart. The same may happen in subtraction.

Teacher Moves

1. Not only should this be pointed out to students, but it is essential also to provide more explicit experiences with concrete materials in which student are adding on to the given addend or subtracting from the total.

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<ol style="list-style-type: none"> 2. It is not expected that students develop an understanding of place value with standard 1.NBT.A.1. However watch for students who reverse digits in writing the numeral or do not demonstrate an understanding that 21 does not have the same value as 12. 3. Students who recognize two-digit numbers but do not understand that the position of the digit determines its value. 4. It is important for students to associate the symbols $<$ and $>$ with their real meaning. 5. Since understanding the concept of 10 more or 10 less leads to understanding additional place value concepts, students who depend on counting or using their fingers have not met this standard. 6. Some students may subtract the digits in the tens place but ignore the digits in the ones place. 	<ol style="list-style-type: none"> 2. When reversals occur, have students model each number, using straws or linking cubes to reinforce the place value of digits and to help student differentiate between numbers. 3. The students need additional work with concrete representations. Give each student a number and ask them to represent that number on their place value chart. They work with a partner to determine which number is greater. Only when students show understanding with materials and pictorial representations should they begin to connect those representations with numerals. 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 they symbol is always closest to the greater number and the closed end is always pointed to the lesser number. It is also 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 cannot determine 10 more or 10 less than a number from 1 to 100 need more experiences with 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). 6. 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 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
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<p>7. Students may incorrectly align objects to be measured. This may result in an inaccurate comparison of the items.</p> <p>8. Some students may leave a gap or space or overlap as the units are placed next to an item. Some students may simply think about measurement as merely a counting task.</p> <p>9. Some students may pose a question that has too many choices such as “What is your favorite color?”</p> <p>10. Some students may not realize they have not collected data from every person necessary.</p> <p>11. Some students may not be able to summarize with statements like, “The majority of the people like or have...” or a similar statement.</p>	<p>should explain why there are 0 ones and why it is necessary to put the digit 0 in the ones place.</p> <p>7. Teachers can remind students to carefully check the object alignments.</p> <p>8. To correct these misconceptions, model and remind students that the length of an object is the number of units counted. Reiterate the idea that when using different sizes of nonstandard objects to measure the same item, the sizes of the objects must be taken into account rather than the amount of objects counted.</p> <p>9. To help with this error, ensure students limit the categories to only three choices.</p> <p>10. To help with with this error, make sure students know the total number of individuals who will be answering the question.</p> <p>11. To help with this, review and discuss summary statements.</p>
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Vocabulary and Representations

Tier 2 (Academic Vocabulary)	Tier 3 (Domain Specific Vocabulary)
add* attributes + change classify + clock clock face chart compare day difference* distance double estimate +* edge fast fold gap greater than*	addition circumference + cube* equal* fives graph* half hour (hr.) hundreds* minute (min.) minute hand non-standard unit of measure + number line* parallel* rectangle* second hand subtract* subtraction

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group (s) highest length* less than* location long/longer/longest lowest measure* minus more than ones* order organize pattern* plus range + rule second short/shorter/shortest slow strategies sudden the same time total weight year	sum* tally marks tens* *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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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. [Illustrating the Standards for Mathematical Practice](#)
4. [Math Practice Standards Posters](#) Gr. K-1
5. [Implementing the Standards of Mathematics Practice](#)
6. [Modeling with Mathematics](#)
7. [Implementing Tasks that Promote Reasoning and Problem Solving](#)
8. [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.
9. [Number Talks Matter - Number Talks at a Glance](#) and Fluency without Fear
10. [Measuring with the Teacher's Feet](#) -Need NCTM Membership to Access
11. K-5 Teaching Resource
 - [Measuring with Snap Cubes](#)
 - [Missing Number Grid 1-50](#)
 - [Comparing Two-Digit Numbers](#)

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- [Ten More](#)
 - [Race Around](#) - subtracting by 10
 - [Subtract 10](#) - using Base Ten materials
12. [Illustrative Math – Grade 1](#) - Resources and activities for the grade aligned by standard.
 13. [Journal Prompts for Math](#)
 14. [Bridges Interactive Math Manipulatives](#)
 15. [Accountable Talk Moves](#)
 16. [Sample Language Frames for Mathematics](#)
 17. [Teacher/Student Actions](#)
 18. [Fletcher Three Act Tasks](#)
 19. [Vocabulary Development Frayer Model](#) – Elementary and secondary video and resources.
 20. [Ladybug Lengths](#) - Helps students explore and understand the attribute of length
 21. [Which is Longest?](#) - Provides word bank and sentence frame to assist students.
 22. [Scoop and Order](#) - Provides sentence frame to assist students, along with a visual representation of expectation with linking cubes.
 23. [Measuring with Sticks](#) - Provides sentence frame and give a visual example of expectation.
 24. [Which has Fewer?](#) - Provides a word bank to assist students in describing the data
 25. [Draw a Graph](#) - provides 3 options for creating a graph
 26. [Tens and Ones with Snap Cubes](#) - Use to support continuing development of 11-19
 27. [Scoop It!](#) - Comparing two-digit numbers using concrete objects.

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)

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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](#)
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- 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.

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- 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:

- How Big is a Foot? by Rolf Myller [Illuminations Investigation](#) (Need NCTM membership to access)
- [Bar Graph Investigations](#)
- [The Eyes Have It](#) - have student create the bar graph using the computer tool provided.
- 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?"
- 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?
- Have the child count a collection of at least 120 objects. Ask 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.

Interdisciplinary Connections

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

- | | |
|---|---|
| *How Long Does it Take by Jilly Atwood | *Pigs on a Blanket by Amy Axelrod |
| *Just a Second by Steve Jenkins | *Time to by Bruce McMillan |
| *Seconds, Hours, and Minutes by Holly Karapetkova | *Tom and the Tinfal of Trouble by Nick Sharratt |
| *How Many Feet in the Bed? by Diane Johnston Hamm | *Two of Everything by Lily Toy Hong |
| *The Token Gift by Hugh William McKibbon | *On the Day You Were Born by Debra Frasier |
| *Measuring Penny by Loreen Leedy | *How Long Is It? by Donna Loughran |
| *Now I’m Big by Margaret Miller | *How Big is a Foot? by Rolf Myller |
| *On the Night You Were Born by Nancy Tillman | |

ELA

[SL.1.1](#)

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

[CCSS.ELA-LITERACY.SL.1.1.A](#)

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

[CCSS.ELA-LITERACY.SL.1.1.B](#)

Build on others' talk in conversations by responding to the comments of others through multiple

exchanges.

CCSS.ELA-LITERACY.SL.1.1.C

Ask questions to clear up any confusion about the topics and texts under discussion

Science (Skills Addressed in this Math Unit)

- Plan and conduct a simple investigation.
- Employ simple equipment and tools to gather data and extend senses.
- Use data to construct a reasonable explanation.
- Communicate investigations and explanations.
- Demonstrate an understanding that objects have many observable properties, and those properties can be measured using tools.
- Demonstrate an understanding that some common materials such as water can be changed from one state to another by heating or cooling.
- Demonstrate an understanding that the position of an object can be described by locating it relative to another object or the background.
- Demonstrate an understanding that the position and motion of objects can be changed by pushing or pulling. The size of the change is related to the strength of the push or pull.
- Plants and animals have life cycles that include being born, developing into adults, reproducing and eventually dying. The details of this life cycle are different for different organisms.
- Identify a simple problem.
- Propose a solution.
- Recognize that designing a solution might have constraints, such as cost materials, time, space, or safety.
- Implement proposed solutions.
- Evaluate a product or design.
- Communicate a problem, design, and solution.