

Winchester Math Curriculum Grade 2

Subject	Mathematics
Grade/Course	Grade Two
Unit of Study	Unit 4
Pacing	January
Unit Summary	Second graders will explore measurement through different units of measurement. Students will work on conversions of measurement between inches, feet and yards. In this unit the initial groundwork is laid out for students to begin to understand ratios, proportional reasoning, and multiplicative comparison. Students begin to develop the relationship between repeated addition and multiplication as well as skip counting by 3's.
<u>Overarching Mathematical Practices</u>	
<p>2.MP.1 Make sense of problems and persevere in solving them.</p> <p>2.MP.2 Reason abstractly and quantitatively.</p> <p>2.MP.3 Construct viable arguments and critique the reasoning of others.</p> <p>2.MP.4 Model with mathematics.</p> <p>2.MP.5 Use appropriate tools strategically.</p> <p>2.MP.6 Attend to precision.</p> <p>2.MP.7 Look for and make use of structure.</p> <p>2.MP.8 Look for and express regularity in repeated reasoning.</p>	
<u>Unit CT Core Content Standards</u>	
<p><u>2.OA.A.1-</u> 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.</p> <p><u>2.OA.B.2-</u> 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.</p> <p><u>2.OA.C.3-</u> 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.</p> <p><u>2.OA.C.4-</u> 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.</p> <p><u>2.NBT.A.4-</u> Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using $>$, $=$, and $<$ symbols to record the results of comparisons.</p> <p><u>2.NBT.B.5-</u> Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.</p> <p><u>2.NBT.B.6-</u> Add up to four two-digit numbers using strategies based on place value and properties of operations.</p> <p><u>2.MD.A.1-</u> Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.</p> <p><u>2.MD.A.2-</u> Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.</p> <p><u>2.MD.A.3-</u> Estimate lengths using units of inches, feet, centimeters, and meters.</p>	

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.

“Unwrapped” Standards

Skills	Content
Use	<ul style="list-style-type: none"> ● addition and subtraction within 100 to solve one- and two-step word problems. ● addition to find the total number of objects arranged in rectangular arrays ● symbols $>$, $=$, $<$ to record results of comparisons
Fluently add and subtract	<ul style="list-style-type: none"> ● within 20 use mental strategies ● within 100 using strategies
Determine	whether a group of objects (up to 20) has an odd or even numbers of members
Write	<ul style="list-style-type: none"> ● an equation to express an even number as a sum of two equal addends ● an equation to express the total in an array as a sum of equal addends
Compare	two three-digit numbers based on meanings of hundreds, tens, and ones
Add	up to four two-digit numbers using strategies
Measure	<ul style="list-style-type: none"> ● the length of an object ● the length of an object twice using units of different lengths ● to determine how much longer one object is than another
Select and Use	appropriate tools to measure
Describe	how two measurements of the same object relate to the size of the unit
Estimate	lengths
Express	length and length differences in terms of a standard length unit
Represent	<ul style="list-style-type: none"> ● whole numbers as lengths from 0 on a number line with equally spaced points ● whole number sums and differences with 100 on a number line diagram
Essential Questions	Corresponding Big Ideas
1. How do we decide which tool to use to	1. The choice of measurement tool depends

<p>measure something?</p> <p>2. Why is estimation an important tool?</p> <p>3. How do operations affect numbers?</p> <p>4. How can analyzing operations on numbers and the results help us to become more efficient at computation?</p>	<p>of the measurable attribute, the size of the object, and how precise we need the measurement.</p> <p>2. Estimation is an important life skill that people use every day. Many real-life applications of math do not require exact answers. The problem situation determines the best estimation strategy to use. Estimation is also an effective strategy that promotes easy recognition of the reasonableness of an answer, to determine approximations in measuring, and for catching errors made when using calculators.</p> <p>3. Operations involve combining and taking apart numbers using a variety of approaches to arrive at a new number result.</p> <p>4. Analyzing problems and their answers can help us to see patterns that can lead to a deeper understanding of number sense and shortcuts for efficient computation.</p>
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Evidence of Learning - Assessment

Pre/Post Assessment	Interim Assessment	Additional Evidence of Learning
<ul style="list-style-type: none"> ● Unit 4 Pre-Assessment - Module 1, Session 1 ● Unit 4 Post-Assessment - Module 3, Session 6 ● Number Corner Checkup 2 	<ul style="list-style-type: none"> ● Inches, Feet, Yards Checkpoint - M2, S5 	<p>Options</p> <ul style="list-style-type: none"> ● Exit tickets <p>Observational Assessment</p> <ul style="list-style-type: none"> ● Estimate and Measure Inches - M1, S5 ● Measuring in Yards - M2, S2 ● Measure and Compare - M2, S4 ● Climb the Beanstalk - M2, 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 Corner → Problem + Investigations → Work Places → Home Connections

Bridges Number Corner: The focus areas for Number Corner (20 minute workouts that introduce, reinforce, and extend skills) aligned to Unit 4 are:

Shapes

- 4 sides and 4 vertices
- triangles to circles to ellipses (not 4 sides and 4 vertices)
- Symmetries of different figures to find patterns

Surveys and Data

- Why people conduct them
- Results displayed in a picture graph
- Teacher Surveys
- Results displayed in a bar graph
- Class Surveys
- Conducting a survey

Rows and Columns

- Filling in arrays
- Writing equations to match arrays

Computational Fluency

- Add Ten Facts
- Add Nine Facts
- Subtraction combinations related to Add Ten Facts
- Take Away Ten facts

Numeracy

- Practice counting by 10s and 100s from three-digit numbers that aren't multiples of 10
- Guess My Number

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

Possible Misconceptions	Teacher Moves
<ol style="list-style-type: none"> Some students may begin to measure with the “1” on the ruler, yardstick, or meter stick. Describing how two measurements relate to the size of the unit chosen is a very difficult concept for second graders to articulate. Some students will estimate with “wild” estimate statements like, “I estimate our classroom to be one million yards long.” Some students may estimate with a number that is not a close estimate and become frustrated to not give a correct answer. Some second graders 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 may think that they can only measure lengths with a ruler starting at the left edge. 	<ol style="list-style-type: none"> You can use a large number line on the floor to demonstrate where the students must begin before “one” and relate this to all measuring done with linear measurement tools. To address this, provide ongoing experiences and activities for students to learn to predict and measure. Allow students to talk about what they are noticing. Provide additional estimating experiences along with a discussion about the purpose of estimation. 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.

Vocabulary and Representations

Tier 2 (Academic Vocabulary)	Tier 3 (Domain Specific Vocabulary)
distance estimate* equal* foot (ft)*	addend* addition array* circumference +

<p>inch (in)* measure* pattern* row ruler strategies total yard (yd)* yardstick</p>	<p>height length* multiple multiply* ones* subtraction* sum* tens* width</p> <p>*Smarter Balanced Vocabulary is focused on major mathematical concepts. (Not all possible words have been identified by SBAC)</p> <p>+ Students are not responsible for these vocabulary words at this grade level, however they should have some understanding of the mathematical concept.</p>
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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.
 - a. 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. Grade 2 - [Standards + Practices - Explanations and Examples](#)
6. [Exploring the Math Practice Standard: Precision](#)
7. [Number Talks Matter - Number Talks at a Glance](#) and Fluency without Fear
8. [Journal Prompts for Math](#)
9. [Beginning to Problem Solve with I Notice, I Wonder](#)
10. [Accountable Talk Moves](#)
11. [Contribution Checklist](#)
12. [Sentence Frames that Can Build Metacognitive Thinking](#)
13. [Sample Language Frames for Mathematics](#)
14. [Building a Mathematical Mindset Community](#)
15. [Fletcher Three Act Tasks](#)
16. Learn Zillion Grade 2:
 - [Measure Using a Ruler](#)
 - [Find the Difference in Length of Two Objects Using Addition](#)
15. [Illustrative Math - Grade 2](#) - Resources and activities for grade 2 aligned by standard.
16. K-5 Math Teaching Resources
 - [Measuring Paths](#)
 - [Measure it Twice](#)

- [Gummy Worm Stretch](#)

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](#)

Extensions

- [The Longest and the Shortest](#)
- [Measuring My World](#)
- Extension activities aligned with Bridges lessons are included in each module

Interdisciplinary Connections

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

Jim and the Beanstalk by Raymond Briggs
*Twelve Snails to One Lizard by Susan Hightower

*How Big is a Foot? by Rolf Myller

Science

- Describe, measure, estimate, and/or graph quantities such as length, height, weight, area, volume, and time to address scientific and engineering questions and problems

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