

Winchester Math Curriculum Grade 2

Subject	Mathematics
Grade/Course	Grade Two
Unit of Study	Unit 1- Figure the Facts
Pacing	August / September
Unit Summary	Second graders establish classroom norms around mathematical inquiry and discourse. The math focus rests primarily on the developing students' confidence and fluency with number relationships, operations, and fact fluency to 20. Important math models including the number rack, bead strings, and the number line are introduced during the unit, and students are expected to become proficient at using strategies that emerge from these models.
<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.</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 to 2's; writing 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.2-</u> Count within 1000; skip-count by 5s, 10s, and 100s.</p> <p><u>2.NBT.B.5-</u> Fluently add and subtract within 100 using strategies based on place value properties of operation and/or relationship between addition and subtraction.</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.B.6-</u> Represent whole numbers as length 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.</p> <p><u>2.MD.C.8-</u> Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using \$ and ¢ symbols appropriately.</p> <p><u>2.MD.D.10-</u> Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information</p>	

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presented in a bar graph.

2.G.A.1- Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.

2.G.A.2- Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.

2.G.A. 3- Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.

****Note: Sizes are compared directly or visually - not compared by measuring.**

“Unwrapped” Standards

Skills	Content
Use	<ul style="list-style-type: none"> ● addition and subtraction within 100 ● addition to find total objects arranged in arrays ● \$ and ¢ symbols appropriately
Solve	<ul style="list-style-type: none"> ● one - and two- step word problems ● word problems involving money ● problems using information presented in bar graph
Fluently add and subtract	<ul style="list-style-type: none"> ● facts within 20 using mental strategies ● within 100 using strategies
Determine	whether a group or objects is odd or even (up to 20)
Write	<ul style="list-style-type: none"> ● equations to express even numbers as a sum of two equal addends ● equations from arrays to express the total as sum of equal addends
Count	<ul style="list-style-type: none"> ● within 1000 ● to find the total number of equal size squares in a rectangle
Skip-count	by 5’s, 10’s and 100’s
Measure	length of an object
Select and use	appropriate tools for measuring length
Represent	<ul style="list-style-type: none"> ● whole numbers on a number line ● whole number sums to 100 on a number line diagram ● data up to four categories
Draw	<ul style="list-style-type: none"> ● picture graph ● bar graph ● shapes having specified attributes
Recognize	<ul style="list-style-type: none"> ● shapes having specified attributes ● equal shares of identical wholes need not have the same shape.
Identify	<ul style="list-style-type: none"> ● triangles ● quadrilaterals

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	<ul style="list-style-type: none"> • pentagons • hexagons • cubes 	
Partition	<ul style="list-style-type: none"> • a rectangle into rows and columns of same size squares • circles and rectangles into two, three, or four, equal shares 	
Describe	<ul style="list-style-type: none"> • equal shares as halves, half of, a third of, etc.. • the whole as two halves, three thirds, four fourths 	
Essential Questions	Corresponding Big Ideas	
<ol style="list-style-type: none"> 1. How can change be represented mathematically? 2. How do operations affect numbers? 3. What is the purpose of measurement? 	<ol style="list-style-type: none"> 1. Change can be represented mathematically with expressions, equations, operations, graphing, etc.. to understand, develop, and communicate change. 2. Operations involve combining and taking apart numbers using a variety of approaches to arrive at a new number result. 3. Measurement is used to describe and understand the world around us with more precision. 	
Evidence of Learning - Assessment		
Pre/Post Assessment	Interim Assessment	Additional Evidence of Learning
<ul style="list-style-type: none"> • Unit 1 Pre- Assessment - Module 1, Session 5 • Unit 1 Post-Assessment - Module 4, Session 5 • Number Corner Baseline Assessment 	Number Combinations to 10 Checkpoint, M2, S5	Options Exit tickets Observational Assessments <ul style="list-style-type: none"> • Unifix Cubes - M1, S2 • Pattern Blocks- M1, S2 • Tiles - M1, S2 • Geoboards - M1, S2 • Count & Compare Fives - M2, S3 • Count & Compare Two's - M3, S1 • Make the Sum - M2, S5 • Battling Bugs - M3, S4 • What's the Difference? - M3, S5 • Turn them Over, M4, S3 <ul style="list-style-type: none"> • Math Practices Observation Chart

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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 aligned to Unit 1 are:

Addition and Subtraction

- Addition and Subtraction Facts to 20
- Addition and Subtraction Fact Strategies
- Addition and Subtraction Story Problems to 20
- Generate equations and story problems

Measurement

- Telling and recording time to the hour (Analog and Digital)
- Develop understanding of 60 minutes in a hour
- Develop understanding of 24 hours in a day
- A day is divided into a.m. and p.m. hours

Number Sense

- Determine is a quantity is odd or even
- Use concrete materials and arrangements to visual see patterns for odd and even

Computational Fluency

- Addition combinations to 20
- Identifying Facts - zero facts, count on facts, and count back facts (+1, +2, +3) (-1, -2, -3)

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

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

Instructional Supports

Possible Misconceptions	Teacher Moves
<ol style="list-style-type: none"> Teaching key words does not help develop an understanding of problem situations. Students who struggle with two-step problems should work to identify missing information needed to solve the problem. Watch for students who are making reasoning 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. This may occur with physical objects or pictures or using a hundreds chart. Students may decompose a number to make a ten and then incorrectly add the original number on to the 10. Too often, the focus of even and odd numbers is on telling students or having them recognize that even numbers end in 0,2,4,6, or 8 and odd numbers end in 1,3,5,7, or 9. While these are interesting and efficient patterns, they do not define or provide a conceptual understanding of 	<ol style="list-style-type: none"> Rather use concrete models and drawing pictures, students can then relate their actions to whether the situation calls for addition or subtraction. In missing addend cases, students will determine what operations (addition or subtraction) makes the most sense to them, as either will result in a correct solution. While the question in the problem will focus on the final answer, identifying missing information will help students to recognize they need to perform an operation to find that information. 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. Students do not have to be fluent with all of the mental strategies. They should have many opportunities to practice, explain, and compare strategies. Using the strategies that make sense to them will help students to be ready for drill and practice opportunities to become fluent with facts. While this is not a misconception, it is important to emphasize the use of concrete experiences to develop a foundational understanding of the meaning of even or odd numbers.

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<p>even and odd numbers.</p> <p>5. Students who have difficulty counting within 1,000.</p> <p>6. Watch for students who confuse the next number in the tens place.</p>	<p>5. Need more experience counting on with concrete, pictorial, and number line representations. Begin with lesser numbers in the range of 100-200. Point out the patterns in the ones and tens places.</p> <p>6. For example, 127, 128, 129....1? An extended chart with counts from 100 to 200 will be helpful.</p>
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Vocabulary and Representations

Tier 2 (Academic Vocabulary)	Tier 3 (Domain Specific Vocabulary)
<p>arrangement classification/classify combination community compare difference* display equals* greater than* information less than* observation/observe reflection/reflect strategies total trait Venn Diagram</p>	<p>addition* bar graph* equal* equation* even number glyph number line* odd number picture graph* subtraction* sum*</p> <p>*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.</p>

Mathematics Teaching Practice Resources

<ol style="list-style-type: none"> 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. Illustrative Math – Grade 2 - 8. Beginning to Problem Solve with I Notice, I Wonder

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9. [Accountable Talk Moves](#)
10. [Contribution Checklist](#)
11. [Sentence Frames that Can Build Metacognitive Thinking](#)
12. [Sample Language Frames for Mathematics](#)
13. [Number Talks Matter - Number Talks at a Glance](#) and Fluency without Fear
14. [Addition and Subtraction Problem Types](#)
15. [Number Sense Trajectory](#)
16. [Bridges Addition/Subtraction Fact Strategies](#)
17. [The Progression of Addition and Subtraction](#)
18. [Vocabulary Development Frayer Model](#)
19. LearnZillion Grade 2:
 - [Understand a Word Problem](#)
 - [Solve Word Problems by Drawing Bar Models](#)
 - [Sums: Trajectory of Understanding](#)
 - [Using Doubles to Add and Subtract within 20](#)
 - [Subtract within 20 using Tens Frames](#)
 - [Recognizing Odd and Even by Forming Partners and Equal Groups](#)
14. K-5 Math Resources
 - [Add to: Result Unknown](#)
 - [Take From: Result Unknown](#)
 - [Making Ten](#)
 - [Doubles Cover Up](#)
 - [Four in a Row Subtraction](#)
 - [Part Part Whole](#)

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](#)
- [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,

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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.
- Making a drawing of an applied, or "word" problem is one easy tool that students can use to help them find a solution. An additional benefit of the drawing strategy is that it can reveal to the teacher any student misconceptions about how to set up or solve a word problem.

Intervention for facts

- Provide about 10 minutes per session of instruction to build quick retrieval of basic arithmetic facts. Consider using technology, flashcards, and other materials for extensive practice to facilitate automatic retrieval.
- For students in K -2 explicitly teach strategies for efficient counting to improve the retrieval of mathematics facts.
- Teach students in grade 2-8 how to use their knowledge of properties, such as commutative, associative, and distributive to derive facts in their heads.
- [How to Promote Acquisition of Math Facts – Intervention for struggling students](#)
- [National Center on Intensive Intervention - Basic Facts](#)
- Once a strategy has been taught, it is important to reinforce it. The reinforcement or practice exercises should be varied in type and focus as much on the discussion of how students obtained their answers as on the answers themselves.
- Having students work in groups (as opposed to handing your bright students a workbook to work on when the classroom material isn't challenging enough) with other children ready for advanced material shows them that mathematics is not a solitary discipline -- mathematics is exciting and vibrant and creative and fun.
- [Concrete, Representational, Abstract Progression](#)
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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.
- 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

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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

- Students can keep a math journal of how numbers/math is used in their everyday lives.
- Extension activities aligned with Bridges lessons are included in each module
- [Ask Dr. Math](#) -students are introduced to the "Ask Dr. Math" website. Using strategies they have learned, they will answer math questions (fictional) from students across the state.

Interdisciplinary Connections

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

**Arctic Fives Arrive* by Elinor J. Pinczes

Twelve Ways to Get to Eleven by Eve Merriam

Math Potatoes by Greg Tang

The Doorbell Rang by Pat Hutchins

Mission Addition by Loreen Leedy

How Many Blue Birds Flew Away by Paul Giganti

Subtraction Action by Loreen Leedy

If You Were a Minus Sign by Trisha Speed Shaskan

Science

- Using Mathematical and Computational Thinking -Describe, measure, and/or compare quantitative attributes of different objects and display the data using simple graphs. Students could describe, measure, and/or compare [the number of] different kinds of living things in any area and display the data using simple graphs. 2-LS4-1

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