

Winchester Math Curriculum Grade K

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| Subject | Mathematics |
| Grade/Course | Kindergarten |
| Unit of Study | Unit 4: Paths to Adding, Subtracting & Measuring |
| Pacing | January |
| Unit Summary | Kindergarteners begin this unit by building a number line to model the number sequence 0 to 10. They continue to practice counting forward and backward between 0 and 50, starting with any number in the range. They also solve addition and subtraction problems, compute with pennies, and nickels, and begin measuring length using non-standard units. The number line and measurement activities provide many opportunities for students to consider the relationship between numbers and quantities, including making comparisons about which are great and which are less. |
| <u>Overarching Mathematical Practices</u> | |
| <p>K.MP.1 Make sense of problems and persevere in solving them.</p> <p>K.MP.2 Reason abstractly and quantitatively.</p> <p>K.MP.3 Construct viable arguments and critique the reasoning of others.</p> <p>K.MP.4 Model with mathematics.</p> <p>K.MP.5 Use appropriate tools strategically.</p> <p>K.MP.6 Attend to precision.</p> <p>K.MP.7 Look for and make use of structure.</p> <p>K.MP.8 Look for and express regularity in repeated reasoning.</p> | |
| <u>Unit CT Core Content Standards</u> | |
| <p><u>K.CC.A.1-</u> Count to 100 by ones and by tens.</p> <p><u>K.CC.A.2-</u> Count forward beginning from a given number within the known sequence (instead of having to begin at 1).</p> <p><u>K.CC.A.3-</u> Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).</p> <p><u>K.CC.B.4-</u> Understand the relationship between numbers and quantities; connect counting to cardinality.</p> <p><u>K.CC.B.4a-</u> When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.</p> <p><u>K.CC.B.4b-</u> Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.</p> <p><u>K.CC.B.5-</u> Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1-20, count out that many objects.</p> <p><u>K.CC.C.6-</u> Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies.</p> <p><u>K.CC.C.7-</u> Compare two numbers between 1 and 10 presented as written numerals.</p> <p><u>K.OA.A.1-</u> Represent addition and subtraction with objects, fingers, mental images, drawings 1, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.</p> | |

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K.OA.A.2- Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem..

K.MD.A.1- Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.

K.MD.A.2- Directly compare two objects with a measurable attribute in common, to see which object has "more of"/"less of" the attribute, and describe the difference.

K.MD.B.3- Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.

“Unwrapped” Standards

| Skills | Content |
|----------------------------|---|
| Count | <ul style="list-style-type: none"> ● to 100 by ones and tens ● forward from a given number ● to answer “how many” questions ● out objects for a given number |
| Write | numbers 0 to 20 |
| Represent | <ul style="list-style-type: none"> ● a number of objects with a written numeral ● addition and subtraction with objects, fingers, drawings, sounds, equations, etc.. |
| Understand | <ul style="list-style-type: none"> ● relationship between numbers and quantities ● the last number name said tells the number of objects counted ● the number of objects is the same regardless of arrangement |
| Connect | counting to cardinality |
| Say | <ul style="list-style-type: none"> ● number names in standard order when counting ● each number name with one and only one object |
| Identify | whether the number of objects in one group is greater than, less than, or equal to objects in another group |
| Compare | two numbers between 1 and 10 as written numerals |
| Solve | addition and subtraction word problems |
| Add and Subtract | within 10 |
| Describe | <ul style="list-style-type: none"> ● measurable attributes of objects ● several measurable attributes of a single objects ● difference in measure of common attributes when comparing objects |
| Directly compare | two objects with measurable attribute(s) in common |
| | |
| Essential Questions | Corresponding Big Ideas |

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| <ol style="list-style-type: none"> 1. Why do we count? 2. How can strategies help us add and subtract? 3. Why is it important to be precise in mathematics? | <ol style="list-style-type: none"> 1. Everything can be counted. Number names tell us how many objects are in groups and allow us to count in order and compare groups of objects. 2. Strategies can help us build a better understanding of the relationships between numbers and operations. Some strategies that can help us add and subtract are counting on, making ten, decomposing a number to make ten, using relationships between addition and subtraction, creating easier, but known sums (totals). 3. It is important to be precise in words, numbers, and symbols in order to communicate accurately about mathematics. |
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Evidence of Learning - Assessment

| Pre/Post Assessment | Interim Assessment | Additional Evidence of Learning |
|-------------------------|---|--|
| Number Corner Checkup 2 | <ul style="list-style-type: none"> ● Numeral Order Checkpoint - M1, S4 ● Foxes and Dens Checkpoint - M2, S3 ● Counting and Writing Numbers Checkpoint - M3, S3 ● Money March Partner Game Checkpoint - M4, S4 | <p>Options Exit tickets</p> <p>Observational Assessment</p> <ul style="list-style-type: none"> ● Scrambled Number 1 to 10 - M1, S3 ● Foxes and Dens - M2, S2 ● Beat You to Twenty - M2, S5 ● Which Coin Will Win - M4, S2 ● Race to 15¢- M4, 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 aligned to Unit 4 are:

Geometry

- Two- and three-dimensional figures
- Identify, describe, analyze, and compare these shapes:
 - squares
 - cubes
 - circles
 - spheres
 - cones
 - rectangles
 - cylinders
- Explore the relationships between squares and cubes; circles, spheres, and cones; and rectangles and cylinders

Counting

- Counting collections
- Find length of collection
- Estimate amount in collection
- Forward and backward from 1 to 25
- Numbers before and after a given number

Making Ten

- Use sketches and numbers to solve and show thinking to solve problems

Develop fluency with pairs of numbers whose sum is 5

Numerical Writing

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

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| <ul style="list-style-type: none"> ● Session 4 Home Connection <ul style="list-style-type: none"> ● Sessions 2, 5 | Home Connection <ul style="list-style-type: none"> ● Sessions 2, 5 | Home Connection <ul style="list-style-type: none"> ● Sessions 2, 5 | <ul style="list-style-type: none"> ● Session 4 Home Connection <ul style="list-style-type: none"> ● Sessions 2, 5 |
|--|---|--|---|
| Possible Misconceptions | | Teacher Moves | |
| <ol style="list-style-type: none"> 1. Students who confuse the sequence of numbers, skip numbers, or repeat numbers. 2. Words for teen numbers may be confusing since they do not follow the pattern of other decade numbers. 3. Moving beyond 19. 4. Students who struggle with counting forward from a given number, particularly with numbers greater than 10. 5. Students who are more likely to use finger counting and rote memorization when working with addition and subtraction - especially learning basic facts. 6. Students may have misconceptions of terms for comparison such as biggest. Two students may claim their object is the biggest | | <ol style="list-style-type: none"> 1. These students need more experience in counting within a smaller range of numbers. Students should be fluent in a range before increasing the range. 2. Provide more practice with reciting teen numbers and connecting the number name with the written numeral. 3. Focus on oral patterns such as the sequence of the ones place digits in the twenties is the same as the sequence of the ones place digits in the other decades. 4. Students should master counting within a sequence before counting on from a given number. For example, students must be able to rote count to 20 before they are expected to count on from 8. Begin with smaller numbers and progress to greater numbers. Limit how far you want students to count and then increase range. 5. More time should be provided in representing addition and subtraction by drawing pictures before working with numerical expressions and equations. 6. Teachers should engage students to compare objects or built creations, helping students name measurable attributes, such as one student has a taller block creation (height) and the other student has a greater width. Students should talk about, label several attributes of objects, and compare the creations using different attributes. Eventually, through dialog and discussions, students will begin to distinguish the meaning of comparison words related to measurement. | |
| Vocabulary and Representations | | | |
| Tier 2 (Academic Vocabulary) | | Tier 3 (Domain Specific Vocabulary) | |
| add* after backward | | addition* cent equation* | |

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| before between compare count back count on equal* equal to* forward greater than* half in all left less/less than* long/longer/longest measure* middle minus more next to order plus right short/shorter/shortest strategies the same total | graph* length* nickel ones* penny subtract* subtraction* 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. [Implementing the Standards of Mathematics Practice](#)
4. [Illustrating the Standards of Mathematical Practice](#)
5. [Bridges Interactive Math Manipulatives](#)
6. [Math Practice Posters K-1](#)
7. [K - Standards + Practices Explanations and Examples](#)
8. [Number Sense Trajectory](#)
9. [Number Talks Matter - Number Talks at a Glance](#) and Fluency without Fear
10. Teaching Channel - [Beyond Fingers; Place Value and Numbers 11-19](#)
11. [Early Mathematics - A Resource for Teaching Young Children Mathematics](#)
12. [Lessons for Learning](#) - A Collection of Math Tasks/Instructional Ideas
13. [Building Conceptual Understanding and Fluency Through Games](#)
14. [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.
15. [Beginning to Problem Solve with I Notice, I Wonder](#)

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16. [The Progression of Addition and Subtraction](#)
17. [Illustrative Math – Grade K](#) - Resources and activities for the grade aligned by standard.
18. [Accountable Talk Moves](#)
19. [Sample Language Frames for Mathematics](#)
20. [Teacher/Student Actions](#)
21. [Fletcher Three Act Tasks](#)
22. LearnZillion - Lesson Plans and Activities - None available at this time
23. K-5 Math Teaching Resources
 - [Number Puzzles](#)
 - [Count on Cup](#)
 - [Roll and Cover](#)
 - [Show One Less](#)
 - [Measurement Sentence Frames](#)
 - [Concept Book - What is Long?](#)

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

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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.

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- 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

- [The Train Game](#)
- [Let the Chips Fall](#)
- [Start with the Number](#)
- Extension activities aligned with Bridges lessons are included in each module

Interdisciplinary Connections

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

- | | |
|---|---|
| *Nuts to You by Lois Ehlert | *Pigs will be Pigs by Amy Axelrod |
| *The Busy Little Squirrel by Nancy Tafuri | *Benny's Pennies by Pat Brisson |
| *Arthur's Funny Money by Lillian Hoban | *Jelly Beans for Sale by Bruce McMillan |
| *The Penny Pot by Stuart Murphy | *Bunny Money by Rosemary Wells |
| *Alexander Who Used to Be Rich Last Sunday by Judith Viorst | |

ELA

[SL.K.1](#)

Participate in collaborative conversations with diverse partners about *kindergarten topics and texts* 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).
- Describe, measure, and/or compare quantitative attributes of different objects and display the data using simple graphs