

Winchester Math Curriculum Grade K

Subject	Mathematics
Grade/Course	Kindergarten
Unit of Study	Unit 3: Bikes & Bugs: Double, Add & Subtract
Pacing	November / December
Unit Summary	Kindergarteners begin this unit with an exploration of bicycles and wheels in which they begin counting by 2s. This leads them to an exploration of doubling and even numbers. They also use five and ten frames to add 1 to numbers 1 to 10, compare and order numbers, and write equations to show combinations of numbers that have a sum of 5.

Overarching Mathematical Practices

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

Unit CT Core Content Standards

- K.CC.A.1- Count to 100 by ones and by tens.
K.CC.A.2- Count forward beginning from a given number within the known sequence (instead of having to begin at 1).
K.CC.A.3- 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).
K.CC.B.4a- 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.
K.CC.B.4b- 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.
K.CC.B.4c- Understand that each successive number name refers to a quantity that is one larger.
K.CC.B.5- 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.
K.CC.C.6- 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.
K.CC.C.7- Compare two numbers between 1 and 10 presented as written numerals.
K.OA.A.1- Represent addition and subtraction with objects, fingers, mental images, drawings 1, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.
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.OA.A.3- Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., $5 = 2 + 3$ and $5 = 4 + 1$).

K.OA.A.4- For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.

K.G.B.5- Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.

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.

"Unwrapped" Standards

Skills	Content
Count	<ul style="list-style-type: none"> ● to 100 by ones and tens ● forward from a given number (not 1) ● to answer "how many?"
Write	numbers 0 to 20
Represent	<ul style="list-style-type: none"> ● a number of objects with a written numeral 0-20 ● addition and subtraction with objects, fingers, drawings, etc.. including expressions and equations
Say	number names in order
Understand	<ul style="list-style-type: none"> ● the last number name said tell the number of objects counted ● the number counted is the same regardless of the arrangement or order of objects ● each successive number refers to a quantity one larger
Identify	<ul style="list-style-type: none"> ● whether the number of objects in one group is greater than, less than, or equal to objects in another group
Compare	<ul style="list-style-type: none"> ● numbers between 1 and 10 written as numerals
Solve	<ul style="list-style-type: none"> ● addition and subtraction word problems using objects or drawings ● addition and subtraction within 10 using objects or drawing
Decompose	numbers less than or equal to 10 into pairs in more than one way
Find	the number that makes 10 when added to a given number
Record	answers with drawings, expressions, or equations
Model	shapes from the world by building or drawing
Describe	<ul style="list-style-type: none"> ● measurable attributes of objects

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	<ul style="list-style-type: none"> • several measurable attributes of a single object • the difference when comparing common attributes of objects
Compare	common measurable attributes of objects
Essential Questions	Corresponding Big Ideas
<ol style="list-style-type: none"> 1. How does counting help us in our everyday lives? 2. How can strategies help us add and subtract? 3. How do numbers relate and compare to objects? 	<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, compare groups of objects, and solve problems. 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 by creating easier but known sums. 3. The last number name tells the number of objects or “how many” counted regardless of the arrangement or the order.

Evidence of Learning - Assessment

Pre/Post Assessment	Interim Assessment	Additional Evidence of Learning
	<ul style="list-style-type: none"> • Beat You to Ten Checkpoint - M1, S4 • Working with Numbers Checkpoint - M3, S5 	<p>Options</p> <ul style="list-style-type: none"> • Exit tickets <p>Observational Assessments</p> <ul style="list-style-type: none"> • Grab Bag Doubles - M1, S5 • Butterfly Race - M2, S1 • Spill Ten Beans - M2, S2 • Grab Bag More or Less - M3, S4 • Bicycle Race - M3, S5 • Fives Up - 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).

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- 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 3 are:

Geometry

- Two and Three-Dimensional Shapes
 - squares
 - cubes
 - circles
 - spheres
 - cones
 - rectangles
 - cylinders
- Identify, describe, analyze, and compare shapes
- Estimate amount of calendar collection
- Count calendar collection

Measurement

- Find length

Problem Solving

- Solve problems and share thinking/reasoning

Number Sense

- Use a ten-frame to find pairs that equal 10.
- Fluency to 5
- Count forward and backward 1 to 25
- Writing numerals to 20

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

Module 1	Module 2	Module 3	Module 4
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Problem + Investigation <ul style="list-style-type: none"> ● Sessions 1-5 Work Place <ul style="list-style-type: none"> ● Sessions 1-5 Assessment <ul style="list-style-type: none"> ● Session 4 Home Connection <ul style="list-style-type: none"> ● Sessions 2, 5 	Problem + Investigation <ul style="list-style-type: none"> ● Sessions 2-5 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 1-5 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, 5 	Problem + Investigation <ul style="list-style-type: none"> ● Sessions 1-4 Work Place <ul style="list-style-type: none"> ● Sessions 1-5 Home Connection <ul style="list-style-type: none"> ● Sessions 2, 5
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Possible Misconceptions	Teacher Moves
<ol style="list-style-type: none"> 1. Students who struggle with counting fluently from 1 particularly with numbers greater than 10. 2. It is common for kindergarten students to invert or reverse numerals. 3. Watch for students who find it confusing to say one number name with one object as the count (one-to-one correspondence) 4. Watch for students who double count an object. 5. Students may see 5 items spread out as different from 5 items close together. 6. Students are more likely to use finger counting and rote memorization in working with addition and subtraction - especially when learning basic facts when not previously provided enough conceptual experiences. 	<ol style="list-style-type: none"> 1. Students should master counting within a sequence starting from one before counting forward from a given number in a sequence. For example, students should 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 the range. 2. With additional experience, most children will self-correct. Give children opportunities to have a variety of kinesthetic experiences to form numerals (write numerals in sand, rice, etc.) before they use paper and pencil. 3. Begin with a smaller number of objects and model saying the number name as you physically move the object. Have students do the same. 4. Physically moving the object and saying one number name for each object will help to reinforce one-to-one correspondence; that is one object goes with one number name. 5. Students should physically move the objects matching one item from one set with one item from the other set to understand that the count of 5 remains the same no matter how the objects are organized. 6. To prevent this occurrence provide students with time to draw pictures for the problems before working with numerical expressions and equations.

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<p>7. Although it is appropriate for kindergarteners to use their fingers in initial counting and exploration experiences, it eventually needs to be phased out.</p>	<p>7. Focus on concrete and pictorial representations to develop an understanding that numbers can be put together and taken apart in a variety of ways. Students need many opportunities with different materials to explore this concept and to explain their thinking with numbers to 5 and later extending to 10. This forms the foundation for future work with place value and helps students to form mental images and strategies as they start to work with number facts.</p>
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Vocabulary and Representations

Tier 2 (Academic Vocabulary)	Tier 3 (Domain Specific Vocabulary)
<p>add* alike backward bottom compare different double equal* even forward greater than* in all less, less than* longer than minus more number order plus same shorter than strategies symbol* top</p>	<p>addition* circle* equation*+ expression*+ half number words 0 - 10* <ul style="list-style-type: none"> ● zero, one, two, three, four, five, six, seven, eight, nine, ten numeral + subtract* subtraction* ten frame Venn diagram</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>

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. [Math Practice Posters K-1](#)

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6. [K - Standards + Practices Explanations and Examples](#)
7. [Number Sense Trajectory](#)
8. [Number Talks Matter - Number Talks at a Glance](#) and Fluency without Fear
9. Teaching Channel - [Beyond Fingers; Place Value and Numbers 11-19](#)
10. [Early Mathematics - A Resource for Teaching Young Children Mathematics](#)
11. [Lessons for Learning](#) - A Collection of Math Tasks/Instructional Ideas
12. [Building Conceptual Understanding and Fluency Through Games](#)
13. [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.
14. [Illustrative Math – Grade K](#)
15. LearnZillion
 - [Count and Compare](#)
 - [Marbles in a Jar](#)
15. K-5 Math Teaching Resources
 - [Count on Cup](#)
 - [Show Two More](#)
 - [Writing Numerals](#)
 - [Missing Numbers](#)
 - [Five-Frame Concentration](#)
 - [Towers of Ten](#)

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.

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- 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.
- 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.
- 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.
- 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](#)

EL Strategies

- [Colorin Colorado](#) – A Bilingual site for educators and families of English learners
- [Stanford University - Principles for Mathematics Instruction of ELs](#)
- [CT State Dept. Of Education English Learner Standards and Resources](#)
- Nonverbal responses, such as thumbs up, will help you check for understanding without requiring students to produce language. ELLs can participate and show that they understand a concept, or agree or disagree with an idea, without having to talk. This is especially important for students whose comprehension of English is more advanced than their ability to speak the language.
- Pre-teach vocabulary in ways that connect to students' prior knowledge.
- Display posters of graphic representations of vocabulary words.
- <http://www.cal.org/siop/lesson-plans/>
- Provide support to assist in explaining thinking with sentence starters and work banks.
- Use Work Place Sentence Frames or other sentence frames to assist students in math discourse.
- Speak slowly and use clear articulation. Reduce the amount of teacher talk and use a variety of words for the same idea. Exaggerate intonation and place more stress on important new

concepts or questions. After asking a question, wait for a few moments before calling on a volunteer. Writing the question on the board will also help.

- English language learners are not always able to answer the questions posed to them, especially when the questions are open-ended. Provide support for and improve the participation of students with lower levels of English proficiency by using a prompt that requires a physical response, like "Show me a half, a third, etc.." or "Touch the larger number."
- [Increase academic language knowledge for English learner success.](#)

Extension

- [Cross the Decade](#)
- [Add to: Result Unknown](#) - Solving word problems within 10
- [Value of a Sight Word](#) - Students will use an alphabet/number code to figure out the value of sight words
- Extension activities aligned with Bridges lessons are included in each module

Interdisciplinary Connections

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

*What Comes in 2's, 3's, & 4's by Suzanne Aker

Benny's Penny's by Pat Brisson

I Can Count the Petals on a Flower by John and Stacy Wahl

How Many Snails? by Paul Giganti

Mouse Count by Ellen Stall Walsh

Ten Black Dots by Donald Crews

City by Numbers by Stephen Johnson

Ten, Nine, Eight by Molly Bang

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.

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.