

Winchester Math Curriculum Grade K

Subject	Mathematics
Grade/Course	Kindergarten
Unit of Study	Unit 8: Computing & Measuring with Frogs & Bugs
Pacing	May / June
Unit Summary	This final unit of the kindergarten year prepares students for the work ahead in Grade 1. In the content of explorations about frogs, students build a deeper understanding of subtraction and strengthen the connections between quantity, related number combinations, and written notation to 20. The activities in this unit should help students learn to add and subtract to 5 with fluency, to add to 10, and strengthen their understanding of place value by the end of the year.
<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.1-</u> Count to 100 by ones and by tens.</p> <p><u>K.CC.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.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.4c-</u> Understand that each successive number name refers to a quantity that is one larger.</p> <p><u>K.CC.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.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.MD.1-</u> Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.</p> <p><u>K.MD.2-</u> 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.</p> <p><u>K.MD.3-</u> Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.</p> <p><u>K.NBT.1-</u> Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (such as $18 = 10 + 8$); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.</p>	

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K.OA.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.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.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.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.OA.5- Fluently add and subtract within 5.

“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 ● the number of objects in a category
Write	numbers 0 to 20
Represent	<ul style="list-style-type: none"> ● objects with written numerals 0 to 20 ● addition and subtraction with objects
Understand	<ul style="list-style-type: none"> ● successive number names refers to a quantity that is one larger ● numbers 11 to 19 are composed of tens and ones
Identify	greater than, less than, or equal to of groups of objects
Describe	<ul style="list-style-type: none"> ● measurable attributes ● several measurable attributes ● the difference when comparing common attributes
Directly compare	measurable attributes in common
Classify	objects into given categories
Sort	categories by count
Compose	<ul style="list-style-type: none"> ● numbers 11 to 19 ● numbers up to 10
Decompose	numbers 11 to 19
Solve	addition and subtraction word problems
Add and Subtract	<ul style="list-style-type: none"> ● within 10 ● fluently within 5
Find	the number that makes 10 when added to a given number
Essential Questions	Corresponding Big Ideas
1. How can we use objects and drawings to solve problems?	1. Objects and drawing can be moved or show the actions used to solve the problem and are helpful in building

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<p>2. Why do we compose and decompose numbers?</p> <p>3. How can you describe, compare, and classify objects?</p>	<p>understanding of the various types of problems.</p> <p>2. Breaking apart and putting together numbers helps us to understand the flexibility of numbers and how to use numbers in various ways in solving problems</p> <p>3. Objects can described, compared, and classified by identifying, measuring, and comparing attributes.</p>
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Evidence of Learning - Assessment

Pre/Post Assessment	Interim Assessment	Additional Evidence of Learning
<p>May -Number Corner Checkup 4 June - Comprehensive Growth Assessment</p>	<ul style="list-style-type: none"> ● Bug Catchers Checkpoint, Module 1, Session 2 ● Count and Compare Bugs Checkpoint, Module 2, Session 2 	<p>Options</p> <ul style="list-style-type: none"> ● Exit tickets <p>Observational Assessments:</p> <ul style="list-style-type: none"> ○ Bug Catcher -, M 1, S2 ○ Piggy Bank Subtractions - M 1, S 4 ○ Count and Compare Bugs - M 1, S 5 ○ Frog Jump Measuring - M 2, S 2 ○ Unifix Cube Measuring - M 2, S 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.

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

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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

Bridges Number Corner: The focus areas for Number Corner (workouts that introduce, reinforce, and extend skills) aligned to Unit 8 are:

Problem Solving

- Pose and solve addition and subtraction story problems

Computational Fluency

- Represent and solve addition and subtraction combinations to 10
- Develop fluency with facts to 5

Measurement and Data

- Discuss and make predictions about data
- Compare data to confirm or not predictions

Number Sense

- Practice counting by 1's and 10's
- Explore patterns and relationships of 0-50 on a number grid/number line

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

Possible Misconceptions

1. Words for teen numbers may be confusing since they do not follow the pattern of other decade numbers.
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

Teacher Moves

1. Provide more practice with reciting teen numbers and connecting the number name with the written numeral.
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

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<p>as they count (one-to-one correspondence).</p> <ol style="list-style-type: none"> 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. Some students may be able to match a quantity with a number or numeral but cannot produce that number of objects when given materials or asked to draw a picture. 7. Students who use finger counting and rote memorization in working with addition and subtraction especially when learning basic facts. 8. Student may develop the misconception that certain vocabulary always represents a particular operation. For example, they may perceive that the word <i>more</i> indicates addition, whereas later when working with comparisons, a situations with <i>more</i> may actually call for subtraction. 9. Although it is appropriate for kindergarteners to use their fingers in initial counting and exploration experiences, the use of finger in computation of basic facts should gradually fade over the course of the year. 10. Watch for students who miscount the total number in their representation and actually decompose a number other than 10. 	<p>you physically move the object. Have the students do the same.</p> <ol style="list-style-type: none"> 4. Physically moving the object and saying one number name for each object will help reinforce one-to-one correspondence. 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. Looking for a specific quantity when given a choice of collections has a lower level cognitive demand (is easier) than having to produce a set of objects given a number. This standard will take time to develop. 7. Students need time to draw pictures before working with numerical expressions and equations. 8. It is critical that students connect what to do with actions or problem situations and use models rather than look for clue words. 9. 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. 10. Students who are struggling with counting strategies need more experience modeling how smaller numbers can be decomposed and justifying by counting before working with 10.
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<p>11. Students who cannot give a correct response in a reasonable amount of time (3-4 seconds) or are depending on counting on their fingers have not developed fluency with these facts.</p>	<p>11. An important prerequisite of adding and subtracting is being able to count. Students who continue to count from 1 or struggle with counting on need practice with rote counting as well as more experience with concrete materials and drawings. Only when they are ready should they work with making explicit connections to expressions and equations and basic facts. Begin with strategies such as counting on by 1 or 2. Help students to see the pattern of what happens when they add zero. Explore the doubles facts (1+1, 2+2). The sums to 5 present opportunities to thinking about decomposing an addend to make the sum $2 + 2 + 1$. Subtraction facts are usually more difficult for students to master and require more concrete experiences with subtraction problem situations and concrete connections to related addition facts.</p>
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Vocabulary and Representations

Tier 2 (Academic Vocabulary)	Tier 3 (Domain Specific Vocabulary)
<p>add* after before different equal* estimate* greater than* in all length* less than long/longer/longest measure* minus more/more than number ones* pattern* plus reasonable same short/shorter/shortest</p>	<p>addition equation* fact family numeral square* subtract* subtraction</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>

strategies
tens*

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](#)
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. [The Progression of Early Number and Counting](#)
10. [The Progression of Addition and Subtraction](#)
11. Teaching Channel - [Beyond Fingers; Place Value and Numbers 11-19](#)
12. [Early Mathematics - A Resource for Teaching Young Children Mathematics](#)
13. [Lessons for Learning](#) - A Collection of Math Tasks/Instructional Ideas
14. [Building Conceptual Understanding and Fluency Through Games](#)
15. [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.
16. K- 5 Math Teaching Resources
 - [Add To: Result Unknown \(Word Problems within 10\)](#)
 - [Put Together: Both Addends Unknown \(Word Problems within 10\)](#)
 - [Ten Ones and More Ones](#)
 - [Teen Match](#)
 - [Teen Puzzles](#)
 - [Which Has More?](#)
 - [Sort and Count](#)
17. [Illustrative Math – Grade K](#) - Resources and activities for the grade aligned by standard.
18. [Bridges Interactive Math Manipulatives](#)
19. [Journal Prompts for Math](#)
20. [Beginning to Problem Solve with I Notice, I Wonder](#)
21. [Accountable Talk Moves](#)
22. [Sample Language Frames for Mathematics](#)
23. [Teacher/Student Actions](#)
24. [Fletcher Three Act Tasks](#)
25. [Vocabulary Development Frayer Model](#) – Elementary and secondary video and resources.
26. [Measurement Sentence Frames for Comparing Lengths](#)
27. [Rekenrek Prompt Cards](#)
28. [Language of Mathematics Task Templates](#)
29. [Number Operations: Strategic Number Counting Instruction](#)

Suggestions for Differentiation, Scaffolding and Intervention

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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, flash cards, 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.

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- 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.](#)
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Extension

- Students write addition and subtraction stories to go with the actions from recommended titles.
- Give students the number and ask them to show that many items and. later, draw that many items. Let students model numbers with ten frames and double tens frames explaining different strategies to know the number.
- [Math Lingo](#)
- [Max's Math Adventures](#)
- Children can count as many objects as they are capable of and place the objects in groups of 10 and then count by 10s.

Interdisciplinary Connections

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

**Rooster's Off to See the World* by Eric Carle

**Twenty is Too Many* by Kate Duke

**A Bag Full of Pups* by Dick Gackenbach

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

**Toasty Toes, Counting by Tens* by Michael Dahl

Is it Larger? Is it Smaller? by Tana Hoban

**Penguin Pairs, Counting by 2's* by Amanda Doering Tourville

How Long is a Whale? by Alison Limentani

A Caribbean Counting Book by Faustin Charles

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 work with attributes and measurement to support science concepts related to attributes and measurement.

Write word problems related to science concepts.

Use mathematical terms to describe quantitative relationships such as same as, more than, less than, equal to, etc.