

Winchester Math Curriculum Grade 3

Subject	Mathematics
Grade/Course	Grade Three
Unit of Study	Unit 3: Multi-Digit Addition and Subtraction
Pacing	November / December
Unit Summary	Unit 3 reviews and extends students’ thinking about place value, multi-digit addition and subtraction, and problem solving. In the first module, students are introduced to the idea of rounding 2- and 3-digit numbers to the nearest ten and the nearest hundred. This skill is extended into the realm of computation, as students use rounding as a way to estimate and check the results of adding and subtracting multi-digit numbers. Along with reviewing and deepening their understandings of strategies learned in second grade, students are introduced to the standard algorithms for adding and subtracting multi-digit numbers toward the end of the unit.
<u>Overarching Mathematical Practices</u>	
<p>3.MP.1 Make sense and persevere in solving problems.</p> <p>3.MP.2 Reason abstractly and quantitatively.</p> <p>3.MP.3 Construct viable arguments and critique the reasoning of others.</p> <p>3.MP.4 Model with mathematics.</p> <p>3.MP.5 Use appropriate tools strategically.</p> <p>3.MP.6 Attend to precision.</p> <p>3.MP.7 Look for and make use of structure.</p> <p>3.MP.8 Look for and express regularity in repeated reasoning.</p>	
<u>Unit CT Core Content Standards</u>	
<p><u>3.OA.D.8</u> Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. (This standard is limited to problems posed with whole numbers and having whole-number answers; students should know how to perform operations in conventional order when there are no parentheses to specify a particular order (Order of Operations).</p> <p><u>3.NBT.A.1</u></p> <p>Use place value understanding to round whole numbers to the nearest 10 or 100.</p> <p><u>3.NBT.A.2</u></p> <p>Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction. (A range of algorithms may be used)</p>	
“Unwrapped” Standards	
Skills	Content

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Use	place value to round numbers to the nearest 10 or 100
Fluently add and subtract	within 1000 using strategies and algorithms
Solve	two-step word problems
Represent	problems using equations with a letter standing for the unknown quantity
Assess	the reasonableness of answers using mental computation and estimation strategies

Essential Questions	Corresponding Big Ideas
<ol style="list-style-type: none"> 1. What is the difference between rounding and estimating? 2. What strategies support the efficient solving of problems involving addition and subtraction? 	<ol style="list-style-type: none"> 1. Estimating means to make an approximation that gives you a close, but not an exact answer. Rounding is a type of estimation. Rounding is changing a number to a less exact number that is more convenient for computation when an exact answer is not required or to check the reasonableness of an answer. 2. Efficient and fluent solving of addition and subtraction problems is supported through the use of strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

Evidence of Learning - Assessment

Pre/Post Assessment	Interim Assessment	Additional Evidence of Learning
<ul style="list-style-type: none"> ● Unit 3 Pre-Assessment - Module 1, Session 1 ● Unit 3 Post-Assessment - Module 4, Session 5 	<ul style="list-style-type: none"> ● Rounding + Multi-digit Addition Checkpoint - M2, S1 ● Three Digit Addition + Subtraction Checkpoint - M3, S1 	<p>Options</p> <ul style="list-style-type: none"> ● Exit tickets <p>Observational Assessments</p> <ul style="list-style-type: none"> ● Round Ball Tens - M1, S2 ● Round + Add Tens - M1, S3 ● Round Ball Hundreds - M1, S4 ● Round + Add Hundreds - M3, S1

Smarter Balanced Interim Assessment

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[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.
- 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.

Interim Assessment Block - access through [CSDE Assessment Portal](#)

- IAB - Numbers and Operation in Base Ten

**Some interim blocks show clear, strong alignment to priority standards within the unit. Other blocks have been placed in one specific unit but could be aligned to the priority standards of several units. Blocks have been spread out over the course of all units for a more balanced approach to assessment throughout the school year. These interim blocks, used in partnership with the Style Guide, will support the creation of unit- and standard-aligned items for instructional use.*

Learning Plan

Researched-based Instructional Resources and Methods

Sequence of Instruction:

Number Corner → Problem + Investigations → Work Places → Math Forum → Daily Practice or Home Connection

Bridges Number Corner - The focus areas of Number Corner Aligned to Unit 3 are:

Multiplication

- Explore area model for multiplication
- Analyze multiplication strategies
- Write equations with factors and find the product
- Find the dimensions and area of arrays
- Share observations about emerging array patterns and make predictions
- Decompose large arrays into smaller arrays (partial product)
- Compute total product from partial products

Fractions

- Unit fractions $\frac{1}{2}$, $\frac{1}{4}$, or $\frac{1}{8}$
- Develop each units fractions own number line

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- Compare number lines to develop deeper understanding of unit fractions

Rounding/Estimation

- Round two-digit numbers to the nearest ten on a number line

Problem Solving

- Solve story problems
- Write equations to represent word problems with a variable for unknown quantity
- Begin developing mathematical discourse by discussing problems, sharing work, and discussing results.

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

Module 1	Module 2	Module 3	Module 4
Problem + Investigation <ul style="list-style-type: none"> • Sessions 2,4,5 Problem String <ul style="list-style-type: none"> • Session 3 Work Place <ul style="list-style-type: none"> • Sessions 1-6 Math Forum <ul style="list-style-type: none"> • Session 6 Daily Practice <ul style="list-style-type: none"> • Session 1,3-6 Home Connection <ul style="list-style-type: none"> • Sessions 1,3,5 	Problem + Investigation <ul style="list-style-type: none"> • Sessions 1,2,4 Problem String <ul style="list-style-type: none"> • Session 3 Work Place <ul style="list-style-type: none"> • Sessions 3,5 Math Forum <ul style="list-style-type: none"> • Sessions 2,5 Daily Practice <ul style="list-style-type: none"> • Session 1, 3-5 Home Connection <ul style="list-style-type: none"> • Sessions 1,3,5 	Problem + Investigation <ul style="list-style-type: none"> • Sessions 2-4 Problem String <ul style="list-style-type: none"> • None Work Place <ul style="list-style-type: none"> • Sessions 1-3 Math Forum <ul style="list-style-type: none"> • None Daily Practice <ul style="list-style-type: none"> • Sessions 1-4 Home Connection <ul style="list-style-type: none"> • Sessions 2,4 	Problem + Investigation <ul style="list-style-type: none"> • Sessions 1-4 Problem String <ul style="list-style-type: none"> • None Work Place <ul style="list-style-type: none"> • Session 5 Math Forum <ul style="list-style-type: none"> • None Daily Practice <ul style="list-style-type: none"> • Sessions 1-5 Home Connection <ul style="list-style-type: none"> • Sessions 2,4

Possible Misconceptions

1. Student who struggle with knowing what to do to solve a problem.
2. Students who become frustrated with word problems.
3. The rounding “rules” can cause students a variety of misconceptions. Rounding up to

Teacher Moves

1. Have student restate the problem in their own words. They should identify and underline or highlight the important information in the problem and determine what other informations they might need in order to solve the problem. When they explain what the problem is asking, students will find that it will help them determine whether their answer is reasonable.
2. The students may need carefully constructed questions to help direct them in determining what to do to solve the problem, but they shouldn't be told what to do to reach a solution.
3. Following the rules that do not make sense can be more complicated than the

<p>the nearest ten mean the digit in the tens place will increase by one. Rounding down can lead students to believe that the digit in the tens place would decrease by one, when in reality it remains the same.</p> <p>4. Students who learn to add and subtract procedurally without a deep understanding of place value and regrouping will struggle to determine whether their answer is reasonable. They also make common errors when subtracting with zero in the sum or take the smaller number from the larger.</p>	<p>number line representation. Students should have many experiences using number line models and justifying their solutions.</p> <p>4. Students who make these errors need more experience with concrete models, using place value charts with bundling/unbundling straws. They should make explicit connections from models to written work. They should also explain their reasoning in composing and decomposing numbers when regrouping using pictures, numbers , and words.</p>
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Vocabulary and Representations

Tier 2 (Academic Vocabulary)	Tier 3 (Domain Specific Vocabulary)
<p>approximate difference* estimate* minimal collection remove/removal round/rounding* strategy</p>	<p>addend* algorithm benchmark number expanded form landmark number minuend nearest ten* nearest hundred* subtrahend sum* thousand*</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. Grade 3 - [Standards + Practice Explanations and Examples](#)
6. [Math Practice Standards Posters](#) Gr. 2-3
7. [Illustrative Math – Grade 3](#) - Resources and activities for the grade aligned by standard.

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8. [Supporting Productive Struggle](#)
9. [Use and Connect Mathematical Representations](#)
10. [Journal Prompts for Math](#)
11. [Accountable Talk Moves](#)
12. [Contribution Checklist](#)
13. [Sentence Frames that Can Build Metacognitive Thinking](#)
14. [Sample Language Frames for Mathematics](#)
15. [Building a Mathematical Mindset Community](#)
16. [Pose Purposeful Questions](#)
17. [Number Talks Matter - Number Talks at a Glance](#) and Fluency without Fear
18. [National Library of Virtual Manipulatives](#)
19. Bridges - [Interactive Math Manipulatives](#)
20. [Three Act Math Tasks](#)
21. Illustrative Mathematics Tasks
 - [Rounding to the Nearest Ten or Hundred](#)
 - [Classroom Supplies Task](#)
22. K-5 Math Resources
 - [Two-Step Word Problems](#)
 - [Round to the Nearest Ten](#)
 - [Estimating Sums](#)
 - [Estimating Differences](#)
 - [Addition and Subtraction Word Problems within 1000](#)

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

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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.

- 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.
- Difficulty identifying information in a problem situation can be improved by providing more experiences making explicit connections between their representations (models, or pictures).
- Provide carefully constructed questions to help direct students in determining what to do to solve problems, but they shouldn't be told what to do to reach the solution.
- At times, partner struggling students with students who are very articulate about their mathematical thinking so they can hear (through conversations) how these students have made sense of the problems

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.
- How to Promote Acquisition of Math Facts – Intervention for struggling students
- National Center on Intensive Intervention - Basic Facts
- [Concrete, Representational, Abstract Progression](#)

Strategies to Support English Learners

- [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/> - SIOP strategies can be effective with all learners
- 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

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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:

- Explore different operations to reach a given target number. Describe what is noticed in the process and how estimation may help to determine the most effective operation and numbers to reach the target.
- Have students think of target numbers between 100 and 10,000 that align with their capabilities and then develop clues, including rounding and estimation, for other to use to figure out the target number.
- Provide students with a problem involving shopping. Have students make an estimate on how much they will spend by trying out various estimation strategies. Students will find out if the estimate is reasonable and calculate the real cost. They will explain in writing how they arrived at their estimate and which estimation strategy was most efficient and accurate.

Interdisciplinary Connections

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

- | | |
|---|---|
| # <i>The 329th Friend</i> by Marjorie Weinman Sharmat | * <i>Let’s Estimate</i> by David A. Adler |
| * <i>For Good Measure</i> by Ken Robbins | * <i>Great Estimations</i> by Bruce Goldstone |
| * <i>Millions to Measure</i> by David A. Schwartz | * <i>Telling Time</i> by Jules Older |
| * <i>Sir Cumference and the Roundabout Battle</i> by Cindy Neuschwander | |

Science

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

ELA

[CCSS.ELA-LITERACY.SL.3.1](#)

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 3 topics and texts*, building on others' ideas and expressing their own clearly.

[CCSS.ELA-LITERACY.SL.3.1.A](#)

Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion.

[CCSS.ELA-LITERACY.SL.3.1.B](#)

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.3.1.C

Ask questions to check understanding of information presented, stay on topic, and link their comments to the remarks of others.

CCSS.ELA-LITERACY.SL.3.1.D

Explain their own ideas and understanding in light of the discussion.