

Winchester Math Curriculum Grade 3

Subject	Mathematics
Grade/Course	Grade Three
Unit of Study	Unit 1 - Addition & Subtraction Patterns
Pacing	August / September
Unit Summary	This unit focuses on patterns in addition and subtraction facts, the pattern of adding 10s, measuring, and problem solving. Students will review the addition strategies for facts to 20 learned in second grade. They will revisit subtraction strategies for facts to 20. Students are introduced to multi-digit addition on the open number line. Students will be presented with a collection of story problems that prompt them to practice their skills with multi-digit addition and subtraction.
<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.</p> <p>** Note - This standard is limited to problems posed with whole numbers and have whole number answers. Student should know how to perform operations in conventional order when there are no parentheses.</p> <p><u>3.OA.D.9</u> Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.</p> <p><u>3.NBT.A.1</u> Use place value understanding to round whole numbers to the nearest 10 or 100.</p> <p><u>3.NBT.A.2</u> 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.</p> <p><u>3.MD.A.1</u> Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.</p>	

3.MD.B.3

Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. *For example, draw a bar graph in which each square in the bar graph might represent 5 pets.*

“Unwrapped” Standards

Skills	Content
Add/Subtract	Numbers within 1000 using strategies
Identify	Arithmetic patterns
Explain	Arithmetic patterns using properties of operations
Solve	<ul style="list-style-type: none">• 2-step word problems using four operations• 1- and 2-step “how many more/less” problems using information in scaled bar graphs• Word problems involving addition/subtraction of time intervals in minutes
Represent	Word problems using equations with a letter for the unknown
Assess	Reasonableness of answers
Write	Time to the nearest minute
Measure	Time intervals in minutes
Draw	Scaled picture and bar graph to represent a data set with several categories
Use	<ul style="list-style-type: none">• place value to round whole numbers to the nearest 10 or 100• estimation strategies
Essential Questions	Corresponding Big Ideas
<ol style="list-style-type: none">1. How can recognizing arithmetic patterns be explained using properties of operations?2. How do strategies help us become fluent in computation?3. How do I know which operation to use to solve problems?	<ol style="list-style-type: none">1. The properties of operations can explain the relationship between arithmetic patterns in our number system and operations for example, 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.2. Strategies help us to deeply understand the relationship between the structure of our number system and operations and use that understanding to develop efficient short-cuts to arrive at accurate answers.3. The best operation to use to solve a

problem can be selected based on the structure of the problem. (See problem situations in Math Teaching Practices)

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 3 and Unit 7 Pre-Assessment Student Reflection Sheet Unit 1 Post-Assessment - Module 4, Session 6 Number Corner Baseline Assessment 	<ul style="list-style-type: none"> Multiplication Division Checkpoint - Module 2. Session 3 	<p>Options</p> <ul style="list-style-type: none"> Exit tickets <p>Observational Assessments</p> <ul style="list-style-type: none"> Make the Sum - M1, S5 Target Twenty - M2, S2 Blast off to Space - M2, S3 Subtraction Bingo - M2, S4 Adding Lengths Work Sample -: M3, S3 Carrot Grab - M3, S4 Rabbit Tracks - M4, S1 Target One Hundred - M4, S3 Anything But Five - M4, S5 <ul style="list-style-type: none"> Math Practices Observation Chart

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.
- 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 - No blocks match this unit

**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 1 are:

Multiplication

- Introduce key multiplication concepts and models
- Make observations
- Generate equations to match visuals
- Describe emerging patterns and make predictions

Data

- Opportunities to understand, generate, and/or conduct surveys
- Gather data
- Create scaled bar graph
- Create scaled picture graph

Computational Fluency

- Find products
- Create visual representations of equal groups and write equations to represent results
- Find sums by combining products

Number Sense

- Review of place value through 1,000
- Use number lines to solve number riddles
- Read numbers to 1,000
- Read numbers to 1,000 using expanded form
- Look for and describe patterns in multiples of 10 and 100 to 1,000

Addition

- Strategies for adding 2- and 3- digit numbers

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

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

Possible Misconceptions	Teacher Moves
<ol style="list-style-type: none"> 1. Students may have difficulty finding and describing arithmetic patterns. 2. Some students may be more likely to notice visual patterns before numerical patterns. 3. Students who learn to add and subtract procedurally without a deep understanding of place value and regrouping will struggle to determine whether their answers are reasonable. They also make common errors when subtracting with zero in the sum or take the smaller number from the larger. Example: 736 $\begin{array}{r} 736 \\ -259 \\ \hline 523 \end{array}$ 4. Some students may have difficulty simply reading a clock to tell time. 	<ol style="list-style-type: none"> 1. Start with simple examples and build to more complex patterns. 2. If possible, project the multiplication or addition tables and shade the patterns for all to see. This will help struggling students to visualize the patterns and then look at characteristics of the numbers. 3. Students who make these errors need more experience with concrete models, using place value charts with bundling and 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. 4. Before teaching elapsed time, make sure students can tell time to the minute. Allow students to use a clock with movable hands, but keep in mind that numerous ongoing practices telling time to the minute using a clock or number line to show elapsed time will help students become proficient.

Vocabulary and Representations

Tier 2 (Academic Vocabulary)	Tier 3 (Domain Specific Vocabulary)
difference* measure* measuring tape patterns* reasonableness ruler time*	arithmetic patterns associative property of addition + centimeter (cm)* commutative property of addition + equations* estimate* estimation*

<p>time intervals* total unknown quantity</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>	<p>even number friendly number inch (in) mental computation number line* number rack odd number operation(s)* problem string properties of operations + place value* rounding (round to the nearest)* sum* tens</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. [Teacher/Student Actions](#)
8. [Journal Prompts for Math](#)
9. [Bridges Interactive Math Manipulatives](#)
10. [Number Talks Matter - Number Talks at a Glance](#) and Fluency without Fear
11. [National Library of Virtual Manipulatives](#)
12. [Illustrative Math – Grade 3](#) - Resources and activities for the grade aligned by standard.
13. [Bridging Practices - UCONN](#) – Training and a Task Repository to develop and support student capacity for argumentation in mathematics
14. [Accountable Talk Moves](#)
15. [Contribution Checklist](#)
16. [Sentence Frames that Can Build Metacognitive Thinking](#)
17. [Sample Language Frames for Mathematics](#)
18. [Building a Mathematical Mindset Community](#)
19. [Fletcher Three Act Tasks](#)
20. [Vocabulary Development Frayer Model](#) – Elementary and secondary video and resources.
21. [Addition and Subtraction Problem Situation Types](#)
22. [The Progression of Addition and Subtraction](#)
23. LearnZillion
 -

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, 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.
- All students will not be ready at the same time to discontinue use of the base-ten manipulatives. The teacher will need to be conscientious about monitoring each student’s level of understanding to know when the student will be ready to transition to diagrams without manipulatives support. If students experience frustration or uncertainty during this process, the manipulatives should be kept available for use as reinforcement or support..

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](#)
-
- 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

- Ask students to create and solve their own story problems
- Students can create story problems that have a two step process.
- [Party Planning](#) - In this activity, students are given the task of planning a birthday party for six guests with a budget of \$100.

Interdisciplinary Connections

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

My Little Sister Ate a Hare by Bill Grossman

One Hundred Hungry Ants by Elinor Pinczes

Mission Addition by Loreen Leedy

A Fair Bear Share by Stuart J. Murphy

Shark Swmathon by Stuart J. Murphy

Subtraction Action by Loreen Leedy

How Do You Know What Time It Is? by Robert E. Wells

Chimp Math - Learning About Time by Ann Whitehead Nagda

Science

Develop and/or use a model to represent amounts, relationships, relative scales (bigger, smaller) and/or patterns in the natural and designed world(s).

Social Studies

Read- *A First Look at Time and Clocks* by Bruce Koscielniak - This book teaches about clocks and how time has measured through history.

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.