Thomaston Public Schools

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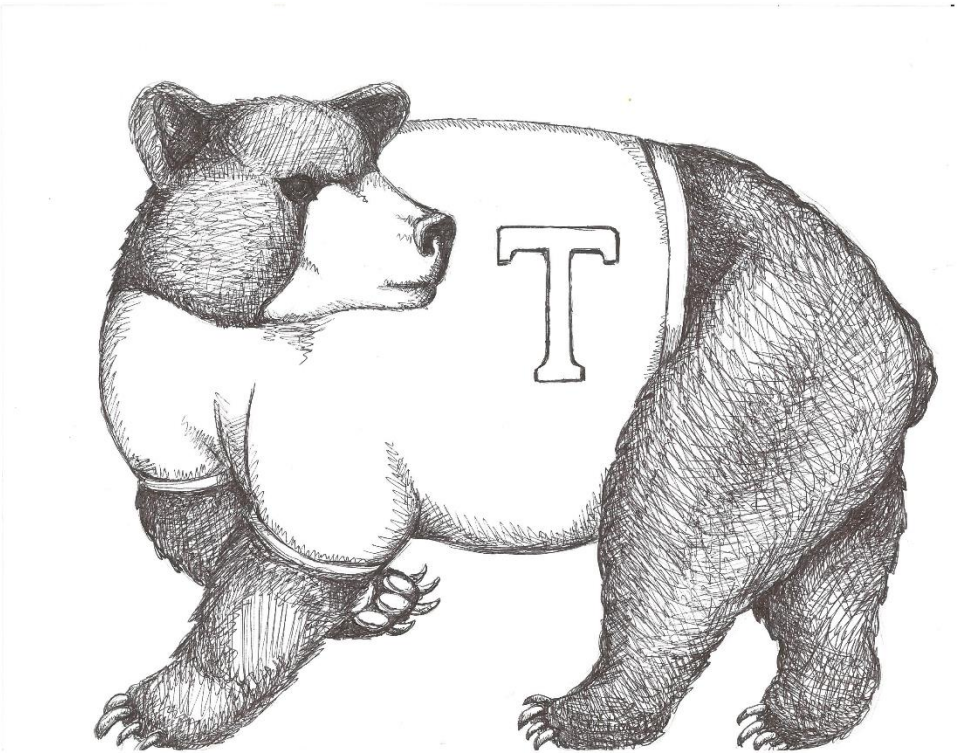

Thomaston Public Schools Curriculum
Black Rock School
Grade 1: Mathematics 2015

A Nurturing Community Where Children Are Primary

Acknowledgements

Curriculum Writer(s): Diana Jonas

We acknowledge and celebrate the professionalism, expertise, and diverse perspectives of these teachers. Their contributions to this curriculum enrich the educational experiences of all Thomaston students.

_____*Alisha DiCorpo*_____

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Director of Curriculum and Professional Development

Date of Presentation to the Board of Education: August 2015

(Math Curriculum Grade 1)

Grade 1 Mathematics

Board of Education Mission Statement:

IN A PARTNERSHIP OF FAMILY, SCHOOL AND COMMUNITY, OUR MISSION IS TO EDUCATE, CHALLENGE AND INSPIRE EACH INDIVIDUAL TO EXCEL AND BECOME A CONTRIBUTING MEMBER OF SOCIETY.

Departmental Philosophy:

The Mathematics Department strives to instill in each student a conceptual understanding of and procedural skill with the basic facts, principles and methods of mathematics. We want our students to develop an ability to explore, to make conjectures, to reason logically and to communicate mathematical ideas. We expect our students to learn to think critically and creatively in applying these ideas. We recognize that individual students learn in different ways and provide a variety of course paths and learning experiences from which students may choose. We emphasize the development of good writing skills and the appropriate use of technology throughout our curriculum. We hope that our students learn to appreciate mathematics as a useful discipline in describing and interpreting the world around us.

Main resource used when writing this curriculum:

NYS COMMON CORE MATHEMATICS CURRICULUM A Story of Units Curriculum. This work is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License. A Story of Units: A Curriculum Overview for Grades P-5 Date: 7/31/13 5 © 2013 Common Core, Inc. Some rights reserved. commoncore.org

Course Description:

Sequence of Grade 1 Modules Aligned with the Standards

Module 1: Sums and Differences to 10

Module 2: Introduction to Place Value Through Addition and Subtraction Within 20

Module 3: Ordering and Comparing Length Measurements as Numbers

Module 4: Place Value, Comparison, Addition and Subtraction to 40

Module 5: Identifying, Composing, and Partitioning Shapes

Module 6: Place Value, Comparison, Addition and Subtraction to 100

Summary of Year

First Grade mathematics is about (1) developing understanding of addition, subtraction, and strategies for addition and subtraction within 20; (2) developing understanding of whole number relationships and place value, including grouping in tens and ones; (3) developing understanding of linear measurement and measuring lengths as iterating length units; and (4) reasoning about attributes of, and composing and decomposing geometric shapes.

Key Areas of Focus for K-2: Addition and subtraction—concepts, skills, and problem solving

Required Fluency: 1.OA.6 Add and subtract within 10.

CCS Major Emphasis Clusters Operations and Algebraic Thinking • Represent and solve problems involving addition and subtraction. • Understand and apply properties of operations and the relationship between addition and subtraction. • Add and subtract within 20. • Work with addition and subtraction equations. Number and Operations in Base Ten • Extend the counting sequence. • Understand place value. • Use place value understanding and properties of operations to add and subtract. Measurement and Data • Measure lengths indirectly and by iterating length units.

Rationale for Module Sequence in Grade 1 In Grade 1, work with numbers to 10 continues to be a major stepping-stone in learning the place value system. In Module 1, students work to further understand the meaning of addition and subtraction begun in Kindergarten, largely within the context of the Grade 1 word problem types. They begin intentionally and energetically building fluency with addition and subtraction facts—a major gateway to later grades.

In Module 2, students add and subtract within 20. Work begins by modeling “adding and subtracting across ten” in word problems and with equations. Solutions involving decomposition and composition like that shown to the right for 8 + 5 reinforce the need to “make 10.” In Module 1, students loosely grouped 10 objects to make a ten. They now transition to conceptualizing that ten as a single unit (using 10 linking cubes stuck together, for example). This is the next major stepping-stone in understanding place value, learning to group “10 ones” as a single unit: 1 ten. Learning to “complete a unit” empowers students in later grades to understand “renaming” in the addition algorithm, to add 298 and 35 mentally (i.e., 298 + 2 + 33), and to add measurements like 4 m, 80 cm, and 50 cm (i.e., 4 m + 80 cm + 20 cm + 30 cm = 4 m + 1 m + 30 cm = 5 m 30 cm).

Module 3, which focuses on measuring and comparing lengths indirectly and by iterating length units, gives students a few weeks to practice and internalize “making a 10” during daily fluency activities.

Module 4 returns to understanding place value. Addition and subtraction within 40 rest on firmly establishing a “ten” as a unit that can be counted, first introduced at the close of Module 2. Students begin to see a problem like 23 + 6 as an opportunity separate the “2 tens” in 23 and concentrate on the familiar addition problem 3 + 6. Adding 8 + 5 is related to solving 28 + 5; complete a unit of ten and add 3 more.

In Module 5, students think about attributes of shapes and practice composing and decomposing geometric shapes. They also practice work with addition and subtraction within 40 during daily fluency activities (from Module 4). Thus, this module provides important “internalization time” for students between two intense number-based modules. The module placement also gives more spatially-oriented students the opportunity to build their confidence before they return to arithmetic.

Although Module 6 focuses on “adding and subtracting within 100,” the learning goal differs from the “within 40” module. Here, the new level of complexity is to build off the place value understanding and mental math strategies that were introduced in earlier modules. Students explore by using simple examples and the familiar units of 10 made out of linking cubes, bundles, and drawings. Students also count to 120 and represent any number within that range with a numeral.

Math Unit

Grade 1 Unit 1 (Module 1)

Sums and Differences to 10

OVERVIEW

In this first module of Grade 1, students make significant progress towards fluency with addition and subtraction of numbers to 10 (1.OA.6) as they are presented with opportunities intended to advance them from counting all to counting on, which leads many students then to decomposing and composing addends and total amounts. In Kindergarten, students achieved fluency with addition and subtraction facts to 5. This means they can decompose 5 into 4 and 1, 3 and 2, and 5 and 0. They can do this without counting all. They perceive the 3 and 2 embedded within the 5.

Topic A continues the work of developing this ability with all the numbers within 10 in *put togethe*r situations (1.OA.1), with a special focus on the numbers 6, 7, 8 and 9, since recognizing how much a number needs to make 10 is part of the Kindergarten standards (K.OA.4) and easier for most children. Students decompose numbers into two sets, or conceptually subitize, in Lessons 1 and 2 and record their decompositions as number bonds.

T: How many dots do you see?

S: 8!

T: What two parts do you see?

S: I see 5 and 3.

T: Did you need to count all the dots?

S: No! I could see the top row was a full five, so I just said 6, 7, 8.

In Lesson 3, students see and describe *1 more* as + 1. They use the structure of the first addend rather than its cardinality, just as the student speaking in the above vignette used the five. The number is a unit to which they can add one, or count on by one, without recounting. All three lessons in Topic A prepare students to solve addition problems by counting on rather than counting all (1.OA.5).

Topic B continues the process of having the students compose and decompose. They describe *put together* situations (pictured to the right) with number bonds and count on from the first part to totals of 6, 7, 8, 9, and 10 (1.OA.1, 1.OA.5). As they represent all the partners of a number, they reflect and see the decompositions, “Look at all these ways to make 8! I can see connections between them.”

Through dialogue, they engage in seeing both the composition invited by the *put together* situation, and the decomposition invited by the number bonds. Expressions are another way to model both the stories and the bonds, the compositions and the decompositions (1.OA.1).

In Topic C, students interpret the meaning of addition from *adding to with result unknown* or *putting together with result unknown* story problems by drawing their own pictures and generating solution equations. Advancing beyond the Kindergarten word problem types, students next solve *add to with change unknown* problems such as, "Ben has 5 pencils. He got some more from his mother. Now, he has 9 pencils. How many pencils did Ben get from his mother?" These problems set the foundation early in the module for relating addition to subtraction in Topic G (1.OA.4).[1]

In Topic D, students work outside the context of stories for three days, to further their understanding of and skill with counting on using 5-group cards. The first addend is represented with a numeral card, symbolizing the structure to count on from. The number to be added is represented using the dot side of the 5-group card. Students count on from the first addend. They learn to replace counting the dots by tracking the count on their fingers to find the solution (1.OA.5). In Lesson 16, they solve problems such as 4 + ___ = 7 by tracking the number of counts as they say, "5, 6, 7" (1.OA.8).

In Topic E, in the context of addition to 10, students expand their knowledge of two basic ideas of mathematics: equality and the commutativity of addition (1.OA.3 and 1.OA.7). The lesson on the equal sign precedes the lessons on commutativity in order to allow students to later construct true number sentences such as 4 + 3 = 3 + 4 without misunderstanding the equal sign to mean that the numbers are the same. Students apply their new generalization about the position of the addends to count on from the larger number. For example, "I can count on 2 from 7 when I solve 2 + 7!"

Like Topic E, Topic F leads students to make more generalizations that support their deepening understanding of addition within 10. They learn to recognize doubles and doubles plus 1. They analyze the addition chart for repeated reasoning and structures (such as 5-groups, plus ones, doubles, sums equal to 10, etc.) that can help them to better understand relationships and connections between different addition facts.

"Ben had 5 crackers. He got some more. Now he has 7. How many crackers did Ben get?"

Following the Mid-Module Assessment, Topic G relates addition to subtraction. Since Module 4 in Kindergarten, students have been very familiar with subtraction as "take away." During Fluency Practice in the lessons in Topics A through F, students have had opportunities to remember their Kindergarten work with subtraction. Therefore, Topic G starts immediately with the concept of subtraction as a missing addend, just as Grade 3 students learn division as a missing factor in a multiplication problem. Having already worked with *add to with change unknown* problems earlier in the module, students revisit this familiar problem type, reinterpreting it as subtraction (1.OA.1, 1.OA.4). The topic then uses the strategies of counting with both 5-group cards and the number path to solve subtraction problems (1.OA.5, 1.OA.6).

K-5 Pacing Guide:

	Pre-Kindergarten	Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	
20 days	M1: Numbers to 5 (45 days)	M1: Numbers to 10 (43 days)	M1: Sums and Differences to 10 (45 days)	M1: Sums and Differences to 20 (10 days)	M1: Properties of Multiplication and Division and Solving Problems with Units of 2-5 and 10 (25 days)	M1: Place Value, Rounding, and Algorithms for Addition and Subtraction (25 days)	M1: Place Value and Decimal Fractions (20 days)	20 days
20 days				M2: Addition and Subtraction of Length Units (12 days)				
20 days				M3: Place Value, Counting, and Comparison of Numbers to 1000 (25 days)	M2: Place Value and Problem Solving with Units of Measure (25 days)	*M2: Unit Conversions (7 days)	M2: Multi-Digit Whole Number and Decimal Fraction Operations (35 days)	20 days
20 days	M2: Two-Dimensional and Three-Dimensional Shapes (15 days)	*M2: 2D and 3D Shapes (12 days)	M2: Introduction to Place Value Through Addition and Subtraction Within 20 (35 days)	M4: Addition and Subtraction Within 200 with Word Problems to 100 (35 days)	M3: Multiplication and Division with Units of 0, 1, 6-9, and Multiples of 10 (25 days)	M3: Multi-Digit Multiplication and Division (43 days)		20 days
20 days	M3: Counting to Answer Questions of How Many (50 days)	M3: Comparison of Length, Weight, Capacity, and Numbers to 10 (38 days)					M3: Addition and Subtraction of Fractions (22 days)	20 days
20 days			M3: Ordering and Comparing Length Measurements as Numbers (15 days)	M5: Addition and Subtraction Within 1000 with Word Problems to 100 (24 days)	M4: Multiplication and Area (20 days)	M4: Angle Measure and Plane Figures (20 days)	M4: Multiplication and Division of Fractions and Decimal Fractions (38 days)	20 days
20 days	M4: Comparison of Length, Weight, and Capacity (35 days)	M4: Number Pairs, Addition and Subtraction to 10 (47 days)	M4: Place Value, Comparison, Addition and Subtraction to 40 (35 days)	M6: Foundations of Multiplication and Division (24 days)	M5: Fractions as Numbers on the Number Line (35 days)	M5: Fraction Equivalence, Ordering, and Operations (45 days)		20 days
20 days			M5: Identifying, Composing, and Partitioning Shapes (15 days)	M7: Problem Solving with Length, Money, and Data (30 days)	M6: Collecting and Displaying Data (10 days)		M5: Addition and Multiplication with Volume and Area (25 days)	20 days
20 days	M5: Numerals to 5, Addition and Subtraction Stories, Counting to 20 (35 days)	M5: Numbers 10-20 and Counting to 100 (30 days)	M6: Place Value, Comparison, Addition and Subtraction to 100 (35 days)		M7: Geometry and Measurement Word Problems (40 days)	M6: Decimal Fractions (20 days)	M6: Problem Solving with the Coordinate Plane (40 days)	20 days
20 days		M6: Analyzing, Comparing, and Composing Shapes (10 days)		M8: Time, Shapes, and Fractions as Equal Parts of Shapes (20 days)		M7: Exploring Multiplication (20 days)		20 days

Approx. test date for grades 3-5

*Please refer to grade-level descriptions to identify partially labeled modules and the standards corresponding to all modules.

Key:	Geometry	Number	Number and Geometry, Measurement	Fractions

Unit : 1 Sums and Differences to 10

Subject: Math

Grade/Course: Grade 1

Pacing: 45 Days

Unit of Study: Unit : Sums and Differences to 10

Priority Standards:

Represent and solve problems involving addition and subtraction.

1.OA.1 Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart and comparing, with unknowns in all positions, e.g., by using objects, drawings and equations with a symbol for the unknown number to represent the problem.

Understand and apply properties of operations and the relationship between addition and subtraction.

1.OA.3 Apply properties of operations as strategies to add and subtract. (Students need not use formal terms for these properties.) *Examples: If 8 + 3 = 11 is known, then 3 + 8 = 11 is also known. (Commutative property of addition.) To add 2 + 6 + 4, the second two numbers can be added to make a ten, so 2 + 6 + 4 = 2 + 10 = 12. (Associative property of addition.)*

1.OA.4 Understand subtraction as an unknown-addend problem. *For example, subtract 10 – 8 by finding the number that makes 10 when added to 8.*

Add and subtract within 20.

1.OA.5 Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).

1.OA.6 Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14); decomposing a number leading to a ten (e.g., 13 – 4 = 13 – 3 – 1 = 10 – 1 = 9); using the relationship between addition and subtraction (e.g., knowing that 8 + 4 = 12, one knows 12 – 8 = 4); and creating equivalent but easier or known sums (e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13).

Work with addition and subtraction equations.

1.OA.7 Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. *For example, which of the following equations are true and which are false? 6 = 6, 7 = 8 – 1, 5 + 2 = 2 + 5, 4 + 1 = 5 + 2.*

1.OA.8 Determine the unknown whole number in an addition or subtraction equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations 8 + ? = 11, 5 = □ – 3, 6 + 6 =□.*

Foundational Standards

K.CC.2 *Count forward beginning from a given number within the known sequence (instead of having to begin at 1).*

K.CC.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.4c *Understand that each successive number name refers to a quantity that is one larger.*

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.*

Math Practice Standards:

MP.2 Reason abstractly and quantitatively. Students make sense of quantities and their relations as they reason about two new problem types in Grade 1: *change unknown* and *addend unknown.* They write an addition sentence that corresponds to the situation and then reason to see that a subtraction number sentence also can be used to solve for the unknown.
Furthermore, in Topic D, students decontextualize addition from stories and work on strategies for computing.

MP.6 Attend to precision. Students clarify the meaning of the commutative property as they represent the same stories with repositioned addends. Students also state the meaning of the equal sign when they represent one amount with two different expressions connected by the equal sign.

MP.7 Look for and make use of structure. Students use the structure of embedded numbers or a known part from which to count on to find a total. After studying the commutative property, the larger addend becomes a structure from which to count on. Also, they analyze the addition chart for repeated reasoning and structures (such as 5-groups, plus ones, doubles, sums equal to 10, etc.) that can help them to better understand relationships and connections between different addition facts.

MP.8 Look for and express regularity in repeated reasoning. Students recognize when they are adding they are counting on by the same amount (e.g., + 2 or + 3 is the same as counting on by 2 or 3). Therefore, they apply the same strategy to solve other problems, recognizing the repetition of the reasoning.

"Unwrapped" Standards	
Concepts -What Students Need to Know (Context)	**Skills -What Students Need to Be Able to Do** **Depth of Knowledge (DOK)**

Addition (within 20) Subtraction (within 20)	Use (DOK 1)
Word problems involving: Adding to Taking from Putting together Taking apart Comparing (with unknowns in all positions) (See table 1 below)	Solve (DOK 3)
Properties of operations: Add Subtract	Apply (DOK 4)

Table 1. Common addition and subtraction situations.[a]

	Result Unknown	Change Unknown	Start Unknown
Add to	Two bunnies sat on the grass. Three more bunnies hopped there. How many bunnies are on the grass now? 2 + 3 = ?	Two bunnies were sitting on the grass. Some more bunnies hopped there. Then there were five bunnies. How many bunnies hopped over to the first two? 2 + ? = 5	Some bunnies were sitting on the grass. Three more bunnies hopped there. Then there were five bunnies. How many bunnies were on the grass before? ? + 3 = 5
Take from	Five apples were on the table. I ate two apples. How many apples are on the table now? 5 − 2 = ?	Five apples were on the table. I ate some apples. Then there were three apples. How many apples did I eat? 5 − ? = 3	Some apples were on the table. I ate two apples. Then there were three apples. How many apples were on the table before? ? − 2 = 3

	Total Unknown	Addend Unknown	Both Addends Unknown[b]
Put Together/ Take Apart[c]	Three red apples and two green apples are on the table. How many apples are on the table? 3 + 2 = ?	Five apples are on the table. Three are red and the rest are green. How many apples are green? 3 + ? = 5, 5 − 3 = ?	Grandma has five flowers. How many can she put in her red vase and how many in her blue vase? 5 = 0 + 5, 5 = 5 + 0 5 = 1 + 4, 5 = 4 + 1 5 = 2 + 3, 5 = 3 + 2

	Difference Unknown	Bigger Unknown	Smaller Unknown
Compare[d]	("How many more?" version): Lucy has two apples. Julie has five apples. How many more apples does Julie have than Lucy? ("How many fewer?" version): Lucy has two apples. Julie has five apples. How many fewer apples does Lucy have than Julie? 2 + ? = 5, 5 − 2 = ?	(Version with "more"): Julie has three more apples than Lucy. Lucy has two apples. How many apples does Julie have? (Version with "fewer"): Lucy has 3 fewer apples than Julie. Lucy has two apples. How many apples does Julie have? 2 + 3 = ?, 3 + 2 = ?	(Version with "more"): Julie has three more apples than Lucy. Julie has five apples. How many apples does Lucy have? (Version with "fewer"): Lucy has 3 fewer apples than Julie. Julie has five apples. How many apples does Lucy have? 5 − 3 = ?, ? + 3 = 5

[a]These take apart situations can be used to show all the decompositions of a given number. The associated equations, which have the total on the left of the equal sign, help children understand that the = sign does not always mean makes or results in but always does mean is the same number as.
[b]Either addend can be unknown, so there are three variations of these problem situations. Both Addends Unknown is a productive extension of this basic situation, especially for small numbers less than or equal to 10.
[c]For the Bigger Unknown or Smaller Unknown situations, one version directs the correct operation (the version using more for the bigger unknown and using less for the smaller unknown). The other versions are more difficult.

Essential Questions	**Big ideas**
How do number relationships help solve problems?	Relationships are important because numbers are interconnected and can help you solve problems. Numbers can be combined to make bigger groups or separated to make smaller groups.

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Assessments		
Common Formative Pre-Assessments	Progress Monitoring Checks – "Dipsticks"	Common Formative Mid and or Post-Assessments
Exit tickets for pre assessment of each lesson	Application problems Problem set data Student debriefs	Exit ticket data Mid-Module Assessment End-of Module Assessment *See Table Below

*Assessment Summary

Type	Administered	Format	Standards Addressed
Mid-Module Assessment Task	After Topic F	Constructed response with rubric	1.OA.1 1.OA.3 1.OA.5 1.OA.6 1.OA.7 1.OA.8
End-of-Module Assessment Task	After Topic J	Constructed response with rubric	1.OA.1 1.OA.3 1.OA.4 1.OA.5 1.OA.6 1.OA.7 1.OA.8

Performance Assessment/Engaging Scenario (*To be completed by grade level team)
Overview: See Appendix A
Engaging Learning Experiences/ Performance Tasks
Task 1: Task 2: Task 3: Task 4:

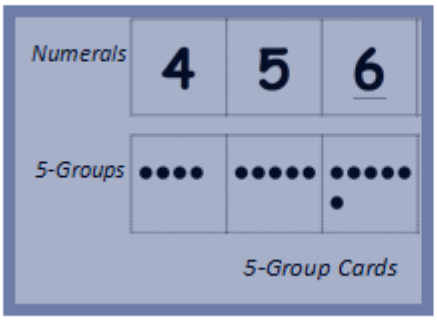
Instructional Resources
Useful Websites:

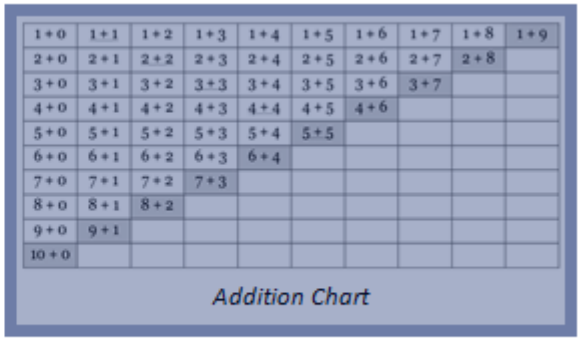
Engage NY K-5 Curriculum overview and guiding documents:
https://www.engageny.org/resource/pre-kindergarten-grade-5-mathematics-curriculum-map-and-guiding-documents
Engage NY Grade 1 Resources:
https://www.engageny.org/resource/grade-1-mathematics
Eureka Math Module PDFs:
http://greatminds.net/maps/math/module-pdfs
North Carolina 1st Grade Standards Unpacked:
http://www.ncpublicschools.org/docs/acre/standards/common-core-tools/unpacking/math/1st.pdf
Illustrative Mathematics – problems and tasks by grade and standard
https://www.illustrativemathematics.org/
NCTM Illuminations – problems, tasks and interactives by grade and standard
http://illuminations.nctm.org/Default.aspx
Inside Mathematics – Problems of the Month and Performance Assessment tasks
http://www.insidemathematics.org/
LearnZillion –lesson plans/some with embedded tasks
https://learnzillion.com/resources/17132
SBAC Digital Library

Books:
Max and Ruby's Snowy Day Wells, Rosemary
Two Ways to Count to Ten Dee, Ruby
Adding and Subtracting at the Lake Rauen, Amy
Ten Friends Goldstone, Bruce

Suggested Tools and Representations

- Number bonds
- Addition chart
- Rekenrek
- Counters
- Number path
- 5-Group cards
- Hide Zero cards





Instructional Strategies	Meeting the Needs of All Students

21st Century Skills

- Critical thinking and problem solving
- Collaboration and leadership
- Agility and adaptability
- Initiative and entrepreneurialism
- Effective oral and written communication
- Accessing and analyzing information
- Curiosity and imagination

Marzano's Nine Instructional Strategies for Effective Teaching and Learning

1. Identifying Similarities and Differences: helps students understand more complex problems by analyzing them in a simpler way

2. Summarizing and Note-taking: promotes comprehension because students have to analyze what is important and what is not important and put it in their own words

3. Reinforcing Effort and Providing Recognition: showing the connection between effort and achievement helps students helps them see the importance of effort and allows them to change their beliefs to emphasize it more. Note that recognition is more effective if it is contingent on achieving some specified standard.

4. Homework and Practice: provides opportunities to extend learning outside the classroom, but should be assigned based on relevant grade level. All homework should have a purpose and that purpose should be readily evident to the students. Additionally, feedback should be given for all homework assignments.

5. Nonlinguistic Representations: has recently been proven to stimulate and increase brain activity.

6. Cooperative Learning: has been proven to have a positive impact on overall learning. Note: groups should be small enough to be effective and the strategy should be used in a systematic and consistent manner.

7. Setting Objectives and Providing Feedback: provide students with a direction. Objectives should not be too specific and should be adaptable to students' individual objectives. There is no such thing

The modules that make up A Story of Units propose that the components of excellent math instruction do not change based on the audience. That said, there are specific resources included within this curriculum to highlight strategies that can provide critical access for all students.

Researched-based Universal Design for Learning (UDL) has provided a structure for thinking about how to meet the needs of diverse learners. Broadly speaking, that structure asks teachers to consider multiple means of representation; multiple means of action and expression; and multiple means of engagement. Charts at the end of this section offer suggested scaffolds, utilizing this framework, for English Language Learners, Students with Disabilities, Students Performing above Grade Level, and Students Performing below Grade Level. UDL offers ideal settings for multiple entry points for students and minimizes instructional barriers to learning. Teachers will note that many of the suggestions on a chart will be applicable to other students and overlapping populations.

Additionally, individual lessons contain marginal notes to teachers (in text boxes) highlighting specific UDL information about scaffolds that might be employed with particular intentionality when working with students. These tips are strategically placed in the lesson where the teacher might use the strategy to the best advantage.

It is important to note that the scaffolds/accommodations integrated into A Story of Units might change how a learner accesses information and demonstrates learning; they do not substantially alter the instructional level, content, or performance criteria. Rather, they provide students with choices in how they access content and demonstrate their knowledge and ability.

We encourage teachers to pay particular attention to the manner in which knowledge is sequenced in A Story of Units and to capitalize on that sequence when working with special student populations. Most lessons contain a suggested teaching sequence that moves from simple to complex, starting, for example, with an introductory problem for a math topic and building up inductively to the general case encompassing multifaceted ideas. By breaking down problems from simple to complex, teachers can locate specific steps that students are struggling with or stretch out problems for students who desire a challenge.

Throughout A Story of Units, teachers are encouraged to

as too much positive feedback, however, the method in which you give that feedback should be varied.	give classwork utilizing a “time frame” rather than a “task frame.” Within a given time frame, all students are expected to do their personal best, working at their maximum potential. “Students, you have 10 minutes to work independently.” Bonus questions are always ready for accelerated students. The teacher circulates and monitors the work, error-correcting effectively and wisely. Some students will complete more work than others. Neither above nor below grade level students are overly praised or penalized. Personal success is what we are striving for. Another vitally important component for meeting the needs of all students is the constant flow of data from student work. A Story of Units provides daily tracking through “exit tickets” for each lesson as well as mid and end-of-module assessment tasks to determine student understanding at benchmark points. These tasks should accompany teacher-made test items in a comprehensive assessment plan. Such data flow keeps teaching practice firmly grounded in student learning and makes incremental forward movement possible. A culture of “precise error correction” in the classroom breeds a comfort with data that that is non-punitive and honest. When feedback is provided with emotional neutrality, students understand that making mistakes is part of the learning process. “Students, for the next five minutes I will be meeting with Brenda, Scott, and Jeremy. They did not remember to rename the remainder in the tens place as 10 ones in their long division on Question 7.” Conducting such sessions then provides the teacher the opportunity to quickly assess if students need to start at a simpler level or just need more monitored practice now that their eyes are opened to their mistake. Good mathematics instruction, like any successful coaching, involves demonstration, modeling, and lots of intelligent practice. In math, just as in sports, skill is acquired incrementally; as the student acquires greater skill, more complexity is added and proficiency grows. The careful sequencing of the mathematics and the many scaffolds that have been designed into A Story of Units makes it an excellent curriculum for meeting the needs of all students, including those with special and unique learning modes. **Scaffolds for Students with Disabilities** Individualized education programs (IEP)s or Section 504 Accommodation Plans should be the first source of information for designing instruction for students with disabilities. The following chart provides an additional bank of suggestions within the Universal Design for

	Learning framework for strategies to use with these students in your class. Variations on these scaffolds are elaborated at particular points within lessons with text boxes at appropriate points, demonstrating how and when they might be used. Provide Multiple Means of Representation · Teach from simple to complex, moving from concrete to representation to abstract at the student's pace. · Clarify, compare, and make connections to math words in discussion, particularly during and after practice. · Partner key words with visuals (e.g., photo of "ticket") and gestures (e.g., for "paid"). Connect language (such as 'tens') with concrete and pictorial experiences (such as money and fingers). Couple teacher-talk with "math-they-can-see," such as models. Let students use models and gestures to calculate and explain. For example, a student searching to define "multiplication" may model groups of 6 with drawings or concrete objects and write the number sentence to match. · Teach students how to ask questions (such as "Do you agree?" and "Why do you think so?") to extend "think-pair-share" conversations. Model and post conversation "starters," such as: "I agree because…" "Can you explain how you solved it?" "I noticed that…" "Your solution is different from/ the same as mine because…" "My mistake was to…" · Couple number sentences with models. For example, for equivalent fraction sprint, present 6/8 with: · Enlarge sprint print for visually impaired learners. · Use student boards to work on one calculation at a time. · Invest in or make math picture dictionaries or word walls. Provide Multiple Means of Action and Expression · Provide a variety of ways to respond: oral; choral; student boards; concrete models (e.g., fingers), pictorial models (e.g., ten-frame); pair share; small group share. For example: Use student boards to adjust "partner share" for deaf and hard-of-hearing students. Partners can jot questions and answers to one another on slates. Use vibrations or visual signs (such as clap, rather than a

	snap or “show”) to elicit responses from deaf/hard of hearing students. · Vary choral response with written response (number sentences and models) on student boards to ease linguistic barriers. Support oral or written response with sentence frames, such as “_____ is ____ hundreds, ____ tens, and ____ ones. · Adjust oral fluency games by using student and teacher boards or hand signals, such as showing the sum with fingers. Use visual signals or vibrations to elicit responses, such as hand pointed downward means count backwards in “Happy Counting.” · Adjust wait time for interpreters of deaf and hard-of-hearing students. · Select numbers and tasks that are “just right” for learners. · Model each step of the algorithm before students begin. · Give students a chance to practice the next day’s sprint beforehand. (At home, for example.) · Give students a few extra minutes to process the information before giving the signal to respond. · Assess by multiple means, including “show and tell” rather than written. · Elaborate on the problem-solving process. Read word problems aloud. Post a visual display of the problem-solving process. Have students check off or highlight each step as they work. Talk through the problem-solving process step-by-step to demonstrate thinking process. Before students solve, ask questions for comprehension, such as, “What unit are we counting? What happened to the units in the story?” Teach students to use self-questioning techniques, such as, “Does my answer make sense?” · Concentrate on goals for accomplishment within a time frame as opposed to a task frame. Extend time for task. Guide students to evaluate process and practice. Have students ask, “How did I improve? What did I do well?” · Focus on students’ mathematical reasoning (i.e., their ability to make comparisons, describe patterns, generalize, explain conclusions, specify claims, and use models), not their accuracy in language. Provide Multiple Means of Engagement

	· Make eye-to-eye contact and keep teacher-talk clear and concise. Speak clearly when checking answers for sprints and problems. · Check frequently for understanding (e.g., 'show'). Listen intently in order to uncover the math content in the students' speech. Use non-verbal signals, such as "thumbs-up." Assign a buddy or a group to clarify directions or process. · Teach in small chunks so students get a lot of practice with one step at a time. · Know, use, and make the most of Deaf culture and sign language. · Use songs, rhymes, or rhythms to help students remember key concepts, such as "Add your ones up first/Make a bundle if you can!"

New Vocabulary	Students Achieving Below Standard	Students Achieving Above Standard
Count on (count up from one addend to the total) Track (use different objects to track the count on from one addend to the total) Expression (e.g., 2 + 1 or 5 – 3) Addend (one of the numbers being added) Doubles (eg: 3+3 or 4+4) Double +1 (eg: 3+4 or 4+5) **Familiar Terms and Symbols** Part (e.g., "What is the unknown part? 3 + ___ = 8") Total and whole (use interchangeably instead of sum; eg. "What is the total when we add 3 and 5?") Label (using letters or words on a a math drawing to indicate the referents from the story's context) Addition, equal, and subtraction signs	The following provides a bank of suggestions within the Universal Design for Learning framework for accommodating students who are below grade level in your class. Variations on these accommodations are elaborated within lessons, demonstrating how and when they might be used. **<u>Provide Multiple Means of Representation</u>** ● Model problem-solving sets with drawings and graphic organizers (e.g., bar or tape diagram), giving many examples and visual displays. ● Guide students as they select and practice using their own graphic organizers and models to solve. ● Use direct instruction for vocabulary with visual or concrete representations. ● Use explicit directions with steps and procedures enumerated. ● Guide students through initial practice promoting gradual independence. "I do, we do, you do." ● Use alternative methods of delivery of instruction such as recordings and videos that can be	The following chart provides a bank of suggestions within the Universal Design for Learning framework for accommodating students who are above grade level in your class. Variations on these accommodations are elaborated within lessons, demonstrating how and when they might be used. Provide Multiple Means of Representation Teach students how to ask questions (such as, "Do you agree?" and "Why do you think so?") to extend "think-pair-share" conversations. Model and post conversation "starters," such as: "I agree because…" "Can you explain how you solved it?" "I noticed that…" "Your solution is different from/ the same as mine because…" "My mistake was to…" Incorporate written reflection, evaluation, and synthesis. Allow creativity in expression and modeling solutions. Provide Multiple Means of Action and Expression Encourage students to explain their reasoning both orally and in writing. Extend exploration of math topics by means of challenging games, puzzles, and brain teasers. Offer choices of independent or group assignments for early finishers. Encourage students to notice and explore patterns and to identify rules

Equation and number sentence (used interchangeably throughout the module) Number bond (graphic showing part-part-whole) Equal sign (=) 5-groups, 2 rows of 5	accessed independently or repeated if necessary. ● Scaffold complex concepts and provide leveled problems for multiple entry points. **<u>Provide Multiple Means of Action and Expression</u>** ● First use manipulatives or real objects (such as dollar bills), then make transfer from concrete to pictorial to abstract. ● Have students restate their learning for the day. Ask for a different representation in the restatement. 'Would you restate that answer in a different way or show me by using a diagram?' ● Encourage students to explain their thinking and strategy for the solution. ● Choose numbers and tasks that are "just right" for learners but teach the same concepts. ● Adjust numbers in calculations to suit learner's levels. For example, change 429 divided by 2 to 400 divided by 2 or 4 divided by 2. **<u>Provide Multiple Means of Engagement</u>** ● Clearly model steps, procedures, and questions to ask when solving. ● Cultivate peer-assisted learning interventions for instruction (e.g., dictation) and practice, particularly for computation work (e.g., peer modeling). ● Have students work together to solve and then check their solutions. ● Teach students to ask themselves questions as they solve: Do I know the meaning of all the words in this problem?; What is being asked?; Do I have all of the information I need?; What do I do first?; What is the order to solve this problem? What calculations do I need to make? ● Practice routine to ensure smooth	and relationships in math. Have students share their observations in discussion and writing (e.g., journaling). Foster their curiosity about numbers and mathematical ideas. Facilitate research and exploration through discussion, experiments, internet searches, trips, etc. Have students compete in a secondary simultaneous competition, such as skip-counting by 75s, while peers are completing the sprint. Let students choose their mode of response: written, oral, concrete, pictorial, or abstract. Increase the pace. Offer two word problems to solve, rather than one. Adjust difficulty level by increasing the number of steps (e.g., change a one-step problem to a two-step problem). Adjust difficulty level by enhancing the operation (e.g., addition to multiplication), increasing numbers to millions, or decreasing numbers to decimals/fractions. Let students write word problems to show mastery and/or extension of the content. Provide Multiple Means of Engagement Push student comprehension into higher levels of Bloom's Taxonomy with questions such as: "What would happen if…?" "Can you propose an alternative…?" "How would you evaluate…?" "What choice would you have made…?" Ask "Why?" and "What if?" questions. Celebrate improvement in completion time (e.g., Sprint A completed in 45 seconds and Sprint B completed in 30 seconds). Make the most of the fun exercises for practicing skip-counting. Accept and elicit student ideas and suggestions for ways to extend games. Cultivate student persistence in problem-solving and do not neglect their need for guidance and support.

	transitions. ● Set goals with students regarding the type of math work students should complete in 60 seconds. ● Set goals with the students regarding next steps and what to focus on next.	

Math Unit

Grade 1 Unit 2 (Module 2)

Introduction to Place Value Through Addition and Subtraction Within 20

OVERVIEW

Level 1: Count all

Level 2: Count on

Level 3: Decompose an addend to compose ten

Module 2 serves as a bridge from problem solving within 10 to work within 100 as students begin to solve addition and subtraction problems involving teen numbers (1.NBT.2ab). In Module 1, students were encouraged to move beyond the Level 1 strategy of counting all to the more efficient counting on. Now, they go beyond Level 2 to learn Level 3 decomposition and composition strategies, informally called make ten or take from ten.

Though many students may continue to count on as their primary means of adding and subtracting, the larger purpose of composing and decomposing ten is to lay the foundation for the role of place value units in addition and subtraction. Meanwhile, from the beginning of the year, fluency activities have focused on the three prerequisite skills for the Level 3 decomposition and composition methods:

1. Partners to ten (K.OA.4).
2. Decompositions for all numbers within 10 (K.OA.3).
3. Representations of teen numbers as 10 + *n* (K.NBT.1 and 1.NBT.2b). For example, students practice counting the Say Ten way (i.e., ten 1, ten 2…) from Kindergarten on.

To introduce students to the make ten strategy, in Topic A, students solve problems with three addends (1.OA.2) and realize it is sometimes possible to use the associative and commutative properties to compose ten, e.g., "Maria made 1 snowball. Tony made 5, and their father made 9. How many snowballs did they make in all?" 1 + 5 + 9 = (9 + 1) + 5 = 10 + 5 = 15. Since we can add in any order, we can pair the 1 with the 9 to make a ten first. Having seen how to use partners to ten to simplify addition, students next decompose a second addend in order to compose a ten from 9 or 8, e.g., "Maria has 9 snowballs and Tony has 6. How many do they have in all?" 9 + 6 = 9 + (1 + 5) = (9 + 1) + 5 = 10 + 5 = 15 (1.OA.3). Between the intensive work with addends of 8 and 9 is a lesson exploring commutativity so that students realize they can compose ten from the larger addend

Throughout Topic A, students also count on to add. Students begin by modeling the situations with concrete materials, move to representations of 5-groups, and progress to modeling with number bonds. The representations and models make the connection between the two strategies clear. For example, using the 5-groups pictured above, students can simply count on from 9 to 15, tracking the number of counts on their fingers just as they did in Module 1. They repeatedly compare and contrast counting on with making ten, seeing that the latter is a convenient shortcut. Many start to make the important move from counting on, a Level 2 strategy, to make ten, a Level 3 strategy, persuaded by confidence in their increasing skill and the joy of the shortcut. This is a critical step in building flexible part–whole thinking whereby students see numbers as parts and wholes rather than as discrete counts or one part and some ones. Five-groups soon begin to be thought of as ten-frames, focusing on the usefulness of trying to group 10 when possible. This empowers students in later modules and future grade levels to compose and decompose place value units and work adeptly with the four operations. For example, in Grade 1, this is applied in later modules to solve problems such as 18 + 6, 27 + 9, 36 + 6, 49 + 7, etc. (1.OA.3).

Level 3: Decompose ten and compose with the ones

Level 2: Count on

To introduce students to the take from ten strategy, Topic B opens with questions such as, "Mary has two plates of cookies, one with 10 and one with 2. At the party, 9 cookies were eaten from the plate with 10 cookies. How many cookies were left after the party?" 10 – 9 = 1 and 1 + 2 = 3. Students then reinterpret the story to see its solution can also be written as 12 – 9.

Students relate counting on and subtraction as pictured above. Notice the model is identical, but the thinking is very different.

S: To solve 12 – 9, I count on from 9 to 12, 9, 10, 11, 12, three counts. To solve 12 – 9, I make 12 into 10 and 2 and subtract 9 from ten. 1 + 2 = 3.

Students practice a pattern of action, take from ten and add the ones, as they face different contexts in word problems (MP.8), e.g., "Maria has 12 snowballs. She threw 8 of them. How many does she have left?" (1.OA.3). This is important foundational work for decomposing in the context of subtraction problem solving in Grade 2, e.g., "Hmmm. 32 – 17, do I take 7 ones from 2 ones or from a ten?" Grade 1 students begin using horizontal linear models of 5-groups or ten-frames to begin the transition towards a unit of ten.

Topic C presents students with opportunities to solve varied *add to with change unknown*, *take from with change unknown*, *put together with addend unknown,* and *take apart with addend unknown* word problems. These situations give ample time for exploring strategies for finding an unknown. The module so far has focused on counting on and subtracting by decomposing and composing (1.OA.1). These lessons open up the possibilities to include other Level 3 strategies, e.g., 12 – 3 = 12 – 2 - 1.[2] Teachers can include or adjust such strategy use dependent on whether they feel it enhances understanding or rather undermines or overwhelms. The topic closes with a lesson to further solidify student understanding of the equal sign as it has been applied throughout the module. Students match equivalent expressions to construct true number sentences and explain their reasoning using words, pictures, and numbers, e.g., 12 – 7 = 3 + 2, 10 + 5 = 9 + 6 (1.OA.7).

In Topic D, after all the work with 10, the module culminates with naming a ten (1.NBT.2a). Familiar representations of teen numbers, such as two 5-groups, the Rekenrek, and 10 fingers, are all renamed as a ten and some ones (1.NBT.2b) rather than 10 ones and some more ones (K.NBT.1). The ten is shifting to being one unit, a structure from which students can compose and decompose teen numbers (1.NBT.2b, MP.7). This significant step forward sets the stage for understanding all the numbers within 100 as composed of a number of units of ten and some ones (1.NBT.2b). The horizontal linear 5-group modeling of 10 is moved to a vertical representation in preparation for this next stage, in Module 4, as shown in the image on the right. This topic's work is done while solving both abstract equations and contextualized word problems.

Rigorous Curriculum Design Template

Unit : 2 Introduction to Place Value Through Addition and Subtraction Within 20

Subject: Math

Grade/Course: Grade 1

Pacing: 35 Days

Unit of Study: Unit : Introduction to Place Value Through Addition and Subtraction Within 20 Introduction to Place Value Through Addition and Subtraction Within 20

Priority Standards:

Represent and solve problems involving addition and subtraction.

1.OA.1 Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

1.OA.2 Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

Understand and apply properties of operations and the relationship between addition and subtraction.

1.OA.3 Apply properties of operations as strategies to add and subtract. (Students need not use formal terms for these properties.) *Examples: If 8 + 3 = 11 is known, then 3 + 8 = 11 is also known. (Commutative property of addition.) To add 2 + 6 + 4, the second two numbers can be added to make a ten, so 2 + 6 + 4 = 2 + 10 = 12. (Associative property of addition.)*

1.OA.4 Understand subtraction as an unknown-addend problem. *For example, subtract 10 – 8 by finding the number that makes 10 when added to 8.*

Add and subtract within 20.

1.OA.6 Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use mental strategies such as counting on; making ten (e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14); decomposing a number leading to a ten (e.g., 13 – 4 = 13 – 3 – 1 = 10 – 1 = 9); using the relationship between addition and subtraction (e.g., knowing that 8 + 4 = 12, one knows 12 – 8 = 4); and creating equivalent but easier or known sums (e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13).

Understand place value.

1.NBT.2 Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases:

a. 10 can be thought of as a bundle of ten ones—called a "ten."

b. The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six ,seven, eight, or nine ones.

Foundational Standards

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.NBT.1 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 (e.g., 18 = 10 + 8); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.

Math Practice Standards:

MP.2 Reason abstractly and quantitatively. Students solve *change unknown* problem types such as, "Maria has 8 snowballs. Tony has 15 snowballs. Maria wants to have the same number of snowballs as Tony. How many more snowballs does Maria need to have the same number as Tony?" They write the equation 8 + __ = 15 to describe the situation, make ten or count on to 15 to find the answer of 7, and reason abstractly to make a connection to subtraction, that the same problem can be solved using 15 – 8 = __.

MP.4 Model with mathematics. Students use 5-groups, number bonds, and equations to represent decompositions when both subtracting from the teens and adding to make teens when crossing the ten.

MP.7 Look for and make use of structure. This module introduces students to the unit *ten*. Students use the structure of the ten to add within the teens, to add to the teens, and to subtract from the teens. For example, 14 + 3 = 10 + 4 + 3 = 17, 8 + 5 = 8 + 2 + 3 = 10 + 3 and conversely, 13 – 5 = 10 – 5 + 3 = 5 + 3.

MP.8 Look for and make use of repeated reasoning. Students realize that when adding 9 to a number 1–9, they can complete the ten by decomposing the other addend into "1 and __." They internalize the commutative and associative properties, looking for ways to make ten within situations and equations.

"Unwrapped" Standards	
Concepts -What Students Need to Know	**Skills -What Students Need to Be Able to Do** **Depth of Knowledge (DOK)**
Two digits of a two-digit number represent amounts of tens and ones.	Understand (DOK-3)

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Essential Questions	**Big ideas**
Why is order important?	The position of a digit determines its value in a number.

Assessments		
Common Formative Pre-Assessments	Progress Monitoring Checks – "Dipsticks"	Common Formative Mid and or Post-Assessments
Exit tickets for pre assessment of each lesson	Application problems Problem set data Student debriefs	Exit ticket data Mid-Module Assessment End-of Module Assessment *See Table Below

*Assessment Summary

Type	Administered	Format	Standards Addressed
Mid-Module Assessment Task	After Topic A	Constructed response with rubric	1.OA.1 1.OA.2 1.OA.3 1.OA.6
End-of-Module Assessment Task	After Topic D	Constructed response with rubric	1.OA.1 1.OA.2 1.OA.3 1.OA.4 1.OA.6 1.NBT.2a 1.NBT.2b

Performance Assessment/ Engaging Scenarios (*To be completed by grade level team)
Overview:
Engaging Learning Experiences/ Performance Tasks
Task 1: See Appendix A Task 2: Task 3: Task 4:

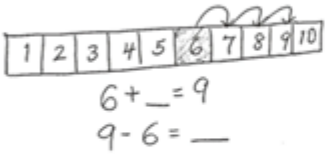
Instructional Resources
Useful Websites: Engage NY K-5 Curriculum overview and guiding documents: https://www.engageny.org/resource/pre-kindergarten-grade-5-mathematics-curriculum-map-and-guiding-documents Engage NY Grade 1 Resources: https://www.engageny.org/resource/grade-1-mathematics Eureka Math Module PDFs: http://greatminds.net/maps/math/module-pdfs North Carolina 1st Grade Standards Unpacked:

http://www.ncpublicschools.org/docs/acre/standards/common-core-tools/unpacking/math/1st.pdf
Illustrative Mathematics – problems and tasks by grade and standard
https://www.illustrativemathematics.org/
NCTM Illuminations – problems, tasks and interactives by grade and standard
http://illuminations.nctm.org/Default.aspx
Inside Mathematics – Problems of the Month and Performance Assessment tasks
http://www.insidemathematics.org/
LearnZillion –lesson plans/some with embedded tasks
https://learnzillion.com/resources/17132
SBAC Digital Library

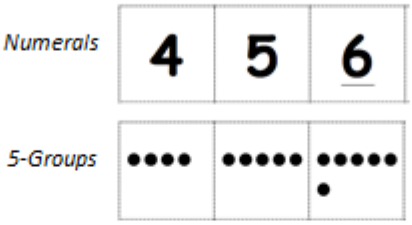
Books:
The Warlords' Beads Pilegard, Virginia Walton
Elevator Magic Murphy, Stuart

Suggested Tools and Representations

- 5-group formations: 5-groups (and 5-group cards), 5-group rows, 5-group column
- Hide Zero cards
- Number bonds
- Number path
- Rekenrek

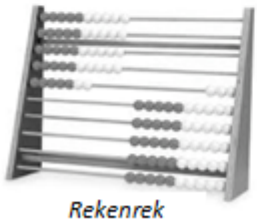


Number Path

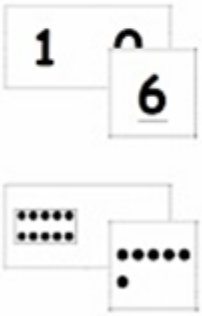


5-Group Cards


5-Group Rows


Rekenrek


5-Group Column



Hide Zero Cards

Instructional Strategies	Meeting the Needs of All Students

21st Century Skills

- Critical thinking and problem solving
- Collaboration and leadership
- Agility and adaptability
- Initiative and entrepreneurialism
- Effective oral and written communication
- Accessing and analyzing information
- Curiosity and imagination

Marzano's Nine Instructional Strategies for Effective Teaching and Learning

1. Identifying Similarities and Differences: helps students understand more complex problems by analyzing them in a simpler way

2. Summarizing and Note-taking: promotes comprehension because students have to analyze what is important and what is not important and put it in their own words

3. Reinforcing Effort and Providing Recognition: showing the connection between effort and achievement helps students helps them see the importance of effort and allows them to change their beliefs to emphasize it more. Note that recognition is more effective if it is contingent on achieving some specified standard.

4. Homework and Practice: provides opportunities to extend learning outside the classroom, but should be assigned based on relevant grade level. All homework should have a purpose and that purpose should be readily evident to the students. Additionally, feedback should be given for all homework assignments.

5. Nonlinguistic Representations: has recently been proven to stimulate and increase brain activity.

6. Cooperative Learning: has been proven to have a positive impact on overall learning. Note: groups should be small enough to be effective and the strategy should be used in a systematic and consistent manner.

7. Setting Objectives and Providing Feedback: provide students with a direction. Objectives should not be too specific and should be adaptable to students' individual objectives. There is no such thing

The modules that make up A Story of Units propose that the components of excellent math instruction do not change based on the audience. That said, there are specific resources included within this curriculum to highlight strategies that can provide critical access for all students.

Researched-based Universal Design for Learning (UDL) has provided a structure for thinking about how to meet the needs of diverse learners. Broadly speaking, that structure asks teachers to consider multiple means of representation; multiple means of action and expression; and multiple means of engagement. Charts at the end of this section offer suggested scaffolds, utilizing this framework, for English Language Learners, Students with Disabilities, Students Performing above Grade Level, and Students Performing below Grade Level. UDL offers ideal settings for multiple entry points for students and minimizes instructional barriers to learning. Teachers will note that many of the suggestions on a chart will be applicable to other students and overlapping populations.

Additionally, individual lessons contain marginal notes to teachers (in text boxes) highlighting specific UDL information about scaffolds that might be employed with particular intentionality when working with students. These tips are strategically placed in the lesson where the teacher might use the strategy to the best advantage.

It is important to note that the scaffolds/accommodations integrated into A Story of Units might change how a learner accesses information and demonstrates learning; they do not substantially alter the instructional level, content, or performance criteria. Rather, they provide students with choices in how they access content and demonstrate their knowledge and ability.

We encourage teachers to pay particular attention to the manner in which knowledge is sequenced in A Story of Units and to capitalize on that sequence when working with special student populations. Most lessons contain a suggested teaching sequence that moves from simple to complex, starting, for example, with an introductory problem for a math topic and building up inductively to the general case encompassing multifaceted ideas. By breaking down problems from simple to complex, teachers can locate specific steps that students are struggling with or stretch out problems for students who desire a challenge.

Throughout A Story of Units, teachers are encouraged to

as too much positive feedback, however, the method in which you give that feedback should be varied. **8. Generating and Testing Hypotheses**: it's not just for science class! Research shows that a deductive approach works best, but both inductive and deductive reasoning can help students understand and relate to the material. **9. Cues, Questions, and Advanced Organizers:** helps students use what they already know to enhance what they are about to learn. These are usually most effective when used before a specific lesson.	give classwork utilizing a "time frame" rather than a "task frame." Within a given time frame, all students are expected to do their personal best, working at their maximum potential. "Students, you have 10 minutes to work independently." Bonus questions are always ready for accelerated students. The teacher circulates and monitors the work, error-correcting effectively and wisely. Some students will complete more work than others. Neither above nor below grade level students are overly praised or penalized. Personal success is what we are striving for. Another vitally important component for meeting the needs of all students is the constant flow of data from student work. A Story of Units provides daily tracking through "exit tickets" for each lesson as well as mid and end-of-module assessment tasks to determine student understanding at benchmark points. These tasks should accompany teacher-made test items in a comprehensive assessment plan. Such data flow keeps teaching practice firmly grounded in student learning and makes incremental forward movement possible. A culture of "precise error correction" in the classroom breeds a comfort with data that that is non-punitive and honest. When feedback is provided with emotional neutrality, students understand that making mistakes is part of the learning process. "Students, for the next five minutes I will be meeting with Brenda, Scott, and Jeremy. They did not remember to rename the remainder in the tens place as 10 ones in their long division on Question 7." Conducting such sessions then provides the teacher the opportunity to quickly assess if students need to start at a simpler level or just need more monitored practice now that their eyes are opened to their mistake. Good mathematics instruction, like any successful coaching, involves demonstration, modeling, and lots of intelligent practice. In math, just as in sports, skill is acquired incrementally; as the student acquires greater skill, more complexity is added and proficiency grows. The careful sequencing of the mathematics and the many scaffolds that have been designed into A Story of Units makes it an excellent curriculum for meeting the needs of all students, including those with special and unique learning modes. **Scaffolds for Students with Disabilities** Individualized education programs (IEP)s or Section 504 Accommodation Plans should be the first source of information for designing instruction for students with disabilities. The following chart provides an additional bank of suggestions within the Universal Design for

	Learning framework for strategies to use with these students in your class. Variations on these scaffolds are elaborated at particular points within lessons with text boxes at appropriate points, demonstrating how and when they might be used. Provide Multiple Means of Representation · Teach from simple to complex, moving from concrete to representation to abstract at the student's pace. · Clarify, compare, and make connections to math words in discussion, particularly during and after practice. · Partner key words with visuals (e.g., photo of "ticket") and gestures (e.g., for "paid"). Connect language (such as 'tens') with concrete and pictorial experiences (such as money and fingers). Couple teacher-talk with "math-they-can-see," such as models. Let students use models and gestures to calculate and explain. For example, a student searching to define "multiplication" may model groups of 6 with drawings or concrete objects and write the number sentence to match. · Teach students how to ask questions (such as "Do you agree?" and "Why do you think so?") to extend "think-pair-share" conversations. Model and post conversation "starters," such as: "I agree because…" "Can you explain how you solved it?" "I noticed that…" "Your solution is different from/ the same as mine because…" "My mistake was to…" · Couple number sentences with models. For example, for equivalent fraction sprint, present 6/8 with: · Enlarge sprint print for visually impaired learners. · Use student boards to work on one calculation at a time. · Invest in or make math picture dictionaries or word walls. Provide Multiple Means of Action and Expression · Provide a variety of ways to respond: oral; choral; student boards; concrete models (e.g., fingers), pictorial models (e.g., ten-frame); pair share; small group share. For example: Use student boards to adjust "partner share" for deaf and hard-of-hearing students. Partners can jot questions and answers to one another on slates. Use vibrations or visual signs (such as clap, rather than a

	snap or “show”) to elicit responses from deaf/hard of hearing students. · Vary choral response with written response (number sentences and models) on student boards to ease linguistic barriers. Support oral or written response with sentence frames, such as “_____ is ____ hundreds, ____ tens, and ____ ones. · Adjust oral fluency games by using student and teacher boards or hand signals, such as showing the sum with fingers. Use visual signals or vibrations to elicit responses, such as hand pointed downward means count backwards in “Happy Counting.” · Adjust wait time for interpreters of deaf and hard-of-hearing students. · Select numbers and tasks that are “just right” for learners. · Model each step of the algorithm before students begin. · Give students a chance to practice the next day’s sprint beforehand. (At home, for example.) · Give students a few extra minutes to process the information before giving the signal to respond. · Assess by multiple means, including “show and tell” rather than written. · Elaborate on the problem-solving process. Read word problems aloud. Post a visual display of the problem-solving process. Have students check off or highlight each step as they work. Talk through the problem-solving process step-by-step to demonstrate thinking process. Before students solve, ask questions for comprehension, such as, “What unit are we counting? What happened to the units in the story?” Teach students to use self-questioning techniques, such as, “Does my answer make sense?” · Concentrate on goals for accomplishment within a time frame as opposed to a task frame. Extend time for task. Guide students to evaluate process and practice. Have students ask, “How did I improve? What did I do well?” · Focus on students’ mathematical reasoning (i.e., their ability to make comparisons, describe patterns, generalize, explain conclusions, specify claims, and use models), not their accuracy in language. Provide Multiple Means of Engagement

	· Make eye-to-eye contact and keep teacher-talk clear and concise. Speak clearly when checking answers for sprints and problems. · Check frequently for understanding (e.g., 'show'). Listen intently in order to uncover the math content in the students' speech. Use non-verbal signals, such as "thumbs-up." Assign a buddy or a group to clarify directions or process. · Teach in small chunks so students get a lot of practice with one step at a time. · Know, use, and make the most of Deaf culture and sign language. · Use songs, rhymes, or rhythms to help students remember key concepts, such as "Add your ones up first/Make a bundle if you can!"

New Vocabulary	Students Achieving Below Standard	Students Achieving Above Standard
A ten (a group or unit consisting of 10 items) Ones (individual units, 10 of which become a ten) **Familiar Terms and Symbols** 5-Groups Add Equals Number Bonds Partners to ten Subtract Teen numbers	The following provides a bank of suggestions within the Universal Design for Learning framework for accommodating students who are below grade level in your class. Variations on these accommodations are elaborated within lessons, demonstrating how and when they might be used. **<u>Provide Multiple Means of Representation</u>** ● Model problem-solving sets with drawings and graphic organizers (e.g., bar or tape diagram), giving many examples and visual displays. ● Guide students as they select and practice using their own graphic organizers and models to solve. ● Use direct instruction for vocabulary with visual or concrete representations. ● Use explicit directions with steps and procedures enumerated. ● Guide students through initial practice promoting gradual independence. "I do, we do, you do." ● Use alternative methods of delivery of instruction such as recordings and videos that can be	The following chart provides a bank of suggestions within the Universal Design for Learning framework for accommodating students who are above grade level in your class. Variations on these accommodations are elaborated within lessons, demonstrating how and when they might be used. Provide Multiple Means of Representation Teach students how to ask questions (such as, "Do you agree?" and "Why do you think so?") to extend "think-pair-share" conversations. Model and post conversation "starters," such as: "I agree because…" "Can you explain how you solved it?" "I noticed that…" "Your solution is different from/ the same as mine because…" "My mistake was to…" Incorporate written reflection, evaluation, and synthesis. Allow creativity in expression and modeling solutions. Provide Multiple Means of Action and Expression Encourage students to explain their reasoning both orally and in writing. Extend exploration of math topics by means of challenging games, puzzles, and brain teasers. Offer choices of independent or group assignments for early finishers. Encourage students to notice and explore patterns and to identify rules

	accessed independently or repeated if necessary. ● Scaffold complex concepts and provide leveled problems for multiple entry points. **<u>Provide Multiple Means of Action and Expression</u>** ● First use manipulatives or real objects (such as dollar bills), then make transfer from concrete to pictorial to abstract. ● Have students restate their learning for the day. Ask for a different representation in the restatement. 'Would you restate that answer in a different way or show me by using a diagram?' ● Encourage students to explain their thinking and strategy for the solution. ● Choose numbers and tasks that are "just right" for learners but teach the same concepts. ● Adjust numbers in calculations to suit learner's levels. For example, change 429 divided by 2 to 400 divided by 2 or 4 divided by 2. **<u>Provide Multiple Means of Engagement</u>** ● Clearly model steps, procedures, and questions to ask when solving. ● Cultivate peer-assisted learning interventions for instruction (e.g., dictation) and practice, particularly for computation work (e.g., peer modeling). ● Have students work together to solve and then check their solutions. ● Teach students to ask themselves questions as they solve: Do I know the meaning of all the words in this problem?; What is being asked?; Do I have all of the information I need?; What do I do first?; What is the order to solve this problem? What calculations do I need to make? ● Practice routine to ensure smooth	and relationships in math. Have students share their observations in discussion and writing (e.g., journaling). Foster their curiosity about numbers and mathematical ideas. Facilitate research and exploration through discussion, experiments, internet searches, trips, etc. Have students compete in a secondary simultaneous competition, such as skip-counting by 75s, while peers are completing the sprint. Let students choose their mode of response: written, oral, concrete, pictorial, or abstract. Increase the pace. Offer two word problems to solve, rather than one. Adjust difficulty level by increasing the number of steps (e.g., change a one-step problem to a two-step problem). Adjust difficulty level by enhancing the operation (e.g., addition to multiplication), increasing numbers to millions, or decreasing numbers to decimals/fractions. Let students write word problems to show mastery and/or extension of the content. Provide Multiple Means of Engagement Push student comprehension into higher levels of Bloom's Taxonomy with questions such as: "What would happen if…?" "Can you propose an alternative…?" "How would you evaluate…?" "What choice would you have made…?" Ask "Why?" and "What if?" questions. Celebrate improvement in completion time (e.g., Sprint A completed in 45 seconds and Sprint B completed in 30 seconds). Make the most of the fun exercises for practicing skip-counting. Accept and elicit student ideas and suggestions for ways to extend games. Cultivate student persistence in problem-solving and do not neglect their need for guidance and support.

	transitions. ● Set goals with students regarding the type of math work students should complete in 60 seconds. ● Set goals with the students regarding next steps and what to focus on next.	

Math Unit -

Grade 1 Unit 3 (Module 3)

Ordering and Comparing Length Measurements as Numbers

OVERVIEW

Grade 1 Module 3 opens in Topic A by extending students' Kindergarten experiences with direct length comparison to the new learning of indirect comparison whereby the length of one object is used to compare the lengths of two other objects (1.MD.1). "My string is longer than your book. Your book is longer than my pencil. That means my string is longer than my pencil!" Students use the same transitivity, or indirect comparison, to compare short distances within the classroom in order to find the shortest path to their classroom door, which is helpful to know for lining up and for emergencies. Students place one endpoint of a length of string at their desks and then extend the string towards the door to see if it will reach. After using the same piece of string from two students' desks, they make statements such as, "Maya's path is shorter than the string. Bailey's path is longer than the string. That means Bailey's path to the door is longer than Maya's path."

Topic B takes *longer than* and *shorter than* to a new level of precision by introducing the idea of a *length unit*. Centimeter cubes are laid alongside the length of an object as students learn that the total number of cubes laid end to end with no gaps or overlaps represents the length of that object (1.MD.2). The Geometric Measurement Progressions Document expresses the research indicating the importance of teaching standard units to Grade 1 students *before* non-standard units. Thus, Grade 1 students learn about the centimeter before exploring non-standard units of measurement in this module. Simply lining the cubes up to the ruler allows students to see that they are using units which relate to a tool used around the world. One of the primary reasons why we recognize standard units is because they are ubiquitous, used on rulers at Grandma's house in the Bronx, in school, and in local shops. Students ask and answer the question, "Why would we use a standard unit to measure?" The topic closes with students measuring and comparing sets of three items using centimeter cubes. They return to the statements of Topic A, but now with more sophisticated insights, such as, "The pencil measures 10 centimeters. The crayon measures 6 centimeters. The book measures 20 centimeters. I can put them in order from shortest to longest: the crayon, the pencil, the book. The book is longer than the pencil, and the pencil is longer than crayon, so the book is longer than the crayon" (1.MD.1).

Topic C explores the usefulness of measuring with similar units. Students measure the same objects from Topic B using two different non-standard units, toothpicks and small paper clips, simultaneously to measure one object and answer the question, "Why do we measure with same-sized length units?" (1.MD.2). They realize that using iterations of the *same* unit will yield consistent measurement results. Similarly, students explore what it means to use a different unit of measurement from their classmates. It becomes obvious to students that if we want to have discussions about the lengths of objects, we *must* measure with the same units. Students answer the question, "If Bailey uses paper clips and Maya uses toothpicks, and they both measure things in our classroom, will they be able to compare their measurements?" With this new understanding of consistent measurement, Topic C closes with students solving *compare with difference unknown* problems. Students use standard units to answer such questions as, "How much longer is the pencil than the marker?" (1.OA.1).

Topic D closes the module as students represent and interpret data (1.MD.4). They collect data about their classmates and sort that information into three categories. Using same-sized pictures on squares, students represent this sorted data so that it can be easily compared and described. Students interpret information presented in the graphs by first determining the number of data points in a given category, e.g., "How many students like carrots the best?" Then, students combine categories, e.g., "How many total students like carrots or broccoli the best?" The module closes with students asking and answering varied questions about data sets, such as, "How many students were polled in all?" (*put together with result unknown*) and, "How many more students preferred broccoli to string beans?" (c*ompare with difference* unknown) (1.OA.1). Their work with units representing data points is an application of the students' earlier work with length as they observe that each square can be lightly interpreted as a length unit, which helps them analyze the data.

Rigorous Curriculum Design Template

Unit : 3 Ordering and Comparing Length Measurements as Numbers

Subject: Math

Grade/Course: Grade 1

Pacing: 15 Days

Unit of Study: Unit : Ordering and Comparing Length Measurements as Numbers Ordering and Comparing Length Measurements as Numbers

Priority Standards:

Represent and solve problems involving addition and subtraction.

1.OA.1 Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

Measure lengths indirectly and by iterating length units.

1.MD.1 Order three objects by length; compare the lengths of two objects indirectly by using a third object.

1.MD.2 Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. *Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps*.

Represent and interpret data.

1.MD.4 Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in anoth

Foundational Standards

K.CC.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.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. (Include groups with up to ten objects.)

K.CC.7 Compare two numbers between 1 and 10 presented as written numerals.

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

K.MD.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. *For example, directly compare the heights of two children and describe one child as taller/shorter.*

Math Practice Standards:

MP.2 Reason quantitatively and abstractly. Students describe and compare lengths using *longer than* and *shorter than* and numerically represent relationships among and between lengths. This takes place in the context of comparing sets within data collection as well as comparing objects with different length units. For example, students compare the number of peers who enjoy one hobby with the number of peers who enjoy a different hobby. Students also compare the length of one object, in centimeter cubes, with the length of a second object, in centimeter cubes.

MP.3 Construct viable arguments and critique the reasoning of others. Students describe and explain their process of finding accurate length measurements and challenge each other to measure precisely.

MP.6 Attend to precision. Students use measuring tools, such as centimeter cubes, precisely and explain precisely the cause of errors in using the tools.

MP.7 Look for and make use of structure. Students use transitivity to compare multiple objects. "My string is longer than the pencil. My string is shorter than the book. That means the book is longer than the pencil." In this case, the students use the string as the structure to compare the book and the pencil.

"Unwrapped" Standards	
Concepts (What Students Need to Know)	**Skills (What Students Need to Be Able to Do)**

The length of an object as a whole number of length units,by laying multiple copies of a shorter object end to end. The length measurement of an object is the number of same-size length units that span it with no gaps or overlaps.	Express (DOK-1) Understand (DOK-3)

Essential Questions	**Big ideas**
How can objects be compared?	Objects can be compared by their different attributes.

Assessments		
Common Formative Pre-Assessments	Progress Monitoring Checks – "Dipsticks"	Common Formative Mid and or Post-Assessments
Exit tickets for pre assessment of each lesson	Application problems Problem set data Student debriefs	Exit ticket data Mid-Module Assessment End-of Module Assessment *See Table Below

*Assessment Summary

Type	Administered	Format	Standards Addressed
End-of-Module Assessment Task	After Topic D	Constructed response with rubric	1.OA.1 1.MD.1 1.MD.2 1.MD.4

Performance Assessments/ Engaging Scenarios (*To be completed by grade level team)
Overview:
Engaging Learning Experiences/ Performance Tasks

Task 1:

Task 2:

Task 3:

Task 4:

Instructional Resources

Useful Websites:
Engage NY K-5 Curriculum overview and guiding documents:
https://www.engageny.org/resource/pre-kindergarten-grade-5-mathematics-curriculum-map-and-guiding-documents
Engage NY Grade 1 Resources:
https://www.engageny.org/resource/grade-1-mathematics
Eureka Math Module PDFs:
http://greatminds.net/maps/math/module-pdfs
North Carolina 1st Grade Standards Unpacked:
http://www.ncpublicschools.org/docs/acre/standards/common-core-tools/unpacking/math/1st.pdf
Illustrative Mathematics – problems and tasks by grade and standard
https://www.illustrativemathematics.org/
NCTM Illuminations – problems, tasks and interactives by grade and standard
http://illuminations.nctm.org/Default.aspx
Inside Mathematics – Problems of the Month and Performance Assessment tasks
http://www.insidemathematics.org/
LearnZillion –lesson plans/some with embedded tasks
https://learnzillion.com/resources/17132
SBAC Digital Library

Books:
How Big Is A Foot? Myller, Rolf
Lulu's Lemonade deRubertis, Barbara

Suggested Tools and Representations

- Centimeter cubes
- Centimeter rulers (simply for the purpose of naming the centimeter)
- Non-standard units (toothpicks, small and large paper clips)
- String lengths of about 25 centimeters
- Tally marks

Instructional Strategies	Meeting the Needs of All Students
<u>21st Century Skills</u> ● Critical thinking and problem solving ● Collaboration and leadership ● Agility and adaptability ● Initiative and entrepreneurialism ● Effective oral and written communication ● Accessing and analyzing information ● Curiosity and imagination **<u>Marzano's Nine Instructional Strategies for Effective Teaching and Learning</u>** **1. Identifying Similarities and Differences**: helps students understand more complex problems by analyzing them in a simpler way **2. Summarizing and Note-taking**: promotes comprehension because students have to analyze what is important and what is not important and put it in their own words **3. Reinforcing Effort and Providing Recognition**: showing the connection between effort and achievement helps students helps them see the importance of effort and allows them to change their beliefs to emphasize it more. Note that recognition is more effective if it is contingent on achieving some specified standard. **4. Homework and Practice**: provides opportunities to extend learning outside the classroom, but should be assigned based on relevant grade level. All homework should have a purpose and that purpose should be readily evident to the students. Additionally, feedback should be given for all homework assignments. **5. Nonlinguistic Representations:** has recently been proven to stimulate and increase brain activity.	The modules that make up A Story of Units propose that the components of excellent math instruction do not change based on the audience. That said, there are specific resources included within this curriculum to highlight strategies that can provide critical access for all students. Researched-based Universal Design for Learning (UDL) has provided a structure for thinking about how to meet the needs of diverse learners. Broadly speaking, that structure asks teachers to consider multiple means of representation; multiple means of action and expression; and multiple means of engagement. Charts at the end of this section offer suggested scaffolds, utilizing this framework, for English Language Learners, Students with Disabilities, Students Performing above Grade Level, and Students Performing below Grade Level. UDL offers ideal settings for multiple entry points for students and minimizes instructional barriers to learning. Teachers will note that many of the suggestions on a chart will be applicable to other students and overlapping populations. Additionally, individual lessons contain marginal notes to teachers (in text boxes) highlighting specific UDL information about scaffolds that might be employed with particular intentionality when working with students. These tips are strategically placed in the lesson where the teacher might use the strategy to the best advantage. It is important to note that the scaffolds/accommodations integrated into A Story of Units might change how a learner accesses information and demonstrates learning; they do not substantially alter the instructional level, content, or performance criteria. Rather, they provide students with choices in how they access content and demonstrate their knowledge and ability. We encourage teachers to pay particular attention to the manner in which knowledge is sequenced in A Story of Units and to capitalize on that sequence when working with special student populations. Most lessons contain a

6. Cooperative Learning: has been proven to have a positive impact on overall learning. Note: groups should be small enough to be effective and the strategy should be used in a systematic and consistent manner. **7. Setting Objectives and Providing Feedback**: provide students with a direction. Objectives should not be too specific and should be adaptable to students' individual objectives. There is no such thing as too much positive feedback, however, the method in which you give that feedback should be varied. **8. Generating and Testing Hypotheses**: it's not just for science class! Research shows that a deductive approach works best, but both inductive and deductive reasoning can help students understand and relate to the material. **9. Cues, Questions, and Advanced Organizers:** helps students use what they already know to enhance what they are about to learn. These are usually most effective when used before a specific lesson.	suggested teaching sequence that moves from simple to complex, starting, for example, with an introductory problem for a math topic and building up inductively to the general case encompassing multifaceted ideas. By breaking down problems from simple to complex, teachers can locate specific steps that students are struggling with or stretch out problems for students who desire a challenge. Throughout A Story of Units, teachers are encouraged to give classwork utilizing a "time frame" rather than a "task frame." Within a given time frame, all students are expected to do their personal best, working at their maximum potential. "Students, you have 10 minutes to work independently." Bonus questions are always ready for accelerated students. The teacher circulates and monitors the work, error-correcting effectively and wisely. Some students will complete more work than others. Neither above nor below grade level students are overly praised or penalized. Personal success is what we are striving for. Another vitally important component for meeting the needs of all students is the constant flow of data from student work. A Story of Units provides daily tracking through "exit tickets" for each lesson as well as mid and end-of-module assessment tasks to determine student understanding at benchmark points. These tasks should accompany teacher-made test items in a comprehensive assessment plan. Such data flow keeps teaching practice firmly grounded in student learning and makes incremental forward movement possible. A culture of "precise error correction" in the classroom breeds a comfort with data that that is non-punitive and honest. When feedback is provided with emotional neutrality, students understand that making mistakes is part of the learning process. "Students, for the next five minutes I will be meeting with Brenda, Scott, and Jeremy. They did not remember to rename the remainder in the tens place as 10 ones in their long division on Question 7." Conducting such sessions then provides the teacher the opportunity to quickly assess if students need to start at a simpler level or just need more monitored practice now that their eyes are opened to their mistake. Good mathematics instruction, like any successful coaching, involves demonstration, modeling, and lots of intelligent practice. In math, just as in sports, skill is acquired incrementally; as the student acquires greater skill, more complexity is added and proficiency grows. The careful sequencing of the mathematics and the many scaffolds that have been designed into A Story of Units makes it an excellent curriculum for meeting the needs of all students, including those with special and unique

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	task. Guide students to evaluate process and practice. Have students ask, "How did I improve? What did I do well?" · Focus on students' mathematical reasoning (i.e., their ability to make comparisons, describe patterns, generalize, explain conclusions, specify claims, and use models), not their accuracy in language. Provide Multiple Means of Engagement · Make eye-to-eye contact and keep teacher-talk clear and concise. Speak clearly when checking answers for sprints and problems. · Check frequently for understanding (e.g., 'show'). Listen intently in order to uncover the math content in the students' speech. Use non-verbal signals, such as "thumbs-up." Assign a buddy or a group to clarify directions or process. · Teach in small chunks so students get a lot of practice with one step at a time. · Know, use, and make the most of Deaf culture and sign language. · Use songs, rhymes, or rhythms to help students remember key concepts, such as "Add your ones up first/Make a bundle if you can!"

New Vocabulary	Students Achieving Below Standard	Students Achieving Above Standard
Centimeter(standard length unit within the metric system) Centimeter cube (used as a length unit in this module) Centimeter ruler (measurement tool using length units of centimeters) Data (collected information) Endpoint (the end of an object, referenced when aligning for measurement purposes) Height (measurement of vertical distance of an object) Length unit (measuring the length of an object with equal-sized units) Poll (survey) Table of graph (organized charts visually representing data) **Familiar Terms and Symbols** Less Than Longer than/taller than More than	The following provides a bank of suggestions within the Universal Design for Learning framework for accommodating students who are below grade level in your class. Variations on these accommodations are elaborated within lessons, demonstrating how and when they might be used. **<u>Provide Multiple Means of Representation</u>** ● Model problem-solving sets with drawings and graphic organizers (e.g., bar or tape diagram), giving many examples and visual displays. ● Guide students as they select and practice using their own graphic organizers and models to solve. ● Use direct instruction for	The following chart provides a bank of suggestions within the Universal Design for Learning framework for accommodating students who are above grade level in your class. Variations on these accommodations are elaborated within lessons, demonstrating how and when they might be used. Provide Multiple Means of Representation Teach students how to ask questions (such as, "Do you agree?" and "Why do you think so?") to extend "think-pair-share" conversations. Model and post conversation "starters," such as: "I agree because…" "Can you explain how you solved it?" "I noticed that…" "Your solution is different from/ the same as mine because…" "My mistake was to…" Incorporate written reflection, evaluation, and synthesis. Allow creativity in

Shorter than Tally Marks	vocabulary with visual or concrete representations. ● Use explicit directions with steps and procedures enumerated. ● Guide students through initial practice promoting gradual independence. “I do, we do, you do.” ● Use alternative methods of delivery of instruction such as recordings and videos that can be accessed independently or repeated if necessary. ● Scaffold complex concepts and provide leveled problems for multiple entry points. **<u>Provide Multiple Means of Action and Expression</u>** ● First use manipulatives or real objects (such as dollar bills), then make transfer from concrete to pictorial to abstract. ● Have students restate their learning for the day. Ask for a different representation in the restatement. ’Would you restate that answer in a different way or show me by using a diagram?’ ● Encourage students to explain their thinking and strategy for the solution. ● Choose numbers and tasks that are “just right” for learners but teach the same concepts. ● Adjust numbers in calculations to suit learner’s levels. For example, change 429 divided by 2 to 400 divided by 2 or 4 divided by 2. **<u>Provide Multiple Means of Engagement</u>** ● Clearly model steps, procedures, and questions to ask when solving. ● Cultivate peer-assisted learning interventions for instruction (e.g., dictation) and practice, particularly for computation work (e.g., peer modeling). ● Have students work together to solve and then check their	expression and modeling solutions. Provide Multiple Means of Action and Expression Encourage students to explain their reasoning both orally and in writing. Extend exploration of math topics by means of challenging games, puzzles, and brain teasers. Offer choices of independent or group assignments for early finishers. Encourage students to notice and explore patterns and to identify rules and relationships in math. Have students share their observations in discussion and writing (e.g., journaling). Foster their curiosity about numbers and mathematical ideas. Facilitate research and exploration through discussion, experiments, internet searches, trips, etc. Have students compete in a secondary simultaneous competition, such as skip-counting by 75s, while peers are completing the sprint. Let students choose their mode of response: written, oral, concrete, pictorial, or abstract. Increase the pace. Offer two word problems to solve, rather than one. Adjust difficulty level by increasing the number of steps (e.g., change a one-step problem to a two-step problem). Adjust difficulty level by enhancing the operation (e.g., addition to multiplication), increasing numbers to millions, or decreasing numbers to decimals/fractions. Let students write word problems to show mastery and/or extension of the content. Provide Multiple Means of Engagement Push student comprehension into higher levels of Bloom’s Taxonomy with questions such as: “What would happen if…?” “Can you propose an alternative…?” “How would you evaluate…?” “What choice would you have made…?” Ask “Why?” and “What if?” questions. Celebrate improvement in completion time (e.g., Sprint A completed in 45 seconds and Sprint B completed in 30 seconds). Make the most of the fun exercises for practicing skip-counting. Accept and

	solutions. ● Teach students to ask themselves questions as they solve: Do I know the meaning of all the words in this problem?; What is being asked?; Do I have all of the information I need?; What do I do first?; What is the order to solve this problem? What calculations do I need to make? ● Practice routine to ensure smooth transitions. ● Set goals with students regarding the type of math work students should complete in 60 seconds. ● Set goals with the students regarding next steps and what to focus on next.	elicit student ideas and suggestions for ways to extend games. Cultivate student persistence in problem-solving and do not neglect their need for guidance and support.

Math Unit -

Grade 1 Unit 4 (Module 4)

Place Value, Comparison, Addition and Subtraction to 40

OVERVIEW

Module 4 builds upon Module 2's work with place value within 20, now focusing on the role of place value in the addition and subtraction of numbers to 40.

The module opens with Topic A, where students study, organize, and manipulate numbers within 40. Having worked with creating a ten and some ones in Module 2, students now recognize multiple tens and ones. Students use fingers, linking cubes, dimes, and pennies to represent numbers to 40 in various ways—from all ones to tens and ones (1.NBT.2). They use a place value chart to organize units. The topic closes with the identification of 1 more, 1 less, 10 more, and 10 less as students learn to add or subtract *like* units (1.NBT.5).

In Topic B, students compare quantities and begin using the symbols for *greater than* (>) and *less than* (<) (1.NBT.3). Students demonstrate their understanding of place

value when they recognize that 18 is less than 21 since 2 tens Already have a greater value than 1 ten 8 ones. To support understanding, the first lesson in the topic focuses on identifying the greater or lesser amount. With this understanding, students label each of the quantities being compared and compare from left to right. Finally, students are introduced to the mathematical symbols using the story of the alligator whose hungry mouth always opens toward the greater number. The abstract symbols are introduced after the conceptual foundation has been laid.

Topic C focuses on addition and subtraction of tens (1.NBT.4, 1.NBT.6). Having used concrete models in Topic A to represent 10 more and 10 less, students now recognize that just as 3 + 1 = 4, 3 tens + 1 ten = 4 tens. With this understanding, students add and subtract a multiple of 10 from another multiple of 10. The topic closes with the addition of multiples of 10 to numbers less than 40 (e.g., 12 + 30).

In Topic D, students use familiar strategies to add two-digit and single-digit numbers within 40. Students apply the Level 2 strategy of counting on and use the Level 3 strategy of making ten, this time making *the next ten* (1.NBT.4). For instance, when adding 28 + 5, students break 5 into 2 and 3 so that 28 and 2 can make *the next ten*, which is 30, or 3 tens, and then add 3 to make 33. The topic closes with students sharing and critiquing peer strategies.

In Topic E, students consider new ways to represent larger quantities when approaching *put together/take apart with total or addend unknown* and *add to with result or change unknown* word problems. Students begin labeling drawings with numerals and eventually move to tape diagrams to represent the problems pictorially (1.OA.1). Throughout this topic, students continue developing their skills with adding single-digit and double-digit numbers (introduced in Topic D) during fluency activities.

The module closes with Topic F, focusing on adding like place value units as students add two-digit numbers. The topic begins with interpreting two-digit numbers in varied combinations of tens and ones (e.g., 34 = 34 ones = 3 tens 4 ones = 2 tens 14 ones = 1 ten 24 ones). This flexibility in representing a given number prepares students for addition with regrouping (e.g., 12 + 8 = 1 ten 10 ones = 2 tens or 18 + 16 = 2 tens 14 ones = 3 tens 4 ones). To close the module, students add pairs of numbers with varied sums in the ones place to support flexibility in thinking.

Rigorous Curriculum Design Template

Unit : 4 Place Value, Comparison, Addition, and Subtraction to 40

Subject: Math

Grade/Course: Grade 1

Pacing: 35 Days

Unit of Study: Unit : Place Value, Comparison, Addition, and Subtraction to 40 Place Value, Comparison, Addition and Subtraction to 40

Priority Standards:

Represent and solve problems involving addition and subtraction.

1.OA.1 Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem. (See CCS Glossary, Table 1.)

Extend the counting sequence.

1.NBT.1 Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.

Understand place value.

1.NBT.2 Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases:

a. 10 can be thought of as a bundle of ten ones—called a "ten."

c. The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).

1.NBT.3 Compare two two-digit numbers based on meaning of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.

Use place value understanding and properties of operations to add and subtract.

1.NBT.4 Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.

1.NBT.5 Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.

1.NBT.6 Subtract multiples of 10 in the range 10–90 from multiples of 10 in the range 10–90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Foundational Standards

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.NBT.1 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 (e.g., 18 = 10 + 8); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.

Math Practice Standards:

MP.3 Construct viable arguments and critique the reasoning of others. Students describe and explain their strategies for adding within 40. They critique and adjust student samples to more efficiently solve addition problems.

MP.5 Use appropriate tools strategically. After learning varied representations and strategies for adding and subtracting pairs of two-digit numbers, students choose their preferred methods for representing and solving problems efficiently. Students may represent their computations using arrow notation, number bonds, quick ten drawings, and linking cubes. As they share their strategies, students explain their choice of counting on, making ten, adding tens and then ones, or adding ones and then tens.

MP.6 Attend to precision. Students recognize and distinguish between units, demonstrating an understanding of the difference between 3 tens and 3 ones. They use this understanding to compare numbers and add like place value units.

MP.7 Look for and make use of structure. Students are introduced to the place value chart, deepening their understanding of the structure within the number system. Throughout the module, students use this structure as they add and subtract within 40. They recognize the similarities between 2 tens + 2 tens = 4 tens and 2 + 2 = 4 and use their understanding of tens and ones to explain the connection.

"Unwrapped" Standards	
Concepts (What Students Need to Know)	**Skills (What Students Need to Be Able to Do)**
Addition (within 20) Subtraction (within 20)	Use (DOK-1)
Word problems involving: Adding to Taking from Putting together Taking apart Comparing (with unknowns in all positions)	Solve (DOK-3)
Properties of operations: Add Subtract	Apply (DOK-4)
Two digits of a two-digit number represent amounts of tens and ones.	Understand (DOK-3)
Within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10.	Add (DOK-1)
Concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.	Use (DOK-1)
The strategy to a written method and the reasoning used.	Relate (DOK-2) Explain (DOK-3)
In adding two-digit numbers, one adds tens and tens, ones and ones: and sometimes it is necessary to compose a ten.	Understand (DOK-3)

Essential Questions	**Big ideas**
How do number relationships help solve problems?	Relationships are important. Numbers can be combined to make bigger groups or separate to make smaller groups.

Assessments		
Common Formative Pre-Assessments	Progress Monitoring Checks – "Dipsticks"	Common Formative Mid and or Post-Assessments
Exit tickets for pre assessment of each lesson	Application problems Problem set data Student debriefs	Exit ticket data Mid-Module Assessment End-of Module Assessment *See Table Below

*Assessment Summary

Type	Administered	Format	Standards Addressed
Mid-Module Assessment Task	After Topic C	Constructed response with rubric	1.NBT.1 1.NBT.2 1.NBT.3 1.NBT.4 1.NBT.5 1.NBT.6
End-of-Module Assessment Task	After Topic F	Constructed response with rubric	1.OA.1 1.NBT.1 1.NBT.2 1.NBT.3 1.NBT.4 1.NBT.5 1.NBT.6

Performance Assessment/ Engaging Scenarios (*To be completed by grade level team)
Overview:
Engaging Learning Experiences/ Performance Tasks
Task 1: Task 2: Task 3: Task 4:

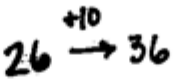
Instructional Resources
Useful Websites: Engage NY K-5 Curriculum overview and guiding documents: https://www.engageny.org/resource/pre-kindergarten-grade-5-mathematics-curriculum-map-and-guiding-documents Engage NY Grade 1 Resources: https://www.engageny.org/resource/grade-1-mathematics Eureka Math Module PDFs: http://greatminds.net/maps/math/module-pdfs North Carolina 1st Grade Standards Unpacked: http://www.ncpublicschools.org/docs/acre/standards/common-core-tools/unpacking/math/1st.pdf

Illustrative Mathematics – problems and tasks by grade and standard
https://www.illustrativemathematics.org/
NCTM Illuminations – problems, tasks and interactives by grade and standard
http://illuminations.nctm.org/Default.aspx
Inside Mathematics – Problems of the Month and Performance Assessment tasks
http://www.insidemathematics.org/
LearnZillion –lesson plans/some with embedded tasks
https://learnzillion.com/resources/17132
SBAC Digital Library

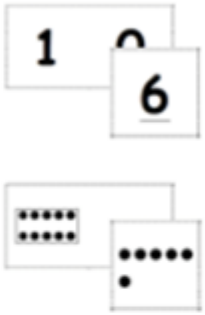
Books:
Alfie the Alligator Turley, Sandy
More or Less Murphy, Stuart

Suggested Tools and Representations

- Arrow notation
- Comparison symbols: >, <, =
- Dime
- Hide Zero cards
- Hundred chart
- Number bond
- Penny
- Place value chart
- Quick Ten
- Rekenrek
- Tape diagram



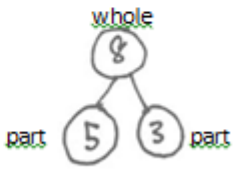
Arrow Notation



Hide Zero Cards

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40

Hundred Chart to 40



Number Bond

Instructional Strategies	Meeting the Needs of All Students

21st Century Skills

- Critical thinking and problem solving
- Collaboration and leadership
- Agility and adaptability
- Initiative and entrepreneurialism
- Effective oral and written communication
- Accessing and analyzing information
- Curiosity and imagination

Marzano's Nine Instructional Strategies for Effective Teaching and Learning

1. Identifying Similarities and Differences: helps students understand more complex problems by analyzing them in a simpler way

2. Summarizing and Note-taking: promotes comprehension because students have to analyze what is important and what is not important and put it in their own words

3. Reinforcing Effort and Providing Recognition: showing the connection between effort and achievement helps students helps them see the importance of effort and allows them to change their beliefs to emphasize it more. Note that recognition is more effective if it is contingent on achieving some specified standard.

4. Homework and Practice: provides opportunities to extend learning outside the classroom, but should be assigned based on relevant grade level. All homework should have a purpose and that purpose should be readily evident to the students. Additionally, feedback should be given for all homework assignments.

5. Nonlinguistic Representations: has recently been proven to stimulate and increase brain activity.

6. Cooperative Learning: has been proven to have a positive impact on overall learning. Note: groups should be small enough to be effective and the strategy should be used in a systematic and consistent manner.

7. Setting Objectives and Providing Feedback: provide students with a direction. Objectives should not be too specific and should be adaptable to students' individual objectives. There is no such thing

The modules that make up A Story of Units propose that the components of excellent math instruction do not change based on the audience. That said, there are specific resources included within this curriculum to highlight strategies that can provide critical access for all students.

Researched-based Universal Design for Learning (UDL) has provided a structure for thinking about how to meet the needs of diverse learners. Broadly speaking, that structure asks teachers to consider multiple means of representation; multiple means of action and expression; and multiple means of engagement. Charts at the end of this section offer suggested scaffolds, utilizing this framework, for English Language Learners, Students with Disabilities, Students Performing above Grade Level, and Students Performing below Grade Level. UDL offers ideal settings for multiple entry points for students and minimizes instructional barriers to learning. Teachers will note that many of the suggestions on a chart will be applicable to other students and overlapping populations.

Additionally, individual lessons contain marginal notes to teachers (in text boxes) highlighting specific UDL information about scaffolds that might be employed with particular intentionality when working with students. These tips are strategically placed in the lesson where the teacher might use the strategy to the best advantage.

It is important to note that the scaffolds/accommodations integrated into A Story of Units might change how a learner accesses information and demonstrates learning; they do not substantially alter the instructional level, content, or performance criteria. Rather, they provide students with choices in how they access content and demonstrate their knowledge and ability.

We encourage teachers to pay particular attention to the manner in which knowledge is sequenced in A Story of Units and to capitalize on that sequence when working with special student populations. Most lessons contain a suggested teaching sequence that moves from simple to complex, starting, for example, with an introductory problem for a math topic and building up inductively to the general case encompassing multifaceted ideas. By breaking down problems from simple to complex, teachers can locate specific steps that students are struggling with or stretch out problems for students who desire a challenge.

Throughout A Story of Units, teachers are encouraged to

as too much positive feedback, however, the method in which you give that feedback should be varied. **8. Generating and Testing Hypotheses**: it's not just for science class! Research shows that a deductive approach works best, but both inductive and deductive reasoning can help students understand and relate to the material. **9. Cues, Questions, and Advanced Organizers:** helps students use what they already know to enhance what they are about to learn. These are usually most effective when used before a specific lesson.	give classwork utilizing a "time frame" rather than a "task frame." Within a given time frame, all students are expected to do their personal best, working at their maximum potential. "Students, you have 10 minutes to work independently." Bonus questions are always ready for accelerated students. The teacher circulates and monitors the work, error-correcting effectively and wisely. Some students will complete more work than others. Neither above nor below grade level students are overly praised or penalized. Personal success is what we are striving for. Another vitally important component for meeting the needs of all students is the constant flow of data from student work. A Story of Units provides daily tracking through "exit tickets" for each lesson as well as mid and end-of-module assessment tasks to determine student understanding at benchmark points. These tasks should accompany teacher-made test items in a comprehensive assessment plan. Such data flow keeps teaching practice firmly grounded in student learning and makes incremental forward movement possible. A culture of "precise error correction" in the classroom breeds a comfort with data that that is non-punitive and honest. When feedback is provided with emotional neutrality, students understand that making mistakes is part of the learning process. "Students, for the next five minutes I will be meeting with Brenda, Scott, and Jeremy. They did not remember to rename the remainder in the tens place as 10 ones in their long division on Question 7." Conducting such sessions then provides the teacher the opportunity to quickly assess if students need to start at a simpler level or just need more monitored practice now that their eyes are opened to their mistake. Good mathematics instruction, like any successful coaching, involves demonstration, modeling, and lots of intelligent practice. In math, just as in sports, skill is acquired incrementally; as the student acquires greater skill, more complexity is added and proficiency grows. The careful sequencing of the mathematics and the many scaffolds that have been designed into A Story of Units makes it an excellent curriculum for meeting the needs of all students, including those with special and unique learning modes. **Scaffolds for Students with Disabilities** Individualized education programs (IEP)s or Section 504 Accommodation Plans should be the first source of information for designing instruction for students with disabilities. The following chart provides an additional bank of suggestions within the Universal Design for

	Learning framework for strategies to use with these students in your class. Variations on these scaffolds are elaborated at particular points within lessons with text boxes at appropriate points, demonstrating how and when they might be used. Provide Multiple Means of Representation · Teach from simple to complex, moving from concrete to representation to abstract at the student's pace. · Clarify, compare, and make connections to math words in discussion, particularly during and after practice. · Partner key words with visuals (e.g., photo of "ticket") and gestures (e.g., for "paid"). Connect language (such as 'tens') with concrete and pictorial experiences (such as money and fingers). Couple teacher-talk with "math-they-can-see," such as models. Let students use models and gestures to calculate and explain. For example, a student searching to define "multiplication" may model groups of 6 with drawings or concrete objects and write the number sentence to match. · Teach students how to ask questions (such as "Do you agree?" and "Why do you think so?") to extend "think-pair-share" conversations. Model and post conversation "starters," such as: "I agree because…" "Can you explain how you solved it?" "I noticed that…" "Your solution is different from/ the same as mine because…" "My mistake was to…" · Couple number sentences with models. For example, for equivalent fraction sprint, present 6/8 with: · Enlarge sprint print for visually impaired learners. · Use student boards to work on one calculation at a time. · Invest in or make math picture dictionaries or word walls. Provide Multiple Means of Action and Expression · Provide a variety of ways to respond: oral; choral; student boards; concrete models (e.g., fingers), pictorial models (e.g., ten-frame); pair share; small group share. For example: Use student boards to adjust "partner share" for deaf and hard-of-hearing students. Partners can jot questions and answers to one another on slates. Use vibrations or visual signs (such as clap, rather than a

	snap or “show”) to elicit responses from deaf/hard of hearing students. · Vary choral response with written response (number sentences and models) on student boards to ease linguistic barriers. Support oral or written response with sentence frames, such as “_____ is ____ hundreds, ____ tens, and ____ ones. · Adjust oral fluency games by using student and teacher boards or hand signals, such as showing the sum with fingers. Use visual signals or vibrations to elicit responses, such as hand pointed downward means count backwards in “Happy Counting.” · Adjust wait time for interpreters of deaf and hard-of-hearing students. · Select numbers and tasks that are “just right” for learners. · Model each step of the algorithm before students begin. · Give students a chance to practice the next day’s sprint beforehand. (At home, for example.) · Give students a few extra minutes to process the information before giving the signal to respond. · Assess by multiple means, including “show and tell” rather than written. · Elaborate on the problem-solving process. Read word problems aloud. Post a visual display of the problem-solving process. Have students check off or highlight each step as they work. Talk through the problem-solving process step-by-step to demonstrate thinking process. Before students solve, ask questions for comprehension, such as, “What unit are we counting? What happened to the units in the story?” Teach students to use self-questioning techniques, such as, “Does my answer make sense?” · Concentrate on goals for accomplishment within a time frame as opposed to a task frame. Extend time for task. Guide students to evaluate process and practice. Have students ask, “How did I improve? What did I do well?” · Focus on students’ mathematical reasoning (i.e., their ability to make comparisons, describe patterns, generalize, explain conclusions, specify claims, and use models), not their accuracy in language. Provide Multiple Means of Engagement

	· Make eye-to-eye contact and keep teacher-talk clear and concise. Speak clearly when checking answers for sprints and problems. · Check frequently for understanding (e.g., 'show'). Listen intently in order to uncover the math content in the students' speech. Use non-verbal signals, such as "thumbs-up." Assign a buddy or a group to clarify directions or process. · Teach in small chunks so students get a lot of practice with one step at a time. · Know, use, and make the most of Deaf culture and sign language. · Use songs, rhymes, or rhythms to help students remember key concepts, such as "Add your ones up first/Make a bundle if you can!"

New Vocabulary	Students Achieving Below Standard	Students Achieving Above Standard
> Greater than < Less than Place value (quantity represented by a digit in a particular place within a number) **Familiar Terms and Symbols** **=** Equal Numerals Ones Tens	The following provides a bank of suggestions within the Universal Design for Learning framework for accommodating students who are below grade level in your class. Variations on these accommodations are elaborated within lessons, demonstrating how and when they might be used. **<u>Provide Multiple Means of Representation</u>** ● Model problem-solving sets with drawings and graphic organizers (e.g., bar or tape diagram), giving many examples and visual displays. ● Guide students as they select and practice using their own graphic organizers and models to solve. ● Use direct instruction for vocabulary with visual or concrete representations. ● Use explicit directions with steps and procedures enumerated. ● Guide students through initial practice promoting gradual independence. "I do, we do, you do." ● Use alternative methods of delivery of instruction such as recordings and videos that can be	The following chart provides a bank of suggestions within the Universal Design for Learning framework for accommodating students who are above grade level in your class. Variations on these accommodations are elaborated within lessons, demonstrating how and when they might be used. Provide Multiple Means of Representation Teach students how to ask questions (such as, "Do you agree?" and "Why do you think so?") to extend "think-pair-share" conversations. Model and post conversation "starters," such as: "I agree because…" "Can you explain how you solved it?" "I noticed that…" "Your solution is different from/ the same as mine because…" "My mistake was to…" Incorporate written reflection, evaluation, and synthesis. Allow creativity in expression and modeling solutions. Provide Multiple Means of Action and Expression Encourage students to explain their reasoning both orally and in writing. Extend exploration of math topics by means of challenging games, puzzles, and brain teasers. Offer choices of independent or group assignments for early finishers. Encourage students to notice and explore patterns and to identify rules

	accessed independently or repeated if necessary. ● Scaffold complex concepts and provide leveled problems for multiple entry points. **<u>Provide Multiple Means of Action and Expression</u>** ● First use manipulatives or real objects (such as dollar bills), then make transfer from concrete to pictorial to abstract. ● Have students restate their learning for the day. Ask for a different representation in the restatement. 'Would you restate that answer in a different way or show me by using a diagram?' ● Encourage students to explain their thinking and strategy for the solution. ● Choose numbers and tasks that are "just right" for learners but teach the same concepts. ● Adjust numbers in calculations to suit learner's levels. For example, change 429 divided by 2 to 400 divided by 2 or 4 divided by 2. **<u>Provide Multiple Means of Engagement</u>** ● Clearly model steps, procedures, and questions to ask when solving. ● Cultivate peer-assisted learning interventions for instruction (e.g., dictation) and practice, particularly for computation work (e.g., peer modeling). ● Have students work together to solve and then check their solutions. ● Teach students to ask themselves questions as they solve: Do I know the meaning of all the words in this problem?; What is being asked?; Do I have all of the information I need?; What do I do first?; What is the order to solve this problem? What calculations do I need to make? ● Practice routine to ensure smooth	and relationships in math. Have students share their observations in discussion and writing (e.g., journaling). Foster their curiosity about numbers and mathematical ideas. Facilitate research and exploration through discussion, experiments, internet searches, trips, etc. Have students compete in a secondary simultaneous competition, such as skip-counting by 75s, while peers are completing the sprint. Let students choose their mode of response: written, oral, concrete, pictorial, or abstract. Increase the pace. Offer two word problems to solve, rather than one. Adjust difficulty level by increasing the number of steps (e.g., change a one-step problem to a two-step problem). Adjust difficulty level by enhancing the operation (e.g., addition to multiplication), increasing numbers to millions, or decreasing numbers to decimals/fractions. Let students write word problems to show mastery and/or extension of the content. Provide Multiple Means of Engagement Push student comprehension into higher levels of Bloom's Taxonomy with questions such as: "What would happen if…?" "Can you propose an alternative…?" "How would you evaluate…?" "What choice would you have made…?" Ask "Why?" and "What if?" questions. Celebrate improvement in completion time (e.g., Sprint A completed in 45 seconds and Sprint B completed in 30 seconds). Make the most of the fun exercises for practicing skip-counting. Accept and elicit student ideas and suggestions for ways to extend games. Cultivate student persistence in problem-solving and do not neglect their need for guidance and support.

	transitions. ● Set goals with students regarding the type of math work students should complete in 60 seconds. ● Set goals with the students regarding next steps and what to focus on next.	

Math Unit -

Grade 1 Unit 5 (Module 5)

Identifying, Composing, and Partitioning Shapes

OVERVIEW

Throughout the year, students have explored part–whole relationships in many ways, such as their work with number bonds, tape diagrams, and the relationship between addition and subtraction. In Module 5, students consider part–whole relationships through a geometric lens.

In Topic A, students identify the defining parts, or attributes, of two- and three-dimensional shapes, building on their kindergarten experiences of sorting, analyzing, comparing, and creating various two- and three-dimensional shapes and objects (1.G.1). Using straws, students begin the exploration by creating and describing two-dimensional shapes without naming them. This encourages students to attend to and clarify a shape's defining attributes. In the following lessons, students name two- and three-dimensional shapes and find them in pictures and in their environment. New shape names are added to the students' repertoire, including *trapezoid, rhombus, cone,* and *rectangular prism*.

In Topic B, students combine shapes to create a new whole: a composite shape (1.G.2). Students identify the name of the composite shape as well as the names of each shape that forms it. Students see that another shape can be added to a composite shape so that the composite shape becomes part of an even larger whole.

During Topic C, students relate geometric figures to equal parts and name the parts as halves and fourths (or quarters) (1.G.3). For example, students now see that a rectangle can be partitioned into two equal triangles (whole to part) and that the same triangles can be recomposed to form the original rectangle (part to whole). Students see that as they create more parts, decomposing the shares from halves to fourths, the parts get smaller.

The module closes with Topic D, in which students apply their understanding of halves (1.G.3) to tell time to the hour and half hour (1.MD.3). Students construct simple clocks and begin to understand the hour hand, then the minute hand, and then both together. Throughout each lesson, students read both digital and analog clocks to tell time.

Throughout Module 5, students continue daily fluency with addition and subtraction, preparing for Module 6, where they will add within 100 and ensure their mastery of the grade-level fluency goal of sums and differences within 10.

Rigorous Curriculum Design Template

Unit : 5 - Identifying, Composing, and Partitioning Shapes

Subject: Math

Grade/Course: Grade 1

Pacing: 15 days

Unit of Study: Unit : Identifying, Composing, and Partitioning Shapes Identifying, Composing, and Partitioning Shapes

Priority Standards:

Tell and write time and money.

1.MD.3 Tell and write time in hours and half-hours using analog and digital clocks. Recognize and identify coins, their names, and their values.

Reason with shapes and their attributes.
1.G.1 Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes.

1.G.2 Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape. (Students do not need to learn formal names such as "right rectangular prism.")

1.G.3 Partition circles and rectangles into two and four equal shares, describe the shares using the words *halves, fourths*, and *quarters*, and use the phrases *half of*, *fourth of*, and *quarter of*. Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares.

Foundational Standards

K.G.2 Correctly name shapes regardless of their orientations or overall size.

K.G.3 Identify shapes as two-dimensional (lying in a plane, "flat") or three-dimensional ("solid").

K.G.4 Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/"corners") and other attributes (e.g., having sides of equal length).

K.G.6 Compose simple shapes to form larger shapes. For example, *"Can you join these two triangles with full sides touching to make a rectangle*?"

Math Practice Standards:

MP.1 Make sense of problems and persevere in solving them. Although some students thrive on the visual–spatial perspective of geometric concepts, it can be quite challenging for others. Throughout the module, students will be encouraged to continue working toward success when trying to arrange shapes to create specific composite shapes and when recomposing the pieces into different shapes. For some students, sorting shapes into groups without using the common shape names can also create challenges through which they must persevere. This will take place as students distinguish shapes from among variants, palpable distractors, and difficult distractors in Topic A. See examples to the right.

MP.6 Attend to precision. Students will use clear definitions with peers as they define attributes. For example, while working with a partner, students describe a composite figure by explaining surfaces, sides, and corners so that their partners can create the same composite shape without seeing a visual representation. Students appropriately name parts of a whole using terms such as *halves, fourths,* and *quarters*.

MP.7 Look for and make use of structure. Students identify attributes in order to classify shapes such as triangles and cylinders. Students recognize that attributes such as the number of sides, surfaces, etc., are defining attributes, whereas color, size, and orientation are not. Students use their understanding of the partitioning of a circle to tell time..

"Unwrapped" Standards	
Concepts (What Students Need to Know)	**Skills (What Students Need to Be Able to Do)**
Time in hours and half-hours using analog and digital clocks.	Tell (DOK-1 Write (DOK-1)
Between defining attributes versus non-defining attributes.	Distinguish (DOK-2)
Shapes to possess defining attributes.	Build (DOK-3) Draw (DOK-1)

Essential Questions	**Big ideas**
How can attributes be used to classify?	Attributes can be used to describe.

Assessments		
Common Formative Pre-Assessments	Progress Monitoring Checks – "Dipsticks"	Common Formative Mid and or Post-Assessments
Exit tickets for pre assessment of each lesson	Application problems Problem set data Student debriefs	Exit ticket data Mid-Module Assessment End-of Module Assessment *See Table Below

*Assessment Summary

Type	Administered	Format	Standards Addressed
End-of-Module Assessment Task	After Topic D	Constructed response with rubric	1.MD.3 1.G.1 1.G.2 1.G.3

Performance Assessment/ Engaging Scenarios (*To be completed by grade level team)
Overview:
Engaging Learning Experiences/ Performance Tasks
Task 1: Task 2: Task 3: Task 4:

Instructional Resources
Useful Websites: Engage NY K-5 Curriculum overview and guiding documents: https://www.engageny.org/resource/pre-kindergarten-grade-5-mathematics-curriculum-map-and-guiding-documents Engage NY Grade 1 Resources: https://www.engageny.org/resource/grade-1-mathematics Eureka Math Module PDFs: http://greatminds.net/maps/math/module-pdfs North Carolina 1st Grade Standards Unpacked: http://www.ncpublicschools.org/docs/acre/standards/common-core-tools/unpacking/math/1st.pdf Illustrative Mathematics – problems and tasks by grade and standard https://www.illustrativemathematics.org/ NCTM Illuminations – problems, tasks and interactives by grade and standard http://illuminations.nctm.org/Default.aspx Inside Mathematics – Problems of the Month and Performance Assessment tasks http://www.insidemathematics.org/ LearnZillion –lesson plans/some with embedded tasks https://learnzillion.com/resources/17132 SBAC Digital Library Books: Cubes, Cones, Cylinders and Spheres Hoban, Tana The Greedy Triangle Burns, Marilyn **Suggested Tools and Representations** ▪ Pattern blocks ▪ Square tiles ▪ Straws ▪ Student clocks, preferably with gears that can provide the appropriate hour-hand alignment ▪ Three-dimensional shape models (commercially produced or commonly found examples) including cube, cone, cylinder, rectangular prism, and sphere

Instructional Strategies	Meeting the Needs of All Students
21st Century Skills ● Critical thinking and problem solving ● Collaboration and leadership ● Agility and adaptability ● Initiative and entrepreneurialism ● Effective oral and written communication ● Accessing and analyzing information ● Curiosity and imagination **Marzano's Nine Instructional Strategies for Effective**	The modules that make up A Story of Units propose that the components of excellent math instruction do not change based on the audience. That said, there are specific resources included within this curriculum to highlight strategies that can provide critical access for all students. Researched-based Universal Design for Learning (UDL) has provided a structure for thinking about how to meet the needs of diverse learners. Broadly speaking, that structure asks teachers to consider multiple means of representation; multiple means of action and expression; and multiple means of engagement. Charts at the end of

Teaching and Learning

1. Identifying Similarities and Differences: helps students understand more complex problems by analyzing them in a simpler way

2. Summarizing and Note-taking: promotes comprehension because students have to analyze what is important and what is not important and put it in their own words

3. Reinforcing Effort and Providing Recognition: showing the connection between effort and achievement helps students helps them see the importance of effort and allows them to change their beliefs to emphasize it more. Note that recognition is more effective if it is contingent on achieving some specified standard.

4. Homework and Practice: provides opportunities to extend learning outside the classroom, but should be assigned based on relevant grade level. All homework should have a purpose and that purpose should be readily evident to the students. Additionally, feedback should be given for all homework assignments.

5. Nonlinguistic Representations: has recently been proven to stimulate and increase brain activity.

6. Cooperative Learning: has been proven to have a positive impact on overall learning. Note: groups should be small enough to be effective and the strategy should be used in a systematic and consistent manner.

7. Setting Objectives and Providing Feedback: provide students with a direction. Objectives should not be too specific and should be adaptable to students' individual objectives. There is no such thing as too much positive feedback, however, the method in which you give that feedback should be varied.

8. Generating and Testing Hypotheses: it's not just for science class! Research shows that a deductive approach works best, but both inductive and deductive reasoning can help students understand and relate to the material.

9. Cues, Questions, and Advanced Organizers: helps students use what they already know to enhance what they are about to learn. These are usually most

this section offer suggested scaffolds, utilizing this framework, for English Language Learners, Students with Disabilities, Students Performing above Grade Level, and Students Performing below Grade Level. UDL offers ideal settings for multiple entry points for students and minimizes instructional barriers to learning. Teachers will note that many of the suggestions on a chart will be applicable to other students and overlapping populations.

Additionally, individual lessons contain marginal notes to teachers (in text boxes) highlighting specific UDL information about scaffolds that might be employed with particular intentionality when working with students. These tips are strategically placed in the lesson where the teacher might use the strategy to the best advantage.

It is important to note that the scaffolds/accommodations integrated into A Story of Units might change how a learner accesses information and demonstrates learning; they do not substantially alter the instructional level, content, or performance criteria. Rather, they provide students with choices in how they access content and demonstrate their knowledge and ability.

We encourage teachers to pay particular attention to the manner in which knowledge is sequenced in A Story of Units and to capitalize on that sequence when working with special student populations. Most lessons contain a suggested teaching sequence that moves from simple to complex, starting, for example, with an introductory problem for a math topic and building up inductively to the general case encompassing multifaceted ideas. By breaking down problems from simple to complex, teachers can locate specific steps that students are struggling with or stretch out problems for students who desire a challenge.

Throughout A Story of Units, teachers are encouraged to give classwork utilizing a "time frame" rather than a "task frame." Within a given time frame, all students are expected to do their personal best, working at their maximum potential. "Students, you have 10 minutes to work independently." Bonus questions are always ready for accelerated students. The teacher circulates and monitors the work, error-correcting effectively and wisely. Some students will complete more work than others. Neither above nor below grade level students are overly praised or penalized. Personal success is what we are striving for.

Another vitally important component for meeting the

effective when used before a specific lesson.	needs of all students is the constant flow of data from student work. A Story of Units provides daily tracking through “exit tickets” for each lesson as well as mid and end-of-module assessment tasks to determine student understanding at benchmark points. These tasks should accompany teacher-made test items in a comprehensive assessment plan. Such data flow keeps teaching practice firmly grounded in student learning and makes incremental forward movement possible. A culture of “precise error correction” in the classroom breeds a comfort with data that that is non-punitive and honest. When feedback is provided with emotional neutrality, students understand that making mistakes is part of the learning process. “Students, for the next five minutes I will be meeting with Brenda, Scott, and Jeremy. They did not remember to rename the remainder in the tens place as 10 ones in their long division on Question 7.” Conducting such sessions then provides the teacher the opportunity to quickly assess if students need to start at a simpler level or just need more monitored practice now that their eyes are opened to their mistake. Good mathematics instruction, like any successful coaching, involves demonstration, modeling, and lots of intelligent practice. In math, just as in sports, skill is acquired incrementally; as the student acquires greater skill, more complexity is added and proficiency grows. The careful sequencing of the mathematics and the many scaffolds that have been designed into A Story of Units makes it an excellent curriculum for meeting the needs of all students, including those with special and unique learning modes. **Scaffolds for Students with Disabilities** Individualized education programs (IEP)s or Section 504 Accommodation Plans should be the first source of information for designing instruction for students with disabilities. The following chart provides an additional bank of suggestions within the Universal Design for Learning framework for strategies to use with these students in your class. Variations on these scaffolds are elaborated at particular points within lessons with text boxes at appropriate points, demonstrating how and when they might be used. Provide Multiple Means of Representation · Teach from simple to complex, moving from concrete to representation to abstract at the student’s pace. · Clarify, compare, and make connections to math

	words in discussion, particularly during and after practice. · Partner key words with visuals (e.g., photo of "ticket") and gestures (e.g., for "paid"). Connect language (such as 'tens') with concrete and pictorial experiences (such as money and fingers). Couple teacher-talk with "math-they-can-see," such as models. Let students use models and gestures to calculate and explain. For example, a student searching to define "multiplication" may model groups of 6 with drawings or concrete objects and write the number sentence to match. · Teach students how to ask questions (such as "Do you agree?" and "Why do you think so?") to extend "think-pair-share" conversations. Model and post conversation "starters," such as: "I agree because…" "Can you explain how you solved it?" "I noticed that…" "Your solution is different from/ the same as mine because…" "My mistake was to…" · Couple number sentences with models. For example, for equivalent fraction sprint, present 6/8 with: · Enlarge sprint print for visually impaired learners. · Use student boards to work on one calculation at a time. · Invest in or make math picture dictionaries or word walls. Provide Multiple Means of Action and Expression · Provide a variety of ways to respond: oral; choral; student boards; concrete models (e.g., fingers), pictorial models (e.g., ten-frame); pair share; small group share. For example: Use student boards to adjust "partner share" for deaf and hard-of-hearing students. Partners can jot questions and answers to one another on slates. Use vibrations or visual signs (such as clap, rather than a snap or "show") to elicit responses from deaf/hard of hearing students. · Vary choral response with written response (number sentences and models) on student boards to ease linguistic barriers. Support oral or written response with sentence frames, such as "_____ is ____ hundreds, ____ tens, and ____ ones. · Adjust oral fluency games by using student and teacher boards or hand signals, such as showing the sum with fingers. Use visual signals or vibrations to elicit responses, such as hand pointed downward means count

	backwards in “Happy Counting.” · Adjust wait time for interpreters of deaf and hard-of-hearing students. · Select numbers and tasks that are “just right” for learners. · Model each step of the algorithm before students begin. · Give students a chance to practice the next day’s sprint beforehand. (At home, for example.) · Give students a few extra minutes to process the information before giving the signal to respond. · Assess by multiple means, including “show and tell” rather than written. · Elaborate on the problem-solving process. Read word problems aloud. Post a visual display of the problem-solving process. Have students check off or highlight each step as they work. Talk through the problem-solving process step-by-step to demonstrate thinking process. Before students solve, ask questions for comprehension, such as, “What unit are we counting? What happened to the units in the story?” Teach students to use self-questioning techniques, such as, “Does my answer make sense?” · Concentrate on goals for accomplishment within a time frame as opposed to a task frame. Extend time for task. Guide students to evaluate process and practice. Have students ask, “How did I improve? What did I do well?” · Focus on students’ mathematical reasoning (i.e., their ability to make comparisons, describe patterns, generalize, explain conclusions, specify claims, and use models), not their accuracy in language. Provide Multiple Means of Engagement · Make eye-to-eye contact and keep teacher-talk clear and concise. Speak clearly when checking answers for sprints and problems. · Check frequently for understanding (e.g., ‘show’). Listen intently in order to uncover the math content in the students’ speech. Use non-verbal signals, such as “thumbs-up.” Assign a buddy or a group to clarify directions or process. · Teach in small chunks so students get a lot of practice with one step at a time.

	· Know, use, and make the most of Deaf culture and sign language. · Use songs, rhymes, or rhythms to help students remember key concepts, such as "Add your ones up first/Make a bundle if you can!"

New Vocabulary	Students Achieving Below Standard	Students Achieving Above Standard
New or Recently Introduced Terms Attributes (characteristics of an object such as color or number of sides) Composite shapes (shapes composed of two or more shapes) Digital clock Fourth of (shapes), fourths (1 out of 4 equal parts) Half-hour (interval of time lasting 30 minutes) Half of, halves (1 out of 2 equal parts) Half past (expression for 30 minutes past a given hour) Hour (unit for measuring time, equivalent to 60 minutes or 1/24 of a day) Hour hand (component on clock tracking hours) Minute (unit for measuring time, equivalent to 60 seconds or 1/60 of an hour) Minute hand (component on clock tracking minutes) O'clock (used to indicate time to a precise hour, with no additional minutes) Quarter of (shapes) (1 out of 4 equal parts) Three-dimensional shapes: Cone Rectangular prism Two-dimensional shapes: Half-circle Quarter-circle Rhombus (flat figure enclosed by four straight sides of the same length wherein two pairs	The following provides a bank of suggestions within the Universal Design for Learning framework for accommodating students who are below grade level in your class. Variations on these accommodations are elaborated within lessons, demonstrating how and when they might be used. **<u>Provide Multiple Means of Representation</u>** ● Model problem-solving sets with drawings and graphic organizers (e.g., bar or tape diagram), giving many examples and visual displays. ● Guide students as they select and practice using their own graphic organizers and models to solve. ● Use direct instruction for vocabulary with visual or concrete representations. ● Use explicit directions with steps and procedures enumerated. ● Guide students through initial practice promoting gradual independence. "I do, we do, you do." ● Use alternative methods of delivery of instruction such as recordings and videos that can be accessed independently or repeated if necessary. ● Scaffold complex concepts and provide leveled problems for multiple entry points. **<u>Provide Multiple Means of Action</u>**	The following chart provides a bank of suggestions within the Universal Design for Learning framework for accommodating students who are above grade level in your class. Variations on these accommodations are elaborated within lessons, demonstrating how and when they might be used. Provide Multiple Means of Representation Teach students how to ask questions (such as, "Do you agree?" and "Why do you think so?") to extend "think-pair-share" conversations. Model and post conversation "starters," such as: "I agree because…" "Can you explain how you solved it?" "I noticed that…" "Your solution is different from/ the same as mine because…" "My mistake was to…" Incorporate written reflection, evaluation, and synthesis. Allow creativity in expression and modeling solutions. Provide Multiple Means of Action and Expression Encourage students to explain their reasoning both orally and in writing. Extend exploration of math topics by means of challenging games, puzzles, and brain teasers. Offer choices of independent or group assignments for early finishers. Encourage students to notice and explore patterns and to identify rules and relationships in math. Have students share their observations in discussion and writing (e.g., journaling). Foster their curiosity about numbers and mathematical ideas. Facilitate research and exploration through discussion,

of opposite sides are parallel) Trapezoid (a quadrilateral in which at least one pair of opposite sides is parallel) **Familiar Terms and Symbols** Clock Shape names (two-dimensional and three dimensional) from Kindergarten Circle Cube Cylinder	**<u>and Expression</u>** ● First use manipulatives or real objects (such as dollar bills), then make transfer from concrete to pictorial to abstract. ● Have students restate their learning for the day. Ask for a different representation in the restatement. 'Would you restate that answer in a different way or show me by using a diagram?' ● Encourage students to explain their thinking and strategy for the solution. ● Choose numbers and tasks that are "just right" for learners but teach the same concepts. ● Adjust numbers in calculations to suit learner's levels. For example, change 429 divided by 2 to 400 divided by 2 or 4 divided by 2. **<u>Provide Multiple Means of Engagement</u>** ● Clearly model steps, procedures, and questions to ask when solving. ● Cultivate peer-assisted learning interventions for instruction (e.g., dictation) and practice, particularly for computation work (e.g., peer modeling). ● Have students work together to solve and then check their solutions. ● Teach students to ask themselves questions as they solve: Do I know the meaning of all the words in this problem?; What is being asked?; Do I have all of the information I need?; What do I do first?; What is the order to solve this problem? What calculations do I need to make? ● Practice routine to ensure smooth transitions. ● Set goals with students regarding the type of math work students should complete in 60 seconds. ● Set goals with the students regarding next steps and what to focus on next.	experiments, internet searches, trips, etc. Have students compete in a secondary simultaneous competition, such as skip-counting by 75s, while peers are completing the sprint. Let students choose their mode of response: written, oral, concrete, pictorial, or abstract. Increase the pace. Offer two word problems to solve, rather than one. Adjust difficulty level by increasing the number of steps (e.g., change a one-step problem to a two-step problem). Adjust difficulty level by enhancing the operation (e.g., addition to multiplication), increasing numbers to millions, or decreasing numbers to decimals/fractions. Let students write word problems to show mastery and/or extension of the content. Provide Multiple Means of Engagement Push student comprehension into higher levels of Bloom's Taxonomy with questions such as: "What would happen if…?" "Can you propose an alternative…?" "How would you evaluate…?" "What choice would you have made…?" Ask "Why?" and "What if?" questions. Celebrate improvement in completion time (e.g., Sprint A completed in 45 seconds and Sprint B completed in 30 seconds). Make the most of the fun exercises for practicing skip-counting. Accept and elicit student ideas and suggestions for ways to extend games. Cultivate student persistence in problem-solving and do not neglect their need for guidance and support.

Math Unit -

Grade 1 Unit 6 (Module 6)

Place Value, Comparison, Addition and Subtraction of Numbers to 100

OVERVIEW

In this final module of the Grade 1 curriculum, students bring together their learning from Module 1 through Module 5 to learn the most challenging Grade 1 standards and celebrate their progress.

In Topic A, students grapple with comparative word problem types (1.OA.1). While students have solved some comparative problem types during Module 3 and within the Application Problems in Module 5, this will be their first opportunity to name these types of problems and learn to represent comparisons using tape diagrams with two tapes.

Students extend their understanding of and skill with tens and ones to numbers to 100 in Topic B (1.NBT.2). For example, they mentally find 10 more, 10 less, 1 more, and 1 less (1.NBT.5) and compare numbers using the symbols >, =, and < (1.NBT.3). They then count and write numbers to 120 (1.NBT.1) using both standard numerals and the unit form.

In Topics C and D, students again extend their learning from Module 4 to the numbers to 100 to add and subtract (1.NBT.4, 1.NBT.6). They add pairs of two-digit numbers in which the ones digits sometimes have a sum greater than 10, recording their work using various methods based on place value (1.NBT.4). In Topic D, students focus on using drawings, numbers, and words to solve, highlighting the role of place value, the properties of addition, and related facts.

At the start of the second half of Module 6, students are introduced to nickels and quarters (1.MD.3), having already used pennies and dimes in the context of their work with numbers to 40 in Module 4. Students use their knowledge of tens and ones to explore decompositions of the values of coins. For example, they might represent 25 cents using 1 quarter, 25 pennies, 2 dimes and 1 nickel, or 1 dime and 15 pennies.

In Topic F, students really dig into MP.1 and MP.3. The topic includes the more challenging *compare with bigger or smaller unknown* word problem types wherein *more* or *less* suggest the incorrect operation (1.OA.1), thus giving a context for more in-depth discussions and critiques. On the final day of this topic, students work with varied problem types, sharing and explaining their strategies and reasoning. Peers ask each other questions and defend their choices. The End-of-Module Assessment follows Topic F.

The module and year close with Topic G, wherein students celebrate their year's worth of learning with fun fluency festivities that equip them with games to maintain their fluency during the summer months prior to Grade 2. The final day is devoted to creating a math folder illustrating their learning in which to send home their year's work.

Rigorous Curriculum Design Template

Unit : 6 Place Value, Comparison and Addition and Subtraction to 100

Subject: Math

Grade/Course: Grade 1

Pacing: 35 Days

Unit of Study: Unit : Place Value, Comparison and Addition and Subtraction to 100 Place Value, Comparison and Addition and Subtraction to 100

Priority Standards:

Represent and solve problems involving addition and subtraction.

1.OA.1 Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem. (See CCS Glossary, Table 1.)

Extend the counting sequence.

1.NBT.1 Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.

Understand place value.

1.NBT.2 Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following special cases:

a. 10 can be thought of as a bundle of ten ones—called a "ten."

c. The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).

1.NBT.3 Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.

Use place value understanding and properties of operations to add and subtract.

1.NBT.4 Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.

1.NBT.5 Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.

1.NBT.6 Subtract multiples of 10 in the range 10–90 from multiples of 10 in the range 10–90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Tell and write time and money.

1.MD.3 Tell and write time in hours and half-hours using analog and digital clocks. Recognize and identify coins, their names, and their values.

Foundational Standards

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.NBT.1 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 (e.g., 18 = 10 + 8); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.

Math Practice Standards:

MP.1 Make sense of problems and persevere in solving them. Throughout Topic A, students analyze given situations and determine whether they are compare, take away, or put together problem types. Students' drawings, such as single and double tape diagrams, represent their planning towards a solution pathway. During Topic F, students initially work independently, supporting them in learning how to persevere and make sense of problems. As students share their strategies and solutions asking and answering peer questions, they demonstrate understanding of the approaches of their peers and identify corresponding elements between the approaches.

MP.3 Construct viable arguments and critique the reasoning of others. During Topic F, students share their strategies and reasoning as they explain their solutions to various problem types. They ask useful questions to help clarify or improve peers' explanations, such as, "How does your drawing help demonstrate your thinking?" Students consider how a selected student's work helped her solve the problem as well considering other pathways for student to correctly solve the problem. As students share their thinking, they explain the mathematical reasoning that supports their argument.

MP.4 Model with mathematics. Throughout this module, students model their mathematics in various ways. While problem solving, students use tape diagrams and number sentences to model situations and solutions. When sharing various strategies for adding within 100, students use number bonds, number sentences, and sometimes drawings to solve for the sums and to demonstrate their understanding and use of place value, properties of addition, and the relationship between addition and subtraction as they decompose and recompose numbers.

MP.5 Use appropriate tools strategically. After learning varied representations and strategies for adding and subtracting pairs of two-digit numbers, students choose their preferred methods for representing and solving problems

efficiently. As they share their strategies, students explain their choice of making ten, adding tens and then ones, or adding ones and then tens. They also demonstrate how their choice of written method (number bonds, vertical alignment, or arrow notation) expresses their strategy work.

"Unwrapped" Standards	
Concepts (What Students Need to Know)	**Skills (What Students Need to Be Able to Do)**
Addition (within 20) Subtraction (within 20)	Use (DOK 1)
Word problems involving: Adding to Taking from Putting together Taking apart Comparing (with unknowns in all positions)	Solve (DOK 3)
Properties of operations: Add Subtract	Apply (DOK 4)
Two digits of a two-digit number represent amounts of tens and ones.	Understand (DOK-3)
Within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10.	Add (DOK-1)
Concrete models or drawings and strategies based on place value, properties of operation, and/or the relationship between addition and subtraction.	Use (DOK-1)
The strategy to a written method and the reasoning used.	Relate (DOK-2) Explain (DOK-3)

Essential Questions	**Big ideas**
How do number relationships solve problems?	Addition and Subtraction are related.

Assessments		
Common Formative Pre-Assessments	Progress Monitoring Checks – "Dipsticks"	Common Formative Mid and or Post-Assessments
Exit tickets for pre assessment of each lesson	Application problems Problem set data Student debriefs	Exit ticket data Mid-Module Assessment End-of Module Assessment *See Table Below

*Assessment Summary

Type	Administered	Format	Standards Addressed
Mid-Module Assessment Task	After Topic D	Constructed response with rubric	1.OA.1 1.NBT.1 1.NBT.2a 1.NBT.2c 1.NBT.3 1.NBT.4

			1.NBT.5 1.NBT.6
End-of-Module Assessment Task	After Topic F	Constructed response with rubric	1.OA.1 1.NBT.1 1.NBT.2a 1.NBT.2c 1.NBT.3 1.NBT.4 1.NBT.5 1.NBT.6 1.MD.3[1]

Performance Assessment/ Engaging Scenarios(*To be completed by grade level team)
Overview:
Engaging Learning Experiences/ Performance Tasks
Task 1: Task 2: Task 3: Task 4:

Instructional Resources
Useful Websites: Engage NY K-5 Curriculum overview and guiding documents: https://www.engageny.org/resource/pre-kindergarten-grade-5-mathematics-curriculum-map-and-guiding-documents Engage NY Grade 1 Resources: https://www.engageny.org/resource/grade-1-mathematics Eureka Math Module PDFs: http://greatminds.net/maps/math/module-pdfs North Carolina 1st Grade Standards Unpacked: http://www.ncpublicschools.org/docs/acre/standards/common-core-tools/unpacking/math/1st.pdf Illustrative Mathematics – problems and tasks by grade and standard https://www.illustrativemathematics.org/ NCTM Illuminations – problems, tasks and interactives by grade and standard http://illuminations.nctm.org/Default.aspx Inside Mathematics – Problems of the Month and Performance Assessment tasks http://www.insidemathematics.org/ LearnZillion –lesson plans/some with embedded tasks https://learnzillion.com/resources/17132 SBAC Digital Library Books: What's the Place Value Duke, Shirley Penguin Place Value Stone, Kathleen **Suggested Tools and Representations** ▪ 100-bead Rekenrek ▪ Tape diagram

Instructional Strategies	Meeting the Needs of All Students

21st Century Skills

- Critical thinking and problem solving
- Collaboration and leadership
- Agility and adaptability
- Initiative and entrepreneurialism
- Effective oral and written communication
- Accessing and analyzing information
- Curiosity and imagination

Marzano's Nine Instructional Strategies for Effective Teaching and Learning

1. Identifying Similarities and Differences: helps students understand more complex problems by analyzing them in a simpler way

2. Summarizing and Note-taking: promotes comprehension because students have to analyze what is important and what is not important and put it in their own words

3. Reinforcing Effort and Providing Recognition: showing the connection between effort and achievement helps students helps them see the importance of effort and allows them to change their beliefs to emphasize it more. Note that recognition is more effective if it is contingent on achieving some specified standard.

4. Homework and Practice: provides opportunities to extend learning outside the classroom, but should be assigned based on relevant grade level. All homework should have a purpose and that purpose should be readily evident to the students. Additionally, feedback should be given for all homework assignments.

5. Nonlinguistic Representations: has recently been proven to stimulate and increase brain activity.

6. Cooperative Learning: has been proven to have a positive impact on overall learning. Note: groups should be small enough to be effective and the strategy should be used in a systematic and consistent manner.

7. Setting Objectives and Providing Feedback: provide students with a direction. Objectives should not be too specific and should be adaptable to students' individual objectives. There is no such thing

The modules that make up A Story of Units propose that the components of excellent math instruction do not change based on the audience. That said, there are specific resources included within this curriculum to highlight strategies that can provide critical access for all students.

Researched-based Universal Design for Learning (UDL) has provided a structure for thinking about how to meet the needs of diverse learners. Broadly speaking, that structure asks teachers to consider multiple means of representation; multiple means of action and expression; and multiple means of engagement. Charts at the end of this section offer suggested scaffolds, utilizing this framework, for English Language Learners, Students with Disabilities, Students Performing above Grade Level, and Students Performing below Grade Level. UDL offers ideal settings for multiple entry points for students and minimizes instructional barriers to learning. Teachers will note that many of the suggestions on a chart will be applicable to other students and overlapping populations.

Additionally, individual lessons contain marginal notes to teachers (in text boxes) highlighting specific UDL information about scaffolds that might be employed with particular intentionality when working with students. These tips are strategically placed in the lesson where the teacher might use the strategy to the best advantage.

It is important to note that the scaffolds/accommodations integrated into A Story of Units might change how a learner accesses information and demonstrates learning; they do not substantially alter the instructional level, content, or performance criteria. Rather, they provide students with choices in how they access content and demonstrate their knowledge and ability.

We encourage teachers to pay particular attention to the manner in which knowledge is sequenced in A Story of Units and to capitalize on that sequence when working with special student populations. Most lessons contain a suggested teaching sequence that moves from simple to complex, starting, for example, with an introductory problem for a math topic and building up inductively to the general case encompassing multifaceted ideas. By breaking down problems from simple to complex, teachers can locate specific steps that students are struggling with or stretch out problems for students who desire a challenge.

Throughout A Story of Units, teachers are encouraged to

as too much positive feedback, however, the method in which you give that feedback should be varied. **8. Generating and Testing Hypotheses**: it's not just for science class! Research shows that a deductive approach works best, but both inductive and deductive reasoning can help students understand and relate to the material. **9. Cues, Questions, and Advanced Organizers:** helps students use what they already know to enhance what they are about to learn. These are usually most effective when used before a specific lesson.	give classwork utilizing a "time frame" rather than a "task frame." Within a given time frame, all students are expected to do their personal best, working at their maximum potential. "Students, you have 10 minutes to work independently." Bonus questions are always ready for accelerated students. The teacher circulates and monitors the work, error-correcting effectively and wisely. Some students will complete more work than others. Neither above nor below grade level students are overly praised or penalized. Personal success is what we are striving for. Another vitally important component for meeting the needs of all students is the constant flow of data from student work. A Story of Units provides daily tracking through "exit tickets" for each lesson as well as mid and end-of-module assessment tasks to determine student understanding at benchmark points. These tasks should accompany teacher-made test items in a comprehensive assessment plan. Such data flow keeps teaching practice firmly grounded in student learning and makes incremental forward movement possible. A culture of "precise error correction" in the classroom breeds a comfort with data that that is non-punitive and honest. When feedback is provided with emotional neutrality, students understand that making mistakes is part of the learning process. "Students, for the next five minutes I will be meeting with Brenda, Scott, and Jeremy. They did not remember to rename the remainder in the tens place as 10 ones in their long division on Question 7." Conducting such sessions then provides the teacher the opportunity to quickly assess if students need to start at a simpler level or just need more monitored practice now that their eyes are opened to their mistake. Good mathematics instruction, like any successful coaching, involves demonstration, modeling, and lots of intelligent practice. In math, just as in sports, skill is acquired incrementally; as the student acquires greater skill, more complexity is added and proficiency grows. The careful sequencing of the mathematics and the many scaffolds that have been designed into A Story of Units makes it an excellent curriculum for meeting the needs of all students, including those with special and unique learning modes. **Scaffolds for Students with Disabilities** Individualized education programs (IEP)s or Section 504 Accommodation Plans should be the first source of information for designing instruction for students with disabilities. The following chart provides an additional bank of suggestions within the Universal Design for

	Learning framework for strategies to use with these students in your class. Variations on these scaffolds are elaborated at particular points within lessons with text boxes at appropriate points, demonstrating how and when they might be used. Provide Multiple Means of Representation · Teach from simple to complex, moving from concrete to representation to abstract at the student's pace. · Clarify, compare, and make connections to math words in discussion, particularly during and after practice. · Partner key words with visuals (e.g., photo of "ticket") and gestures (e.g., for "paid"). Connect language (such as 'tens') with concrete and pictorial experiences (such as money and fingers). Couple teacher-talk with "math-they-can-see," such as models. Let students use models and gestures to calculate and explain. For example, a student searching to define "multiplication" may model groups of 6 with drawings or concrete objects and write the number sentence to match. · Teach students how to ask questions (such as "Do you agree?" and "Why do you think so?") to extend "think-pair-share" conversations. Model and post conversation "starters," such as: "I agree because…" "Can you explain how you solved it?" "I noticed that…" "Your solution is different from/ the same as mine because…" "My mistake was to…" · Couple number sentences with models. For example, for equivalent fraction sprint, present 6/8 with: · Enlarge sprint print for visually impaired learners. · Use student boards to work on one calculation at a time. · Invest in or make math picture dictionaries or word walls. Provide Multiple Means of Action and Expression · Provide a variety of ways to respond: oral; choral; student boards; concrete models (e.g., fingers), pictorial models (e.g., ten-frame); pair share; small group share. For example: Use student boards to adjust "partner share" for deaf and hard-of-hearing students. Partners can jot questions and answers to one another on slates. Use vibrations or visual signs (such as clap, rather than a

	snap or “show”) to elicit responses from deaf/hard of hearing students. · Vary choral response with written response (number sentences and models) on student boards to ease linguistic barriers. Support oral or written response with sentence frames, such as “_____ is ____ hundreds, ____ tens, and ____ ones. · Adjust oral fluency games by using student and teacher boards or hand signals, such as showing the sum with fingers. Use visual signals or vibrations to elicit responses, such as hand pointed downward means count backwards in “Happy Counting.” · Adjust wait time for interpreters of deaf and hard-of-hearing students. · Select numbers and tasks that are “just right” for learners. · Model each step of the algorithm before students begin. · Give students a chance to practice the next day’s sprint beforehand. (At home, for example.) · Give students a few extra minutes to process the information before giving the signal to respond. · Assess by multiple means, including “show and tell” rather than written. · Elaborate on the problem-solving process. Read word problems aloud. Post a visual display of the problem-solving process. Have students check off or highlight each step as they work. Talk through the problem-solving process step-by-step to demonstrate thinking process. Before students solve, ask questions for comprehension, such as, “What unit are we counting? What happened to the units in the story?” Teach students to use self-questioning techniques, such as, “Does my answer make sense?” · Concentrate on goals for accomplishment within a time frame as opposed to a task frame. Extend time for task. Guide students to evaluate process and practice. Have students ask, “How did I improve? What did I do well?” · Focus on students’ mathematical reasoning (i.e., their ability to make comparisons, describe patterns, generalize, explain conclusions, specify claims, and use models), not their accuracy in language. Provide Multiple Means of Engagement

	· Make eye-to-eye contact and keep teacher-talk clear and concise. Speak clearly when checking answers for sprints and problems. · Check frequently for understanding (e.g., 'show'). Listen intently in order to uncover the math content in the students' speech. Use non-verbal signals, such as "thumbs-up." Assign a buddy or a group to clarify directions or process. · Teach in small chunks so students get a lot of practice with one step at a time. · Know, use, and make the most of Deaf culture and sign language. · Use songs, rhymes, or rhythms to help students remember key concepts, such as "Add your ones up first/Make a bundle if you can!"

New Vocabulary	Students Achieving Below Standard	Students Achieving Above Standard
Comparison problem type Dime Nickel Penny Quarter **Familiar Terms and Symbols** <, >, = (less than, greater than and equal to)	The following provides a bank of suggestions within the Universal Design for Learning framework for accommodating students who are below grade level in your class. Variations on these accommodations are elaborated within lessons, demonstrating how and when they might be used. **<u>Provide Multiple Means of Representation</u>** ● Model problem-solving sets with drawings and graphic organizers (e.g., bar or tape diagram), giving many examples and visual displays. ● Guide students as they select and practice using their own graphic organizers and models to solve. ● Use direct instruction for vocabulary with visual or concrete representations. ● Use explicit directions with steps and procedures enumerated. ● Guide students through initial practice promoting gradual independence. "I do, we do, you do." ● Use alternative methods of delivery of instruction such as recordings and videos that can be	The following chart provides a bank of suggestions within the Universal Design for Learning framework for accommodating students who are above grade level in your class. Variations on these accommodations are elaborated within lessons, demonstrating how and when they might be used. Provide Multiple Means of Representation Teach students how to ask questions (such as, "Do you agree?" and "Why do you think so?") to extend "think-pair-share" conversations. Model and post conversation "starters," such as: "I agree because…" "Can you explain how you solved it?" "I noticed that…" "Your solution is different from/ the same as mine because…" "My mistake was to…" Incorporate written reflection, evaluation, and synthesis. Allow creativity in expression and modeling solutions. Provide Multiple Means of Action and Expression Encourage students to explain their reasoning both orally and in writing. Extend exploration of math topics by means of challenging games, puzzles, and brain teasers. Offer choices of independent or group assignments for early finishers. Encourage students to notice and explore patterns and to identify rules

	accessed independently or repeated if necessary. ● Scaffold complex concepts and provide leveled problems for multiple entry points. **<u>Provide Multiple Means of Action and Expression</u>** ● First use manipulatives or real objects (such as dollar bills), then make transfer from concrete to pictorial to abstract. ● Have students restate their learning for the day. Ask for a different representation in the restatement. 'Would you restate that answer in a different way or show me by using a diagram?' ● Encourage students to explain their thinking and strategy for the solution. ● Choose numbers and tasks that are "just right" for learners but teach the same concepts. ● Adjust numbers in calculations to suit learner's levels. For example, change 429 divided by 2 to 400 divided by 2 or 4 divided by 2. **<u>Provide Multiple Means of Engagement</u>** ● Clearly model steps, procedures, and questions to ask when solving. ● Cultivate peer-assisted learning interventions for instruction (e.g., dictation) and practice, particularly for computation work (e.g., peer modeling). ● Have students work together to solve and then check their solutions. ● Teach students to ask themselves questions as they solve: Do I know the meaning of all the words in this problem?; What is being asked?; Do I have all of the information I need?; What do I do first?; What is the order to solve this problem? What calculations do I need to make? ● Practice routine to ensure smooth	and relationships in math. Have students share their observations in discussion and writing (e.g., journaling). Foster their curiosity about numbers and mathematical ideas. Facilitate research and exploration through discussion, experiments, internet searches, trips, etc. Have students compete in a secondary simultaneous competition, such as skip-counting by 75s, while peers are completing the sprint. Let students choose their mode of response: written, oral, concrete, pictorial, or abstract. Increase the pace. Offer two word problems to solve, rather than one. Adjust difficulty level by increasing the number of steps (e.g., change a one-step problem to a two-step problem). Adjust difficulty level by enhancing the operation (e.g., addition to multiplication), increasing numbers to millions, or decreasing numbers to decimals/fractions. Let students write word problems to show mastery and/or extension of the content. Provide Multiple Means of Engagement Push student comprehension into higher levels of Bloom's Taxonomy with questions such as: "What would happen if…?" "Can you propose an alternative…?" "How would you evaluate…?" "What choice would you have made…?" Ask "Why?" and "What if?" questions. Celebrate improvement in completion time (e.g., Sprint A completed in 45 seconds and Sprint B completed in 30 seconds). Make the most of the fun exercises for practicing skip-counting. Accept and elicit student ideas and suggestions for ways to extend games. Cultivate student persistence in problem-solving and do not neglect their need for guidance and support.

	transitions. ● Set goals with students regarding the type of math work students should complete in 60 seconds. ● Set goals with the students regarding next steps and what to focus on next.	

Appendix A: Performance Task

Appendix B: Three representative sample CFAs

Appendix C: Three representative model lessons

Appendix A: Performance Task

Module 1: Sum and Differences to 10

Begin this lesson with the story Max and Ruby's Snowy Day by Rosemary Wells.

Engaging Scenario:

"No school, it' a snow day", yells Mom. Max and Ruby jump out of bed. They put on their snow suit and boots and run outside. They yell to Mom, "We are going to make snowballs!" Max and Ruby have so much fun playing in the snow! Now it's time to help them count and organize how many snowballs they have made.

GRADE 1 MATH: FUN IN THE SNOW WITH MAX AND RUBY

UNIT OVERVIEW

This 4-5 week unit is designed to introduce students to the operations of addition and subtraction, and to provide students the opportunity to apply these operations. Throughout the unit, students will model by counting all or taking away, and counting on. Guided practice with these methods will lead to growth in Grade 1 and fluency and precision in Grade 2.

TASK DETAILS

Task Name: Fun in the Snow with Max and Ruby

Grade: 1

Subject: Mathematics

Depth of Knowledge: 2 -3

Task Description: This task includes the recall of facts in one-step operation problems within twenty and requires students to make some decisions on how to approach the problem using basic addition and subtraction skills. It demands reasoning abilities, and students must apply their understanding of operations to solve a problem presented in a novel and unrehearsed way.

Math Standards:

Math.1.OA.1 - Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from , putting together, taking apart, and comparing, with unknowns in all positions.

Math.1.OA.4 - Understand subtraction as an unknown-addend problem.

Math.1.OA.5 - Relate counting to addition and subtraction.

Math.1.OA.6 - Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten; decomposing a number leading to a ten, using the relationship between addition and subtraction; and creating equivalent but easier or known sums.

1. Max and Ruby are playing in the snow. Together they make 9 snowballs. Write 10 number sentences to show all the ways to make 9.

_____ ○ _____=_____

_____ ○ _____=_____

_____ ○ _____=_____

_____ ○ _____=_____

_____ ○ _____=_____

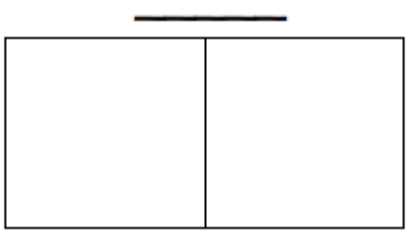
_____ ○ _____=_____

_____ ○ _____=_____

_____ ○ _____=_____

2. The next day Max made more snowballs. He now has 15 snowballs. Ruby has 9 snowballs. How many more snowballs does Max have than Ruby?

Complete the model to show your answer:



Write a subtraction sentence about the story:

_____ ◯ _____=_____

Write an addition sentence about the story:

_____ ◯ _____=_____

3. Max had 15 snowballs. Some melted. Now he only has 11. Write a subtraction sentence to see how many melted:

_____ ◯ _____=_____

Ruby thinks that subtraction is the only way to show how many melted. Show an addition sentence to prove her wrong:

_____ ◯ _____=_____

4. There are 18 buttons for Max and Ruby to use on their snowmen. Max uses 8 buttons. Ruby uses 6 buttons. How many buttons are left over?
Use pictures or numbers to prove your answer:

Explain your thinking:

_____

_____

_____

GRADE 1 MATH: FUN IN THE SNOW WITH MAX AND RUBY

RUBRIC

The rubric section contains a scoring guide and performance level descriptions for the *Fun in the Snow with Max and Ruby* task.

Scoring Guide: The scoring guide is designed specifically for the culminating performance task. The points highlight each specific piece of student thinking and explanation required by the task and help teachers see common misconceptions. The scoring guide can then be used to refer back to the performance level descriptions.

Performance Level Descriptions: Performance level descriptions help teachers think about the overall qualities of work for the task by providing information about the expected level of performance for students. Performance level descriptions provide score ranges for each level, which are assessed using the scoring guide.

Max and Ruby's Scoring Guide
Performance Assessment Rubric Grade 1

	Fun in the Snow with Max and Ruby	**Points**	**Maximum Section Points**
The core elements of the performance required by this task are: • Demonstrate fluency for addition and subtraction within 10. • Add and subtract within 20 to solve word problems. • Use strategies to add and subtract within 20, such as implementing the relationship between addition and subtraction and creating equivalent but easier or known sums. • Communicate reasoning using numbers or pictures. Based on these specific aspects of performance, credit should be assigned as follows:			
1.	Correct answers are: 0+9, 1+8, 2+7, 3+6, 4+5, 5+4, 6+3, 7+2, 8+1, 9+0 If you get 9-10 correct Or If you get 6-8 Correct	**2** **1**	**2**
2.	Shows the correct model demonstrating the unknown. Shows correct subtraction equation (15-9=6) AND correct addition equation (9+6=15 or 6+9=15)	**1** **1**	**2**
3.	Shows correct subtraction equation (15-11=4 or 15-4=11) Shows correct addition equation (4+11=15 or 11+4=15)	**1** **1**	**2**
4.	Uses pictures or numbers to demonstrate the correct answer (4 is left over). Strategies will vary. Explanation that demonstrates the strategy used to come up with the correct answer of 4.	**1** **1**	**2**
	Total Points:		**8**

Grade 1 Math: Fun in the Snow with Max and Ruby
Performance Level Descriptors

Performance Level Descriptions and Scores
Performance is reported at four levels: 1 through 4, with 4 as the highest.

Level 1: Demonstrates Minimal Success (0-2 points)
The student's response shows *few of the elements* of performance that the tasks demand as defined by the Common Core standards. The work shows a minimal attempt at the problem. Communication is limited and shows minimal reasoning. The student's response rarely uses definitions in the explanations. The student struggles to recognize patterns or the structure of the problem situation.

Level 2: Performance Approaching Standard (3-4 points)
The student's response shows *some of the elements* of performance that the tasks demand and some signs of a coherent attack on the core of some of the problems as defined by the Common Core standards. However, the shortcomings are substantial, and the evidence suggests that the student would not be able to produce high-quality solutions without significant further instruction. The student might ignore or fail to address some of the constraints of the problem. The student may occasionally make sense of quantities in relationships in the problem, but the use of quantity is limited or not fully developed. The student response may not state assumptions, definitions, and previously established results. While the student makes an attack on the problem, it is incomplete. The student may recognize some patterns or structures, but has trouble generalizing or using them to solve the problem.

Level 3: Performance At Standard (5-6 points)
For most of the task, the student's response shows the *major elements* of performance that the tasks demand as defined by the Common Core standards, and is organized as a coherent attack on the core of the problem. There are errors or omissions, some of which may be important, but of a kind that the student could well fix with more time for checking and revision and some limited help. The student explains the problem and identifies constraints. The student makes sense of quantities and their relationships in the problem situations. S/he often uses abstractions to represent a problem symbolically or with other mathematical representations. The student response may use assumptions, definitions, and previously established results in constructing arguments. S/he may make conjectures and build a logical progression of statements to explore the truth of the conjectures. The student might discern patterns or structures and make connections between representations

Level 4: Achieves Standards at a High Level (7-8 points)
The student's response *masters* the demands of nearly all of the tasks as defined by the Common Core standards, with little or no errors. With more time for checking and revision, excellent solutions would seem likely. The student response shows understanding and use of stated assumptions, definitions, and previously established results in constructing arguments. The student is able to make conjectures and build a logical progression of statements to explore the truth of the conjecture. The student response routinely interprets the mathematical results in the context of the situation and reflects on whether the results make sense. The communication is precise, using definitions clearly. The student looks closely to discern a pattern or structure. The body of work addresses the overall situation of the problem and process, while attending to the detail.

* Acknowledgement NYC Department of Education	

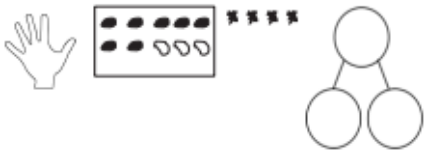
Appendix B: Assessments

Pre Assessment:

A STORY OF UNITS **Lesson 5 Exit Ticket** 1•2

Name _____ Date _____

Complete the number sentence.
Use an efficient strategy to solve the number sentences.



1. 9 + 2 = ____

2. 7 + 9 = ____

3. ____ = 9 + 5

Mid Unit Assessment

Name _____ Date _____

1. Pedro has 8 pennies. Anita has 4 pennies. Olga has 2 pennies.
   a. Whose pennies together make ten?
   b. How many pennies do Pedro, Anita, and Olga have in all? Explain your thinking using a math drawing and a number sentence. Complete the statement.

Pedro, Anita, and Olga have _____ pennies in all.

2. Hakop has 6 pennies in a bowl. Nine pennies are in his drawer. How many pennies does Hakop have in all? Explain how you know with a labeled math drawing and number sentence. Complete the statement.

Hakop has _____ pennies in all.

End of Unit Assessment

Name _____ Date _____

1. Mr. Baggy owns a pet store.
   He counted 10 goldfish in a big tank and 5 goldfish in a small tank. He sold 8 goldfish out of the big tank. How many goldfish did he have left in all? Explain your answer using a labeled math drawing and a number sentence.

Mr. Baggy had _____ goldfish.

2. Mr. Baggy also has 9 birds, 15 snakes, and 12 turtles.

   a. Show the number of snakes as a ten and some ones with a number bond, and a number sentence.

   3. Mr. Baggy sold some snakes. Now, he has 5. How many snakes did he sell? Explain your solution using a number bond or a math drawing. Write a number sentence. Complete the statement.

   Mr. Baggy sold _____ snakes.

   4. Mr. Baggy sold 8 turtles. How many turtles does he have left? Explain your solution using a number bond or a math drawing. Write a number sentence. Complete the statement.

Mr. Baggy has _____ turtles left.

Lesson 17

Objective: Understand the meaning of the equal sign by pairing equivalent expressions and constructing true number sentences.

Suggested Lesson Structure

Fluency Practice	(10 minutes)
Application Problem	(5 minutes)
Concept Development	(35 minutes)
Student Debrief	(10 minutes)
Total Time	**(60 minutes)**

Fluency Practice (10 minutes)

- Penny Drop: 7 **1.OA.6** (5 minutes)
- Number Bond Dash: 7 **1.OA.6** (5 minutes)

Penny Drop: 7 (5 minutes)

Materials: (T) 7 pennies, 1 can

Note: This activity addresses the core fluency objective for Grade 1 of adding and subtracting within 10.

Show students 7 pennies. Have students close their eyes and listen. Drop some of the pennies in a can, one at a time. Ask students to open their eyes and guess how many pennies are still in the teacher's hand. Then, have students say how many pennies they heard drop and count on to 7, using the remaining pennies.

NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

Provide a variety of ways to respond with Fluency Practice when students are not able to complete it the way it is intended. They can be given extra time or allowed to complete the activity orally. The goal of the task is for students to show what they know.

Number Bond Dash: 7 (5 minutes)

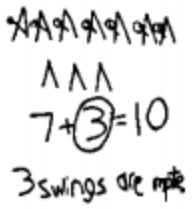
Materials: (T) Stopwatch or timer (S) Number bond dash 7 (Lesson 6 Fluency Template), marker to correct work

Note: By using the same system repeatedly, students can focus on the mathematics alone. The activity addresses the core fluency objective for Grade 1 of adding and subtracting within 10.

Follow the procedure for the Number Bond Dash (Lesson 2). Tell students to remember how many problems they get correct so they can try to improve their scores tomorrow.

Application Problem (5 minutes)

There are 10 swings on the playground, and 7 students are using the swings. How many swings are empty? Draw or write a number sentence to show your thinking. Use a sentence at the end to answer today's question: How many swings are empty?



Note: This problem serves as a bridge from the previous lesson's focus on solving for a missing addend.

NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

When asking English language learners to answer a question, support their response with a sentence frame. Write the statement on the board:

_____ swings are empty.

This also helps other students organize their thoughts.

Concept Development (35 minutes)

Materials: (S) Bag of 20 linking cubes (10 red and 10 yellow), personal white board

Have students sit next to their math partners at their tables.

T: Let's play a game called Make it Equal. Partner B, close your eyes. Partner A, make your linking cubes look exactly like mine. (Show 4 red cubes and 1 yellow cube as a stick.) Hide your stick behind you and close your eyes.

T: Partner B, open your eyes. Make your linking cubes look exactly like mine. (Show 3 red and 2 yellow cubes as a stick.)

T: Partner A, open your eyes. Everyone, write the expression that shows how many cubes you have.

S: (Partner A writes 4 + 1; Partner B writes 3 + 2.)

T: Show each other your linking cube stick. How are they the same? How are they different? (Circulate.)

S: (Discuss.)

T: How are they different?

S: I had 4 red and 1 yellow cube, but my partner had 3 red and 2 yellow cubes.

T: How are they the same?

S: We both have 5 cubes.

T: Even though you have different parts, do you have the same total?

S: Yes.

T: Put your expressions next to each other. Now, put your sticks in between the expressions by putting them one above the other. What do the two sticks look like now?

S: An equal sign!

T: Hmmm… does this make sense? How many cubes do you have on the left side of the equal sign?

S: 5.

T: How many cubes do you have on the right side of the equal sign?

S: 5.

T: Does 5 equal 5?

S: Yes!

T: Does 4 + 1 equal 3 + 2?

S: Yes!

T: Let's say the number sentence.

T/S: 4 + 1 = 3 + 2.

T: This is called a true number sentence.

Repeat this process. Possibly use the following suggested sequence: 5 + 2 and 6 + 1; 7 + 2 and 6 + 3.

Next, project 3 red and 3 yellow linking cubes and have partners use one board to write the expression. Then, project 1 red and 5 yellow linking cubes. Partners write the expression on the second board. Ask students to give thumbs up if these expressions are equal. If yes, have them draw an imaginary equal sign between the two boards and say the true number sentence. Repeat this process, but be sure to include some expressions that are not equivalent (such as 3 + 5 and 4 + 2).

T: (Project a stick of 6 red and 2 yellow cubes.) Write an expression to match these cubes on one of your white boards.

S: (Write 6 + 2.)

T: With your partner, use your linking cubes to make another stick to show the same total in a different way. Write the expression to match your stick. Then, use your sticks to make the equal sign to help you say the true number sentence.

If students finish early, encourage them to make up as many equivalent expressions as they can. Repeat this process. Possibly use the following suggested sequence: 3 + 4, 4 + 5, and 3 + 7.

Problem Set (10 minutes)

Distribute Problem Set to students, and allow them to work independently or in small groups.

Students should do their personal best to complete the Problem Set within the allotted 10 minutes. For some classes, it may be appropriate to modify the assignment by specifying which problems they work on first. Some problems do not specify a method for solving. Students solve these problems using the RDW approach used for Application Problems.

Student Debrief (10 minutes)

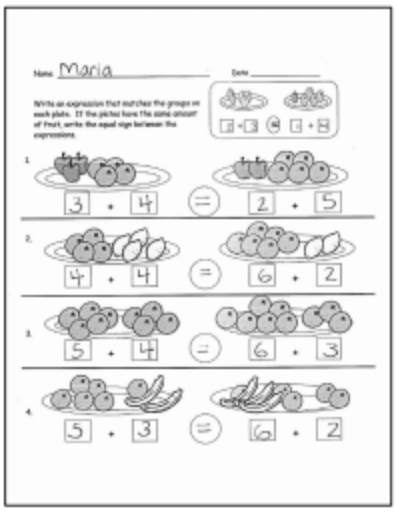
Lesson Objective: Understand the meaning of the equal sign by pairing equivalent expressions and constructing true number sentences.

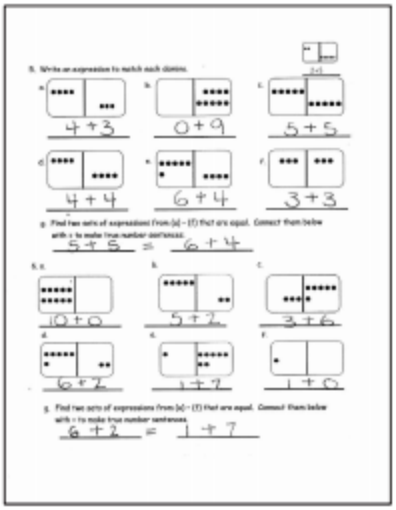
The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

Any combination of the questions below may be used to lead the discussion.

- Look at Problems 1–4. In Problem 1, we have apples plus oranges, and that equals fruit. What about Problem 2? What about Problem 3? What about Problem 4? How is Problem 3 different from the others? (They are like units.)
- Look at Problem 5(g). Share what you wrote as your true number sentence. What is the total represented by each side of this true number sentence? (10.)
- If both sides equal 10, is 6 + 4 = 5 + 5 the same as 10 = 10? (Write this on the board.) Talk with your partner about why or why not.
- Look at the true number sentence you wrote for Problem 6(g). Think about what we just decided about Problem 5(g). What is another way you can write the true number sentence? (8 = 8.)
- Think about the goal of today's lesson. What does the equal sign tell us?





Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help with assessing students' understanding of the concepts that were presented in today's lesson and planning more effectively for future lessons. The questions may be read aloud to the students.

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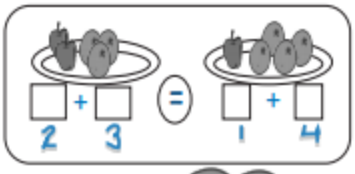
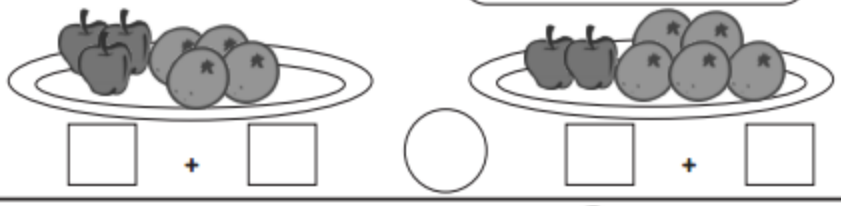
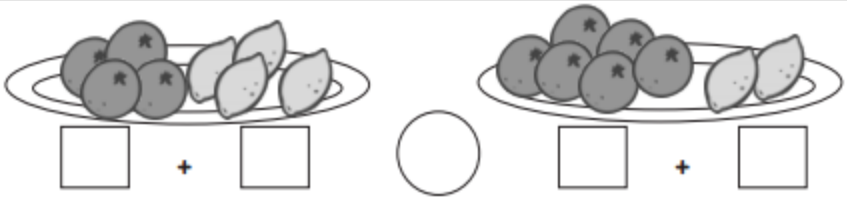
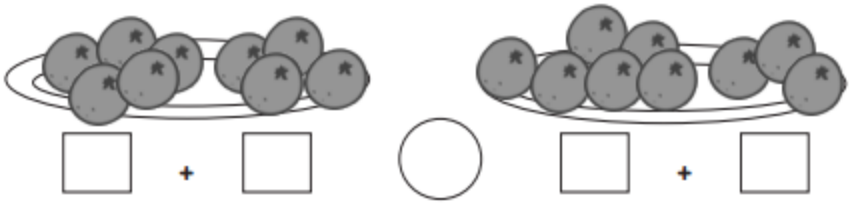
Name _____ Date _____

Write an expression that matches the groups on each plate. If the plates have the same amount of fruit, write the equal sign between the expressions.



1. 

2. 

3. 

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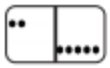
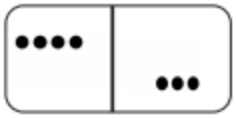


2+5

5. Write an expression to match each domino.

a. 

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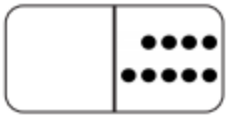
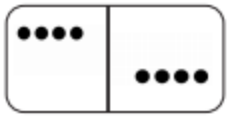
b. 

_____

c. 

_____

d. 

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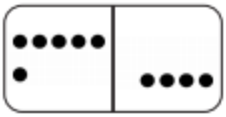
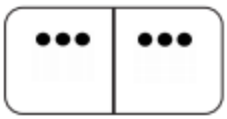
e. 

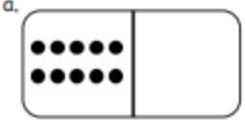
_____

f. 

_____

g. Find two sets of expressions from (a)–(f) that are equal. Connect them below with = to make true number sentences.

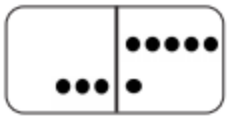
_____ _____

6. a. 

_____

b. 

_____

c. 

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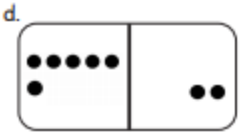
d. 

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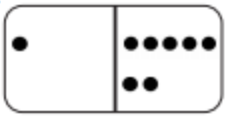
e. 

_____

f. 

_____

g. Find two sets of expressions from (a)–(f) that are equal. Connect them below with = to make true number sentences.

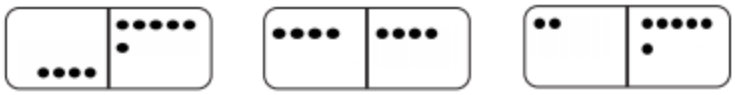
_____ _____

Name _____ Date _____

1. Use math drawings to make the pictures equal. Connect them below with = to make true number sentences.

_____ _____

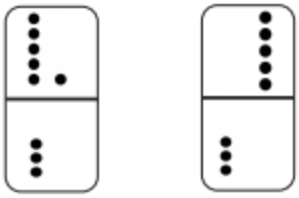
2. Shade the equal dominoes. Write a true number sentence.

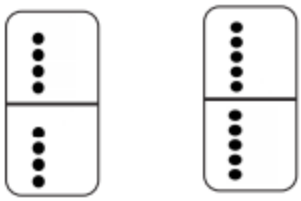


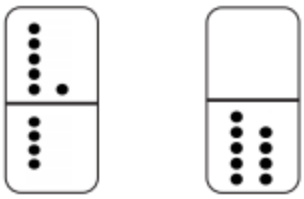
_____ _____

Name _____ Date _____

1. Match the equal dominoes. Then, write true number sentences.  4+4=5+3

a.  _____ _____

b.  _____ _____

c.  _____ _____

2. Find the expressions that are equal. Use the equal expressions to write true number sentences.

a. _____ _____

b. _____ _____

Lesson 2

Objective: Find and name two-dimensional shapes including trapezoid, rhombus, and a square as a special rectangle, based on defining attributes of sides and corners.

Suggested Lesson Structure

Fluency Practice	(15 minutes)
Application Problem	(5 minutes)
Concept Development	(30 minutes)
Student Debrief	(10 minutes)
Total Time	**(60 minutes)**

Fluency Practice (15 minutes)

- Grade 1 Core Fluency Sprint **1.OA.6** (10 minutes)
- Make It Equal: Subtraction Expressions **1.OA.7** (5 minutes)

Grade 1 Core Fluency Sprint (10 minutes)

Materials: (S) Core Fluency Sprint (Lesson 1 Core Fluency Sprint)

Note: Based on the needs of the class, select a Sprint from Lesson 1. Consider the options below:

1. Re-administer the previous lesson's Sprint.
2. Administer the next Sprint in the sequence.
3. Differentiate. Administer two different Sprints. Simply have one group do a counting activity on the back of its Sprint while the other group corrects the second Sprint.

Make It Equal: Subtraction Expressions (5 minutes)

Materials: (S) Numeral cards (Lesson 1 Fluency Template), one "=" card, two "–" cards

Note: This activity builds fluency with subtraction within 10 and promotes an understanding of equality.

Assign students partners of similar skill or ability level. Students arrange numeral cards from 0 to 10, including the extra 5. Place the "=" card between the partners. Write four numbers on the board (e.g., 9, 10, 2, 1). Partners take the numeral cards that match the numbers written to make two equivalent subtraction expressions (e.g., 10 – 9 = 2 – 1). Students can be encouraged to make another sentence of equivalent expressions for the same set of cards as well (e.g., 10 – 2 = 9 – 1). Encourage students to find examples that result in an answer other than 1 = 1, as in the previous example.

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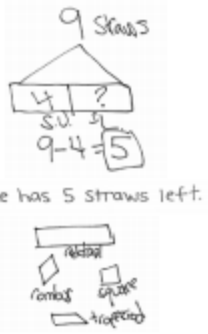
Suggested sequence: 10, 9, 2, 1; 2, 10, 3, 9; 4, 5, 9, 10; 10, 8, 7, 9; 7, 10, 9, 6; 2, 4, 10, 8; etc.

Application Problem (5 minutes)



Lee has 9 straws. He uses 4 straws to make a shape. How many straws does he have left to make other shapes?

Extension: What possible shapes could Lee have created? Draw the different shapes Lee might have made using 4 straws. Label any shapes whose name you know.

Note: Today's Application Problem uses a familiar context that was established during Lesson 1 of the module. Through the extension, students have the opportunity to apply the previous lesson and generate prior knowledge that is useful for today's objective.

Concept Development (30 minutes)

Materials: (T) Charts from Lesson 1, shape description cards (Template), tape (S) Straw kit, 10 additional straws per person, square corner tester (Lesson 1 Template 2), shape description cards (Template)

Note: The description of each shape is consistent with mathematical descriptions used throughout the K–12 continuum of this curriculum. Below are some clarifying comments about each shape mentioned in this lesson:

Triangle: Triangles can be described based on their three sides or their three corners or angles.

Rectangle: Rectangles are quadrilaterals with four right angles. The length of each side is not a defining attribute. For this reason, a square is a type of rectangle. While some rectangles have two short sides and two longer sides, that is not a requirement or defining attribute of a rectangle.

Rhombus: A rhombus is a quadrilateral with four sides of the same length. The definition does not depend on the measure of its angles. For this reason, a square is also a special type of rhombus that has right angles.

Square: A square is a special shape that is both a rectangle and a rhombus since it is a quadrilateral with four right angles and four sides of the same length.

NOTES ON MULTIPLE MEANS OF REPRESENTATION:

Highlight the critical vocabulary for English language learners throughout the lesson. Key vocabulary words—*characteristic* and *attribute*—were introduced in Lesson 1. Without understanding these words, English language learners will struggle with the first few lessons of this module. Spend some extra time relating the words while describing the classroom or students so that students see the relationship between describing shapes and other things in their environment.

T: Yesterday, you made all of these shapes with your straws. (Show charts from Lesson 1.) Today, we're going to name them based on their attributes, or characteristics. (Hold up the triangle card.)

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The word *triangle* actually describes something about the shape! Listen carefully—*tri* means three, and *angle* is what gives us corners. So, when we say *triangle*, we're saying it has three angles, or three corners. Which can we label as triangles?

S: The ones on the first chart. (Students point to triangles.)

T: Are they all triangles? Tell me about each one.

Students explain or touch each of the three corners of each shape to confirm that they are all triangles. Ensure that students point out that all the triangles also have three straight sides. Tape the triangle description card under triangles.

T: Let's try another card. (Hold up the hexagon card.) A **hexagon** is a shape with six straight sides. Do we have any hexagons on our chart?

S: (Point to the two hexagons on Chart 3.) Yes, these shapes have six straight sides!

T: (Tape the card on the chart near hexagons.) Do we have any other hexagons on these charts?

S: No!

Move to the rectangle and square description cards.

T: A rectangle is a shape with four square corners, or right angles. Do we have any rectangles on our chart? Use your square corner tester to check.

S: (Point to any rectangles on the charts, and explain why they fit the description.)

T: (Ensure that students include the squares as shapes that fit the description. Add rectangle cards under shapes.) Do any of these rectangles have another name you know?

S: Yes! The square.

T: Yes, a square is a type of special rectangle with four straight sides of equal length. (Tape a square card under the rectangle card.)

T: A **rhombus** is a shape with four straight sides of equal length. Do we have any rhombuses?

S: (Point to shapes with four straight sides of equal length, including the shape that is already labeled with *square* and *rectangle*.)

T: (As students explain how each shape fits the description, tape the description card below the drawing.) Yes, a square is a special kind of rectangle, and it is also a special kind of rhombus. Squares are pretty special!

T: (Point to the example of a trapezoid on the chart.) Does anyone know what this shape is called?

S: A **trapezoid**. (If no one knows the name, tell the students it is a trapezoid.)

T: How is this shape the same as the other shapes we have defined?

S: It has four straight sides and four corners.

T: How is this trapezoid different from the other shapes?

S: The sides are not all the same length, like the square. → This trapezoid doesn't have four square corners.

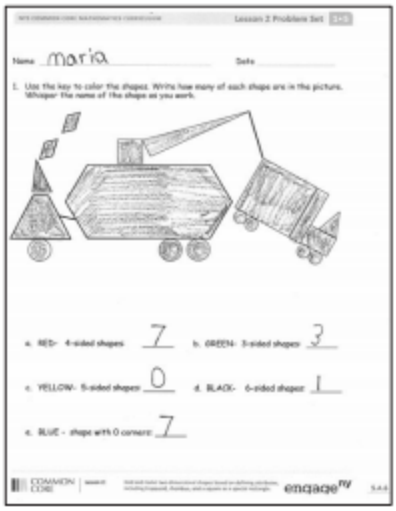
T: Now, you're ready to play Make the Shape with your partner. Here's how to play:

- Each pair gets a stack of shape description cards and places 10 additional straws in their straw kit.
- Turn over a card. Use your straws to make that shape, and put the card below your shape.

- Take turns until one player has used all of his straws.
- If you have more time, shuffle up the cards, and take turns trying to pick the cards that match the shapes you've made.

Problem Set (10 minutes)

Students should do their personal best to complete the Problem Set within the allotted 10 minutes. For some classes, it may be appropriate to modify the assignment by specifying which problems they work on first.


Lesson 2 Problem Set

Name maria Date

1. Use the key to color the shapes. Write how many of each shape are in the picture. Whisper the name of the shape as you work.

a. RED- 4-sided shapes 7 b. GREEN- 3-sided shapes 3

c. YELLOW- 5-sided shapes 0 d. BLACK- 6-sided shapes 1

e. BLUE - shape with 0 corners 7

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Student Debrief (10 minutes)

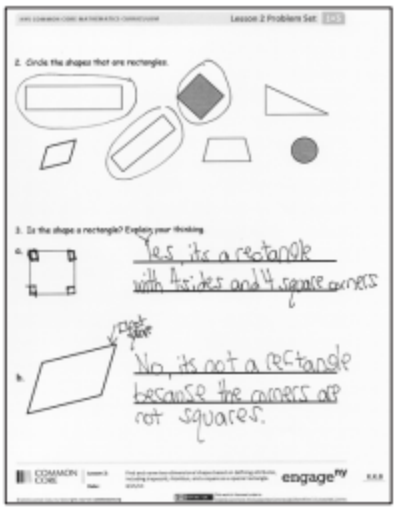
Lesson Objective: Find and name two-dimensional shapes including trapezoid, rhombus, and a square as a special rectangle, based on defining attributes of sides and corners.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

Any combination of the questions below may be used to lead the discussion.

- Look at Problem 1. Which shapes were the most challenging to count or find? Which shapes were the easiest? Explain your thinking.
- Which four-sided shapes are squares? Which are **rhombuses**? Which are rectangles? Which are **trapezoids**? (Note that a square is a type of rectangle *and* a type of rhombus.) How many sides do **hexagons** have?
- What name can we use for the three-sided shapes? What name can we use for the six-sided shapes? What name can we use for all of the curved shapes in this picture?


Lesson 2 Problem Set

2. Circle the shapes that are rectangles.

3. Is the shape a rectangle? Explain your thinking.

a. Yes, its a rectangle with 4 sides and 4 square corners

b. not square

No, its not a rectangle because the corners are not squares.

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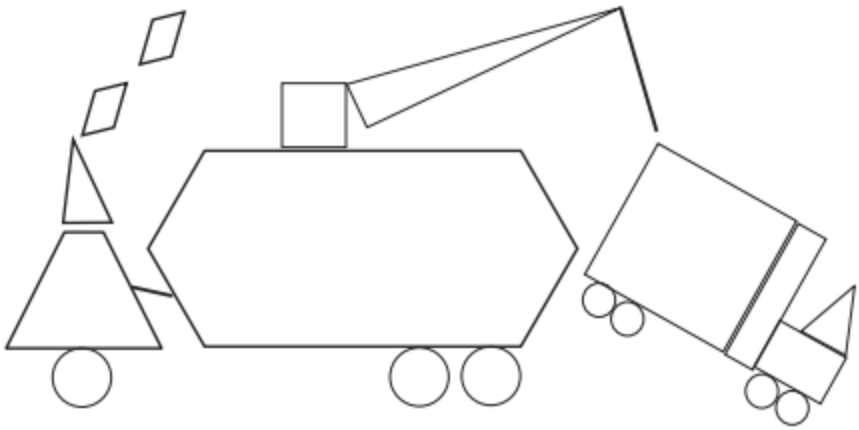
Name _____ Date _____

1. Use the key to color the shapes. Write how many of each shape are in the picture. Whisper the name of the shape as you work.



a. RED—4-sided shapes: _____

b. GREEN—3-sided shapes: _____

c. YELLOW—5-sided shapes: _____

d. BLACK—6-sided shapes: _____

e. BLUE—shape with 0 corners: _____

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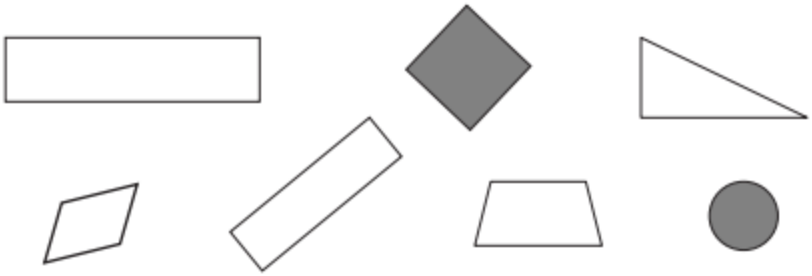
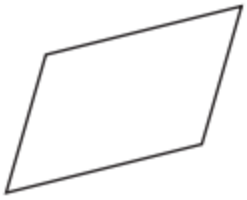
2. Circle the shapes that are rectangles.



3. Is the shape a rectangle? Explain your thinking.

a.

b.



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Name _____ Date _____

Write the number of corners and sides that each shape has. Then, match the shape to its name. Remember that some special shapes may have more than one name.

1. 

____ corners

____ straight sides

2. 

____ corners

____ straight sides

3. 

____ corners

____ straight sides

4. 

____ corners

____ straight sides

triangle

circle

rectangle

hexagon

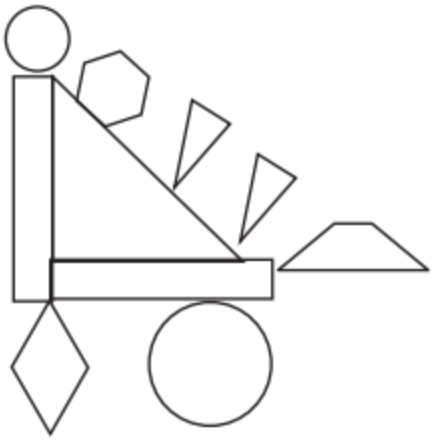
square

rhombus

Name _____ Date _____

1. Color the shapes using the key. Write the number of shapes you colored on each line.

Key	
RED 3 straight sides:	_____
BLUE 4 straight sides:	_____
GREEN 6 straight sides:	_____
YELLOW 1 curved side:	_____



2.

a. A **triangle** has _____ straight sides and _____ corners.

b. I colored _____ triangles.

3.

a. A **hexagon** has _____ straight sides and _____ corners.

b. I colored _____ hexagon.

4.

a. A **circle** has _____ straight sides and _____ corners.

b. I colored _____ circles.

5.

a. A **rhombus** has _____ straight sides that are equal in length and _____ corners.

b. I colored _____ rhombus.

6. A **rectangle** is a closed shape with 4 straight sides and 4 square corners.

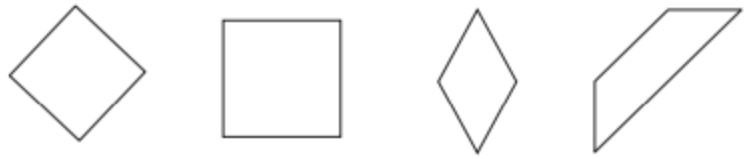
a. Cross off the shape that is NOT a rectangle.

b. Explain your thinking: _____

_____

7. A **rhombus** is a closed shape with 4 straight sides of the same length.

a. Cross off the shape that is NOT a rhombus.



b. Explain your thinking: _____

_____

hexagon closed shape with 6 straight sides	**rectangle** closed shape with 4 straight sides and 4 square corners
square closed shape with 4 straight sides of the same length and 4 square corners	**triangle** closed shape with 3 straight sides
rhombus closed shape with 4 straight sides of the same length	

shape description cards

Lesson 1

Objective: Compare length directly and consider the importance of aligning endpoints.

Suggested Lesson Structure

Fluency Practice	(15 minutes)
Application Problem	(5 minutes)
Concept Development	(30 minutes)
Student Debrief	(10 minutes)
Total Time	**(60 minutes)**

Fluency Practice (15 minutes)

- Speed Writing **1.NBT.1** (2 minutes)
- Tens and Ones **1.NBT.2** (3 minutes)
- Sprint: Subtracting Ones from Teen Numbers **1.OA.6** (10 minutes)

Speed Writing (2 minutes)

Materials: (S) Personal white board

Note: This fluency activity provides students practice with writing numbers while reinforcing place value understanding.

Tell students to write their numbers from 10 to as high as they can in one minute while they whisper count the Say Ten Way. Teachers may also want to instruct students to organize their numbers in a column so that the patterns in the tens and ones columns become visible.

Tens and Ones (3 minutes)

Materials: (T) 100-bead Rekenrek

Note: This activity addresses the Grade 1 standard requiring students to understand that two-digit numbers represent amounts of tens and ones.

Practice decomposing numbers into tens and ones using the Rekenrek.

T: (Show 16 on the Rekenrek). How many tens do you see?
S: 1.
T: How many ones?

S: 6.
T: Say the number the Say Ten Way.
S: Ten 6.
T: Good. 1 ten plus 6 ones is…?
S: 16.
T: (Slide over 10 from the next row.) How many tens do you see?
S: 2.
T: How many ones?
S: 6.
T: Say the number the Say Ten Way.
S: 2 tens 6.
T: Good. 2 tens plus 6 ones is…?
S: 26.

Slide over the next row and repeat. Continue with the following suggested sequence within 40: 15, 25, 35; 17, 27, 37; 19, 29, 39.

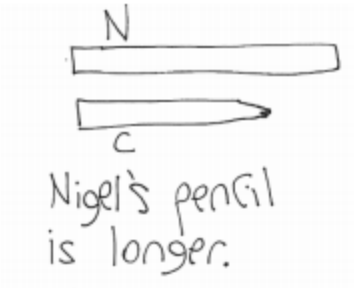
Sprint: Subtracting Ones from Teen Numbers (10 minutes)

Materials: (S) Subtracting Ones from Teen Numbers Sprint

Note: This Sprint addresses the Grade 1 standard of adding and subtracting within 20 and provides continued practice from the lessons at the end of Module 2.

Application Problem (5 minutes)

Nigel and Corey each have new pencils that are the same length. Corey uses his pencil so much that he needs to sharpen it several times. Nigel doesn't use his at all. Nigel and Corey compare pencils. Whose pencil is longer? Draw a picture to show your thinking.

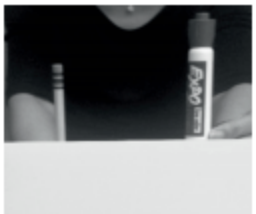


Note: In this Application Problem, students use their prior experiences to consider what happens to a pencil after repeated use and then use that knowledge to compare a new with a used pencil. Students have the opportunity to draw to show their understanding of length and of the term *longer*. During the Debrief, students discuss drawings in light of today's lesson, making statements such as, "Corey's pencil is shorter than Nigel's pencil. Nigel's pencil is longer than Corey's pencil."

Concept Development (30 minutes)

Materials: (T) Folder, new crayon, pencil, dry erase marker, jumbo glue stick, *longer than* and *shorter than* sentence frames (Template 1) (S) Folder, 5 strips of paper (of varying lengths) per pair, various classroom objects

Have students sit in a meeting area in a semi-circle.



T: (Prop up a folder on the floor. Hold a dry erase marker and a pencil behind the folder, making the marker appear taller than the pencil.) Which of these items, the marker or the pencil, is longer?

S: The marker!

T: How do you know?

S: The marker is taller. → The pencil is shorter.

T: (Call up a student.) Please take away the folder and reveal what's behind it.

S: (Takes away the folder.)

T: (Keep the way the marker and the pencil were held.) Now, can you tell which one is longer? Turn and talk to your partner.

S: The marker is longer because the top of it is taller. → The pencil is taller. Look at how much higher up the marker is in the air. → It's hard to tell.

T: (Stand both items on the floor, side by side.) Now, can you tell which one is longer?

S: Yes! The pencil is longer!

T: (Project the sentence frame with *longer than* from Template 1.) Which is longer? Use this sentence frame to say your answer.

S: The pencil is *longer than* the marker.

T: (Project the sentence frame with *shorter than.*) Which is shorter? Use this sentence frame to say your answer.

S: The marker is shorter than the pencil.

T: Are you sure about your answer?

S: Yes.

T: Turn and talk to your partner about what I did differently to help you be sure that the pencil is longer than the marker.

S: You put both things on the floor. → They started at the same place.

T: So, what do we have to make sure to do when we compare two different objects to see which is longer?

NOTES ON MULTIPLE MEANS OF REPRESENTATION:

Highlight the critical vocabulary for English language learners by showing a visual representation of new words. Vocabulary that should be highlighted includes *shorter than, longer than*, and *endpoint*. Without understanding these words, English language learners may have difficulty with this module.

S: You have to start at the same spot. That's the fair way to see which is longer.

T: You're right. We have to pay close attention and make sure we line up the very end of each object, which we call the **endpoint**, so that we can compare which is longer or shorter accurately.

T: Let's try it again. (Hold up the crayon in the other hand in a fist and the jumbo glue stick in the other fist, making the crayon appear longer.) Which is longer? Turn and talk to your partner.

S: The crayon. → No, we can't tell. We don't know if they are starting from the same place.

T: Good thinking! You can't be sure which is longer because I'm hiding the endpoints. Turn and talk to your partner about how you would arrange these items so we can accurately figure out which is longer.

Students discuss as the teacher circulates to choose a volunteer with the idea of aligning the endpoints.

T: (Call up a student to demonstrate.) What did he do to make sure we can be accurate about which item is longer?

S: He lined up the endpoints!

T: Which is longer, the crayon or the glue stick? Use the sentence frame to say your answer.

S: The glue stick is longer than the crayon.

Allow students to "fool" their friends with varying endpoints. Pass out the paper strips and folders. Partner A will hide behind the folder and select two paper strips. She will hold them up, and Partner B will guess which one is longer. Partner A can then reveal the actual lengths. Students should discuss Partner B's guess and why it was accurate or inaccurate. After discussion, they can switch roles.

T: Now that we know about endpoints, let's practice lining things up! Go on a scavenger hunt. Find two items of different lengths, one longer or shorter than the other. You have one minute to bring those items to your table.

Students look around the room to find two items of different lengths.

T: Show how you can compare the length of your two items. Then, make two statements to your partner using the sentence frames.

T: I saw you making sure to line up your items. Now try this: flip just one of your items and make it stand upside down. Does this change which item is longer or shorter?

S: (Flip and compare.) No.

T: Why not?

NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

Students may need some extra practice understanding how to compare lengths of different objects accurately. Help them to understand the importance of endpoints. Offer opportunities for student leadership as "teacher" for those students who understand the concept of an endpoint.

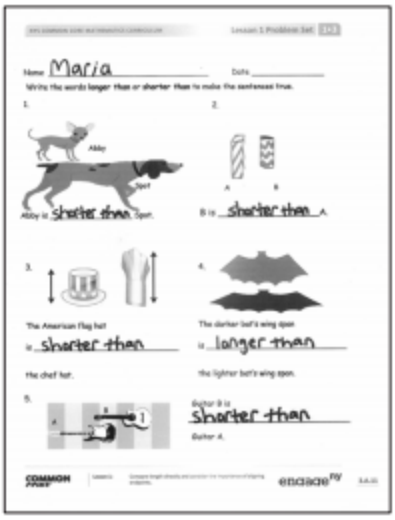
S: Because it doesn't matter if you have them standing the regular way or upside down as long as you line up the endpoints.

T: I observed so many students lining up their endpoints by making them stand from the table. Can you show a different way to line up the endpoints? (Have students share the different ways in which they can align the endpoints.)

S: You can lay them down, one on top of the other. Just make sure the endpoints are starting at the same line. → You can use the edge of the table and lay down the items so they both start from the same place.

If time allows, give students several one-minute periods to look for more objects and practice comparing lengths by aligning endpoints and making accurate statements.

Problem Set (8 minutes)



Students should do their personal best to complete the Problem Set within the allotted 10 minutes. Some problems do not specify a method for solving. This is an intentional reduction of scaffolding that invokes MP.5, Use Appropriate Tools Strategically. Students should solve these problems using the RDW approach used for Application Problems.

For some classes, it may be appropriate to modify the assignment by specifying which problems students should work on first. With this option, let the purposeful sequencing of the Problem Set guide your selections so that problems continue to be scaffolded. Balance word problems with other problem types to ensure a range of practice. Consider assigning incomplete problems for homework or at another time during the day.

Student Debrief (10 minutes)

Lesson Objective: Compare length directly and consider the importance of aligning endpoints.

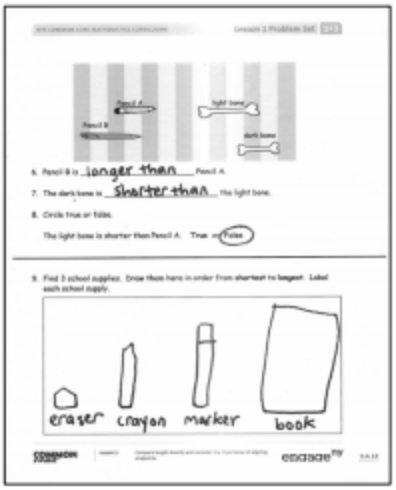
The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

You may choose to use any combination of the questions below to lead the discussion.

- When we compare lengths of different objects, what do we need to do to make sure we are comparing accurately?

- When you compare two objects and see that one of them is longer, can you make an accurate statement about which is shorter without looking? How?
- I saw one student compare the length of two objects by standing both objects on the table instead of standing the objects on the floor. Will the student be able to compare them accurately? Why or why not?
- Look at the bats in Problem 4. Were the **endpoints** aligned? Could you still see which bat has the longer wingspan? How?
- Look at the pencils and bones from Problems 6 and 7. Compare a pencil to a bone and talk about how they are longer or shorter than one another and how you know.
- Look at your drawings from today's Application Problem. Does your drawing show an accurate way to compare the length of these two pencils? If not, re-draw your solution based on what you now know about endpoints.



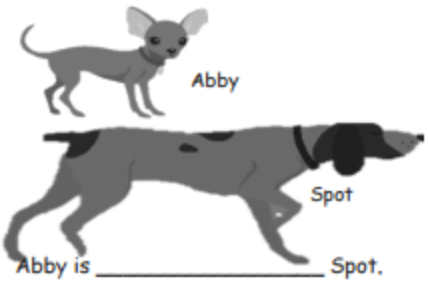
Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help you assess the students' understanding of the concepts that were presented in the lesson today and plan more effectively for future lessons. You may read the questions aloud to the students.

Name _____ Date _____

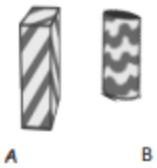
Write the words **longer than** or **shorter than** to make the sentences true.

1.



Abby is _____ Spot.

2.



B is _____ A.

3.

The American flag hat

is _____

the chef hat.

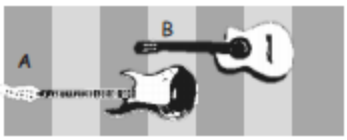
4.

The darker bat's wing span

is _____

the lighter bat's wing span.

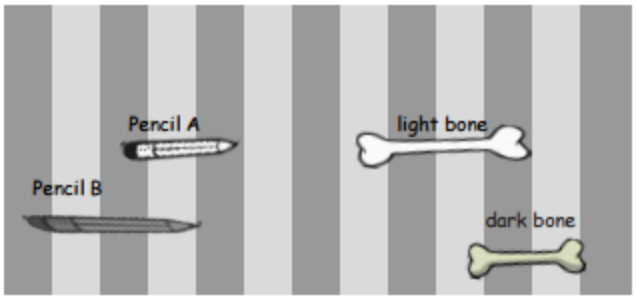
5.



Guitar B is

_____

Guitar A.



6. Pencil B is _____ Pencil A.

7. The dark bone is _____ the light bone.

8. Circle true or false.

   The light bone is shorter than Pencil A. **True** or **False**

---

9. Find 3 school supplies. Draw them here in order from **shortest** to **longest**. Label each school supply.

Name _____ Date _____

Write the words **longer than** or **shorter than** to make the sentence true.

A 

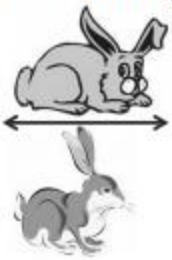
B 

Shoe A is _____ Shoe B.

Name _____ Date _____

Follow the directions. Complete the sentences.

1. Circle the **longer** rabbit.

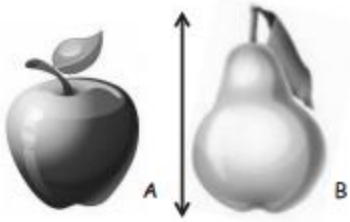


Peter

Floppy

_____ is longer than _____.

2. Circle the **shorter** fruit.



___ is shorter than ___.

Write the words **longer than** or **shorter than** to make the sentences true.

3.

The glue

is _____

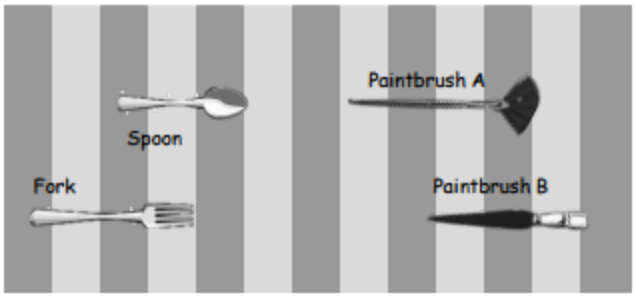
the ketchup.

4.

The dragonfly's wing span

is _____

the butterfly's wing span.



5. Paintbrush A is _____ Paintbrush B.

6. The spoon is _____ the fork.

7. Circle true or false.

   The spoon is shorter than Paintbrush B. **True** or **False**

---

8. Find 3 objects in your room. Draw them here in order from shortest to longest. Label each object.

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The _____ is longer than the _____.

The _____ is shorter than the _____.