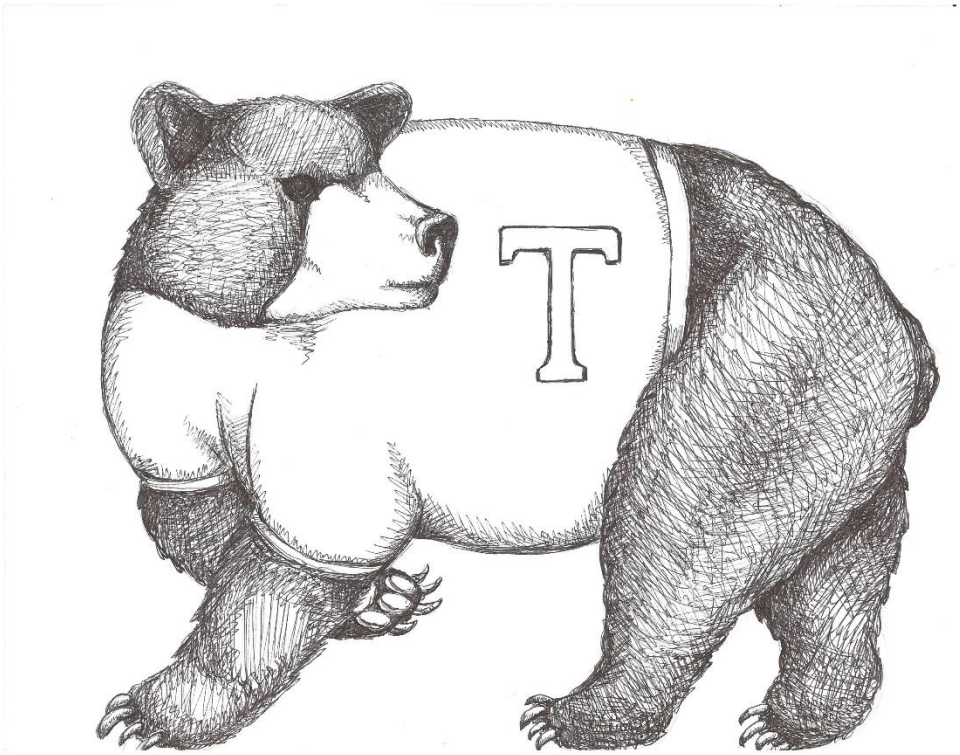
# Thomaston Public Schools

**158 Main Street**
**Thomaston, Connecticut 06787**
**www.thomastonschools.org – 860-283-4796**




## Thomaston Public Schools Curriculum
## Black Rock School
## Grade: Kindergarten Mathematics 2015

**A Nurturing Community Where Children Are Primary**

# Acknowledgements

Curriculum Writer(s):
Cindy Sabolcik

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*_____
Alisha L. DiCorpo
Director of Curriculum and Professional Development

**Date of Presentation to the Board of Education: August 2015**

**(Math Curriculum Grade: Kindergarten )**

**Grade: Kindergarten 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.

**Black Rock School Mission Statement:**
Through our shared beliefs and collective commitment, students at Black Rock School will learn the essential skills needed to be powerful thinkers and contributing global citizens.

**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:**

Module 1: Numbers to 10
Module 2: Two-Dimensional and Three-Dimensional Shapes
Module 3: Comparison of Length, Weight, Capacity, and Numbers to 10
Module 4: Number Pairs, Addition and Subtraction to 10
Module 5: Numbers 10–20 and Counting to 100
Module 6: Analyzing, Comparing, and Composing Shapes

**Summary of Year**

Kindergarten mathematics is about (1) representing, relating, and operating on whole numbers, initially with sets of objects; and (2) describing shapes and space. More learning time in Kindergarten should be devoted to number than to other topics.

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

Required Fluency: K.OA.5 Add and subtract within 5.

**CCS Major Emphasis Clusters**

*Counting and Cardinality*

• Know number names and count sequence.
• Count to tell the number of objects.
• Compare numbers.

*Operations and Algebraic Thinking*

• Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.

*Number and Operations in Base Ten*

• Work with numbers 11-19 to gain foundations for place value.

**Rationale for Module Sequence in Kindergarten**

Like Pre-Kindergarten, in Module 1, Kindergarten starts out with solidifying the meaning of numbers to 10 with a focus on embedded numbers and relationships to 5 using fingers, cubes, drawings, 5 groups and the Rekenrek. Students then investigate patterns of "1 more" and "1 less" using models such as the number stairs (see picture). Because fluency with addition and subtraction within 5 is a Kindergarten goal, addition within 5 is begun in Module 1 as another representation of the decomposition of numbers.

In Module 2, Students learn to identify and describe squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders and spheres. During this module students also practice their fluency with numbers to 10.

In Module 3, students begin to experiment with comparison of length, weight and capacity. Students first learn to identify the attribute being compared, moving away from non-specific language such as "bigger" to "longer than," "heavier than," or "more than." Comparison begins with developing the meaning of the word "than" in the context of "taller than," "shorter than," "heavier than," "longer than," etc. The terms "more" and "less" become increasingly abstract later in Kindergarten. "7 is 2 more than 5" is more abstract than "Jim is taller than John."

In Module 4, number comparison leads to a further study of embedded numbers (e.g., "3 is less than 7" leads to, "3 and 4 make 7," and 3 + 4 = 7,). "1 more, 2 more, 3 more" lead into addition (+1, +2, +3). Students now represent stories with blocks, drawings, and equations.

After Module 5, after students have a meaningful experience of addition and subtraction within 10 in Module 4, they progress to exploration of numbers 10-20. They apply their skill with and understanding of numbers within 10 to teen numbers, which are decomposed as "10 ones and some ones." For example, "12 is 2 more than 10." The number 10 is special; it is the anchor that will eventually become the "ten" unit in the place value system in Grade 1.

Module 6 rounds out the year with an exploration of shapes. Students build shapes from components, analyze and compare them, and discover that they can be composed of smaller shapes, just as larger numbers are composed of smaller numbers.

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 | M2: Two-Dimensional and Three-Dimensional Shapes (15 days) | *M2: 2D and 3D Shapes (12 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 | M3: Counting to Answer Questions of How Many (50 days) | M3: Comparison of Length, Weight, Capacity, and Numbers to 10 (38 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) | 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 |
|---|---|---|---|---|

**Math Unit - 1 (Module 1)**

**OVERVIEW**

The first day of Kindergarten is long anticipated by parents and young students. Students expect school to be a dynamic and safe place to learn, an objective that is realized immediately by their involvement in purposeful and meaningful action.

In Topics A and B, classification activities allow students to analyze and observe their world and articulate their observations. Reasoning and dialogue begin immediately. "These balloons are exactly the same." "These are the same but a different size." As Topic B closes, students recognize cardinalities as yet one more lens for classification (K.MD.3). "I put a pencil, a book, and an eraser, three things, in the backpack for school." "I put five toys in the closet to keep at home." From the moment students enter school, they practice the counting sequence so that when counting a set of objects, their attention can be on matching one count to one object, rather than on retrieving the number words (K.CC.4a).

In Topics C, D, E, and F, students order, count (K.CC.1), and write (K.CC.3) up to ten objects to answer *how many* questions from linear, to array, to circular, and finally to scattered configurations wherein they must devise a path through the objects as they count. Students use their understanding of numbers and matching numbers with objects to answer *how many* questions about a variety of objects, pictures, and drawings (K.CC.5).

They learn that the last number name said tells the number of objects counted (K.CC.4b). Daily, they engage in mathematical dialogue. They might compare their seven objects to a friend's. For example, "My cotton balls are bigger than your cubes, but when we count them, we both have seven!"

Very basic expressions and equations are introduced early in order to ensure students' familiarity with numbers throughout the entire year so that they exit fluent in sums and differences to 5 (K.OA.5). Decomposition is modeled with small numbers with materials and drawings and as addition equations. Students see that both the expression 2 + 1 (Topic C) and the equation 3 = 2 + 1 (Topic D) describe a stick of three cubes decomposed into two parts (K.OA.3). Emphasis is not placed on the expressions and equations or using them in isolation from the concrete and pictorial—they are simply included to show another representation of decompositions alongside counters and drawings.

In Topics G and H, students use their understanding of relationships between numbers to recognize that each successive number name refers to a quantity that is one greater and that the number before is one less (K.CC.4c). This important insight leads students to use the Level 2 strategy of counting on rather than counting all, later in the year and on into Grade 1.

In this module, daily fluency activities with concentration and emphasis on counting (K.CC.4ab, K.CC.5) are integrated throughout the concept development: "I counted six beans in a row. I counted six beans in a circle and then squished them together and counted again. There were still six!" "I can make my six beans into rows, and there are no extras." Students complete units of five using the fingers of their left hand and 5-groups. The numbers 6, 7, 8, and 9 are introduced relative to the number 5: "Five fingers and ____ more." Students also explore numbers 5 to 9 in relation to 10, or two complete fives: "Nine is missing one to be ten or two fives." (K.OA.4)

As students begin to master writing numbers to 10, they practice with paper and pencil. This is a critical daily fluency that may work well to close lessons, since management of young students is generally harder towards the end of math time. The paper and pencil work is calming, though energized.

**Rigorous Curriculum Design Template**

**Unit : 1 - Numbers to 10**

**Subject:** Math

**Grade/Course:** Kindergarten

**Pacing:** 43 days

**Unit of Study:** Unit 1 : Numbers to 10

**Priority Standards**:

*Know number names and the count sequence.*

**K.CC.3** Write numbers from 0 to 20. Represent a number of objects with a written numeral 0–20 (with 0 representing a count of no objects).

*Count to tell the number of objects.*

**K.CC.4** Understand the relationship between numbers and quantities; connect counting to cardinality.

a. When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.

b. 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.

c. Understand that each successive number name refers to a quantity that is one larger.

**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.

*Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.*

**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).

*Classify objects and count the number of objects in each category.*

**K.MD.3** Classify objects into given categories; count the numbers of objects in each category and sort the categories by count. (Limit category counts to be less than or equal to 10.)

**Foundational Standards**

**PK.CC.1** Count to 20.

**PK.CC.2** Represent a number of objects with a written numeral 0–5 (with 0 representing a count of no objects).

**PK.CC.3** Understand the relationship between numbers and quantities to 10; connect counting to cardinality.

a. When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.

b. 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.

c. Understand that each successive number name refers to a quantity that is one larger.

**PK.CC.4** Count to answer "how many?" questions about as many as 10 things arranged in a line, a rectangular array, or a circle, or as many as 5 things in a scattered configuration; given a number from 1–10, count out that many objects.

**PK.CC.6** Identify "first" and "last" related to order or position.

**Math Practice Standards:**

**MP.2** **Reason abstractly and quantitatively.** Students represent quantities with numerals.

**MP.3** **Construct viable arguments and critique the reasoning of others.** Students reason about each other's ways of counting fingers or a scattered set of objects. They reason about counting fingers by comparing the fingers counted and about scattered objects by comparing counting paths through a set of up to 10 scattered objects.

**MP.4** **Model with mathematics.** Students model decompositions of three objects as math drawings and addition equations.

**MP.7** **Look for and make use of structure.** Students use the 5-group to reason about numbers within 10.

**MP.8** **Look for and express regularity in repeated reasoning.** Students build a number stair to reason about 1 more and 1 less than each number within 10.

| **"Unwrapped" Standards** | |
|---|---|
| Write numbers from 0 to 20. Represent a number of objects with a written numeral 0–20 (with 0 representing a count of no objects).<br><br>Understand the relationship between numbers and quantities; connect counting to cardinality.<br><br>When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.<br><br>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.<br><br>Understand that each successive number name refers to a quantity that is one larger.<br><br>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.<br><br>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).<br><br>Classify objects into given categories; count the numbers of objects in each category and sort the categories by count. (Limit category counts to be less than or equal to 10.) | |
| **Concepts -What Students Need to Know (context)** | **Skills -What Students Need to Be Able to Do (Depth of Knowledge level (DOK))** |

| | |
|---|---|
| Numbers (0-20). | Write (DOK 2) |
| Number of objects with a written numeral 0-20. | Represent (DOK 1) |
| Relationship between numbers and quantities. | Understand (DOK 2) |
| Counting to cardinality. | Connect (DOK 1) |
| Number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object. | Count (DOK 1)<br>Pairing (DOK 1) |
| The last number name said tells the number of objects counted. | Understand (DOK 2) |
| Successive number name refers to a quantity that is one larger. | Understand (DOK 2) |
| "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<br>given a number from 1-20 (count out that many objects). | Count (DOK 1) |
| Numbers less than or equal to 10 into pairs in more than one way (by using objects or drawings, and record each decomposition by a drawing or equation). | Decompose (DOK 2) |
| Objects into given categories.<br>The objects.<br>Categories by count. | Classify (DOK 1)<br>Count (DOK 1)<br>Sort (DOK 1) |

| Essential Questions | Big ideas |
|---|---|
| ● Why are numbers important?<br>● Why do we count? | ● Numbers are found everywhere.<br>● Numbers represent quantities.<br>● Counting tells how many in a group regardless of their arrangement |

| Assessments | | |
|---|---|---|
| Common Formative Pre-Assessments | Progress Monitoring Checks – "Dipsticks" | Common Formative Mid and or Post-Assessments |
| Exit tickets for each lesson | Application problems<br>Problem set data<br>Student debriefs | Mid module and end of module assessments<br><br>*See table below |

*Assessment Summary

| Assessment Type | Administered | Format | Standards Addressed |
|---|---|---|---|
| Mid-Module Assessment Task | After Topic D | Interview with Rubric | (Numbers 1–5)<br>K.CC.3<br>K.CC.4ab<br>K.CC.5<br><br>K.OA.3<br><br>K.MD.3 |

| | | | |
|---|---|---|---|
| End-of-Module Assessment Task | After Topic H | Interview with Rubric | (Numbers 0–10)<br>K.CC.3<br>K.CC.4abc<br>K.CC.5 |
| Culminating Task<br><br>*If this task proves to be more of a lesson than an assessment remove from this section during revisions. | Lesson 37 | *"Decide how to classify the objects in your bag into two groups. Count the number of objects in each group. Represent the greater number in various ways. Next, remove the 5-group card from your pack that shows the number of objects in the smaller group. Put your remaining cards in order from smallest to greatest. Your friends will have to figure out what card is missing when they visit your station!"* | K.CC.3<br>K.CC.4abc<br>K.CC.5<br>K.MD.3 |

| **Performance Assessment/ Engaging Scenario** |
|---|
| The school is going to be having a bake sale and the Kindergarten is in charge of making the apple treats to sell. We will be making apple pies, applesauce, and apple crisp. Each treat is going to require certain amounts of apples. In order to make these treats we will need to get the apples ready and then get the treats ready for the bake sale.<br><br>Suggested children's books:<br>Apple Pie Tree by Zoe Hall<br>Apple Pigs by Ruth Orbach<br>10 Apples on Top by Theo LeSieg |
| **Engaging Learning Experiences/ Performance Tasks** |

See Appendix A for complete Performance Assessment and related Performance Tasks.

| Instructional Resources |
| --- |
| **Suggested Children's Books:**<br><u>1 is One</u><br>Tasha Tudor<br>Scholastic, 2000<br><br><u>A Chair for My Mother</u><br>Vera B. Williams<br>Greenwillow, 1998 |

Bat Jamboree
Kathi Appelt
HarperCollins Publishers, 1998

Can You Count Ten Toes?: Count to
10 in 10 Different Languages
Lezlie Evans
Houghton Mifflin Harcourt, 2004

Chicka, Chicka 1, 2, 3
Bill Martin, Jr., Michael Sampson, and Lois Ehlert
Simon & Schuster Children's, 2004

For additional books go to http://www.the-best-childrens-books.org/math-for-kids.html

**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 Kindergarten Resources:

https://www.engageny.org/resource/kindergarten-mathematics

Eureka Math Module PDFs:

http://greatminds.net/maps/math/module-pdfs

North Carolina Standards Unpacked (scroll down and open Math Unpacking Standards- Kindergarten):

http://www.ncpublicschools.org/acre/standards/common-core-tools/

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/

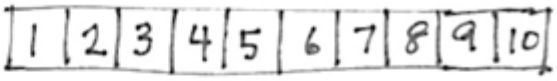
LearnZillion –lesson plans/some with embedded tasks

https://learnzillion.com/resources/17132

SBAC Digital Library

## Suggested Tools and Representations

- Rulers for use as a straightedge
- Five dot mat
- Five-frame and ten-frame cards
- Number path
- Left hand mat
- Two hands mat
- 5-group cards
- Rekenrek (Slavonic abacus having beads with a color change at the five)
- Concrete materials in individual bags for counting and sorting (white beans painted red on one side, bags of twigs, dried leaves, dry pasta, pennies; plates, forks, spoons, cups, etc.)
- Commercial concrete materials (linking cubes in tens, non-linking cubes, square-inch tiles, etc.)



*Number Path*


*Left Hand Mat*


*20-Bead Rekenrek*


*100-Bead Rekenrek*

| 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

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

| | |
|---|---|
| should be small enough to be effective and the strategy should be used in a systematic and consistent manner.<br>**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.<br>**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.<br>**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. | 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.<br><br>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.<br><br>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.<br><br>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 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 representational 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:<br>● Enlarge sprint print for visually impaired learners.<br>● Use student boards to work on one calculation at a time.<br>● Invest in or make math picture dictionaries or word walls.<br><br>Provide Multiple Means of Action and Expression<br><br>● 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.<br>● 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.<br>● 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."<br>● Adjust wait time for interpreters of deaf and hard-of-hearing students.<br>● Select numbers and tasks that are "just right" for learners.<br>● Model each step of the algorithm before students begin.<br>● Give students a chance to practice the next day's sprint beforehand. (At home, for example.)<br>● Give students a few extra minutes to process the information before giving the signal to respond.<br>● Assess by multiple means, including "show and tell" rather than written.<br>● 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?”<br>● 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?”<br>● 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.<br><br>Provide Multiple Means of Engagement<br><br>● Make eye-to-eye contact and keep teacher-talk clear and concise. Speak clearly when checking answers for sprints and problems.<br>● 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.<br>● Teach in small chunks so students get a lot of practice with one step at a time.<br>● Know, use, and make the most of Deaf culture and sign language.<br>● Use songs, rhymes, or rhythms to help students remember key concepts, such as “Add your ones up first/Make a bundle if you can!”<br>● Point to visuals and captions while speaking, using your hands to clearly indicate the image that corresponds to your words.<br>● Incorporate activity. Get students up and moving, coupling language with motion, such as “Say ‘right angle’ and show me a right angle with your legs,” and “Make groups of 5 right now!” Make the most of the fun exercises for activities like sprints and fluencies. Conduct simple oral games, such as “Happy Counting.” Celebrate improvement. Intentionally highlight student math success frequently.<br>● Follow predictable routines to allow students to focus on content rather than behavior.<br>● Allow “everyday” and first language to express |

| | |
|---|---|
| | math understanding.<br>● Re-teach the same concept with a variety of fluency games.<br>● Allow students to lead group and pair-share activities.<br>● Provide learning aids, such as calculators and computers, to help students focus on conceptual understanding |

| New Vocabulary | Students Achieving Below Standard | Students Achieving Above Standard |
|---|---|---|
| ● Exactly the same, not exactly the same, and the same, but…(ways to analyze objects to match or sort)<br>● Match (group items that are the same or that have the same given attribute)<br>● Sort (group objects according to a particular attribute)<br>● How many? (with reference to counting quantities or sets)<br>● Hidden partners (embedded numbers)<br>● Counting path (with reference to order of count)<br>● Number story (stories with *add to* or *take from* situations)<br>● Zero (understand the meaning of, write, and recognize)<br>● Number sentence (3 = 2 + 1)<br>● 5-group (pictured right)<br>● Rows and columns (linear configuration types)<br>● Number path<br>● 1 more (e.g., 4. 1 more is 5.)<br>● 1 less (e.g., 4. 1 less is 3.) | 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.<br><br>**<u>Provide Multiple Means of Representation</u>**<br><br>● Model problem-solving sets with drawings and graphic organizers (e.g., bar or tape diagram), giving many examples and visual displays.<br>● Guide students as they select and practice using their own graphic organizers and models to solve.<br>● Use direct instruction for vocabulary with visual or concrete representations.<br>● Use explicit directions with steps and procedures enumerated.<br>● Guide students through initial practice promoting gradual independence. “I do, we do, you do.”<br>● Use alternative methods of delivery of instruction such as recordings and videos that can be | The following 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.<br><br>**<u>Provide Multiple Means of Representation</u>**<br><br>● Teach students how to ask questions (such as,“Do you agree?” and “Why do you think so?”) to extend “think-pair-share” conversations.<br>● Model and post conversation “starters,” such as: “I agree because...” “Can you explain how you solved it?”<br>● “I noticed that...”“Your solution is different from/ the same as mine because...”“My mistake was to...”<br>● Incorporate written reflection, evaluation, and synthesis<br>● Allow creativity in expression and modeling solutions.<br><br>**<u>Provide Multiple Means of Action and Expression</u>**<br><br>● Encourage students to explain their reasoning both orally and in writing. |

| | | |
|---|---|---|
| | accessed independently or repeated if necessary.<br>● Scaffold complex concepts and provide leveled problems for multiple entry points.<br><br>**<u>Provide Multiple Means of Action and Expression</u>**<br><br>● First use manipulatives or real objects (such as dollar bills), then make transfer from concrete to pictorial to abstract.<br>● 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?'<br>● Encourage students to explain their thinking and strategy for the solution.<br>● Choose numbers and tasks that are "just right" for learners but teach the same concepts.<br>● 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. | ● Extend exploration of math topics by means of challenging games, puzzles, and brain teasers.<br>● Offer choices of independent or group assignments for early finishers.<br>● 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).<br>● Foster their curiosity about numbers and mathematical ideas. Facilitate research and exploration through discussion, experiments, internet searches, trips, etc.<br>● Have students compete in a secondary simultaneous competition, such as skip-counting by 5s, while peers are completing the sprint.<br>● Let students choose their mode of response: written, oral, concrete, pictorial, or abstract.<br>● Increase the pace. Offer two word problems to solve, rather than one.<br>● Adjust difficulty level by increasing the number of steps (e.g., change a one-step problem to a two- step problem).<br>● Adjust difficulty level by enhancing the operation (e.g., addition to multiplication), increasing numbers to millions, or decreasing numbers to decimals/fractions.<br>● Let students write word problems to show mastery and/or extension of the content.<br><br>**<u>Provide Multiple Means of Engagement</u>**<br><br>● 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.<br>● Celebrate improvement in completion time (e.g., Sprint A completed in 45 seconds and Sprint B completed in 30 seconds).<br>● Make the most of the fun exercises for practicing skip-counting.<br>● Accept and elicit student ideas and suggestions for ways to extend games.<br>● Cultivate student persistence in problem-solving and do not neglect their need for guidance and support |

**Math Unit - 2**

**OVERVIEW**

In Module 1, students began the year observing their world. What is exactly the same? What is the same but…? They matched and sorted according to criteria sequenced from simple to complex. Their perceptions evolved into observations about numbers to 10. "4 is missing 1 to make 5." "4 plus 1 more is 5." "There are the same number of dogs and flowers, 6!"

In this module, students seek out flat and solid shapes in their world (K.G.1). Empowered by this lens, they begin to make connections between the wheel of a bicycle, the moon, and the top of an ice cream cone. Just as the number 4 allowed them to quantify 4 mountains and 4 mice as equal numbers, learning to identify flats and solids allows them to see the relationship of the simple to the complex, a mountain's top to a plastic triangle and cone sitting on their desk.

To open Topic A, students find and name shapes in their environment using informal language, describing flat shapes without naming them (K.G.4). In Lesson 2, they classify the shapes, juxtaposing them with various examples and non-examples. This process further refines their ability to talk about the shapes, for example, as closed or having straight sides. The naming of the flat shape as a triangle or hexagon is part of that process, not the focus of it (K.G.2, K.G.1).

The same process is then repeated with rectangles in Lesson 3 and hexagons and circles in Lesson 4. In Lesson 5, students manipulate all the flat shapes using position words as the teacher gives directives such as, "Move the closed shape with three straight sides behind the shape with six straight sides." These positioning words are subsequently woven into the instructional program, at times in math fluency activities, but also throughout the entire school day.

The lessons of Topic B replicate those of Topic A but with solid shapes. In addition, students recognize the presence of the flats within the solids. The module closes in Topic C with discrimination between flats and solids. A culminating task involves students in creating displays of a given flat shape with counter-examples and show related solid shapes (K.G.3).

The fluency components in the lessons of Module 1 included activities wherein students used a variety of triangles and rectangles to practice the decompositions of 3 and 4. Flats and solids will continue to be included in fluency activities in this module, and throughout the year so that students have repeated experiences with shapes, their attributes, and their names. Daily number fluency practice in this new module is critical. There are two main goals of consistent fluency practice: (1) to solidify the numbers of Module 1 and (2) to anticipate the numbers of Modules 3, 4, and 5. Therefore, students continue to work extensively with numbers to 10 and fluency with addition and subtraction to 5.

The kindergarten year closes in Module 6 with another geometry unit. By that time having become much more familiar with flats and solids, the students compose new flat shapes ("Can you make a rectangle from these two triangles?") and build solid shapes from components ("Let's use these straws to be the edges and these balls of clay to be the corners of a cube!"). This module will allow them to bring together all that they have learned throughout the year as they manipulate shapes and their components (K.G.4 and K.G.5).

**Rigorous Curriculum Design Template**

**Unit : 2 - Two Dimensional and Three Dimensional Shapes**

**Subject:** Math

**Grade/Course:** Kindergarten

**Pacing:** 12 days

**Unit of Study:** Unit 2 : Two Dimensional and Three Dimensional Shapes

**Priority Standards**:

*Classify objects and count the number of objects in each category.*

**K.MD.3** Classify objects into given categories; count the numbers of objects in each category and sort the categories by count. (Limit category counts to be less than or equal to 10.)

*Identify and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres).*

**K.G.1** Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as *above*, *below*, *beside*, *in front of*, *behind*, and *next to*.

**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").

*Analyze, compare, create, and compose shapes.*

**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).

**Foundational Standards**

*Identify and describe shapes (squares, circles, triangles, rectangles).*

**PK.G.1** Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as *top, bottom, up, down, in front of, behind, over, under,* and *next to.*

**PK.G.2** Correctly name shapes regardless of size.

*Analyze, compare, and sort objects*.

**PK.G.3** Analyze, compare, and sort two- and three-dimensional shapes and objects, in different sizes, using informal language to describe their similarities, differences, and other attributes (e.g., color, size, and shape).

**PK.G.4** Create and build shapes from components (e.g., sticks and clay balls).

**Math Practice Standards:**

**MP.1** Make sense of problems and persevere in solving them. Students distinguish shapes from among variants, palpable distractors, and difficult distractors.[1] (See examples to the right).

**MP.3** Construct viable arguments and critique the reasoning of others. Students are increasingly able to use shape attributes to defend identification of a plane or solid shape.

**MP.6** Attend to precision. Students use position words to clearly indicate the location of shapes. Also, when kindergarten students are analyzing and defining attributes such as "3 straight sides" they are attending to precision.

**MP.7** Look for and make use of structure. Students use examples, non-examples, and shared attributes of geometric figures in order to develop a richer concept image (Geometry Progressions, p. 6) of each geometric shape. This concept image allows for more acute discernment of the shape within the environment.

| **“Unwrapped” Standards** | |
|---|---|
| Classify objects into given categories; count the numbers of objects in each category and sort the categories by count. (Limit category counts to be less than or equal to 10.)<br><br>Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as *above*, *below*, *beside*, *in front of*, *behind*, and *next to*.<br><br>Correctly name shapes regardless of their orientations or overall size.<br><br>Identify shapes as two-dimensional (lying in a plane, “flat”) or three-dimensional (“solid”).<br><br>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). | |
| **Concepts (What Students Need to Know)** | **Skills (What Students Need to Be Able to Do)<br>(Depth of Knowledge level (DOK))** |
| objects into given categories<br>objects<br>categories by count | Classify (DOK 2)<br>Count (DOK 1)<br>Sort (DOK 2) |
| objects in the environment using names of shapes<br>relative positions of these objects using terms such as *above*, *below*, *beside*, *in front of*, *behind*, and *next to* | Describe (DOK 1)<br>Describe (DOK 2) |
| shapes (regardless of their orientations or overall size.) | Name (DOK 1) |
| shapes as two-dimensional (lying in a plane, “flat”) or three-dimensional (“solid”). | Identify (DOK 1) |
| 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). | Analyze (DOK 2)<br>Compare (DOK 2) |

| **Essential Questions** | **Big ideas** |
|---|---|
| | |

| | |
|---|---|
| • What is a shape?<br>• How can attributes be used to identify shapes?<br>• What words can be used to describe shapes? | • Shapes are all around us.<br>• Shapes can be found in the world.<br>• Specific vocabulary can be used to identify shapes. |

| **Assessments** | | |
|---|---|---|
| Common Formative Pre-Assessments | Progress Monitoring Checks – "Dipsticks" | Common Formative Mid and or Post-Assessments |
| Exit tickets for each lesson | Application problems<br>Problem set data<br>Student debriefs | Mid module and end of module assessments<br><br>*See table below |

*Assessment Summary

| Type | Administered | Format | Standards Addressed |
|---|---|---|---|
| End-of-Module Assessment Task | After Topic C | Interview with Rubric | K.MD.3<br>K.G.1<br>K.G.2<br>K.G.3<br>K.G.4 |
| Culminating Task | Lesson 10 | Collaborative Project | K.MD.3 |

| | | | |
|---|---|---|---|
| | | | K.G.1<br>K.G.2<br>K.G.3<br>K.G.4 |

**Performance Assessment/ Engaging Scenario (*To be completed by grade level team)**

| **Overview:** |
| --- |
| **Engaging Learning Experiences/ Performance Tasks** |
| Task 1:<br><br>Task 2:<br><br>Task 3:<br><br>Task 4: |

| **Instructional Resources** |
| --- |
| Suggested Children's books: |

Circus Shapes
Stuart J. Murphy
HarperCollins Publishers, 1998

Cubes, Cones, Cylinders, & Spheres
Tana Hoban
Greenwillow Books, 2000

Ed Emberley's Picture Pie: A Circle Drawing Book
Ed Emberley
Little Brown, 2006

Grandfather Tang's Story
Ann Tompert
Dragonfly Books, 1997

Icky Bug Shapes
Jerry Pallotta
Scholastic, 2004

For additional books go to http://www.the-best-childrens-books.org/math-for-kids.html

**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 Kindergarten Resources:
https://www.engageny.org/resource/kindergarten-mathematics

Eureka Math Module PDFs:
http://greatminds.net/maps/math/module-pdfs

North Carolina Standards Unpacked (scroll down and open Math Unpacking Standards- Kindergarten):
http://www.ncpublicschools.org/acre/standards/common-core-tools/

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

## Suggested Tools and Representations

- Three-dimensional shapes: cone, sphere, cylinder, and cube
- Two-dimensional shapes: circle, hexagon, rectangle, square, and triangle

| Instructional Strategies | Meeting the Needs of All Students |
|---|---|
| **21st Century Skills**<br>● Critical thinking and problem solving<br>● Collaboration and leadership<br>● Agility and adaptablity<br>● Initiative and entrepreneurialism<br>● Effective oral and written communication<br>● Accessing and analyzing information<br>● Curiosity and imagination<br><br>**Marzano's Nine Instructional Strategies for Effective Teaching and Learning**<br>1. **Identifying Similarities and Differences**: helps students understand more complex problems by analyzing them in a simpler way<br>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<br>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 | 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.<br><br>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.<br><br>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.<br><br>It is important to note that the |

| | |
|---|---|
| contingent on achieving some specified standard.<br>**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.<br>**5. Nonlinguistic Representations:** has recently been proven to stimulate and increase brain activity.<br>**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.<br>**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.<br>**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.<br>**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. | 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.<br><br>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.<br><br>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.<br><br>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 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.<br>● 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…”<br>● Couple number sentences with models. For example, for equivalent fraction sprint, present 6/8 with:<br>● Enlarge sprint print for visually impaired learners.<br>● Use student boards to work on one calculation at a time.<br>● Invest in or make math picture dictionaries or word walls.<br><br>Provide Multiple Means of Action and Expression<br><br>● 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.<br>● 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.<br>● 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.”<br>● Adjust wait time for interpreters of deaf and hard-of-hearing students.<br>● Select numbers and tasks that are “just right” for |

| | |
|---|---|
| | learners.<br>● Model each step of the algorithm before students begin.<br>● Give students a chance to practice the next day's sprint beforehand. (At home, for example.)<br>● Give students a few extra minutes to process the information before giving the signal to respond.<br>● Assess by multiple means, including "show and tell" rather than written.<br>● 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?"<br>● 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?"<br>● 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.<br><br>Provide Multiple Means of Engagement<br><br>● Make eye-to-eye contact and keep teacher-talk clear and concise. Speak clearly when checking answers for sprints and problems.<br>● 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.<br>● Teach in small chunks so students get a lot of practice with one step at a time.<br>● Know, use, and make the most of Deaf culture and sign language.<br>● Use songs, rhymes, or rhythms to help students remember key concepts, such as "Add your ones |

| | |
|---|---|
| | up first/Make a bundle if you can!”<br>● Point to visuals and captions while speaking, using your hands to clearly indicate the image that corresponds to your words.<br>● Incorporate activity. Get students up and moving, coupling language with motion, such as “Say ‘right angle’ and show me a right angle with your legs,” and “Make groups of 5 right now!” Make the most of the fun exercises for activities like sprints and fluencies. Conduct simple oral games, such as “Happy Counting.” Celebrate improvement. Intentionally highlight student math success frequently.<br>● Follow predictable routines to allow students to focus on content rather than behavior.<br>● Allow “everyday” and first language to express math understanding.<br>● Re-teach the same concept with a variety of fluency games.<br>● Allow students to lead group and pair-share activities.<br>● Provide learning aids, such as calculators and computers, to help students focus on conceptual understanding |

| New Vocabulary | Students Achieving Below Standard | Students Achieving Above Standard |
|---|---|---|
| New or Recently Introduced Terms<br>● Above, below, beside, in front of, next to, behind (position words)<br>● Circle<br>● Cone (solid shape)<br>● Cube (solid shape)<br>● Cylinder (solid shape)<br>● Face (flat side of a solid)[1]<br>● Flat (two-dimensional shape)<br>● Hexagon (flat figure enclosed by six straight sides)<br>● Rectangle (flat figure enclosed by four straight sides)<br>● Solid (three-dimensional shape)<br>● Sphere (solid shape)<br>● Square (flat figure enclosed by four straight, equal sides)<br>● Triangle (flat figure enclosed by three straight sides) | 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.<br><br>**<u>Provide Multiple Means of Representation</u>**<br><br>● Model problem-solving sets with drawings and graphic organizers (e.g., bar or tape diagram), giving many examples and visual displays.<br>● Guide students as they select and practice using their own graphic organizers and models to solve.<br>● Use direct instruction for vocabulary with visual or | The following 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.<br><br>**<u>Provide Multiple Means of Representation</u>**<br><br>● Teach students how to ask questions (such as,“Do you agree?” and “Why do you think so?”) to extend “think-pair-share” conversations.<br>● Model and post conversation “starters,” such as: “I agree because...” “Can you explain how you solved it?”<br>● “I noticed that...”“Your solution is different from/ the same as mine because...”“My mistake was to...” |

| | | |
|---|---|---|
| Familiar Terms and Symbols<br>● Match (group items that are the same or have the same given attribute)<br>● Sort | concrete representations.<br>● Use explicit directions with steps and procedures enumerated.<br>● Guide students through initial practice promoting gradual independence. “I do, we do, you do.”<br>● Use alternative methods of delivery of instruction such as recordings and videos that can be accessed independently or repeated if necessary.<br>● Scaffold complex concepts and provide leveled problems for multiple entry points.<br><br>**Provide Multiple Means of Action and Expression**<br><br>● First use manipulatives or real objects (such as dollar bills), then make transfer from concrete to pictorial to abstract.<br>● 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?’<br>● Encourage students to explain their thinking and strategy for the solution.<br>● Choose numbers and tasks that are “just right” for learners but teach the same concepts.<br>● 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. | ● Incorporate written reflection, evaluation, and synthesis<br>● Allow creativity in expression and modeling solutions.<br><br>**Provide Multiple Means of Action and Expression**<br><br>● Encourage students to explain their reasoning both orally and in writing.<br>● Extend exploration of math topics by means of challenging games, puzzles, and brain teasers.<br>● Offer choices of independent or group assignments for early finishers.<br>● 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).<br>● Foster their curiosity about numbers and mathematical ideas. Facilitate research and exploration through discussion, experiments, internet searches, trips, etc.<br>● Have students compete in a secondary simultaneous competition, such as skip-counting by 5s, while peers are completing the sprint.<br>● Let students choose their mode of response: written, oral, concrete, pictorial, or abstract.<br>● Increase the pace. Offer two word problems to solve, rather than one.<br>● Adjust difficulty level by increasing the number of steps (e.g., change a one-step problem to a two- step problem).<br>● Adjust difficulty level by enhancing the operation (e.g., addition to multiplication), increasing |

| | | |
|---|---|---|
| | | numbers to millions, or decreasing numbers to decimals/fractions.<br>● Let students write word problems to show mastery and/or extension of the content.<br><br>**<u>Provide Multiple Means of Engagement</u>**<br><br>● 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.<br>● Celebrate improvement in completion time (e.g., Sprint A completed in 45 seconds and Sprint B completed in 30 seconds).<br>● Make the most of the fun exercises for practicing skip-counting.<br>● Accept and elicit student ideas and suggestions for ways to extend games.<br>● Cultivate student persistence in problem-solving and do not neglect their need for guidance and support |

**Math Unit - 3**

**OVERVIEW**

Having observed, analyzed, and classified objects by shape into predetermined categories in Module 2, students now compare and analyze length, weight, capacity, and, finally, numbers in Module 3. Students use language such as *longer than*, *shorter than*, *as long as*; *heavier than*, *lighter than*, *as heavy as*; and *more than*, *less than*, *the same as*. "8 is *more than* 5. 5 is *less than* 8." "5 is *the same as* 5." "2 and 3 is also *the same as* 5."

Topics A and B focus on comparison of length, Topic C on comparison of weight, and Topic D on comparison of volume (K.MD.2). Each of these topics opens with an identification of the attribute being compared within the natural context

of the lesson (K.MD.1). For example, in Topic A, before exploring length, students realize they could have chosen to compare by a different attribute: weight, length, volume, or numbers (K.MD.1).

T: Students, when you compare and say it is bigger, let's think about what you mean. (After each question, allow students to have a lively, brief discussion.)

T: Do you mean that it is bigger, like this book is *heavier than* this ribbon? (Dramatize the weight of the book and ribbon.)

T: Do you mean that it is longer, like this ribbon is *longer than* this book? (Dramatize the length of the ribbon.)

T: Do you mean that it takes up more space, like this book *takes up more space* than this ribbon when it is all squished together? (Dramatize.)

T: Do you mean to compare the number of things, like *the number* of books and ribbons? (Dramatize a count.)

T: So, we can compare things in different ways! Today, let's compare by thinking about longer than, taller than, or shorter than. (Dramatize.)

After the Mid-Module Assessment, Topic E begins with an analysis using the question, "Are there enough?" This leads naturally from exploring when and if there is enough space to seeing whether there are enough chairs for a small set of students: "There are fewer chairs than students!" This bridges into Topics F and G, which present a sequence building toward the comparison of numerals (K.CC.7). Topic F begins with counting and matching sets to compare (K.CC.6). The module culminates in a three-day exploration, one day devoted to each attribute: length, weight, and volume (K.MD.2). The module closes with a culminating task devoted to distinguishing between the measurable attributes of a set of objects: a water bottle, cup, dropper, and juice box (K.MD.1).

The module supports students' understanding of amounts and their developing number sense. For example, counting how many small cups of rice are contained within a larger quantity provides a foundational concept of place value: Within a larger amount are smaller equal units, which together make up the whole. "4 cups of rice is the same as 1 mug of rice." Compare that statement to "10 ones is the same as 1 ten" (1.NBT.2a). As students become confident directly comparing the length of a pencil and a crayon with statements such as "The pencil is longer than the crayon" (K.MD.2), they will be ready in later grades to indirectly compare using length units with statements such as "The pencil is longer than the crayon because 7 cubes is more than 4 cubes" (1.MD.2).

Additional foundational work for later grades is as follows:

- Foundational work with equivalence. The length of a stick with 5 linking cubes is the same as the length of my cell phone. A pencil weighs the same as a stick with 5 linking cubes. Each module component on measurement closes with a focus on *the same as*.
- Foundational work for the precise use and understanding of rulers and number lines. The module opens with lessons pointing out the importance of aligning endpoints to measure length.
- **Foundational understanding of area.** At the opening of the second half of the module, students informally explore area as they see whether a yellow circle fits inside a red square. They then see how many small blue squares will fit inside the red square and, finally, that many beans will cover the same area.
- Foundational understanding of comparison. As students count to compare the length of linking cube sticks, they are laying the foundation for answering *how many more…than/less…than* questions in Grade 1 (1.MD.2).

**Unit : 3 - Comparison of Length, Weight, Capacity and Numbers to 10**

**Subject:** Math

**Grade/Course:** Kindergarten

**Pacing:** 38 days

**Unit of Study:** Unit : Comparison of Length, Weight, Capacity and Numbers to 10

**Priority Standards**:

## *Compare numbers.*

**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 10 objects.)

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

## *Describe and compare measurable attributes.*

**K.MD.1** Describe measurable 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.*

**Foundational Standards**

**PK.CC.5** Identify whether the number of objects in one group is more, less, greater than, fewer, and/or equal to the number of objects in another group, e.g., by using matching and counting strategies.[1]

**PK.CC.6** Identify "first" and "last" related to order or position.

**PK.MD.1** Identify measurable attributes of objects, such as length and weight. Describe them using correct vocabulary (e.g., small, big, short, tall, empty, full, heavy, and light).

**Math Practice Standards:**

**MP.2** Reason quantitatively and abstractly. Students compare quantities by drawing objects in columns and matching the objects one to one to see that one column has more than another and draw the conclusion that 6 is more than 4 because 2 objects do not have a match.

**MP.3** Construct viable arguments and critique the reasoning of others. Students describe measurable attributes of a single object and reason about how to compare its length, weight, and volume to that of another object.

**MP.5** Use appropriate tools strategically. During the culminating task and End-of-Module Assessment, students might choose to use a scale to compare weight, linking cube sticks to compare length and rice and cups to compare volume.

**MP.6** Attend to precision. Students attend to precision by aligning endpoints when comparing lengths. They are also precise when weighing an object with cubes (or units) on a balance scale. Adding 1 more makes the cubes too heavy when the goal is to see how many cubes have the same weight as the object.

**MP.7** Look for and make use of structure. Students use structure to see that the amount of rice in 1 container is equal to the amount in 4 smaller containers. The smaller unit is a structure, as is the larger unit.

**"Unwrapped" Standards**

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 10 objects.)

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

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

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.*

| Concepts (What Students Need to Know) | Skills (What Students Need to Be Able to Do) |
|---|---|

| | **(Depth of Knowledge level (DOK))** |
|---|---|
| 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 10 objects.)) | Identify (DOK 2) |
| Two numbers between 1 and 10 (presented as written numerals.) | Compare (DOK 2) |
| Measurable attributes of objects, (such as length or weight.) | Describe (DOK 2) |
| Several measurable attributes of a single object. | Describe (DOK 2) |
| Two objects with a measurable attribute in common, to see which object has “more of”/”less of” the attribute. | Compare (DOK 2) |
| Difference. | Describe (DOK 2) |

| **Essential Questions** | **Big ideas** |
|---|---|
| | |

| | |
|---|---|
| • Why are numbers important?<br>• How do you compare quantities? | • One quantity is either greater than, less than or equal to another.<br>• A numeral is a way to write a number for a specific quantity.<br>• Counting tells how many in a group. |

| **Assessments** | | |
|---|---|---|
| Common Formative Pre-Assessments | Progress Monitoring Checks – "Dipsticks" | Common Formative Mid and or Post-Assessments |
| Exit tickets for each lesson | Application problems<br>Problem set data<br>Student debriefs | Mid module and end of module assessments<br><br>*See table below |

*Assessment Summary

| Type | Administered | Format | Standards Addressed |
|---|---|---|---|
| Mid-Module Assessment Task | After Topic D | Constructed response with rubric | K.MD.1<br>K.MD.2 |
| End-of-Module Assessment Task | After Topic H | Constructed response with rubric | K.CC.6<br>K.CC.7<br>K.MD.1<br>K.MD.2 |
| Culminating | Lesson 32 | Determining the attribute to be | K.MD.1<br>K.MD.2 |

| | | | |
|---|---|---|---|
| Task | | measured | |

| Performance Assessment/ Engaging Scenario (*To be completed by grade level team) |
|---|
| **Overview:** |
| **Engaging Learning Experiences/ Performance Tasks** |
| Task 1:<br><br>Task 2:<br><br>Task 3:<br><br>Task 4: |

| Instructional Resources |
|---|
| Suggested Children's books:<br><br><u>Super Sand castle Saturday</u><br>by Stuart Murphy<br><br><u>Mighty Maddie</u><br>by Stuart Murphy<br><br><u>Counting on Frank</u><br>by Rod Clement<br><br>For additional books go to http://www.the-best-childrens-books.org/math-for-kids.html<br><br>**Useful Websites:**<br>Engage NY K-5 Curriculum overview and guiding documents:<br>https://www.engageny.org/resource/pre-kindergarten-grade-5-mathematics-curriculum-map-and-guiding-documents |

Engage NY Kindergarten Resources:
https://www.engageny.org/resource/kindergarten-mathematics

Eureka Math Module PDFs:
http://greatminds.net/maps/math/module-pdfs

North Carolina Standards Unpacked (scroll down and open Math Unpacking Standards- Kindergarten):
http://www.ncpublicschools.org/acre/standards/common-core-tools/

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

## Suggested Tools and Representations

- Balance scales (as pictured to the right)
- Centimeter cubes
- Clay
- Linking cubes in sticks with a color change at the five
- Plastic cups and containers for measuring volume

| Instructional Strategies | Meeting the Needs of All Students |
|---|---|

**21st Century Skills**

- Critical thinking and problem solving
- Collaboration and leadership
- Agility and adaptablity
- 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

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

| | |
|---|---|
| should be small enough to be effective and the strategy should be used in a systematic and consistent manner.<br>**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.<br>**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.<br>**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. | 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.<br><br>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.<br><br>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.<br><br>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 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:<br>● Enlarge sprint print for visually impaired learners.<br>● Use student boards to work on one calculation at a time.<br>● Invest in or make math picture dictionaries or word walls.<br><br>Provide Multiple Means of Action and Expression<br><br>● 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.<br>● 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.<br>● 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."<br>● Adjust wait time for interpreters of deaf and hard-of-hearing students.<br>● Select numbers and tasks that are "just right" for learners.<br>● Model each step of the algorithm before students begin.<br>● Give students a chance to practice the next day's sprint beforehand. (At home, for example.)<br>● Give students a few extra minutes to process the information before giving the signal to respond.<br>● Assess by multiple means, including "show and tell" rather than written.<br>● 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?”<br>● 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?”<br>● 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.<br><br>Provide Multiple Means of Engagement<br><br>● Make eye-to-eye contact and keep teacher-talk clear and concise. Speak clearly when checking answers for sprints and problems.<br>● 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.<br>● Teach in small chunks so students get a lot of practice with one step at a time.<br>● Know, use, and make the most of Deaf culture and sign language.<br>● Use songs, rhymes, or rhythms to help students remember key concepts, such as “Add your ones up first/Make a bundle if you can!”<br>● Point to visuals and captions while speaking, using your hands to clearly indicate the image that corresponds to your words.<br>● Incorporate activity. Get students up and moving, coupling language with motion, such as “Say ‘right angle’ and show me a right angle with your legs,” and “Make groups of 5 right now!” Make the most of the fun exercises for activities like sprints and fluencies. Conduct simple oral games, such as “Happy Counting.” Celebrate improvement. Intentionally highlight student math success frequently.<br>● Follow predictable routines to allow students to focus on content rather than behavior.<br>● Allow “everyday” and first language to express |

| | |
|---|---|
| | math understanding.<br>● Re-teach the same concept with a variety of fluency games.<br>● Allow students to lead group and pair-share activities.<br>● Provide learning aids, such as calculators and computers, to help students focus on conceptual understanding |

| New Vocabulary | Students Achieving Below Standard | Students Achieving Above Standard |
|---|---|---|
| New or Recently Introduced Terms<br>● Balance scale (tool for weight measurement)<br>● Capacity (with reference to volume)<br>● Compare (specifically using direct comparison)<br>● Endpoint (with reference to alignment for direct comparison)<br>● Enough/not enough (comparative term)<br>● Heavier than/lighter than (weight comparison)<br>● Height (vertical distance measurement from bottom to top)<br>● Length (distance measurement from end to end; in a rectangular shape, length can be used to describe any of the four sides)<br>● Longer than/shorter than (length comparison)<br>● More than/fewer than (discrete quantity comparison)<br>● More than/less than (volume, area, and number comparisons)<br>● Taller than/shorter 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.<br><br>**<u>Provide Multiple Means of Representation</u>**<br><br>● Model problem-solving sets with drawings and graphic organizers (e.g., bar or tape diagram), giving many examples and visual displays.<br>● Guide students as they select and practice using their own graphic organizers and models to solve.<br>● Use direct instruction for vocabulary with visual or concrete representations.<br>● Use explicit directions with steps and procedures enumerated.<br>● Guide students through initial practice promoting gradual independence. “I do, we do, you do.”<br>● Use alternative methods of delivery of instruction such as recordings and videos that can be | The following 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.<br><br>**<u>Provide Multiple Means of Representation</u>**<br><br>● Teach students how to ask questions (such as,“Do you agree?” and “Why do you think so?”) to extend “think-pair-share” conversations.<br>● Model and post conversation “starters,” such as: “I agree because...” “Can you explain how you solved it?”<br>● “I noticed that...”“Your solution is different from/ the same as mine because...”“My mistake was to...”<br>● Incorporate written reflection, evaluation, and synthesis<br>● Allow creativity in expression and modeling solutions.<br><br>**<u>Provide Multiple Means of Action and Expression</u>**<br><br>● Encourage students to explain their reasoning both orally and in writing. |

| | | |
|---|---|---|
| (height comparison)<br>● The same as (comparative term)<br>● Weight (heaviness measurement)<br>Familiar Terms and Symbols<br>● Match (group items that are the same or that have the same given attribute)<br>● Numbers 1–10 | accessed independently or repeated if necessary.<br>● Scaffold complex concepts and provide leveled problems for multiple entry points.<br><br>**<u>Provide Multiple Means of Action and Expression</u>**<br><br>● First use manipulatives or real objects (such as dollar bills), then make transfer from concrete to pictorial to abstract.<br>● 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?'<br>● Encourage students to explain their thinking and strategy for the solution.<br>● Choose numbers and tasks that are "just right" for learners but teach the same concepts.<br>● 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. | ● Extend exploration of math topics by means of challenging games, puzzles, and brain teasers.<br>● Offer choices of independent or group assignments for early finishers.<br>● 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).<br>● Foster their curiosity about numbers and mathematical ideas. Facilitate research and exploration through discussion, experiments, internet searches, trips, etc.<br>● Have students compete in a secondary simultaneous competition, such as skip-counting by 5s, while peers are completing the sprint.<br>● Let students choose their mode of response: written, oral, concrete, pictorial, or abstract.<br>● Increase the pace. Offer two word problems to solve, rather than one.<br>● Adjust difficulty level by increasing the number of steps (e.g., change a one-step problem to a two- step problem).<br>● Adjust difficulty level by enhancing the operation (e.g., addition to multiplication), increasing numbers to millions, or decreasing numbers to decimals/fractions.<br>● Let students write word problems to show mastery and/or extension of the content.<br><br>**<u>Provide Multiple Means of Engagement</u>**<br><br>● 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.<br>● Celebrate improvement in completion time (e.g., Sprint A completed in 45 seconds and Sprint B completed in 30 seconds).<br>● Make the most of the fun exercises for practicing skip-counting.<br>● Accept and elicit student ideas and suggestions for ways to extend games.<br>● Cultivate student persistence in problem-solving and do not neglect their need for guidance and support |

**Math Unit - 4**

**OVERVIEW**

Module 4 marks the next exciting step in math for kindergartners—addition and subtraction! Students begin to harness their practiced counting abilities, knowledge of the value of numbers, and work with embedded numbers to reason about and solve addition and subtraction expressions and equations (**K.OA.1**, **K.OA.2**).

In Topic A, decompositions and compositions of numbers to 5 are revisited to reinforce how a whole can be broken into two parts and how two parts can be joined to make a whole. Decomposition and composition are taught simultaneously

using the number bond model so students begin to understand the relationship between parts and wholes before adding and subtracting, formally addressed in Topics C and D.

Topic B continues with decomposing and composing 6, 7, and 8 using the number bond model. Students systematically work with each quantity, finding all possible number pairs using story situations, objects, sets, arrays, 5 + n patterns,[1] and numerals (**K.OA.3**).

Topic C introduces addition to totals of 6, 7, and 8 within concrete and pictorial settings, first generating number sentences without unknowns (e.g., 5 + 2 = 7) to develop an understanding of the addition symbol and the referent of each number within the equation. Next, students graduate to working within the addition word problem types taught in kindergarten: *add to with result unknown* (A + B = ___), *put together with total unknown* (A + B = ___), and *both addends unknown* (C =____ + ___) (**K.OA.2**). Students draw a box around the total to track the unknown.

Topic D introduces subtraction with 6, 7, and 8 with no unknown. The lessons in Topic D build from the concrete level of students acting out, crossing out objects in a set, and breaking and hiding parts, to more formal representations of decomposition recorded as or matched to equations (C – B = ___).

Topics E, F, and G parallel the first half of the module with the numbers 9 and 10. Topic E explores composition, decomposition, and number pairs using the number bond model (**K.OA.3**). It is essential that students build deep understanding and skill with identifying the number pairs of 6 through 10 because this is foundational to Grade 1's fluency with sums and differences within 10, as well as Grade 2's fluency with sums and differences to 20. Topics F and G deal with addition and subtraction, respectively. Students are refocused on representing larger numbers by drawing the 5 + n pattern to bridge efficiently from seeing the embedded five to representing that as addition.

After addition and subtraction have been introduced, Topic H explores the behavior of zero: the additive identity. Students learn that adding or subtracting zero does not change the original quantity. Students also begin to see patterns when adding 1 more and the inverse relationship between addition and subtraction

(8 + 2 = 10 and 10 – 2 = 8). Finally, students begin to formally study and explore partners to 10 (**K.OA.4**), though this essential work has been supported throughout Module 4 during Fluency Practice.

The culminating task of this module asks students to demonstrate their understanding of addition as *putting together, adding to* and subtraction as *taking apart,* or *taking from*. Students use mathematical models and equations to teach a small group of students, administrators, family members, or community partners about a decomposition of 10.

**Rigorous Curriculum Design Template**

**Unit : 4 - Number Pairs, Addition and Subtraction to 10**

**Subject:** Math

**Grade/Course:** Kindergarten

**Pacing:** 47 days

**Unit of Study:** Unit : Number Pairs, Addition and Subtraction to 10

**Priority Standards**:

*Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.*

K.OA.1 Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations. (Drawings need not show details, but should show the mathematics in the problem. This applies wherever drawings are mentioned in the 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.OA.5 Fluently add and subtract within 5.

**Foundational Standards**

PK.OA.1 Demonstrate an understanding of addition and subtraction by using objects, fingers, and responding to practical situations (e.g., If we have 3 apples and add two more, how many apples do we have all together?).

PK.OA.2 Duplicate and extend (e.g., What comes next?) simple patterns using concrete objects.

**Math Practice Standards:**

**MP.1** Make sense of problems and persevere in solving them. Students identify story problems as addition or subtraction situations and find the unknown. Students demonstrate with drawings and verbal explanations the referent of each number in a given problem type.

**MP.2** Reason abstractly and quantitatively. Students reason about the relationships between numbers in composition and decomposition situations. For example, they can use the number bond mat to show and explain that 6 and 4 make 10, and that 10 can be broken into 6 and 4.

**MP.4** Model with mathematics. Students use number bonds and addition and subtraction equations to model composition and decomposition. Students tell story problems using drawings, numbers, and symbols.

**MP.5** Use appropriate tools strategically. Students select and use tools such as drawings, number bonds, and the number path to solve problems.

**MP.7** Look for and make use of structure. Students draw the 5 + n pattern to reason about numbers within 10.

**MP.8** Look for and express regularity in repeated reasoning. Students add and subtract 0 to get the same number. They also use linking cubes to add and subtract 1 to reason about 1 more and 1 less than with numbers to 10.

**"Unwrapped" Standards**

Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations. (Drawings need not show details, but should show the mathematics in the problem. This applies wherever drawings are mentioned in the Standards.)

Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings

| | |
|---|---|
| to represent the problem.<br>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).<br>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.<br>Fluently add and subtract within 5. | |
| **Concepts (What Students Need to Know)** | **Skills (What Students Need to Be Able to Do) (Depth of Knowledge level (DOK))** |
| addition and subtraction (with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.) | Represent (DOK 2) |
| addition and subtraction word problems | Solve (DOK 2) |
| within 10 (e.g., by using objects or drawings to represent the problem.) | Add (DOK 2)<br>Subtract (DOK 2) |
| 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)) | Decompose (DOK 3) |
| 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.) (For any number from 1 to 9) | Find (DOK 2) |
| within 5. | Fluently (DOK 1)<br>Add (DOK 2)<br>Subtract (DOK 2) |

| **Essential Questions** | **Big ideas** |
|---|---|
| | |

| | |
|---|---|
| • Why is it important to understand quantities?<br>• How many different ways can you show addition and subtraction of numbers?<br>• How can numbers be broken apart? | • Numbers can change, getting bigger or smaller.<br>• Numbers represent groups of objects.<br>• Addition and subtraction concepts can be represented in multiple ways. |

| **Assessments** | | |
|---|---|---|
| Common Formative Pre-Assessments | Progress Monitoring Checks – "Dipsticks" | Common Formative Mid and or Post-Assessments |
| Exit tickets for each lesson | Application problems<br>Problem set data<br>Student debriefs | Mid module and end of module assessments<br><br>*See table below |

*Assessment Summary

| Type | Administered | Format | Standards Addressed |
|---|---|---|---|
| Mid-Module Assessment Task | After Topic D | Constructed response with rubric | K.OA.1<br>K.OA.2<br>K.OA.3<br>K.OA.5 |
| End-of-Module Assessment Task | After Topic H | Constructed response with rubric | K.OA.1<br>K.OA.2 |

| | | | |
|---|---|---|---|
| | | | K.OA.3<br><br>K.OA.4 |
| Culminating Task | Lesson 41 | Choose tools strategically to model and represent a stick of 10 cubes broken into two parts. | K.OA.1<br><br>K.OA.2<br><br>K.OA.4 |

| **Performance Assessment/ Engaging Scenario (*To be completed by grade level team)** |
|---|
| **Overview:** |
| **Engaging Learning Experiences/ Performance Tasks** |
| Task 1:<br><br>Task 2:<br><br>Task 3:<br><br>Task 4: |

| **Instructional Resources** |
|---|
| Suggested Children's Books:<br><br><u>Each Orange Had 8 Slices</u><br>Paul Giganti<br>HarperTrophy, 1999 |

Little Quack
Lauren Thompson
Simon & Schuster Children's, 2005

More, Fewer, Less
Tana Hoban
HarperCollins Publishers, 1998

My Little Sister Ate One Hare
Bill Grossman
Dragonfly, 1998

One Is a Snail, Ten Is a Crab
April Pulley Sayre and Jeff Sayre
Candlewick, 2006

For additional books go to http://www.the-best-childrens-books.org/math-for-kids.html

**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 Kindergarten Resources:

https://www.engageny.org/resource/kindergarten-mathematics

Eureka Math Module PDFs:

http://greatminds.net/maps/math/module-pdfs

North Carolina Standards Unpacked (scroll down and open Math Unpacking Standards- Kindergarten):

http://www.ncpublicschools.org/acre/standards/common-core-tools/

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/

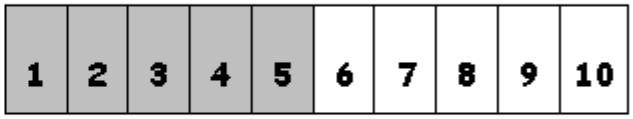
LearnZillion –lesson plans/some with embedded tasks

https://learnzillion.com/resources/17132

SBAC Digital Library

## Suggested Tools and Representations

- 5-group dot cards
- Hula hoops
- Linking cubes
- Number bonds
- Number path
- Number towers
- Sets of objects
- Showing fingers the Math Way




Number Path

| Instructional Strategies | Meeting the Needs of All Students |
|---|---|
| **<u>21st Century Skills</u>**<br>● Critical thinking and problem solving<br>● Collaboration and leadership<br>● Agility and adaptablity<br>● Initiative and entrepreneurialism<br>● Effective oral and written communication<br>● Accessing and analyzing information<br>● Curiosity and imagination<br><br>**<u>Marzano's Nine Instructional Strategies for Effective Teaching and Learning</u>**<br>**1. Identifying Similarities and Differences**: helps students understand more complex problems by analyzing them in a simpler way<br>**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<br>**3. Reinforcing Effort and Providing Recognition**: showing | 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.<br><br>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.<br><br>Additionally, individual lessons contain marginal notes to teachers (in text boxes) highlighting specific UDL information about scaffolds that might be employed with |

| | |
|---|---|
| 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.<br>**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.<br>**5. Nonlinguistic Representations:** has recently been proven to stimulate and increase brain activity.<br>**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.<br>**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.<br>**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.<br>**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. | 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.<br><br>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.<br><br>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.<br><br>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.<br><br>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.<br><br>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.<br><br>**Scaffolds for Students with Disabilities**<br>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 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.<br>Provide Multiple Means of Representation<br><br>● Teach from simple to complex, moving from concrete to representation to abstract at the student's pace.<br>● Clarify, compare, and make connections to math |

| | |
|---|---|
| | words in discussion, particularly during and after practice.<br>● 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.<br>● 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…"<br>● Couple number sentences with models. For example, for equivalent fraction sprint, present 6/8 with:<br>● Enlarge sprint print for visually impaired learners.<br>● Use student boards to work on one calculation at a time.<br>● Invest in or make math picture dictionaries or word walls.<br><br>Provide Multiple Means of Action and Expression<br><br>● 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.<br>● 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.<br>● 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."<br>● Adjust wait time for interpreters of deaf and hard-of-hearing students.<br>● Select numbers and tasks that are "just right" for learners.<br>● Model each step of the algorithm before students begin.<br>● Give students a chance to practice the next day's sprint beforehand. (At home, for example.)<br>● Give students a few extra minutes to process the information before giving the signal to respond.<br>● Assess by multiple means, including "show and tell" rather than written.<br>● 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?"<br>● 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?"<br>● 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.<br><br>Provide Multiple Means of Engagement<br><br>● Make eye-to-eye contact and keep teacher-talk clear and concise. Speak clearly when checking answers for sprints and problems.<br>● 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.<br>● Know, use, and make the most of Deaf culture and sign language.<br>● Use songs, rhymes, or rhythms to help students remember key concepts, such as “Add your ones up first/Make a bundle if you can!”<br>● Point to visuals and captions while speaking, using your hands to clearly indicate the image that corresponds to your words.<br>● Incorporate activity. Get students up and moving, coupling language with motion, such as “Say ‘right angle’ and show me a right angle with your legs,” and “Make groups of 5 right now!” Make the most of the fun exercises for activities like sprints and fluencies. Conduct simple oral games, such as “Happy Counting.” Celebrate improvement. Intentionally highlight student math success frequently.<br>● Follow predictable routines to allow students to focus on content rather than behavior.<br>● Allow “everyday” and first language to express math understanding.<br>● Re-teach the same concept with a variety of fluency games.<br>● Allow students to lead group and pair-share activities.<br>● Provide learning aids, such as calculators and computers, to help students focus on conceptual understanding |

| New Vocabulary | Students Achieving Below Standard | Students Achieving Above Standard |
|---|---|---|
| New or Recently Introduced Terms<br>● Addition (specifically using *add to with result unknown*, *put together with total unknown*, *put together with both addends unknown*)<br>● Addition and subtraction sentences (equations)<br>● Make 10 (combine two numbers from 1 to 9 that add up to 10)<br>● Minus (–)<br>● Number bond (mathematical model)<br>● Number pairs or partners (embedded numbers)<br>● Part (addend or embedded number)<br>● Put together (add) | 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.<br><br>**<u>Provide Multiple Means of Representation</u>**<br><br>● Model problem-solving sets with drawings and graphic organizers (e.g., bar or tape diagram), giving many examples and visual displays. | The following 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.<br><br>**<u>Provide Multiple Means of Representation</u>**<br><br>● Teach students how to ask questions (such as,“Do you agree?” and “Why do you think so?”) to extend “think-pair-share” conversations.<br>● Model and post conversation “starters,” such as: “I agree because...” “Can you explain |

| | | |
|---|---|---|
| ● Subtraction (specifically using *take from with result unknown*)<br>● Take apart (decompose)<br>● Take away (subtract)<br>● Whole (total)<br>Familiar Terms and Symbols<br>● 5-group<br>● Equals (=)<br>● Hidden partners (embedded numbers)<br>● Number sentence (3 = 2 + 1)<br>● Number story (stories with *add to* or *take from* situations)<br>● Numbers 0–10<br>● Plus (+) | ● Guide students as they select and practice using their own graphic organizers and models to solve.<br>● Use direct instruction for vocabulary with visual or concrete representations.<br>● Use explicit directions with steps and procedures enumerated.<br>● Guide students through initial practice promoting gradual independence. "I do, we do, you do."<br>● Use alternative methods of delivery of instruction such as recordings and videos that can be accessed independently or repeated if necessary.<br>● Scaffold complex concepts and provide leveled problems for multiple entry points.<br><br>**<u>Provide Multiple Means of Action and Expression</u>**<br><br>● First use manipulatives or real objects (such as dollar bills), then make transfer from concrete to pictorial to abstract.<br>● 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?'<br>● Encourage students to explain their thinking and strategy for the solution.<br>● Choose numbers and tasks that are "just right" for learners but teach the same concepts.<br>● 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. | how you solved it?"<br>● "I noticed that..."“Your solution is different from/ the same as mine because..."“My mistake was to..."<br>● Incorporate written reflection, evaluation, and synthesis<br>● Allow creativity in expression and modeling solutions.<br><br>**<u>Provide Multiple Means of Action and Expression</u>**<br><br>● Encourage students to explain their reasoning both orally and in writing.<br>● Extend exploration of math topics by means of challenging games, puzzles, and brain teasers.<br>● Offer choices of independent or group assignments for early finishers.<br>● 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).<br>● Foster their curiosity about numbers and mathematical ideas. Facilitate research and exploration through discussion, experiments, internet searches, trips, etc.<br>● Have students compete in a secondary simultaneous competition, such as skip-counting by 5s, while peers are completing the sprint.<br>● Let students choose their mode of response: written, oral, concrete, pictorial, or abstract.<br>● Increase the pace. Offer two word problems to solve, rather than one.<br>● Adjust difficulty level by increasing the number of steps (e.g., change a one- |

| | | |
|---|---|---|
| | | step problem to a two- step problem).<br>● Adjust difficulty level by enhancing the operation (e.g., addition to multiplication), increasing numbers to millions, or decreasing numbers to decimals/fractions.<br>● Let students write word problems to show mastery and/or extension of the content.<br><br>**<u>Provide Multiple Means of Engagement</u>**<br><br>● 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.<br>● Celebrate improvement in completion time (e.g., Sprint A completed in 45 seconds and Sprint B completed in 30 seconds).<br>● Make the most of the fun exercises for practicing skip-counting.<br>● Accept and elicit student ideas and suggestions for ways to extend games.<br>● Cultivate student persistence in problem-solving and do not neglect their need for guidance and support |

**Math Unit - 5**

**OVERVIEW**

Students have worked intensively within 10 and have often counted to 30 using the Rekenrek during Fluency Practice. This sets the stage for Module 5, where students clarify the meaning of the 10 ones and some ones within a teen number and extend that understanding to count to 100. In Topic A, students start at the concrete level, counting 10 straws.

T: Count straws with me into piles of ten.

S: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10. 1, 2, 3, … 8, 9, 10. 1, 2, 3, … 8, 9, 10.

T: Let's count the piles!

S: 1 pile, 2 piles, 3 piles, 4 piles.

Thus, Kindergarten students learn to comfortably talk about 10 ones, setting the foundation for the critical Grade 1 step of understanding 1 ten. They next separate 10 objects from within concrete and pictorial counts up to 20, analyzing the total as 10 ones and no ones or 10 ones and some ones (**K.CC.1, K.NBT.1**). They see two distinct sets which are then counted the Say Ten Way: ten one, ten two, ten three, ten four, ten five, ten six, ten seven, ten eight, ten nine, 2 tens. The students hear the separation of the 10 ones and some ones as they count, solidifying their understanding as they also return to regular counting: eleven, twelve, thirteen…etc. (**K.CC.5**)

In Topic B, the two distinct sets of ones are composed, or brought together, through the use of the Hide Zero cards (pictured below) and number bonds. Students represent the whole number numerically while continuing to separate the count of 10 ones from the count of the remaining ones with drawings and materials (**K.NBT.1**). Emerging from Topic B, students should be able to model and write a teen number without forgetting that the 1 in 13 represents 10 ones (**K.CC.3**).

Topic C opens with the students making a simple Rekenrek to 20 (pictured below) and modeling numbers thereon. The tens can be seen both as two lines with a color change at the five or two parallel unicolor fives.

In Topic C, the focus is now on the decomposition of the total teen quantity so that one part is ten ones. This is what makes Topic C a step forward from Topics A and B. Previously, the ten and ones were always separated when modeled pictorially or with materials. Now, the entire teen number is a whole quantity represented both concretely and pictorially in different configurations: towers or linear configurations, arrays (including the 10-frame or 5-groups), and circles. The students decompose the total into 10 ones and some ones. Through their experiences with the different configurations, students have practice both separating 10 ones within teen numbers and counting or conservation as they count quantities arranged in different ways and, as always, use math talk to share their observations (**K.CC.5**). They also come to know each successive teen number as one larger than the previous number (**K.CC.4a**).

In Topic D, students extend their understanding of counting teen numbers to numbers from 21 to 100. They first count by tens both the Say Ten Way—1 ten, 2 tens, 3 tens, 4 tens, etc.—and the regular way: twenty, thirty, forty, etc. They then count by ones to 100, first within a decade and finally across the decade (**K.CC.1, K.CC.2**). Topic D involves the Grade 1 standard **1.NBT.1** because students also write their numbers from 21 to 100.

The writing of larger numbers has been included because of the range of activities they make possible. The writing of these numbers is not assessed or emphasized, however. Topic D closes with an optional exploration of numbers on the

Rekenrek, bringing together counting with decomposition and finding embedded numbers within larger numbers. This lesson is optional because it does not directly address a particular Kindergarten standard.

In Topic E, students apply their skill with the decomposition and composition of teen numbers. In Lesson 20, they represent both compositions and decompositions as addition statements (**K.NBT.1**). In Lesson 21, they model teen quantities with materials in a number bond and hide one part. The hidden part is represented as an addition sentence with a hidden part, e.g., 10 + ___ = 13 or 13 = ___ + 3. The missing addend aligns

Lesson 21 to the Grade 1 standard **1.OA.8**. In Lesson 22, students apply their skill with decomposition into 10 ones and some ones to compare the some ones of two numbers and thus to compare the teen numbers. They *stand* on the structure of the 10 ones and use what they know of numbers 1–9 (**MP.7**). Comparison of numbers 1–9 is a Kindergarten standard (**K.CC.6, K.CC.7**).

In Lesson 23, students reason about situations to determine whether they are decomposing a teen number (as 10 ones and some ones) or composing 10 ones and some ones to find a teen number. They analyze their number sentences that represent each situation to determine if they started with the total or the parts and if they composed or decomposed, for example, 13 = 10 + 3 or 10 + 3 = 13 (**K.NBT.1**). Throughout the lesson, students draw the number of objects presented in the situation (**K.CC.5**).

The module closes with a culminating task, wherein students integrate all the methods they have used up until now to show decomposition. For example, they are instructed, "Open your mystery bag. Show the number of objects in your bag in different ways using the materials you choose" (**MP.5**). This experience also serves as a part of the End-of-Module Assessment, allowing the student to demonstrate skill and understanding using all he has learned throughout the module.

**Rigorous Curriculum Design Template**

**Unit : 5 - Numbers 10-20 and Counting to 100**

**Subject:** Math

**Grade/Course:** Kindergarten

**Pacing:** 30 days

**Unit of Study:** Unit : Numbers 10-20 and Counting to 100

**Priority Standards**:

*Know number names and the count sequence.*

**K.CC.1** Count to 100 by ones and by tens.

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

**K.CC.3** Write numbers from 0 to 20. Represent a number of objects with a written numeral 0–20 (with 0 representing a count of no objects).

*Count to tell the number of objects.*

**K.CC.4** Understand the relationship between numbers and quantities; connect counting to cardinality.

**b.** 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.

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

**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.

*Work with numbers 11–19 to gain foundations for place value.*

**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.

**No foundational skills listed for this unit**

**Math Practice Standards:**

**MP.2** Reason abstractly and quantitatively. Students represent teen numerals with concrete objects separated as 10 ones and some ones.

**MP.3** Construct viable arguments and critique the reasoning of others. Students explain their thinking about teen numbers as 10 ones and some ones and how to represent those numbers as addition sentences.

**MP.4** Model with mathematics. Students model teen quantities with number bonds, place value cards, and teen numbers.

**MP.7** Look for and make use of structure. Students use the structure of 10 ones to reason about teen numbers. They compare teen numbers using the structure of the 10 ones to compare the some ones.

**"Unwrapped" Standards**

Count to 100 by ones and by tens.

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

Write numbers from 0 to 20. Represent a number of objects with a written numeral 0–20 (with 0 representing a count of no objects).

Understand the relationship between numbers and quantities; connect counting to cardinality.

b. 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.

c. Understand that each successive number name refers to a quantity that is one larger.

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.

| 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. | |
|---|---|
| **Concepts (What Students Need to Know)** | **Skills (What Students Need to Be Able to Do) (Depth of Knowledge level (DOK))** |
| 100 by ones and by tens. | Count (DOK 1) |
| Forward beginning from a given number within the known sequence (instead of having to begin at 1). | Count (DOK 1) |
| Numbers from 0 to 20. | Write (DOK 1) |
| A number of objects with a written numeral 0–20 (with 0 representing a count of no objects). | Represent (DOK 2) |
| The relationship between numbers and quantities; | Understand (DOK 2) |
| Counting to cardinality. | Connect (DOK 2) |
| 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.) | Understand (DOK 2) |
| Successive number name refers to a quantity that is one larger. | Understand (DOK 2) |
| "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 (DOK 1) |
| Numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings | Compose (DOK 2)<br>Decompose (DOK 2) |
| Composition or decomposition by a drawing or equation (e.g., 18 = 10 + 8); | Record (DOK 2) |
| Numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones. | Understand (DOK 2) |

| | |
|---|---|
| | |

| **Essential Questions** | **Big ideas** |
|---|---|
| ● Why are numbers significant?<br>● Why do we count?<br>● How do you compare quantities? | ● People use numbers all the time.<br>● A numeral is a way to write a number for a specific quantity.<br>● Counting tells how many in a group.<br>● The last number said when counting tells the total number of objects. |

| **Assessments** | | |
|---|---|---|
| Common Formative Pre-Assessments | Progress Monitoring Checks – "Dipsticks" | Common Formative Mid and or Post-Assessments |
| Exit tickets for each lesson | Application problems<br>Problem set data<br>Student debriefs | Mid module and end of module assessments<br><br>*See table below |

*Assessment Summary

| Assessment Type | Administered | Format | Standards Addressed |
|---|---|---|---|
| Mid-Module Assessment Task | After Topic C | Interview with Rubric | K.CC.1<br>K.CC.3<br>K.CC.4bc<br>K.CC.5<br>K.NBT.1 |
| End-of-Module Assessment Task | After Topic E | Interview with Rubric | K.CC.1<br>K.CC.2<br>K.CC.3<br>K.CC.4<br>K.CC.5<br>K.NBT.1 |
| Culminating Task | Last Instructional Day, Lesson 24 | Cooperative Group Task | K.NBT.1 |

| Performance Assessment/ Engaging Scenario (*To be completed by grade level team) |
|---|
| **Overview:** |
| **Engaging Learning Experiences/ Performance Tasks** |
| Task 1:<br><br>Task 2:<br><br>Task 3:<br><br>Task 4: |

| Instructional Resources |
|---|
| Suggested Children's Books: |

Emily's First 100 Days of School
Rosemary Wells
Hyperion, 2005

Hannah's Collections
Marthe Jocelyn
Tundra, 2004

How the Stars Fell into the Sky
Jerrie Oughton
Houghton Mifflin Harcourt, 1996

One Hundred Is a Family
Pam Ryan
Hyperion, 1996

One Hundred Ways to Get to 100
Jerry Pallotta
Scholastic, 2003

For additional books go to http://www.the-best-childrens-books.org/math-for-kids.html

**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 Kindergarten Resources:

https://www.engageny.org/resource/kindergarten-mathematics

Eureka Math Module PDFs:

http://greatminds.net/maps/math/module-pdfs

North Carolina Standards Unpacked (scroll down and open Math Unpacking Standards- Kindergarten):

http://www.ncpublicschools.org/acre/standards/common-core-tools/

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

## Suggested Tools and Representations

- 50 sticks or straws for each group of 2 students
- Student-made Rekenrek (pictured to the right): 10 red and 10 white pony beads, 1 cardboard strip, 2 elastics
- 1 egg carton per pair of students with 2 slots cut off to make a carton with 10 slots
- Hide Zero cards (called Place Value cards in later grades)
- Objects to put in the egg carton such as mandarin oranges, plastic eggs, or beans
- Single and double ten-frames
- Linking cubes: ideally 10 of two different colors per student
- Number bond template

| Instructional Strategies | Meeting the Needs of All Students |
|---|---|
| **21st Century Skills**<br>● Critical thinking and problem solving<br>● Collaboration and leadership<br>● Agility and adaptablity<br>● Initiative and entrepreneurialism<br>● Effective oral and written communication<br>● Accessing and analyzing information<br>● Curiosity and imagination<br><br>**Marzano's Nine Instructional Strategies for Effective Teaching and Learning**<br>**1. Identifying Similarities and Differences**: helps students understand more complex problems by analyzing them in a simpler way<br>**2. Summarizing and Note-taking**: promotes | 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.<br><br>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 |

| | |
|---|---|
| comprehension because students have to analyze what is important and what is not important and put it in their own words<br>**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.<br>**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.<br>**5. Nonlinguistic Representations:** has recently been proven to stimulate and increase brain activity.<br>**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.<br>**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.<br>**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.<br>**9. Cues, Questions, and Advanced Organizers:** helps students use what they already know to enhance what | applicable to other students and overlapping populations.<br><br>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.<br><br>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.<br><br>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.<br><br>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. |

| | |
|---|---|
| they are about to learn. These are usually most effective when used before a specific lesson. | 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.<br><br>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.<br><br>**Scaffolds for Students with Disabilities**<br>Individualized education programs (IEPs) or Section 504 Accommodation Plans should be the first source of information for designing instruction for students with disabilities. The following 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.<br>Provide Multiple Means of Representation<br><br>● Teach from simple to complex, moving from concrete to representation to abstract at the student's pace.<br>● Clarify, compare, and make connections to math words in discussion, particularly during and after practice.<br>● 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.<br>● 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…"<br>● Couple number sentences with models. For example, for equivalent fraction sprint, present 6/8 with:<br>● Enlarge sprint print for visually impaired learners.<br>● Use student boards to work on one calculation at a time.<br>● Invest in or make math picture dictionaries or word walls.<br><br>Provide Multiple Means of Action and Expression<br><br>● 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.<br>● 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.<br>● 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."<br>● Adjust wait time for interpreters of deaf and hard-of-hearing students.<br>● Select numbers and tasks that are "just right" for learners.<br>● Model each step of the algorithm before students begin.<br>● Give students a chance to practice the next day's sprint beforehand. (At home, for example.)<br>● Give students a few extra minutes to process the information before giving the signal to respond.<br>● Assess by multiple means, including "show and tell" rather than written.<br>● 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?"<br>● 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?"<br>● 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.<br><br>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.<br>● 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.<br>● Teach in small chunks so students get a lot of practice with one step at a time.<br>● Know, use, and make the most of Deaf culture and sign language.<br>● Use songs, rhymes, or rhythms to help students remember key concepts, such as "Add your ones up first/Make a bundle if you can!"<br>● Point to visuals and captions while speaking, using your hands to clearly indicate the image that corresponds to your words.<br>● Incorporate activity. Get students up and moving, coupling language with motion, such as "Say 'right angle' and show me a right angle with your legs," and "Make groups of 5 right now!" Make the most of the fun exercises for activities like sprints and fluencies. Conduct simple oral games, such as "Happy Counting." Celebrate improvement. Intentionally highlight student math success frequently.<br>● Follow predictable routines to allow students to focus on content rather than behavior.<br>● Allow "everyday" and first language to express math understanding.<br>● Re-teach the same concept with a variety of fluency games.<br>● Allow students to lead group and pair-share activities.<br>● Provide learning aids, such as calculators and computers, to help students focus on conceptual understanding |

| New Vocabulary | Students Achieving Below Standard | Students Achieving Above Standard |
|---|---|---|
| New or Recently Introduced Terms<br>● 10 and __<br>● 10 ones and some ones<br>● 10 plus<br>● Hide Zero cards (called Place Value cards in later grades)<br>● Regular counting by ones from 11 to 20 (e.g., eleven, twelve, thirteen, etc.)<br>● Regular counting by tens to 100 (e.g., ten, twenty, | 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.<br><br>**<u>Provide Multiple Means of</u>** | The following 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.<br><br>**<u>Provide Multiple Means of Representation</u>** |

| | | |
|---|---|---|
| thirty, forty, fifty, sixty, seventy, eighty, ninety, one hundred)<br>● Say Ten counting by tens to 100 (e.g., 1 ten, 2 tens, 3 tens, 4 tens, 5 tens, 6 tens, 7 tens, 8 tens,<br>● 9 tens, 10 tens)<br>● Teen numbers<br>Familiar Terms and Symbols **[1]**<br>● 10-frame<br>● 5-group<br>● Circle 10 ones<br>● Circular count<br>● Count 10 ones<br>● Dot path, empty path, number path<br>● Linear count<br>● Number bond<br>● Number tower<br>● Part, whole, total<br>● Say Ten counting (e.g., 11–20 is spoken as "ten one, ten two, ten three, ten four, ten five, ten six,<br>● ten seven, ten eight, ten nine, two tens")<br>● Scatter count | **Representation**<br>● Model problem-solving sets with drawings and graphic organizers (e.g., bar or tape diagram), giving many examples and visual displays.<br>● Guide students as they select and practice using their own graphic organizers and models to solve.<br>● Use direct instruction for vocabulary with visual or concrete representations.<br>● Use explicit directions with steps and procedures enumerated.<br>● Guide students through initial practice promoting gradual independence. "I do, we do, you do."<br>● Use alternative methods of delivery of instruction such as recordings and videos that can be accessed independently or repeated if necessary.<br>● Scaffold complex concepts and provide leveled problems for multiple entry points.<br><br>**Provide Multiple Means of Action and Expression**<br>● First use manipulatives or real objects (such as dollar bills), then make transfer from concrete to pictorial to abstract.<br>● 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?'<br>● Encourage students to explain their thinking and strategy for the solution.<br>● Choose numbers and tasks that | ● Teach students how to ask questions (such as,"Do you agree?" and "Why do you think so?") to extend "think-pair-share" conversations.<br>● Model and post conversation "starters," such as: "I agree because..." "Can you explain how you solved it?"<br>● "I noticed that..."“Your solution is different from/ the same as mine because..."“My mistake was to..."<br>● Incorporate written reflection, evaluation, and synthesis<br>● Allow creativity in expression and modeling solutions.<br><br>**Provide Multiple Means of Action and Expression**<br>● Encourage students to explain their reasoning both orally and in writing.<br>● Extend exploration of math topics by means of challenging games, puzzles, and brain teasers.<br>● Offer choices of independent or group assignments for early finishers.<br>● 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).<br>● Foster their curiosity about numbers and mathematical ideas. Facilitate research and exploration through discussion, experiments, internet searches, trips, etc.<br>● Have students compete in a secondary simultaneous competition, such as skip-counting by 5s, while peers are completing the sprint.<br>● Let students choose their mode of response: written, |

| | | |
|---|---|---|
| | are “just right” for learners but teach the same concepts.<br>● 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. | oral, concrete, pictorial, or abstract.<br>● Increase the pace. Offer two word problems to solve, rather than one.<br>● Adjust difficulty level by increasing the number of steps (e.g., change a one-step problem to a two- step problem).<br>● Adjust difficulty level by enhancing the operation (e.g., addition to multiplication), increasing numbers to millions, or decreasing numbers to decimals/fractions.<br>● Let students write word problems to show mastery and/or extension of the content.<br><br>**<u>Provide Multiple Means of Engagement</u>**<br><br>● 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.<br>● Celebrate improvement in completion time (e.g., Sprint A completed in 45 seconds and Sprint B completed in 30 seconds).<br>● Make the most of the fun exercises for practicing skip-counting.<br>● Accept and elicit student ideas and suggestions for ways to extend games.<br>● Cultivate student persistence in problem-solving and do not neglect their need for guidance and support |

**Math Unit - 6**

OVERVIEW

The kindergarten chapter of *A Story of Units* comes to a close with another opportunity for students to explore geometry. Throughout the year, students have built an intuitive understanding of two- and three-dimensional figures by examining exemplars, variants, and non-examples. They have used geometry as a context for exploring numerals as well as comparing attributes and quantities. To wrap up the year, students further develop their spatial reasoning skills and begin laying the groundwork for an understanding of area through composition of geometric figures.

Topic A begins with students applying their knowledge of attributes to analyze two- and three-dimensional shapes from the real world and construct models using straws and clay (**K.G.5**). "Let's use the straws to make the sides of the rectangle, and we'll stick the straws together at each corner using clay!" Students use their understanding of ordination to thirds to share and communicate the systematic construction of flats and solids. "First, I cut four straws to be the same length. Second, I made a square by placing the four straws so they look like a frame. Third, I connected the sides at the corners with four little clay balls" (**K.CC.4d**).

As in Module 2, students explore the relationship between flats and solids, this time using flats to build solids. "I made my square into a cube. First, I made another square the same size. Second, I attached the two squares with four straws the same length." They also apply their knowledge of ordinal numbers to describe the relative position of shapes within a set (**K.CC.4d**). "The yellow circle is first, and the red square is tenth."

The lessons of Topic B focus on composition and decomposition of flat shapes (**K.G.6**). Students begin by using flats to compose geometric shapes. "I put two triangles together to make a square." They then decompose shapes by covering part of a larger shape with a smaller shape and analyzing the remaining space. "When I cover part of my square with this triangle, I can see another triangle in the empty space."

As they build competence in combining and composing shapes, students build toward more complex pictures and designs. Students progress through stages as they build competence in combining shapes to form pictures: beginning with trial and error and gradually considering the systematic combination of components. "This square fits here because the corners match the puzzle." The culminating task of this module is set up as a Math Olympics, a celebration of student learning from the whole year. Students complete tasks related to number, measurement, operations, and geometry.

Composition and decomposition of geometric figures reinforce the idea that smaller units can combine to form larger units. This concept, central to *A Story of Units*, underlies not only area concepts but also the base ten number system. Students leave this module and the kindergarten year prepared to tackle the mathematical concepts of first grade and beyond.

**Rigorous Curriculum Design Template**

**Unit : 6 - Analyzing, Comparing, and Composing Shapes**

**Subject:** Math

**Grade/Course:** Kindergarten

**Pacing:** 10 days

**Unit of Study:** Unit : Analyzing, Comparing, and Composing Shapes

**Priority Standards**:

*Count to tell the number of objects.*

**K.CC.4** Understand the relationship between numbers and quantities; connect counting to cardinality.

**d.** Develop understanding of ordinal numbers (first through tenth) to describe the relative position and magnitude of whole numbers.

*Analyze, compare, create, and compose shapes.*

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

**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?"*

**Foundational Standards**

**PK.CC.6** Identify "first" and "last" related to order or position.

**PK.G.3** Analyze, compare, and sort two- and three-dimensional shapes and objects, in different sizes, using informal language to describe their similarities, differences, and other attributes (e.g., color, size, and shape).

**PK.G.4** Create and build shapes from components (e.g., sticks and clay balls).

**Math Practice Standards:**

**MP.1** Make sense of problems and persevere in solving them. Students persist in their use of trial and error until they begin to use the attributes of a puzzle to determine which shape fits into an open space. "The empty space has a long side like my triangle. Let's see if my triangle fits."

**MP.4** Model with mathematics. Students use shapes to create pictures of common objects and use straws and clay to create models of two- and three-dimensional objects in their environment.

**MP.6** Attend to precision. Ordinal numbers provide students with vocabulary to precisely describe the spatial organization of ten shapes in a straight line.

**MP.7** Look for and make use of structure. Students make use of their understanding of a shape's attributes to build three-dimensional shapes from two-dimensional shapes.

| **"Unwrapped" Standards** | |
|---|---|
| Understand the relationship between numbers and quantities; connect counting to cardinality.<br><br>Develop understanding of ordinal numbers (first through tenth) to describe the relative position and magnitude of whole numbers.<br><br>Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.<br><br>Compose simple shapes to form larger shapes. *For example, "Can you join these two triangles with full sides touching to make a rectangle?"* | |
| **Concepts (What Students Need to Know)** | **Skills (What Students Need to Be Able to Do) (Depth of Knowledge level (DOK))** |
| Relationship between numbers and quantities | Understand (DOK 2) |
| Counting to cardinality. | Connect (DOK 2) |
| Ordinal numbers (first through tenth) | Understand (DOK 2) |
| Relative position and magnitude of whole numbers. | Describe (DOK 2) |
| Shapes in the world (by building shapes from components (e.g., sticks and clay balls)) | Model (DOK 4) |
| Shapes. | Draw (DOK 2) |
| Simple shapes to form larger shapes. ( *For example, "Can you join these two triangles with full sides touching to make a rectangle?")* | Compose (DOK 4) |

| Essential Questions | Big ideas |
|---|---|
| ● What is a shape?<br>● Where can shapes be found in the world?<br>● How can you use different materials to make shapes? | ● Our world is made up of all different shapes.<br>● Attributes can be used to identify shapes.<br>● Shapes can be constructed of various components. |

| Assessments | | |
|---|---|---|
| Common Formative Pre-Assessments | Progress Monitoring Checks – "Dipsticks" | Common Formative Mid and or Post-Assessments |
| Exit tickets for each lesson | Application problems<br>Problem set data<br>Student debriefs | Mid module and end of module assessments<br><br>*See table below |

*Assessment Summary

| Type | Administered | Format | Standards Addressed |
|---|---|---|---|
| End-of-Module Assessment Task | After Topic B | Constructed response with rubric | K.CC.4d<br>K.G.5<br>K.G.6 |
| Culminating Task | Lesson 8 | Collaborative project: Review selected topics to create a cumulative year-end project. | K.G.6 |

| Performance Assessment/ Engaging Scenario (*To be completed by grade level team) |
| --- |
| **Overview:** |
| **Engaging Learning Experiences/ Performance Tasks** |
| Task 1:<br><br>Task 2:<br><br>Task 3:<br><br>Task 4: |

| Instructional Resources |
| --- |
| Suggested Children's Books<br><br>Selina and the Bear Paw Quilt<br>Barbara Smucker<br>Stoddart Kids, 2002<br><br>Spotted Yellow Frogs: Fold-out Fun with Patterns, Colors, 3-D Shapes, Animals<br>Matthew Van Fleet<br>Dial, 1998<br><br>The Quilt<br>Ann Jonas<br>Houghton Mifflin Harcourt, 1998<br><br>The Village of Round and Square Houses<br>Ann Grifalconi<br>Little, Brown, & Co., 1986<br><br>For additional books go to http://www.the-best-childrens-books.org/math-for-kids.html |

**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 Kindergarten Resources:

https://www.engageny.org/resource/kindergarten-mathematics

Eureka Math Module PDFs:

http://greatminds.net/maps/math/module-pdfs

North Carolina Standards Unpacked (scroll down and open Math Unpacking Standards- Kindergarten):

http://www.ncpublicschools.org/acre/standards/common-core-tools/

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

## Suggested Tools and Representations

- Pattern block activity cards or attribute block activity cards
- Three-dimensional shapes: cone, sphere, cylinder, and cube
- Two-dimensional shapes: circle, hexagon, rectangle, square, and triangle

| 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

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

| | |
|---|---|
| should be small enough to be effective and the strategy should be used in a systematic and consistent manner.<br>**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.<br>**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.<br>**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. | 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.<br><br>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.<br><br>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.<br><br>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 (IEPs) or Section 504 Accommodation Plans should be the first source of information for designing instruction for students with disabilities. The following 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:<br>● Enlarge sprint print for visually impaired learners.<br>● Use student boards to work on one calculation at a time.<br>● Invest in or make math picture dictionaries or word walls.<br><br>Provide Multiple Means of Action and Expression<br><br>● 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.<br>● 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.<br>● 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."<br>● Adjust wait time for interpreters of deaf and hard-of-hearing students.<br>● Select numbers and tasks that are "just right" for learners.<br>● Model each step of the algorithm before students begin.<br>● Give students a chance to practice the next day's sprint beforehand. (At home, for example.)<br>● Give students a few extra minutes to process the information before giving the signal to respond.<br>● Assess by multiple means, including "show and tell" rather than written.<br>● 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?”<br>● 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?”<br>● 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.<br><br>Provide Multiple Means of Engagement<br><br>● Make eye-to-eye contact and keep teacher-talk clear and concise. Speak clearly when checking answers for sprints and problems.<br>● 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.<br>● Teach in small chunks so students get a lot of practice with one step at a time.<br>● Know, use, and make the most of Deaf culture and sign language.<br>● Use songs, rhymes, or rhythms to help students remember key concepts, such as “Add your ones up first/Make a bundle if you can!”<br>● Point to visuals and captions while speaking, using your hands to clearly indicate the image that corresponds to your words.<br>● Incorporate activity. Get students up and moving, coupling language with motion, such as “Say ‘right angle’ and show me a right angle with your legs,” and “Make groups of 5 right now!” Make the most of the fun exercises for activities like sprints and fluencies. Conduct simple oral games, such as “Happy Counting.” Celebrate improvement. Intentionally highlight student math success frequently.<br>● Follow predictable routines to allow students to focus on content rather than behavior.<br>● Allow “everyday” and first language to express |

| | |
|---|---|
| | math understanding.<br>● Re-teach the same concept with a variety of fluency games.<br>● Allow students to lead group and pair-share activities.<br>● Provide learning aids, such as calculators and computers, to help students focus on conceptual understanding |

| New Vocabulary | Students Achieving Below Standard | Students Achieving Above Standard |
|---|---|---|
| New or Recently Introduced Terms<br>● First, second, third, fourth, fifth, sixth, seventh, eighth, ninth, tenth (ordinal numbers)<br>Familiar Terms and Symbols<br>● Above, below, beside, in front of, next to, behind (position words)<br>● Circle<br>● Cube (three-dimensional shape)<br>● Cylinder (three-dimensional shape)<br>● Face (two-dimensional side of a shape )<br>● Flat (two-dimensional shape)<br>● Hexagon (flat figure enclosed by six straight sides)<br>● Rectangle (flat figure enclosed by four straight sides)<br>● Solid (three-dimensional shape)<br>● Cone (three-dimensional shape)<br>● Sphere (three-dimensional shape)<br>● Square (flat figure enclosed by four straight, equal sides)<br>● Triangle (flat figure enclosed by three straight sides) | 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.<br><br>**<u>Provide Multiple Means of Representation</u>**<br><br>● Model problem-solving sets with drawings and graphic organizers (e.g., bar or tape diagram), giving many examples and visual displays.<br>● Guide students as they select and practice using their own graphic organizers and models to solve.<br>● Use direct instruction for vocabulary with visual or concrete representations.<br>● Use explicit directions with steps and procedures enumerated.<br>● Guide students through initial practice promoting gradual independence. “I do, we do, you do.”<br>● Use alternative methods of delivery of instruction such as recordings and videos that can be | The following 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.<br><br>**<u>Provide Multiple Means of Representation</u>**<br><br>● Teach students how to ask questions (such as,“Do you agree?” and “Why do you think so?”) to extend “think-pair-share” conversations.<br>● Model and post conversation “starters,” such as: “I agree because...” “Can you explain how you solved it?”<br>● “I noticed that...”“Your solution is different from/ the same as mine because...”“My mistake was to...”<br>● Incorporate written reflection, evaluation, and synthesis<br>● Allow creativity in expression and modeling solutions.<br><br>**<u>Provide Multiple Means of Action and Expression</u>**<br><br>● Encourage students to explain their reasoning both orally and in writing. |

| | | |
|---|---|---|
| | accessed independently or repeated if necessary.<br>● Scaffold complex concepts and provide leveled problems for multiple entry points.<br><br>**<u>Provide Multiple Means of Action and Expression</u>**<br><br>● First use manipulatives or real objects (such as dollar bills), then make transfer from concrete to pictorial to abstract.<br>● 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?'<br>● Encourage students to explain their thinking and strategy for the solution.<br>● Choose numbers and tasks that are "just right" for learners but teach the same concepts.<br>● 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. | ● Extend exploration of math topics by means of challenging games, puzzles, and brain teasers.<br>● Offer choices of independent or group assignments for early finishers.<br>● 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).<br>● Foster their curiosity about numbers and mathematical ideas. Facilitate research and exploration through discussion, experiments, internet searches, trips, etc.<br>● Have students compete in a secondary simultaneous competition, such as skip-counting by 5s, while peers are completing the sprint.<br>● Let students choose their mode of response: written, oral, concrete, pictorial, or abstract.<br>● Increase the pace. Offer two word problems to solve, rather than one.<br>● Adjust difficulty level by increasing the number of steps (e.g., change a one-step problem to a two- step problem).<br>● Adjust difficulty level by enhancing the operation (e.g., addition to multiplication), increasing numbers to millions, or decreasing numbers to decimals/fractions.<br>● Let students write word problems to show mastery and/or extension of the content.<br><br>**<u>Provide Multiple Means of Engagement</u>**<br><br>● 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.<br>● Celebrate improvement in completion time (e.g., Sprint A completed in 45 seconds and Sprint B completed in 30 seconds).<br>● Make the most of the fun exercises for practicing skip-counting.<br>● Accept and elicit student ideas and suggestions for ways to extend games.<br>● Cultivate student persistence in problem-solving and do not neglect their need for guidance and support |

Appendix A: Performance Assessment

**Engaging Scenario**

The school is going to be having a bake sale and the Kindergarten is in charge of making the apple treats to sell. We will be making apple pies, applesauce, and apple crisp. Each treat is going to require certain amounts of apples. In order to make these treats we will need to get the apples ready and then get the treats ready for the bake sale.

Suggested children's books:
Apple Pie Tree by Zoe Hall
Apple Pigs by Ruth Orbach
10 Apples on Top by Theo LeSieg

**Task 1**
*Description*:
The teacher will explain that the apples they will be using to create their apple treats for the bake sale have gotten mixed together and need to be sorted into groups. The teacher will hand out individual bags of precut paper apples. The students will sort the apples into groups (either by color or size) and then explain to the class how they sorted them and why they chose to sort them this way. They will then record their method for sorting in a class graph.

*Standard*: K.MD.3

*Materials required*:

- pre-cut paper apples in assorted colors (red, green, yellow) and sizes (large and small)
- ziploc bags or some other container to hold the individual groups of pre-cut apples
- chart paper to create the class graph on

*Rubric*

| |
|---|
| 4. Exemplary:<br>All "proficient" criteria, plus the following:<br>Sorts apples in more than one way. |
| 3. Proficient:<br>Accurately sorts apples.<br>Is able to explain to the class the type of sort.<br>Correctly includes information to class graph. |
| 2. Progressing:<br>Meets 1 or 2 of the proficient criteria. |
| 1. Beginning:<br>Meets none of the criteria.<br>Needs help completing this task. |

**Task 2**

*Description*

The teacher will explain to the class that the bake sale will need 10 apple pies. The pies that they make for the bake sale need to be displayed in numerical order to ensure that all of the pies are accounted for. The class will then be given a page with 10 apple pies on it and the students will need to cut them out, rearrange the pies into sequential order and glue them down. After they have glued the pies down they need to write the number under the pie.

*Standard*: K.CC.3

*Materials required*

- Work sheet with the pictures of the apple pies on it for the students to cut apart
- scissors
- glue
- pencil or other writing utensil
- separate sheet of paper for the apple pies to be glued to in sequential order

*Rubric*

| |
|---|
| 4. Exemplary:<br>All "proficient" criteria, plus the following: |

| |
|---|
| Write the name of the number as well as write the number (ex. “one” under/next to “1”). |
| 3. Proficient:<br>Cut out the pictures.<br>Glue the pictures into numerical sequential order.<br>Write the number under the matching apple pie. |
| 2. Progressing:<br>Meets 1 or 2 of the proficient criteria. |
| 1. Beginning:<br>Meets none of the criteria.<br>Needs help completing this task. |

| | | |
|---|---|---|
|  |  |  |
| **1** | **8** | **4** |

| | | |
|---|---|---|
|  |  |  |
| **3** | **5** | **7** |
|  |  |  |
| **2** | **9** | **10** |
|  | | |
| **6** | | |

**Task 3**

*Description*

The teacher will explain that the containers of applesauce are going to displayed in various groups and that the students need to count the groups so that the person buying the group will know how much applesauce they are buying. After they count the group they need to write the number in the box with the applesauces.

*Standard*: K.CC.4 a,b,c, K.CC.5

*Materials required*

- Worksheet with the groups of applesauce.
- pencil or other writing utensil

*Rubric*

| |
|---|
| 4. Exemplary: |

| |
|---|
| All “proficient” criteria, plus the following:<br>On the back of the page the student draws a new group of applesauce containers, writes the number of containers and shares with the class their drawing and number. |
| 3. Proficient:<br>Counts the groups of applesauce correctly.<br>Writes the correct number with each group. |
| 2. Progressing:<br>Meets 1 of the proficient criteria. |
| 1. Beginning:<br>Meets none of the criteria.<br>Needs help completing this task. |

Name: _____

Count the groups of applesauce and write the correct number on the line.

| | |
|---|---|
|    |   <br>_____ |

| _____ | |
|---|---|
|  <br>_____ |  <br>_____ |

**Task 4**

*Description*

The teacher will explain to the students that when they get the apple crisp ready for the bake sale they will be given a container of apples and need to break them into 2 groups, which will then decide how big each batch of apple crisp will be. Once they have divided the apples into two groups they need to record on their dry erase board (with either pictures or numbers) the groups they have created. If there is time they should then try and divide the apples into two new groups, and record the new group as well. Once everyone has completed their apple groups the class will move around the room to see what groups their peers have created. Also the teacher will record the various combinations on the class dry erase board.

*Standard*: K.OA.3

*Materials required*

- pre-cut paper apples
- ziploc bags or some other container to hold the individual groups of pre-cut apples
- individual dry erase boards and class dry erase board
- dry erase markers and erasers

*Rubric*

| |
|---|
| 4. Exemplary:<br>All "proficient" criteria, plus at least one of the following:<br>Record the groups with both pictures and numbers.<br>Create multiple combinations using the apples. |
| 3. Proficient:<br>Sort the apples into two groups.<br>Record their groups on the dry erase boards, with either pictures or numbers. |
| 2. Progressing:<br>Meets 1 or 2 of the proficient criteria. |
| 1. Beginning:<br>Meets none of the criteria.<br>Needs help completing this task. |

Appendix B: Three representative sample CFA's

Exit Ticket, Module 1, Lesson 14

Name _____ Date _____

Color the apples to show that 3 = 2 + 1.

How many apples are there altogether? _____

3 is the same as _____ and _____.

3 apples = _____ apples + _____ apple



Mid-Module Assessment Task, Module 1

Student Name: _____

**Topic A: Attributes of Two Related Objects**

Rubric Score: _____ Time Elapsed: _____

| | Date 1 | Date 2 | Date 3 |
|---|---|---|---|
| Topic A | | | |
| Topic B | | | |
| Topic C | | | |
| Topic D | | | |

Materials: (S) Module 1 assessment picture cards (cut out)

T: (Identify the pictures as you place them in a row before the student.) Show me the pictures that are exactly the same.

T: How are they exactly the same?

T: Show me something that is *the same but* a little different.

T: Use your words, "They are the same, but…" to tell me how the bears are different.

| What did the student do? | What did the student say? |
|---|---|
| | |

**Topic B: Classify to Make Categories and Count**

Rubric Score: _____ Time Elapsed: _____

Materials: (S) Module 1 assessment picture cards (cut out), sorting mat

T: (Place all of the cards before the student.) Please sort the pictures into two groups on your sorting mat. (After sorting, have the student explain her reasoning.)

T: (Point to the objects that went in the backpack.) Count the things that are in this group. (Look for the student to answer "3" rather than "1, 2, 3." If the student recounts to find the answer, ask again.)

Set the sort aside for the Topic D assessment.

| What did the student do? | What did the student say? |
|---|---|
| | |

**Topic C: Numbers to 5 in Different Configurations, Math Drawings, and Expressions**

Rubric Score: _____ Time Elapsed: _____

Materials: (S) 10 linking cubes

T: (Put 5 loose cubes in front of the student.) Whisper-count as you put the cubes into a line. How many cubes are there?

T: (Move the cubes into a circle.) How many cubes are there?

T: (Scatter the cubes.) How many cubes are there?

T: Please show this (show 2 + 1) using your cubes. (Have the student explain what she does. We might expect the student to make a linking cube stick of 3 and break it into two parts.)

| What did the student do? | What did the student say? |
|---|---|
| | |

**Topic D: The Concept of Zero and Working with Numbers 0–5**

Rubric Score: _____ Time Elapsed: _____

Materials: (S) Sort from Topic B (remove one identical bear for this assessment task so that there are 5 toys and 3 school items), numeral writing sheet

Note: Arrange the pictures as shown to the right. This arrangement is intended to give the student the opportunity to see 5 as *3 and some more*, without recounting all.

T: How many things for school do you see? (Point to the top row.)

T: (Point to the second row.) These are things we don't usually bring to school. How many are in this group? (Note if the student recounts all or determines the set of 5 using the set of 3 in any way.) How do you know it is 5?

T: How many cats are shown here?

T: Write your numbers in order from 0 to 5. (Note reversals, if any.)

T: Write the number that tells how many toys there are.

| What did the student do? | What did the student say? |
|---|---|
| Did the student show evidence of subitizing or recognizing embedded numbers, seeing 5 as 2 and 3 or 4 and 1? | |



© 2014 Common Core, Inc. All rights reserved. commoncore.org

**Mid-Module Assessment Task Standards Addressed** **Topics A–D**

**Know number names and the count sequence.**

**K.CC.3** Write numbers from 0 to 20. Represent a number of objects with a written numeral 0–20 (with 0 representing a count of no objects).

**Count to tell the number of objects.**

**K.CC.4** Understand the relationship between numbers and quantities; connect counting to cardinality.

a. When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.

b. 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.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.

**Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.**

**K.OA.3** Decompose numbers less than or equal to 10 into pairs in more than one way, by using objects or drawings, and record each decomposition by a drawing or equation (e.g., 5 = 2 + 3 and 5 = 4 + 1).

**Classify objects and count the number of objects in each category.**

**K.MD.3** Classify objects into given categories; count the numbers of objects in each category by count. (Limit category counts to be less than or equal to 10.)

## Evaluating Student Learning Outcomes

A Progression Toward Mastery is provided to describe and quantify steps that illuminate the gradually increasing understandings that students develop *on their way to proficiency*. In this chart, this progress is presented from left (Step 1) to right (Step 4). The learning goal for each student is to achieve Step 4 mastery. These steps are meant to help teachers and students identify and celebrate what the student can do now, and what they need to work on next.


© 2014 Common Core, Inc. All rights reserved. commoncore.org

| A Progression Toward Mastery | | | | |
|---|---|---|---|---|
| Assessment Task Item | STEP 1 Little evidence of reasoning without a correct answer. (1 Point) | STEP 2 Evidence of some reasoning without a correct answer. (2 Points) | STEP 3 Evidence of some reasoning with a correct answer or evidence of solid reasoning with an incorrect answer. (3 Points) | STEP 4 Evidence of solid reasoning with a correct answer. (4 Points) |
| Topic A<br>K.MD.3 | The student shows little evidence of identifying or explaining similarities or differences. The student is almost non-responsive. | The student shows evidence of beginning to identify similarities and differences, but is unable to explain those similarities or differences using words. | The student correctly identifies both sets of bears, but provides a partial explanation of how the bears are similar or different.<br>Or, the student can explain the similarities and differences, but cannot identify one of the sets of bears.<br>(ELLs may point to express their insights and gain a score of 3 if their understanding is clear.) | The student correctly:<br>• Identifies the two large bears as being identical.<br>• Identifies similarities by attribute (size, color, type, etc.).<br>• Explains, in words, how the two bears differ either based on size or shade. |
| Topic B<br>K.CC.4a<br>K.CC.4b<br>K.MD.3 | The student shows little evidence of understanding how to sort or what reasonable categories might be.<br>The student is unable to answer *3* or count correctly. | The student shows a beginning understanding of how to sort (with some misplaced items) and demonstrates early explanation skills with incomplete reasoning.<br>The student recounts to answer *1, 2, 3*. | The student correctly sorts the pictures into two clearly distinct categories, but cannot provide a reasonable explanation of the categories or why the items belong.<br>Or, the student provides a reasonable explanation of the categories, but sorts incorrectly.<br>The student is able to answer *3* without recounting. | The student correctly:<br>• Sorts the pictures into two distinct categories.<br>• Provides a reasonable explanation outlining the sorting categories and why the items belong (e.g., things we keep at home, things we need to bring to school).<br>• The student is able to answer *3* without recounting. |

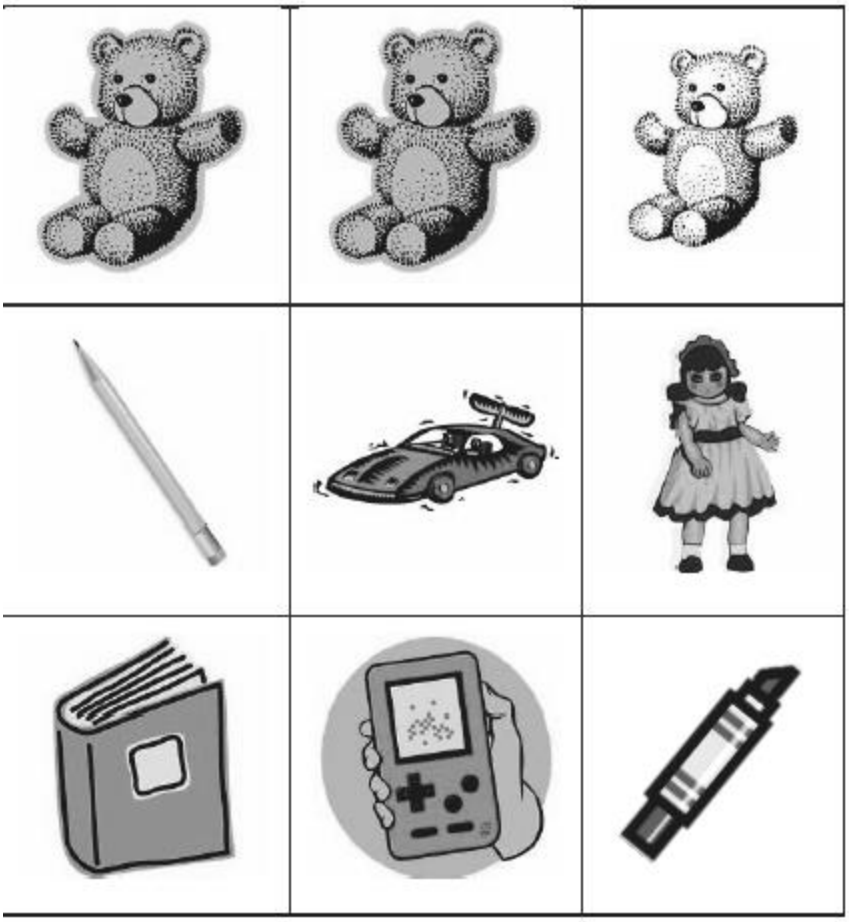
| A Progression Toward Mastery | | | | |
|---|---|---|---|---|
| **Topic C**<br><br>K.CC.4a<br>K.CC.4b<br>K.CC.5<br>K.OA.3<br>K.MD.3 | The student shows little evidence of understanding how to count objects in any configuration, and is unable to complete the addition task. | The student shows evidence of beginning to understand counting in a line, circle, and scattered configuration, but is unable to do so accurately and consistently. Student recounts each time.<br>The student attempts to add 2 + 1, but either lacks an understanding of how to add or how to interpret the expression. | The student arranges and counts cubes in a line, circle, and scattered configuration correctly, responding with *5* to each *how many* question, but recounts once.<br>The student adds 2 + 1, but cannot explain how to add; or, the student accurately explains the process of addition, but adds 2 + 1 incorrectly. | The student correctly:<br>• Arranges and counts 5 cubes into a line, circle, and scattered configuration.<br>• Answers *5* in response to each *how many* question without recounting.<br>• Breaks apart 3 to show the decomposition of 3 as 2 and 1 or 1 and 2. |
| **Topic D**<br><br>K.CC.3<br>K.CC.4a<br>K.CC.4b<br>K.CC.5 | The student shows little evidence of understanding how to count items in a category.<br>The student is beginning to form some numbers. | The student shows evidence of beginning to understand counting items in a category.<br>The student is unsure of the word and meaning of *zero*.<br>The student writes some numerals correctly, with reversals. | The student correctly counts the items in each category. The student gives some explanation about how she knows there are 5 toys but is unclear in her explanation (e.g., "I just know").<br>The student answers *none* when asked about the cats.<br>The student writes four out of six numerals correctly, with a maximum of one reversal. | The student correctly:<br>• Identifies the number of items in each category (counting all in the toy category is acceptable).<br>• Gives a reasonable answer as to how he knows there are 5 toys (e.g., "I counted them all one at a time," or "I knew it was 3 up to the doll, then I just counted 2 more toys").<br>• Understands and uses the word *zero* when asked how many cats there are.<br>• Writes numerals 0–5. |



© 2014 Common Core, Inc. All rights reserved. commoncore.org

| Class Record Sheet of Rubric Scores: Module 1 | | | | | |
|---|---|---|---|---|---|
| **Student Names:** | **Topic A:** Attributes of Two Related Objects | **Topic B:** Classify to Make Categories and Count | **Topic C:** Numbers to 5 in Different Configurations, Math Drawings, and Expressions | **Topic D:** Concept of Zero and Working with Numerals 0–5 | **Next Steps:** |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

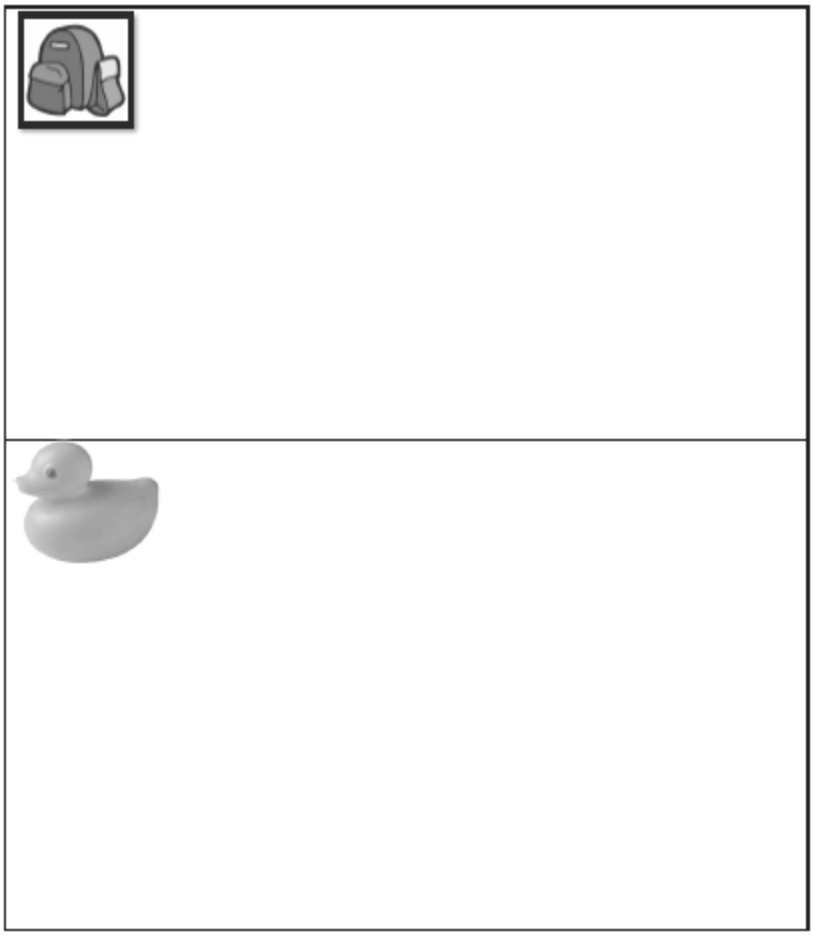
Module 1 Assessment Picture Cards





© 2014 Common Core, Inc. All rights reserved. commoncore.org

Sorting Mat




© 2014 Common Core, Inc. All rights reserved. commoncore.org

Student Name _____

Numeral Writing

| | | | | |
|---|---|---|---|---|
| | | | | |


© 2014 Common Core, Inc. All rights reserved. commoncore.org

End of Module Assessment Task, Module 1



Student Name: _____

Topic E: **Working with Numbers 6–8 in Different Configurations**

Rubric Score: _____ Time Elapsed: _____

| | Date 1 | Date 2 | Date 3 |
|---|---|---|---|
| Topic E | | | |
| Topic F | | | |
| Topic G | | | |
| Topic H | | | |

Materials: (S) 10 linking cubes (or other familiar classroom object)

T: Please count 6 linking cubes, and put them in a row. (Pause.) Write the numeral 6.

T: (Arrange 7 cubes in a circular configuration.) Please count the cubes. (Pause.) Write the number 7. Show me the 5-group that's hiding in this group of cubes.

T: (Arrange 8 cubes into an array of 4 and 4.) How many cubes are there now? (Pause.) How did you know there were that many?

| What did the student do? | What did the student say? |
|---|---|
| 1. | |
| 2. | |
| 3. | |

**Topic F: Working with Numbers 9–10 in Different Configurations**

Rubric Score: _____ Time Elapsed: _____

Materials: (S) 12 linking cubes (or other familiar classroom object), woods template

T: Now, let's pretend these cubes are bears! Show me this problem: There were six bears who were eating leaves here in the woods. (Pause.) Three more bears came over to snack on some leaves. How many bears were eating leaves in the woods?

T: Use your words to tell me how you figured out the problem.

T: Write the number that tells how many bears there are eating leaves.

T: Another bear came. Show me the bears now. How many bears is that? Write that number.

| What did the student do? | What did the student say? |
|---|---|
| 1. | |
| 2. | |
| 3. | |
| 4. | |

**Topic G: *One More Than* with Numbers 0–10**

Rubric Score: _____ Time Elapsed: _____

Materials: (T) 5-group cards (Lesson 7 Template, numeral side: 7, 8, and 9), 5-group card (Lesson 7 Template, dot side), 10 cubes

T: (Hold up the card showing 4 dots.) Use the cubes to show me the number of cubes that is 1 more than this.

T: (Hold up the card showing the numeral 7.) Use the number cards to show me the numeral that's 1 more. How did you learn that?

T: Put these numeral cards in order from smallest to greatest. (Hand the students the 7, 8, and 9 cards out of order.)

| What did the student do? | What did the student say? |
|---|---|
| 1. | |
| 2. | |
| 3. | |



© 2014 Common Core, Inc. All rights reserved. commoncore.org

**Topic H: *One Less Than* with Numbers 0–10**

Rubric Score: _____ Time Elapsed _____

Materials: (T) 5-group cards (Lesson 7 Template), 10 counting objects

T: (Place 10 objects in an array of two 5-groups.) How many objects are there? (Note how the student counts.) Show 1 less. Write how many you have now.

T: (Put the number cards in order from 10 to 1. Turn over the numbers 9, 7, 5, and 2.) Touch and tell me the hidden numbers. Don't turn over the cards, though!

T: (Place the 9, 7, 5, and 2 dot cards in a line out of order.) Match the dot cards to the hidden numbers. Turn over the hidden card when you are sure you have matched it.

| What did the student do? | What did the student say? |
|---|---|
| 1.<br><br>2.<br><br>3. | |



© 2014 Common Core, Inc. All rights reserved. commoncore.org

**End-of-Module Assessment Task Standards Addressed** **Topics E–H**

**Know number names and the count sequence.**

K.CC.3 Write numbers from 0 to 20. Represent a number of objects with a written numeral 0–20 (with 0 representing a count of no objects).

**Count to tell the number of objects.**

K.CC.4 Understand the relationship between numbers and quantities; connect counting to cardinality.

a. When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.

b. 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.

c. Understand that each successive number name refers to a quantity that is one larger.

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.

## Evaluating Student Learning Outcomes

A Progression Toward Mastery is provided to describe and quantify steps that illuminate the gradually increasing understandings that students develop *on their way to proficiency*. In this chart, this progress is presented from left (Step 1) to right (Step 4). The learning goal for each student is to achieve Step 4 mastery. These steps are meant to help teachers and students identify and celebrate what the student can do now, and what they need to work on next.


© 2014 Common Core, Inc. All rights reserved. commoncore.org

| A Progression Toward Mastery | | | | |
|---|---|---|---|---|
| Assessment Task Item | STEP 1 Little evidence of reasoning without a correct answer. (1 Point) | STEP 2 Evidence of some reasoning without a correct answer. (2 Points) | STEP 3 Evidence of some reasoning with a correct answer or evidence of solid reasoning with an incorrect answer. (3 Points) | STEP 4 Evidence of solid reasoning with a correct answer. (4 Points) |
| Topic E<br>K.CC.3<br>K.CC.4a<br>K.CC.4b<br>K.CC.5<br>K.MD.3 | The student shows little evidence of writing or counting numerals, no understanding of the 5-group, and is almost non-responsive. | The student inconsistently counts the cubes. The student may or may not say and write the correct number.<br>The student is unable to identify the 5-group and is unable to state a reason why she knows there are 8 cubes. | The student correctly counts and states the number of cubes (with more time elapsed), but struggles with writing the numerals and identifying the 5-group.<br>The student is able to verbalize how she knows there are 8 cubes, but is unclear in her explanation. | The student correctly:<br>• Counts the linking cubes and puts them in a row. Writes the number 6.<br>• Counts to 7 in the circular configuration, writes the number 7, and identifies the 5-group.<br>• Counts 8 cubes and gives a reasonable answer to how she knows there are 8 (e.g., "I counted all of the cubes one at a time," or "I see 4 on top and 4 on the bottom, and I know 4 and 4 is 8"). |
| Topic F<br>K.CC.3<br>K.CC.4a<br>K.CC.4b<br>K.CC.5 | The student shows little evidence of understanding zero or how to solve *put together with result unknown* problems. Numbers are illegible. | The student shows an early understanding of how to solve *put together with result unknown* problems and demonstrates weak explanation skills with incomplete reasoning. The student has difficulty counting and writing the numbers. | The student completes three of the four tasks. For example, the student solves the *put together with result unknown* problem, but cannot clearly explain his thinking. He correctly writes the numbers. | The student correctly:<br>• Solves the *put together with result unknown* problem using cubes.<br>• Explains thinking, citing the solution process.<br>• Writes the number 9 and adds 1 more bear and says and writes *10*. |



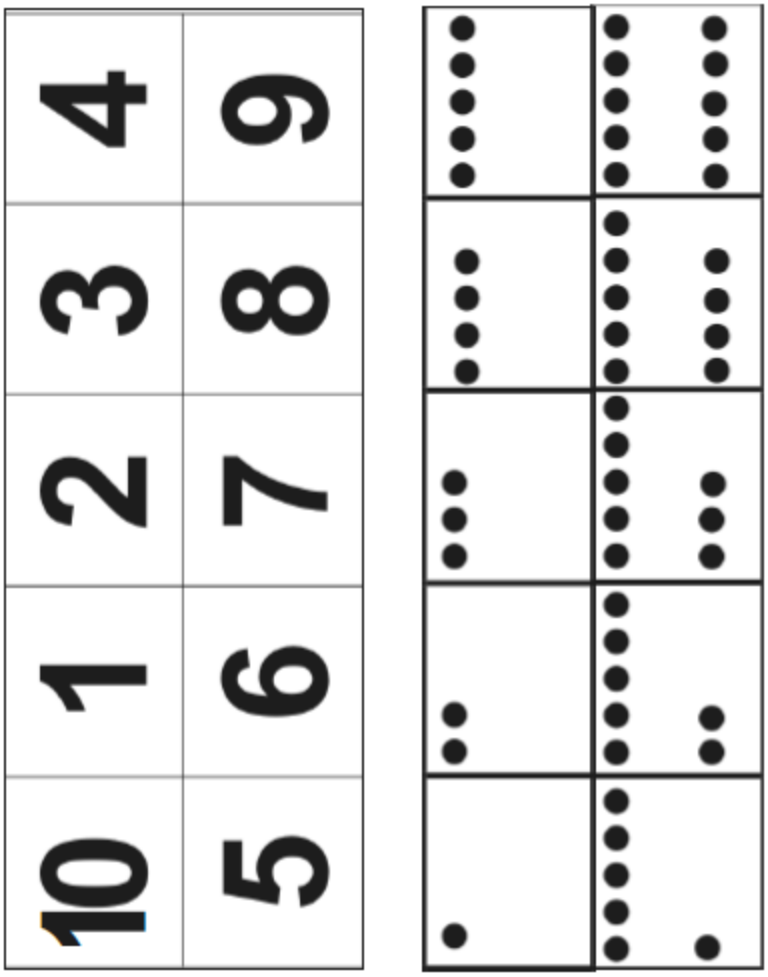
© 2014 Common Core, Inc. All rights reserved. commoncore.org

| A Progression Toward Mastery | | | | |
|---|---|---|---|---|
| Topic G<br><br>K.CC.4a<br>K.CC.4b<br>K.CC.4c<br>K.CC.2<br>K.CC.5 | The student shows little evidence of understanding *1 more*, or is unable to complete the task. | The student shows evidence of beginning to understand that *1 more* is the next number in the counting sequence, but requires support to recall and apply the concept. | The student accurately completes two of the tasks. For example, the student identifies 5 as 1 more than the 4 dot card, but is unable to identify 7 as 1 more than the numeral 6, and puts 7, 8, 9 in order.<br>Or, the student accurately identifies 7 as 1 more than the numeral 6 and identifies 1 more than the 4 dots, but is unable to put the number cards in order. | The student correctly:<br>• Identifies the numeral 5 as 1 more than the 4 dots pictured on the dot card.<br>• Identifies 7 as 1 more than the numeral 6.<br>• Places 7, 8, and 9 in order. |
| Topic H<br><br>K.CC.4a<br>K.CC.4b<br>K.CC.4c<br>K.CC.5 | The student shows little evidence of understanding organized counting, numeral writing, and matching concrete objects (dots) to the corresponding abstract numeral and/or cannot complete most of the tasks. | The student shows evidence of beginning to understand, but miscounts. The student struggles with one-to-one correspondence. She might show 1 less, but is confused and has difficulty counting and writing how many are left. She may or may not say and write *9*.<br>The student is able to say and match dot cards to some of the hidden numbers, but not all of them. When the student turns over the hidden numbers, she moves the dot cards to the correct place, but is unable to complete the task unless all the numbers are showing. | The student correctly counts and states that there are 10 objects, removes 1 when asked to show 1 less, and writes and says *9*, but struggles with counting and writing of the numeral 9. More time elapsed.<br>The student touches the hidden numbers and correctly says *2, 5, 7, 9*, and correctly matches the dot cards to the number cards, but recounts often and looks to the teacher for support. More time elapsed. | The student correctly:<br>• Gives 10 as an answer. Shows 1 less by removing 1 object and writes and says *9*.<br>• Identifies by touching the hidden number card and says *2, 5, 7, 9*.<br>• Matches the dot cards to his corresponding hidden number card. Turns over the number cards after the dot cards are in place. |


© 2014 Common Core, Inc. All rights reserved. commoncore.org

| Class Record Sheet of Rubric Scores: Module 1 | | | | | |
|---|---|---|---|---|---|
| **Student Names:** | **Topic E:** Working with Numbers 6–8 in Different Configurations | **Topic F:** Working with Numbers 9–10 in Different Configurations | **Topic G:** *One More Than* with Numbers 0–10 | **Topic H:** *One Less Than* with Numbers 0–10 | **Next Steps:** |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |


© 2014 Common Core, Inc. All rights reserved. commoncore.org





© 2014 Common Core, Inc. All rights reserved. commoncore.org

Appendix C - Three Representative Model Lessons

Please note that the exit ticket will be used as a pre-assessment as well as the daily end of lesson assessment.

Module 1, Lesson 9



## Lesson 9

Objective: Within linear and array dot configurations of numbers 3, 4, and 5, find *hidden partners*.

**Suggested Lesson Structure**

| | |
|---|---|
| Fluency Practice | (12 minutes) |
| Application Problem | (7 minutes) |
| Concept Development | (20 minutes) |
| Student Debrief | (11 minutes) |
| **Total Time** | **(50 minutes)** |

### Fluency Practice (12 minutes)

- Hands Number Line to 5 K.CC.4a (4 minutes)
- 5-Frame Peek-a-Boo K.CC.5 (4 minutes)
- Roll, Count, Show K.CC.4a (4 minutes)

**Hands Number Line to 5 (4 minutes)**

Materials: (S) Left hand mat (Lesson 1 Fluency Template), bag of beans or small counters

Conduct the activity as outlined in Lesson 2.

Continue this process to 5. Then, guide students to recognize the group of 5 on one hand. Ask questions such as, "Are you showing me all of your fingers on one hand? How many is that? So, how many fingers do you have on the other hand?"

**5-Frame Peek-a-Boo (4 minutes)**

Materials: (T) Large 5-group cards (Lesson 8 Fluency Template)

T: I'm going to show you my 5-group cards, but only for a second! Like this (hold up the card briefly and then quickly take it out of view). Quickly count the dots, and raise your hand when you know how many. Remember to wait for the snap. (Wait for all students to raise hands, and then give the signal.)

S: 1!

Work within numbers to 3 at first, and as students demonstrate mastery, introduce 4 and 5. A possible sequence is 1, 2, 1, 2, 3, 2, 3, 4, 3, 2, 3, 2, 3, 4, 5, 4, 5, 4, 3. Then, say numbers randomly.



© 2014 Common Core, Inc. All rights reserved. commoncore.org

### Roll, Count, Show (4 minutes)

Materials: (S) 1 die with the 6 dot side replaced with 0 (cover with a piece of mailing label), 5-group cards (Lesson 7 Template, numeral side)

1. Roll the die.
2. Touch and count the dots.
3. Find the numeral card with that many dots.
4. Repeat (or verify with partner).

## Application Problem (7 minutes)

Draw a caterpillar pet that has 4 different parts. Show your pet to a friend.

Note: This is a classic sequence of concrete to pictorial. They *made* a caterpillar yesterday with cotton balls, and today they draw one.

**NOTES ON MULTIPLE MEANS OF REPRESENTATION:**

When giving directions for the Application Problem, show a picture of a caterpillar to assist your English language learners and special needs students in understanding your directions.

## Concept Development (20 minutes)

Materials: (S) 2 linking cube sticks of 5, hidden partners (Lesson 9 Template) per pair

T: We are going to be builders today! Count with me as I build this tower. (Build a tower of 5, one block at a time, with the linking cubes.)

S: 1, 2, 3, 4, 5.

T: This is a tall tower. I'm going to break it to find **hidden partners** inside. (Break off two.)

T: What do you notice? Talk to your partner.

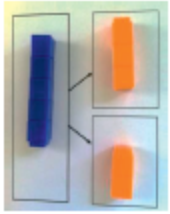
S: One tower has 2 small cubes. → One of the towers has 3 cubes. → There is a 3 tower and a 2 tower inside the 5 tower! → Those must be the hidden partners. → They were hiding inside the 5!

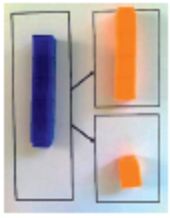
T: Here is a tower of 5 for you. Break it the same way I broke mine. (Let them investigate.)

T: Put your tower together again. Can anyone find different hidden partners inside the 5?

S: If you take 1 block off the top you will find the partners 4 and 1.

Continue finding hidden partners with 4 blocks and 3 blocks.







© 2014 Common Core, Inc. All rights reserved. commoncore.org

Have students go back to their seats, and pass out another linking cube tower of 5 and hidden partners template for each pair of students.

T: Build a tower of 5, and put it inside the large box on the left. Take your other linking cube tower of 5. Does it have the same number of cubes as the other tower?

S: Yes.

T: Break it into two hidden partners that together make 5.

Guide students to then do the same with two towers of 4 and two towers of 3. Circulate and encourage them to notice the hidden partners.

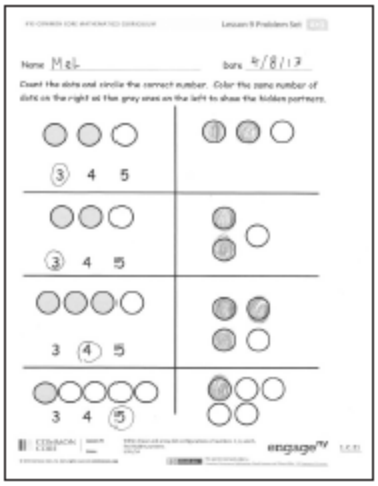
**NOTES ON MULTIPLE MEANS FOR ACTION AND EXPRESSION:**

Challenge students performing at or above grade level who finish early to try the same exercise with a tower of 6.

### Problem Set (5 minutes)

Students should do their personal best to complete the Problem Set within the allotted time.

Go over the directions one step at a time. Remind students to count all of the dots, not just the gray ones.




## Student Debrief (11 minutes)

**Lesson Objective:** Within linear and array dot configurations of numbers 3, 4, and 5, find *hidden partners*.

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.

- What **hidden partners** of 3 do you see inside the first example on the Problem Set? (Go through each example.)
- What numbers are hiding inside 5?
- Show me 5 the Math Way. Show me 3 fingers inside. 4 fingers.
- Talk to your partner about our lesson today. What did you learn?



© 2014 Common Core, Inc. All rights reserved. commoncore.org

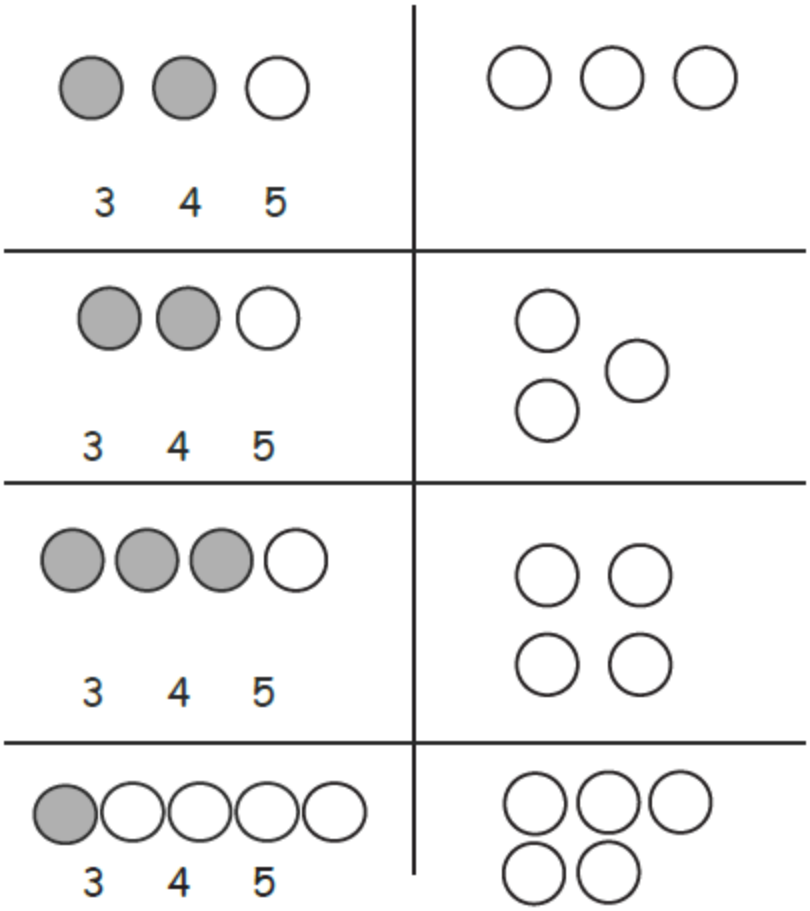
### Exit Ticket (3 minutes)

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.


© 2014 Common Core, Inc. All rights reserved. commoncore.org

Name _____ Date _____

Count the dots, and circle the correct number. Color the same number of dots on the right as the gray ones on the left to show the hidden partners.

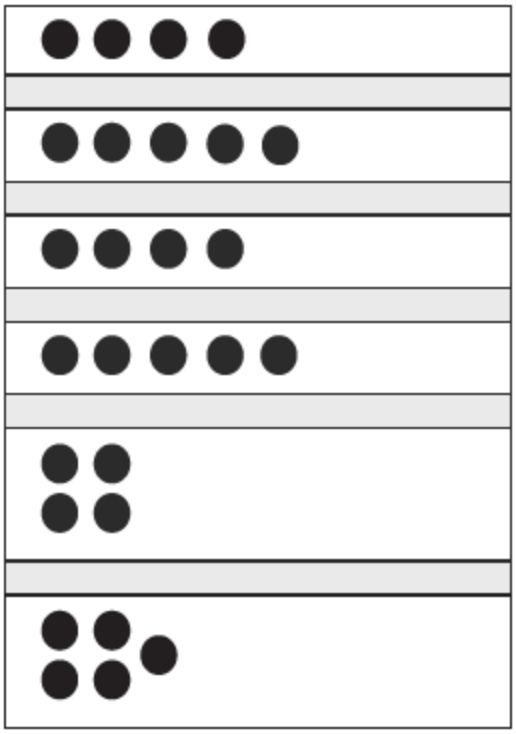




© 2014 Common Core, Inc. All rights reserved. commoncore.org

Name _____ Date _____

Circle 3 to show the hidden partners.

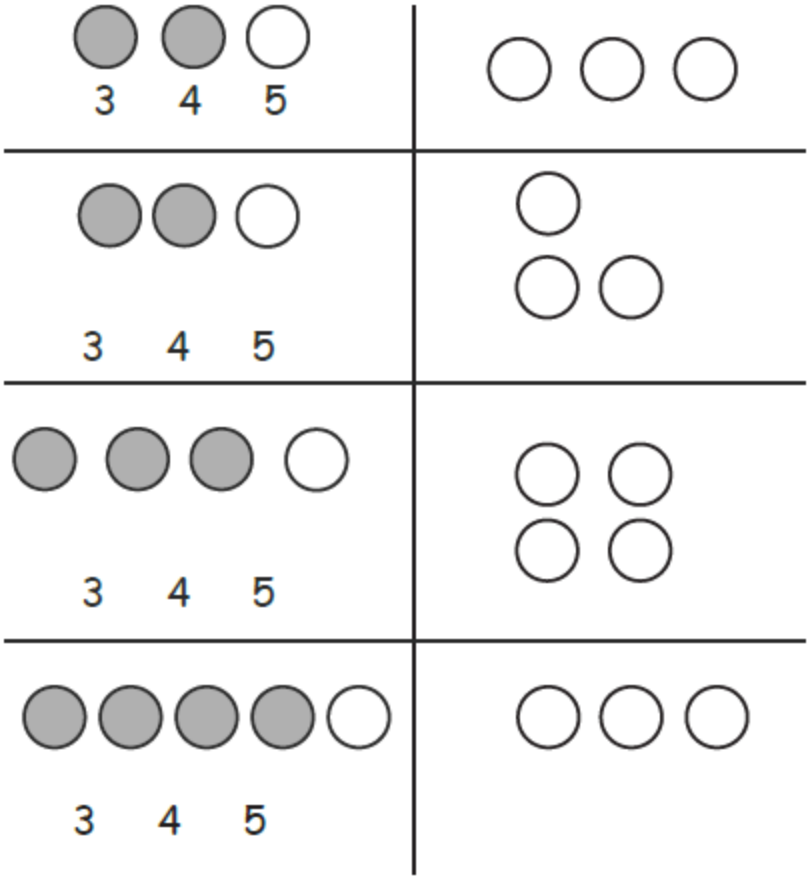




© 2014 Common Core, Inc. All rights reserved. commoncore.org

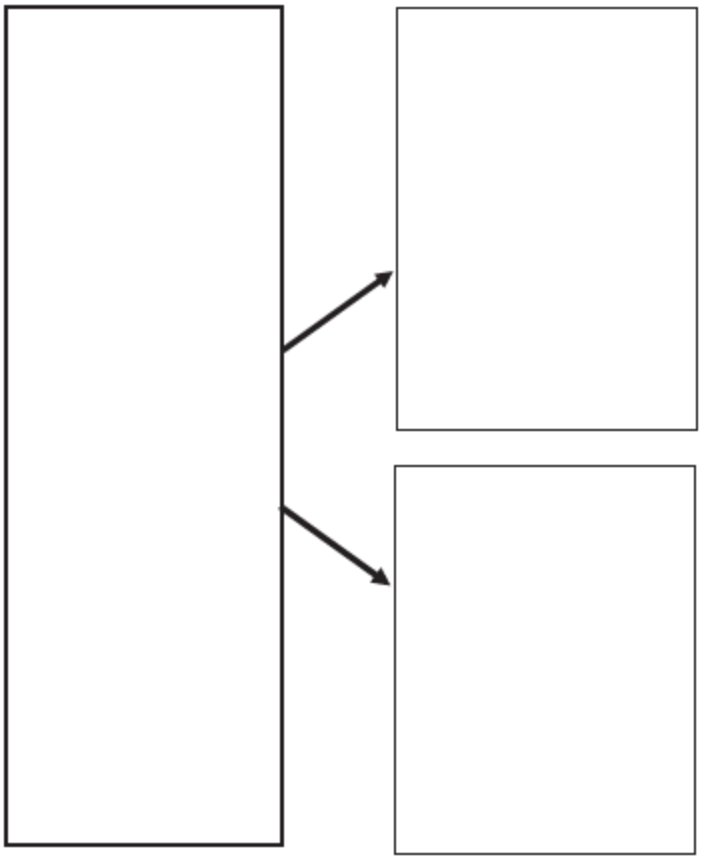
Name _____ Date _____

Count the circles, and box the correct number. Color in the same number of circles on the right as the shaded ones on the left to show hidden partners.






© 2014 Common Core, Inc. All rights reserved. commoncore.org



hidden partners



© 2014 Common Core, Inc. All rights reserved. commoncore.org

Module 3, Lesson 25

Please use the homework from this lesson as the pre-assessment and as an exit ticket.



## Lesson 25

Objective: Match and count to compare a number of objects. State which quantity is more.

**Suggested Lesson Structure**

| | |
|---|---|
| Fluency Practice | (12 minutes) |
| Application Problem | (3 minutes) |
| Concept Development | (27 minutes) |
| Student Debrief | (8 minutes) |
| **Total Time** | **(50 minutes)** |

### Fluency Practice (12 minutes)

- Beat Your Score! K.CC.4b (12 minutes)

**Beat Your Score! (12 minutes)**

Materials: (S) 2 copies of *count and circle how many* (Lesson 20 Sprint)

Note: The purpose of this activity is to help students become accustomed to the full Sprint routine while completing a task involving relatively simple concepts (hence the reuse of a Sprint from Lesson 20). This activity builds confidence and enthusiasm for Sprints.

T: It's time for a Sprint! (Briefly recall previous Sprint preparation activities, and distribute Sprints facedown.) Take out your pencil and one crayon, any color.

T: On your mark, get set, go!

S: (Work.)

T: (Ring the bell or give another signal for students to stop. Although it will not be necessary to time the students in this short practice Sprint, be sure to give the stop signal before students finish so they do not develop the expectation of finishing every time.) Pencils up!

T: Pencils down, crayons up!

T: It's time to check answers. What do you do if the answer is right?

S: Circle it. (Circling correct answers instead of crossing out wrong ones avoids stigmatization.)

T: What do you say?

S: Yes!

T: We'll begin with the hearts. Ready? 1.

S: Yes!



© 2014 Common Core, Inc. All rights reserved. commoncore.org

Proceed through the checking answers procedure as in Lesson 21.

T: Kindergarteners, do you ever wish you had more time? Another chance to do even better?

S: Yes.

T: Before we try again, let's get our mind and body ready to work hard with an exercise. Stand up and push in your chairs. Let's do jumping jacks while counting to 10. Ready?

S: 1, 2, 3, ...10. (Count while doing jumping jacks.)

T: Hands on your hips. Twist slowly, counting down from 10. Ready? (While students exercise, distribute the second set of Sprints, which is the same as the first.)

S: 10, 9, 8, ...1. (Count while twisting.)

T: Have a seat. Pencils up. Do you remember the number you got the first time?

S: Yes.

T: See if you can beat your own score! Race against yourself! On your mark, get set, go!

Students work on the Sprint for a second time. Perhaps give an additional three to five seconds to help students beat their first score. Give the signal to stop, reiterating that it is okay not to finish. Continue to emphasize that the goal is simply to do better than the first time. Proceed through the checking answers procedure with more enthusiasm than ever. Then, facilitate a comparison of Sprint A to Sprint B. Because students are still developing understanding of the concept of more, it may be necessary to circulate and facilitate the comparison, either visually or numerically.

T: Stand up if you beat your score.

T: You worked so hard, and I am so proud of you! Let's celebrate (e.g., congratulate each other, give three pats on the back, shake hands, have a parade).

Variation: Allow students to finish, but provide an early finisher activity to do on the back.

## Application Problem (3 minutes)

Materials: (S) Bag of 10 pennies, bag of 8 linking cubes

Note: This Application Problem introduces the comparing of sets of objects in linear configurations, serving as an anticipatory set for the lesson.

Put your pennies in a row. Now, put one linking cube on top of each penny. Are there enough cubes to cover each penny? Talk to your friend about which has more, the set of cubes or the set of pennies?

**NOTES ON MULTIPLE MEANS OF REPRESENTATION:**

Model the Application Problem for English language learners. Show what to do by placing a linking cube on top of a penny while speaking the instruction. Model how to tell a partner which set has more, "I have more pennies than linking cubes because two pennies are not covered."



© 2014 Common Core, Inc. All rights reserved. commoncore.org

## Concept Development (27 minutes)

Materials: (T) White board and markers, *shapes* (Lesson 21 Template), cut out and placed in scatter arrangements on the board



T: What do you notice on the board today?

S: We have lots of shapes.

T: Do you remember the names of the shapes?

S: There are triangles and hexagons. We have circles. There are some rectangles and special rectangles, too. → Yeah, the special ones are squares!

T: We've been talking lately about sets that have *more than* and *less than*. Today we are going to talk about ways to organize our groups of shapes so that it is easier to tell which has more.

T: Which has more, the circles or triangles?

S: There are more circles than triangles.

T: How did you know so fast?

S: I could just see there were lots more. → Yeah, I didn't have to count because there are circles all over the place and just 4 triangles. → I didn't count the circles, but I could see there were more than 4.

T: That makes sense, but what about the squares and the hexagons? Right now it is hard for me to guess which has more. It isn't so easy to just see. Do you have any ideas?

S: (Discuss)

MP.2

T: Guide the discussion so that students remember how they worked with the coins and cubes in previous lessons.

S: Let's line them up!

T: I can move our shapes. I will put the squares in a row, and the hexagons in a row just underneath. (Demonstrate.) Now, what do you notice?

S: The hexagon line is longer. → The hexagons are bigger. Maybe there are more, but I can't tell.

T: We can show which set has more. Let's draw a line between the first hexagon and the first square.

**NOTES ON MULTIPLE MEANS OF REPRESENTATION:**

Scaffold the lesson for students working below grade level and those having trouble grasping the concept of one-to-one correspondence by matching hexagons and squares one at a time. "One hexagon. Let's count one square. Two hexagons. Two squares." etc. Once students get the idea, move on to counting one set with more members than the other.


© 2014 Common Core, Inc. All rights reserved. commoncore.org

(Demonstrate.) Now, let's match the second hexagon with the second square. (Continue until all hexagons are matched.) Each of our hexagons has a partner in the other set. What do you notice now?

S: There's a square left over.

T: I wonder if we could count them to find out which has more. Let's count the hexagons and write that number at the end. 1, 2, 3, 4, 5, 6, 7. Now, let's count the squares. 1, 2, 3, 4, 5, 6, 7, 8.

MP 2

T: Let's write that number, too. (Write the number.) What do you notice?

T: Look at the numbers at the ends of the lines. There are 8 squares and 7 hexagons. 8 is more than 7. Repeat with me.

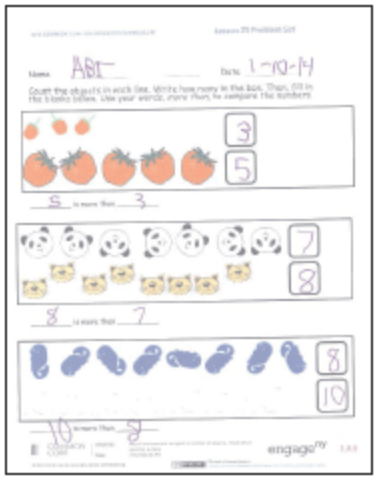
S: 8 is more than 7.

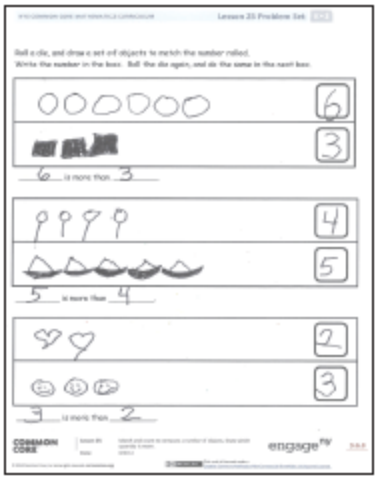
T: Here is a question to ask your partner, "Partner, which is more, 8 or 7?" What will your partner say?

S: 8 is more than 7.

T: Take turns, and ask your partner the question.

Repeat activity several times, using various combinations of shapes. Model the linear configuration and one-to-one correspondence each time. Have the students work with their own drawings, representing the shapes as soon as they are ready. They should be able to line things up and match them independently.





### Problem Set (10 minutes)

Students should do their personal best to complete the Problem Set within the allotted time.

## Student Debrief (8 minutes)

**Lesson Objective:** Match and count to compare a number of objects. State which quantity is more.

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


© 2014 Common Core, Inc. All rights reserved. commoncore.org

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.

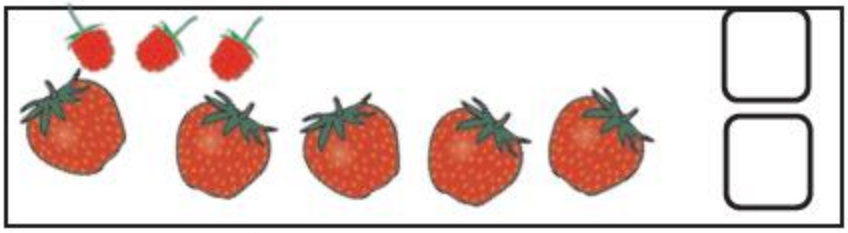
You may choose to use any combination of the questions below to lead the discussion.

- How did you organize your shapes to help you know which had more?
- Can you tell by lining up the shapes, which has more? How or how not?
- On the Problem Set, how did you know which set had more? Fewer?
- On the second page of the Problem Set, you compared two numbers. Did anyone roll the same number to compare? What did you do?
- What math vocabulary did we use today to communicate precisely? How did the Application Problem connect to today's lesson?

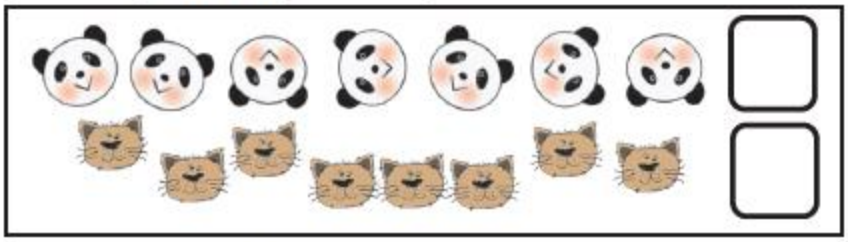

© 2014 Common Core, Inc. All rights reserved. commoncore.org

Name _____ Date _____

1. Count the objects in each line. Write how many in the box. Then, fill in the blanks below. Use the words *more than* to compare the numbers.



_____ is more than _____.



_____ is more than _____.

_____ is more than _____.



© 2014 Common Core, Inc. All rights reserved. commoncore.org

2. Roll a die, and draw a set of objects to match the number rolled. Write the number in the box. Roll the die again, and do the same in the next box. Use the words *more than* to compare the numbers.

_____ is more than _____.

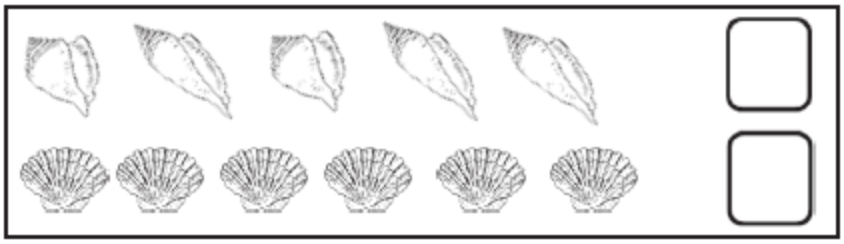
_____ is more than _____.

_____ is more than _____.


© 2014 Common Core, Inc. All rights reserved. commoncore.org

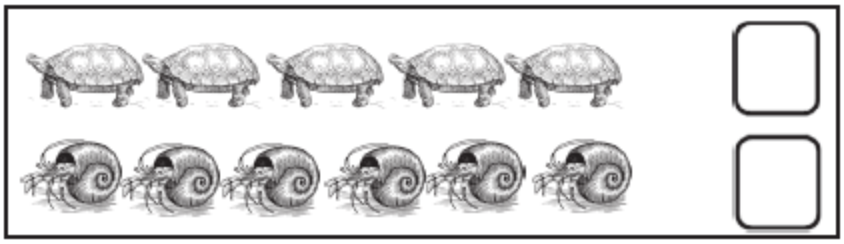
Name _____ Date _____

Count the objects in each line. Write how many in the box. Then, fill in the blanks below.



_____ is more than _____.

_____ is more than _____.



_____ is more than _____.



© 2014 Common Core, Inc. All rights reserved. commoncore.org

Module 6, Lesson 2



# Lesson 2

## Objective: Build flat shapes with varying side lengths and record with drawings.

### Suggested Lesson Structure

| | |
|---|---|
| Fluency Practice | (12 minutes) |
| Concept Development | (25 minutes) |
| Student Debrief | (13 minutes) |
| **Total Time** | **(50 minutes)** |

## Fluency Practice (12 minutes)

- Sprint: Core Fluency K.OA.5 (9 minutes)
- Compose Teen Numbers K.NBT.1 (3 minutes)

### Sprint: Core Fluency (9 minutes)

Materials: (S) Core Fluency Sprint A, B, C, or D

Note: This activity continues students' progress toward mastery of the required fluency for kindergarten.

Decide on a core fluency skill in which students would benefit from extra practice: addition, subtraction, or mixed addition with subtraction within 5. Select the Sprint that is most appropriate for the class: Core Fluency Sprint A, B, C, or D in the materials that follow. In order to correct the work as a class, all students take the same Sprint.

T: It's time for a Sprint! (Briefly recall previous Sprint preparation activities, and distribute Sprints facedown.) Take out your pencil and one crayon, any color. (Demonstrate the first problem as needed.)

Continue to follow the familiar Sprint procedure. Have students work on the same Sprint a second time. Continue to emphasize that the goal is simply to do better than the first time and celebrate improvement.

### Compose Teen Numbers (3 minutes)

Materials: (T) Hide Zero cards (Fluency Template) (optional)

Note: This maintenance activity ensures that students stay sharp on the work of the previous module.

T: (Show cards, or say the numbers 10 and 6.) Raise your hand when you can say the number the Say Ten Way. (Wait for all hands to go up, and then signal.) Ready?

S: Ten 6.


© 2014 Common Core, Inc. All rights reserved. commoncore.org

T: Now, say it the regular way, please.

S: 16.

T: (If using Hide Zero cards, slide them together to form the number 16.)

Continue with the following sequence: 17, 18, 19, 13, 14, 15, 11, 12, 10, 20.

Variation: Students can write the number bond or write two addition sentences on their personal white boards.

## Concept Development (25 minutes)

Materials: (S) Approximately 15 coffee stir sticks, scissors, personal white board, small ball of clay

T: Who can remind us about what we did in math class yesterday? Can you use your math words to tell us, in order, the steps that we took in our lesson?

S: First, we cut our sticks. They were all the same length! → Second, we made flat shapes with them on our desks. → Third, we stuck the ends together with clay at the corners.

T: That's right. We are going to make more flat shapes today. Yesterday, we made special rectangles that had equal sides. What did we call them?

S: Squares.

T: Today, use your sticks and your clay to create another type of rectangle: one that has corners like an L but whose sides are not all the same length.

MP.4

T: (Pause.) You may cut one or two of your sticks if you need to. (Allow time for students to plan and create the shape. Circulate to support students who might need it.) Hold up your rectangles! How do you know they are rectangles?

S: It's like a square, but it is stretched! → It has two long sides and two shorter sides. → I had to cut one of my sticks in half! → They have corners that look like an L. → It has four sides.

T: Take three sticks that are the same length. Now, use those sticks to make a closed shape with three straight sides. (Allow time for students to experiment.) Hold up your shapes. What do we call this shape?

S: It is a triangle!

T: What if you take one of the sides of your triangle and cut it to be shorter and then put it back into your shape? (Allow time for students to experiment.) What do you notice?

S: It is still a triangle. → It just has one side that is shorter. → It looks pointier, but it still has three sides and three corners. → Two sides are the same length!

**NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:**

As more shapes are introduced, be sure to put the shapes with pictures or models on the word wall. This will help English language learners study the names of the shapes and allow teachers to point to the shapes while talking about them, making a clear connection between the words and the meaning.



© 2014 Common Core, Inc. All rights reserved. commoncore.org

T: Great job! With your partner, use your sticks and your clay to make several different flat shapes. You may cut the sticks to be any lengths you like. Be creative! (Allow ample time for student work. Encourage students to think about not only convex but also concave figures. Hold up any interesting examples you observe for extra inspiration. Again, if students ask, casually mention the names of created shapes they may not have studied yet.)

T: Wow! You made a lot of different shapes! Would anyone like to show their favorite and tell the class about it? (Allow time for discussion.)

T: With your ruler and your marker, try to copy each of your new shapes on your personal white board.

Allow time for students to replicate their shapes on paper. Circulate to offer assistance to students who may still need help in keeping their rulers straight and still during construction. If time permits, allow students to turn and talk to their partners to describe the shapes they drew.

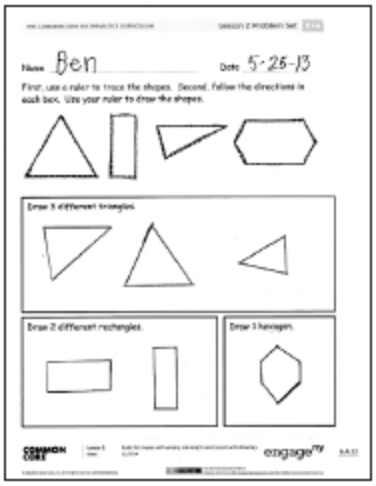
**NOTES ON MULTIPLE MEANS OF ENGAGEMENT:**

Students with disabilities who might have difficulty with fine motor activities could benefit from using a geoboard and rubber bands to make different shapes or by allowing them to use interactive technology such as the one found at http://www.glencoe.com/sites/common_assets/mathematics/ebook_assets/vmf/VMF-Interface.html.

(In the Select Grade drop-down menu, click *Kindergarten*. In the Manipulatives drop-down menu, click *Geoboard/Bands*.)

### Problem Set (10 minutes)

Students should do their personal best to complete the Problem Set within the allotted time.


Name Ben Date 5-26-13

First, use a ruler to trace the shapes. Second, follow the directions in each box. Use your ruler to draw the shapes.

Draw 3 different triangles.

Draw 2 different rectangles.

Draw 1 hexagon.

## Student Debrief (13 minutes)

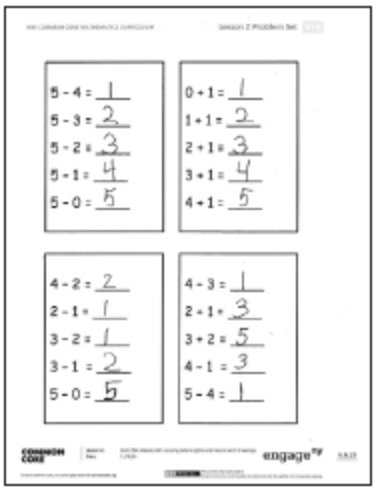
**Lesson Objective:** Build flat shapes with varying side lengths and record with drawings.

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.


© 2014 Common Core, Inc. All rights reserved. commoncore.org

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



| | |
|---|---|
| 5 - 4 = 1 | 0 + 1 = 1 |
| 5 - 3 = 2 | 1 + 1 = 2 |
| 5 - 2 = 3 | 2 + 1 = 3 |
| 5 - 1 = 4 | 3 + 1 = 4 |
| 5 - 0 = 5 | 4 + 1 = 5 |
| 4 - 2 = 2 | 4 - 3 = 1 |
| 2 - 1 = 1 | 2 + 1 = 3 |
| 3 - 2 = 1 | 3 + 2 = 5 |
| 3 - 1 = 2 | 4 - 1 = 3 |
| 5 - 0 = 5 | 5 - 4 = 1 |

- Look at all the triangles on your Problem Set. Tell your partner what they all have in common. Choose two triangles that are different. Tell your partner how they are different.
- Does a triangle need to be closed? Can it have gaps between the sides?
- I heard you say that all of the triangles are closed and have three sides and three corners. Do they all look the same? Tell your partner how many different looking triangles you think you could draw.
- When you made a shape with four sticks and corners like an L, what did you call it? What did you call the special shape you made where all four sticks were the same length?
- (Hold up a set of three equal stir sticks and a set of three sticks with different lengths.) If I asked you to make a triangle, which set of sticks would you choose? Why?
- Look carefully at your flat shapes and at those of your peers. What are some ways we could sort them? (Take time to allow several iterations of shape sorting with the students. Encourage them to be creative in their thinking. Apart from the number of sides, also guide them to think about attributes such as concave vs. convex, regular vs. irregular, etc.)

## 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.


© 2014 Common Core, Inc. All rights reserved. commoncore.org

Number Correct: ☐

Name _____ Date _____

Write the missing number.

| | | | |
|---|---|---|---|
| 1. | 2 + 1 = ☐ | 11. | ☐ = 3 + 2 |
| 2. | 1 + 1 = ☐ | 12. | 1 + 3 = ☐ |
| 3. | 1 + 4 = ☐ | 13. | ☐ = 2 + 2 |
| 4. | 3 + 1 = ☐ | 14. | ☐ = 1 + 2 |
| 5. | 2 + 2 = ☐ | 15. | 1 + 4 = ☐ |
| 6. | 2 + 3 = ☐ | 16. | ☐ = 2 + 3 |
| 7. | 1 + 2 = ☐ | 17. | ☐ = 5 + 1 |
| 8. | 4 + 1 = ☐ | 18. | 5 + 2 = ☐ |
| 9. | 3 + 2 = ☐ | 19. | 1 + 0 = ☐ |
| 10. | 1 + 3 = ☐ | 20. | 5 + 0 = ☐ |


© 2014 Common Core, Inc. All rights reserved. commoncore.org

Number Correct: ☐

Name _____ Date _____

Write the missing number.

| | | | |
|---|---|---|---|
| 1. | 2 - 1 = ☐ | 11. | ☐ = 4 - 2 |
| 2. | 4 - 1 = ☐ | 12. | 5 - 3 = ☐ |
| 3. | 5 - 1 = ☐ | 13. | ☐ = 3 - 1 |
| 4. | 3 - 1 = ☐ | 14. | ☐ = 5 - 2 |
| 5. | 3 - 2 = ☐ | 15. | 4 - 1 = ☐ |
| 6. | 4 - 2 = ☐ | 16. | ☐ = 5 - 4 |
| 7. | 5 - 3 = ☐ | 17. | ☐ = 5 - 1 |
| 8. | 5 - 2 = ☐ | 18. | 6 - 1 = ☐ |
| 9. | 4 - 3 = ☐ | 19. | 1 - 0 = ☐ |
| 10. | 5 - 4 = ☐ | 20. | 5 - 5 = ☐ |


© 2014 Common Core, Inc. All rights reserved. commoncore.org

Number Correct: ☐

Name _____ Date _____

Write the missing number.

| | | | |
|---|---|---|---|
| 1. | 2 + 1 = ☐ | 11. | 3 + 2 = ☐ |
| 2. | 2 - 1 = ☐ | 12. | 3 - 2 = ☐ |
| 3. | 3 + 1 = ☐ | 13. | 4 + 0 = ☐ |
| 4. | 3 - 1 = ☐ | 14. | 4 - 0 = ☐ |
| 5. | 4 + 1 = ☐ | 15. | 5 + 0 = ☐ |
| 6. | 4 - 1 = ☐ | 16. | 5 - 0 = ☐ |
| 7. | 1 + 1 = ☐ | 17. | 5 - 5 = ☐ |
| 8. | 1 - 1 = ☐ | 18. | 4 + 1 = ☐ |
| 9. | 2 + 2 = ☐ | 19. | 5 - 4 = ☐ |
| 10. | 2 - 2 = ☐ | 20. | 5 - 1 = ☐ |


© 2014 Common Core, Inc. All rights reserved. commoncore.org

Number Correct: ☐

Name _____ Date _____

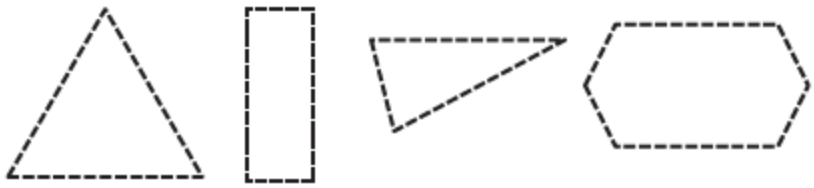
Write the missing number.

| | | | |
|---|---|---|---|
| 1. | 2 + 1 = ☐ | 11. | ☐ = 1 + 2 |
| 2. | 4 + 1 = ☐ | 12. | 5 + 0 = ☐ |
| 3. | 5 - 1 = ☐ | 13. | ☐ = 3 - 1 |
| 4. | 3 + 1 = ☐ | 14. | ☐ = 2 + 2 |
| 5. | 3 + 2 = ☐ | 15. | 4 - 1 = ☐ |
| 6. | 4 - 2 = ☐ | 16. | ☐ = 5 - 4 |
| 7. | 5 - 3 = ☐ | 17. | ☐ = 5 - 1 |
| 8. | 5 - 2 = ☐ | 18. | 3 + 0 = ☐ |
| 9. | 2 + 3 = ☐ | 19. | 1 - 0 = ☐ |
| 10. | 5 - 4 = ☐ | 20. | 5 - 5 = ☐ |


© 2014 Common Core, Inc. All rights reserved. commoncore.org

Name _____ Date _____

First, use a ruler to trace the shapes. Second, follow the directions in each box. Use your ruler to draw the shapes.



Draw 3 different triangles.

Draw 2 different rectangles.

Draw 1 hexagon.


© 2014 Common Core, Inc. All rights reserved. commoncore.org

5 - 4 = _____

5 - 3 = _____

5 - 2 = _____

5 - 1 = _____

5 - 0 = _____

0 + 1 = _____

1 + 1 = _____

2 + 1 = _____

3 + 1 = _____

4 + 1 = _____

4 - 2 = _____

2 - 1 = _____

3 - 2 = _____

3 - 1 = _____

5 - 0 = _____

4 - 3 = _____

2 + 1 = _____

3 + 2 = _____

4 - 1 = _____

5 - 4 = _____


© 2014 Common Core, Inc. All rights reserved. commoncore.org

Name _____ Date _____

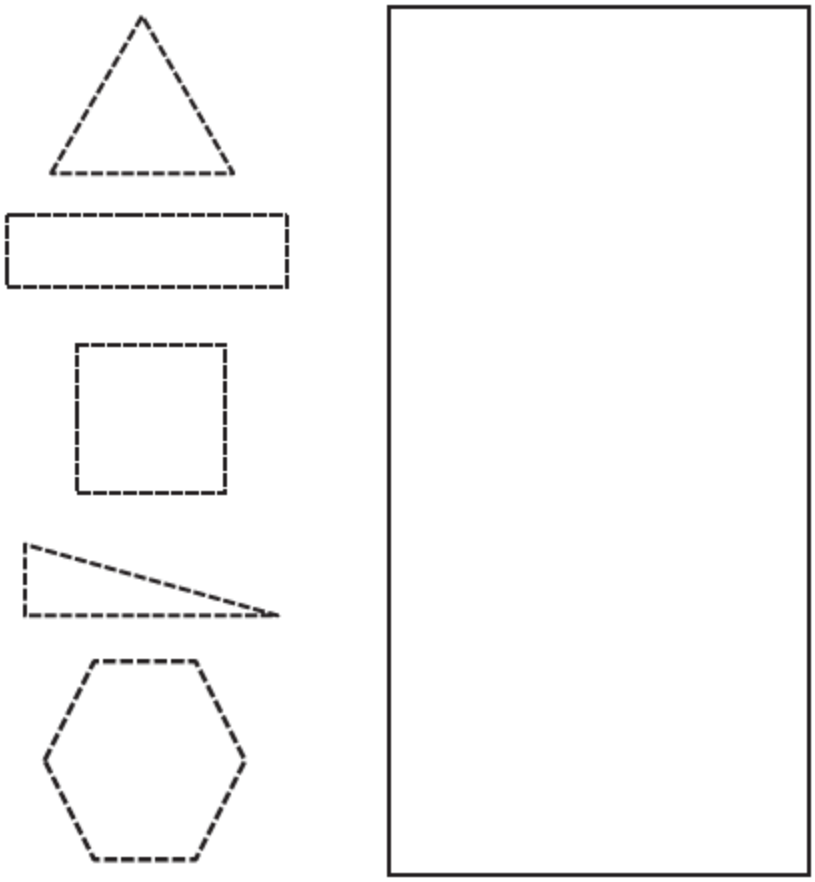
First, draw a triangle so all of the sides are different lengths.

Second, draw a triangle with your ruler that has 2 sides that are about the same length.


© 2014 Common Core, Inc. All rights reserved. commoncore.org

Name _____ Date _____

Trace the shapes. Then, use a ruler to draw similar shapes, on your own, in the large rectangle. Draw more on the back of your paper if you would like!





© 2014 Common Core, Inc. All rights reserved. commoncore.org

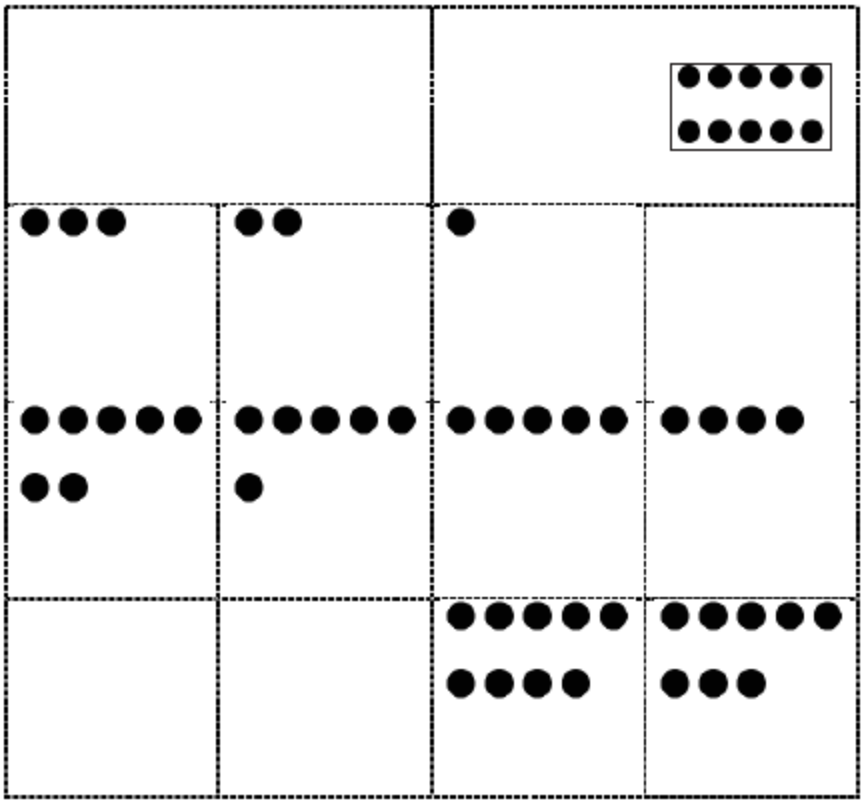
Numerals

| | | | |
|---|---|---|---|
| 1 | 0 | | |
| 0 | 1 | 2 | 3 |
| 4 | 5 | 6 | 7 |
| 8 | 9 | | |

hide zero cards (numeral side) (Copy double-sided on cardstock with 3-groups page, and cut.)


© 2014 Common Core, Inc. All rights reserved. commoncore.org

5-Groups



hide zero cards (5-groups side) (Copy double-sided on cardstock with numerals page, and cut.)


© 2014 Common Core, Inc. All rights reserved. commoncore.org