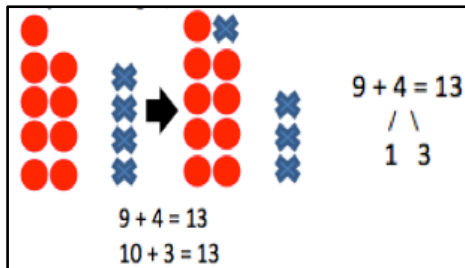


Sums and Differences to 20

In this first module of Grade 2, we set the foundation for students to master sums and differences to 20. They will then apply these skills to fluently add one-digit to two-digit numbers up through 100, using place value understanding, properties of operations, and the relationship between addition and subtraction.



The “make a ten” strategy: note how 4 is decomposed as 1 and 3 in order to make a ten, i.e., $9 + 1 + 3 = 10 + 3$.

A new way to count!

Regular	Say Ten
fifty-one	5 tens 1
sixty-seven	6 tens 7
seventy-five	7 tens 5
eighty-four	8 tens 4
ninety-five	9 tens 5

Above, an illustration of the “Say Ten” way of counting, in which students name how many tens are in a number and then say the ones.

What Comes After this

Module: In Module 2, students will engage in activities designed to deepen their conceptual understanding of measurement and to relate addition and subtraction to length. They will use metric units in this module; customary units will be introduced in Module 7.

Terms, Phrases, and Strategies in this Module:

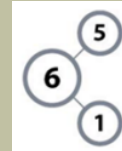
STRATEGY: Make ten and subtract from ten - strategy in which students decompose a number in order to make a ten, thus using simpler, known facts to solve the problem, e.g., $8 + 3 = 8 + 2 + 1$ and $15 - 7 = 10 - 7 + 5 = 3 + 5$

STRATEGY: Say ten counting - e.g., 11 is “1 ten 1,” 12 is “1 ten 2,” twenty is “2 tens,” 27 is “2 tens 7,” 35 is “3 tens 5,” 100 is “10 tens,” 146 is “14 tens 6”

Ten plus: number sentences in which students automatically combine one addend with the group of 10 without having to count, e.g., $10 + 3 = 13$, $30 + 5 = 35$, $70 + 8 = 78$

Number bond: used to explore the part/whole relationships within a given number, e.g., for the number 6:

$$\begin{aligned} 5 + 1 &= 6, \\ 1 + 5 &= 6, \\ 6 - 1 &= 5, \\ 6 - 5 &= 1 \end{aligned}$$



+ How you can help at home:

- Review with your student all the ways to make 10; students will need to have these memorized as we work through this module
- Practice “10 plus” problems, such as $10 + 9$, $20 + 8$, $40 + 6$, $70 + 7$, and so on, so that your student becomes very adept at doing them mentally and quickly

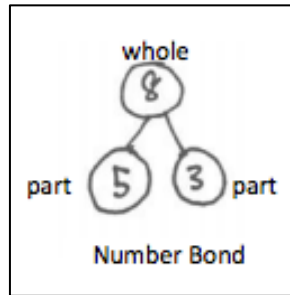
Key Common Core Standards:

- Represent and solve problems involving addition and subtraction**
 - Use addition and subtraction within 100 to solve one- and two-step word problems
- Add and subtract within 20**
 - Fluently add and subtract within 20 using mental strategies
- Use place value understanding and properties of operations to add and subtract**
 - Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction

Welcome to A Story of Units!

Each module's parent tip sheet will highlight a new strategy or math model your student will be working on.

Number Bonds are a tool first introduced in earlier years of *A Story of Units*. They illustrate a part-part-whole relationship and are very useful in this module as students use the “make a 10” strategy for both addition and subtraction.



$$\begin{array}{r} 87 \\ \swarrow \searrow \\ 80 \quad 7 \end{array} + \begin{array}{r} 5 \\ \swarrow \searrow \\ 3 \quad 2 \end{array} = 92$$

In the above problem, the number bonds illustrate how to decompose the numbers in order to make $80 + 7 + 3 + 2$, or $80 + 10 + 2$, or 92.

Read on to learn a little bit about *Eureka Math*, the creators of *A Story of Units*:

Eureka Math is a complete, PreK-12 curriculum and professional development platform. It follows the focus and coherence of the Common Core State Standards (CCSS) and carefully sequences the progression of mathematical ideas into expertly crafted instructional modules.

This curriculum is distinguished not only by its adherence to the CCSS; it is also based on a theory of teaching math that is proven to work. That theory posits that mathematical knowledge is conveyed most effectively when it is taught in a sequence that follows the “story” of mathematics itself. This is why we call the elementary portion of *Eureka Math* “*A Story of Units*.” The sequencing has been joined with methods of instruction that have been proven to work, in this nation and abroad. These methods drive student understanding beyond process, to deep mastery of mathematical concepts.

The goal of *Eureka Math* is to produce students who are not merely literate, but fluent, in mathematics. Your student has an exciting year of discovering the story of mathematics ahead!

Sample Problem from Module 1: (Example taken from Module 1, Lesson 8)

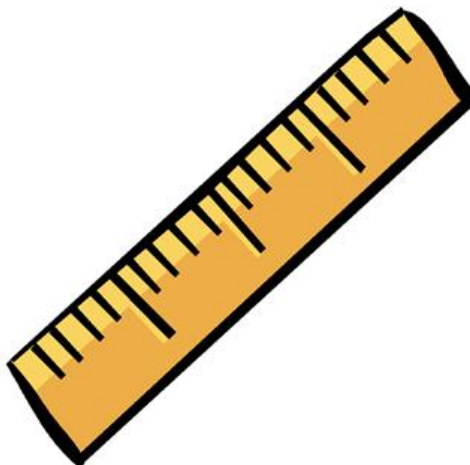
Kayla has 21 stickers.

She gives Sergio 7 stickers.

How many stickers does she have left?

Addition and Subtraction of Length Units

In this module, we will be exploring the ruler, estimating and measuring lengths using various tools and units, and finally, relating addition and subtraction to length.



Key Words to Know

Endpoint: Where something ends, where measurement begins

Hash mark: The marks on a ruler or other measurement tool

Number Line: A line marked at evenly spaced intervals

Estimate: An approximation of the value of a quantity or number

Tape Diagram: See back of this sheet!

Common Words:

Length
Combine
Difference
Meter
Height
Compare
Centimeter



What Came Before this Module: We practiced making sums and differences to the number 20

What Comes After this Module: We will begin work with the base-10 place value system

+ How you can help at home:

- Ask questions that encourage your student to estimate lengths of household items
- Continue to review adding and subtracting up to 20
- Practice measuring lengths longer than a ruler by marking and measuring from a mark

Key Common Core Standards:

• **Relate addition and subtraction to length**

Examples:

- Line A is 4 cm long, and Line B is 7 cm long. Together, Lines A and B measure _____ cm.
- In the example above, how much shorter is Line A than Line B?

• **Measure and estimate lengths in standard and non-standard units**

Examples:

- How many centimeter cubes long is my pencil?
- How many Lego-pieces long is this bracelet?



Spotlight on Math Models:

Tape Diagram

You will often see this mathematical representation in *A Story of Units*.

A Story of Units has several key mathematical “models” that will be used throughout a student’s elementary years.

The tape diagram is a powerful model that students can use to solve various kinds of problems. In second grade, you will often see this model as an aid to addition and subtraction problems. Tape diagrams are also called “bar models” and consist of a simple bar drawing that students make and adjust to fit a word problem. They then use the drawing to discuss and solve the problem.

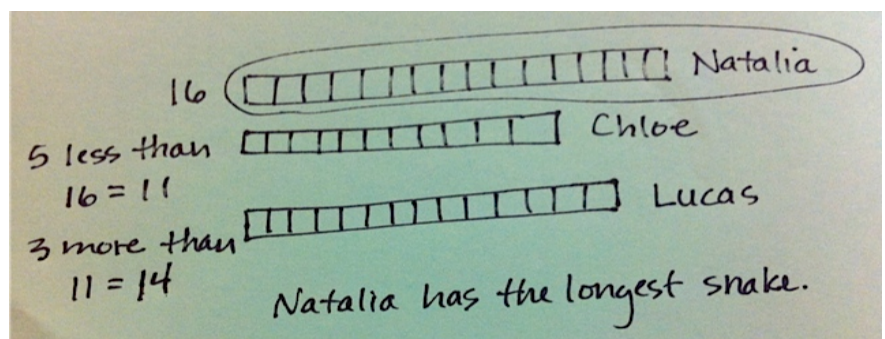
As students move through the grades, tape diagrams provide an essential bridge to algebra. Below is a sample word problem from Module 2 solved using a tape diagram to show the parts of the problem.

Sample Problem from Module 2:

(Example taken from Module 2, Lesson 7)

Natalia, Chloe, and Lucas are making clay snakes. Natalia’s snake is 16 centimeters. Chloe’s snake is 5 centimeters shorter than Natalia’s. How long is Chloe’s snake?

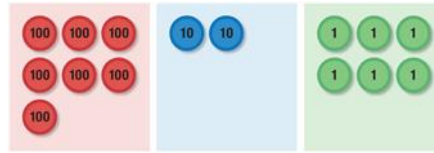
Lucas’s snake is 3 centimeters longer than Chloe’s snake. Who has the longest snake: Natalia, Lucas, or Chloe?



Place Value, Counting, and Comparison of Numbers to 1,000

In this 25-day module, students expand their skill with and understanding of unit by bundling ones, tens, and hundreds (up to a thousand) with straws or sticks. They solve simple problems that require an understanding of place value as a system based on repeated groupings by 10.

We are working on many different ways to represent two- and three-digit numbers!



Unit form modeled with number disks:
7 hundreds 2 tens 6 ones = 72 tens 6 ones

Key Vocabulary:

Standard Form: e.g. 576

Expanded Form: e.g. $576 = 500 + 70 + 6$

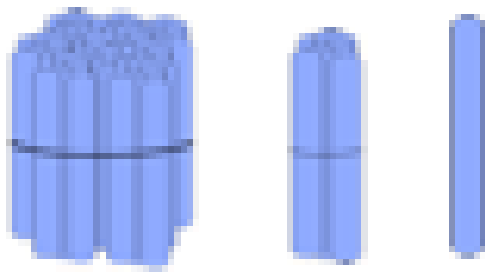
Word Form: e.g. Five hundred seventy-six

Unit Form: Stating the amount of hundreds, tens, and ones in each number, e.g., 11 is stated as *1 ten 1 one*, 27 as *2 tens 7 ones*, 100 as *1 hundred*, and 576 as *5 hundreds, 7 tens, 6 ones*

Base-Ten Numeral: The idea that 1000 equals 10 hundreds, 100 equals 10 tens, and so on

Bundling: Putting smaller units together to make a larger one, e.g. putting 10 tens together to make a hundred

Regrouping: Renaming, (instead of “carrying” or “borrowing,”) e.g., a group of 10 ones is “renamed” a ten when the ones are bundled and moved from the ones to the tens place



Ten ones are bundled into a ten.

Ten bundles of ten are bundled into a hundred.

What Came Before this Module:

We worked on measurement with various tools, and related our work to addition and subtraction.

What Comes After this Module:

We will continue to work on adding and subtracting fluently within 100, and build conceptual understanding up through 200.

How you can help at home:

- Ask how many ones, tens, and hundreds are in numbers that you and your student come across
- Continue to review addition and subtraction skills
- Help your student begin to compare numbers by asking questions about “more than”, “less than”, and “equal”

Key Common Core Standards:

Understand Place Value

More specifically:

- Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones
- Count within 1000, skip-counting by 5s, 10s, and 100s
- Read and write numbers using base-ten numerals, number names, and expanded form
- Compare three-digit numbers using $>$, $<$, and $=$



A classroom model of bundles created to show the number 476...

Hundreds	Tens	Ones
4	7	6

...will build the foundation that enables students' transition to writing the numerals in the place value chart.

Spotlight on Math Models:

Bundling

You will often see this mathematical representation in the lower grades in *A Story of Units*.

A Story of Units has several key mathematical “models” that will be used throughout a student’s elementary years.

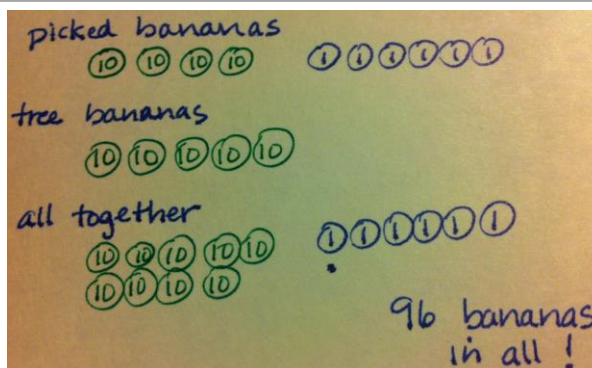
A model used primarily in grades K-2, bundles are discrete groupings of place value units (tens, hundreds, thousands). Students or teachers easily make them by placing a rubber band or twist tie around straws, popsicle sticks, or coffee stirrers. But these humble models are a key step in the transition that students must make from the very concrete (seeing the bundled popsicle sticks), to the more abstract place value chart, and finally to working with pure numbers in computation.

Bundled numbers can also be “unbundled”, e.g. a group of 10 can be broken apart into its component 10 ones when needed for subtraction. Students will use this same concept when they work with division in the upper grades. Bundling and unbundling are critical skills for students to have as a tool for our continued work with place value and operations.

Module 3 Sample Problem (from Lesson 6)

Timmy the monkey picked 46 bananas from the tree. When he was done, there were 50 bananas left.

How many bananas were on the tree at first?



This problem was solved using place value disks, yet another way of representing base-ten numerals.

Addition and Subtraction Within 200 with Word Problems to 100

In this 31-lesson module, students will work on fluency in addition and subtraction up to 100. They will also build conceptual understanding of adding and subtracting multi-digit numbers to 200, and will apply their skills when solving problems.



Building the number 234 with place value cards showing the following:

$$2 = 2 \text{ hundreds} = 200$$

$$3 = 3 \text{ tens} = 30$$

$$4 = 4 \text{ ones} = 4$$

$$\text{So } 234 = 200 + 30 + 4!$$

Key Vocabulary:

Minuend: A quantity or number from which another number is to be subtracted

Subtrahend: A quantity or number being subtracted from another

Difference: The solution to a subtraction problem

Place value: Referring to the unit value of each digit in a given number

Place Value Chart: (see reverse): A graphic organizer that students can use to see the coherence of place value and operations between different units.

$$\begin{array}{r} 125 \\ + 75 \\ \hline 100 \\ 90 \\ + 10 \\ \hline 200 \end{array} \quad \text{or} \quad \begin{array}{r} 125 \\ + 75 \\ \hline 10 \\ 90 \\ + 100 \\ \hline 200 \end{array}$$

This is a picture of the method known as “**totals below**”, in which students decompose multi-digit numbers into like place-value groups as they add.

What Came Before this Module:

Students expanded their understanding of unit and of place value by bundling ones, tens, and hundreds with sticks.

What Comes After this Module:

In Module 5, we will continue to strengthen and deepen our conceptual understanding of addition and subtraction, working with numbers up to 1000.

How you can help at home:

- Continue to ask how many ones, tens, and hundreds are in numbers that you and your student come across

- When possible, encourage your student to explain their mathematical thinking by drawing a diagram or picture that links to their addition and subtraction problems

Key Common Core Standards:

- Represent and solve problems involving addition and subtraction
- Use place value understanding and properties of operations to add and subtract, including:
 - Fluently add and subtract within 100
 - Add and subtract within 200, using concrete models or drawings and strategies based on place value, and explaining chosen strategies in writing

Place Value Chart Without Headings
(Used with labeled materials such as disks)

Hundreds	Tens	Ones

Place Value Chart with Headings
(Used with unlabeled materials such as base-ten blocks or bundles)

Spotlight on Math Models:

Place Value Charts

You will see this mathematical representation throughout the grades in *A Story of Units*.

A Story of Units has several key mathematical “models” that will be used throughout a student’s elementary years.

The place value chart is a graphic organizer that students can use to see the coherence of place value and operations between different units. It enables students to discover the value of each digit in a given number at the concrete level, as they represent numbers with place value disks or bundles. Use of the place value chart begins in Grade 1 as students learn about tens and ones, and continues through the use of decimals in Grade 5. The place value chart is a flexible tool.

Young students can place chips on the chart, and physically move them as they bundle and group numbers. Older students can quickly create their own place value charts to illustrate their thinking for a problem and show their understanding of more complex numbers. In second grade, students use the chart extensively as they work to build their understanding of numbers up to 1000, and will often be asked to use the chart to illustrate how to compose and decompose numbers.

Module 4 Sample Problem (Lesson 15): Model $172 - 48$ using the place value chart.

