Kenmore-Town of Tonawanda UFSD

We educate, prepare, and inspire all students to achieve their highest potential

Grade 4 Module 1 Parent Handbook

.

Eureka Math™ Tips for Parents

Place Value, Rounding, and Algorithms for Addition and Subtraction

In this first module of Grade 4, students extend their work with whole numbers, first with familiar large units (hundreds and thousands), and then develop their understanding up to 1 million. They practice and further deepen their facility with patterns in the base-10 number system.
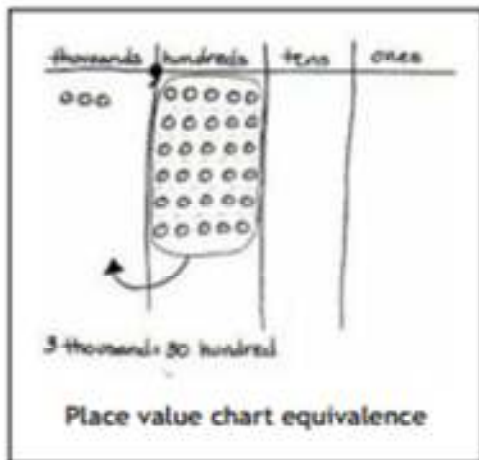
4th grade students will learn to round large numbers to various place values.

$$935,292 \approx 900,000$$
$$935,292 \approx 940,000$$
$$935,292 \approx 935,000$$

We will also discuss which place value is appropriate to round to in different situations - what degree of accuracy is required?

Place value chart equivalence

What Comes After this Module:

In Module 2, students further deepen their understanding of the place value system through the lens of measurement and metric units. Students will recognize patterns as they use the place value chart to convert units, e.g. kilograms to grams, meters to centimeters, etc.

How you can help at home:

- When given a large, multi-digit number, ask your student what each digit represents. (e.g. "What does the 4 signify in the number 34,500?" Answer: 4,000)

- Help practice writing numbers correctly by saying large numbers and having your student write them down. Students can create their own place value charts to help.

Key Common Core Standards:

- *Use the four operations with whole numbers to solve problems*
  - Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations
- *Generalize place value understanding for multi-digit whole numbers less than or equal to 1,000,000*
  - Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right
  - Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form
  - Use place value understanding to round multi-digit whole numbers to any place
- *Use place value understanding and properties of operations to perform multi-digit arithmetic*
  - Fluently add and subtract multi-digit whole numbers using the standard algorithm

Prepared by Erin Schweng, Math Coach

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.

Place Value Chart and Place Value Cards - In Module 1, students make extensive use of place value tools, as they have done in earlier grade levels. Now, however, students work with the extended place value chart, which includes place values beyond hundreds, tens, and ones. They may also use place value cards as they have in earlier years to support their learning.

millions	hundred thousands	ten thousands	thousands	hundreds	tens	ones

(Above) Place Value Chart, to the millions place

(Left) Place Value Cards

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 successful methods of instruction that have been used in this nation and abroad. These methods drive student understanding beyond process and into 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 ahead, discovering the story of mathematics!

Sample Problem from Module 1:
(Example taken from Module 1, Lesson 3)

The school library has 10,600 books.

The town library has 10 times as many books.

How many books does the town library have?

The town library has 106,000 books.

(1 ten thousand 6 hundred) × 10 = 1 hundred thousand 6 thousands = 106,000

Grade 4 • Module 1

Place Value, Rounding, and Algorithms for Addition and Subtraction

OVERVIEW

In this 25-day Grade 4 module, students extend their work with whole numbers. They begin with large numbers using familiar units (hundreds and thousands) and develop their understanding of millions by building knowledge of the pattern of times ten in the base ten system on the place value chart (4.NBT.1). They recognize that each sequence of three digits is read as hundreds, tens, and ones followed by the naming of the corresponding base thousand unit (thousand, million, billion).

The place value chart is fundamental to Topic A. Building upon their previous knowledge of bundling, students learn that 10 hundreds can be composed into 1 thousand, and therefore, 30 hundreds can be composed into 3 thousands because a digit's value is 10 times what it would be one place to its right (4.NBT.1). Students learn to recognize that in a number such as 7,777, each 7 has a value that is 10 times the value of its neighbor to the immediate right. One thousand can be decomposed into 10 hundreds; therefore 7 thousands can be decomposed into 70 hundreds.

thousands	hundreds	tens	ones
ooo	ooooo ooooo ooooo ooooo ooooo ooooo		

3 thousand = 30 hundred
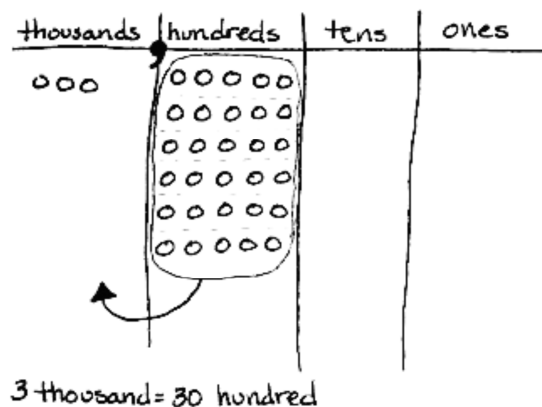
Similarly, multiplying by 10 shifts digits one place to the left, and dividing by 10 shifts digits one place to the right.

$$3,000 = 10 \times 300 \quad 3,000 \div 10 = 300$$

In Topic B, students use place value as a basis for comparing whole numbers. Although this is not a new concept, it becomes more complex as the numbers become larger. For example, it becomes clear that 34,156 is 3 thousands greater than 31,156.

$$34,156 > 31,156$$

Comparison leads directly into rounding, where their skill with isolating units is applied and extended. Rounding to the nearest ten and hundred was mastered with three-digit numbers in Grade 3. Now, Grade 4 students moving into Topic C learn to round to any place value (4.NBT.3), initially using the vertical number line though ultimately moving away from the visual model altogether. Topic C also includes word problems where students apply rounding to real life situations.

In Grade 4, students become fluent with the standard algorithms for addition and subtraction. In Topics D and E, students focus on single like-unit calculations (ones with ones, thousands with thousands, etc.), at times requiring the composition of greater units when adding (10 hundreds are composed into 1 thousand) and decomposition into smaller units when subtracting (1 thousand is decomposed into 10 hundreds) (4.NBT.4). Throughout these topics, students apply their algorithmic knowledge to solve word problems. Students also use a variable to represent the unknown quantity.

The module culminates with multi-step word problems in Topic F (4.OA.3). Tape diagrams are used throughout the topic to model additive compare problems like the one exemplified below. These diagrams facilitate deeper comprehension and serve as a way to support the reasonableness of an answer.

A goat produces 5,212 gallons of milk a year.
A cow produces 17,279 gallons of milk a year.
How much more milk does a goat need to produce to make the
same amount of milk as a cow?

goat | 5,212 |

cow | 17,279 |

?
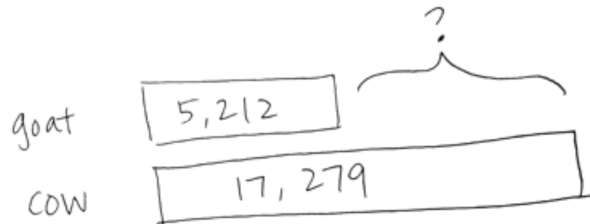
17,279 – 5,212 = _____

A goat needs to produce _____ more gallons of milk a year.

Terminology

New or Recently Introduced Terms

- Ten thousands, hundred thousands (as places on the place value chart)
- Millions, ten millions, hundred millions (as places on the place value chart)
- Variable (letters that stand for numbers and can be added, subtracted, multiplied, and divided as numbers are)

Familiar Terms and Symbols[5]

- =, <, > (equal to, less than, greater than)
- Addend (e.g., in 4 + 5, the numbers 4 and 5 are the addends)
- Algorithm (a step-by-step procedure to solve a particular type of problem)
- Bundling, making, renaming, changing, exchanging, regrouping, trading (e.g., exchanging 10 ones for 1 ten)
- Compose (e.g., to make 1 larger unit from 10 smaller units)
- Decompose (e.g., to break 1 larger unit into 10 smaller units)
- Difference (answer to a subtraction problem)
- Digit (any of the numbers 0 to 9; e.g., What is the value of the digit in the tens place?)
- Endpoint (used with rounding on the number line; the numbers that mark the beginning and end of a given interval)
- Equation (e.g., 2,389 + 80,601 = _____)
- Estimate (an approximation of a quantity or number)
- Expanded form (e.g., 100 + 30 + 5 = 135)
- Expression (e.g., 2 thousands × 10)
- Halfway (with reference to a number line, the midpoint between two numbers, e.g., 5 is halfway between 0 and 10)
- Number line (a line marked with numbers at evenly spaced intervals)
- Number sentence (e.g., 4 + 3 = 7)
- Place value (the numerical value that a digit has by virtue of its position in a number)
- Rounding (approximating the value of a given number)
- Standard form (a number written in the format 135)
- Sum (answer to an addition problem)
- Tape diagram (bar diagram)
- Unbundling, breaking, renaming, changing, regrouping, trading (e.g., exchanging 1 ten for 10 ones)
- Word form (e.g., one hundred thirty-five)

NOTES ON EXPRESSION, EQUATION, AND NUMBER SENTENCE:

Please note the descriptions for the following terms, which are frequently misused.

- **Expression:** A number, or any combination of sums, differences, products or divisions of numbers that evaluates to a number (e.g., 3 + 4, 8 × 3, 15 ÷ 3 as distinct from an equation or number sentence).
- **Equation:** A statement that two expressions are equal (e.g., 3 × ___ = 12, 5 × b =20, 3 + 2 = 5).
- **Number sentence** (also addition, subtraction, multiplication or division sentence): An equation or inequality for which both expressions are numerical and can be evaluated to a single number (e.g., 4 + 3 = 6 + 1, 2 = 2, 21 > 7 × 2, 5 ÷ 5 =1). Number sentences are either true or false (e.g., 4 + 4 < 6 × 2 and 21 ÷ 7 = 4) and contain no unknowns.

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[5] These are terms and symbols students have used or seen previously.
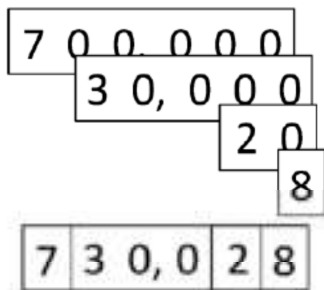
Suggested Tools and Representations

- Number lines (vertical to represent rounding *up* and rounding *down*)
- Personal white boards (one per student; see explanation on the following pages)
- Place value cards (one large set per classroom including 7 units to model place value)
- Place value chart (templates provided in lessons to insert into personal white boards)
- Place value disks (can be concrete manipulatives or pictorial drawings, such as the chip model, to represent numbers)
- Tape diagrams (drawn to model a word problem)

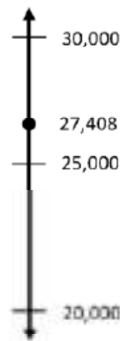| millions	hundred thousands	ten thousands	thousands	hundreds	tens	ones

Place Value Chart with Headings
(used for numbers or the chip model)

Place Value Chart Without Headings
(used for place value disk manipulatives or drawings)

```
7 0 0 , 0 0 0
  3 0 , 0 0 0
        2 0
          8

7 3 0 , 0 2 8
```

Place Value Cards

30,000

27,408

25,000

20,000

Vertical Number Line

100,000   10,000   1000   100   10   1

Place Value Disks

RDW or Read, Draw, Write (an Equation and a Statement)

Mathematicians and teachers suggest a simple process applicable to all grades:

1) Read.
2) Draw and Label.
3) Write an equation.
4) Write a word sentence (statement).

The more students participate in reasoning through problems with a systematic approach, the more they internalize those behaviors and thought processes.

- What do I see?
- Can I draw something?
- What conclusions can I make from my drawing?

Tape Diagrams

A tape diagram is a way for students to visually represent a mathematical problem. It helps students to break down and make sense of a word problem. It provides students access to selecting the appropriate operation as they visualize the relationships between the quantities. Tape diagrams enable students to solve problems efficiently. In Grade 4 Module 1 students will utilize tape diagrams to solve addition and subtraction problems. Several examples follow:

On Saturday, 32,736 more bus tickets were sold than on Sunday. On Sunday, only 17,295 tickets were sold. How many people bought bus tickets over the weekend? Use a tape diagram to show your work.
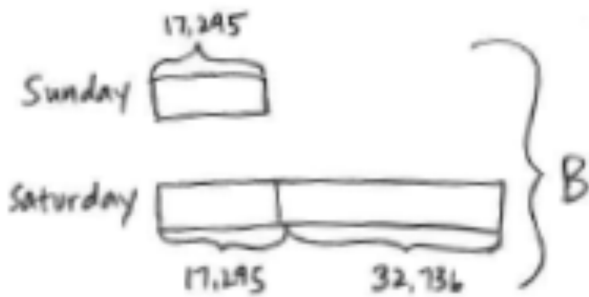
Last year, there were 620,073 people in attendance at a local parade. This year, there were 456,795 people in attendance. How many more people were in attendance last year?
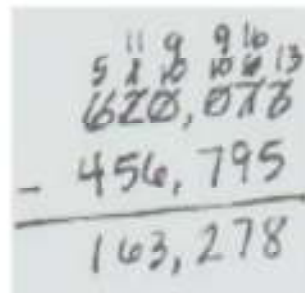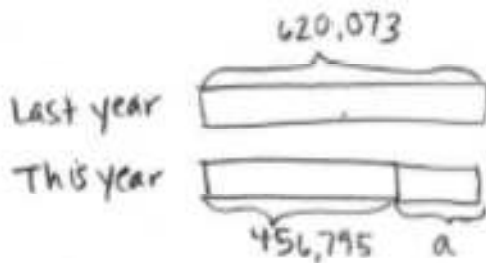
Watch a short video example of a student using a tape diagram at:

https://www.youtube.com/watch?v=GT4fEhfE_8E

Additional Resources for Parents can be found at:

http://greatminds.net/parents

Grade 4 Module 1 Topic A

Place Value of Multi-Digit Whole Numbers

Focus Standards:

4.NBT.1 Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. *For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division.*

4.NBT.2 Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.

Instructional Days Recommended: 4

In Topic A, students build the place value chart to 1 million and learn the relationship between each place value as *10 times* the value of the place to the right. Students manipulate numbers to see this relationship, such as 30 hundreds composed as 3 thousands. They decompose numbers to see that 7 thousands is the same as 70 hundreds. As students build the place value chart into thousands and up to 1 million, the sequence of three digits is emphasized. They become familiar with the base thousand unit names up to 1 billion. Students fluently write numbers in multiple formats: as digits, in unit form, as words, and in expanded form up to 1 million.

The sample homework responses contained in this manual are intended to provide insight into the skills expected of students and instructional strategies used in Eureka Math.

Lesson 1

Objective: Interpret a multiplication equation as a comparison.

Key

Homework

1. 1. Chart accurately labeled; 40; 40; disks accurately drawn

   6. Chart accurately labeled; 20; 200; disks accurately drawn

   7. Chart accurately labeled; 50; 5,000; disks accurately drawn

2. a. 10; 1
   b. 6:6
   c. 10 times as many
   d. 40; explanations will vary.

3. 600 GB; explanations will vary.

4. $2,000; explanations will vary.

5. a. 12
   b. 90
   c. 70
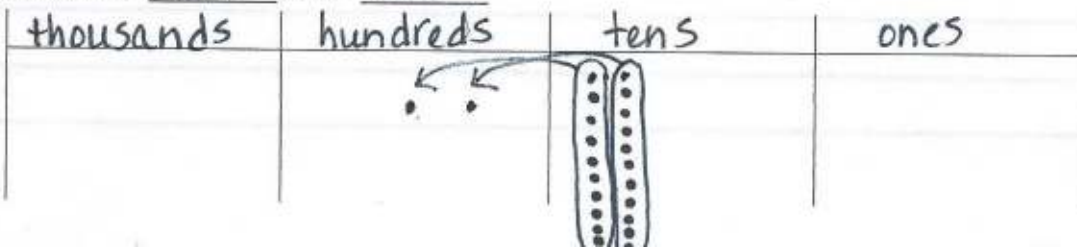   d. 10 times as many

6. 10

Homework Samples

1. Label the place value charts. Fill in the blanks to make the following equations true. Draw disks in the place value chart to show how you got your answer, using arrows to show any regrouping.

   a. 10 × 4 ones = __40__ ones = __40__
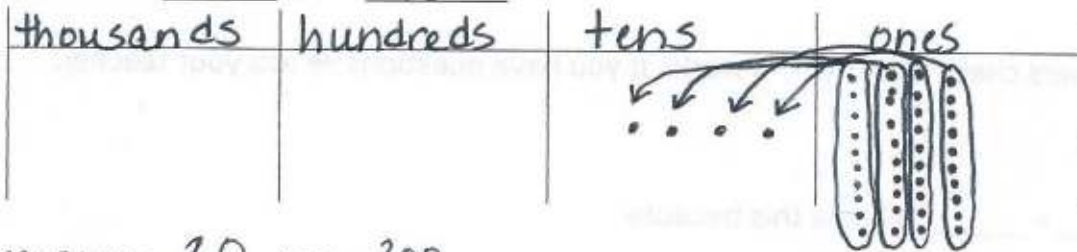
   b. 10 × 2 tens = __20__ tens = __200__

3. Katrina has 60 GB of storage on her tablet. Katrina's father has 10 times as much storage on his computer. How much storage does Katrina's father have? Use numbers or words to explain how you got your answer.

$$60 \text{ GB} \times 10 = 600 \text{ GB}$$

thousands	hundreds	tens	ones
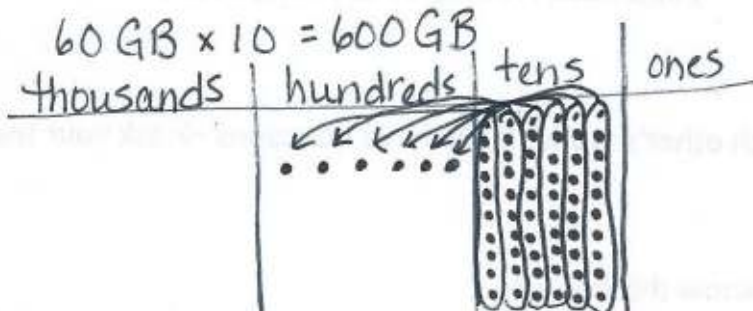
Katrina's father has 600 GB of storage on his computer.

Lesson 2

Objective: Recognize a digit represents 10 times the value of what it represents in the place to its right.

Key

Homework

1. a. Chart accurately labeled; 40; 4 ten thousands; disks accurately drawn
   b. Chart accurately labeled; 40; 4 hundreds; disks accurately drawn
2. 30 tens; 300
   50 hundreds; 5,000
   9 thousands; 9,000
   70 thousands; 70,000
3. 2 hundreds 1 tens; 210
   5 thousands 5 hundreds; 5,500
   2 hundreds 7 ones; 207
   4 thousands 8 tens; 4,080
4. a. $9,500
   b. $95
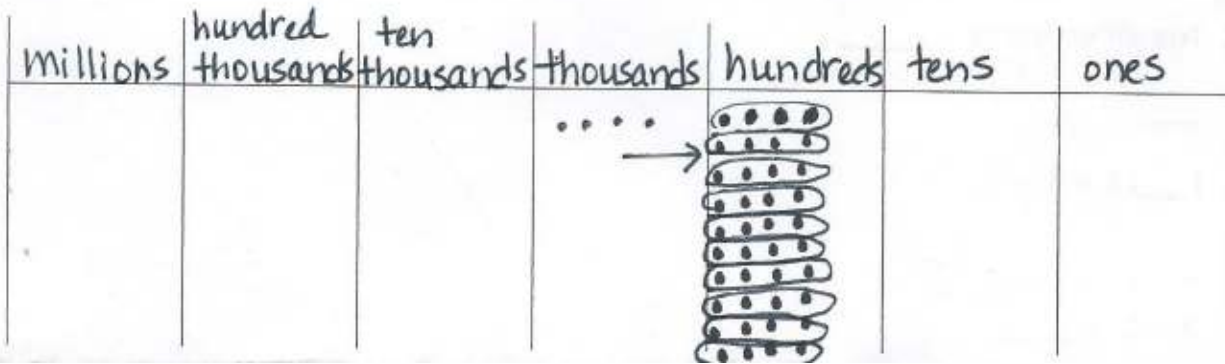
1. As you did during the lesson, label and represent the product or quotient by drawing disks on the place value chart.

a. 10×4 thousands = __40__ thousands = __40,000__

millions	hundred thousands	ten thousands	thousands	hundreds	tens	ones
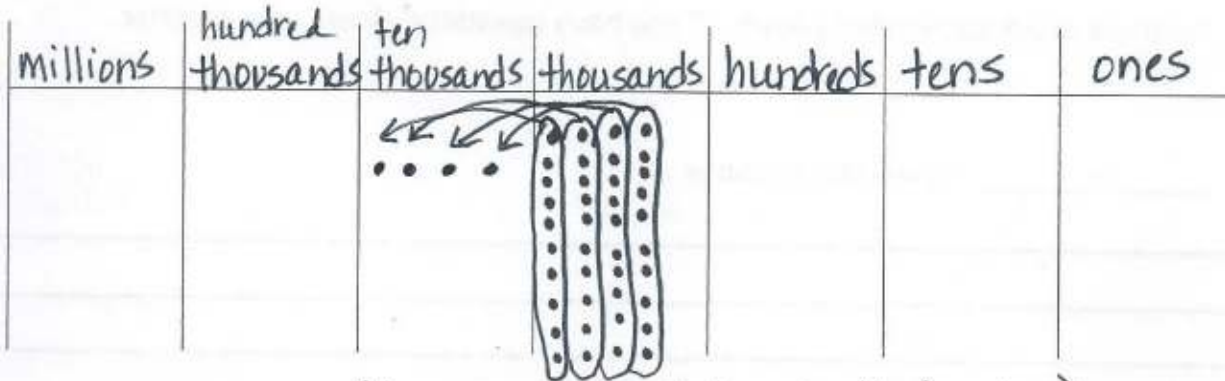
b. 4 thousands ÷ 10 = __40__ hundreds ÷ 10 = __4 hundreds (or 400)__

| millions	hundred thousands	ten thousands	thousands	hundreds	tens	ones

4.

a. Emily collected $950 selling Girl Scout cookies all day Saturday. Emily's troop collected 10 times as much as she did. How much money did Emily's troop raise?

thousands	hundreds	tens	ones
9	4	5	
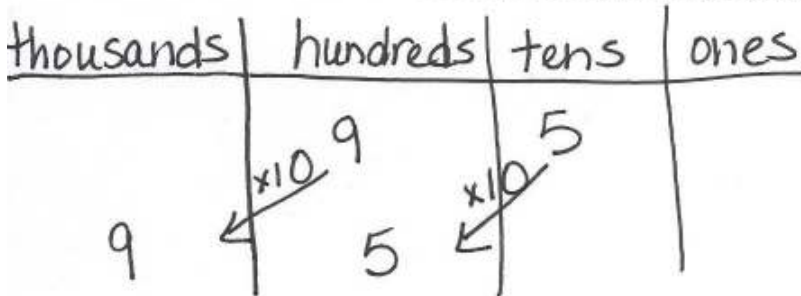
Emily's troop collected $9,500.

b. On Saturday, Emily made 10 times as much as on Monday. How much money did Emily collect on Monday?

hundreds	tens	ones
9	5	
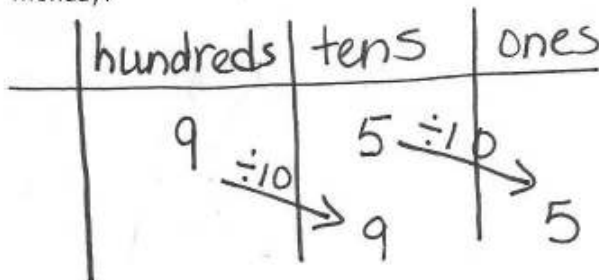
Emily collected $95. on Monday.

Lesson 3

Objective: Name numbers within 1 million by building understanding of the place value chart and placement of commas for naming base thousand units.

Key

Homework

1. a. 4,321
    b. 54,321
    c. 224,466
    d. 2,224,466
    e. 10,010,011,001

2. 100
    1,000
    12,000

3. a. Disks accurately drawn; 3,200
    b. Disks accurately drawn; 152,000

4. a. Disks or numbers accurately represented; 50,000; 50
    b. Disks or numbers accurately represented; 440,000; 440
    c. Disks or numbers accurately represented; 273,050; 273

5. Disks or numbers prove equivalent amounts

Homework Samples

1. Rewrite the following numbers including commas where appropriate:

    a. 4321   4,321
    b. 54321   54,321
    c. 224466   224,466
    d. 2224466   2,224,466
    e. 10010011001   10,010,011,001

2. Solve each expression. Record your answer in standard form.

Expression	Standard Form
4 tens + 6 tens	100
8 hundreds + 2 hundreds	1,000
5 thousands + 7 thousands	12,000

Lesson 4

Objective: Read and write multi-digit numbers using base ten numerals, number names, and expanded form.

Key

Homework

1. a. Units accurately labeled; 50,679 written in chart
   b. Fifty thousand, six hundred seventy-nine
   c. 50,000 + 600 + 70 + 9

2. a. Units accurately labeled; 506,709 written in chart
   b. Five hundred six thousand, seven hundred nine
   c. 500,000 + 6,000 + 700 + 9

3. 5,370; 5,000 + 300 + 70

   50,372; fifty thousand, three hundred seventy-two

   39,701; 30,000 + 9,000 + 700 + 1

   Three hundred nine thousand, seventeen; 300,000 + 9,000 + 10 + 7

   Seven hundred seventy thousand, seventy; 700,000 + 70,000 + 70

4. Answers and explanations will vary.

Homework Samples

1. a. On the place value chart below, label the units and represent the number 50,679.

Millions	hundred thousands	ten thousands	thousands	hundreds	tens	ones
		5	0	6	7	9

   b. Write the number in word form.

   fifty thousand, six hundred seventy nine

   c. Write the number in expanded form.

   50,000 + 600 + 70 + 9

Grade 4 Module 1 Topic B

Comparing Multi-Digit Whole Numbers

Focus Standard:

<u>4.NBT.2</u> Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons

Instructional Days Recommended: 2

In Topic B, students use place value to compare whole numbers. Initially using the place value chart, students compare the value of each digit to surmise which number is of greater value. Moving away from dependency on models and towards fluency with numbers, students compare numbers by observing across the entire number and noticing value differences. For example, in comparing 12,566 to 19,534, it is evident 19 thousands is greater than 12 thousands because of the value of the digits in the thousands unit. Additionally, students continue with number fluency by finding what is 1, 10, or 100 thousand more or less than a given number.

The sample homework responses contained in this manual are intended to provide insight into the skills expected of students and instructional strategies used in Eureka Math.

Lesson 5

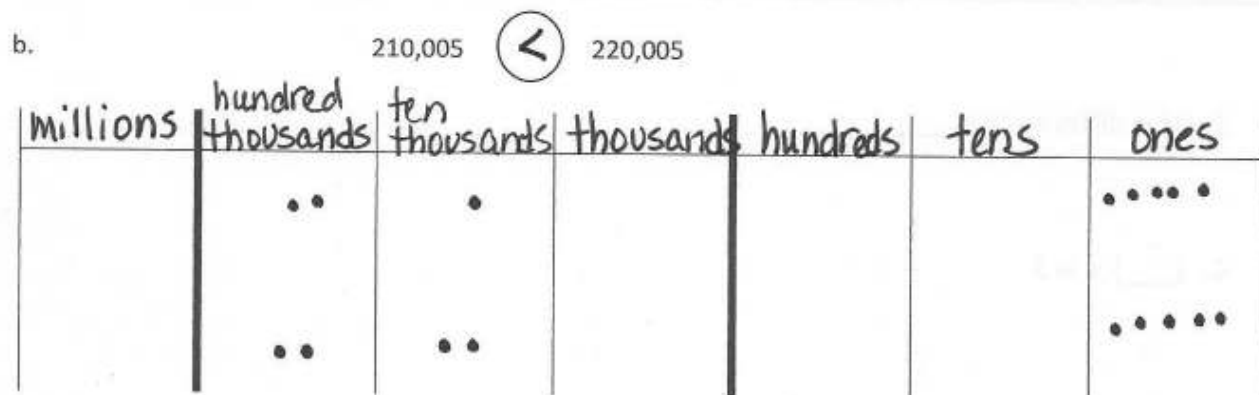Objective: Compare numbers based on meanings of the digits using >, <, or = to record the comparison.
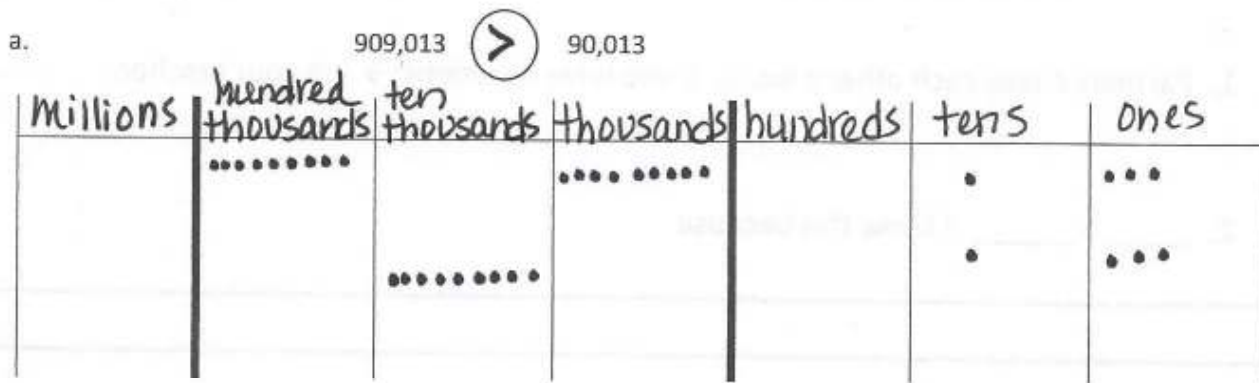
Key

Homework

1. a. Units accurately labeled; disks accurately drawn; >
    b. Units accurately labeled; disks accurately drawn; <

2. a. >
    b. <
    c. =
    d. >

3. 1,450 ft, 1,483 ft, 1,670 ft, 1.776 ft; Freedom Tower

4. 750; 5,007; 5,070; 7,505; 7,550

5. 640,020; 426,000; 406,200; 46,600

6. Nevada, Arizona, Montana, California, Texas, Alaska

Homework Samples

1. Label the units in the place value chart. Draw place value disks to represent each number in the place value chart. Use <, >, or = to compare the two numbers. Write the correct symbol in the circle.

a.
909,013 ⟩ 90,013

Millions	hundred thousands	ten thousands	thousands	hundreds	tens	ones
	••••••••		•••• •••••		•	•••
		••••• •••• •			•	•••

b.
210,005 ⟨ 220,005

millions	hundred thousands	ten thousands	thousands	hundreds	tens	ones
	••	•				••••• •
	••	••				••••••

Lesson 6

Objective: Find 1, 10, and 100 thousand more and less than a given number.

Key
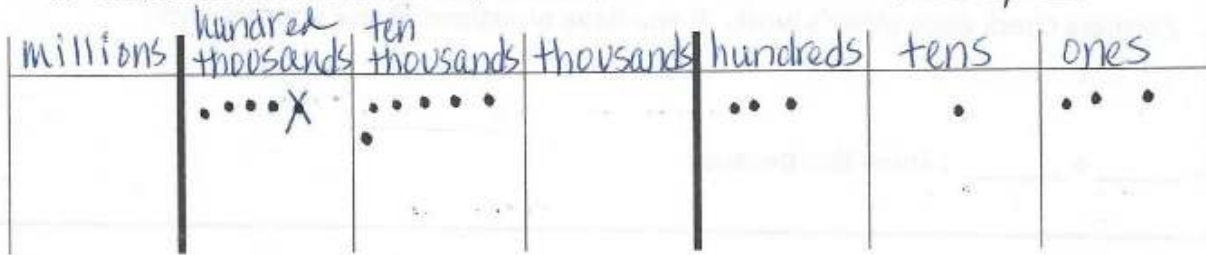
Homework

1.   a. Units accurately labeled; disks accurately drawn; 460,313
      b. Units accurately labeled; disks accurately drawn; 405,040
      c. Units accurately labeled; disks accurately drawn; 100,000 more

2.   a. 176,960
      b. 12,097
      c. 839,000
      d. 452,210
      e. 1,000
      f. 100,000

3.   a. 146,555; 148,555; 150,555; explanations will vary.
      b. 754,321; 784,321; 794,321; explanations will vary.
      c. 325,876; 525,876; 625,876; explanations will vary.
      d. 264,445; 244,445; 234,445; explanations will vary.

4. $64,098; explanations will vary.
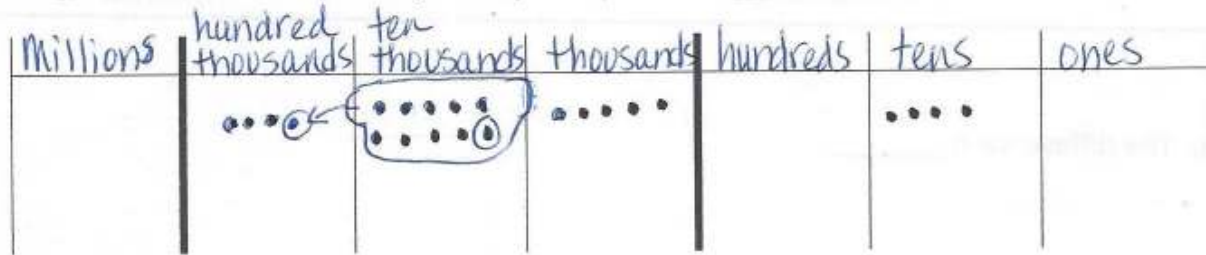
Lesson 6 (continued)

Homework Samples

1. Label the place value chart. Use place value disks to find the sum or difference. Write the answer in standard form on the line.
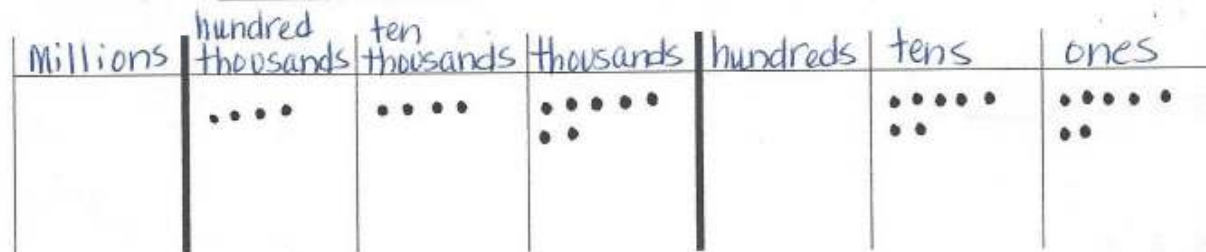
   a. 100,000 less than five hundred sixty thousand, three hundred thirteen is __460, 313__

millions	hundred thousands	ten thousands	thousands	hundreds	tens	ones
	• • • • X	• • • • • •		• • •	•	• • •
		•				

   b. Ten thousand more than 300,000 + 90,000 + 5,000 + 40 is _____.

Millions	hundred thousands	ten thousands	thousands	hundreds	tens	ones
	• • • ⊙	(• • • • • •)	• • • • • •		• • • •	
		• • • • ⊙				

   c. 447,077 is _____ than 347,077.

Millions	hundred thousands	ten thousands	thousands	hundreds	tens	ones
	• • • •	• • • •	• • • • • •		• • • • •	• • • • •
			• •		• •	• •

Grade 4 Module 1 Topic C

Rounding Multi-Digit Whole Numbers

Focus Standard:

4.NBT.3 Use place value understanding to round multi-digit whole numbers to any place.

Instructional Days Recommended: 4

In Topic C, students round to any place using the vertical number line and approximation. The vertical number line allows students to line up place values of the numbers they are comparing. In Grade 3, students rounded to the nearest 10 or 100 using place value understanding. Now, they extend this understanding rounding to the nearest thousand, ten thousand, and hundred thousand. Uniformity in the base ten system easily transfers understanding from the Grade 3 (**3.NBT.1**) to Grade 4 (**4.NBT.3**) standard.

Rounding to the leftmost unit is easiest for students, but Grade 4 students learn the advantages to rounding to any place value, which increases accuracy. Students move from dependency on the number line and learn to round a number to a particular unit. To round 34,108 to the nearest thousand, students find the nearest multiple, 34,000 or 35,000, by seeing if 34,108 is more than or less than halfway between the multiples. The final lesson of Topic C presents complex and real world examples of rounding, including instances where the number requires rounding down, but the context requires rounding up.

Lesson 7
Objective: Round multi-digit numbers to the thousands place using the vertical number line.

Key

Homework

1. a. 6,000
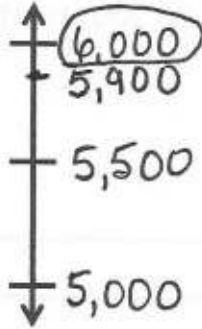   b. 4,000
    c. 33,000
    d. 79,000
    e. 251,000
    f. 700,000
2. 981 ≈ 1,000; explanations will vary.
3. $5,990 ≈ $6,000; $4,720 ≈ $5,000; Sophia's family; explanations will vary.
4. Incorrect; explanations will vary.

Homework Samples

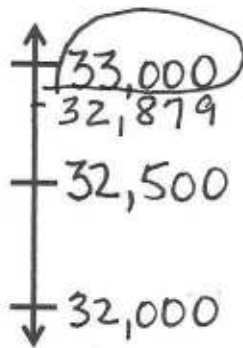1. Round to the nearest thousand. Use the number line to model your thinking.

    a. 5,900 ≈ __6,000__

    ⊢(6,000)
    ⊢ 5,900

    ⊢ 5,500

    ⊢ 5,000

    b. 4,180 ≈ __4,000__

    ⊢ 5,000

    ⊢ 4,500

    ⊢ 4,180
    (4,000)

    c. 32,879 ≈ __33,000__

    ⊢(33,000)
    ⊢ 32,879

    ⊢ 32,500

    ⊢ 32,000

    d. 78,600 ≈ __79,000__

    ⊢(79,000)

    ⊢ 78,600
    ⊢ 78,500

    ⊢ 78,000

    e. 251,031 ≈ __251,000__

    ⊢ 252,000

    ⊢ 251,500
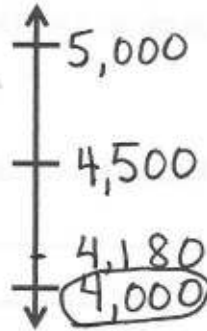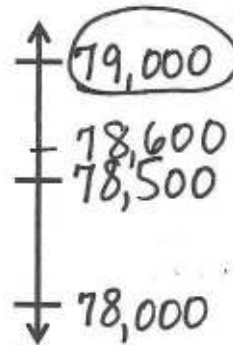
    ⊢ 251,031
    (251,000)

    f. 699,900 ≈ __700,000__

    ⊢(700,000)
    ⊢ 699,900

    ⊢ 699,500
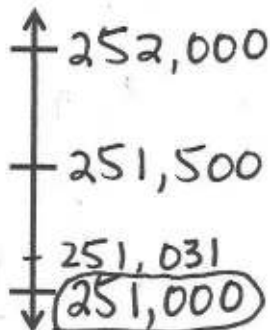
    ⊢ 699,000
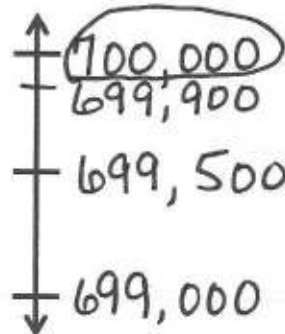
Lesson 8
Objective: Round multi-digit numbers to any place using the vertical number line.

Key

Homework

1. a. 70,000; number line accurately models work.

   b. 50,000; number line accurately models work.

   c. 110,000; number line accurately models work.

2. a. 900,000; number line accurately models work.

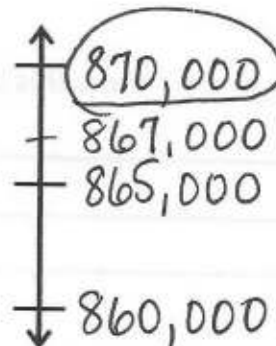   b. 800,000; number line accurately models work.

   c. 600,000; number line accurately models work.

3. 500,000; number line accurately models work.

4. Possible digits are 0, 1, 2, 3, or 4; number line accurately models work.

5. a. 380,000

   b. 400,000

Homework Work Samples

1. a. 67,000 rounded to the nearest ten thousand is __70,000__.
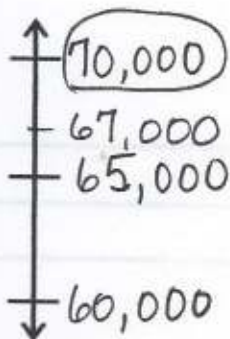
2. a. 867,000 rounded to the nearest hundred thousand is _____.

Lesson 9

Objective: Use place value understanding to round multi-digit numbers to any place value.

Key

Homework

1. a. 7,000
    b. 3,000
    c. 16,000
    d. 706,000
    e. Explanations will vary.
2. a. 90,000
    b. 90,000
    c. 790,000
    d. 910,000
    e. Explanations and numbers will vary.

3. a. 100,000
    b. 800,000
    c. 600,000
    d. 800,000
    e. Explanations and numbers will vary.
4. a. 849,999; 750,000
    b. 404,999; 395,000
    c. 30,499; 29,500

Homework Samples

1. Round to the nearest thousand.

    a. 6,842 ≈ __7,000__

    b. 2,722 ≈ __3,000__

    c. 16,051 ≈ __16,000__

    d. 706,421 ≈ __706,000__

    e. Explain how you found your answer for Part (d).

    For part d I looked at the thousands place which was 6. Next I looked at the hundreds place which was 4. I knew that it was closer to 706,000.

Lesson 10

Objective: Use place value understanding to round multi-digit numbers to any place value using real world applications.

Key

Homework

1. a. 845,000
   b. 850,000
   c. 800,000

2. a. 800
   b. 12,800
   c. 951,200
   d. 1,000
   e. 65,000
   f. 99,000

   g. 60,000
   h. 80,000
   i. 900,000
   j. 900,000
   k. 500,000
   l. 700,000

3. a. Answers and explanations will vary.
   b. Answers and explanations will vary.
   c. Answers and explanations will vary.

Homework Samples

1. Round 845,001 to the nearest

   a. thousand: __845,000__

   b. ten thousand: __850,000__

   c. hundred thousand: __800,000__

Multi-Digit Whole Number Addition

Focus Standards:

<u>4.OA.3</u> Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

<u>4.NBT.4</u> Fluently add and subtract multi-digit whole numbers using the standard algorithm.

Instructional Days Recommended: 2

Moving away from special strategies for addition, students develop fluency with the standard addition algorithm (**4.NBT.4**). Students compose larger units to add like base ten units, such as composing 10 hundreds to make 1 thousand and working across the numbers unit by unit (ones with ones, thousands with thousands). Recording of regrouping occurs on the line under the addends as shown below.

$$
\begin{array}{r}
755{,}206 \\
+\ \ \ 89{,}814 \\
\hline
845{,}020
\end{array}
$$

For example, in the ones column, students do not record the 0 in the ones column and the 1 above the tens column, instead students record 10, writing the 1 under the tens column and then a 0 in the ones column. They practice and apply the algorithm within the context of word problems and assess the reasonableness of their answers using rounding (**4.OA.3**). When using tape diagrams to model word problems, students use a variable to represent the unknown quantity.

*The sample homework responses contained in this manual are intended to provide insight into the skills expected of students and instructional strategies used in Eureka Math.

Lesson 11

Objective: Use place value understanding to fluently add multi-digit whole numbers using the standard addition algorithm, and apply the algorithm to solve word problems using tape diagrams.

Key

Homework

1.			2.		
	a.	8,953		a.	15,123 lb
	b.	37,649		b.	17,353 lb
	c.	870,898		c.	20,020 lb
	d.	301,050		d.	5,020 lb
	e.	662,831			
	f.	380,880			
	g.	119,714			
	h.	381,848			
	i.	1,000,000			

Homework Samples

1. Solve the addition problems below using the standard algorithm.

a.
$$7,909$$
$$+ \quad 1,044$$
$$8,953$$

b.
$$27,909$$
$$+ \quad 9,740$$
$$37,649$$

c.
$$827,909$$
$$+ \quad 42,989$$
$$870,898$$

d.
$$289,205$$
$$+ \quad 11,845$$
$$301,050$$

e.
$$547,982$$
$$+ \quad 114,849$$
$$662,831$$

f.
$$258,983$$
$$+ \quad 121,897$$
$$380,880$$

Lesson 12

Objective: Solve multi-step word problems using the standard addition algorithm modeled with tape diagrams, and assess the reasonableness of answers using rounding.

Key

Homework

1. a. 24,000
   b. 23,613
   c. Explanations will vary.
2. a. 157,593
   b. 157,000; explanations will vary.
3. a. 30,238
   b. Explanations will vary.

Homework Samples

1. There were 3,905 more hits on the school's website in January than February. February had 9,854 hits. How many hits did the school's website have during both months?

   a. About how many hits did the website have during January and February?

   Jan. | 9,854 | 3,905 | } ?
   Feb. | 9,854 |

   10,000
   10,000
   4,000
   _____
   24,000

   The school's site had about 24,000 hits during Jan. + Feb.

   b. Exactly how many hits did the website have during January and February?

   9,854
   9,854
   3,905
   _____
   23,613

   The school's website had 23,613 hits during Jan. and Feb.

   c. Is your answer reasonable? Compare your estimate from (a) to your answer from (b). Write a sentence to explain your reasoning.

   yes my answer to part b is reasonable because 23,613 is close to 24,000 when rounding to the nearest thousand.

Grade 4 Module 1 Topic E

Multi-Digit Whole Number Subtraction

Focus Standards:

4.OA.3 Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

4.NBT.4 Fluently add and subtract multi-digit whole numbers using the standard algorithm.

Instructional Days Recommended: 4

Following the introduction of the standard algorithm for addition in Topic D, the standard algorithm for subtraction replaces special strategies for subtraction in Topic E. Moving slowly from smaller to larger minuends, students practice decomposing larger units into smaller units. First, only one decomposition is introduced, where one zero may appear in the minuend. As in Grades 2 and 3, students continue to decompose all necessary digits before performing the algorithm, allowing subtraction from left to right, or, as taught in the lessons, from right to left. Students use the algorithm to subtract numbers from 1 million allowing for multiple decompositions (**4.NBT.4**). The topic concludes with practicing the standard algorithm for subtraction in the context of two-step word problems where students have to assess the reasonableness of their answers by rounding (**4.OA.3**). When using tape diagrams to model word problems, students use a variable to represent the unknown quantity.

$$
\begin{array}{r}
\overset{\scriptstyle 3\ \ \ 11\ \ 9}{\cancel{4}\,\cancel{2}\cancel{0},\cancel{0}\cancel{6}\cancel{1}} \\
{\scriptstyle \ \ \ \ \ 10\ \ 5\ 11} \\
-\ \ \ 56,328 \\
\hline
363,733
\end{array}
$$

Lesson 13

Objective: Use place value understanding to decompose to smaller units once using the standard subtraction algorithm and apply the algorithm to solve word problems using tape diagrams.

Homework

1. a. 2,090	2. 24,717
b. 408,110	3. 1,922
c. 330,011	4. $312,571
d. 30,011	5. a. 390,211
e. 890,130	b. 204,110
f. 106,010	
g. 1,511	
h. 371,631	

Homework Samples

1. Use the standard algorithm to solve the following subtraction problems.

a.
```
  3 13
2,4̷3̷1
- 341
2,090
```

b.
```
 1 12
4̷2̷2,431
- 14,321
408,110
```

c.
```
    3
4̷22,431
-92,420
330,011
```

d.
```
    3
4̷22,431
-392,420
30,011
```

e.
```
  8
9̷82,430
-92,300
890,130
```

f.
```
    3
24̷3,089
-137,079
106,010
```

g. 2,431 – 920 =
```
 1
2̷,431
- 920
1,511
```

h. 892,431 – 520,800 =
```
   1
89̷2,431
-520,800
371,631
```

Lesson 14

Objective: Use place value understanding to decompose to smaller units up to three times using the standard subtraction algorithm, and apply the algorithm to solve word problems using tape diagrams.

Key

Homework

1.	a.	50,497		2.	212,181 lb
	b.	275,497		3.	92,944
	c.	345,897		4.	361,200 lb
	d.	158,497			
	e.	90,517			
	f.	858,919			
	g.	857,011			
	h.	87,897			
	i.	258,989			

Homework Samples

1. Use the standard algorithm to solve the following subtraction problems.

a.
$$71,989$$
$$-21,492$$
$$50,497$$

b.
$$871,989$$
$$-\ 96,492$$
$$275,497$$

c.
$$371,089$$
$$-25,192$$
$$345,897$$

d.
$$879,989$$
$$-721,492$$
$$158,497$$

e.
$$879,009$$
$$-788,492$$
$$90,517$$

f.
$$879,989$$
$$-\ 21,070$$
$$858,919$$

Lesson 15

Objective: Use place value understanding to fluently decompose to smaller units multiple times in any place using the standard subtraction algorithm, and apply the algorithm to solve word problems using tape diagrams.

Key

Homework

1. a. 8,818
   b. 53,776
   c. 179,667
   d. 127,780
   e. 55,061
   f. 197,750
   g. 720,511
   h. 755,000
   i. 523,836

2. 7,919 mi
3. 598,909
4. $674,700
5. 18,647 g

Homework Samples

.. Use the standard subtraction algorithm to solve the problems below.

a.
$$\begin{array}{r} \overset{8\ \ 4}{9,656} \\ -\ \ \ \ 838 \\ \hline 8,818 \end{array}$$

b.
$$\begin{array}{r} \overset{8\ \ 15}{59,656} \\ -\ \ 5,880 \\ \hline 53,776 \end{array}$$

c.
$$\begin{array}{r} \overset{6\ 14\ 8\ \ 15\ 14}{759,656} \\ -\ 579,989 \\ \hline 179,667 \end{array}$$

d.
$$\begin{array}{r} \overset{8\ 13\ \ 10}{294,450} \\ -\ 166,370 \\ \hline 127,780 \end{array}$$

e.
$$\begin{array}{r} \overset{8\ \ 0\ 14}{294,150} \\ -\ 239,089 \\ \hline 55,061 \end{array}$$

f.
$$\begin{array}{r} \overset{1\ \ 8\ 13}{294,150} \\ -\ \ 96,400 \\ \hline 197,750 \end{array}$$

Lesson 16

Objective: Solve two-step word problems using the standard subtraction algorithm fluently modeled with tape diagrams, and assess the reasonableness of answers using rounding.

Key

Homework

1. a. 40,000
    b. 40,699
    c. Explanations will vary.
2. a. 700,000
    b. 601,801
    c. Explanations will vary.
3. 19,999; explanations will vary.

Homework Samples

1. Zachary's final project for a college course took a semester to write and had 95,234 words. Zachary wrote 35,295 words the first month and 19,240 words the second month.

   a. Round each value to the nearest ten thousand to estimate how many words Zachary wrote during the remaining part of the semester.

   1st month $35,295 \approx 40,000$

   2nd month $19,240 \approx 20,000$

   $60,000$

   Semester $95,234 \approx 100,000$

   $100,000 - 60,000 = 40,000$

   Zachary wrote about 40,000 words during the remaining part of the semester.

   b. Find the exact number of words written during the remaining part of the semester.

   $35,295$
   $+19,240$
   $54,535$

   $95,\overset{4\ 11\ 12}{234}$
   $-54,535$
   $40,699$

   Zachary wrote 40,699 words during the remaining part of the semester.

   c. Use your answer from (a) to explain why your answer in (b) is reasonable.

   My estimate to part a was 40,000.
   My exact answer was 40,699.
   40,699 rounds to 40,000 when rounded to the nearest ten-thousand
   so my answer seems reasonable.

Grade 4 Module 1 Topic F

Addition and Subtraction Word Problems

Focus Standard:

4.OA.3 Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

Instructional Days Recommended: 3

Module 1 culminates with multi-step addition and subtraction word problems in Topic F (**4.OA.3**). In these lessons, the format for the Concept Development is different from the traditional vignette. Instead of following instruction, the Problem Set facilitates the problems and discussion of the Concept Development.

Throughout the module, tape diagrams are used to model word problems, and students continue to use tape diagrams to solve *additive comparative* word problems. Students also continue using a variable to represent an unknown quantity.

To culminate the module, students are given tape diagrams or equations and are encouraged to use creativity and the mathematics learned during this module to write their own word problems to solve using place value understanding and the algorithms for addition and subtraction. The module facilitates deeper comprehension and supports determining the reasonableness of an answer. Solving multi-step word problems using multiplication and division are addressed in later modules.

The sample homework responses contained in this manual are intended to provide insight into the skills expected of students and instructional strategies used in Eureka Math.

Lesson 17

Objective: Solve *additive compare* word problems modeled with tape diagrams.
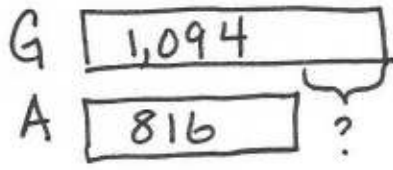
Key

Homework

1. 278

2. 7,093 L

3. 160 in

Homework Samples

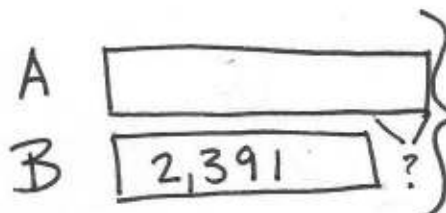Draw a tape diagram to represent each problem. Use numbers to solve, and write your answer as a statement.

1. Gavin has 1,094 toy building blocks. Avery only has 816 toy building blocks. How many more building blocks does Gavin have?

G [1,094]
A [816] ?

$$\begin{array}{r} \overset{0\ \ 8}{\cancel{1},0\cancel{9}4} \\ -\ 8\ 1\ 6 \\ \hline 2\ 7\ 8 \end{array}$$

Gavin has 278 more building blocks than Avery.

2. Container B holds 2,391 liters of water. Together, Container A and Container B hold 11,875 liters of water. How many more liters of water does Container A hold than Container B?
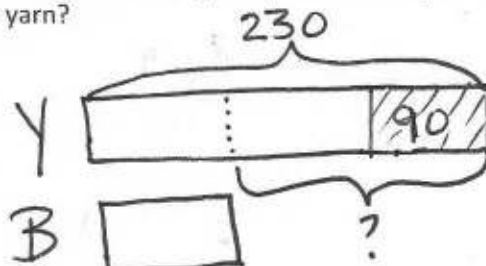
A [ ]
B [2,391] ? } 11,875

$$\begin{array}{r} \overset{0\ \ 7}{\cancel{1}1,8\cancel{7}5} \\ -\ 2,391 \\ \hline 9,484 \end{array}$$

$$\begin{array}{r} \overset{\ \ \ 3}{9\cancel{4}\cancel{8}4} \\ -\ 2,391 \\ \hline 7,093 \end{array}$$

Container A holds 7,093 more liters than B.

3. A piece of yellow yarn was 230 inches long. After 90 inches had been cut from it, the piece of yellow yarn was twice as long as a piece of blue yarn. At first, how much longer was the yellow yarn than the blue yarn?

230

Y [90   ]
B [   ]   ?

$$\begin{array}{r} \overset{1}{2}\cancel{3}0 \\ -\ \ 90 \\ \hline 140 \end{array}$$

$2 \times \boxed{70} = 140$

$70 + 90 = \underline{160}$

The yellow yarn was 160 inches longer than the blue at first.

Lesson 18

Objective: Solve multi-step word problems modeled with tape diagrams, and assess the reasonableness of answers using rounding.
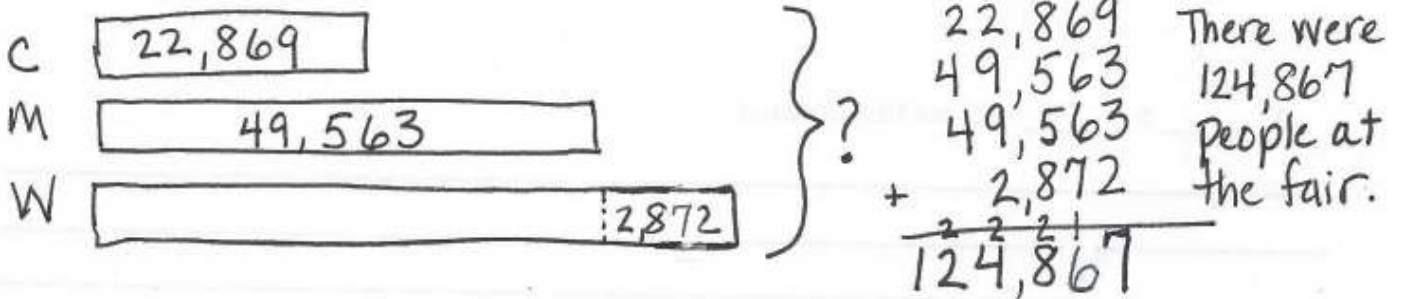
Key

Homework

1. 124,867
2. 31,504
3. 2,210

Homework Samples

1. There were 22,869 children. 49,563 men, and 2,872 more women than men at the fair. How many people were at the fair?

C 　22,869

M 　49,563

W 　2872

$$\left.\begin{matrix} \end{matrix}\right\}?$$

$$\begin{array}{r} 22,869 \\ 49,563 \\ 49,563 \\ + \quad 2,872 \\ \hline 124,867 \end{array}$$

There were 124,867 people at the fair.

2. Number A is 4,676. Number B is 10,043 greater than A. Number C is 2,610 less than B. What is the total value of numbers A, B, and C?

A 　4,676

B 　10,043

C 　2,610

$$\left.\begin{matrix} \end{matrix}\right\}?$$
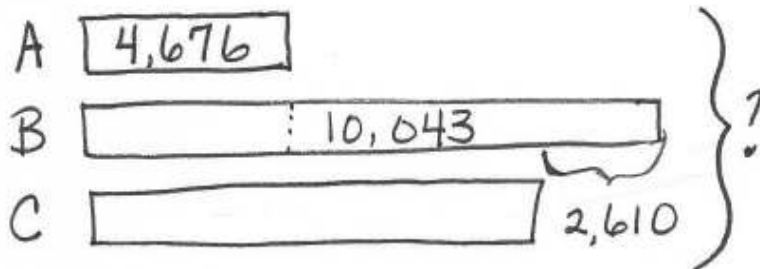
Lesson 19

Objective: Create and solve multi-step word problems from given tape diagrams and equations.

Key

Homework

1. Word problems will vary; 1,972
2. Word problems will vary; 93,168
3. Word problems will vary; 94,851
4. Tape diagram models the equation; word problems will vary; 5,606

Homework Samples

Using the diagrams below, create your own word problem. Solve for the value of the variable.
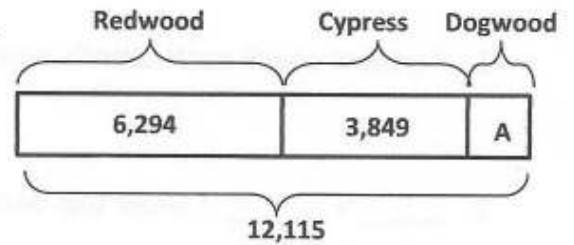
1. At the local botanical gardens, there are __6,294__ Redwoods and __3,849__ Cypress trees.

   There are a total of __12,115__ Redwood, Cypress, and Dogwood trees.

   How many __Dogwood trees are__ __there__.

   _____ ?

	Redwood	Cypress	Dogwood
	6,294	3,849	A

   12,115

   $$\begin{array}{r} 6294 \\ 3849 \\ \hline 10,143 \end{array}$$

   $$\begin{array}{r} 12,115 \\ -10,143 \\ \hline 1,972 \end{array}$$

   There are 1,972 dogwood trees.