Eureka Acceleration Tool: Grade 6
Module 2, Topic C

To become mathematically proficient, students **must** access on-grade-level content. This document aims to help teachers who use the Eureka curriculum to ensure readiness for students before and during on-grade-level work, creating opportunities for timely support directly connected to the new learning.

About this Topic

Focus Standards:
6.NS.B.2: Fluently divide multi-digit numbers using the standard algorithm.
6.NS.B.3: Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

Note to Louisiana Teachers: The **Grade 4 and Grade 5 Louisiana Guides to Implementing Eureka** encourage 4th and 5th grade teachers to only teach the lessons regarding the standard algorithm of long division as enrichment as time allows. The Louisiana Student Standards for Mathematics do not require that students be introduced to the algorithm for division until 6th grade. Therefore, most students entering 6th grade will not have been exposed to the algorithm and will need instruction to connect the algorithm to previously learned models.

Topic Overview per the Eureka Curriculum

In Grades 4 and 5, students used concrete models, pictorial representations, and properties to divide whole numbers (4.NBT.6, 5.NBT.6). ~~They became efficient in applying the standard algorithm for long division.~~ They broke dividends apart into like base-ten units, applying the distributive property to find quotients place by place.

In Topic C, students connect estimation to place value and determine that the standard algorithm is simply a tally system arranged in place value columns (6.NS.2). Students understand then when they "bring down" the next digit in the algorithm, they are essentially distributing, recording, and shifting to the next place value. They understand that the steps in the algorithm continually provide better approximations to the answer. Students further their understanding of division as they develop fluency in the use of the standard algorithm to divide multi digit decimals (6.NS.3). They make connections to division of fractions and rely on mental math strategies to implement the division algorithm when finding the quotients of decimals.

Eureka Acceleration Tool: Grade 6
Module 2, Topic C

Overview

Eureka Acceleration Tools include:

1. a diagnostic assessment to help teachers determine the misunderstandings or gaps in mathematical knowledge related to a specific Topic in the Eureka curriculum
2. guidance for teachers to analyze student work on the diagnostic assessment
3. suggested materials for targeted remedial instruction

Note: The use of this guidance is not intended to delay students' engagement with on-grade-level learning. On-grade-level learning should be the focus of instructional time and be treated as an opportunity for students to "finish" learning previous skills and deepen conceptual understanding.

Diagnostic Assessment

The diagnostic assessment is designed to be administered to targeted students prior to beginning instruction on the given Topic. When appropriate, it is broken into parts (Part A, Part B, and so on); each part addresses a different prerequisite standard and contains three problems. If a student correctly answers at least 2 out of the 3 problems, it can be assumed that he/she is ready to engage with the new content of the Topic with little to no support needed prior to engaging with the Topic. The diagnostic assessment is designed in this way so that teachers can determine the "entry point" to remedial instruction and/or opportunities for unfinished learning within the context of the new learning. The entry points and opportunities for unfinished learning will vary between students.

Guidance for Acceleration

The Acceleration Guidance is designed for teacher use. It is also broken into parts (Part A, Part B, and so on) and correlates to the parts on the diagnostic assessment. Each part contains the following:

1. **The focus standard**: The focus standards are strategically chosen to address prerequisite skills and are purposefully arranged in the order that students typically master the skills and knowledge.
2. **Why this is important for current grade level work**: This section describes how the work of the prerequisite standard relates to the standard(s) addressed in the Topic of instruction.
3. **Using the diagnostic assessment to identify gaps**: This section identifies common errors students make on the diagnostic assessment items.
4. **Acceleration Resources for Targeted Instruction**: The resources pinpoint specific Eureka lessons and parts of lessons for teachers to use to address gaps in mathematical knowledge. Using Eureka materials to address acceleration ensures alignment to the standards, consistency in approach to learning, and similarities in strategies for solving problems.

Part A: 4.NBT.B.4

1. Subtract using the standard algorithm.
   105 – 88

2. Subtract using the standard algorithm.
   478 – 252

3. Subtract using the standard algorithm.
   657 – 289

Part B: 4.NBT.B.6

4. Find the quotient. Illustrate and explain the calculation by using an equation, rectangular array, and/or area model.
   76 ÷ 4

5. Find the quotient. Illustrate and explain the calculation by using an equation, rectangular array, and/or area model.
   469 ÷ 7

6. Find the quotient. Illustrate and explain the calculation by using an equation, rectangular array, and/or area model.
   6,241 ÷ 3

Part C: 5.NBT.A.1

7. Write a number including a 7 that is ten times the value of the 7 in the number 27,543.

8. Write a number including a 3 that is $\frac{1}{10}$ the value of the 3 in the number 27,543.

9. Write a number including a 6 that is $\frac{1}{100}$ the value of the 6 in the number 63.17.

Part D: 5.NBT.B.6

10. Find the quotient. Illustrate and/or explain the calculation by using an equation, rectangular array, area model, or other strategy based on place value.
    $705 \div 15$

11. Find the quotient. Illustrate and/or explain the calculation by using an equation, rectangular array, area model, or other strategy based on place value.
    $467 \div 23$

12. Find the quotient. Illustrate and/or explain the calculation by using an equation, rectangular array, area model, or other strategy based on place value.
    $4{,}992 \div 32$

Part E: 5.NBT.B.5

13. Multiply using the standard algorithm.
    43×5

14. Multiply using the standard algorithm.
    77×9

15. Multiply using the standard algorithm.
    356×7

Part F: 5.NBT.B.7

16. Find the quotient. Illustrate and/or explain the calculation by using an equation, rectangular array, area model, or other strategy based on place value.
    $33.6 \div 14$

17. Find the quotient. Illustrate and/or explain the calculation by using an equation, rectangular array, area model, or other strategy based on place value.
    $41 \div 2.5$

18. Find the quotient. Illustrate and/or explain the calculation by using an equation, rectangular array, area model, or other strategy based on place value.
    $39.13 \div 9.1$

Solutions:

1. 17
2. 226
3. 368
4. 19
5. 67
6. 2,080 R1 (sample)
7. 70,000 (sample)
8. 0.3 (sample)
9. 0.6 (sample)
10. 47
11. 20 R7 (sample)
12. 156
13. 215
14. 693
15. 2,492
16. 2.4
17. 16.4
18. 4.3

Part A Focus: 4.NBT.B.4 Fluently add and subtract multi-digit whole numbers with sums less than or equal to 1,000,000, using the standard algorithm.

Why this is important for current grade level work:
When carrying out the standard algorithm for multi-digit division, students must subtract multi-digit whole numbers. Since the subtraction shows up within the division algorithm, the standard algorithm proves to be the most efficient method for students. The three problems show possible subtraction problems that may arise during the division algorithm and scaffold in difficulty.

Using the Diagnostic Assessment to identify gaps:

Problem 1:
It is possible that a student may use an alternative strategy (e.g., counting on) and still be considered ready for the target standard.

Problem 2:
Students should use a more efficient strategy and recognize that all the single-digit differences can be calculated without any regrouping.

Problem 3:
When using the standard algorithm, students must regroup twice. Look for students who either do not regroup or regroup incorrectly. Students should recognize that the standard algorithm is the most efficient strategy for this problem.

Acceleration Resources for Targeted Instruction:

adapted from
4th Grade, Module 1, Topic E, Lesson(s) 13 - 15

Teacher Companion
Student Activity Sheet

Part B Focus: 4.NBT.B.6 Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

Why this is important for current grade level work:

This standard does not call for the standard algorithm, so students may engage with these problems in a variety of ways. The most important look-fors here are the accuracy of their answer, the efficiency of their strategy, and how they deal with the remainder in problem 6. The problems scaffold in difficulty.

Using the Diagnostic Assessment to identify gaps:

Problem 4:
Students may recognize that 76 is exactly 4 less than 80 and use that fact to deduce that the quotient is 19.

Problem 5:
Look for students who think 7 can go into 46 7 times since 49 is close to 46. This shows a gap in their fundamental understanding of division.

Problem 6:
Students representing the remainder as a fraction or using remainder notation should be considered ready for the target standard. It is likely that a student attempting to use decimal notation will truncate their answer, not understanding that the quotient includes a repeating decimal.

Acceleration Resources for Targeted Instruction

adapted from:
4th Grade, Module 3, Topic E, Lesson(s) 15 - 18

Teacher Companion
Student Activity Sheet

Part C Focus: 5.NBT.A.1 Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.

Why this is important for current grade level work:
Instruction often fails to connect the division algorithm to place value, making it difficult for students to connect to and understand the division algorithm. These items ensure students have the necessary understanding of place value to connect to the target standard.

Using the Diagnostic Assessment to identify gaps:

Problem 7:
Students may misinterpret the item and identify the place value of the 7 in the given number. This does not necessarily point to a gap in understanding of place value.

Problem 8:
Students may not understand that there exist numbers that are not whole numbers, not realizing the answer should involve a decimal.

Problem 9:
Look for students whose answer includes a 6 that is $\frac{1}{10}$ the value of the 6 in the given number as this might indicate a limitation in their understanding of place value.

Acceleration Resources for Targeted Instruction:

adapted from:
5th Grade, Module 1, Topic A, Lesson(s) 1 - 2

Teacher Companion
Student Activity Sheet

Part D Focus: 5.NBT.B.6 Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, subtracting multiples of the divisor, and/or the relationship between multiplication and division. Illustrate and/or explain the calculation by using equations, rectangular arrays, area models, or other strategies based on place value.

Why this is important for current grade level work:
This standard does not call for the standard algorithm, so students may engage with these problems in a variety of ways. The most important look-fors here are the accuracy of the answer, the efficiency of the strategy, and how the remainder in problem 11 is dealt with. The problems scaffold in difficulty.

Using the Diagnostic Assessment to identify gaps:

Problem 10:
Students may replace 705 with 600 + 105, recognizing two multiples of 15, and still be considered ready for the target standard.

Problem 11:
Students representing the remainder as a fraction or using remainder notation should be considered ready for the target standard. It is likely that a student attempting to use decimal notation will truncate their answer, not understanding that the quotient includes a repeating decimal.

Problem 12:
Students may struggle with the size of the dividend, giving the teacher a hook for introducing the standard algorithm for division.

Acceleration Resources for Targeted Instruction:
adapted from:
5th Grade, Module 2, Topic F, Lesson(s) 20 - 23

Teacher Companion
Student Activity Sheet

Part E Focus: 5.NBT.B.5 Fluently multiply multi-digit whole numbers using the standard algorithm.

Why this is important for current grade level work:
When carrying out the standard algorithm for multi-digit division, students must multiply multi-digit whole numbers. Since the multiplication shows up within the division algorithm, the standard algorithm proves to be the most efficient method for students. The three problems show possible multiplication problems that may arise during the division algorithm and scaffold in difficulty.

Using the Diagnostic Assessment to identify gaps:

Problem 13:
Some students may be able to calculate the product mentally and be considered ready for the target standard.

Problem 14:
Some students may use partial products to calculate the product (i.e., calculating $9 \times 7 = 63$ and $9 \times 70 = 630$, then adding $630 + 63 = 693$) and be considered ready for the target standard.

Problem 15:
Look for students who either write all of the two-digit products without adding (i.e., $356 \times 7 = 213{,}542$) or who add but assume all products only consists of tens and ones (i.e., $356 \times 7 = 21 + 35 + 42 = 98$). Both mistakes reveal a disconnect between place value and the algorithm.

Acceleration Resources for Targeted Instruction:

adapted from
5th Grade, Module 2, Topic B, Lesson(s) 5 - 8

Teacher Companion
Student Activity Sheet

Part F Focus: 5.NBT.B.7 Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; justify the reasoning used with a written explanation.

Why this is important for current grade level work:
This standard does not call for the standard algorithm, so students may engage with these problems in a variety of ways. The most important look-fors here are the accuracy of the answer, the efficiency of the strategy, and how the work with the decimal dividends and divisors. Furthermore, students who produce unreasonable answers may not understand the connection between place value and division. The problems scaffold in difficulty.

Using the Diagnostic Assessment to identify gaps:

Problem 16:
Students may replace 33.6 with 28 + 5.6, recognizing 28 and 56 as multiples of 14. Then, using their understanding of place value, students conclude that, if $14 \times 4 = 56$, then $14 \times 0.4 = 5.6$.

Problem 17:
Students may recognize that 2.5 goes into 40 16 times, since $2.5 \times 4 = 10$ and $10 \times 4 = 40$. Then, using their understanding of equivalent fractions, students conclude that $\frac{1}{2.5} = \frac{4}{10}$, leading to the quotient of 16.4.

Problem 18:
Students may struggle to apply the same reasoning used in problems 16 and 17 to find the quotient in problem 18. This provides the teacher a hook for introducing/extending the standard algorithm for division.

Acceleration Resources for Targeted Instruction:

adapted from:
5th Grade, Module 1, Topic F, Lesson(s) 13 - 15

Teacher Companion
Student Activity Sheet

Acceleration Guidance:
Grade 6 Eureka Module 2, Topic C

Appendix

Eureka Acceleration Tools

Prerequisite Support Lesson for Grade 6, Module 2, Topic C

Part A: Subtract Multi-Digit Whole Numbers

Adapted from Eureka Lesson: 4th Grade, Module 1, Topic E, Lessons 13-15

Use Prior to: Grade 6, Module 2, Topic C, Lesson 12

Standard: 4.NBT.B.4 Fluently add and *subtract* multi-digit whole numbers with sums less than or equal to 1,000,000, using the standard algorithm.

Purpose: When carrying out the standard algorithm for multi-digit division, students must subtract multi-digit whole numbers. Since the subtraction shows up within the division algorithm, the standard algorithm proves to be the most efficient method for students.

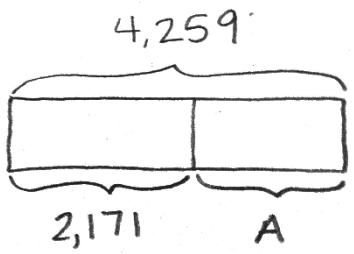
Note: Complete the Example Problems together as a class. The problems increase with complexity in the Example Problems and follow the same format in the Problem Set. Depending on the needs of the students, consider working one section of the example problems at a time, and then letting the students practice the corresponding Problem Set items before moving onto the next set of Example Problems.

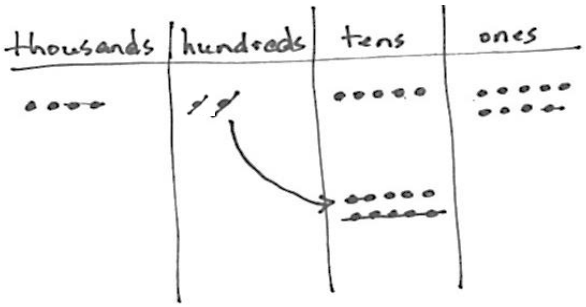
Example Problems

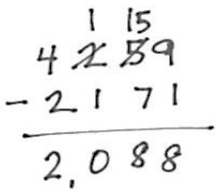
A. Use a tape diagram, place value chart and the standard algorithm to solve.

Complete the Example Problems 1-3 together as a class, modeling the use of tape diagrams and place value charts so students can conceptualize the process of regrouping. Students should solve using the standard algorithm to the side of the place value chart so they can relate regrouping in the place value chart to the regrouping in the process of solving vertically. (Problem Set items: a, b, c)

1. 4,259 – 2,171



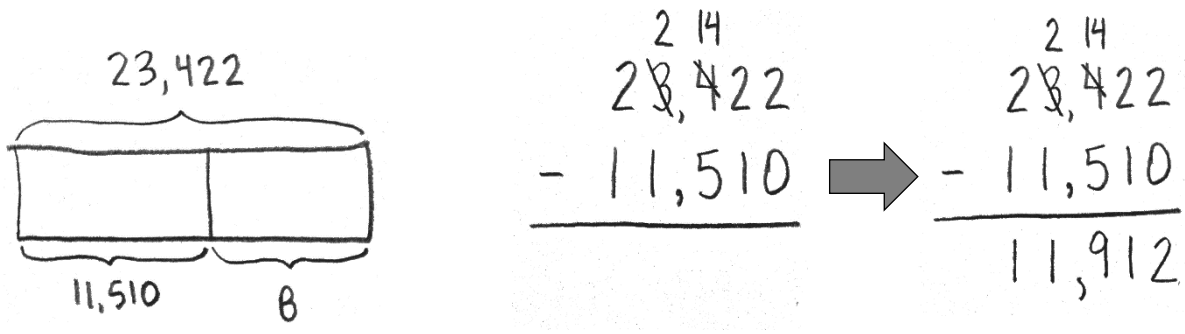




- Model the tape diagram
  - What is the whole? (4,259)
  - Record 4,259 at the top. Record the known part of 2,171 under the tape. The unknown part is marked with the variable A.
  - Model the whole, 4,259 using the place value chart. Do we model the part we are subtracting? (No, just the whole). Write the subtraction problem vertically to the side of the place value chart.
  - Let's first determine if we are ready to subtract. Look across the top number, from right to left, to see if there are enough units in each column. Look at the ones column. Are there enough ones in the top number to subtract the ones in the bottom number? (Yes, 9 ones are greater than 1 one).
  - That means we are ready to subtract the ones column. Let's look at the tens column. Are there enough tens in the top number to subtract the tens in the bottom number? (No, 5 tens are less than 7 tens).

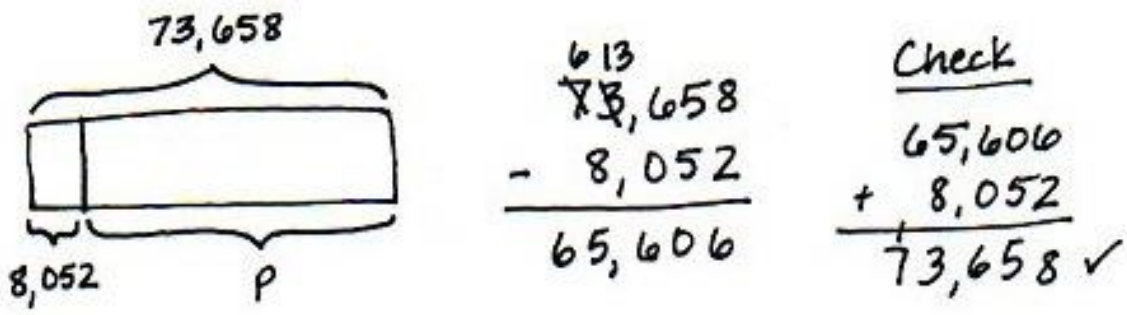
- *Regroup using the place value chart* – We ungroup or unbundle 1 unit from the hundreds to make 10 tens. I now have 1 hundred and 15 tens. Let's rename and represent the change in writing using the algorithm. *Cross out the hundreds and tens to rename them in the problem.*
- Show the change with your disks. *Cross of 1 hundred, and change it for 10 tens.*
- Are there enough hundreds in the top number to subtract the hundreds in the bottom number (Yes, 1 hundred is equal to 1 hundred).
- Are there enough thousands in the top number to subtract the thousands in the bottom number? (Yes, 4 thousands are greater than 2 thousands).
- Are we ready to subtract? (Yes, we are ready to subtract).
- 9-1 (8) *Cross off 1 disk and write 8 in the problem.*
- 15 tens minus 7 tens? (8 tens) *Cross off 7 disks, write an 8 in the problem.*
- Continue subtracting through the hundreds and thousands, crossing off disks as needed.
- The value of A in our tape diagram is 2,088. We write A=2,088 below the tape diagram. What can be added to 2,171 to result in the sum of 4,259? (2,088)

2. 23,422 – 11,510



- Repeat the modeling process for this problem. Consider using the place value chart if needed.

3. The paper mill produced 73,658 boxes of paper. 8,052 boxes have been sold. How many boxes remain?

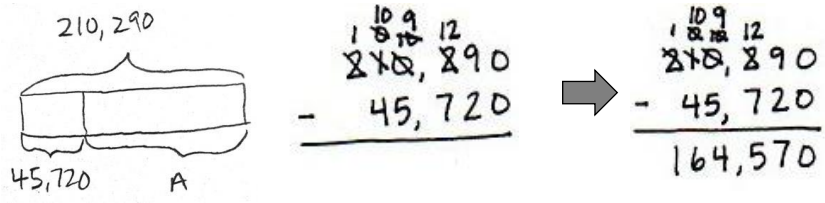


- Repeat the modeling process for this problem. The tape diagram helps students make sense of the numbers in the problem. Have students check their answer by adding the two values of the tape diagram to see if the sum is the value of the tape, 73,658.

B. Use a tape diagram and the standard algorithm to solve

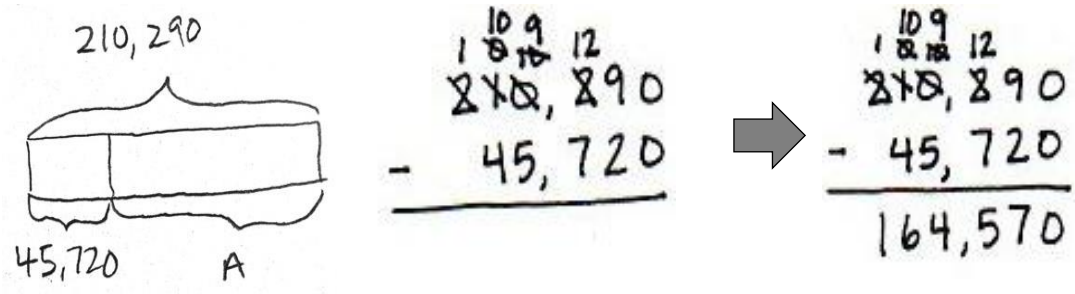
Complete the Example Problems 4-6 together as a class. Use tape diagrams to represent the numbers in the problems. Model how to regroup completely before beginning to subtract. (Problem Set Items: d, e, f)

4. 210,290 – 45,720



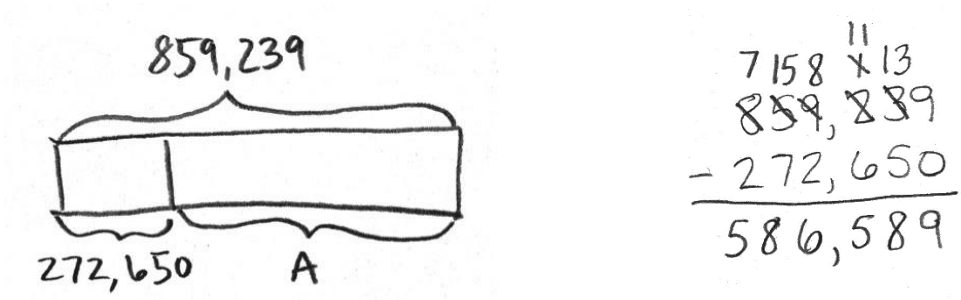
- Have students look across the top number to determine if they are ready to subtract. As you work through each place value column, have students explain whether or not they are ready to subtract
    - Ones: Yes, 7 ones are greater than 5 ones.
    - Tens: Yes, 9 tens are greater than 4 tens.
    - Hundreds: No, 3 hundreds are less than 7 hundreds. Unbundle 1 thousand as 10 hundreds to make 1 thousand and 13 hundreds.
    - Thousands: No, 1 thousand is less than 3 thousands. Unbundle 1 ten thousand as 10 thousands to make 1 ten thousand and 11 thousands.
    - Ten Thousands: Yes, 1 thousand is greater than 0 thousands.
    - Subtract, modeling in each column.
    - Have students check the answer using addition.

5. 210,290 – 45,720



- Repeat the modeling process.

6. 859,239 – 272,589

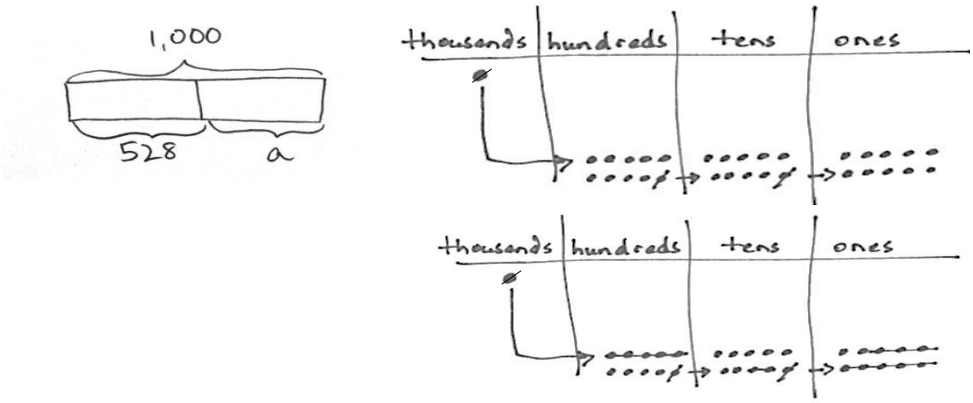


- Repeat the modeling process.

C. Decompose numbers from 1 thousand and 1 million into smaller units to subtract.

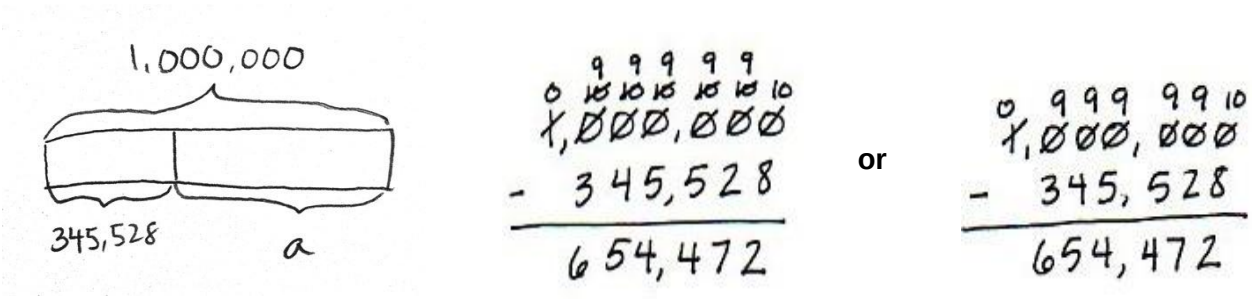
Complete the Example Problems 7-8 together as a class. Use tape diagrams to represent the numbers in the problems. Place value charts can help students with the regrouping process, depending on their level of need. Model how to regroup completely before beginning to subtract. (Problem Set Items: g, h, l, j)

7. 1,000 – 528



- Look across the units in the top number. Are we ready to subtract? (No)
- Are there enough ones in the top number to subtract the ones in the bottom number? (No. 0 ones is less than 8 ones).
- I need to ungroup 1 unit from the tens. What do you notice? (There are no tens to ungroup)
- We can look to the hundreds. (There are no hundreds to ungroup either.)
- In order to get 10 ones, we need to regroup 1 thousand. Watch as I represent the ungrouping in my subtraction problem. *Model using place value disks, and rename units in the problem simultaneously.*
- Now it is your turn. Are we ready to subtract? (Yes, we are ready to subtract.)
- Solve for 9 hundreds 9 tens 10 ones minus 5 hundreds 2 tens 8 ones. (1,000 – 528 is 472)
- Check our answer. (The sum of 472 and 528 is 1,000).

8. 1,000,000 – 345,528



- Repeat the modeling process.

Problem Set

Use the standard algorithm to solve the following subtraction problems.

Students can use place value charts or tape diagrams, but should work towards only using the standard algorithm.

a.	7,525 −3,502 4,023	b.	5 12 4,~~8~~~~2~~5 −435 4,190	c.	1 15 6,6~~2~~~~5~~ −4,417 2,208
d.	3 ~~0~~ ~~0~~ 16 124,006 −121,117 2,889	e.	0 12 2 ~~0~~ 16 124,306 −31,117 93,189	f.	0 12 3 10 5 10 124,060 −31,117 92,943

g.	9 10 15 0 ~~0~~ ~~0~~ ~~6~~ 16 101,~~0~~~~6~~0 −91,680 9,980	h.	9 10 15 0 ~~0~~ ~~0~~ ~~5~~ 16 ~~1~~0~~1~~,~~0~~~~5~~0 −9,980 91,680
i.	0 9 9 ~~0~~ ~~0~~ 10 1,000,000 −592,000 408,000	j.	9 14 5 ~~0~~ 11 5 ~~4~~ 18 ~~6~~~~0~~~~0~~,~~6~~~~5~~~~8~~ −592,569 8,089

Name: _____

Eureka Acceleration Tools

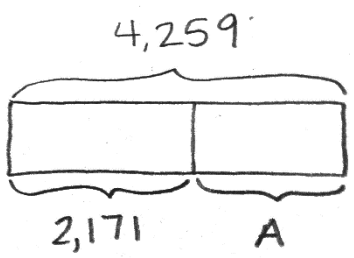
Prerequisite Support Lesson for Grade 6, Module 2, Topic C

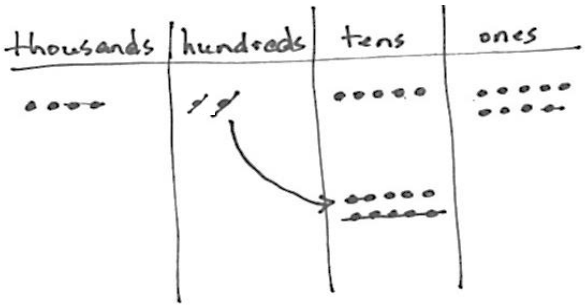
Part A: Subtract Multi-Digit Whole Numbers

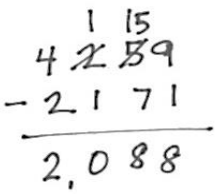
Example Problems

A. Use a tape diagram, place value chart and the standard algorithm to solve.

1. 4,259 – 2,171





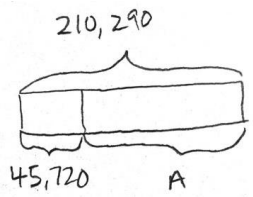


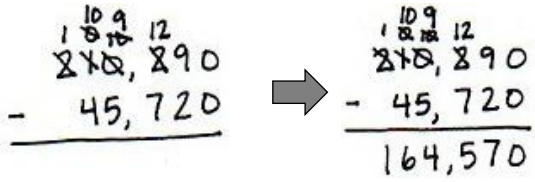
2. 23,422 – 11,510

3. The paper mill produced 73,658 boxes of paper. 8,052 boxes have been sold. How many boxes remain?

B. Use a tape diagram and the standard algorithm to solve

4. 210,290 – 45,720



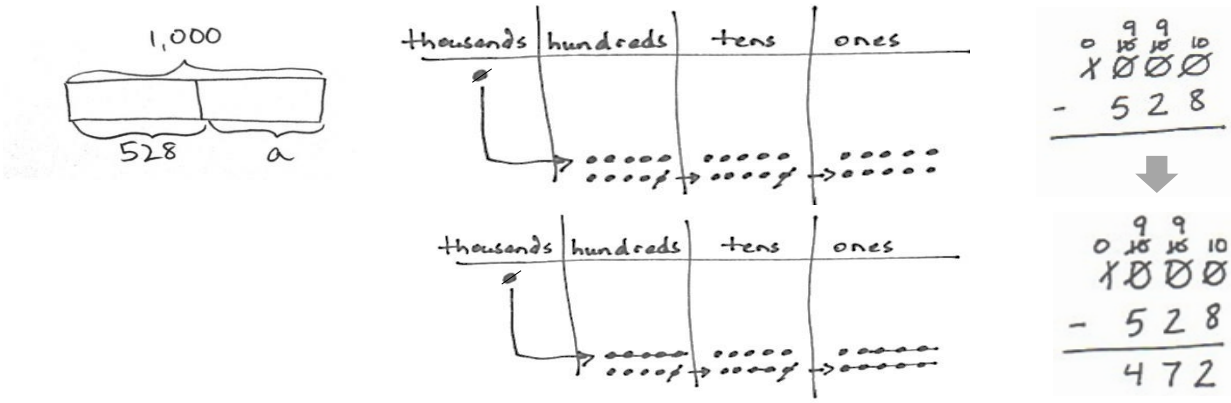


5. 210,290 – 45,720

6. 859,239 – 272,589

C. Decompose numbers from 1 thousand and 1 million into smaller units to subtract.

7. 1,000 – 528



8. 1,000,000 – 345,528

Problem Set

Use the standard algorithm to solve the following subtraction problems.

a. 7,525
− 3,502

b. 4,625
− 435

c. 6,625
− 4,417

d. 124,006
− 121,117

e. 124,306
− 31,117

f. 124,060
− 31,117

g. 101,660
− 91,680

h. 101,660
− 9,980

i. 1,000,000
− 592,000

j. 600,658
− 592,569

Eureka Acceleration Tools

Prerequisite Support Lesson for Grade 6, Module 2, Topic C

Part B: Dividing Whole Numbers (up to 2 digit dividends and 1 digit divisors)

Adapted from Eureka Lesson: 4th Grade, Module 3, Topic E, Lessons 15-18

Use Prior to: Grade 6, Module 2, Topic C, Lesson 12

Standard: 4.NBT.B.6 Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

Purpose: This standard does not call for the standard algorithm, so students may engage with these problems in a variety of ways. The most important look-fors here are the accuracy of their answer, the efficiency of their strategy, and how they deal with the remainders. The problems scaffold in difficulty. By then end of the lesson, students should be working towards the standard algorithm.

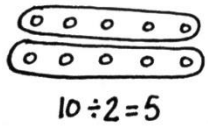
Note: Complete the Example Problems together as a class. The problems increase with complexity in the Example Problems and follow the same format in the Problem Set. Depending on the needs of the students, consider working one section of the example problems at a time, and then letting the students practice the corresponding Problem Set items before moving onto the next set of Example Problems.

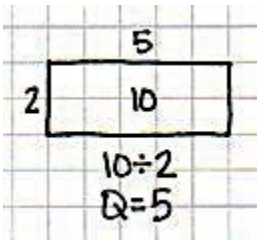
Example Problems

A. Solve division problems with and without a remainder using the area model.

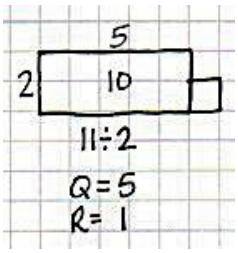
Complete the Example Problems 1-4 together as a class, modeling the use of an area model to help represent the numbers in the division problem. (Problem Set items: 1, 2)

1. 10 ÷ 2





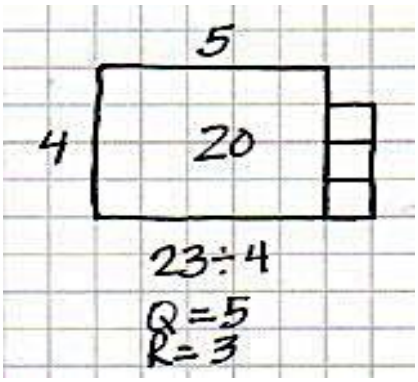
2. 11÷ 2



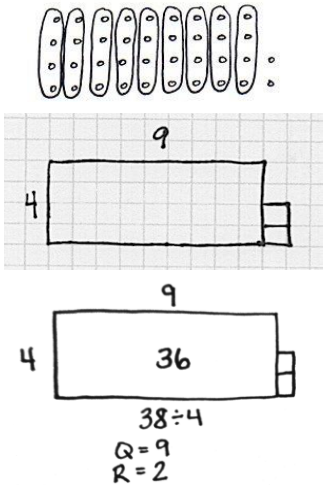
- Instruct students to draw an array to solve 10÷2 and explain how they solved the problem.
- Model how to use an area model to find the answer to problem 1.
  - Let's use grid paper to draw a rectangle with an area of 10 square centimeters and one side length of 2 centimeters. We need to find the unknown side length.
  - If the width is 2 centimeters, we can count and mark off by twos until we get to 10. This means that the unknown side length is 5 centimeters. 2 centimeters times 5 centimeters gives an area of 10 square centimeters.
  - Explain how the length of 5 centimeters is represented in the area model. (The length is 5, and the quotient is 5. The length of the area model represents the quotient of this division problem).
- Model how to use an area model to find the answer to problem 2.
  - Ask students how to draw an area model for 11÷2. (Two can be the length or the width. I can't just draw 2 rows of square units because of the remainder. If I mark off 2 squares at a time, I count 2, 4, 6, 8, 10. I can't do another group of 2 because it would be 12. There aren't enough.)

- Eleven square centimeters is the total area. Let's draw a rectangle starting with a width of 2 centimeters. We'll continue lengthening it until we get as close to 11 square centimeters as we can.
- A length of 5 centimeters and width of 2 centimeters is as close as we can get to 11 square centimeters. We can't do 2 × 6 because that's 12 square centimeters, and the total area is 11 square centimeters.
- We can show a total area of 11 square centimeters by modeling 1 more square centimeter. The remainder of 1 represents 1 more square centimeter.

3. 23 ÷ 4



4. 38 ÷ 4

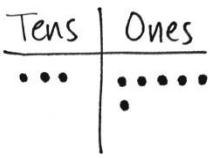


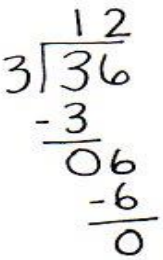
- Repeat the modeling process for problems 3 & 4.

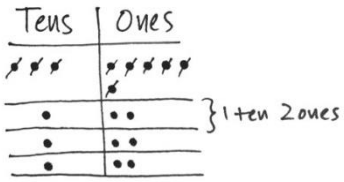
B. Solve division problems with a tens place value chart.

Complete Example Problems 5-8 together as a class using a tens place value chart to help students conceptualize the division of the numbers. (Problem Set items 3, 4, 5)

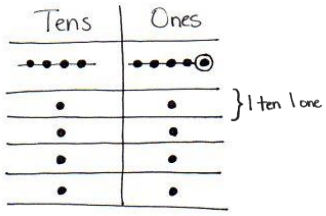
5. 36 ÷ 3

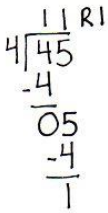






6. 45 ÷ 4





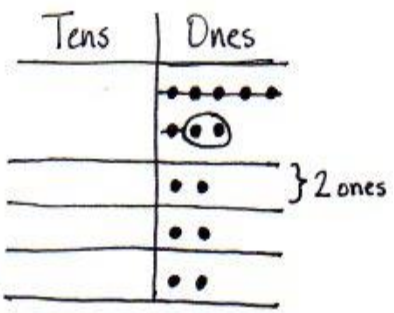
- Problem 5
  - 3 tens and 6 ones represents what? (The whole. The total. What you are dividing.)
  - Show 36 using place value disks. What is the number we are dividing by? (3)
  - Let's assume it's telling us how many groups to make. Draw 3 groups below. For the tens, can we distribute 3 tens into 3 groups? Think of it like dealing cards evenly among 3 players. *Model as students follow along*. First, put one ten in each group. Cross off the tens one at a time as you distribute them

evenly. Next, put another one in each group if you are able. Continue this until all of the ones are distributed. (We can put 1 ten in each group.)

- Are there any ones left over? (No).
- For the ones, can we distribute 6 ones into 3 groups? (Yes, we can put two ones in each group).
- Are there any ones left over? (No).
- How man tens and ones are in each group? (1 ten and 2 ones).
- What is 36÷3? (12)
- Now walk students through using the standard algorithm to divide, referring back to the tens place value chart throughout each step.
  - 3 tens divided by 3 is (1 ten), Record 1 ten, 1 ten times 3 equals 3 tens. Record. Do we have any more tens that need to be distributed? (No).3 tens minus 3 tens equals 0 tens.
  - What of our whole remains to be divided? (6 ones)
  - 6 ones divided by 2 equals 2 ones. Record 2 ones, 2 ones times 3 equals 6 ones, 6 ones minus 6 ones equals 0.
  - Have students use multiplication to check the answer.

- Problem 6
  - Repeat this modeling process.
  - Students will end up with 1 one left over when distributing the ones into 4 groups. Explain that this leftover one represents the remainder of the problem.

7. 8 ÷ 3

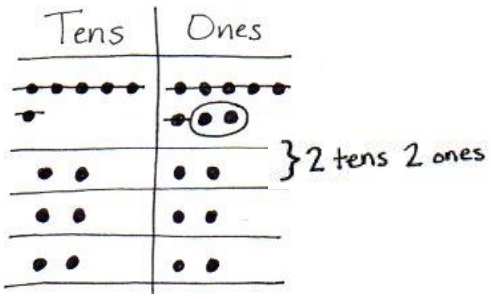


$$\begin{array}{r} 2\ R2 \\ 3\overline{)8} \\ -6 \\ \hline 2 \end{array}$$

$2 \times 3 = 6$

$6 + 2 = 8$

8. 68 ÷ 3



$$\begin{array}{r} 22\ R2 \\ 3\overline{)68} \\ -6 \\ \hline 08 \\ -6 \\ \hline 2 \end{array}$$

$22 \times 3 = 66$

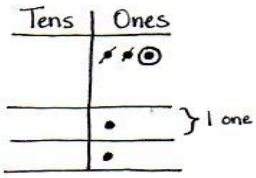
$66 + 2 = 68$

- Repeat the modeling process with problems 7 & 8. Use multiplication (and adding remainder) to check the answer.

C. Divide two-digit numbers by one-digit numbers using place value disks, regrouping in the tens.

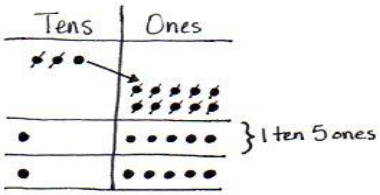
Complete Exercise Problems 9-12 as a class. Students will build upon division concepts learned in Exercise Problems 5-8 as they will now have a remainder in the tens place and have to rename one ten as ten ones. (Problem Set items: 6, 7, 8)

9. 3 ÷ 2



$$\begin{array}{r} 1 \text{ R1} \\ 2\overline{)3} \\ -2 \\ \hline 1 \end{array}$$

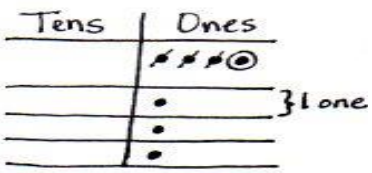
10. 30 ÷ 2



$$\begin{array}{r} 15 \\ 2\overline{)30} \\ -2 \\ \hline 10 \\ -10 \\ \hline 0 \end{array}$$

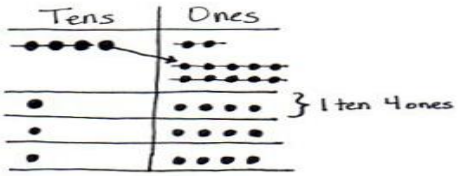
- Remind students of the process for completing problem 9.
- Model how to regroup in the tens when then tens have a remainder for problem 10.
  - Represent 30 on the tens place value chart. How many groups are needed below? (2). *Draw.*
  - 3 tens divided by 2 tens is? Distribute your disks, and cross off what has been distributed. The answer is? (1 ten with a remainder of 1 ten).
  - Can we rename the leftover ten? (Yes, change 1 ten for 10 ones).
  - Let's rename 1 ten. Rename and distribute the 10 ones. (Our answer is 1 ten and 5 ones).
  - Why didn't we stop when we had a remainder of 1 ten? (Because 1 ten is just 10 ones, and you can keep dividing).
  - So why did we stop when we got a remainder of 1 one? (The ones are the smallest unit on our place value chart, so we stopped there and made a remainder).
  - Now let's solve using the standard algorithm. Record the answer as students solve.
    - 3 tens divided by 2? (1 ten). 1 ten times 2 equals 2 tens.
    - We started with 3 tens, distributed 2 tens, and have 1 ten remaining. Tell me a subtraction equation for that (3 tens minus 2 tens equals 1 ten).
    - How many ones have to be divided? (10 ones)
    - Yes. We changed 1 ten for 10 ones. Say a division equation for how you distributed 1 ten or 10 ones (10 ones divided by 2 equals 5 ones).
    - We renamed 10 ones, distributed 10 ones, and have no ones remaining. Say a subtraction equation for that (10 ones minus 10 ones equals 0 ones.)

11. 4 ÷ 3



$$\begin{array}{r} 1 \text{ R1} \\ 3\overline{)4} \\ -3 \\ \hline 1 \end{array}$$

12. 42 ÷ 3



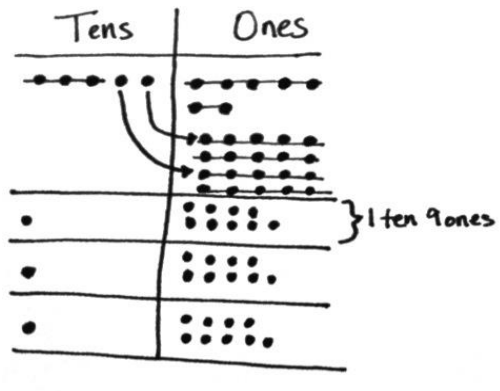
$$\begin{array}{r} 14 \\ 3\overline{)42} \\ -3 \\ \hline 12 \\ -12 \\ \hline 0 \end{array}$$

- Repeat the modeling process with problems 11 & 12.

Divide a two-digit number by a one-digit number with a remainder in the tens place.

Complete Example Problems 13-15 with students. These examples will also build upon what students have gained conceptually throughout the previous section as the tens place will have a remainder and the ones place may or may not have a remainder. This last section should act as a bridge from conceptual understanding and dividing with models to solving problems using just the standard algorithm. (Problem Set items: 9-20)

13. 57 ÷ 3

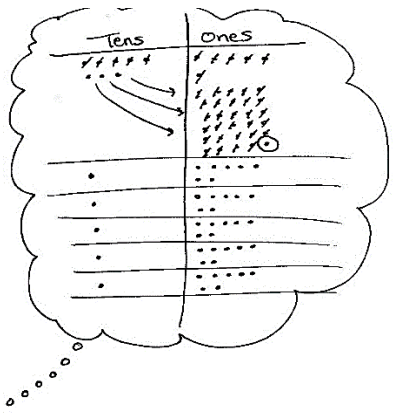


$$\begin{array}{r} 19 \\ 3\overline{)57} \\ -3 \\ \hline 27 \\ -27 \\ \hline 0 \end{array}$$

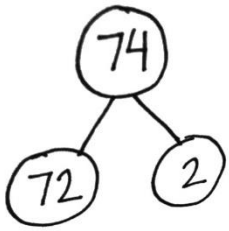
- Repeat the modeling process with problem 57.
- Bring students attention to the fact that there are 2 tens left over after three tens were distributed.
- Model unbundling two tens as 20 ones in the place value chart.
- Model the standard algorithm by showing that there is one ten in each group with two tens remaining. Write the three in the tens place, with 2 tens remaining (since 5 tens minus 3 tens equals 2 tens)
- Referring to both the place value chart and the standard algorithm, ask how many ones do they have altogether now (27 ones, 20 ones plus 7 ones equals 27 ones).
- Ask what is 27 ones divided by 3? (9).
- 9 in each group is recorded above, in the ones place. Record the remaining steps. Find quotient, check with multiplication.

14. 86 ÷ 5

$$\begin{array}{r} 17 \text{ R}1 \\ 5\overline{)86} \\ -5 \\ \hline 36 \\ -35 \\ \hline 1 \end{array}$$



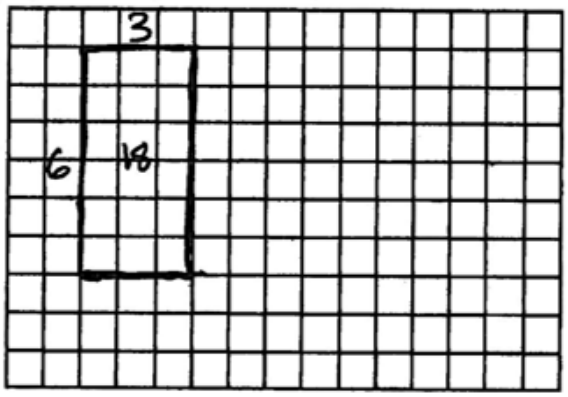
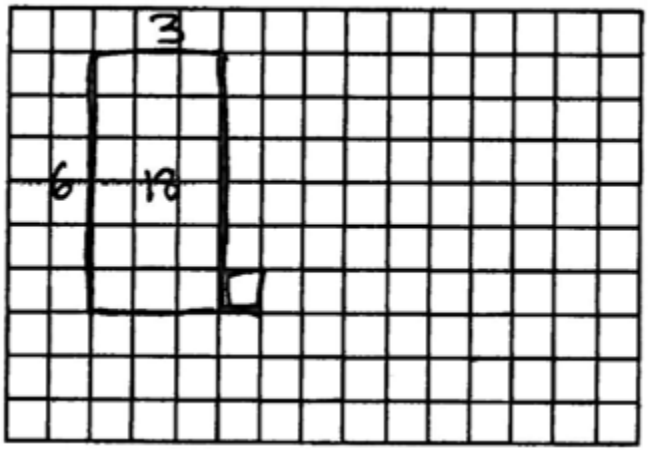
15. 74 ÷ 8



- For Problems 14 and 15, encourage students to think about the place value chart and use mental math as they solve these two problems with the standard algorithm. Plenty of practice problems have been provided so students can build towards just using the standard algorithm.
- For Problem 15, encourage mental math strategies, such as 8 times 9 equals 72. 72 is part of 74 with 2 left over, so 74 divided by 8 is 9 with a remainder of 2.

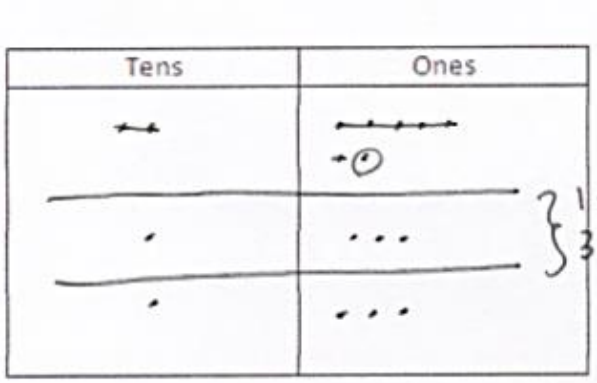
Problem Set

Show division using an array and an area model.

Show division using an array.	Show division using an area model.
1. 18 ÷ 6 Quotient = 3 Remainder = 0	 Can you show 18 ÷ 6 with one rectangle? yes
2. 19 ÷ 6 Quotient = 3 Remainder = 1	 Can you show 19 ÷ 6 with one rectangle? no Explain how you showed the remainder: I outlined one more square unit

Show division using disks. Relate your work on the place value chart to long division. Check your quotient and remainder by using multiplication and addition.

3. 27 ÷ 2



13 R1
2) 27
−2
07
−6
1

quotient = 13

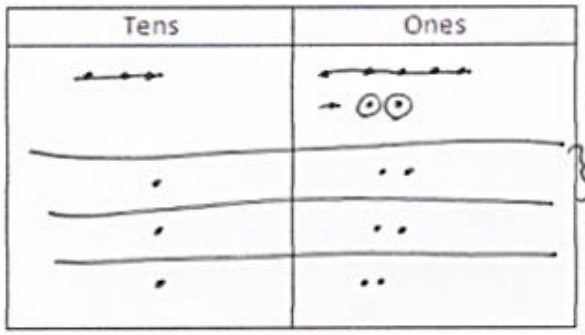
remainder = 1

Check Your Work

13 × 2 = 26

26 + 1 = 27 ✓

4. 38 ÷ 3



12 R2
3) 38
3
08
−6
2

quotient = 12

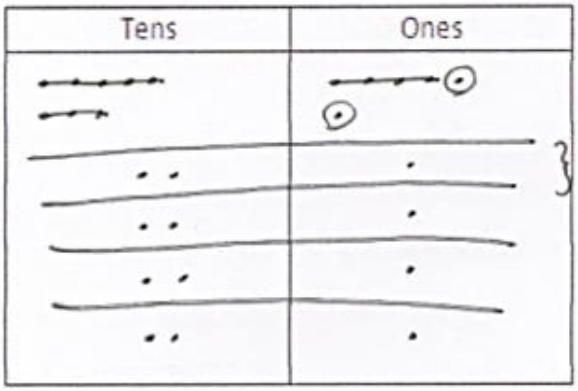
remainder = 2

Check Your Work

12 × 3 = 36

36 + 2 = 38 ✓

5. 86 ÷ 4



21 R2
4) 86
−8
06
−4
2

quotient = 21

remainder = 2

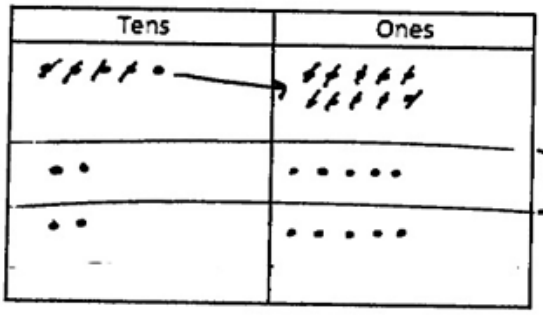
Check Your Work

21 × 4 = 84

84 + 2 = 86 ✓

Show division using disks. Relate your work on the place value chart to long division. Check your quotient and remainder by using multiplication and addition.

6. 50 ÷ 2



$$\begin{array}{r} 25 \\ 2\overline{)50} \\ -4 \\ \hline 10 \\ -10 \\ \hline 0 \end{array}$$

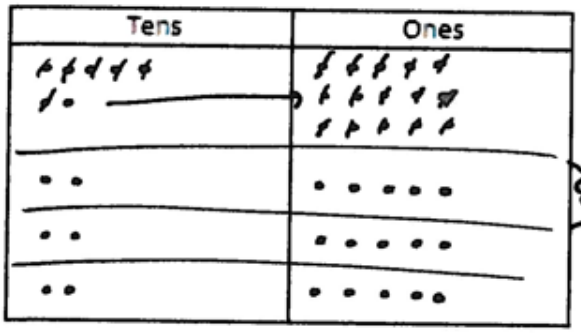
quotient = 25

remainder = 0

Check Your Work

$$\begin{array}{r} 25 \\ \times\ 2 \\ \hline 50 \end{array} \checkmark$$

7. 75 ÷ 3



$$\begin{array}{r} 25 \\ 3\overline{)75} \\ -6 \\ \hline 15 \\ -15 \\ \hline 0 \end{array}$$

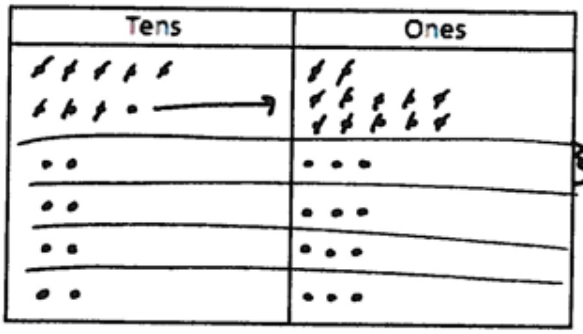
quotient = 25

remainder = 0

Check Your Work

$$\begin{array}{r} 25 \\ \times\ 3 \\ \hline 75 \end{array} \checkmark$$

8. 92 ÷ 4



$$\begin{array}{r} 23 \\ 4\overline{)92} \\ -8 \\ \hline 12 \\ -12 \\ \hline 0 \end{array}$$

quotient = 23

remainder = 0

Check Your Work

$$\begin{array}{r} 23 \\ \times\ 4 \\ \hline 92 \end{array} \checkmark$$

Solve using the standard algorithm. Check your quotient and remainder by using multiplication and addition.

9. 46 ÷ 2 23 2⟌46 −4 06 −6 0 Quotient = 23 Remainder = 0 23 × 2 = 46 ✓	10. 96 ÷ 3 32 3⟌96 −9 06 −6 0 Quotient = 32 Remainder = 0 32 × 3 = 96 ✓
11. 85 ÷ 5 17 5⟌85 −5 35 −35 0 Quotient = 17 Remainder = 0 17 × 5 = 85 ✓	12. 52 ÷ 4 13 4⟌52 −4 12 −12 0 Quotient = 13 Remainder = 0 13 × 4 = 52 ✓
13. 53 ÷ 3 17 R2 3⟌53 −3 23 −21 2 Quotient = 17 Remainder = 2 17 × 3 = 51 51 + 2 = 53 ✓	14. 95 ÷ 4 23 R3 4⟌95 −8 15 −12 3 Quotient = 23 Remainder = 3 23 × 4 = 92 92 + 3 = 95 ✓
15. 89 ÷ 6 14 R5 6⟌89 −6 29 −24 5 Quotient = 14 Remainder = 5 14 × 6 = 84 84 + 5 = 89 ✓	16. 96 ÷ 6 16 6⟌96 −6 36 −36 0 Quotient = 16 Remainder = 0 16 × 6 = 96 ✓
17. 60 ÷ 3 20 3⟌60 −6 00 −0 0 Quotient = 20 Remainder = 0 20 × 3 = 60 ✓	18. 60 ÷ 4 15 4⟌60 −4 20 −20 0 Quotient = 15 Remainder = 0 15 × 4 = 60 ✓
19. 95 ÷ 8 11 R7 8⟌95 −8 15 −8 7 Quotient = 11 Remainder = 7 11 × 8 = 88 88 + 7 = 95 ✓	20. 95 ÷ 7 13 R4 7⟌95 −7 25 −21 4 Quotient = 13 Remainder = 4 13 × 7 = 91 91 + 4 = 95 ✓

Name: _____

Eureka Acceleration Tools

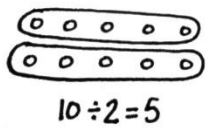
Prerequisite Support Lesson for Grade 6, Module 2, Topic C

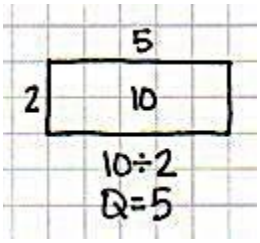
Part B: Dividing Whole Numbers (up to 2 digit dividends and 1 digit divisors)

Example Problems

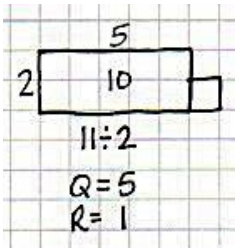
Solve division problems with and without a remainder using the area model.

1. 10 ÷ 2





2. 11÷ 2

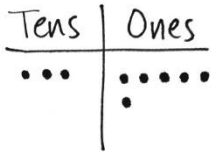


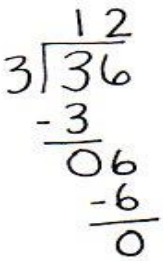
3. 23 ÷ 4

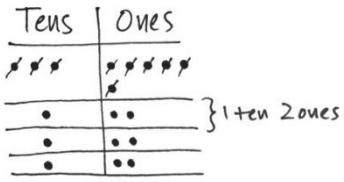
4. 38 ÷ 4

Solve division problems with a tens place value chart.

5. 36 ÷ 3







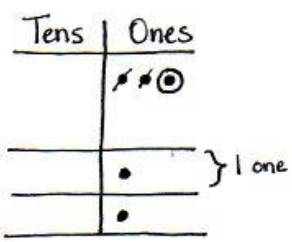
6. 45 ÷ 4

7. 8 ÷ 3

8. 68 ÷ 3

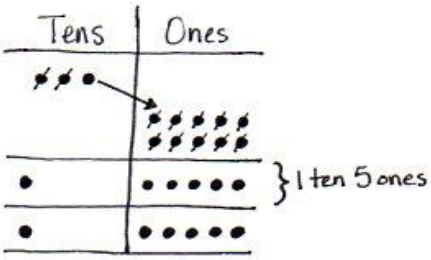
Divide two-digit numbers by one-digit numbers using place value disks, regrouping in the tens.

9. 3 ÷ 2



$$\begin{array}{r} 1 \text{ R1} \\ 2\overline{)3} \\ -2 \\ \hline 1 \end{array}$$

10. 30 ÷ 2



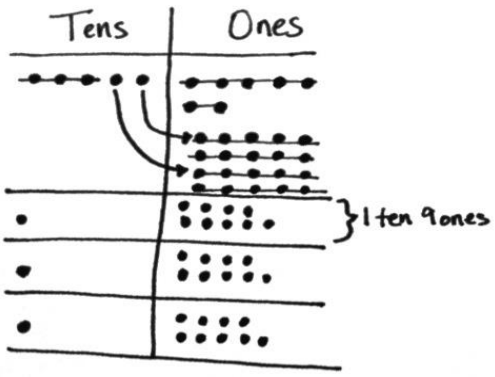
$$\begin{array}{r} 15 \\ 2\overline{)30} \\ -2 \\ \hline 10 \\ -10 \\ \hline 0 \end{array}$$

11. 4 ÷ 3

12. 42 ÷ 3

Divide a two-digit number by a one-digit number with a remainder in the tens place.

13. 57 ÷ 3



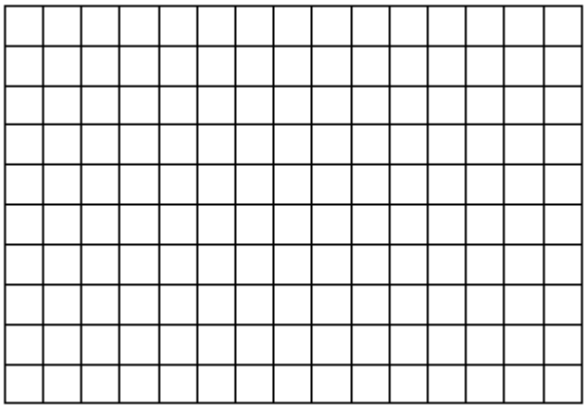
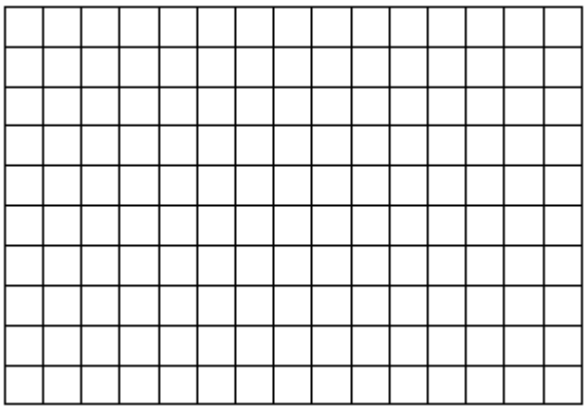
$$\begin{array}{r} 19 \\ 3\overline{)57} \\ -3 \\ \hline 27 \\ -27 \\ \hline 0 \end{array}$$

14. 86 ÷ 5

15. 74 ÷ 8

Problem Set

Show division using an array and an area model.

Show division using an array.	Show division using an area model.
1. 18 ÷ 6 Quotient = _____ Remainder = _____	 Can you show 18 ÷ 6 with one rectangle? _____
2. 19 ÷ 6 Quotient = _____ Remainder = _____	 Can you show 19 ÷ 6 with one rectangle? _____ Explain how you showed the remainder:

Show division using disks. Relate your work on the place value chart to long division. Check your quotient and remainder by using multiplication and addition.

3. 27 ÷ 2

Tens	Ones

2) 2 7

Check Your Work

quotient = _____

remainder = _____

4. 38 ÷ 3

Tens	Ones

3) 38

Check Your Work

quotient = _____

remainder = _____

5. 86 ÷ 4

Tens	Ones

4) 86

Check Your Work

quotient = _____

remainder = _____

Show division using disks. Relate your work on the place value chart to long division. Check your quotient and remainder by using multiplication and addition.

6. 50 ÷ 2

Tens	Ones

2) 50

Check Your Work

quotient = _____

remainder = _____

7. 75 ÷ 3

Tens	Ones

3) 75

Check Your Work

quotient = _____

remainder = _____

8. 92 ÷ 4

Tens	Ones

4) 92

Check Your Work

quotient = _____

remainder = _____

Solve using the standard algorithm. Check your quotient and remainder by using multiplication and addition.

9. 46 ÷ 2	10. 96 ÷ 3
11. 85 ÷ 5	12. 52 ÷ 4
13. 53 ÷ 3	14. 95 ÷ 4
15. 89 ÷ 6	16. 96 ÷ 6
17. 60 ÷ 3	18. 60 ÷ 4
19. 95 ÷ 8	20. 95 ÷ 7

Eureka Acceleration Tools

Prerequisite Support Lesson for Grade 6, Module 2, Topic C

Part C: Place Value and Adjacent Base Ten Units

Adapted from Eureka Lesson: 5th Grade, Module 1, Topic A, Lessons 1-2

Use Prior to: Grade 6, Module 2, Topic C, Lesson 14

Standard: : 5.NBT.A.1 Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.

Purpose: Instruction often fails to connect the division algorithm to place value, making it difficult for students to connect to and understand the division algorithm. These items ensure students have the necessary understanding of place value to connect to the target standard.

Note: Begin this lesson with a Fluency Practice. For 1-14, work through the examples together. Repeat this procedure for 15-24. Working through the Example Problems with a place value chart will build student understanding of place value. By the time students get to the Problem Set, they should be able to complete the problems without the place value chart.

Fluency Practice

Fill in the missing values.

1. 10 ones = 1 ten
2. 20 ones = 2 tens
3. 30 ones = 3 tens
4. 80 ones = 8 tens
5. 90 ones = 9 tens
6. 100 ones = 10 tens
7. 110 ones = 11 tens
8. 120 ones = 12 tens
9. 170 ones = 17 tens
10. 270 ones = 27 tens
11. 640 ones = 64 tens
12. 670 ones = 67 tens
13. 830 ones = 83 tens
14. 980 ones = 98 tens

Write each decimal in standard form.

15. 3 tenths = 0.3
16. 4 tenths = 0.4
17. 3 hundredths = 0.03
18. 43 hundredths = 0.43
19. 5 hundredths = 0.05
20. 35 hundredths = 0.35
21. 7 ones 35 hundredths = 7.35
22. 9 ones 24 hundredths = 9.24
23. 6 tens 2 ones 4 hundredths = 62.04
24. 3 hundreds 7 tens 9 ones 8 hundredths = 379.08

- Reviewing this foundation will help support students in the work of this lesson.
- Emphasis on unit language strenthens place value understanding and also builds important parrallels between whole number and decimal fraction understanding.

Example Problems

Use the place value chart and disks to solve the following problems.

Students can use the place value chart and discs to solve the problesm. Students can also insert this page into a page protector and write directly on the place value chart.

Problem 1

- Represent 1 million on the chart. (Students place a disc in the millions place)
- How can you show 1 million using hundred thousands (1 million is the same as 10 hundred thousands)
- What is the result if I divide 10 hundred thousands by 10? (Ten discs can be placed in the hundred thousands)
- How many are in each group? (When I divid 10 hundred thousands by 10, I get 1 hundred thousand in each group)
- So 10 hundred thousands ÷ 10 = 1 hundred thousand; 1 million ÷ 10 = 1 hundred thousand (because 1 million is the same as 10 hundred thousands); 1 hundred thousand is 1/10 as large as 1 million.
- *Complete a through a – i together, asking students to recognize the pattern as they continue to divide by 10.* (it takes 10 of the smaller units to make 1 of the larger)

Problem 2

- Represent 4 tenths on the chart (students write a 4 in the tenths place).
- Find the value of 10 times 0.4. Show your result at the bottom of your place value chart. (4 tenths x 10 = 40 tenths, which is the same as 4 wholes. 4 ones is 10 times as large as 4 tenths.)
- On your place value chart, use arrows to show how the value of the digits has changed. *Draw an arrow to indicate the shift of the digit to the left, and write x10 near the arrow.*
- Why does it move to the left? (Because it is 10 times as large, it has to be bundled for the next larger unit).
- *Complete a through a – i together, asking students to articulate how the value of the digit changes and why it changes position in the chart.*

Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones	Tenths	Hundredths	Thousandths

1. Divide single units by 10 to the thousandths.	2. Multiply and Divide by 10, 100, and 1,000
a. 1 million ÷ 10 = 1 hundred thousand b. 1 hundred thousand ÷ 10 = 1 ten thousand c. 1 ten thousand ÷ 10 = 1 thousand d. 1 thousand ÷ 10 = 1 hundred e. 1 hundred ÷ 10 = 1 ten f. 1 ten ÷ 10 = 1 one	a. 0.4 × 10 = 4 b. 0.04 × 10 = 0.4 c. 0.004 × 10 = 0.04 d. 6 ÷ 10 = 0.6 e. 6 ÷ 100 = 0.06

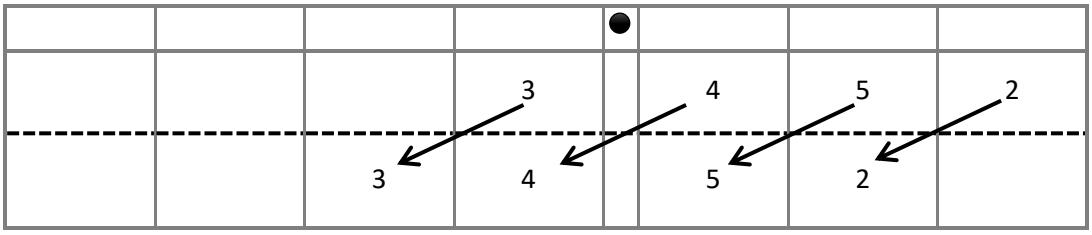
g. 1 one ÷ 10 = 1 tenth h. 1 tenth ÷ 10 = 1 hundredth i. 1 hundredth ÷ 10 = 1 thousandth	f. 6 ÷ 1,000 = 0.006 g. 2.43 × 10 = 24.3 h. 2.43 × 100 = 243 i. 2.43 × 1,000 = 2430

3. Use the place value chart and arrows to show how the value of the each digit changes.

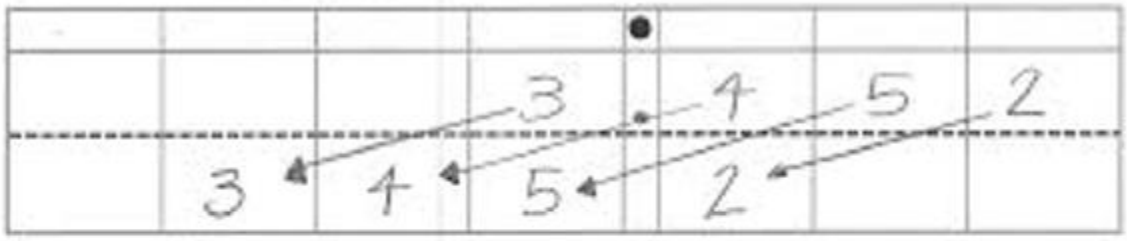
Guide students in articulating changes in value and shifts in position while showing it on the place value chart. Lead students to discuss how the digits shift as a result of their change in value by isolating one digit. Ask students the following questions to help them identify patterns.

- What do you notice about the number of zeros in your products when multiplying by 10, 100, and 1,000 relative to the number of places the digits shift on the place value chart? What patterns do you notice?
- What is the same and what is different about the products of a, b, and c? (The digits are exactly the same, only the values have changed)

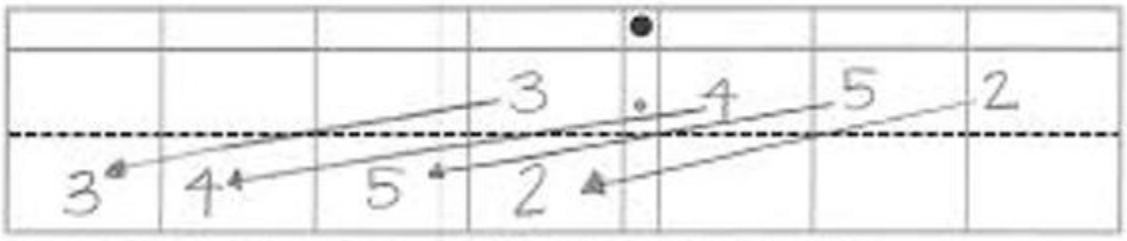
a. 3.452 × 10 = 34.52



b. 3.452 x 100 = 345.2



c. 3.452 x 1,000 = 3,452



d. Explain how and why the value of the 5 changed in (a), (b), and (c).

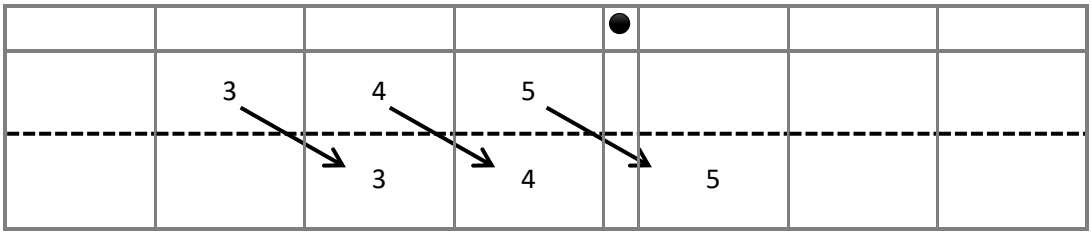
The value of the 5 in 3.452 is 5 hundredths. In (a), the 5 becomes 5 tenths. In (b), the 5 becomes 5 ones. In (c), the 5 becomes 5 tens. The value keeps changing because I multiplied and made the 5 ten times, then 100 times, and finally 1,000 greater.

4. Use the place value chart and arrows to show how the value of each digit changes. The first one has been done for you.

Guide students in articulating changes in value and shifts in position while showing it on the place value chart. Lead students to discuss how the digits shift as a result of their change in value by isolating one digit. Ask students the following questions to help them identify patterns.

- Compare the solutions you found when multiplying by 10 and dividing by 10 (3.452 x 10 and 345 ÷ 10). How do the solutions of these two expressions relate to the value of the original quantity? How do they relate to each other?

a. 345 ÷ 10 = 34.5



b. 345 ÷ 100 = 3.45

c. 345 ÷ 1,000 = 0.345

d. Explain how and why the value of the 4 changed in the quotients in (a), (b), and (c).

In all of the problems the 4 got smaller. In (a) it became 4 ones because I divided it by 10. In (b) it moved 2 places smaller because I divided by 100 – which is like dividing by 10 twice. In (c), it got the smallest. It moved three places because I divided by 1,000, which is like dividing by 10 three times.

5. Solve without using the place value chart.

Now that students have practice with the place value chart, encourage a move away from the concrete-pictorial representations of the products and quotients and, instead, move toward reasoning about the patterns of the number of zeros in the products and quotients and the placement of the decimal.

1. 6.671 × 100 = 667.1

2. 684 ÷ 1,000 = 0.684

3. 4.582 × 10 = 45.82

4. 7.281 × 100 = 728.1

5. 9.254 × 1,000 = 9,254

6. 2.46 ÷ 10 = 0.246

7. 678 ÷ 100 = 6.78

8. 67 ÷ 1,000 = 0.067

Problem Set

Students should work the Problem Set independently. Check for understanding as they complete the work.

1. Solve.

   a. 54,000 × 10 = 540,000

   b. 54,000 ÷ 10 = 5,400

   c. 8.7 × 10 = 87

   d. 8.7 ÷ 10 = 0.87

   e. 0.13 × 100 = 13

   f. 13 ÷ 1,000 = 0.013

   g. 3.12 × 1,000 = 40.312

2. Find the products.

   a. 19,340 × 10 = 193,400

   b. 19,340 × 100 = 1,934,000

   c. 19,340 × 1,000 = 19,340,000

3. Find the quotients.

   a. 152 ÷ 10 = 15.2

   b. 152 ÷ 100 = 1.52

   c. 152 ÷ 1,000 = 0.152

Name: _____

Eureka Acceleration Tools

Prerequisite Support Lesson for Grade 6, Module 2, Topic C

Part C: Place Value and Adjacent Base Ten Units

Fluency Practice

Fill in the missing values.

1. 10 ones = _____ ten
2. 20 ones = _____ tens
3. 30 ones = _____ tens
4. 80 ones = _____ tens
5. 90 ones = _____ tens
6. 100 ones = _____ tens
7. 110 ones = _____ tens
8. 120 ones = _____ tens
9. 170 ones = _____ tens
10. 270 ones = _____ tens
11. 640 ones = _____ tens
12. 670 ones = _____ tens
13. 830 ones = _____ tens
14. 950 ones = _____ tens

Write each decimal in standard form.

15. 3 tenths = _____
16. 4 tenths = _____
17. 3 hundredths = _____
18. 43 hundredths = _____
19. 5 hundredths = _____
20. 35 hundredths = _____
21. 7 ones 35 hundredths = _____
22. 9 ones 24 hundredths = _____
23. 6 tens 2 ones 4 hundredths = _____
24. 3 hundreds 7 tens 9 ones 8 hundredths = _____

Exercise Problems

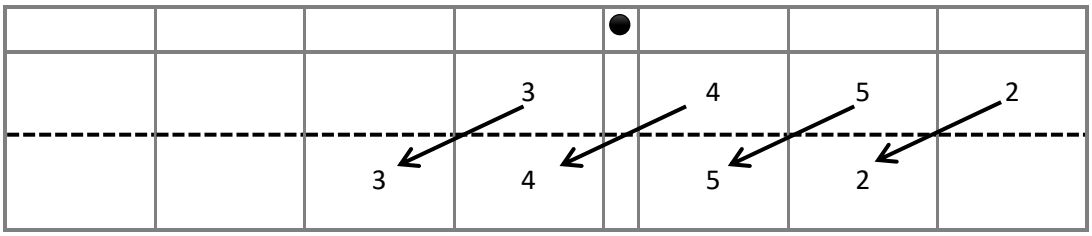
Use the place value chart and disks to solve the following problems.

Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones	Tenths	Hundredths	Thousandths

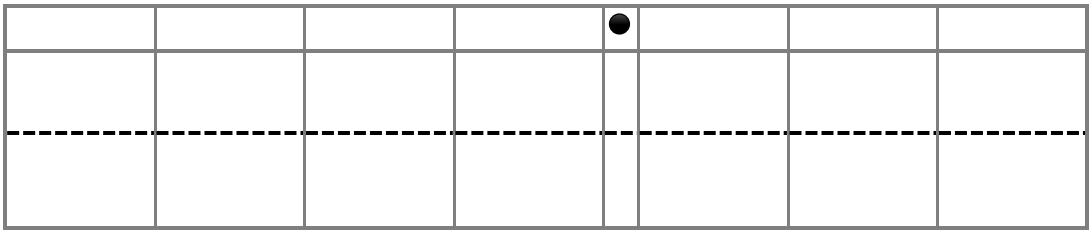
1. Divide single units by 10 to the thousandths.	2. Multiply and Divide by 10, 100, and 1,000
a. 1 million ÷ 10 = _____ b. 1 hundred thousand ÷ 10 = _____ c. 1 ten thousand ÷ 10 = _____ d. 1 thousand ÷ 10 = _____ e. 1 hundred ÷ 10 = _____ f. 1 ten ÷ 10 = _____ g. 1 one ÷ 10 = _____ h. 1 tenth ÷ 10 = _____ i. 1 hundredth ÷ 10 = _____	a. 0.4 × 10 = _____ b. 0.04 × 10 = _____ c. 0.004 × 10 = _____ d. 6 ÷ 10 = _____ e. 6 ÷ 100 = _____ f. 6 ÷ 1,000 = _____ g. 2.43 × 10 = _____ h. 2.43 × 100 = _____ i. 2.43 × 1,000 = _____

3. Use the place value chart and arrows to show how the value of the each digit changes.

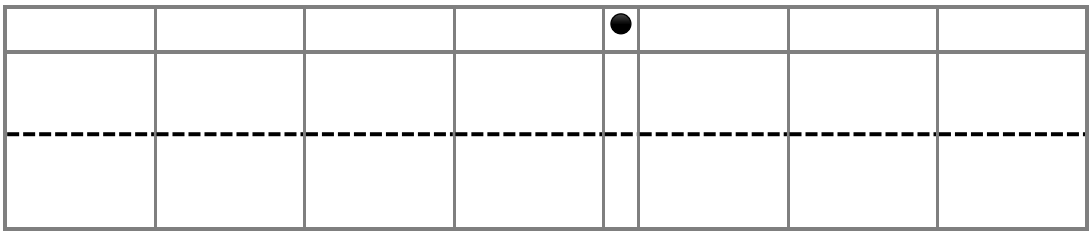
a. 3.452 × 10 = 34.52



b. 3.452 × 100 = _____



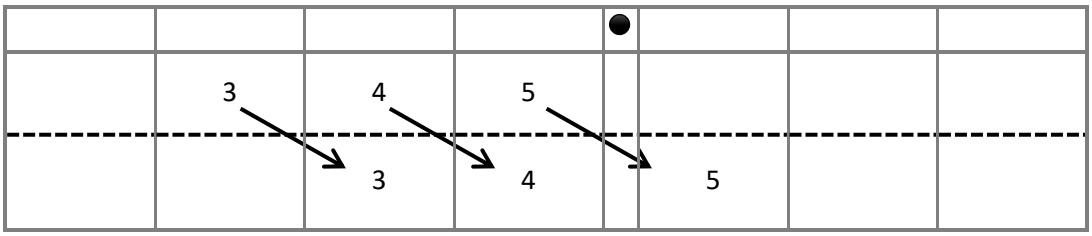
c. 3.452 × 1,000 = _____



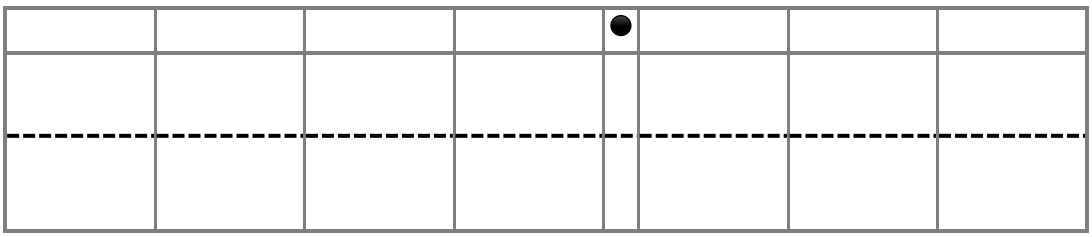
d. Explain how and why the value of the 5 changed in (a), (b), and (c).

4. Use the place value chart and arrows to show how the value of each digit changes. The first one has been done for you.

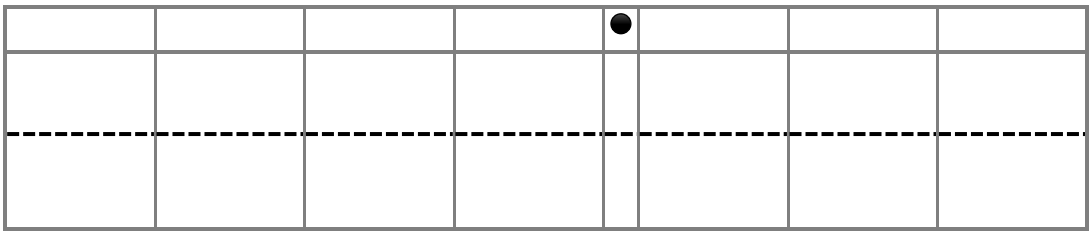
   a. 345 ÷ 10 = 34.5



   b. 345 ÷ 100 = _____



   c. 345 ÷ 1,000 = _____



5. Solve without using the place value chart.
   1. 6.671 × 100 = _____
   2. 684 ÷ 1,000 = _____
   3. 4.582 × 10 = _____
   4. 7.281 × 100 = _____
   5. 9.254 × 1,000 = _____
   6. 2.46 ÷ 10 = _____
   7. 678 ÷ 100 = _____
   8. 67 ÷ 1,000 = _____

Problem Set

1. Solve.

   a. 54,000 × 10 = _____

   b. 54,000 ÷ 10 = _____

   c. 8.7 × 10 = _____

   d. 8.7 ÷ 10 = _____

   e. 0.13 × 100 = _____

   f. 13 ÷ 1,000 = _____

   g. 3.12 × 1,000 = _____

2. Find the products.

   a. 19,340 × 10 = _____

   b. 19,340 × 100 = _____

   c. 19,340 × 1,000 = _____

3. Find the quotients.

   a. 152 ÷ 10 = _____

   b. 152 ÷ 100 = _____

   c. 152 ÷ 1,000 = _____

Eureka Acceleration Tools

Prerequisite Support Lesson for Grade 6, Module 2, Topic C

Part D: Dividing Whole Numbers (up to 4 digit dividends, 2 digit divisors)

Adapted from Eureka Lesson: 5th Grade, Module 2, Topic F, Lessons 20-23

Use Prior to: Grade 6, Module 2, Topic C, Lesson 12

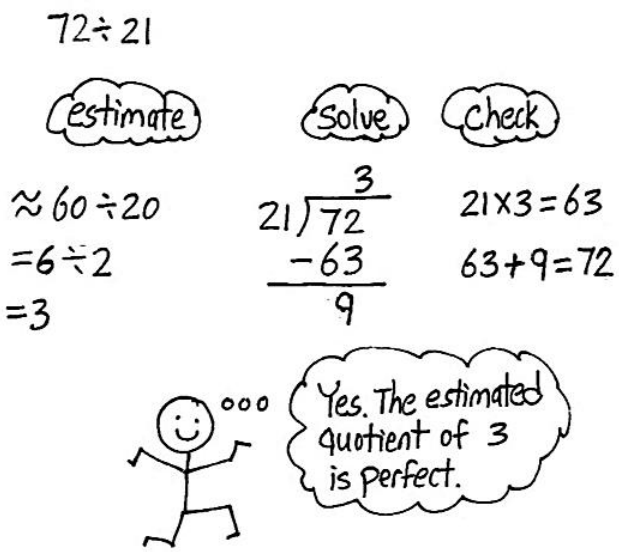
Standard: 5.NBT.B.6 Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, subtracting multiples of the divisor, and/or the relationship between multiplication and division. Illustrate and/or explain the calculation by using equations, rectangular arrays, area models, or other strategies based on place value.
Purpose: This standard does not call for the standard algorithm, so students may engage with these problems in a variety of ways. The most important look-fors here are the accuracy of the answer, the efficiency of the strategy, and how the remainder is dealt with. The problems scaffold in difficulty.

Note: This lesson is designed to build student understanding of division as the problems increase with complexity. The lesson begins with 2 digit dividends and 2 digit divisors and leads up to 4 digit dividends and 2 digit divisors.

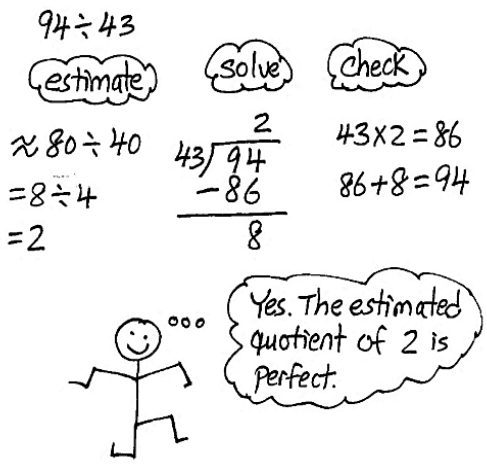
- Each set of Example Problems and Problem Sets should be completed before moving to the next set of Example Problems and Problem Sets.
- Walk students through the example problems using estimating strategies, solving, and checking for correctness.
  - Students should round the dividend and divisor to estimate a quotient.
- Walk students through using unit form when estimating an answer for larger dividends (3 to 4 digit dividends)
  - For example, if dividing 590 by 17, they can estimate 60 tens ÷ 20 tens = 3 tens.
- Then give students the opportunity to complete the Problem Set independently following the same procedure.

Example Problems

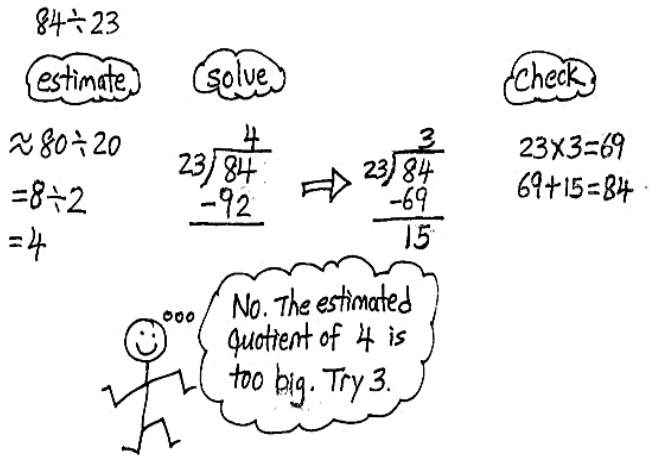
1. 72 ÷ 21



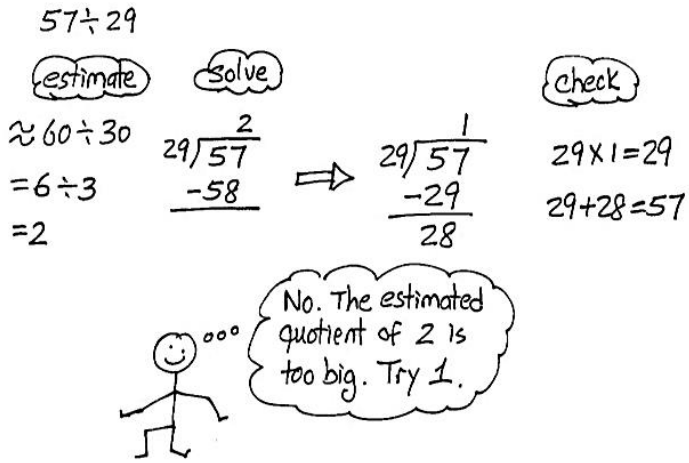
2. 94 ÷ 43



3. 84 ÷ 23



4. 57 ÷ 29



Problem Set

Divide. Then check with multiplication.

1. 65 ÷ 17 3 R 14 17) 6 5 - 5 1 1 4 Check: 17 × 3 = 51 51 + 14 = 65	2. 49 ÷ 21 2 R7 21)49 -42 7 check: 21 ×2 42 42 +7 49	3. 78 ÷ 39 2 39)78 -78 0 Check: 39 ×2 78

4. 84 ÷ 32 2 R20 32)84 −64 20 Check: 32 × 2 = 64 64 + 20 = 84	5. 77 ÷ 25 3 R2 25)77 −75 2 Check: 25 × 3 = 75 75 + 2 = 77	68 ÷ 17 4 17)68 −68 0 Check: 17 × 4 = 68

Example Problems

1. 256 ÷ 47

256 ÷ 47

estimate

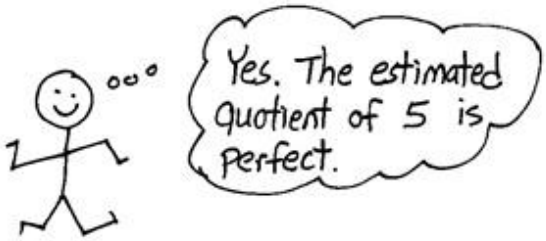
≈ 250 ÷ 50
= 25 ÷ 5
= 5

Solve

5
47)256
−235
21

Check

47 × 5 = 235
235 + 21 = 256



2. 236 ÷ 39

236 ÷ 39

estimate

≈ 240 ÷ 40
= 24 ÷ 4
= 6

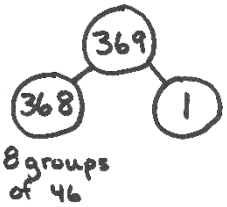
Solve

6
39)236
− 234
2

Check

39 × 6 = 234
234 + 2 = 236

3. 369 ÷ 46



8
46)369
−322
47
−46
1

1
46)369
−322
47
−46
1

46 × 8 = 368
368 + 1 = 369

4. 712 ÷ 94

712 ÷ 94

estimate

≈ 720 ÷ 90

= 72 ÷ 9

= 8

Solve

```
      8
94)712
   -752
```

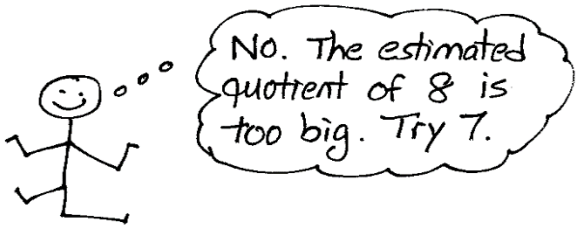
⇒

```
      7
94)712
   -658
     54
```

Check

94 × 7 = 658

658 + 54 = 712



Problem Set

Divide. Then check with multiplication.

6. 258 ÷ 47 5 R 23 47) 258 - 235 23 Check: 47 × 5 = 235 235 + 23 = 258	7. 148 ÷ 67 2 R14 67)148 -134 14 Check: 67 × 2 = 134 134 + 14 = 148	8. 591 ÷ 73 8 R7 73)591 -584 7 Check: 73 × 8 = 584 584 + 7 = 591
9. 759 ÷ 94 8 R7 94)759 -752 7 Check: 94 × 8 = 752 752 + 7 = 759	10. 653 ÷ 74 8 R7 94)759 -752 7 Check: 94 × 8 = 752 752 + 7 = 759	257 ÷ 36 7 R5 36)257 -252 5 Check: 36 × 7 = 252 252 + 5 = 257

Example Problems

1. 590 ÷ 17

estimates

60 tens ÷ 20 = 3 tens

80 ones ÷ 20 = 4 ones

solution

```
      34
17 ) 590
     -51
      80
     -68
      12
```

Check

```
  34      578
 x17     + 12
 ---     ----
 238      590
+340
 ---
 578
```

2. 887 ÷ 27

estimates

90 tens ÷ 30 = 3 tens

60 ones ÷ 30 = 2 ones

solution

```
      32
27 ) 887
     -81
      77
     -54
      23
```

Check

```
  32      864
 x27     + 23
 ---     ----
 224      887
+640
 ---
 864
```

3. 839 ÷ 41

estimates

80 tens ÷ 40 = 2 tens

19 ones ÷ 40 = 0 ones

solution

```
      20
41 ) 839
     -82
      19
     - 0
      19
```

Check

```
  41      820
 x20     + 19
 ---     ----
  00      839
+820
 ---
 820
```

4. 580 ÷ 17

```
            3  4   R2
1  7 | 5  8  0
    -   5  1
        ------
           7  0

           6  8
           ----
              2
```

Check:

3 4 × 17 = 578

578 + 2 = 580

Problem Set

Divide. Then check with multiplication.

11. 730 ÷ 32	12. 940 ÷ 28	13. 553 ÷ 23
22 R26 32)730 -64 90 -64 26 32 × 22 = 64 + 640 = 704 704 + 26 = 730	33 R16 28)940 -84 100 -84 16 33 × 28 = 264 + 660 = 924 924 + 16 = 940	24 R1 23)553 -46 93 -92 1 24 × 23 = 72 + 480 = 552 552 + 1 = 553

Example Problems

1. 6,247 ÷ 29

estimates

60 hundreds ÷ 30 = 2 hundreds

30 tens ÷ 30 = 1 ten

150 ones ÷ 30 = 5 ones

Solution

215
29)6,247
-58
44
-29
157
-145
12

check

215 × 29 = 1,935 + 4300 = 6,235

6,235 + 12 = 6,247

2. 4,289 ÷ 52

estimates

400 tens ÷ 50 = 8 tens

100 ones ÷ 50 = 2 ones

Solution

82
52)4,289
-416
129
-104
25

check

82 × 52 = 164 + 4100 = 4,264

4,264 + 25 = 4,289

3. 6,649 ÷ 63

estimates

60 hundreds ÷ 60 = 1 hundred

300 ones ÷ 60 = 5 ones

Solution

```
      105
63)6,649
   -63
    34
   - 0
    349
   -315
     34
```

Check

```
  105
 x 63
  315
+6,300
 6,615
```

```
 6,615
+   34
 6,649
```

4. 4,859 ÷ 23

```
      211
23)4,859
   -46
    25
   -23
     29
   - 23
      6
```

```
  211
 x 23
  633
+4220
 4,853
```

```
 4,853
    +6
 4,859
```

Problem Set

Divide. Then check with multiplication.

14. 7,242 ÷ 34	15. 9,152 ÷ 29	16. 4, 424 ÷ 63
213 34)7,242 -68 44 -34 102 -102 0 213 x 34 852 +6,390 7,242	315 29)9,152 -87 45 -29 162 -145 17 315 x 29 2835 +6,300 9,135 9,135 + 17 9,152	70 63)4,424 -441 14 - 0 14 70 x 63 210 +4200 4,410 4,410 + 14 4,424

Name: _____

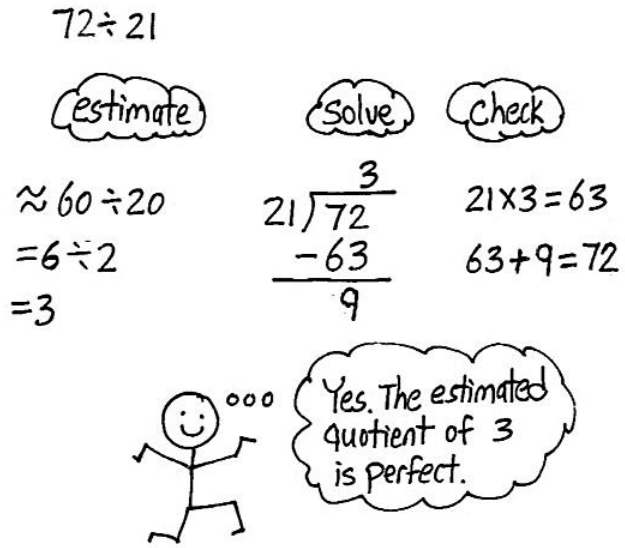
Eureka Acceleration Tools

Prerequisite Support Lesson for Grade 6, Module 2, Topic C

Part D: Dividing Whole Numbers (up to 4 digit dividends, 2 digit divisors)

Example Problems

1. 72 ÷ 21



2. 94 ÷ 43
3. 84 ÷ 2
4. 57 ÷ 29

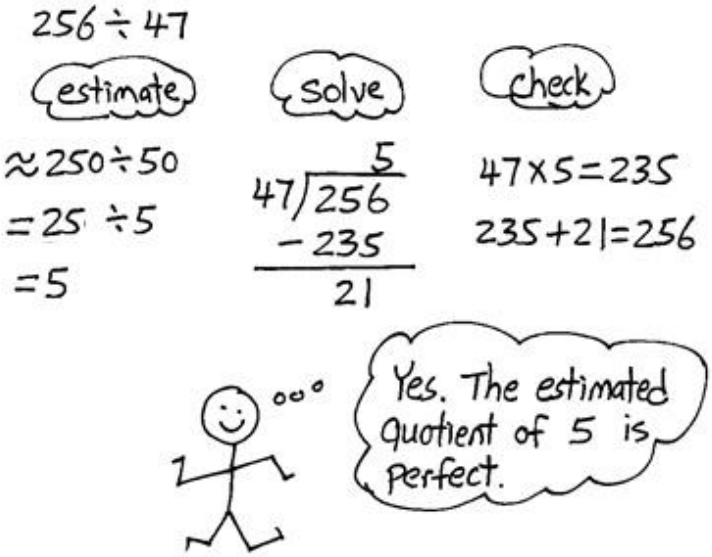
Problem Set

Divide. Then check with multiplication.

1. 65 ÷ 17	2. 49 ÷ 21	3. 78 ÷ 39
4. 84 ÷ 32	5. 77 ÷ 25	68 ÷ 17

Example Problems

1. 256 ÷ 47



2. 236 ÷ 39
3. 369 ÷ 46
4. 712 ÷ 94

Problem Set

Divide. Then check with multiplication.

6. 258 ÷ 47	7. 148 ÷ 67	8. 591 ÷ 73
9. 759 ÷ 94	10. 653 ÷ 74	257 ÷ 36

Example Problems

1. 590 ÷ 17

estimates

60 tens ÷ 20 = 3 tens

80 ones ÷ 20 = 4 ones

solution

$$\begin{array}{r} 34 \\ 17\overline{)590} \\ -51 \\ \hline 80 \\ -68 \\ \hline 12 \end{array}$$

check

$$\begin{array}{r} 34 \\ \times\ 17 \\ \hline 238 \\ +340 \\ \hline 578 \end{array} \qquad \begin{array}{r} 578 \\ +\ 12 \\ \hline 590 \end{array}$$

2. 887 ÷ 27

3. 839 ÷ 41

4. 580 ÷ 17

Problem Set

Divide. Then check with multiplication.

11. 730 ÷ 32	12. 940 ÷ 28	13. 553 ÷ 23

Example Problems

1. 6,247 ÷ 29

estimates

60 hundreds ÷ 30 = 2 hundreds

30 tens ÷ 30 = 1 ten

150 ones ÷ 30 = 5 ones

Solution

```
      215
29)6,247
   -58
    44
   -29
    157
   -145
     12
```

check

```
  215
  x29
 1,935
+4300
 6,235
```

```
6,235
 + 12
6,247
```

2. 4,289 ÷ 52

3. 6,649 ÷ 63

4. 4,859 ÷ 23

Problem Set

Divide. Then check with multiplication.

14. 7,242 ÷ 34	15. 9,152 ÷ 29	16. 4,424 ÷ 63

Eureka Acceleration Tools

Prerequisite Support Lesson for Grade 6, Module 2, Topic C

Part E: Multiply Multi-Digit Numbers

Adapted from Eureka Lesson: 5th Grade, Module 2, Topic B, Lessons 5-8

Use Prior to: Grade 6, Module 2, Topic C, Lesson 12

Standard: 5.NBT.B.5 Fluently multiply multi-digit whole numbers using the standard algorithm.

Purpose: When carrying out the standard algorithm for multi-digit division, students must multiply multi-digit whole numbers. Since the multiplication shows up within the division algorithm, the standard algorithm proves to be the most efficient method for students. The three problems show possible multiplication problems that may arise during the division algorithm and scaffold in difficulty.

Note: In this lesson, students connect visual models of multiplication and the distributive property to partial products of the standard algorithm. By the end of the lesson, students will estimate products and solve using just the standard algorithm. The lesson is divided into sections with Example Problems and Problem Sets. Work through each set of Example Problems and Problems Sets before moving to the next set.

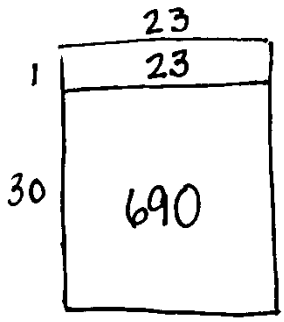
Example Problems

Solve using area model and the standard algorithm.

- Model the use of an area model to solve the first problem.
- Think aloud as you decide which factor to decompose. (For example, I think counting units of 23 is easy because I can find 30 of them and add just one more.)
- Use the text box to help students walk through the problem.
- Use the same procedure for the next problem.

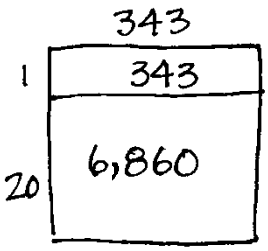
1. 23 x 31

- Label the top 23, with 1 group of 23, and 30 groups of 23.
- Find the product of 1 and 23, and then 30 and 23.
- Add the partial products to find the total area of the rectangle
- What is 23 x 31? 713
- Now solve using the standard algorithm. Compare this process to the area model.



$$\begin{array}{r} 23 \\ \times\ 31 \\ \hline 23 \\ +\ 690 \\ \hline 713 \end{array}$$

2. 343 x 21



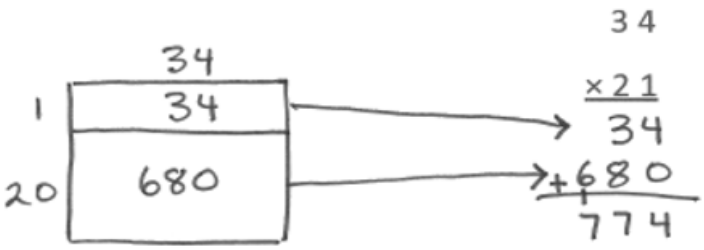
$$\begin{array}{r} 343 \\ \times\ 21 \\ \hline 343 \\ +6860 \\ \hline 7{,}203 \end{array}$$

Problem Set

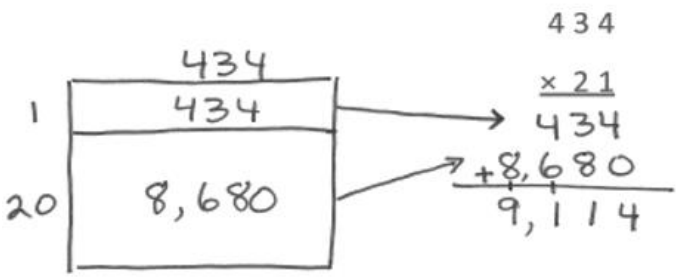
Draw an area model, and then solve using the standard algorithm. Use the arrows to match the partial products from the area model to the partial products of the algorithm.

Allow students to practice the problem set on their own. Check for understanding.

1. 34 × 21 = 774



2. 434 × 21 = 9,114



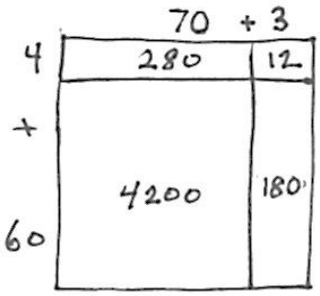
Example Problems

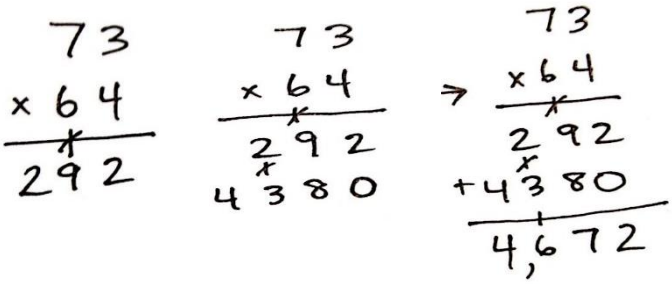
Solve using an area model and the standard algorithm.

Students will now decompose both numbers to solve.

1. 64 x 73

- This time, decompose both factors and label.
- Multiply:
  - 4 x 70 = 280; 4 x 3 = 12
  - 60 x 70 = 4,200; 60 x 3 = 180
- Add the partial products to find the total area of the rectangle (280 + 12 + 4200 + 180 = 4,672)





- Now solve using the standard algorithm
- Find the value of 4 units of 73
  - 4 x 73 = 292
- Find the value of 60 units of 73.
  - 60 x 73 = 4,380
- Add the partial products. What is 64 x 73? 4,672

Compare the model with the algorithm. What do you notice about the partial products?

Be sure that the students see that both processes have students multiply first and then add, and the answers are the same. Also, in the area model, they had to add 4 sections of partial products and then combine into two products. In the standard algorithm, there were only two partial products. The partial products/area model looks like the standard algorithm, but all the parts are decomposed.

2. 814 × 39

	800 +	10 +	4	
30 + 9	24,000	300	120	24,420
	7,200	90	36	7,326

$$\begin{array}{r} 814 \\ \times\ 39 \\ \hline 7326 \\ +24420 \\ \hline 31{,}746 \end{array}$$

3. 624 × 82

	600 +	20 +	4	
80 + 2	48,000	1,600	320	49,920
	1,200	40	8	1,248

$$\begin{array}{r} 624 \\ \times\ 82 \\ \hline 1248 \\ +49920 \\ \hline 51{,}168 \end{array}$$

Problem Set

Draw an area model. Then, solve using the standard algorithm. Use arrows to match the partial products from your area model to the partial products in the algorithm.

Allow the students to complete the problem set independently. The arrows help students identify partial products in both ways of solving of the problem.

1. 48 × 35

	40 +	8	
5 + 30	200	40	240
	1,200	240	1,440

$$\begin{array}{r} 48 \\ \times\ 35 \\ \hline 240 \\ +1440 \\ \hline 1{,}680 \end{array}$$

2. 648 × 35

	600 +	40 +	8	
5 + 30	3,000	200	40	3,240
	18,000	1,200	240	19,440

$$\begin{array}{r} 648 \\ \times\ 35 \\ \hline 3240 \\ +19440 \\ \hline 22{,}680 \end{array}$$

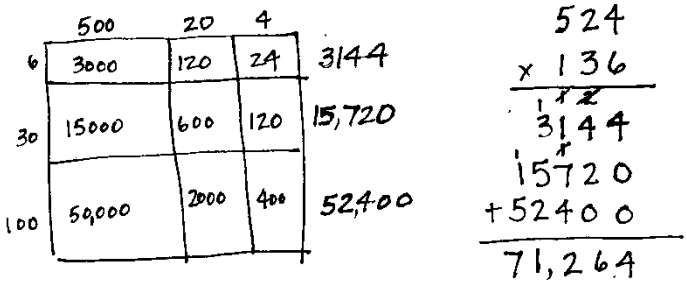
Example Problems

Solve using an area model and the standard algorithm.

Students continue multiplying multi-digit numbers. Some of the examples include factors with 3 digits each, resulting in 9 partial products that combine to 3 partial products. Use the notes in the text box to walk students through the process. Emphasize how the combined partial products match the partial products of the standard algorithm.

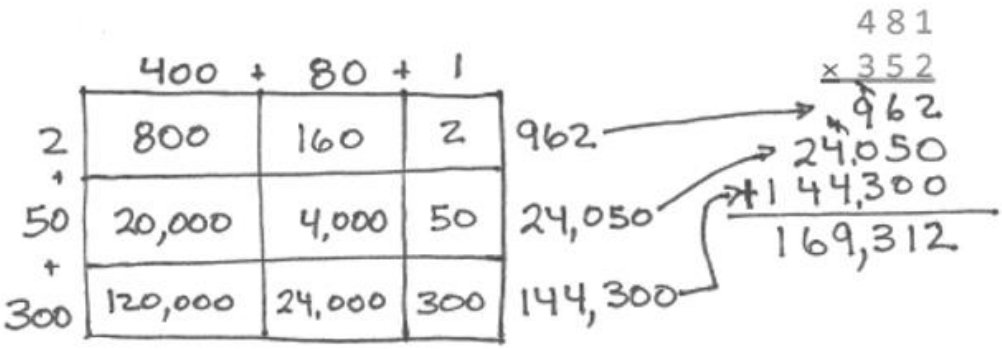
1. 524 x 136

- Decompose both factors
  - 500 + 20 +4 and 100 + 30+ 6
- Multiply and add across
  - (6 x 500) + (6 x 20) + (6 x 4) = 3,144
  - (30 x 500) + (30 x 20) + (30 x 4) = 15,720
  - (100 x 500) + (100 x 20) + (100 x 4) = 52,400
- Add partial products
  - 3,144 + 15,720 + 52,400 = 71,264

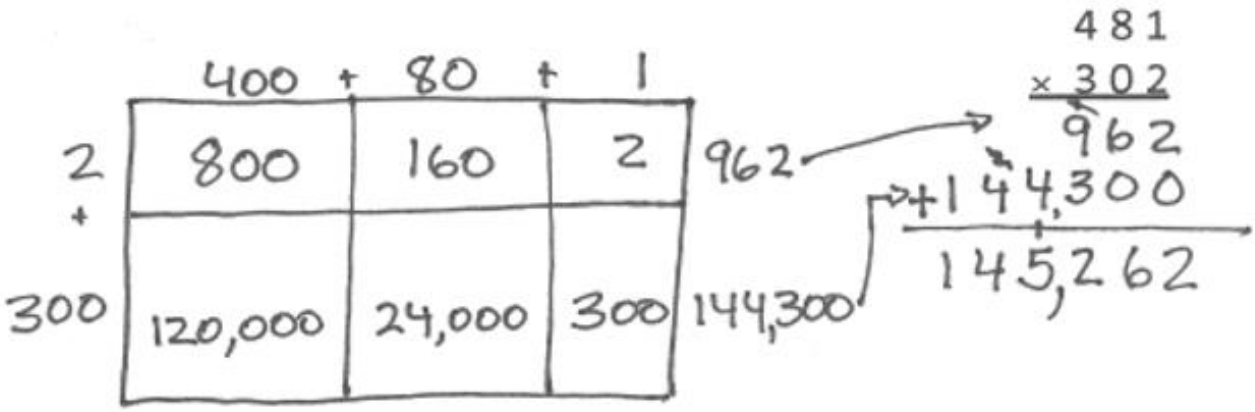


Solve using the standard algorithm. What do you notice about the partial products?

2. 481 x 352



3. 481 x 302

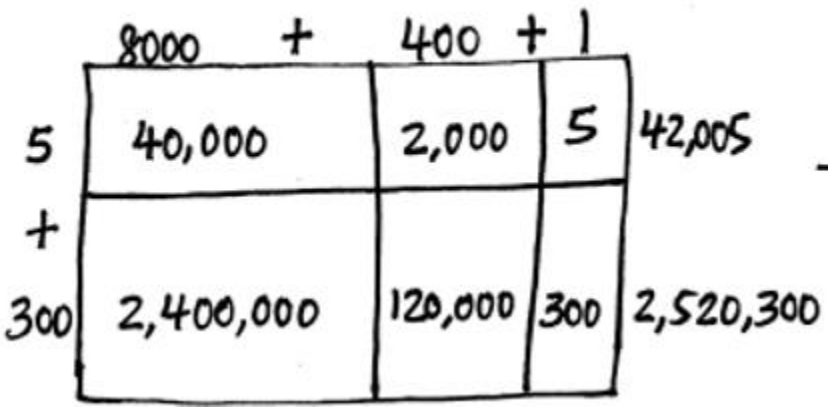


Problem Set

Draw an area model. Then, solve using the standard algorithm. Use arrows to match the partial products from the area model to the partial products in the algorithm.

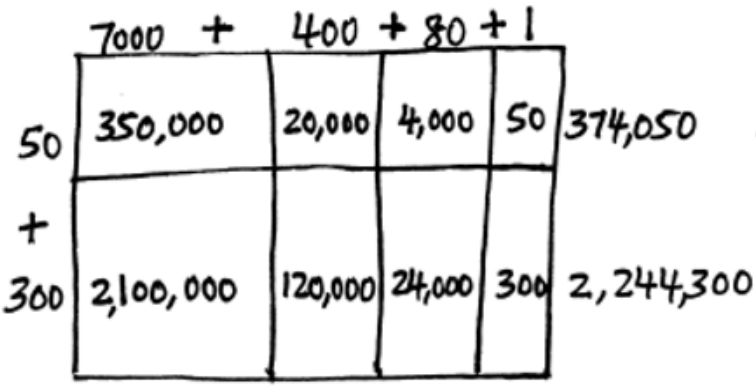
Students will be working with 4 digit numbers, but apply the same concepts as before.

1.



$$\begin{array}{r} 8,401 \\ \times\ 305 \\ \hline 42005 \\ +\ 2520300 \\ \hline 2,562,305 \end{array}$$

2.



$$\begin{array}{r} 7,481 \\ \times\ 350 \\ \hline 374050 \\ +\ 2244300 \\ \hline 2,618,350 \end{array}$$

Example Problems

Estimate the product and then solve using the standard algorithm.

Students will now use the standard algorithm to multiply without the use of the area models. To check if their answer is reasonable, they will first round the factors and estimate an answer. Follow the notes in the text box to walk students through this process.

1. 314 x 236

- Round each factor to estimate the product
- Multiply the rounded factors
- Notice that both factors were rounded down. Will the actual product be more or less than the estimated product? Why? (The actual product will be more than 60,000 because our factors are actually greater than what we rounded them to.)
- Solve the problem using the standard algorithm.
- Was the estimated product reasonable? (Yes, although it is more than our estimated product, it is still close. Our answer makes sense.)

314 x 236
≈ 300 x 200
= 60,000

```
   314
 x 236
 -----
  1884
  9420
+62800
 ------
 74,104
```

2. 1,882 x 296

- Round each factor to estimate product.
- Multiply rounded factors.
- Notice that both factors were rounded up.
- Will the actual answer be more or less? (It will be less because our factors are actually smaller than what we rounded them to.)
- Solve the problem using the standard algorithm.
- Does the answer make sense? (Yes, although it is less than the estimated product, it is still close. Our answer makes sense.

1,882 x 296
≈ 2,000 x 300
= 600,000

```
   1,882
 x   296
 -------
  11292
 16938
+37640
 -------
 557,072
```

Problem Set

Estimate the product first. Solve by using the standard algorithm. Use your estimate to check the reasonableness of the product.

a. 213 × 328 ≈ 200 × 300 = 60,000 213 × 328 1,704 4,260 + 63,900 69,864	b. 662 × 372 ≈ 700 × 400 = 280,000 662 × 372 1324 46340 + 198600 246,264	c. 739 × 442 ≈ 700 × 400 = 280,000 739 × 442 1478 29560 + 295600 326,638
d. 807 × 491 ≈ 800 × 500 = 400,000 807 × 491 807 72,630 + 322,800 396,237	e. 3,502 × 656 ≈ 4,000 × 700 = 2,800,000 3,502 × 656 21012 175100 + 2101200 2,297,312	f. 4,390 × 741 ≈ 4,000 × 700 = 2,800,000 4,390 × 741 4,390 175,600 + 3,073,000 3,252,990

Name: _____

Eureka Acceleration Tools

Prerequisite Support Lesson for Grade 6, Module 2, Topic C

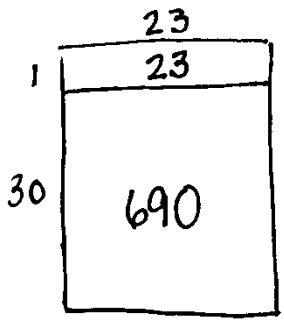
Part E: Multiply Multi-Digit Numbers

Example Problems

Solve using area model and the standard algorithm.

1. 23 x 31

- Label the top 23, with 1 group of 23, and 30 groups of 23.
- Find the product of 1 and 23, and then 30 and 23.
- Add the partial products to find the total area of the rectangle
- What is 23 x 31? 713
- Now solve using the standard algorithm. Compare this process to the area model.



$$\begin{array}{r} 23 \\ \times\ 31 \\ \hline 23 \\ +\ 690 \\ \hline 713 \end{array}$$

2. 343 x 21

Problem Set

Draw an area model, and then solve using the standard algorithm. Use the arrows to match the partial products from the area model to the partial products of the algorithm.

1. 34 × 21 = _____

$$\begin{array}{r} 34 \\ \times\ 21 \\ \hline \end{array}$$

2. 434 × 21 = _____

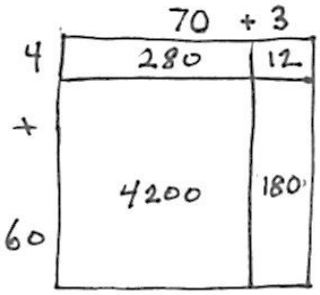
$$\begin{array}{r} 434 \\ \times\ 21 \\ \hline \end{array}$$

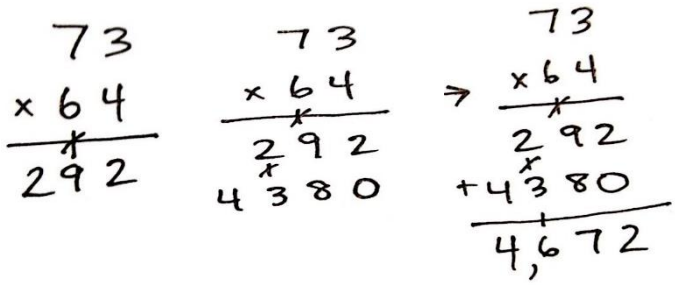
Example Problems

Solve using an area model and the standard algorithm.

1. 64 x 73

- This time, decompose both factors and label.
- Multiply:
  - 4 x 70 = 280; 4 x 3 = 12
  - 60 x 70 = 4,200; 60 x 3 = 180
- Add the partial products to find the total area of the rectangle (280 + 12 + 4200 + 180 = 4,672)





- Now solve using the standard algorithm
- Find the value of 4 units of 73
  - 4 x 73 = 292
- Find the value of 60 units of 73.
  - 60 x 73 = 4,380
- Add the partial products. What is 64 x 73? 4,672

Compare the model with the algorithm. What do you notice about the partial products?

2. 814 × 39

3. 624 × 82

Problem Set

Draw an area model. Then, solve using the standard algorithm. Use arrows to match the partial products from your area model to the partial products in the algorithm.

1. 48 × 35

$$\begin{array}{r} 48 \\ \underline{\times\ 35} \end{array}$$

2. 648 × 35

$$\begin{array}{r} 648 \\ \underline{\times\ 35} \end{array}$$

Example Problems

Solve using an area model and the standard algorithm.

1. 524 x 136

- Decompose both factors
  - 500 + 20 +4 and 100 + 30+ 6
- Multiply and add across
  - (6 x 500) + (6 x 20) + (6 x 4) = 3,144
  - (30 x 500) + (30 x 20) + (30 x 4) = 15,720
  - (100 x 500) + (100 x 20) + (100 x 4) = 52,400
- Add partial products
  - 3,144 + 15,720 + 52,400 = 71,264

	500	20	4	
6	3000	120	24	3144
30	15000	600	120	15,720
100	50,000	2000	400	52,400

$$\begin{array}{r} 524 \\ \times\ 136 \\ \hline 3144 \\ 15720 \\ +52400 \\ \hline 71,264 \end{array}$$

Solve using the standard algorithm. What do you notice about the partial products?

2. 481 x 352

3. 481 x 302

Problem Set

Draw an area model. Then, solve using the standard algorithm. Use arrows to match the partial products from the area model to the partial products in the algorithm.

1. 8,401 × 305

$$\begin{array}{r} 8,401 \\ \times \quad 305 \\ \hline \end{array}$$

2. 7,481 × 350

$$\begin{array}{r} 7,481 \\ \times \quad 350 \\ \hline \end{array}$$

Example Problems

Estimate the product and then solve using the standard algorithm.

1. 314 x 236

- Round each factor to estimate the product
- Multiply the rounded factors
- Notice that both factors were rounded down. Will the actual product be more or less than the estimated product? Why?
- Solve the problem using the standard algorithm.
- Was the estimated product reasonable?

314 x 236
≈ 300 x 200
= 60,000

$$\begin{array}{r} 314 \\ \times\ 236 \\ \hline 1884 \\ 9420 \\ +\ 62800 \\ \hline 74{,}104 \end{array}$$

2. 1,882 x 296

Problem Set

Estimate the product first. Solve by using the standard algorithm. Use your estimate to check the reasonableness of the product.

a. 213 × 328	b. 662 × 372	c. 739 × 442
d. 807 × 491	e. 3,502 × 656	f. 4,390 × 741

Eureka Acceleration Tools

Prerequisite Support Lesson for Grade 6, Module 2, Topic C

Part F: Dividing Decimals to Hundredths

Adapted from Eureka Lesson: 5th Grade, Module 1, Topic F, Lessons 13 - 15

Use Prior to: Grade 6, Module 2, Topic C, Lesson 14

Standard: : 5.NBT.B.7 Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; justify the reasoning used with a written explanation.

Purpose: This standard does not call for the standard algorithm, so students may engage with these problems in a variety of ways. The most important look-fors here are the accuracy of the answer, the efficiency of the strategy, and how the work with the decimal dividends and divisors. Furthermore, students who produce unreasonable answers may not understand the connection between place value and division. The problems scaffold in difficulty.

Note: Walk students through the various types of example problems, allowing them to try some of them on their own along the way. This practice will help students understand that the answers to decimal division is similar to finding basic facts except the units may have a different value because of the decimal point location. When students convert the decimals to their smallest unit, it helps them make sense of dividing decimals. For example, 2.5 ÷ 5, is the same thing as 25 tenths divided by 5. Students can easily group 25 tenths into 5 groups of 5 tenths, resulting in 3 tenths. The lesson builds on this concept as the number of digits increases in the examples. Students will eventually work towards dividing decimals using the standard algorithm.

Example Problems

Divide.

Use a place value chart and disks to begin the problems. Try moving away from the charts as students move along and use basic fact knowledge as well as unit language to help solve.

1. 0.9 ÷ 3 = 0.3
   - Draw disks to show 9 tenths on your place value chart.
   - Divide 9 tenths into 3 equal groups.
   - How many tenths are in each group? (3 tenths or 0.3)

2. 0.24 ÷ 4 = 0.06
   - 24 hundredths divided into 4 groups equals 6 hundredths or 0.06

3. 0.032 ÷ 8 = 0.004
   - 32 thousandths divided into 8 groups equals 4 thousandths or 0.004.

4. 1.5 ÷ 5 = 0.3
   - Read the equation like “Fifteen tenths divided by 5.”
   - Divided 15 tenths into 5 equal groups.
   - How many tenths are in each group? (3 tenths or 0.3)

5. 1.05 ÷ 5 = 0.21
   - 105 hundredths divided into 5 groups equals 21 hundredths or 0.21
6. 3.015 ÷ 5 = 0.603
   - 3,015 thousandths divided into 5 groups equals 603 thousandths or 0.603

Compare the relationships between

7. 4.8 ÷ 6 = 0.8 and 48 ÷ 6 = 8
   Possible response: 8 is ten times greater than 0.8. 48 is 10 times greater than 4.8. The digits are the same in both equations, but the decimal points are in different places.
   Ask students how knowing 48 divided by 6 can help them with 4.8 divided by 6. (If you think of the basic fact first, you can get a quick answer. Then, you just have to remember what units were really in the problem. This one was really 48 tenths. The division is the same, the units are the only difference.

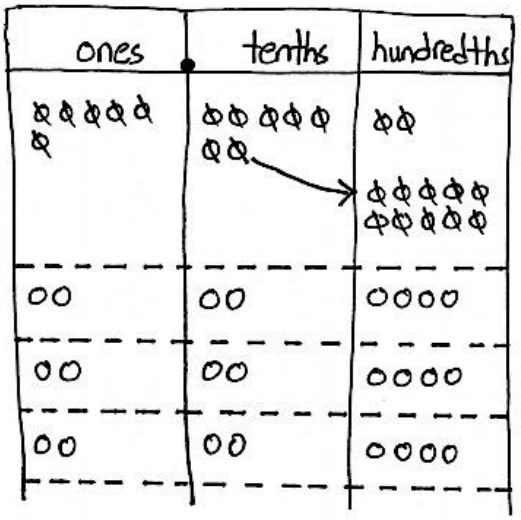
8. 4.08 ÷ 8 = 0.51 and 408 ÷ 8 = 51
   Possible response: 4.80 is the same as 408 hundredths. When I think about 408 divided by 8, I know the answer is 51. So 408 hundredths divided by 8 will give me 51 hundredths (0.51).

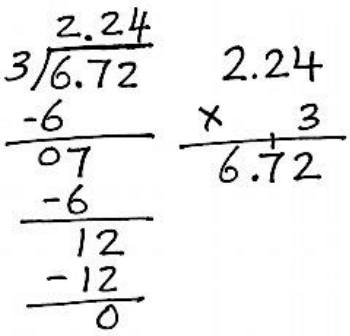
9. 63.021 ÷ 7 = 9.003 and 61,021 ÷ 7 = 9,003
   If I divide 61,021 by 7, I know the answer is 9,003. 63.021 is 63,021 thousandths, so 63,021 thousandths divided by 7 equals 9,003 thousandths, or 9.003

Divide using a place value chart and the standard algorithm
As you instruct students how to use the place value chart, complete the standard algorithm out to the side with each step so they can see the relationship between the two.

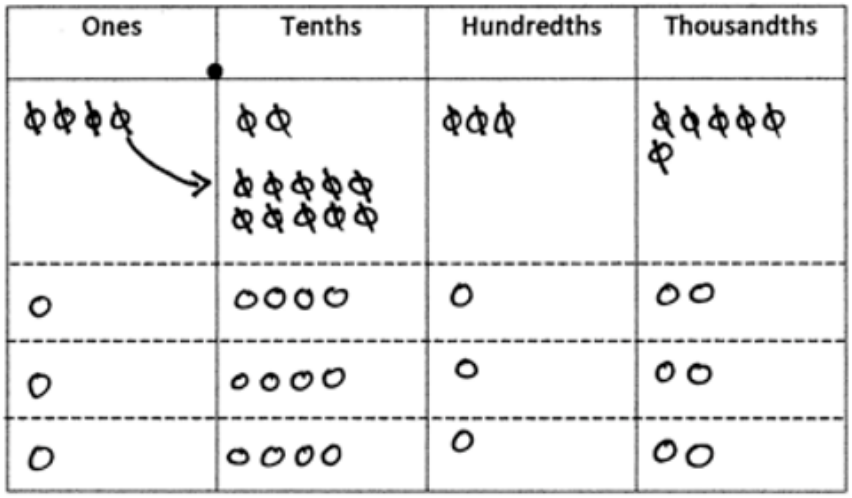
10. 6.72 ÷ 3 = 2.24

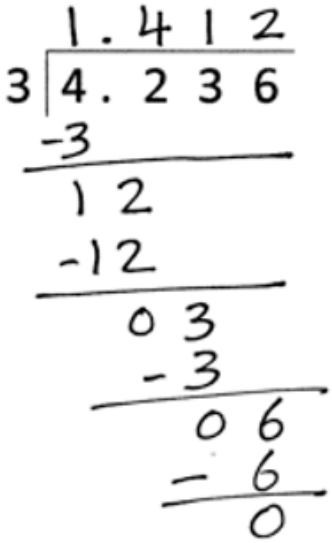
- Begin by sharing 6 ones in three equal groups. How many are in each group? 2, with 0 leftover
- Share 7 tenths into three groups. How many are in each group? Are any leftover? 3 groups with 1 left over
- Change the leftover tenth for 10 hundredths.
- How many hundredths do we have now? 12
- Share the hundredths into 4 groups.
- Look at the three groups. How many are in each group? 2 ones, 2 tenths, and 4 hundredths



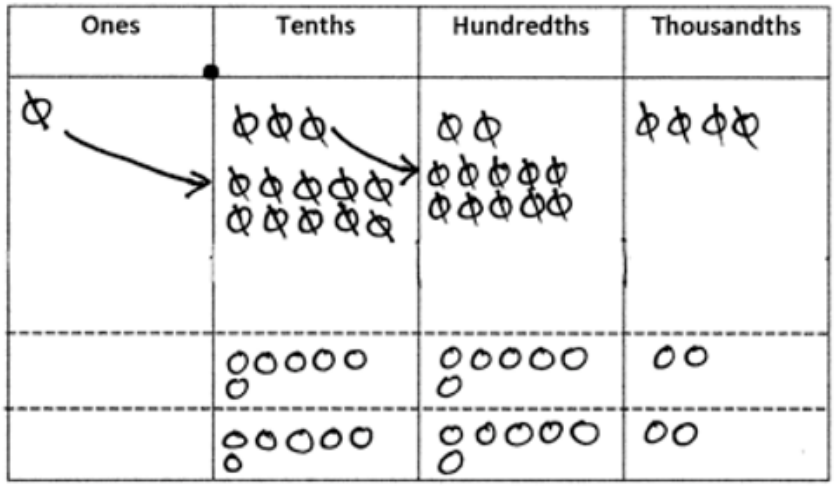


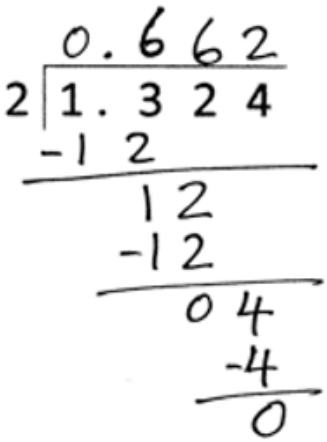
11. 4.236 ÷ 3 = 1.412





12. 1.324 ÷ 2 = 0.662





13. Divide using the standard algorithm.

a. 0.78 ÷ 3 = 0.26	b. 7.28 ÷ 4 = 1.82	c. 17.45 ÷ 5 = 3.49
0.26 3)0.78 -6 18 -18 0	1.82 4)7.28 -4 32 -32 08 -8 0	03.49 5)17.45 -15 24 -20 45 -45 0

Divide using the standard algorithm.

These next two problems have remainders. Student may still choose to use other strategies to solve, but it is important for students to be familiar with placing a 0 at the end of the dividend when there is a remainder and to continue the division process.

14. 1.7 ÷ 2 = 0.85

0.85
2)1.70
-1.6
0.10
-.10
0

0.85
×2
1.70

15. 0.5 ÷ 2 = 0.25

0.25
2)0.50
-04
10
-10
0

16. 5.7 ÷ 4 = 1.425

1.425
4)5.700
-4
17
-16
10
-8
20
-20
0

Problem Set

Divide using the standard algorithm

a. 0.64 ÷ 4 = 0.16

	0.	1	6
4	0.	6	4
−	0		
	0	6	
−		4	
		2	4
	−	2	4
			0

b. 6.45 ÷ 5 = 1.29

	1.	2	9
5	6.	4	5
−	5		
	1	4	
−	1	0	
		4	5
	−	4	5
			0

c. 16.404 ÷ 6 = 2.743

	0	2.	7	3	4
6	1	6.	4	0	4
−	0				
	1	6			
−	1	2			
		4	4		
	−	4	2		
			2	0	
		−	1	8	
				2	4
			−	2	4
					0

d. 0.7 ÷ 2 = 0.35

	0.	3	5
2	0.	7	0
−	0		
	0	7	
−		6	
		1	0
	−	1	0
			0

e. 3.9 ÷ 6 = 0.65

	0.	6	5
6	3.	9	0
−	0		
	3	9	
−	3	6	
		3	0
	−	3	0
			0

f. 9 ÷ 4 = 2.25

	2.	2	5
4	9.	0	0
−	8		
	1	0	
−		8	
		2	0
	−	2	0
			0

g. 0.92 ÷ 2 = 0.46

	0.	4	6
2	0.	9	2
−	0		
	0	9	
−		8	
		1	2
	−	1	2
			0

h. 9.4 ÷ 4 = 2.35

	2.	3	5
4	9.	4	0
−	8		
	1	4	
−	1	2	
		2	0
	−	2	0
			0

i. 91 ÷ 8 = 11.375

	1	1.	3	7	5
8	9	1.	0	0	0
−	8				
	1	1			
−		8			
		3	0		
	−	2	4		
			6	0	
		−	5	6	
				4	0
			−	4	0
					0

Source: Graphic Solutions provided by Calculator Soup

https://www.calculatorsoup.com/calculators/math/longdivisiondecimals.php

Name: _____

Eureka Acceleration Tools

Prerequisite Support Lesson for Grade 6, Module 2, Topic C

Part F: Dividing Decimals to Hundredths

Example Problems

Divide.

1. 0.9 ÷ 3 = _____
   - Draw disks to show 9 tenths on your place value chart.
   - Divide 9 tenths into 3 equal groups.
   - How many tenths are in each group?

2. 0.24 ÷ 4 = _____

3. 0.032 ÷ 8 = _____

4. 1.5 ÷ 5 = _____
   - Read the equation like "Fifteen tenths divided by 5."
   - Divided 15 tenths into 5 equal groups.
   - How many tenths are in each group?

5. 1.05 ÷ 5 = _____

6. 3.015 ÷ 5 = _____

Compare the relationships between

7. 4.8 ÷ 6 = 0.8 and 48 ÷ 6 = 8

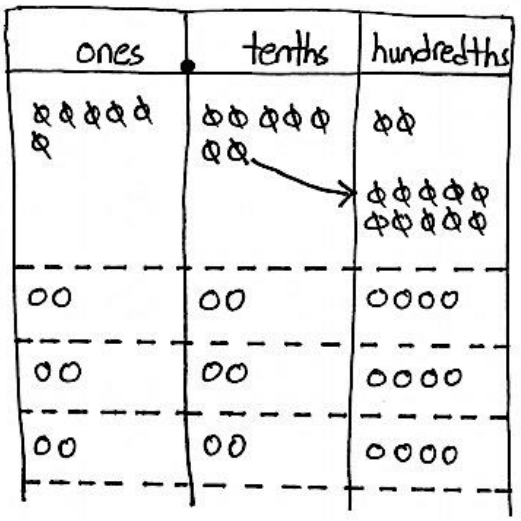
8. 4.08 ÷ 8 = 0.51 and 408 ÷ 8 = 51

9. 63.021 ÷ 7 = 9.003 and 61,021 ÷ 7 = 9,003

Divide using a place value chart and the standard algorithm

10. 6.72 ÷ 3 = _____

- Begin by sharing 6 ones in three equal groups. How many are in each group?
- Share 7 tenths into three groups. How many are in each group? Are any leftover?
- Change the leftover tenth for 10 hundredths.
- How many hundredths do we have now?
- Share the hundredths into 4 groups.
- Look at the three groups. How many are in each group?



$$\begin{array}{r} 2.24 \\ 3\overline{)6.72} \\ -6 \\ \hline 07 \\ -6 \\ \hline 12 \\ -12 \\ \hline 0 \end{array} \qquad \begin{array}{r} 2.24 \\ \times\ \ 3 \\ \hline 6.72 \end{array}$$

11. 4.236 ÷ 3 = _____

Ones	Tenths	Hundredths	Thousandths

$$3\overline{)4.236}$$

12. 1.324 ÷ 2 = _____

Ones	Tenths	Hundredths	Thousandths

2 | 1. 3 2 4

13. Divide using the standard algorithm.

a. 0.78 ÷ 3 =	b. 7.28 ÷ 4 =	c. 17.45 ÷ 5 =

Divide using the standard algorithm.

14. 1.7 ÷ 2 = _____

15. 0.5 ÷ 2 = _____

16. 5.7 ÷ 4 = ____

Problem Set

Divide using the standard algorithm

a. 0.64 ÷ 4 =	b. 6.45 ÷ 5 =	c. 16.404 ÷ 6 =
d. 0.7 ÷ 2 =	*e.* 3.9 ÷ 6 =	f. 9 ÷ 4 =
g. 0.92 ÷ 2 =	*h.* 9.4 ÷ 4 =	*i.* 91 ÷ 8 =