

# ReasoningMind

## Basic I-3 Curriculum Highlights by Objective

<b>Objective 1</b> Numbers up to 1,000: Places and Reading .....	3
<b>Objective 2</b> Writing Numbers and Counting within 1,000 .....	6
<b>Objective 3</b> Comparing Numbers up to 1,000 .....	8
<b>Objective 4</b> “Times More Than” and “More Than” .....	10
<b>Objective 5</b> “Times More/Less Than” and “More/Less Than” Word Problems .....	12
<b>Objective 6</b> Addition and Subtraction: Checking One Operation with the Other .....	15
<b>Objective 7</b> Column Addition of Numbers Under 1,000: Part 1 .....	17
<b>Objective 8</b> Column Addition of Numbers Under 1,000: Part 2.....	19
<b>Objective 9</b> Column Subtraction within 1,000: No Borrow: .....	21
<b>Objective 10</b> Column Subtraction within 1,000 Borrowing Once .....	24
<b>Objective 11</b> Expressions for Solving Word Problems: Part 1 .....	26
<b>Objective 12</b> Column Subtraction within 1,000: No Tens .....	28
<b>Objective 13</b> Column Subtraction within 1,000: Borrowing Twice.....	30
<b>Objective 14</b> Column Addition Within 1,000: Three Summands .....	32
<b>Objective 15</b> Expressions for Solving Word Problems: Part 2 .....	34
<b>Objective 16</b> Equations with an Unknown Summand.....	36
<b>Objective 17</b> Equations with an Unknown Minuend .....	38
<b>Objective 18</b> Division with a Remainder:.....	40
<b>Objective 19</b> Multiplying and Dividing by 10 and 100 .....	44
<b>Objective 20</b> Multiplication and Division are Related.....	46
<b>Objective 21</b> Order of Operations in Expressions without Parentheses .....	48
<b>Objective 22</b> Review: Word Problems with Two Questions.....	51
<b>Objective 23</b> Order of Operations with Parentheses .....	54

## ReasoningMind

Basic I-3 Curriculum

<b>Objective 24</b> Multiplying a Two-Digit Number by a One-Digit Number .....	57
<b>Objective 25</b> Step by Step Solutions to Word Problems.....	59
<b>Objective 26</b> Column Multiplication of a Three-Digit Number: Part 1.....	62
<b>Objective 27</b> Column Multiplication of a Three-Digit Number: Part 2.....	65
<b>Objective 28</b> Division Beyond the Multiplication Table .....	67
<b>Objective 29</b> Long Division with 2-Digit Numbers.....	70
<b>Objective 30</b> Long Division with 3-Digit Numbers.....	72
<b>Objective 31</b> Review: Customary Units of Length .....	74
<b>Objective 32</b> Multiplication and Division: Checking One Operation with the Other .....	78
<b>Objective 33</b> Metric Units of Length: Changing Units .....	82
<b>Objective 34</b> Equations with an Unknown Factor .....	86
<b>Objective 35</b> Equations with an Unknown Dividend .....	88

# Numbers up to 1,000: Places and Reading

## Objective 1 Curriculum Highlights

### Related TEKS

4.2A, 4.2B

### Related Student Expectations

- ◆ Prerequisite for determining products of a number and 10 or 100 using place value understandings
- ◆ Introduces representing the value of the digit in whole numbers through 1,000,000,000 using expanded notation
- ◆ Introduces representing the value of the digit in whole numbers through 1,000,000,000 using numerals
- ◆ Fully covers interpreting the value of each place-value position as 10 times the position to the right
- ◆ Fully covers interpreting the value of each place-value position as one-tenth of the value of the place to its left

### Foundational RM Prerequisites

- ◆ Two-Digit Numbers

### Vocabulary

2-digit number  
ones' place  
sum of place values

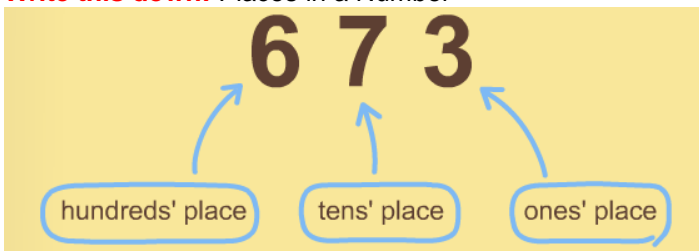
hundreds  
one thousand (1,000)  
tens' place

hundreds' place  
place value

### Key Theory Material

#### I) Numbers up to 1,000

- Write this down:** Counting by Hundreds  
1. 100 200 300 400 500 600 700 800 900
- Write this down:** One Thousand (1,000)  
1. 10 hundreds = 1,000
- Write this down:**  
1. 2 hundreds + 3 tens + 8 ones = 238  
2. 3 hundreds + 4 tens + 2 ones = 342
- Write this down:** Places in a Number



#### II) Places in a Number

- Write this down:** Place Value  
1. 729
  - 7: The place value is 700.
  - 2: The place value is 20.
  - 9: The place value is 9.

## ReasoningMind

Basic I-3 Curriculum

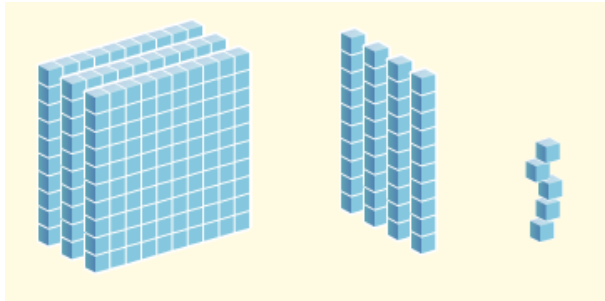
- b. What is the number 196 made up of?
  1.  $196 = 1 \text{ hundred} + 9 \text{ tens} + 6 \text{ ones}$
  2. If we write 196 as a **sum of place values** we get
    - (i)  $196 = 100 + 90 + 6$
- c. **Write this down:** A Sum of Place Values
  1.  $745 = 700 + 40 + 5$
  2.  $196 = 100 + 90 + 6$
- d. **Write this down:** A Sum of Place Values
  1.  $580 = 500 + 80$
  2.  $508 = 500 + 8$

### III) Reading Numbers up to 1,000

- a. When reading a number, first we say the number of hundreds, then we read the **2-digit number**.
- b. **Write this down:** Names of Numbers
  1. 135: one hundred thirty-five
  2. 568: five hundred sixty-eight
- c. **Write this down: 450**
  1. We read this number as four hundred fifty.
- d. **Write this down: 403**
  1. We read this number as four hundred three

### Key Problems for Practice

1.  hundreds + 4 tens + 5 ones =



2. A magic crow lived for a hundred years, then another fifty years, and then two more years. How many years did the magic crow live?
- a. 251
  - b. 152
  - c. 512
3. How do we read 343?
- a. three hundred forty-three
  - b. three hundred forty
  - c. thirty forty-three

4. We read the number 520 as:
  - a. five hundred two
  - b. two hundred fifty
  - c. five hundred twenty
  - d. 152
  - e. 512
  
5. Twenty was added to forty. How much needs to be added to get two hundred sixty?

# Writing Numbers and Counting within 1,000

## Objective 2 Curriculum Highlights

### Related TEKS

4.2B

### Related Student Expectations

- ◆ Introduces representing the value of the digit in whole numbers through 1,000,000,000 using expanded notation
- ◆ Introduces representing the value of the digit in whole numbers through 1,000,000,000 using numerals

### Foundational RM Prerequisites

- ◆ Numbers up to 1,000: Places and Reading

### Vocabulary

adding  
next

after  
previous

before  
subtracting

natural number

### Key Theory Material

#### I) Writing Numbers Less Than 1,000

- Write this down:**
  - “Five hundred ninety-three” in digits is 593.
- Write this down:**
  - There are no ones in “two hundred ninety,” so we put a 0 in the ones’ place.
  - “Two hundred ninety” in digits is 290.
- Write this down:**
  - There are no tens in “four hundred seven,” so we put a 0 in the tens’ place.
  - “Four hundred seven” in digits is 407.

#### II) Counting Within 1,000

- This is how we count: for every **natural number**, we get the **next** natural number by **adding** 1.
- Write this down:**
  - The next number **after** 547 is 548
- For every natural number, we get the **previous** natural number by **subtracting** 1.
- Write this down:**
  - The number that comes right **before** 547 is 546.

### Key Problems for Practice

- The number that comes right before 499 is   
The number that comes next after 499 is
- Write the numbers that are between 397 and 405 in order from greatest to least.

,,,,,,

**ReasoningMind**  
Basic I-3 Curriculum

3. How many numbers between 220 and 300 are written with 5 in the one's place?
  
4. Write the number using digits.
  - a. "seven hundred seventy-seven"
  - b. "seven hundred seventy"
  - c. "seven hundred seven"
  
5. The round number between 217 and 222 is .

# Comparing Numbers up to 1,000

## Objective 3 Curriculum Highlights

### Related TEKS

4.2C

### Related Student Expectations

- ◆ Introduces comparing whole numbers to 1,000,000,000
- ◆ Introduces ordering whole numbers to 1,000,000,000

### Foundational RM Prerequisites

- ◆ Writing Numbers and Counting Within 1,000

### Vocabulary

< (less than)	> (greater than)	comparing	equal
one-digit numbers	same	unequal	

### Key Theory Material

#### I) Comparing 1, 2, and 3-Digit Numbers

- First come the **one-digit numbers**. Next come the two-digit numbers.
  - The number that comes later when we count is greater.
  - Therefore, any 2-digit number is greater than any 1-digit number.
- The greatest 2-digit number is 99.
- Write this down:**
  - The more digits, the greater the number.
    - $329 > 8$
    - $227 > 86$

#### II) Comparing 3-Digit Numbers that Have **Unequal** Hundreds

- Write this down:**
  - 3-digit numbers can be compared by their hundreds.
    - $706 > 581$ , because  $7 > 5$
    - $581 < 706$ , because  $5 < 7$

#### III) Comparing 3-Digit Numbers that Have **Equal** Hundreds

- Write this down:**
  - 3-digit numbers with the **same** hundreds can be compared by their tens:
    - $781 > 756$ , because  $8 > 5$

#### IV) Comparing 3-Digit Numbers that Have **Equal** Hundreds and Tens

- Write this down:**
  - 3-digit numbers with the same hundreds and the same tens can be compared by their ones:
    - $948 > 945$ , because  $8 > 5$



1. Write in digits the numbers three hundred twenty-four and one hundred twenty-eight.  
Which is the smaller number?
  
2. The perimeter of a quadrilateral is 168 cm. The sides of a triangle measure 73 cm, 17 cm, and 74 cm. Which shape has the greater perimeter?
  - a. The triangle has the greater perimeter.
  - b. Their perimeters are the same.
  - c. The quadrilateral has greater perimeter.
3.  $573 > 429$ . Which of the following is true?
  - a.  $429 = 573$
  - b.  $429 < 573$
  - c.  $429 > 573$
  
4. Put the numbers in order from greatest to least: 333, 434, 313, 133, 344
  
  
5. Use the digits 0, 1, and 2 to make all of the inequalities true.
  - a.  $2\square7 < 217$
  - b.  $403 > 40\square$
  - c.  $9\square6 = 916$

## “Times More Than” and “More Than”

### Objective 4 Curriculum Highlights

#### Related TEKS

4.4H

#### Related Student Expectations

- ◆ Fully covers solving with fluency one-step problems involving multiplication
- ◆ Fully covers solving with fluency two-step problems involving multiplication

#### Foundational RM Prerequisites

- ◆ Finding a Number Several Times More/Less
- ◆ More Than and Less Than

#### Vocabulary

divide  
times less than

less than  
times more than

more than

multiply

#### Key Theory Material

##### I) Add or Multiply?

###### a. Write this down:

- To find 3 **more than** 3, add:  
(i)  $4 + 3 = 7$
- To find 3 **times more than** 3, multiply:  
(i)  $4 \times 3 = 12$

##### II) Subtract or Divide?

###### a. Write this down:

- To find 2 **less than** 8, subtract:  
(i)  $8 - 2 = 6$
- To find 2 **times less than** 8, divide:  
(i)  $8 \div 2 = 4$

#### Key Problems for Practice

- By how much do you need to increase 48 to get the number that is 9 times more than 7?
- 2 more than 6 is .
- 2 times less than 6 is .

## ReasoningMind

### Basic I-3 Curriculum

3. The number 7 less than the difference between 52 and 31 is  $\square$ .

The number 7 times less than the sum of 19 and 37 is  $\square$ .

4. 56 is \_\_\_\_\_ than 7.

a. 8 times more

b. 8 more

5. How much less than 12 is the number that is 3 times less than 12?

# “Times More/Less Than” and “More/Less Than” Word Problems

## Objective 5 Curriculum Highlights

### Related TEKS

4.4H

### Related Student Expectations

- ◆ Introduces solving with fluency one-step problems involving division, including interpreting remainders
- ◆ Introduces solving with fluency two-step problems involving division, including interpreting remainders
- ◆ Introduces solving with fluency two-step problems involving multiplication and division, including interpreting remainders

### Foundational RM Prerequisites

- ◆ Step-by-Step Solutions for Two-Step Problems
- ◆ Times More/Less Than Word Problems

### Vocabulary

half as many as  
twice as many as

fewer  
unknown

known

shorthand

### Key Theory Material

#### I) Add or Multiply

- a. **Write this down:** When to Add and When to Multiply
1. Oranges: 2 lb
  2. Apples: 5 times more than oranges
  3. Lemons: 5 lbs more than oranges
  4. Apples:  $2 \times 5 = 10$  (lb)
  5. Lemons:  $2 + 5 = 7$  (lb)

#### II) Subtract or Divide?

- a. “Half as many as” means the same as “2 times less than.”
- b. **Write this down:** When to Subtract and When to Divide
1. Flour: 8 cups
  2. Honey: 2 cups less than flour
  3. Ketchup: 2 times less than flour
  4. How much honey?  $8 - 2 = 6$  (cups)
  5. How much ketchup?  $8 \div 2 = 4$  (cups)

#### III) What do we compare?

- a. Leo rolled 3 fewer balls than his dad. Juan rolled twice as many balls as Leo. Their dad rolled 10 balls. Who rolled the fewest balls?
1. The number of balls dad rolled is known.
  2. The numbers of balls Juan and Leo rolled are unknown.
  3. We make a shorthand:

dad: 10 balls

Leo: ? balls, 3 fewer than

Juan: ? balls, 2 times more than

b.

Watch where the arrows point!

Dan: 6 mi

Yuki: ? mi, 2 times less than

Nate: ? mi, 4 mi more than



1. Yuki:  $6 \div 2 = 3$  (mi)

2. Nate:  $3 + 4 = 7$  (mi)

c. The arrows show what we are comparing

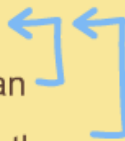
d. **Write this down:**

Watch where the arrows point!

Stars: 30 models

Frogs: ? models, 10 more than

Planes: ? models, 5 times less than



1. Frogs:  $30 + 10 = 40$

2. Planes:  $30 \div 5 = 6$

**Answer:** 40 frogs and 6 planes

### Key Problems for Practice

1. Archie learned 36 new words. Maki learned 26 fewer new words than Archie. Jojo learned 4 times as many new words as Maki. How many new words did Jojo learn?
2. Old McDonald had a farm. There were 7 cows. There were 8 more horses than cows. There were also 8 times more ducks than cows.
  - a. How many horses did Old McDonald have?
  - b. How many ducks did Old McDonald have?
3. The candles are 3 times cheaper than the cake. The bunch of balloons is 4 times more expensive than the cake. The cake costs \$6. How much do the candles and balloons each cost?

4. I had 8 guests at my birthday party this year. Last year, I had 2 fewer guests. How many guests came last year?

a. Fill in the shorthand:

This year: 8 guests  
Last year: ? guests,

2 more than      2 times more than  
2 fewer than      2 times fewer than

b. Last year, there were  guests.

5. The area of rectangle KLMN is 4 times less than the area of rectangle ABCD.

The area of KLMN is   $\text{cm}^2$ .

The area of rectangle GHIJ is  $24 \text{ cm}^2$  more than the area of KLMN.

The area of GHIJ is   $\text{cm}^2$ .



# Addition and Subtraction: Checking One Operation with the Other

## Objective 6 Curriculum Highlights

### Related TEKS

4.4A

### Related Student Expectations

- ◆ Introduces adding whole numbers using the standard algorithm
- ◆ Introduces subtracting whole numbers using the standard algorithm

### Foundational RM Prerequisites

- ◆ Column Subtraction Basics

### Vocabulary

difference  
sum

minuend  
summand

related

subtrahend

### Key Theory Material

#### I) Addition is Related to Subtraction

- $\text{summand} + \text{summand} = \text{sum}$ 
  - We call the numbers that we add summands.
  - We call the result of addition the sum.
- Addition is **related** to subtraction.
  - When we subtract the first summand from the sum we get the second summand.
  - When we subtract the second summand from the sum we get the first summand.
- Write this down:**
  - When we subtract one summand from the sum we get the other summand.
    - $6 + 2 = 8$
    - $8 - 6 = 2$
    - $8 - 2 = 6$
- If you know  $40 + 17 = 57$ , you can find  $57 - 40$  and  $57 - 17$  without calculating!

#### II) Subtraction is Related to Addition

- $\text{minuend} - \text{subtrahend} = \text{difference}$
- Subtraction is related to addition.
- Write this down:**
  - When we add the difference and the subtrahend we get the minuend.
    - $17 - 5 = 12$
    - $12 + 5 = 17$
- If you know  $48 - 35 = 13$ , then you know the equality  $35 + 13 = 52$  cannot be correct!

#### III) Using Addition to Check Subtraction

- Write this down:**
  - We can check subtraction with addition.  
?
  - $73 - 47 = 26$ 
    - Add the difference and the subtrahend.
    - If you get the minuend, you subtracted correctly.
    - $26 + 47 = 73$ , so our subtraction was correct.

## ReasoningMind

Basic I-3 Curriculum

### IV) Using Subtraction to Check Addition

a. **Write this down:**

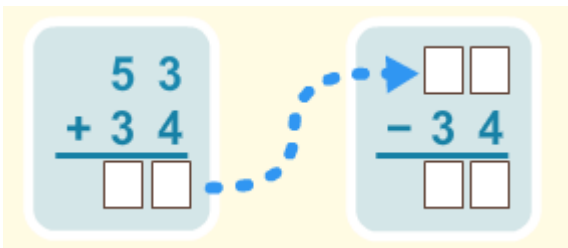
1. We can check addition with subtraction.
2.  $67 + 12 = 79$ 
  - (i) Subtract one of the summands from the sum.
  - (ii) If you get the other summand, the addition is correct.
  - (iii)  $79 - 12 = 67$ ,  $79 - 67 = 12$  so our addition was correct.

### Key Problems for Practice

1. Stephan added correctly and got:  $67 + 6 = 73$ . Use Stephan's equality to help you choose the correct equality below.
  - a.  $73 - 6 = 68$
  - b.  $73 - 6 = 67$
  - c.  $73 - 6 = 66$
2. Chris says that when he added 12 kg of nuts to 28 kg, he got 40 kg of nuts. Ben says that he had 40 kg of carrots and then his donkey ate 12 kg, so there are 29 kg of carrots left. Can both Chris and Ben be right?
  - a. Both are right.
  - b. Only Ben is right.
  - c. Only Chris is right.
  - d. Both are wrong.
3. Fill in the blanks to complete each column.

12	16	
7	6	9
5		11

4. Which equalities could we use to check if the addition  $15 + 42 = 57$  is correct?
  - a.  $57 - 15 = 42$
  - b.  $57 - 42 = 15$
  - c.  $42 - 15 = 27$
5. Add, then use subtraction to check.





# Column Addition of Numbers Under 1,000: Part 1

## Objective 7 Curriculum Highlights

### Related TEKS

4.4A

### Related Student Expectations

- ◆ Introduces adding whole numbers using the standard algorithm

### Foundational RM Prerequisites

- ◆ Comparing Numbers up to 1,000
- ◆ Column Addition Basics

### Vocabulary

carry over

column addition

line up

round number

### Key Theory Material

#### I) Adding a 3-Digit Number and a 3-Digit Number

a. To add 314 and 125 we first remember what 314 and 125 are made up of:

1. **314** = 3 hundreds + 1 ten + 4 ones
2. **125** = 1 hundred + 2 tens + 5 ones
3. 4 hundreds + 3 tens + 9 ones = **439**

b. To add numbers, we can add the ones to the ones, the tens to the tens, and the hundreds to the hundreds. **Column addition** helps us do this.

c. First we **line up** the numbers:

1. ones under ones
2. tens under tens
3. hundreds under hundreds

$$\begin{array}{r} 314 \\ + 125 \\ \hline 439 \end{array}$$

d. Remember: Digits we **carry over** are always written smaller.

e. **Write this down:**

1. The steps for column addition of 3-digit numbers:
  - (i) Line up the numbers.
  - (ii) Work from column to column, starting with the ones.
  - (iii) Carry over, if needed.

$$\begin{array}{r} \phantom{0}^1 \\ 237 \\ + 328 \\ \hline 565 \end{array}$$

#### II) Adding 2-Digit Numbers (With Crossing Over 100)

a. **Write this down:**

1. An example of adding 2-digits numbers and getting a 3-digit number:

$$\begin{array}{r} \phantom{0}^1 \\ 84 \\ + 58 \\ \hline 142 \end{array}$$

b. **Write this down:**

1. Summands that are not round numbers . . .

$$\begin{array}{r} 1 \\ 43 \\ + 57 \\ \hline 100 \end{array}$$

. . . can give a sum that is a round number.

### Key Problems for Practice

1. The Math Pirate wiped off some of the digits in a correct column addition problem. Put the correct digits in the blanks:

$$\begin{array}{r} 52 \\ + 8\ \square \\ \hline \square\ \square\ \square \end{array}$$

2. Enter the second summand and find  $378 + 411$ .

$$\begin{array}{r} 378 \\ + \square\square\square \\ \hline \square\square\square \end{array}$$

3. Mary flew 802 miles in a hot air balloon and then rode 178 miles on a motorcycle. How many miles did Mary go?

4. Evaluate the expression  $429 + w$ , when  $w = 330$ .

5. Fill in the blanks:

$$\begin{array}{r} 78 \\ + \square\square \\ \hline 100 \end{array}$$

## Column Addition of Numbers Under 1,000: Part 2

### Objective 8 Curriculum Highlights

#### Related TEKS

4.4A

#### Related Student Expectations

- ◆ Fully covers adding whole numbers using the standard algorithm

#### Foundational RM Prerequisites

- ◆ Column Addition of Numbers Under 1,000: Part 1

#### Vocabulary

Order

#### Key Theory Material

##### I) Adding a 3-Digit and 2-Digit Numbers

- a. If there are no hundreds in one of the summands, and no carrying over, just write the hundreds from the other summand in the hundreds place of the answer.

- b. **Write this down:** Adding 3-Digit and 2-Digit Numbers

1. Example:

$$\begin{array}{r} 124 \\ + 65 \\ \hline 189 \end{array}$$

- c. **Write this down:** Adding 3-Digit and 2-Digit Numbers (with carrying over)

1. Example:

$$\begin{array}{r} \phantom{1}1 \\ 297 \\ + 23 \\ \hline 320 \end{array}$$

- d. **Write this down:**

1. Changing the **order** of the summands does not change the sum

$$\begin{array}{r} \phantom{1}1 \\ 853 \\ + 79 \\ \hline 932 \end{array} \qquad \begin{array}{r} \phantom{1}1 \\ 79 \\ + 853 \\ \hline 932 \end{array}$$

2.  $79 + 853 = 853 + 79 = 932$

##### II) Adding 3-Digit and 1-Digit Numbers

- a. **Write this down:** Adding 3-Digit and 1-Digit Numbers

1. Example:

$$\begin{array}{r} 354 \\ + 5 \\ \hline 359 \end{array}$$

1. Replace each ♥ with a digit to make the column addition correct.

$$\begin{array}{r} 2 \text{ ♥ } 3 \\ + \quad 9 \text{ ♥ } \\ \hline \text{♥ } 4 \text{ } 3 \end{array}$$

2. Add five to three hundred eighty-seven using column addition.

3. Fill in the table, if  $a = 45$ .

	$97 - a$	$97 + a$	$a - 26$	$907 + a$
<b>Value</b>				

4. We're adding  $c$  to the sum of 357 and 82. What is the result, if  $c = 8$ ?
5. An artist used 196 pints of yellow paint for a wall painting. She used 64 more pints of black paint than yellow paint. How many pints of black paint did she use for the wall painting?

## Column Subtraction within 1,000: No Borrow: Objective 9 Curriculum Highlights

### Related TEKS

4.4A

### Related Student Expectations

- ◆ Introduces subtracting whole numbers using the standard algorithm

### Foundational RM Prerequisites

- ◆ Column Addition of Numbers Under 1,000: Part 2

### Vocabulary

column subtraction

### Key Theory Material

#### I) Column Subtraction Basics: Part 1

- How do you subtract three-digit numbers?
- It's the same as with two-digit numbers.
  - First, we line up the numbers:
    - greater number on top
    - ones under ones
    - tens under tens
    - hundreds under hundreds
  - We subtract the ones, then the tens, then the hundreds.
- Write this down:** Column Subtraction
  - Work by columns, right to left.
  - $$\begin{array}{r} 637 \\ -421 \\ \hline 216 \end{array}$$
- Write this down:** We don't write zeros in the beginning of a number.
  - $$\begin{array}{r} 487 \\ -413 \\ \hline 74 \end{array}$$

#### II) Column Subtraction Basics: Part 2

- Write this down:** Bringing down the hundreds
  - $$\begin{array}{r} 188 \\ -62 \\ \hline 126 \end{array}$$
- Write this down:** Bringing down the tens and hundreds
  - $$\begin{array}{r} 249 \\ -8 \\ \hline 241 \end{array}$$

## ReasoningMind

Basic I-3 Curriculum

### III) Checking Subtraction with Addition

- a. minuend – subtrahend = difference  
b. **Write this down:** How to check subtraction with addition:

1. 
$$\begin{array}{r} 368 \\ - 163 \\ \hline 205 \end{array}$$
 
$$\begin{array}{r} 205 \\ + 163 \\ \hline 368 \end{array}$$

2. **These should be the same.**

### Key Problems for Practice

1. Gabby bikes 3 miles to the bus stop, then takes the bus the rest of the way to school. It is 28 miles from her house to school. How long is the bus ride?

miles.

2. Drag the correct minuend to the blank.

A calculator interface showing a subtraction problem. The display shows  $- 220$  and  $236$ . Below the display are three buttons labeled **3 5 6**, **4 5 6**, and **5 5 6**.

3. Enter the subtrahend and find  $438 - 26$ .

A calculator interface showing a subtraction problem. The display shows  $438$  and a minus sign. Below the minus sign are three empty boxes for the subtrahend. Below a horizontal line are four empty boxes for the difference.

4. Enter the subtrahend and find the difference between 815 and 514.

A calculator interface showing a subtraction problem. The display shows  $815$  and a minus sign. Below the minus sign are three empty boxes for the subtrahend. Below a horizontal line are four empty boxes for the difference.

## ReasoningMind

Basic I-3 Curriculum

5. Click on the card that correctly shows  $536 - 3$  using column subtraction.

		5	3	6	
-				3	
<hr/>					
		3	3		

		5	3	6	
-				3	
<hr/>					
				3	

		5	3	6	
-				3	
<hr/>					
		5	3	3	

		5	3	6	
-				3	
<hr/>					
		5	0	3	

# Column Subtraction within 1,000 Borrowing Once

## Objective 10 Curriculum Highlights

### Related TEKS

4.4A

### Related Student Expectations

- ◆ Introduces subtracting whole numbers using the standard algorithm

### Foundational RM Prerequisites

- ◆ Column Subtraction within 1,000: No borrowing

### Vocabulary

borrow

trade

### Key Theory Material

#### I) Borrowing Once: Part 1

- a. **Write this down:** Column Subtraction  
Work by columns, right to left.  
When needed, borrow and trade 1 ten for 10 ones.

$$\begin{array}{r} 5 \text{ } 13 \\ 1. \quad 7 \cancel{6} \cancel{3} \\ \quad - 2 \underline{5} \underline{6} \\ \quad \quad 5 \ 0 \ 7 \end{array}$$

- b. **Write this down:** Column Subtraction  
When needed, borrow and trade 1 hundred for 10 tens.

$$\begin{array}{r} 4 \text{ } 12 \\ 1. \quad \cancel{5} \ 2 \ 9 \\ \quad - 1 \underline{6} \underline{3} \\ \quad \quad 3 \ 6 \ 6 \end{array}$$

#### II) Borrowing Once: Part 2

- a. Borrowing is the key to success in subtraction!

#### III) Borrowing Once: Part 3

- a. **Write this down:** Column Subtraction  
1. Do not write 0 to start the answer.

$$\begin{array}{r} 0 \text{ } 10 \\ 2. \quad 4 \ \cancel{0} \ 4 \\ \quad - \underline{8} \underline{3} \\ \quad \quad 2 \ 1 \end{array}$$



1. Matt has 30 teeth, and his brother Tom has just 6. How many fewer teeth does Tom have than Matt?

Tom has  fewer teeth than Matt.

2. Enter the subtrahend and find the difference  $527 - 184$ .

<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	5	2	7	<input type="text"/>
-	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<hr/>				
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

3. Complete this column subtraction.

<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	7	0	8	<input type="text"/>
-	3	4	2	<input type="text"/>
<hr/>				
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

4. Calculate the value of the expression.

$$831 - 217 + 386 = \square$$

5. How much greater is the sum of 873 and 119 than the difference between them?

# Expressions for Solving Word Problems: Part 1

## Objective 11 Curriculum Highlights

### Related TEKS

4.4A, 4.5A

### Related Student Expectations

- ◆ Introduces multi-step problems involving the four operations with whole numbers using strip diagrams; maintains adding whole numbers using the standard algorithm
- ◆ Maintains or enriches subtracting whole numbers using the standard algorithm

### Foundational RM Prerequisites

- ◆ "Times More/Less Than" and "More/Less Than" Word Problems

### Vocabulary

N/A

### Key Theory Material

#### I) Review: Expressions for Problems with 1 Step

a. **Write this down:**

1. 2-Ring made 12 solar batteries. Then four of the batteries died. How many good batteries are left?

2.  $12 - 4$

↑  
got smaller

b. **Write this down:**

1. 2-Ring had 12 mice. Then 6 mice were born. How many mice does 2-Ring have now?

2.  $12 + 6$

↑  
got larger

#### II) Expressions for Problems with 2 Steps: Part 1

a. **Write this down:**

1. A donkey ate 5 carrots for breakfast and 8 for lunch. It started with 20 carrots. How many carrots does the donkey have now?

2.  $20 - 5 - 8 = 7$

3. Answer: Now, the donkey has 7 carrots.

#### III) Expressions for Problems with 2 Steps: Part 2

a. **Write this down:**

1. Keyla had 20 teeth. Then 6 of them fell out and 4 new teeth came in. How many teeth does Keyla have now?

2.  $20 - 6 + 4 = 18$

3. Answer: Now, Keyla has 18 teeth.

### Key Problems for Practice

1. 20 swans were swimming in a lake. Then 4 swans flew away. How many swans were left in the lake?

## ReasoningMind

### Basic I-3 Curriculum

a. Choose an expression for the problem.

- A.  $20 + 4$
- B.  $20 - 4$
- C.  $20 \times 4$
- D.  $20 \div 4$

b.  swans were left in the lake.

2. In the morning, 2-Ring cut 14 lb of hair off of his sheep. In the afternoon, he cut off another 2 lb of hair. How many pounds of hair did 2-Ring cut off of his sheep?

a. Use the cards to make an expression for the problem:

The image shows a math card game interface. At the top, there are three empty white boxes for numbers. Below them is a row of eight green rounded rectangular cards. From left to right, the cards contain the numbers 14, 12, 2, 16, and the mathematical symbols +, -, ×, and ÷.

b.  lb of hair were cut off of the sheep.

3. Start with the number 3. Then add 8 and subtract 6. What number do you get?

4. Arushi took \$6 from a piggy bank. Gita put \$7 in the piggy bank. At first, the piggy bank had \$9. How much money is in the piggy bank now?

Which expression can **NOT** be used to solve the problem?

a.  $9 - 7 + 6$

b.  $9 - 6 + 7$

c.  $9 + 7 - 6$

5. Becky, Mortimer, and Higgie drank a total of 14 cups of milk. Becky drank twice as much as Mortimer. Higgie drank twice as much as Becky. How much milk did each of them drink?

Mortimer:  cups

Becky:  cups

Higgie:  cups

# Column Subtraction within 1,000: No Tens

## Objective 12 Curriculum Highlights

### Related TEKS

4.4A

### Related Student Expectations

- Introduces subtracting whole numbers using the standard algorithm

### Foundational RM Prerequisites

- Column Subtraction within 1,000: Borrowing Once

### Vocabulary

N/A

### Key Theory Material

#### I) Borrowing with No Tens: Part 1

- a. **Write this down:** How to borrow from 0 tens.

1. Borrow 1 hundred and trade for 10 tens.

$$\begin{array}{r} 9 \\ 440 \\ - 199 \\ \hline 301 \end{array}$$

2. Borrow 1 ten and trade for 10 ones.

#### II) Borrowing with No Tens: Part 2

- a. Remember: Need to borrow from 0 tens? Borrow from the hundreds!

#### III) Borrowing with No Tens: Part 3

- a. *Example:* Becky counted 105 snails and 98 bugs in the forest. How many more snails than bugs were there?

1. To find how many more, we subtract.

2. We calculate  $105 - 98$  using column subtraction:

$$\begin{array}{r} 105 \\ - 98 \\ \hline \end{array}$$

(ii) We cannot subtract the ones. And there are 0 tens. So we need to borrow 1 hundred first.

(iii) We borrow 1 hundred.

(iv) We trade it for 10 ones.

$$\begin{array}{r} 010 \\ \text{(a)} 405 \\ - 98 \\ \hline \end{array}$$

(v) Now we borrow 1 ten.

(vi) We trade it for 10 ones.

$$\begin{array}{r} 9 \\ 04015 \\ \text{(a)} 405 \\ - 98 \\ \hline \end{array}$$

(vii) Now we subtract the ones.

(viii)  $105 - 98 = 7$

## ReasoningMind

Basic I-3 Curriculum

### IV) Borrowing with No Tens: Part 4

a. **Write this down:**

1. When there are 0 tens, borrow 1 hundred.
2. 1 hundred = 10 tens.
3. Then borrow from the 10 tens.

$$\begin{array}{r} 9 \\ 2 \cancel{4} 10 \\ \text{(i) } 3 \ 0 \ 0 \\ - \quad \underline{7} \\ 2 \ 9 \ 3 \end{array}$$

### Key Problems for Practice

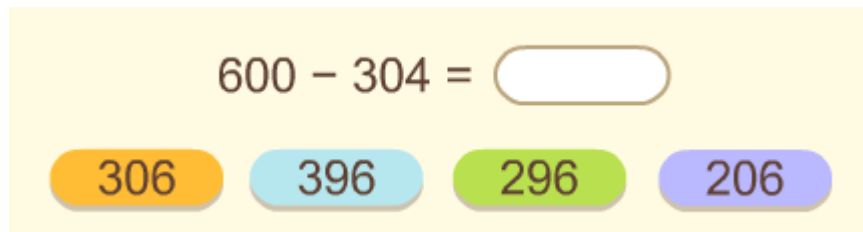
1. 500 pine cones hung from a tree. After a month, only 431 were left. How many pine cones fell?

$$500 - 431 = \square \text{ (pine cones)}$$

2. Find the difference:

$$500 - 7 = \square$$

3. Drag a card to make the equality correct:



600 - 304 =

306   396   296   206

4. Linda, Ben, and Alex together blew 900 bubbles. Ben and Alex blew 537. How many bubbles did Linda blow?

Linda blew  bubbles.

5. Without calculating, choose the expression with the greatest value:

- a.  $965 - 25 \times 17$
- b.  $965 - 25 \times 16$
- c.  $965 - 25 \times 15$

## Column Subtraction within 1,000: Borrowing Twice

### Objective 13 Curriculum Highlights

#### Related TEKS

4.4A

#### Related Student Expectations

- Introduces subtracting whole numbers using the standard algorithm

#### Foundational RM Prerequisites

- Column Subtraction within 1,000: No Tens

#### Vocabulary

N/A

#### Key Theory Material

##### I) Borrowing Twice: Part 1

###### a. Write this down:

- We can borrow twice: first from then tens and then from the hundreds.

2.

$$\begin{array}{r} 11 \\ 5415 \\ \underline{625} \\ -348 \\ \hline 277 \end{array}$$

##### II) Borrowing Twice: Part 2

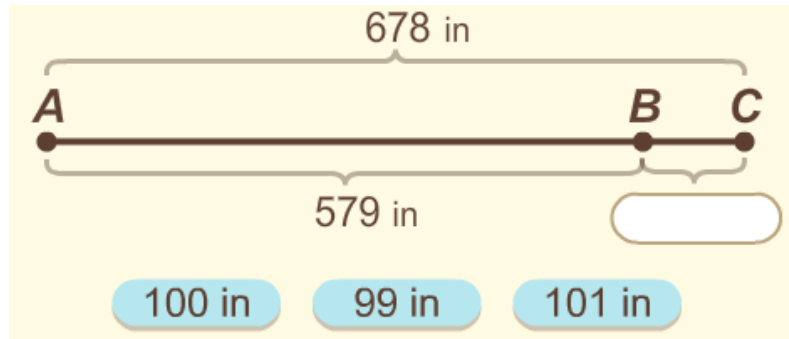
###### a. Write this down: Subtract $516 - 87$ :

1.

$$\begin{array}{r} 10 \\ 4016 \\ \underline{546} \\ -87 \\ \hline 429 \end{array}$$

#### Key Problems for Practice

- Subtract  $564 - 489 = \square$
- To find the length of  $\overline{BC}$ , subtract the length of  $\overline{AB}$  from the length of  $\overline{AC}$ :
  - $678 \text{ in} - 579 \text{ in}$



- b. Drag the card with the length of segment  $\overline{BC}$  to the picture.
3. What number has the same digits as 543, but its digits are in the opposite order?
- Subtract the number you got in a. from 543.
- $543 - \square = \square$
4. Half of a number was subtracted from the original number. The result was 100. What is the number?
5. A cat and a mouse entered a running contest. The cat ran 20 meters and the mouse ran 9 times as far. How many more meters than the cat did the mouse run?
- The mouse ran  more meters than the cat.

## Column Addition Within 1,000: Three Summands

### Objective 14 Curriculum Highlights

#### Related TEKS

4.4A

#### Related Student Expectations

- ◆ Maintains or enriches adding whole numbers using the standard algorithm

#### Foundational RM Prerequisites

- ◆ Column Addition of Numbers Under 1,000: Part 2

#### Vocabulary

N/A

#### Key Theory Material

##### I) Adding 3 Summands

- a. **Write this down:** Adding Three Summands

1. Example:

$$\begin{array}{r} 120 \\ 312 \\ + 102 \\ \hline 534 \end{array}$$

##### II) Adding 2-Digit and 3-Digit Summands

- a. **Write this down:** Adding 2-Digit and 3-Digit Summands

1. Example:

$$\begin{array}{r} 105 \\ 31 \\ + 52 \\ \hline 188 \end{array}$$

##### III) Carrying Over: Part 1

- a. **Write this down:** Adding Three Summands (with carrying over)

1. Example:

$$\begin{array}{r} 1 \\ 246 \\ 113 \\ + \underline{7} \\ \hline 366 \end{array}$$

##### IV) Carrying Over: Part 2

- a. **Write this down:** Adding Three Summands (with carrying a 2)

1. Example:

$$\begin{array}{r} 2 \\ 356 \\ 270 \\ + \underline{91} \\ \hline 717 \end{array}$$



Key Problems for Practice

1. Find the sum:

$$\begin{array}{r} \square \square \square \\ 253 \\ 64 \\ + 31 \\ \hline \square \square \square \square \end{array}$$

2.  $351 + 73 + 35 = ?$

Enter the summands and find the sum.

$$\begin{array}{r} \square \square \square \square \square \\ 351 \\ \square \square \square \square \square \\ + \square \square \square \square \square \\ \hline \square \square \square \square \square \end{array}$$

3. Mortimer's collection of rare things contains 134 books, 190 vases, and 91 rugs.

His collection has a total of  $\square$  rare things.

4. Calculate:  $304 + 3 \times 4 + 34 = \square$

5. The sum of three **equal** summands is 552. Find the summands.

$$\begin{array}{r} \square \square \square \\ \square \square \square \\ + \square \square \square \\ \hline 552 \end{array}$$

## Expressions for Solving Word Problems: Part 2

### Objective 15 Curriculum Highlights

#### Related TEKS

4.4A, 4.5A

#### Related Student Expectations

- ◆ Introduces representing multi-step problems involving the four operations with whole numbers using strip diagrams
- ◆ Maintains or enriches adding whole numbers using the standard algorithm
- ◆ Maintains or enriches covers subtracting whole numbers using the standard algorithm

#### Foundational RM Prerequisites

- ◆ "Times More/Less Than" and "More/Less Than" Word Problems
- ◆ Column Subtraction within 1,000: Borrowing Twice

#### Vocabulary

N/A

#### Key Theory Material

##### I) Word Problems: How Much in Total?

- a. *Example:* Higgie wants a pet. She looked at 124 animals in the morning, 101 animals in the afternoon, and 112 animals in the evening. How many animals did she look at in total?
1. Answer the following questions to help you write an expression:
    - (i) In the morning: 124 animals
    - (ii) In the afternoon: 101 animals
    - (iii) In morning and in the afternoon:  $124 + 101$  animals
    - (iv) In the evening: 112 animals
    - (v) In total:  $124 + 101 + 112$  animals
  2. To solve the problem, we need to evaluate the expression  $124 + 101 + 112$
  3. Higgie looked at 337 animals in total.

##### II) Word Problems: How Many Now?

- a. Follow the Order of Operations Rule.
- b. **Write this down:**
1. The puppy is 148 yards away from Higgie. The puppy runs 76 yards towards Higgie. Then it turns around and runs 65 yards away from Higgie. How far away from Higgie is the puppy now?
  2. 
$$\begin{array}{r} 1 \quad 2 \\ 148 - 76 + 65 \end{array}$$
  3. Operation 1:  $148 - 76 = 72$
  4. Operation 2:  $72 + 65 = 137$

1. Use the expression to complete the problem statement:  $109+39-93$

There was  in Anne's piggy bank. Then she was given . After that, she  \$93. How much money is in Anne's piggy bank now?

2. During the day, a snail went 300 inches up a tree. At night, it went 230 inches down the tree. The snail started 160 inches above the ground. How many inches above the ground is the snail now?

a. Complete the expression for the problem:  $\square + \square - \square$

b. Now, the snail is  inches above the ground.

3. Follow the Order of Operations Rule.

Number each operation with a 1 or 2.

$400 - 137 + 37$

4. Dan bought a phone and an MP3 player for \$160 each. Before that, Dan had \$600. How much money does Dan have left?

a. Choose the expression.

- i.  $600 - 160 - 160$
- ii.  $600 - 160$
- iii.  $160 + 160$
- iv.  $160 - 160$

b. Dan has \$ left.

5. On a field there were 210 ducks and 148 geese. Then another 69 geese landed on the field and some ducks flew away. The number of ducks that flew away is equal to the original number of geese. How many birds are on the field now?

birds.

# Equations with an Unknown Summand

## Objective 16 Curriculum Highlights

### Related TEKS

4.5A

### Related Student Expectations

- ◆ Introduces representing multi-step problems involving the four operations with whole numbers using equations with a letter standing for the unknown quantity

### Foundational RM Prerequisites

- ◆ Equations up to 100
- ◆ Column Subtraction within 1,000: Borrowing Twice

### Vocabulary

correct            equality equation            false            incorrect  
solution true    true equality

### Key Theory Material

#### I) Review: Equations

- In math, we use a letter for an **unknown** number. For example,
  - $5 + x = 12$
  - This is an **equality** with the letter  $x$  standing for an unknown number.
  - We call this an **equation**.
- Write this down:** Equation with an unknown  $x$ :
  - $5 + x = 12$ .
- Equalities can be either **correct** or **incorrect**.
  - The equality  $10 + 8 = 18$  is correct. It is **true**.
  - The equality  $10 + 8 = 20$  is incorrect. It is **false**.
- Substituting 6 for the unknown  $x$  in  $x + 24 = 30$  turned the equation into a **true equality**.  
 $6 + 24 = 30$ . 6 is called a **solution** of this equation.
- To check if 60 is a solution of the equation  $13 + x = 83$ , we replace  $x$  with 60 and see if we get a true equality.
  - $13 + x = 83$
  - $13 + 60 = 83$   
 $\underbrace{\hspace{1.5cm}}$   
73
  - $73 \neq 83$
  - 60 is **NOT** a solution to the equation.
- To check if 70 is a solution to the equation  $13 + x = 83$ , we replace  $x$  with 70 and see if we get a true equality.
  - $13 + x = 83$
  - $13 + 70 = 83$   
 $\underbrace{\hspace{1.5cm}}$   
83
  - $83 = 83$  is a true equality. So 70 is a solution of the equation.

#### II) Solving Equations with an Unknown Summand

- To solve equations with an unknown summand, you will need to remember the relation between subtraction and addition.

## ReasoningMind

### Basic I-3 Curriculum

1. When we subtract one summand from the sum, we get the other summand.
  2.  $6 + x = 32$  is an equation with an unknown summand.
- b. **Write this down:**
1. To find the unknown summand, subtract the other summand from the sum.
  2.  $z + 8 = 79$   
 $z = 79 - 8$   
 $z = 71$
- c. **Write this down:**
1.  $x + 32 = 85$   
 $x = 85 - 32$   
 $x = 53$
  2. Substitute the answer for the unknown and see if you get a true equality.
  3. Check:  
?  
 $53 + 32 = 85$   
 $85 = 85$

### Key Problems for Practice

1. Find a solution of this equation:  
 $49 + c = 121$
2. Which equation has the same solution as  $x + 121 = 139$ ?
  - a.  $58 - x = 40$
  - b.  $x \cdot 5 = 40$
3. Find a solution of this equation:  
 $x + 423 = 1,000$
4. The difference between two numbers is a solution of the equation  $x + 43 = 104$ . Choose the two numbers from the list below.
  - a. 100
  - b. 39
  - c. 30
  - d. 31
5. Which number is a solution of the equation  $85 - (17 + t) = 39$ ?
  - a. 29
  - b. 30
  - c. 28

# Equations with an Unknown Minuend

## Objective 17 Curriculum Highlights

### Related TEKS

4.5A

### Related Student Expectations

- ◆ Introduces representing multi-step problems involving the four operations with whole numbers using equations with a letter standing for the unknown quantity

### Foundational RM Prerequisites

- ◆ Equations with an Unknown Summand

### Vocabulary

N/A

### Key Theory Material

#### I) Review: Equations with an Unknown Minuend

- a. Remember what we call the numbers we subtract?

minuend     subtrahend     difference

$$56 \quad - \quad 32 \quad = 24$$

- b.  $y - 14 = 18$  is an equation with an unknown minuend.

#### II) Solving Equations with an Unknown Minuend

- a. **Write this down:**

1. To find an unknown minuend, add the difference and the subtrahend.

2.  $z - 21 = 34$

$$z = 34 + 21$$

$$z = 55$$

- b. **Write this down:**

1.  $w - 47 = 30$

$$w = 30 + 47$$

$$\underline{w = 77}$$

2. We substitute our answer for the unknown minuend, and see if we get a true equality.

3. Check:

?

$$77 - 47 = 30$$

$$30 = 30$$

1. Find a solution to the equation:

$$z - 235 = 665$$

2. Choose the correct solution to the equation  $x + 40 = 96$ .

a.  $x = 96 - 40$

$x = 56$

b.  $x = 96 + 40$

$x = 136$

c.  $x = 90 + 40$

3. On Saturday, 856 people visited the zoo. 156 more adults than kids were there. How many adults and how many kids visited the zoo that day?

4. Find a solution:

$$z - 21 = 84$$

## Division with a Remainder: Objective 18 Curriculum Highlights

### Related TEKS

4.4H

### Related Student Expectations

- ◆ Fully covers solving with fluency one-step problems involving division, including interpreting remainders
- ◆ Fully covers solving with fluency two-step problems involving division, including interpreting remainders

### Foundational RM Prerequisites

- ◆ Multiplication within 100 Beyond the Table

### Vocabulary

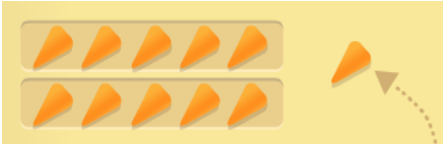
dividend	divisible	division sign	divisor
long division	quotient	remainder	

### Key Theory Material

#### I) The Remainder

- 6 apples are shared equally between 2 plates. None are left over. So, 6 is **divisible** by 2.  
 $6 \div 2 = 3$
- It is *not* possible to share 7 apples equally between 2 plates: we can put 3 apples on each plate, but then 1 apple is left over. So, 7 is *not* divisible by 2.
- There were 11 carrots, and two rabbits equally shared as many carrots as possible.

1.



- 1 carrot is left over. We say that the **remainder** is 1.
- When as many things as possible are shared equally, the remainder tells us how many things are left over.

#### II) Division with a Remainder

- 7 is not divisible by 2. We say that we divide 7 by 2, with a remainder.
  - We get 3 with a remainder of 1.
    - The remainder tells us how much is left over.
  - We write:  $7 \div 2 = 3$  Remainder 1
    - We write "R" for remainder
    - $7 \div 2 = 3$  R1
  - We use the same **division sign**  $\div$  when dividing with a remainder.
- Write this Down:** Dividing with a Remainder
  - $17 \div 3 = 5$  (R2)
  - 17 divided by 3 is 5 remainder 2.
- Write this Down:** Two ways to say the same thing:
  - 8 is divisible by 2.  
 $8 \div 4 = 2$
  - Dividing 8 by 2 gives a remainder of 0.  
 $8 \div 4 = 2$  R0



## ReasoningMind

Basic I-3 Curriculum

### III) The Remainder is Less than the Divisor

- The Most Important Thing About the Remainder
  - Let's put as many of a set 11 squares as possible into two equal groups.
  - As long as there are at least 2 left over, we can keep adding and get equal groups.
  - There is 1 left over. It is less than the number of groups, 2. So we cannot add any more.

$11 \div 2 = 5 \text{ R}1$

1 is left over. It is less than the number of groups, 2.

remainder: 1      divisor: 2

- The remainder is less than the divisor.
- Write this down:** The remainder is always less than the divisor.
- Let's find  $17 \div 3$  with a remainder.
  - To show this division with a remainder, we put as many of the 17 circles as possible into 3 equal groups.
    - "As many circles as possible" is 15.
    - 15 is the greatest number that is less than 17 and divisible by 3.
    - $15 \div 3 = 5$ . This is the quotient of our division of 17 by 3 with a remainder!

$17 \div 3 = 5 \text{ R}2$

$15 \div 3 = 5$

- When we find  $17 \div 3$  with a remainder, we really divide by 15, the greatest number that is less than 17 and divisible by 3.

### IV) Division by Guess and Check

- How to Divide Using Multiplication

dividend    divisor    quotient

- $36 \div 12 = \square$ 
  - Remember, multiplication is related to division. When we multiply the quotient by the divisor, we get the dividend.
  - $\square \times 12 = 36$
  - So the number that makes this multiplication correct is the quotient.
- We try numbers for the quotient to see what works.
  - For example, multiply 2 by the divisor and see if you get the dividend.
  - $2 \times 12 = 24$ . Since  $24 \neq 36$ , 2 is not our quotient

- How to Divide with a Remainder using Multiplication

- Write this down:**

quotient      remainder

- $20 \div 6 = \square \text{ R } \square$
  - Let's try 3 as the quotient:
    - multiply 3 by the divisor:  $3 \times 6 = 18$
    - subtract to find what's left over:  $20 - 18 = 2$
    - compare what's left over to the divisor:  $2 < 6$
  - The quotient is 3. The remainder is 2.
    - $20 \div 6 = 3 \text{ R } 2$
- If the remainder is greater than the divisor, try a greater number for the quotient.

- Long Division

dividend

divisor

## ReasoningMind

Basic I-3 Curriculum

1. So far, we have been writing division like this:  $19 \div 8$ .  
You can also write division another way:

We'll write the quotient here.

divisor  $8 \overline{) 19}$  dividend

2. Let's try 2 as the quotient. We will:  
(i) multiply

multiply

$8 \overline{) 19}$   
 $16$

Write the result for  $2 \times 8$  here.

- (ii) subtract

$8 \overline{) 19}$   
 $- 16$   
 $\hline 3$

Subtract to find what's left over.

- (iii) compare

$8 \overline{) 19}$   
 $- 16$   
 $\hline 3$

Compare what's left over with the divisor:  $3 < 8$

The remainder should always be less than the divisor.

We put the remainder next to the quotient.

$2 R3$   
 $8 \overline{) 19}$   
 $- 16$   
 $\hline 3$

- (iv)  $19 \div 8 = 2 R3$   
3. When we write division this way, we call it **long division**.

## ReasoningMind

Basic I-3 Curriculum

### V) Dividing a Smaller Number by a Larger Number

- a. Let's learn how to divide 3 by 4 with a remainder.

0 squares in each group.

This is what's left over.

$$3 \div 4 = 0 \text{ R } 3$$

- b. **Write this down:**

1. When we divide a smaller number by a greater number, we get 0 as the quotient.
2.  $3 \div 4 = 0 \text{ R } 3$

### Key Problems for Practice

1. Which number will make this division correct?

$$\square \div 7 = 4 \text{ R } 1$$

2. Choose the correct division with a remainder.

- a.  $26 \div 7 = 3 \text{ R } 5$
- b.  $26 \div 7 = 5 \text{ R } 3$
- c.  $26 \div 7 = 2 \text{ R } 12$

3. Look at the long division and give the answer:

$$\begin{array}{r} 7 \\ 6 \overline{) 45} \\ \underline{- 42} \\ 3 \end{array}$$

$$45 \div 6 = \square \text{ R } \square$$

4. Choose 2 signs to replace the  $\bigcirc$  and make a correct equality.

$$(17 \bigcirc 2) \bigcirc 2 = 7 \text{ R } 1$$



5. Find the quotient and the remainder.

$$19 \div 6 = \square \text{ R } \square$$

# Multiplying and Dividing by 10 and 100

## Objective 19 Curriculum Highlights

### Related TEKS

4.2A, 4.4B

### Related Student Expectations

- ◆ Fully covers determining products of a number and 10 or 100 using properties of operations
- ◆ Fully covers determining products of a number and 10 or 100 using place value understandings
- ◆ Maintains interpreting the value of each place-value position as 10 times the position to the right
- ◆ Maintains interpreting the value of each place-value position as one-tenth of the value of the place to its left

### Foundational RM Prerequisites

- ◆ Multiplication within 100 Beyond the Table
- ◆ Writing Numbers and Counting Within 1,000

### Vocabulary

N/A

### Key Theory Material

#### I) Multiplying by 10

- a. **Write this down:** To multiply a number by 10, put a 0 at its end.
1.  $59 \times 10 = 590$
  2.  $70 \times 10 = 700$
  3.  $100 \times 10 = 1000$

#### II) Dividing by 10

- a. Remember, a round number is a natural number ending in one or more zeros.
- b. **Write this down:** To divide a round number by 10, remove a 0 from its end.
1.  $780 \div 10 = 78$
  2.  $400 \div 10 = 40$
  3.  $1000 \div 10 = 100$

#### III) Multiplying by 100

- a. **Write this down:** To multiply a number by 100, put two 0's at its end.
1.  $6 \times 100 = 600$
  2.  $10 \times 100 = 1000$

#### IV) Dividing Hundreds

- a. **Write this down:** To divide hundreds by 100, remove two 0's from the end.
1.  $600 \div 100 = 6$
  2.  $1000 \div 100 = 10$
- b. Notice the pattern:
1.  $400 \div 4 = 100$ ,  $500 \div 5 = 100$ ,  $600 \div 6 = 100$ , ...

### Key Problems for Practice

1. The divisor is 100. The quotient is 2. The dividend is  $\square$ .

## ReasoningMind

### Basic I-3 Curriculum

- Fill in the blank to get a true equality.  $100 \times 9 = 820 + \square$
- 300 books are shared by 3 classrooms. Each classroom has the same number of books. How many books does each classroom have?
- Fill in the table:

a	12	28	67	83
$10 \cdot a$				

- Fill in the blank:  $600 - \square = 810 \div 10$

# Multiplication and Division are Related

## Objective 20 Curriculum Highlights

### Related TEKS

4.4H, 4.5A

### Related Student Expectations

- ◆ Prerequisite for solving with fluency two-step problems involving multiplication and division, including interpreting remainders
- ◆ Prerequisite for representing multi-step problems involving the four operations with whole numbers using strip diagrams
- ◆ Prerequisite for representing multi-step problems involving the four operations with whole numbers using equations with a letter standing for the unknown quantity

### Foundational RM Prerequisites

- ◆ Multiplying and Dividing by 10 and 100

### Vocabulary

factor

product

### Key Theory Material

#### I) From Multiplication to Division

a. Let's remember what we call numbers when multiplying.

1. The numbers we multiply are called **factors**.
2. The result of multiplication is called the **product**.

3.  $\begin{array}{ccc} \boxed{\text{factor}} & \boxed{\text{factor}} & \boxed{\text{product}} \\ 7 & \times & 8 = 56 \end{array}$

b. Two ways to look at the same picture:



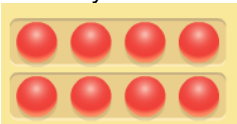
1.  $3 \times 2 = 6$  ← 2 groups of 3 circles make 6 circles.
2.  $6 \div 2 = 3$  ← 6 circles are put into 2 equal groups, with 3 circles in each group.

c. **Write this down:**

1.  $3 \times 2 = 6$
2. When we divide the product by one factor, we get the other factor.
  - (i)  $6 \div 2 = 3$
  - (ii)  $6 \div 3 = 2$

#### II) From Division to Multiplication

a. Two ways to look at the same picture:



1.  $8 \div 2 = 4$  ← 8 circles are put into 2 equal groups, with 4 circles in each group.
2.  $4 \times 2 = 8$  ← 2 groups of 4 circles make 8 circles.

## ReasoningMind

Basic I-3 Curriculum

b. **Write this down:**

1.  $8 \div 2 = 4$

2. When we multiply the quotient by the divisor, we get the dividend.

(i)  $4 \times 2 = 8$

### Key Problems for Practice

1.  $75 \div 5 = 15$ .

Find the related product:  $15 \times 5 = \square$

2. Allie multiplied two numbers. Then she multiplied the product by itself. She got 16. What was the first product?

3. Leticia and Kris each solved a problem:

Leticia:  $29 \times 5 = 145$

Kris:  $145 \div 29 = 4$

Choose a correct statement:

a. Both Leticia and Kris are correct.

b. There is no way to tell.

c. Leticia and Kris can't both be correct.

4. The gnomes were making a chain. Every hour they added 24 links. Is it possible that the gnomes added 200 links in 7 hours?

a. No, it is not.

b. Yes, it is.

c. There is no way to tell.

5.  $32 \div 4 = 8$ .

Make a related multiplication fact. Multiply the quotient by the divisor. You'll get the dividend.

$\square \times \square = \square$

8      4      32

# Order of Operations in Expressions without Parentheses

## Objective 21 Curriculum Highlights

### Related TEKS

4.4A, 4.4H, 4.8C

### Related Student Expectations

- ◆ Prerequisite for solving problems that deal with measurements of length using addition, subtraction, multiplication, or division as appropriate
- ◆ Prerequisite for solving problems that deal with intervals of time using addition, subtraction, multiplication, or division as appropriate
- ◆ Prerequisite for solving problems that deal with liquid volumes using addition, subtraction, multiplication, or division as appropriate
- ◆ Prerequisite for solving problems that deal with mass using addition, subtraction, multiplication, or division as appropriate
- ◆ Prerequisite for solving problems that deal with money using addition, subtraction, multiplication, or division as appropriate
- ◆ Fully covers solving with fluency two-step problems involving multiplication and division, including interpreting remainders
- ◆ Maintains adding whole numbers using the standard algorithm
- ◆ Maintains subtracting whole numbers using the standard algorithm
- ◆ Maintains solving with fluency one-step problems involving multiplication
- ◆ Maintains solving with fluency one-step problems involving division, including interpreting remainders
- ◆ Maintains solving with fluency two-step problems involving multiplication
- ◆ Maintains solving with fluency two-step problems involving division, including interpreting remainders

### Foundational RM Prerequisites

- ◆ Multiplying and Dividing by 10 and 100
- ◆ Equations with Multiplication and Division

### Vocabulary

Order of Operations Rule

### Key Theory Material

#### III) Review: Equations with an Unknown Minuend

- a. Remember what we call the numbers we subtract?

minuend    subtrahend    difference

$$56 \quad - \quad 32 \quad = \quad 24$$

- b.  $y - 14 = 18$  is an equation with an unknown minuend.

#### IV) Solving Equations with an Unknown Minuend

- a. **Write this down:**

1. To find an unknown minuend, add the difference and the subtrahend.

$$\begin{aligned} 2. \quad z - 21 &= 34 \\ z &= 34 + 21 \end{aligned}$$

$$z = 55$$



## ReasoningMind

Basic I-3 Curriculum

b. **Write this down:**

$$1. \quad w - 47 = 30$$
$$w = 30 + 47$$

$$w = 77$$

2. We substitute our answer for the unknown minuend, and see if we get a true equality.

3. Check:  
?

$$77 - 47 = 30$$

$$30 = 30$$

### III) Evaluating Expressions: Part 1

a. **Write this down:**

1. In expressions without parentheses:  
(i) Multiply and divide first. Work from left to right.  
(ii) Then add and subtract. Work from left to right.

$$15 \times 4 + 48 \div 8 = 66$$

60      6

2.  
(i) ①:  $15 \times 4 = 60$   
(ii) ②:  $48 \div 8 = 6$   
(iii) ③:  $60 + 6 = 66$

b. *Example:* Let's find the value of the expression  $30 - 25 + 2 \times 12$ .

1. We start by giving the order of operations, following the [Order of Operations Rule](#).

(i)  $30 - 25 + 2 \times 12$

2. Now we do the operations: 1, 2, and 3.

3. When working in your notebook, use a pencil to underline operations. Here, we'll use an arc.

(i) ①:  $2 \times 12 = 24$

(ii) ②:  $30 - 25 = 5$

(iii) ③:  $5 + 24 = 29$

4.  $30 - 25 + 2 \times 12 = 29$

### IV) Evaluating Expressions: Part 2

a. **Write this down:**

$$14 + 54 \div 9 \times 11 = 80$$

6

66

1. ①:  $54 \div 9 = 6$   
2. ②:  $6 \times 11 = 66$   
3. ③:  $14 + 66 = 80$

1. Follow the Order of Operations Rule to show the order of operations.

$$\square \quad \square \quad \square$$
$$12 \times 8 \div 2 \times 24$$

2. Find the value of this expression.

$$9 + 5 \times 4 - 6 = \square$$

3. Insert arithmetic signs (+, -, x, ÷) so that the given order of operations is correct and the result is a true equality:

$$\begin{array}{ccc} 1 & 2 & 3 \\ 8 \square 5 \square 6 \square 4 = 50 \end{array}$$

4. Which expression has the smallest value?

a.  $18 - 6 + 4 - 2$

b.  $2 + 40 \div 5 \times 2$

c.  $6 \times 5 - 4 \times 2$

5. The order of operations is shown. Evaluate the expression.

$$\begin{array}{ccc} 1 & 2 & 3 \\ 56 \div 7 \div 2 + 15 = \square \end{array}$$

## Review: Word Problems with Two Questions

### Objective 22 Curriculum Highlights

#### Related TEKS

4.4A, 4.4H, 4.5A, 4.8C

#### Related Student Expectations

- ◆ Prerequisite for solving problems that deal with measurements of length using addition, subtraction, multiplication, or division as appropriate
- ◆ Prerequisite for solving problems that deal with intervals of time using addition, subtraction, multiplication, or division as appropriate
- ◆ Prerequisite for solving problems that deal with liquid volumes using addition, subtraction, multiplication, or division as appropriate
- ◆ Prerequisite for solving problems that deal with mass using addition, subtraction, multiplication, or division as appropriate
- ◆ Prerequisite for solving problems that deal with money using addition, subtraction, multiplication, or division as appropriate
- ◆ Introduces representing multi-step problems involving the four operations with whole numbers using strip diagrams
- ◆ Introduces representing multi-step problems involving the four operations with whole numbers using equations with a letter standing for the unknown quantity
- ◆ Maintains adding whole numbers using the standard algorithm
- ◆ Maintains subtracting whole numbers using the standard algorithm
- ◆ Maintains solving with fluency one-step problems involving multiplication
- ◆ Maintains solving with fluency one-step problems involving division, including interpreting remainders
- ◆ Maintains solving with fluency two-step problems involving multiplication
- ◆ Maintains solving with fluency two-step problems involving division, including interpreting remainders
- ◆ Maintains solving with fluency two-step problems involving multiplication and division, including interpreting remainders

#### Foundational RM Prerequisites

- ◆ "Times More/Less Than" and "More/Less Than" Word Problems
- ◆ Column Subtraction within 1,000: Borrowing Twice

#### Vocabulary

N/A

#### Key Theory Material

##### I) Problems with Two Questions: Part 1

- a. Yesterday the egret caught 8 frogs. Today it caught twice as many as that. Find how many frogs the egret has caught today. How many did it catch in total?
  1. This problem asks 2 questions.
  2. We can make a shorthand to answer both questions.
    - (i) First, we write the shorthand with just Question 1 ("Find how many frogs the egret caught today.")

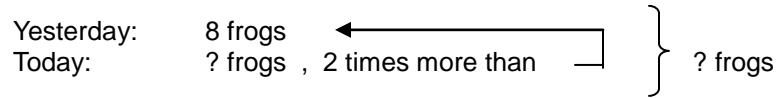
Yesterday:	8 frogs	←
Today:	? frogs , 2 times more	→

## ReasoningMind

Basic I-3 Curriculum

(ii) Now we add Question 2 ("How many did it catch in total?") to the shorthand.

Yesterday: 8 frogs  
Today: ? frogs, 2 times more than



3. Now we answer the questions.

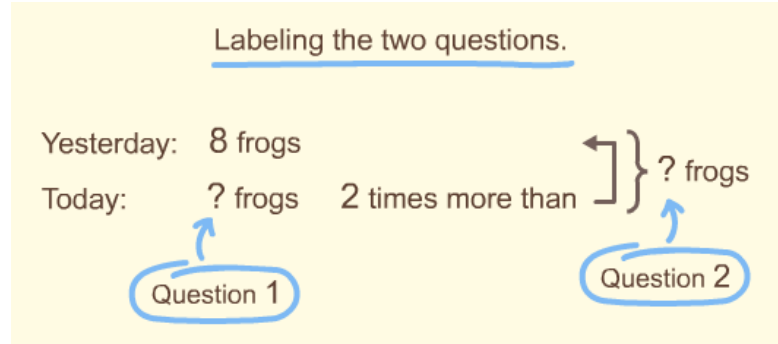
(i) Question 1: the frog caught  $8 \times 2 = 16$  frogs today

(ii) Question 2: the frog caught  $8 + 16 = 24$  frogs in total

b. **Write this down:**

Labeling the two questions.

Yesterday: 8 frogs  
Today: ? frogs, 2 times more than

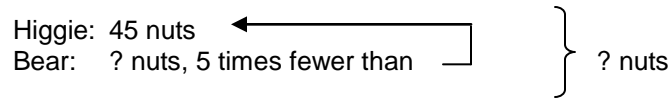


## II) Problems with Two Questions: Part 2

a. Higgie ate 45 nuts. The bear ate 5 times fewer nuts. How many nuts did the bear eat? How many nuts did they eat in total?

1. The problem statement asks you to find two things.
2. So the shorthand has two question marks:

Higgie: 45 nuts  
Bear: ? nuts, 5 times fewer than



3. We have 2 questions in the shorthand. We answer them in two steps.

(i) Question 1: the bear ate  $45 \div 5 = 9$  nuts

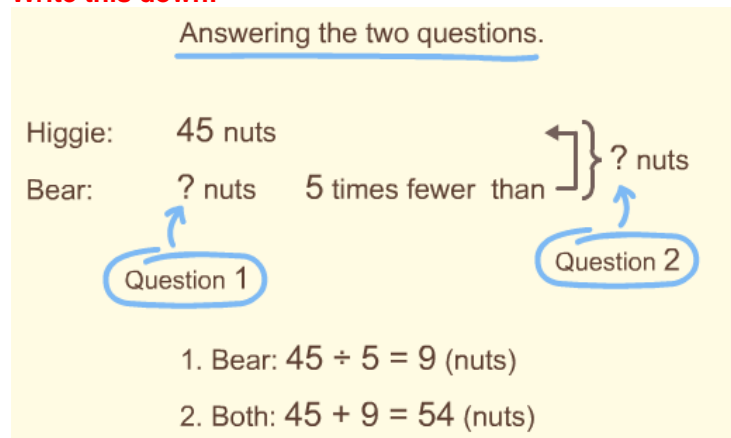
(ii) Now, we have all we need to answer the second question.

(a) Question 2: they ate  $45 + 9 = 54$  nuts in total

b. **Write this down:**

Answering the two questions.

Higgie: 45 nuts  
Bear: ? nuts, 5 times fewer than



1. Bear:  $45 \div 5 = 9$  (nuts)  
2. Both:  $45 + 9 = 54$  (nuts)

## Key Problems for Practice

1. Ken weighs 80 lb, and his dog Loki weighs 8 times less. At the animal hospital, Ken picked up Loki and stepped onto the scale. How many lb did the scale show?

## ReasoningMind

### Basic I-3 Curriculum

2. On the swim team, there were 6 boys and 4 times more girls. How many girls were on the team? How many kids were on the team in total?
3. The Math Pirate has 8 gold coins, and 4 times as many silver coins. How many silver coins does he have? How many total coins does the Math Pirate have?
- a. Complete the shorthand.
- Gold:  coins
- Silver: ? coins,  than  } ? coins
- 
- b. Fill in the solution.
- i. Silver:
- ii. Total:
4. On Saturday, Meg jogged to the park down the road and back. In total, she jogged 6 miles. On Sunday, Meg jogged to a pond and rode home with a friend. How many miles did Meg jog on Sunday, if the pond is 4 times farther than the park? How many miles did Meg jog that weekend?
5. A DVD player costs \$72. A headset costs 8 times less than that. How much does the headset cost? How much do the headset and DVD player cost together? Choose the correct solution.
- a. 1) Headset:  $72 - 8 = 64$  (dollars)  
2) Total:  $72 + 64 = 136$  (dollars)
- b. 1) Headset:  $72 \div 8 = 9$  (dollars)  
2) Total:  $72 + 8 = 80$  (dollars)
- c. 1) Headset:  $72 \div 8 = 9$  (dollars)  
2) Total:  $72 + 9 = 81$  (dollars)
- d. 1) Total:  $72 + 8 = 80$  (dollars)

## Order of Operations with Parentheses

### Objective 23 Curriculum Highlights

#### Related TEKS

4.4A, 4.4H, 4.8C

#### Related Student Expectations

- ◆ Prerequisite for solving problems that deal with measurements of length using addition, subtraction, multiplication, or division as appropriate
- ◆ Prerequisite for solving problems that deal with intervals of time using addition, subtraction, multiplication, or division as appropriate
- ◆ Prerequisite for solving problems that deal with liquid volumes using addition, subtraction, multiplication, or division as appropriate
- ◆ Prerequisite for solving problems that deal with mass using addition, subtraction, multiplication, or division as appropriate
- ◆ Prerequisite for solving problems that deal with money using addition, subtraction, multiplication, or division as appropriate
- ◆ Maintains adding whole numbers using the standard algorithm
- ◆ Maintains subtracting whole numbers using the standard algorithm
- ◆ Maintains solving with fluency one-step problems involving multiplication
- ◆ Maintains solving with fluency one-step problems involving division, including interpreting remainders
- ◆ Maintains solving with fluency two-step problems involving multiplication
- ◆ Maintains solving with fluency two-step problems involving division, including interpreting remainders
- ◆ Maintains solving with fluency two-step problems involving multiplication and division, including interpreting remainders

#### Foundational RM Prerequisites

- ◆ Order of Operations in Expressions without Parentheses
- ◆ Numerical Expressions with All Operations

#### Vocabulary

parentheses

Order of Operations

value

expression(s)

#### Key Theory Material

##### l) Evaluating Expressions with Parentheses: Part I

- In expressions without **parentheses**: multiply and divide first, work from left to right; then add and subtract, work from left to right.
- In **expressions** with **parentheses** we do the operations in **parentheses** first.
- Write this down:**



### The Order of Operations Rule

In expressions with parentheses:

- 1 Do operations in parentheses first.
- 2 Then do  $\times$  and  $\div$  from left to right.
- 3 Then do  $+$  and  $-$  from left to right.

Order of Operations:

- 1 ( )
- 2  $\times \div$
- 3  $+$   $-$

d. Write this down:



$$70 - (8 + 32) \div 4 = 60$$

40  
10

- ①:  $8 + 32 = 40$
- ②:  $40 \div 4 = 10$
- ③:  $70 - 10 = 60$

e. Let's find the value of this expression:  $3 \times (28 - 8) + 19$

## II) Evaluating Expressions with Parentheses: Part 2

a. Remember the rule:

**Remember the rule:**

Order of Operations

- 1 ( )
- 2  $\times \div$
- 3  $+$   $-$

b. Give the order of operations for  $30 \div 3 + (19 + 5)$

c. Write this down:



$$\begin{array}{c} \textcircled{2} \quad \textcircled{3} \quad \textcircled{1} \\ 30 \div 3 + (19 + 5) = 34 \\ \underbrace{\hspace{2cm}} \quad \underbrace{\hspace{2cm}} \\ 10 \qquad \qquad 24 \end{array}$$

- ①:  $19 + 5 = 24$
- ②:  $30 \div 3 = 10$
- ③:  $10 + 24 = 34$

- d. Let's find the **value** of this **expression**:  $(62 + 34) = 14 \times 2$
- e. Dancing Frogs game incorporated

Key Problems for Practice

1. Number the operations. Follow the Order of Operations Rule:

$$\begin{array}{c} \bigcirc \quad \quad \bigcirc \quad \quad \bigcirc \\ 72 - (16 + 24) + 48 \end{array}$$

- 2. Find the value of the expression:  $30 \div 2 - (2 + 10) = \underline{\hspace{2cm}}$
- 3. Which operation is done first? (Follow the Order of Operations Rule):  $80 \div (24 \div 6) \times 3$
- 4. Evaluate the expressions. The operations are already numbered.

$$\begin{array}{c} \textcircled{2} \quad \textcircled{3} \quad \textcircled{1} \\ 2 \times 4 - (20 - 16) = \square \end{array}$$

5. The heart sign stands for a number. Give the order of operations. Use the Order of Operations Rule.

$$\begin{array}{c} \bigcirc \quad \quad \bigcirc \quad \quad \bigcirc \\ \heartsuit + (\heartsuit + \heartsuit) \times \heartsuit \end{array}$$



# Multiplying a Two-Digit Number by a One-Digit Number

## Objective 24 Curriculum Highlights

### Related TEKS

4.4D

### Related Student Expectations

- ◆ Introduces using strategies to multiply up to a four-digit number by a one-digit number
- ◆ Introduces using strategies to multiply a two-digit number by a two-digit number
- ◆ Introduces using algorithms, including the standard algorithm, to multiply up to a four-digit number by a one-digit number
- ◆ Introduces using algorithms, including the standard algorithm, to multiply a two-digit number by a two-digit number

### Foundational RM Prerequisites

- ◆ Column Addition Within 1,000: Three Summands

### Vocabulary

ones

tens

factor

product

### Key Theory Material

#### I) How to Multiply a Two-Digit Number by a One-Digit Number: Part 1

- Math Machine: Multiplication Table game incorporated
- How do we multiply  $43 \times 2$ ? We multiply the **ones** separately from the **tens**. It is easier to do this in a column.
- We usually write the **factor** with more digits on top. Line up the numbers. Put the ones under the ones. Now we can multiply!
- Write this down:**

#### Column Multiplication

$$\begin{array}{r} 21 \\ \times 4 \\ \hline 84 \end{array}$$

Line up the numbers.

Multiply the ones by 4.

Then multiply the tens by 4.

- Hungry Princess: Top Factor game incorporated
- Let's find the **product** of 92 and 4.

#### II) How to Multiply a Two-Digit Number by a One-Digit Number: Part 2

- Write this down:**

$$\begin{array}{r} \phantom{2} \\ 37 \\ \times 4 \\ \hline 148 \end{array}$$

Multiply the ones by 4.

Multiply the tens by 4.

Then add the carry over.

- Find the **product** of  $84 \times 6$ .

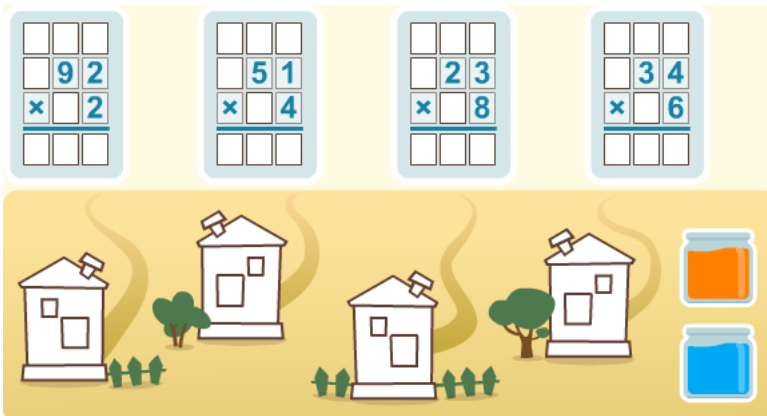
- There are 24 apples on a plate and 3 times more apples in a basket. How many apples are there altogether?
- Choose the melon that has the numbers lined up correctly for column multiplication.



- Calculate:  $23 \times 4$
- Drag the cards to show the calculation.



- Fill in the products:  $46 \times 3 = \underline{\quad}$  ;  $84 \times 3 = \underline{\quad}$
- At last year's fair, Big Beaver sold 83 pounds of tomatoes at \$2 a pound. How much money did Big Beaver make?
- Find the products. Then paint the houses so that those with equal products are the same color.



# Step by Step Solutions to Word Problems

## Objective 25 Curriculum Highlights

### Related TEKS

4.5A, 4.8C

### Related Student Expectations

- ◆ Prerequisite for solving problems that deal with measurements of length using addition, subtraction, multiplication, or division as appropriate
- ◆ Prerequisite for solving problems that deal with intervals of time using addition, subtraction, multiplication, or division as appropriate
- ◆ Prerequisite for solving problems that deal with liquid volumes using addition, subtraction, multiplication, or division as appropriate
- ◆ Prerequisite for solving problems that deal with mass using addition, subtraction, multiplication, or division as appropriate
- ◆ Prerequisite for solving problems that deal with money using addition, subtraction, multiplication, or division as appropriate
- ◆ Introduces representing multi-step problems involving the four operations with whole numbers using equations with a letter standing for the unknown quantity
- ◆ Fully covers representing multi-step problems involving the four operations with whole numbers using strip diagrams

### Foundational RM Prerequisites

- ◆ Expressions for Solving Word Problems: Part 2
- ◆ Review: Word Problems with Two Questions

### Vocabulary

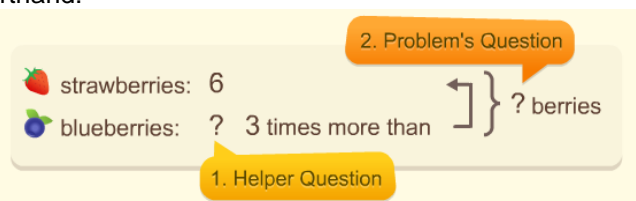
helper question

total

### Key Theory Material

#### I. Helper Question

- a. The Math Pirate ate 6 strawberries and 3 times more blueberries. How many berries did he eat in **total**?
- The **total** we have to find is the number of strawberries + the number of blueberries.
  - Helper Question:** How many blueberries did the Math Pirate eat?
  - Use shorthand:



- b. Higgie made 28 cakes, and the Math Pirate made 7 times fewer cakes than Higgie. How many cakes did the Math Pirate and Higgie make altogether?


2. Problem's Question

Higgie: 28 cakes  
Math Pirate: ? cakes 7 times fewer than } ? cakes

1. Helper Question

1. The Math Pirate:  
 $28 \div 7 = 4$  (cakes)

2. Altogether:  
 $28 + 4 = 32$  (cakes)

 **Answer:** The Math Pirate and Higgie made 32 cakes altogether.

## II. Two-Step Solutions

a. **Write this down:**

Big Beaver has seen 24 episodes of his favorite TV show. There are 3 times fewer episodes he hasn't seen yet. How many episodes are there in total?

1. Hasn't seen yet:  $24 \div 3 = 8$  (episodes)  
2. In total:  $24 + 8 = 32$  (episodes)

Answer: There are 32 episodes in total.

### Key Problems for Practice

- At the stadium, there are 48 fans standing and 3 times as many fans sitting down. How many fans are there in total?
- Martha picked 72 mushrooms, and her son picked 8 times fewer mushrooms. How many mushrooms did they pick altogether?

3. There are 24 girls and 3 times fewer boys in Toni's math class. In total, how many kids are in the class?

- a There are  boys in the class.
- b In total, there are  kids in the class.

**ReasoningMind**

Basic I-3 Curriculum

4.

A beaver swam 3 miles up the river and 5 times as many miles down the river. In total, how many miles did the beaver swim?

Which question will help us solve the problem?

- A How many miles did the beaver swim down the river?
- B How many miles did the beaver swim up the river?
- C How many more miles did the beaver swim down the river than up the river?

5.

35 boys and 5 times fewer girls entered a cooking contest. How many kids entered the cooking contest?

a Drag the cards to label the questions in the shorthand.

boys: 35 kids  
girls: ? kids 5 times fewer than } ? kids

Helper Question      Problem's Question

b How many kids entered the cooking contest?   kids

# Column Multiplication of a Three-Digit Number: Part 1

## Objective 26 Curriculum Highlights

### Related TEKS

4.4D

### Related Student Expectations

- ◆ Introduces using strategies to multiply up to a four-digit number by a one-digit number
- ◆ Introduces using strategies to multiply a two-digit number by a two-digit number
- ◆ Introduces using algorithms, including the standard algorithm, to multiply up to a four-digit number by a one-digit number
- ◆ Introduces using algorithms, including the standard algorithm, to multiply a two-digit number by a two-digit number

### Foundational RM Prerequisites

- ◆ Multiplying a Two-Digit Number by a One-Digit Number

### Vocabulary

N/A

### Key Theory Material

#### I. Multiplying a Three-Digit Number by a One-Digit Number: Part 1

- You already know how to multiply two-digit numbers by one-digit numbers.
- $134 \times 2 = ?$ 
  - To multiply, we line up the numbers – ones under ones.
- Write this down:**

$\begin{array}{r} 231 \\ \times \quad 3 \\ \hline 693 \end{array}$	First, multiply the ones by 3.
	Next, multiply the tens by 3.
	Last, multiply the hundreds by 3.

#### II. Multiplying a Three-Digit Number by a One-Digit Number: Part 2

- Let's multiply 192 by 4.

$$\begin{array}{r} 3 \\ 192 \\ \times \quad 4 \\ \hline 768 \end{array}$$

$$192 \times 4 = 768$$

#### III. Multiplying a Three-Digit Number by a One-Digit Number: Part 3

- Let's multiply 136 by 7

$$\begin{array}{r} 24 \\ 136 \\ \times 7 \\ \hline 952 \end{array}$$

$$136 \times 7 = 952$$

b. **Write this down:**

When multiplying, you can have more than one carry-over.

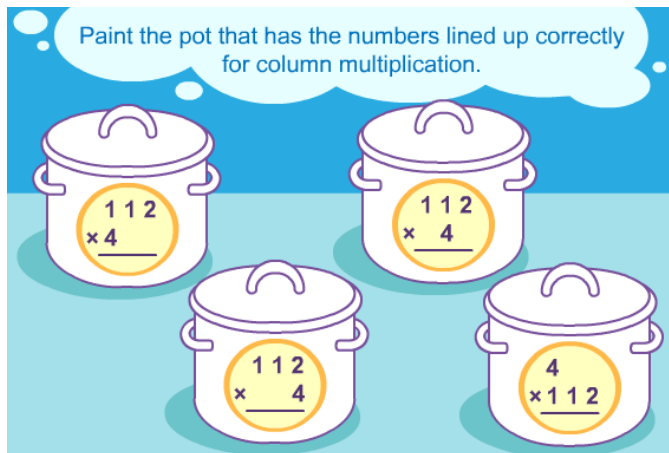
$$\begin{array}{r} 11 \\ 395 \\ \times 2 \\ \hline 790 \end{array}$$

Here we have two carry-overs:  
from ones to tens, and  
from tens to hundreds.

### Key Problems for Practice

1. Find the product.  $124 \times 2 = \underline{\quad}$

2.



## ReasoningMind

Basic I-3 Curriculum

3.

$$148 \times 6 = ?$$

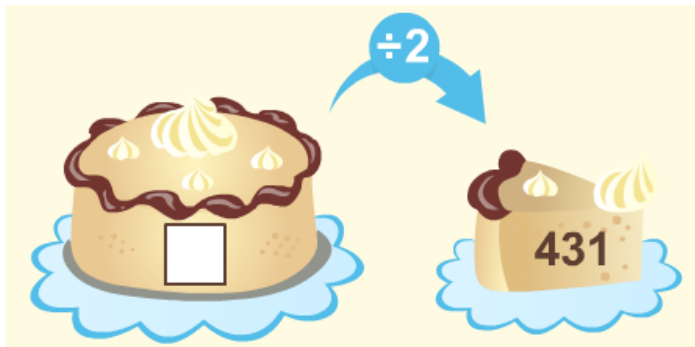
Fill in the missing factor and find the product.

	1	4	8
x			
<hr/>			

4. Evaluate the expression  $s \cdot 6$  when  $s = 144$ .

5. A snail crawled 321 inches from the flower to the pond. Then it crawled back to the flower. How many inches did the snail crawl in total?

6.



7.

Each ★ stands for the same number. What number can you substitute for ★ to get a correctly solved example.

$$\begin{array}{r} 136 \\ \times \quad \star \\ \hline 5\star\star \end{array}$$

Answer

--	--



## Column Multiplication of a Three-Digit Number: Part 2

### Objective 27 Curriculum Highlights

#### Related TEKS

4.4D

#### Related Student Expectations

- ◆ Introduces using strategies to multiply up to a four-digit number by a one-digit number
- ◆ Introduces using algorithms, including the standard algorithm, to multiply up to a four-digit number by a one-digit number
- ◆ Fully covers using strategies to multiply a two-digit number by a two-digit number
- ◆ Fully covers using algorithms, including the standard algorithm, to multiply a two-digit number by a two-digit number

#### Foundational RM Prerequisites

- ◆ Column Multiplication of a Three-Digit Number: Part 1

#### Vocabulary

special alignment

#### Key Theory Material

#### V) Review: Equations with an Unknown Minuend

- a. Remember what we call the numbers we subtract?

minuend   subtrahend   difference

$$56 \quad - \quad 32 \quad = 24$$

- b.  $y - 14 = 18$  is an equation with an unknown minuend.

#### VI) Solving Equations with an Unknown Minuend

- a. **Write this down:**

1. To find an unknown minuend, add the difference and the subtrahend.

$$\begin{aligned} 2. \quad z - 21 &= 34 \\ z &= 34 + 21 \end{aligned}$$

$$z = 55$$

- b. **Write this down:**

$$\begin{aligned} 1. \quad w - 47 &= 30 \\ w &= 30 + 47 \end{aligned}$$

$$\underline{w = 77}$$

2. We substitute our answer for the unknown minuend, and see if we get a true equality.

## ReasoningMind

Basic I-3 Curriculum

3. Check:  
?

$$77 - 47 = 30$$

$$30 = 30$$

### Key Problems for Practice

1. Find the product:  $105 \times 5 = \underline{\quad}$
2. Find the value of  $3 \cdot r$  when  $r = 208$ .
3. Find  $130 \times 4$ .
4. Choose the problem that is solved **incorrectly**.



5. Bill wants to buy three chairs. Each chair costs \$240. Paint the label that shows the total cost of the chairs.



6. Add 31 to the greatest two-digit number. Multiply the result by 4. What number do you get?
7. There are green and yellow marks on a log. If you cut the log only at the yellow marks you will get 3 pieces of wood. If you cut the log only at the green marks you will get 4 pieces of wood. How many pieces of wood will you get if you cut the log at both the yellow and the green marks?

## Division Beyond the Multiplication Table

### Objective 28 Curriculum Highlights

#### Related TEKS

4.4E, 4.4F, 4.4H

#### Related Student Expectations

- ◆ Introduces using strategies to divide up to a four-digit dividend by a one-digit divisor
- ◆ Introduces using algorithms, including the standard algorithm, to divide up to a four-digit dividend by a one-digit divisor
- ◆ Maintains solving with fluency one-step problems involving division, including interpreting remainders
- ◆ Maintains solving with fluency two-step problems involving division, including interpreting remainders

#### Foundational RM Prerequisites

- ◆ Multiplication within 100 Beyond the Table
- ◆ Multiplying and Dividing by 10 and 100

#### Vocabulary

N/A

#### Key Theory Material

##### I) Division Beyond the Multiplication Table

- a. Juke Box: Operation Components game incorporated

##### II) Dividing a Round Number

- a. How do we divide 60 by 2? It's as easy as dividing 6 by 2!  
b. Divide:  $80 \div 4 = \underline{\quad}$

##### III) Dividing a Sum by a Number

- a. **Write this down:**

To divide a sum by a number:

- ① Divide each summand by the number.
- ② Add the results.

$$(6 + 8) \div 2 = 6 \div 2 + 8 \div 2 = 7$$

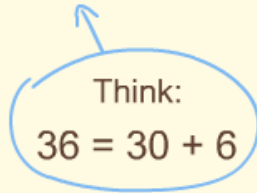
- b. Calculate:  $(8 + 14) \div 2 = \underline{\quad}$

## ReasoningMind

Basic I-3 Curriculum

c. **Write this down:**

$$36 \div 3 = (30 + 6) \div 3 = 10 + 2 = 12$$



- d.  $48 \div 2 = \underline{\quad}$  You can do it with mental math!  
e. How do we find  $78 \div 3$ ?

We think of 78 as the sum of two numbers that are easy to divide by 3.

$$78 = 60 + 18$$

So, here's how we divide:

$$78 \div 3 = (60 + 18) \div 3 = \boxed{26}$$

## IV) Division with Guess and Check

- a. Let's divide 39 by 13.

dividend      divisor      quotient

$$39 \div 13 = \square$$

$$\square \times 13 = 39$$

So, the number that goes here is **the quotient**.

- b. **Write this down:**



Division with Guess and Check

$$\begin{array}{ccc} \text{dividend} & \text{divisor} & \text{quotient} \\ \hline & & \square \\ 39 \div 13 = & & \end{array}$$

We try 3 for the quotient.

- ✓ To check, multiply 3 by the divisor:  $3 \times 13 = 39$
- ✓ We got 39, so 3 is the quotient.

$$39 \div 13 = 3$$

- c. Let's divide 60 by 20.  
d. On their trip to the zoo, 6 kids each brought 7 carrots. The carrots were shared equally among 3 giraffes. How many carrots did each giraffe get?

1. Calculate:  $90 \div 3 = \underline{\quad}$

2. Write 48 as a sum that helps find  $48 \div 4$ .

$48 = \text{○} + \text{○}$

40 18 30 4 8

3. Mrs. Mouse paid \$48 for four “Cat Trap” games for her classroom. How much does each game cost?

4. Click on the greatest round number that is less than 55 and divisible by 2.



5. **a** Write 45 as a sum that helps to divide it by 3.

$$45 \div 3 = (30 + \square) \div 3$$

**b** Use the sum above to find the quotient:

$$45 \div 3 = \square$$

6. Complete the calculation:  $(18 + 8) \div 2 = 18 \div 2 + 8 \div 2 = \underline{\quad} + 4 = \underline{\quad}$

7. Together, a book and a poster cost \$15. Xavier has exactly enough money to buy either the book or 4 copies of the poster. How much money does he have?

# Long Division with 2-Digit Numbers

## Objective 29 Curriculum Highlights

### Related TEKS

4.4E, 4.4F, 4.4H

### Related Student Expectations

- ◆ Introduces representing the quotient of up to a four-digit whole number divided by a one-digit whole number using arrays, area models, or equations.
- ◆ Introduces using strategies to divide up to a four-digit dividend by a one-digit divisor
- ◆ Introduces using algorithms, including the standard algorithm, to divide up to a four-digit dividend by a one-digit divisor
- ◆ Maintains solving with fluency one-step problems involving division, including interpreting remainders
- ◆ Maintains solving with fluency two-step problems involving division, including interpreting remainders

### Foundational RM Prerequisites

- ◆ Column Multiplication of a Three-Digit Number: Part 2
- ◆ Division Beyond the Multiplication Table

### Vocabulary

quotient/divisor      dividend      long division      digit

### Key Theory Material

#### I) How Long Division Works

##### a. Write This Down:

Long Division

$\begin{array}{r} 23 \\ 4 \overline{)92} \\ \underline{-8} \phantom{0} \\ 12 \\ \underline{-12} \\ 0 \end{array}$	<p>We work on the dividend from left to right:</p> <ul style="list-style-type: none"><li>✓ divide the tens</li><li>✓ bring down the ones</li><li>✓ divide the ones</li></ul>
---	--

- b.  $72 \div 3 = 24$       How do we write this as **long division**?
- c. The farmer's mass is 78 kg. The pumpkin's mass is 6 times less. What is the pumpkin's mass?

#### II) Mental Math or Long Division

- a.  $84 \div 2$
- b. Maria needs 36 toothbrushes. Each pack has 3 toothbrushes. How many packs does Maria need?

#### III) Long Division with a Remainder

- a.  $71 \div 3 = \underline{\quad} R \underline{\quad}$

## ReasoningMind

Basic I-3 Curriculum

b.

Find the mistake in this long division. Click on the incorrect digit.

$$\begin{array}{r} 17 \\ 5 \overline{)95} \\ - 5 \phantom{0} \\ \hline 45 \\ - 45 \\ \hline 0 \end{array}$$

### Key Problems for Practice

- 1.) Find the quotient:  $63 \div 3 = \underline{\quad}$
- 2.) There are 90 lilies in a garden. There are 3 times fewer roses than lilies. How many roses are in the garden?
- 3.) Divide:  $57 \div 4 = \underline{\quad}$  R  $\underline{\quad}$
- 4.) Evaluate this expressions:  $96 \div 8 - 8 = \underline{\quad}$
- 5.) There are 34 kids in a dance school. There are half as many adults as kids. How many people are in the dance school altogether?
- 6.) Multiply 28 by 3. Divide the result by 7. What number did you get?

# Long Division with 3-Digit Numbers

## Objective 30 Curriculum Highlights

### Related TEKS

4.4E, 4.4F, 4.4H

### Related Student Expectations

- ◆ Introduces representing the quotient of up to a four-digit whole number divided by a one-digit whole number using arrays, area models, or equations.
- ◆ Introduces using strategies to divide up to a four-digit dividend by a one-digit divisor
- ◆ Introduces using algorithms, including the standard algorithm, to divide up to a four-digit dividend by a one-digit divisor
- ◆ Maintains solving with fluency one-step problems involving division, including interpreting remainders
- ◆ Maintains solving with fluency two-step problems involving division, including interpreting remainders

### Foundational RM Prerequisites

- ◆ Long Division of 2-Digit Numbers

### Vocabulary

N/A

### Key Theory Material

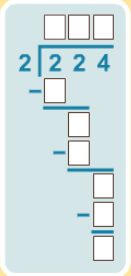
#### 1) Dividing 3-Digit Numbers: Part 1

a.

Divide:

$$224 \div 2 = \square$$

Do long division in your notebook, or here, on the screen.



- b. 286 pounds of flour is packed into 2-pound bags. How many bags are there?



## ReasoningMind

Basic I-3 Curriculum

c. **Write This Down:**

Long Division (3-digit dividend)

We work on the dividend  
left to right.

$$\begin{array}{r} 316 \\ 2 \overline{) 632} \\ \underline{-6} \phantom{2} \\ 3 \phantom{2} \\ \underline{-2} \phantom{2} \\ 12 \\ \underline{-12} \\ 0 \end{array}$$

- d. The suit costs \$372. The jersey costs 3 times less. How much does the jersey cost?  
e. The "Haunted Castle" mystery book has 456 pages. The "Adventures in the Jungle" book is 3 times shorter. How many pages are there in the "Adventures in the Jungle" book?

## II) Dividing 3-Digit Numbers: Part 2

- a. Let's divide 235 by 5.  
b. Frame It: Long Division game incorporated  
c.  $176 \div 8 = \underline{\quad}$   
d. The perimeter of a square is 256 in. How long are its sides?

### Key Problems for Practice

- 1.)  $363 \div 3 = \underline{\quad}$
- 2.) Find the quotient:  $684 \div 6 = \underline{\quad}$
- 3.) Raccoon has \$207. Pirate Jonathan has 9 times less. How much money does Pirate Jonathan have?
- 4.) 6 episodes of a 216-episode cartoon are shown on TV each week. How many weeks will it take to show all of the episodes?
- 5.) Evaluate the expression:  $565 - 248 \div 8 = \underline{\quad}$
- 6.) Two trucks delivered strawberries to Red's Fruit on Monday. The first truck brought 154 kg of strawberries, and the second brought 80 kg. The strawberries were then put into cases. Each case holds 9 kg of strawberries. How many cases were needed to deliver all the strawberries?

## Review: Customary Units of Length

### Objective 31 Curriculum Highlights

#### Related TEKS

4.2C, 4.5D, 4.8B

#### Related Student Expectations

- ◆ Prerequisite for solving problems related to perimeter of rectangles where dimensions are whole numbers
- ◆ Prerequisite for solving problems related to area of rectangles where dimensions are whole numbers
- ◆ Introduces converting measurements within the same measurement system, customary or metric, from a smaller unit into a larger unit or a larger unit into a smaller unit when given other equivalent measures represented in a table
- ◆ Fully covers identifying relative sizes of measurement units within the customary systems
- ◆ Fully covers solving problems that deal with measurements of length using addition, subtraction, multiplication, or division as appropriate
- ◆ Maintains comparing whole numbers to 1,000,000,000
- ◆ Maintains ordering whole numbers to 1,000,000,000
- ◆ Maintains representing comparisons using the symbols  $>$ ,  $<$ , or  $=$

#### Foundational RM Prerequisites

- ◆ Long Division of 3-Digit Numbers

#### Vocabulary

mile          inch          foot          yard          shorter          longer  
distance      closer

#### Key Theory Material

#### I) The Inch, Foot, and Yard

##### a. Write This Down:

1 foot = 12 inches

1 yard = 3 feet

##### b.

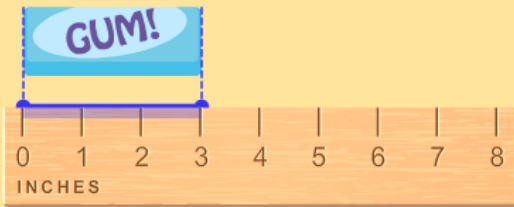


## ReasoningMind

Basic I-3 Curriculum

c.

The length of the bubble gum pack is:



- A  3
- B  3 in
- C  3 ft
- D  3 yd

- d. Compare 325 ft and 347 ft.     325 ft \_\_\_ 347 ft (use < , > , or = sign)  
(i) We compare lengths measured in the same unit the same way we compare numbers.
- e. The road to the lake is 400 yards long, and the path is 295 yards long. Which way is shorter?

## II) The Mile

a. **Write This Down:**

Mile

The word mile is often shortened to mi:  
1 mile = 1 mi  
1 mile = 1,760 yards

- b. Which of the following could be 100 miles long?  
(i) The distance between 2 towns  
(ii) A jogging track  
(iii) A large snake

c.



Give the most reasonable measurement units.

yd   mi   in   ft

Over the last year, Sofia has grown 2 .

Now she is 4  tall. She can jump across a stream 2

wide and ride 3  on her bicycle.

## ReasoningMind

Basic I-3 Curriculum

d. **Write This Down:**

"Greater distance" means "farther."

"Distance is less" means "closer."

e. The **distance** from RM City to Blue Mountain is 374 **miles**, and from RM City to Glass Lake is 57 **miles**. How many **miles closer** to RM City is Glass Lake than Blue Mountain?

### Key Problems for Practice

1.)

Drag the correct units:

in yd ft mi

a The height of a table might be 3 .

b The distance from Chicago to Omaha is 470 .

c The length of a football field is 120 .

d The length of a pencil might be 7 .

2.) The ostrich is 72 in tall. The kangaroo is 68 in tall. Which is taller?

3.) How many more miles is 321 miles than 120 miles?

4.) To get to Pearl Island, the Math Pirate has to sail 196 miles. To get to Coral Island, he must sail 256 miles. Which distance is shorter?

5.)



The distance from the school to the swimming pool is 670 yd, and the distance from the school to the playground is 380 yd. The playground is  the school than the swimming pool is.

closer to farther from

- 6.) Topeka is farther from Dallas than Tulsa is. The distance from Dallas to Topeka is 456 mi. How far from Dallas could Tulsa be?
- a. 465 mi
  - b. 254 mi
  - c. 621 mi

# Multiplication and Division: Checking One Operation with the Other

## Objective 32 Curriculum Highlights

### Related TEKS

4.2C, 4.4D, 4.4E, 4.4F, 4.4h, 4.5D, 4.8C

### Related Student Expectations

- ◆ Maintains or enriches using strategies to multiply up to a four-digit number by a one-digit number
- ◆ Maintains or enriches using strategies to multiply a two-digit number by a two-digit number
- ◆ Maintains or enriches using algorithms, including the standard algorithm, to multiply up to a four-digit number by a one-digit number
- ◆ Maintains or enriches using algorithms, including the standard algorithm, to multiply a two-digit number by a two-digit number
- ◆ Maintains or enriches representing the quotient of up to a four-digit whole number divided by a one-digit whole number using arrays, area models, or equations
- ◆ Maintains or enriches using strategies to divide up to a four-digit dividend by a one-digit divisor
- ◆ Maintains or enriches using algorithms, including the standard algorithm, to divide up to a four-digit dividend by a one-digit divisor
- ◆ Maintains or enriches solving with fluency one-step problems involving multiplication
- ◆ Maintains or enriches solving with fluency one-step problems involving division, including interpreting remainders
- ◆ Maintains or enriches solving with fluency two-step problems involving multiplication
- ◆ Maintains or enriches solving with fluency two-step problems involving division, including interpreting remainders
- ◆ Maintains or enriches solving with fluency two-step problems involving multiplication and division, including interpreting remainders

### Foundational RM Prerequisites

- ◆ Long Division of 3-Digit Numbers

### Vocabulary

N/A

### Key Theory Material

#### 1) Using Multiplication to Check Division

- Multiplication and division are related. We can check one with the other.
- Write This Down:**

$$\textcircled{88} \div 8 = 11 \quad ?$$

To check division,  
multiply the quotient by the divisor.

If you get the dividend,  
the division is correct.

$$11 \times 8 = \textcircled{88}$$

## ReasoningMind

Basic I-3 Curriculum

- c. Divide 75 by 5. Then, we'll check your answer with multiplication.
- d.

$105 \div 5 = 21$

Which equality can be used to check the above?

A   $21 \times 5 = 105$

B   $25 + 80 = 105$

C   $21 \times 4 = 84$

## II) Using Division to Check Multiplication

- a. **Write This Down:**

$12 \times 8 = 96$

To check multiplication,  
divide the product by one of the factors.


If you get the other factor,  
the multiplication is correct.

$96 \div 8 = 12$

- b. Let's see if the multiplication is done correctly:  $7 \times 18 = 119$ ?

Did I multiply correctly?      Divide to check Becky's multiplication.

$$\begin{array}{r} 24 \\ \times 6 \\ \hline 144 \end{array}$$



$$\begin{array}{r} \square \square \\ 6 \overline{) 144} \\ - \square \square \\ \hline \square \square \\ - \square \square \\ \hline \square \end{array}$$

Then choose the correct statement.

A  Becky multiplied correctly.

B  Becky did NOT multiply correctly.

1.)

$$17 \times 6 = 102$$

Which two equalities can be used to check this multiplication?

A   $102 \div 6 \stackrel{?}{=} 17$

B   $102 \div 3 \stackrel{?}{=} 34$

C   $102 \div 17 \stackrel{?}{=} 6$

D   $102 - 6 \stackrel{?}{=} 96$

2.)

$$36 \times 4 = 144$$

Drag the cards to make an equality that can be used to check the above multiplication.

$$\text{ } \div \text{ } \stackrel{?}{=} \text{ }$$

144

4

36

8

3.)

$$175 \div 5 = 35$$

Mark the two equalities that can be used to check the division above.

A   $35 \times 5 \stackrel{?}{=} 175$

B   $5 \times 35 \stackrel{?}{=} 175$

C   $35 \times 6 \stackrel{?}{=} 210$

D   $35 \times 7 \stackrel{?}{=} 245$



**ReasoningMind**

Basic I-3 Curriculum

4.)

**a** Divide:  
 $148 \div 4 = \square$

**b** Check by multiplying.

$$\begin{array}{r} \square \square \\ \times \quad 4 \\ \hline \square \square \square \end{array}$$

## Metric Units of Length: Changing Units

### Objective 33 Curriculum Highlights

#### Related TEKS

4.2C, 4.5D, 4.8A, 4.8B, 4.8C

#### Related Student Expectations

- ◆ Prerequisite for solving problems related to perimeter of rectangles where dimensions are whole numbers
- ◆ Prerequisite for solving problems related to area of rectangles where dimensions are whole numbers
- ◆ Fully covers identifying relative sizes of measurement units within the metric systems
- ◆ Fully covers converting measurements within the same measurement system, customary or metric, from a smaller unit into a larger unit or a larger unit into a smaller unit when given other equivalent measures represented in a table
- ◆ Maintains or enriches comparing whole numbers to 1,000,000,000
- ◆ Maintains or enriches ordering whole numbers to 1,000,000,000
- ◆ Maintains or enriches representing comparisons using the symbols  $>$ ,  $<$ , or  $=$
- ◆ Maintains or enriches solving problems that deal with measurements of length using addition, subtraction, multiplication, or division as appropriate

#### Foundational RM Prerequisites

- ◆ Review: Customary Units of Length
- ◆ Long Division of 3-Digit Numbers

#### Vocabulary

centimeter (cm) millimeter (mm) meter (m)

kilometer (km)

#### Key Theory Material

##### I) From Centimeters to Millimeters

- The **Centimeter**
  - $1 \text{ cm} = 10 \text{ mm}$
- 



## ReasoningMind

Basic I-3 Curriculum

- c. **Write This Down:**

1 centimeter is 10 millimeters.

So, to change 3 cm to millimeters, multiply by 10:

$$3 \times 10 = 30 \text{ (mm)}$$

- d. How many millimeters are there in 12 centimeters?  
e. This doll is 51 centimeters tall. What is its height in millimeters?

### II) From Millimeters to Centimeters

- a. **Write This Down:**

10 millimeters is 1 centimeter.

So, to change 350 mm to centimeters, divide by 10:

$$350 \div 10 = 35 \text{ (cm)}$$

- b. A butterfly is 30 mm. How long is the butterfly in centimeters?

### III) From Meters to Centimeters

- a. The meter is a unit of length used all over the world.  
b. The Meter  
i) 1 m = 100 cm  
c. **Write This Down:**

1 meter is 100 centimeters.

So, to change 8 meters to centimeters, multiply by 100:

$$8 \times 100 = 800 \text{ (cm)}$$

- d. How many centimeters are there in 6 meters?

### IV) From Centimeters to Meters

- a. **Write This Down:**

100 centimeters is 1 meter.

So, to change 600 cm to meters, divide by 100:

$$600 \div 100 = 6 \text{ (m)}$$

- b. A snake is 300 centimeters. What is the length of this snake in meters?

## ReasoningMind

Basic I-3 Curriculum

### V) What is a Kilometer?

#### a. Write This Down:

The Kilometer

$$1 \text{ km} = 1,000 \text{ m}$$

#### b.

Which unit should we use?

Drag the cards.

the length of an ant:

the height of a building:

the height of a flower:

the length of a river:

meter    centimeter    millimeter    kilometer

## Key Problems for Practice

### 1.) Drag the cards to make correct statements.

a The length of a pen might be 12 .

b The height of a building could be about 20 .

c A paper clip is about 3  long.

meters    centimeters    millimeters    kilometers

### 2.) A bug is 20 mm long. How long is the bug in centimeters?

### 3.) Which is longer, 1 m or 10 cm?

- They are the same.
- 1 m is longer.
- 10 cm is longer.

**ReasoningMind**  
Basic I-3 Curriculum

4.) Stamp each sentence with "Correct" or "Incorrect."

**CORRECT**

a  A tall building could be about 100 m high.

b  A bus is usually about 100 mm long.

**INCORRECT**

c  A river could be 10 km long.

d  A bush might be 120 cm tall.

5.) A room is 300 cm wide. It is 2 times as long as it is wide. How long is the room in meters?

# Equations with an Unknown Factor

## Objective 34 Curriculum Highlights

### Related TEKS

4.5A

### Related Student Expectations

- ◆ Introduces representing multi-step problems involving the four operations with whole numbers using equations with a letter standing for the unknown quantity

### Foundational RM Prerequisites

- ◆ Long Division of 3-Digit Numbers

### Vocabulary

factor      product equations

### Key Theory Material

#### I) Review: Equations with an Unknown Factor

a.

Drag the correct name below each number.

$$31 \cdot 4 = 124$$

b. Which is a solution of the equation  $z \cdot 6 = 54$ ?

- (i) 4
- (ii) 8
- (iii) 9

#### II) Solving Equations with an Unknown Factor

a. **Write This Down:**

$$x \cdot 3 = 27$$

$$x = 27 \div 3$$

$$x = 9$$

To find an unknown factor,  
divide the product by the other factor.

b.

Move the cards to write a solution.

$$6 \cdot j = 54$$

$$j = \text{ } \text{ } \text{ }$$

## ReasoningMind

Basic I-3 Curriculum

c. **Write This Down:**

$$\begin{aligned}3 \cdot y &= 63 \\ y &= 63 \div 3 \\ \underline{y} &= \underline{21}\end{aligned}$$

Check:  $3 \cdot 21 \stackrel{?}{=} 63$   
 $63 = 63$

### Key Problems for Practice

1.) Drag the card that shows the correct way to get a solution.

$8 \cdot t = 72$

$t = 72 \times 8$     $t = 72 - 8$

$t = 72 + 8$     $t = 72 \div 8$

2.) Find a solution of this equation:  $4 \cdot c = 84$     $c = \underline{\quad}$

3.) Choose the equation with an unknown factor.

$4 + z = 136$     $136 - z = 4$     $4 \cdot z = 136$

$z = \square$  is a solution of this equation.

4.) What number is 5 more than the solution of  $4 \cdot d = 956$ ?

## Equations with an Unknown Dividend

### Objective 35 Curriculum Highlights

#### Related TEKS

4.5A

#### Related Student Expectations

- ♦ Fully covers representing multi-step problems involving the four operations with whole numbers using equations with a letter standing for the unknown quantity

#### Foundational RM Prerequisites

- ♦ Equations with an Unknown Factor

#### Vocabulary

quotient

dividend

divisor

equation(s)

solution

#### Key Theory Material

#### I) Review: Equations with an Unknown Dividend

- $48 \div 6 = 8$ 
  - The **quotient** is \_\_\_\_\_.
  - The **dividend** is \_\_\_\_\_.
  - The **divisor** is \_\_\_\_\_.
- Which is a solution of the **equation**  $z \div 4 = 20$ 
  - 24
  - 80
- Which of these **equations** have 36 as a **solution**? Check ALL correct answers.
  - $z + 7 = 53$
  - $x - 6 = 30$
  - $9 \cdot t = 36$
  - $y \div 4 = 9$

#### II) Solving Equations with an Unknown Dividend

- Write This Down:**

$$x \div 4 = 11$$

$$x = 11 \cdot 4$$

$$x = 44$$

To find an unknown dividend,  
multiply the quotient by the divisor.



## ReasoningMind

Basic I-3 Curriculum

b. **Write This Down:**

$$\begin{aligned}w \div 3 &= 30 \\w &= 30 \cdot 3 \\w &= \underline{90}\end{aligned}$$

Check:  $90 \div 3 \stackrel{?}{=} 30$   
 $30 = 30$

### III) Solving Equations with an Unknown Factor or Dividend

a. Find a solution:

$$\begin{aligned}s \cdot 5 &= 125 \\s &= 125 \div 5 \\s &= \square\end{aligned}$$

#### Key Problems for Practice

- 1.) Find a solution:  $z \div 9 = 4$        $z = \underline{\hspace{2cm}}$
- 2.) Find the value of  $c$  in this equation:  $c \cdot 9 = 288$        $c = \underline{\hspace{2cm}}$
- 3.) Which number is a solution of  $x \div 3 - 21 = 20$ ?
  - a. 120
  - b. 123
  - c. 126
- 4.) Perna, Diana, and Key go roller skating. Each skate has 4 wheels. How many wheels do their skates have altogether?
- 5.) An apple costs twice as much as a banana. 12 bananas cost \$5. How much do 6 apples cost?