Ready® Common Core | 2 Mathematics INSTRUCTION

Student Instruction, Practice and Problem Solving, and Teacher Resource Books: Lesson Sample

Understand Three-Digit Numbers

Curriculum Associates®

Ready® Common Core

2 Mathematics INSTRUCTION

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Standards in boldface are the focus standards that address major lesson content.

Understand Three-Digit Numbers

2.NBT.A.1a
2.NBT.A.1b
2.NBT.A.2

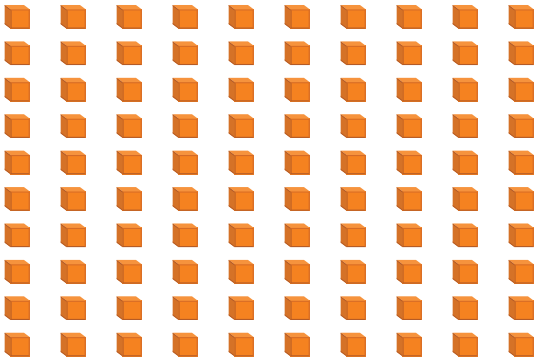
Think It Through

What is one hundred?

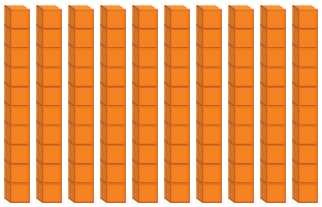
You can count to one hundred. After 99 is **100**.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	**100**

Think **One hundred is 100 ones. One hundred is 10 tens.**



100 = 100 ones

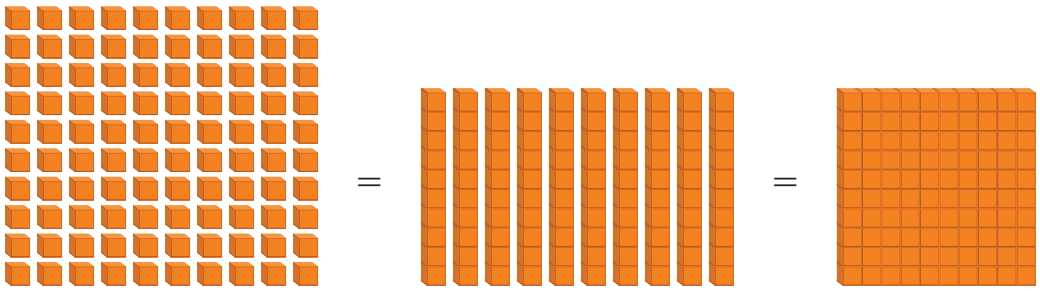


100 = 10 tens

Circle groups of 10 ones in 100.

Think **One hundred can be shown as hundreds, tens, or ones.**

Fill in the blanks.



_____ ones _____ tens _____ hundred

Ways to Show 100			
Hundreds	**Tens**	**Ones**	
0	0	100	0 hundreds + 0 tens + 100 ones
0	10	0	0 hundreds + 10 tens + 0 ones
1	0	0	1 hundred + 0 tens + 0 ones

100

hundreds place

A three-digit number has a hundreds place. It tells how many hundreds there are in a number.

Reflect Work with a partner.

1 Talk About It Think about 200. How many hundreds does 200 have? How many tens? How many ones?

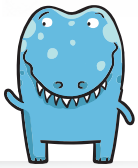
Write About It _____

_____

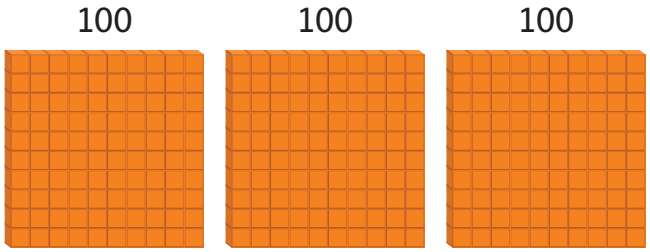
_____

Think About Hundreds, Tens, and Ones

Let's Explore the Idea You can count three-digit numbers by hundreds, tens, and ones.



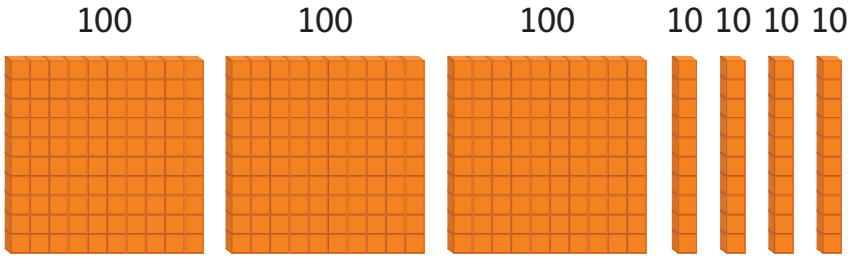
You can count hundreds.



2 Count: 1 hundred, 2 hundreds, ____ hundreds

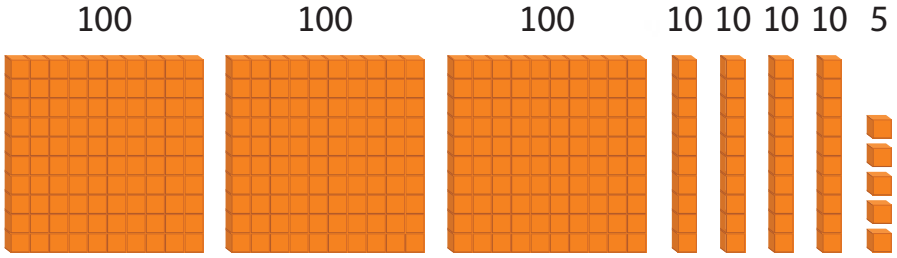
3 ____ hundreds = 300

You can count hundreds and tens.



4 ____ hundreds + ____ tens = 300 + 40 = 340

You can count hundreds, tens, and ones.

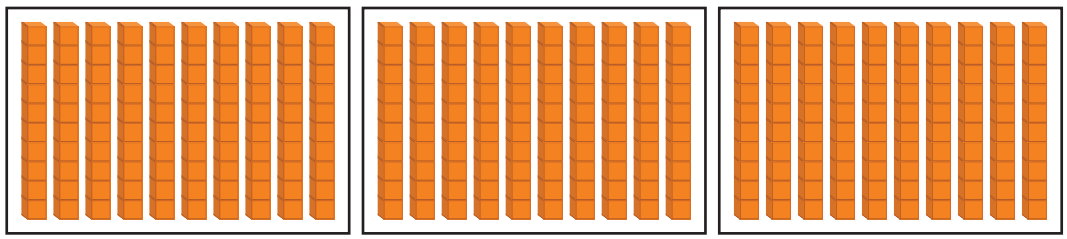


5 ____ hundreds + ____ tens + ____ ones = 300 + 40 + 5 = 345

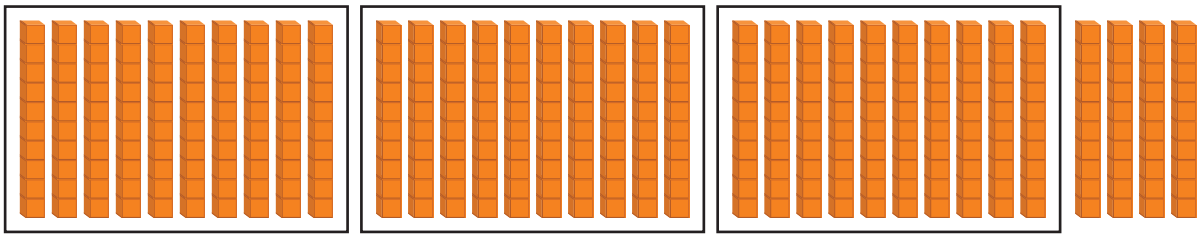
Let's Talk About It

Work with a partner.

6 This model shows 300 in tens. 300 = _____ tens

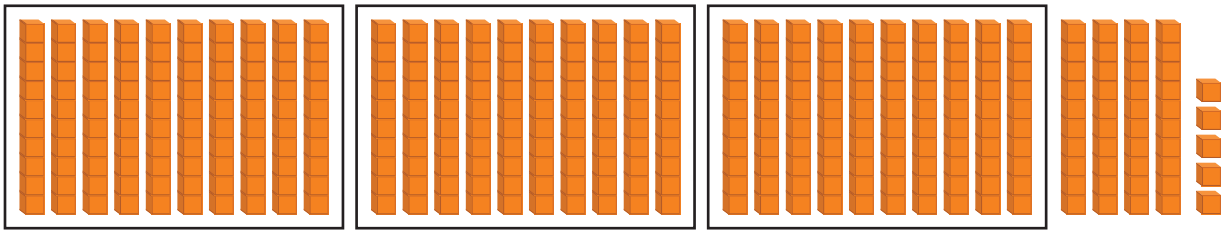


7 This model shows 340 in tens. 340 = _____ tens



8 This model shows 345 in tens. There are ones left over.

345 = _____ tens and _____ ones



Try It Another Way **Write hundreds, tens, and ones in a chart.**

Example

3 hundreds + 5 tens + 8 ones

Hundreds	Tens	Ones
3	5	8

9 5 hundreds + 3 tens

Hundreds	Tens	Ones

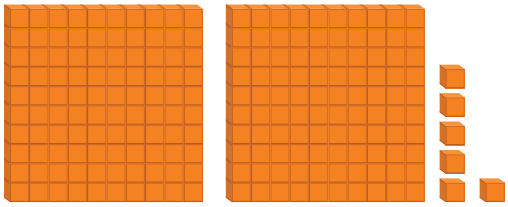
10 7 hundreds + 8 ones

Hundreds	Tens	Ones

Connect Ideas About Place Value in Three-Digit Numbers

Talk about these questions as a class. Then write your answers.

11 Evaluate Lana did this homework problem. What did she do wrong?



2 hundreds + 6 ones = 26

12 Analyze Look at how Sam and Lev wrote 572. Explain what each person did.

Sam 572 = 57 tens + 2 ones

Lev 572 = 5 hundreds + 7 tens + 2 ones

13 Identify Fill in the blanks to show 256 in different ways.

Hundreds	Tens	Ones
0	0	
0		6
	5	

Apply Ideas About Place Value in Three-Digit Numbers

Put It Together **Use what you have learned to complete this task.**

14 Nate puts his coins in stacks of ten. He has 12 stacks of coins with 4 coins left over.

Part A Draw a picture to show Nate's coins.

Part B How many coins does Nate have? Write the answer in two different ways.

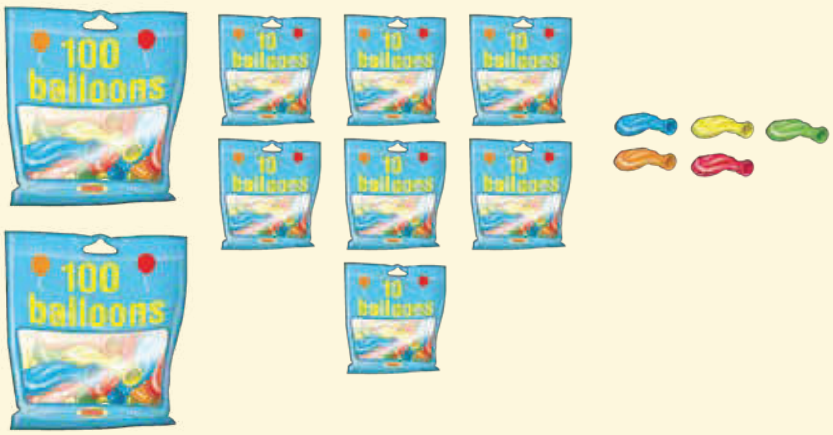
Part C Nate gets 30 more coins from a friend. Nate says that he now has 190 coins. Do you agree or disagree? Explain.

Read and Write Three-Digit Numbers

Use What You Know

Write three-digit numbers with hundreds, tens, and ones.

Jan buys 2 packs of 100 balloons. She also buys 7 packs of 10 balloons and 5 single balloons. How many balloons does Jan buy?



a. 2 packs of 100 = _____ hundreds
The number of balloons in 2 packs of 100 is _____.

b. 7 packs of 10 = _____ tens
The number of balloons in 7 packs of ten is _____.

c. 5 single balloons = _____ ones
The number of single balloons is _____.

d. Complete the equation to find the total number of balloons.

_____ + _____ + _____ = _____
100s 10s 1s

Find Out More

The **digits** 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9 make up all numbers. The digit's place in a number tells its value.

The same digit can have different values.
Look at the value of each 4 in this number.

Hundreds	Tens	Ones
4	4	4
↓	↓	↓
400	40	4

Reflect Work with a partner.

1 Talk About It When does the digit 8 have a value of 8? 80? 800? What are some three-digit numbers that show these values?

Write About It

Learn About

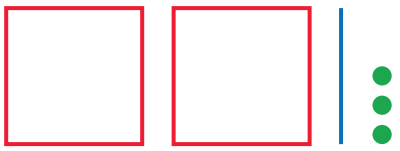
Finding the Value of Three-Digit Numbers

Read the problem. Then you will show hundreds, tens, and ones in different ways.

Amir plays a board game that uses play money.
He wins 2 hundreds bills, 1 tens bill, and 3 ones bills.
What is the total value of the bills Amir wins?

Picture It You can draw a picture to show the problem.

Picture It You can make a quick drawing to show hundreds, tens, and ones.



Model It You can show hundreds, tens, and ones in a chart.

Hundreds	Tens	Ones
2	1	3

Connect It Write the number as hundreds, tens, and ones.

2 Look at the models on the previous page. How many hundreds, tens, and ones are there?

_____ hundreds _____ ten _____ ones

3 What is the value of the hundreds bills? _____ dollars

What is the value of the tens bill? _____ dollars

What is the value of the ones bills? _____ dollars

4 Write an equation to find the total value of all the bills.

_____ + _____ + _____ = _____ dollars

5 **Talk About It** Amir wins 2 more tens bills. How would you write the new total value of Amir's play money? Explain how you found your answer.

Write About It _____

_____

_____

_____

Try It Try another problem.

6 What is another way to show each number? Draw lines to connect each number to another way to write the number.

392	329	239
300 + 20 + 9	200 + 30 + 9	300 + 90 + 2

Practice Reading and Writing Three-Digit Numbers

Study the model below. Then solve Problems 7–9.

Example

Mrs. Cole wrote this number on a check.

five hundred ninety-four

What is this number?

You can show your work in a chart.

Hundreds	Tens	Ones
5	9	4

five hundred ninety-four

Answer The number is 594.

7 Pat wrote these clues about his secret number.

- The hundreds digit is 1 more than 8.
- The tens digit has a value of 40.
- The number has 2 ones.

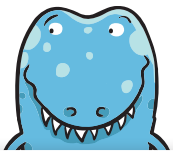
What is the secret number?

Show your work.

How many digits are in the number?

Answer _____

8 Jim is playing a board game. This is Jim's play money. Write the amount in two different ways.



What is the value of each kind of bill in the problem?

_____ dollars + _____ dollars + _____ dollars

_____ dollars

9 Which number is the same as 700 + 6?

A 76

B 607

C 706

D 760

How many tens does the number have?

Zoey chose **A** as the answer. This answer is wrong. How did Zoey get her answer?

Practice Reading and Writing Three-Digit Numbers

Solve the problems.

1 What is another way to show 2 hundreds and 5 ones? Circle all the correct answers.

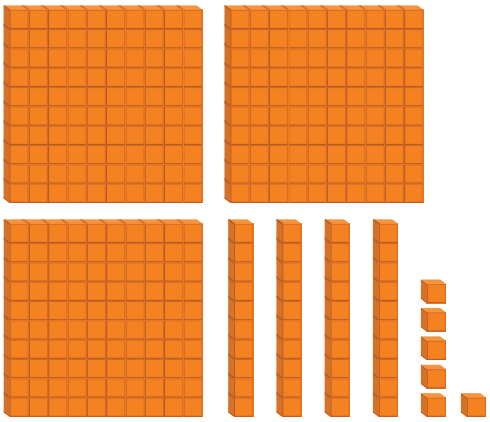
A 200 + 5

B 25

C 200 + 50

D 205

2 What does the model show? Fill in the table and the blanks.



Hundreds	Tens	Ones

Value: _____ + _____ + _____

Total: _____

3 A bear at the zoo weighs 360 pounds. What is true about this number? Circle all the correct answers.

A It is 300 + 6.

B It equals 36 tens.

C It is 300 + 60.

D It has 3 hundreds and 6 tens.

4 Here are clues about a number.

- The number has 7 hundreds.
- The tens digit has a value of 30.
- The ones digit is less than any other digit in the number.

What could the number be? Explain.

5 Write the value of each digit in the two numbers.

275	527
_____ + _____ + _____	_____ + _____ + _____

6 Look at Problem 5. Why do the 2, 5, and 7 have a different value in each number? Explain.

Self Check **Now you can write three-digit numbers. Fill this in on the progress chart on page 59.**

Ready®

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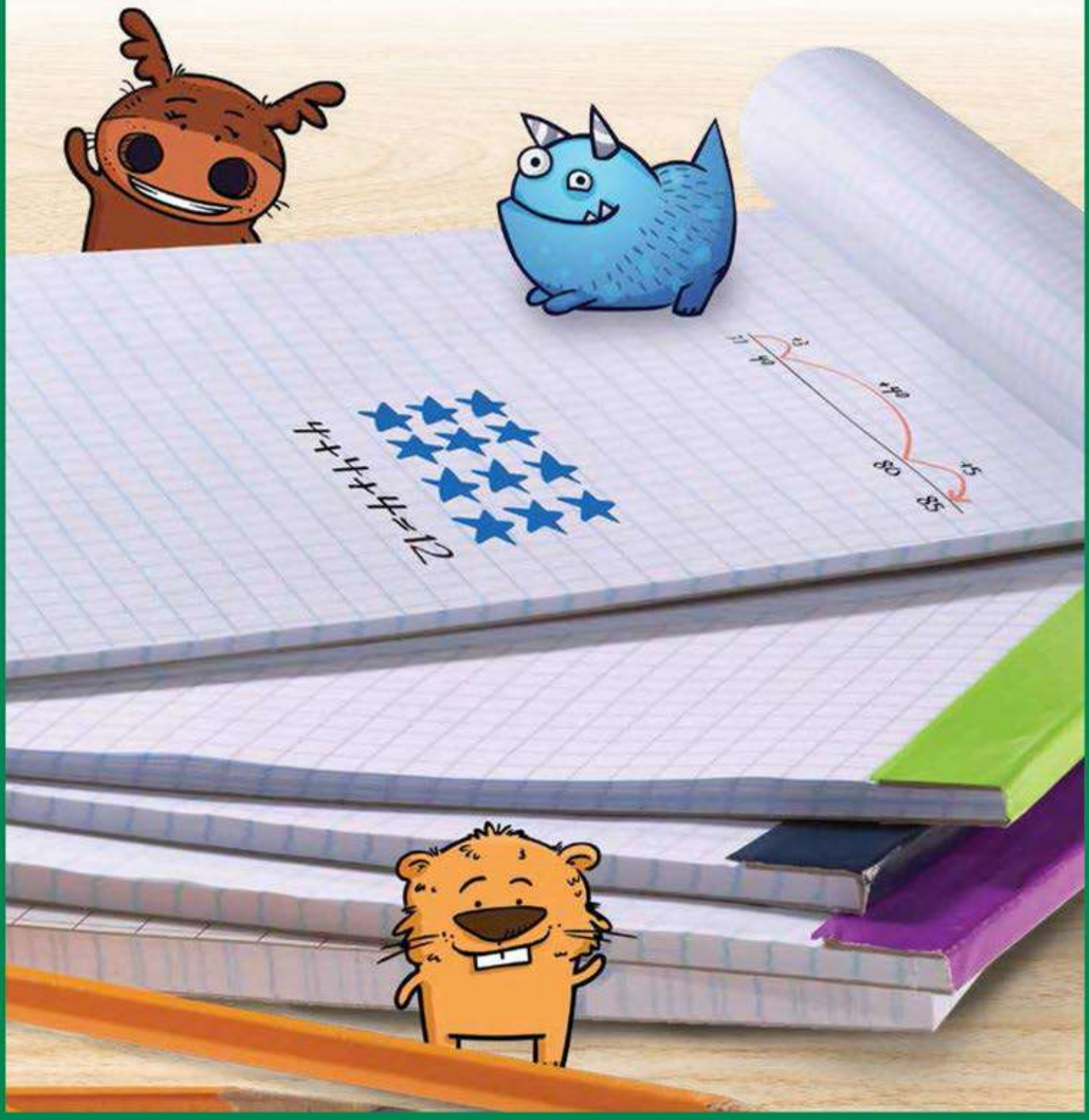
Mathematics
PRACTICE AND
PROBLEM SOLVING



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Family Letter available with every lesson.

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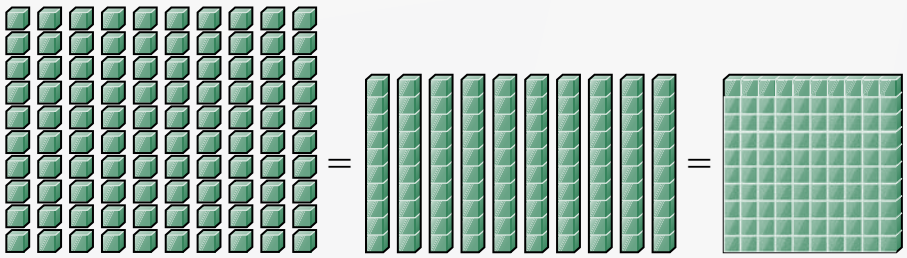
Family Letter available with every lesson.

Dear Family,

This week your child is exploring three-digit numbers.

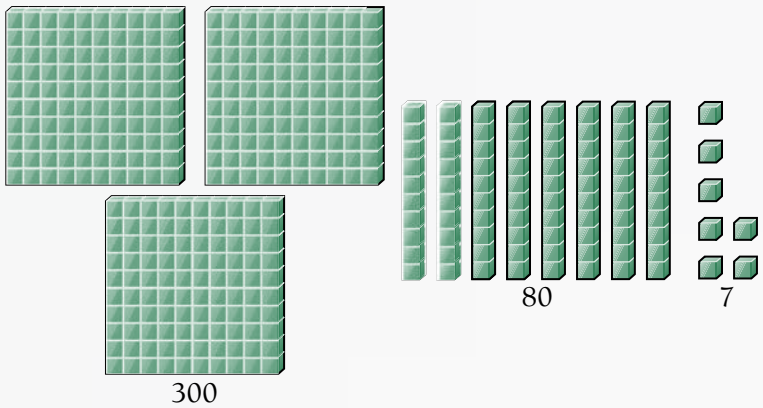
The first three-digit number is 100. It is the same as 100 ones, 10 tens, or 1 hundred.



Three-digit numbers have a hundreds place, a tens place, and a ones place.

	Hundreds	Tens	Ones
387	3	8	7

The hundreds place tells how many hundreds are in the number, the tens place tells how many tens, and the ones place tells how many ones.



Invite your child to explain what he or she knows about three-digit numbers by doing the following activity together.

NEXT

Hundreds Activity

Play the Guess My Number game.

- Think of a three-digit number (Example: 592).
- Give your child a clue and then have your child guess the number. The first clue should be which number is in the hundreds place. (Example: "5 is in the hundreds place.")
- If your child guesses your number, he or she wins the game. If the guess is incorrect, give your child another clue, the number in the tens place. (Example: "9 is in the tens place.")
- Have your child guess the number again. If the guess is incorrect give the final clue, the number in the ones place. (Example: "2 is in the ones place.")
- Encourage your child to use a place value chart to keep track of the clues and write the number.

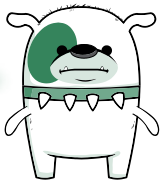
Hundreds	Tens	Ones
5	9	2

- Play the game again and have your child pick the number and give the clues.

Understand Three-Digit Numbers

Name: _____

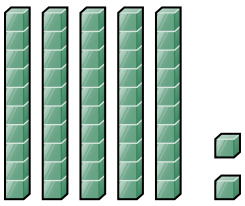
Prerequisite: How are two-digit numbers made up of tens and ones?



Study the example showing two-digit numbers as tens and ones. Then solve Problems 1–7.

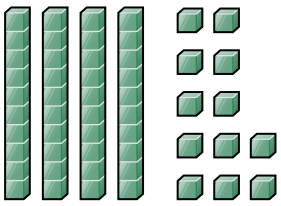
Example

You can show 52 as tens and ones. You can show this in different ways.



5 tens 2 ones

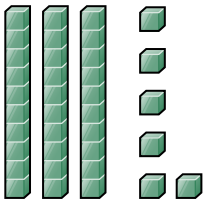
$50 + 2 = 52$



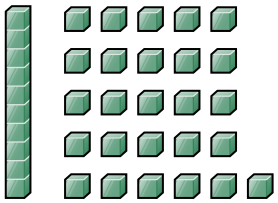
4 tens 12 ones

$40 + 12 = 52$

1 Show 36 as tens and ones. Fill in the blanks to show different ways.



_____ tens _____ ones



_____ tens _____ ones

2 You can show tens and ones in a chart. Complete the chart to show tens and ones in 36.

Tens	Ones
3	

3 Show tens and ones in 36 in a different way. Complete the chart.

Tens	Ones

Solve.

4 What are two different ways 47 can be shown with tens and ones? Fill in the blanks.

_____ tens _____ ones

_____ tens _____ ones

5 What are three different ways 91 can be shown with tens and ones? Fill in the blanks.

_____ tens _____ ones

_____ tens _____ ones

_____ tens _____ ones

6 What are two different ways 83 can be shown with tens and ones? Complete the charts.

Tens	Ones

Tens	Ones

7 Circle all the ways that show 54. Then write three other ways to show 54.

4 tens 14 ones

5 tens 4 ones

50 + 4

40 + 5

5 tens 14 ones

1 ten 44 ones

_____

_____

_____

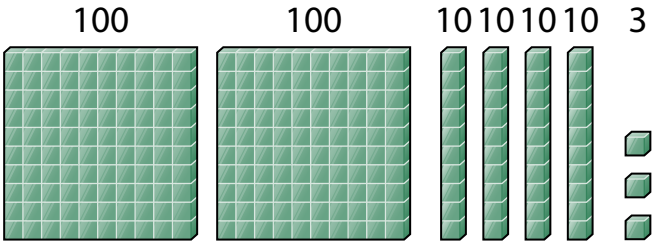
Name: _____

Understand Hundreds, Tens, and Ones

Study the example showing how to count hundreds, tens, and ones. Then solve Problems 1–6.

Example

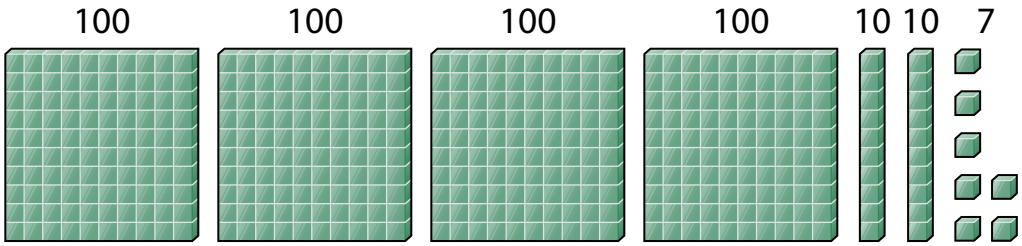
How many hundreds, tens, and ones are there?



Count:

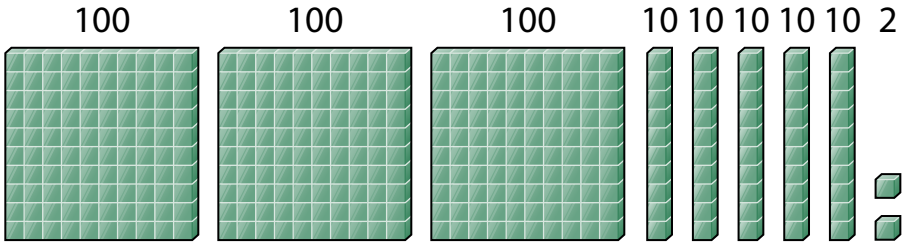
2 hundreds + 4 tens + 3 ones = 200 + 40 + 3 = 243

1 How many hundreds, tens, and ones are there?



_____ hundreds + _____ tens + _____ ones = 400 + 20 + 7 = 427

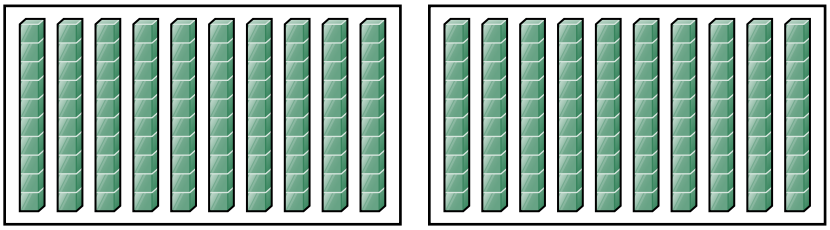
2 How many hundreds, tens, and ones are there?



_____ hundreds + _____ tens + _____ ones = 300 + 50 + 2 = 352

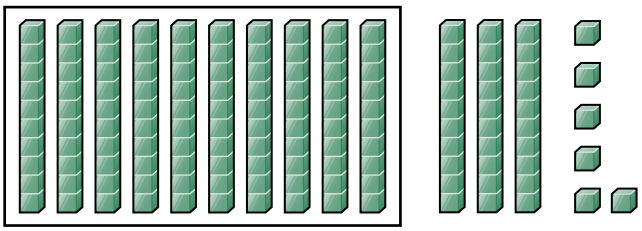
Solve.

3 This model shows 200 in tens. How many tens are in 200?



200 = _____ tens

4 This model shows 136 in tens. How many tens are in 136? How many ones are left over?



136 = _____ tens and _____ ones

5 Complete the chart to show 7 hundreds + 5 ones.

Hundreds	Tens	Ones
	0	5

6 Complete the chart to show 9 hundreds + 4 tens + 8 ones.

Hundreds	Tens	Ones

Name: _____

Reason and Write

Look at the example. Underline a part that you think makes it a good answer.

Example

Eva uses her blocks to build towers of 10 blocks each. There are 15 towers and 2 blocks left over.

1. Draw a picture to show Eva's blocks. Write the total number of blocks that Eva has.
2. Explain how you figured out how many blocks Eva has.
3. Show a different way you can write how many blocks Eva has.

Draw.

152 blocks

Explain.

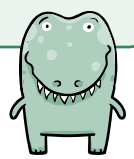
First I counted 10 towers because 10 tens is 100 blocks. Then I counted 5 more towers. That is the same as 50. Then I saw that there were 2 blocks left over. So Eva has 100 + 50 + 2, or 152 blocks.

Show a different way.

1 hundred + 5 tens + 2 ones

Where does the example . . .

- show the picture?
- show the number of blocks?
- use words to explain?
- show a different way to write the number of blocks?



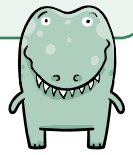
Solve the problem. Use what you learned from the example.

Ty uses his blocks to build towers of 10 blocks each. There are 14 towers and 5 blocks left over.

1. Draw a picture to show Ty's blocks. Write the total number of blocks that Ty has.
2. Explain how you figured out how many blocks Ty has.
3. Show a different way you can write how many blocks Ty has.

Did you . . .

- draw the picture?
- write the number of blocks?
- use words to explain?
- show a different way to write the number of blocks?



Draw.

Explain.

Show a different way.

TEACHER RESOURCE BOOK

Ready® Common Core

2 Mathematics INSTRUCTION

Teacher Resource Book

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2	Solve One-Step Word Problems 8a	**2.OA.A.1,** 2.OA.B.2, 2.NBT.B.5	1, 2, 3, 4, 5, 7	M
3	*Understand* Mental Math Strategies (Make a Ten) 18a	**2.OA.B.2**	1, 3, 4, 5, 7, 8	M
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Standards in boldface are the focus standards that address major lesson content.

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	Standards	Embedded SMPs	Emphasis
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LESSON OVERVIEW

Lesson 10
Understand Three-Digit Numbers

CCSS Focus

Domain
Number and Operations in Base Ten

Cluster
A. Understand place value.

Standards
2.NBT.A.1 Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:

a. 100 can be thought of as a bundle of ten tens—called a "hundred."

b. The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).

2.NBT.A.2 Count within 1000; skip-count by 5s, 10s, and 100s.

Standards for Mathematical Practices (SMP)
2 Reason abstractly and quantitatively.

3 Construct viable arguments and critique the reasoning of others.

7 Look for and make use of structure.

Lesson Objectives

Content Objectives
- Identify ones, tens, and hundreds in a three-digit number.
- Interpret models to determine the combinations of hundreds, tens, and ones in a number.
- Write a three-digit number in terms of varied combinations of hundreds, tens, and ones.

Language Objectives
- Tell how many hundreds, tens, and ones are in a given three-digit number.
- Tell how many tens are in 100 and in 200.

Prerequisite Skills
- Count to 100.
- Count by 10s and by 100s.
- Understand the concept of place value in two-digit numbers.

Lesson Vocabulary
There is no new vocabulary.

Learning Progression
In Grade 1 students are introduced to the concept of place value as it applies to two-digit numbers. This concept is reinforced in Grade 2 as students add and subtract two-digit numbers.

In this lesson students use base-ten blocks to understand that one hundred can be seen as 100 ones or 10 groups of ten. As students count groups of blocks, they record the number in a chart to aid in connecting the concept that a digit is used to indicate the number of groups of objects within a number. This leads to the realization that a digit's value is dependent upon its placement in a number. The 4 in 420 represents 4 groups of one hundred, while the 4 in 42 represents 4 groups of ten. This concept will be further developed in the next lesson as students learn to accurately read and write three-digit numbers.

As early as kindergarten, students are led to recognize the inclusive nature of numbers. Within 7 there is a group of 3 and a group of 4, or 2 groups of three and 1 more, etc. This concept is extended into Grade 1 with two-digit numbers and in Grade 2 with three-digit numbers. This understanding is foundational for upcoming work with subtraction and other operations in the future.

Lesson Pacing Guide

Whole Class Instruction

Day 1
45–60 minutes

Toolbox: Interactive Tutorial
Place Value to 1,000

Introduction
- Opening Activity *15 min*
- Think It Through Question *5 min*
- Think *5 min*
- Think *10 min*
- Reflect *5 min*

Practice and Problem Solving
Assign pages 103–104.

Day 2
45–60 minutes

Guided Instruction

Think About Hundreds, Tens, and Ones
- Let's Explore the Idea *15 min*
- Let's Talk About It *20 min*
- Try It Another Way *10 min*

Practice and Problem Solving
Assign pages 105–106.

Day 3
45–60 minutes

Guided Practice

Connect Ideas About Place Value in Three-Digit Numbers
- Evaluate *15 min*
- Analyze *15 min*
- Identify *15 min*

Practice and Problem Solving
Assign pages 107–108.

Day 4
45–60 minutes

Independent Practice

Apply Ideas About Place Value in Three-Digit Numbers
- Put It Together *30 min*
- Pair/Share *15 min*

Day 5
45–60 minutes

- On-Level, Intervention, or Challenge Activity *20 min*

Toolbox: Lesson Quiz
Lesson 10 Quiz

Small Group Differentiation

Teacher-Toolbox.com

Reteach
Ready Prerequisite Lessons *45–90 min*

Grade 1
- Lesson 17 *Understand* Tens
- Lesson 21 *Understand* Tens and Ones

Teacher-led Activities
Tools for Instruction *15–20 min*

Grade 1 *(Lessons 17 and 21)*
- Patterns on the Hundred Chart

Grade 2 *(Lesson 10)*
- Model Three-Digit Numbers

Student-led Activities
Math Center Activities *30–40 min*

Grade 2 *(Lesson 10)*
- 2.14 Skip Count by 10s and 100s
- 2.11 Three-Digit Number Vocabulary
- 2.12 Understand Three-Digit Numbers

Personalized Learning

i-Ready.com

Independent
i-Ready Lessons *10–20 min*

Grade 1 *(Lessons 17 and 21)*
- Grouping into Tens and Ones

Opening Activity

Tens and Hundreds

Objective Explore three-digit numbers.

Time *20–30 minutes*

Materials for each student

- connecting cubes

Overview

Students explore hundreds as 10 groups of ten by connecting cubes into groups of ten and bundling into groups of hundreds.

Step By Step

1 Build stacks of cubes.

- Organize students into pairs and provide them with connecting cubes.
- Ask students to build 4 stacks of 10 cubes each.
- Ask: *How many cubes did you stack?* [40] *How do you know?* [I counted them all; I counted by tens.]
- Tell students to combine their stacks with a partner. Ask: *How many cubes do you have now?* [8 stacks or 80 cubes]

2 Build hundreds.

- Ask partners to discuss how many more stacks they will need to have 100 cubes. Then have them make the extra stacks.
- Ask: *How many extra stacks did you make?* [2] H*ow many total stacks do you have?* [10] *How can you be sure you have 100 cubes stacked?* [count by tens]
- Ask: *How many stacks would you need to show 200 cubes?* [20] Have partners discuss this question and explain how they know.
- Share students' ideas as a class. You may want them to think about and suggest how many stacks would be needed to show 300, 400, 500, . . . cubes.

3 Apply the concept to multiples of ten.

- Have student pairs build 3 more stacks of 10 and combine them with the 10 stacks they made earlier. Ask partners to identify the total number of cubes they have both in terms of ones and tens, and in terms of hundreds and tens.

4 Extend the concept.

- Engage students in thinking about how they would show other multiples of 10 cubes. You may want to challenge them to think beyond the 100s using numbers such as 240, 350, etc.

Teacher Notes

Introduction

At a Glance

Students explore the meaning of one hundred through different models. They see that 100 can be expressed as 100 ones or 10 tens.

Step By Step

- Introduce the question at the top of the page. Emphasize that there are many ways to count to 100. Have students generate ideas of how they could count to 100. [by 1s, 2s, 5s, 10s, etc.]
- Draw students' attention to the number 100 shown on the chart. Ask students to share what they know about the number 100. [Students may respond that it is a "big" number, that it is "worth more" than 99, etc.]

▶ Mathematical Discourse 1

- Read the **Think** section together. After students circle groups of 10 ones, compare what they did to the model of the 10 tens. Students should notice that they circled ten groups of 10 and the model shows ten groups of 10.
- Refer students back to the hundreds chart on the page. Ask if they can find groups of 10 in the chart. Students may identify groups either horizontally or vertically. Although both are accurate, you may want to point out that the horizontal groups include the counting numbers within each ten.

▶ Mathematical Discourse 2

SMP TIP Look for Structure
Analyzing a hundreds chart for skip counting and identifying groups of ten helps students recognize the patterns and structure inherent in our number system, enabling them to become proficient with the base-ten number system. *(SMP 7)*

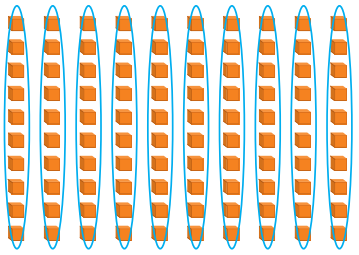
Think It Through

What is one hundred?

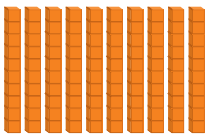
You can count to one hundred. After 99 is **100**.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	**100**

Think **One hundred is 100 ones. One hundred is 10 tens.**



100 = 100 ones



100 = 10 tens

Circle groups of 10 ones in 100.

▶ Mathematical Discourse

1 *Look at the hundreds chart. How is the number 100 different from the other numbers in its column?*

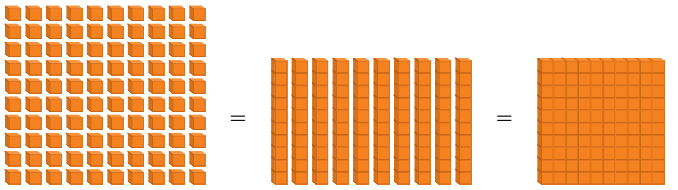
Answers will vary. Help students recognize that it has two zeros instead of only one.

2 *How does counting by tens help you think about 100?*

Instead of counting all the ones, I can count groups of ten to get to 100 much more quickly. I only have to count by tens 10 times, but it is equal to 100 ones.

Think **One hundred can be shown as hundreds, tens, or ones.**

Fill in the blanks.



100 ones = 10 tens = 1 hundred

Ways to Show 100			
Hundreds	**Tens**	**Ones**	
0	0	100	0 hundreds + 0 tens + 100 ones
0	10	0	0 hundreds + 10 tens + 0 ones
1	0	0	1 hundred + 0 tens + 0 ones

100

hundreds place

A three-digit number has a hundreds place. It tells how many hundreds there are in a number.

Reflect **Work with a partner.**

1 **Talk About It** Think about 200. How many hundreds does 200 have? How many tens? How many ones?

Write About It The number 200 has 2 hundreds, or 20 tens, or 200 ones.

Step By Step

- Read aloud the **Think** statement about one hundred at the top of the page. Then draw students' attention to the three picture models and ask what each one represents. Instruct students to fill in the blank under each model.

▶ Mathematical Discourse 3 and 4

- Instruct students to look at the chart and talk to a partner to decide which of the pictures matches each row on the chart. As they share ideas, make sure they understand that the hundreds block is locked together; it has no separate tens and ones. Similarly, each tens block has no separate ones.
- Read the sentence underneath the chart. Direct students' attention to the bottom row of the chart and discuss it. Use Mathematical Discourse question 5 to emphasize what the zeros in 100 represent.

▶ Mathematical Discourse 5

▶ Hands-On Activity

- Have students reply to the *Talk About It* question. Allow students to draw pictures, if necessary, but encourage them to use number representations also.

▶ Hands-On Activity

Use base-ten blocks to understand one hundred.

Materials: base-ten blocks

- Distribute the blocks so that each student has at least 30 ones blocks, 10 tens blocks, and 1 hundreds block.
- Instruct students to use their blocks to show 3 groups of 10. Ask students to show how many ones are in 3 groups of 10. Ask them to show 6 groups of 10. Ask: *How many ones do you think there are in 6 groups of 10?* [60] Make sure students justify their answers.
- Have students show a hundreds block. Ask how many ones they would have if they could break apart the block. [100] Then have them use tens blocks to show how many tens are in a hundreds block. [10]

▶ Mathematical Discourse

3 *How are the three pictures on this page alike?*

They all show 100.

4 *How are the pictures on this page different from each other?*

In the first one, all the pieces are separate. In the second one, the pieces are locked together in groups of ten, but there are spaces between each group. In the third one, all the pieces are locked together.

5 *Why do you think there are two zeros after the 1 in 100?*

Students should recognize that the zeros indicate that there are no tens or ones.

Ready Mathematics PRACTICE AND PROBLEM SOLVING

Assign *Practice and Problem Solving* **pages 103–104** after students have completed this section.

Guided Instruction

At a Glance

Students use counting strategies to understand three-digit numbers. Then students interpret models and organize three-digit numbers in varied ways.

Step By Step

Let's Explore the Idea

- Tell students that they will have time to work individually on the problems on this page and then share their responses in pairs. Ask students to look at the first set of models and count the groups of 100. Ask: *How many groups of 100 are shown?* [3] Instruct students to write that number on the blank. Encourage students to continue counting by hundreds to 900. Use Mathematical Discourse question 1 to connect counting strategies.

▶ Mathematical Discourse 1

- For Problem 3, reinforce the concept that the zeros following the 3 indicate that there are no separate tens or ones. You may want to write the following addition problem on the board: 100 + 100 + 100 = 300. Explain that they are putting groups together just as they do when adding.
- Have students look at the second group of models and ask how these compare to the first group. They should note that in this case, there are groups of ten that are not connected.
- As students complete this page individually, circulate among them. This is an opportunity to assess student understanding and address student misconceptions.

▶ Mathematical Discourse 2

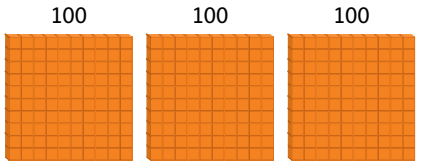
- Take note of students who are still having difficulty and wait to see if their understanding progresses as they work in pairs during the next part of the lesson.

SMP TIP Reason Abstractly and Quantitatively
Using counting strategies to interpret three-digit numbers builds a sense of quantities in students and enables them to use symbolic representations in a meaningful way. *(SMP 2)*

Think About **Hundreds, Tens, and Ones**

Let's Explore the Idea You can count three-digit numbers by hundreds, tens, and ones.

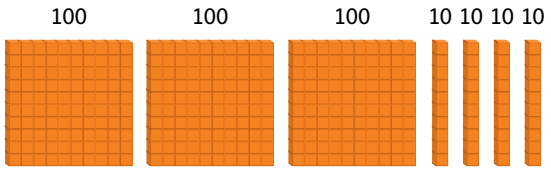
You can count hundreds.



2 Count: 1 hundred, 2 hundreds, 3 hundreds

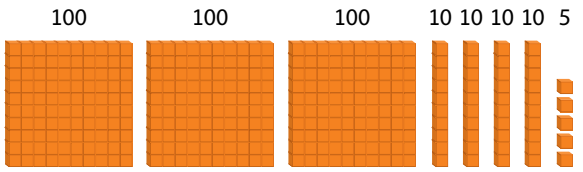
3 3 hundreds = 300

You can count hundreds and tens.



4 3 hundreds + 4 tens = 300 + 40 = 340

You can count hundreds, tens, and ones.



5 3 hundreds + 4 tens + 5 ones = 300 + 40 + 5 = 345

▶ Mathematical Discourse

1 *How is counting by hundreds like counting by tens?*

You count 1 group of one hundred, 2 groups of one hundred, 3 groups of one hundred, and so on, just like you count 1 group of ten, 2 groups of ten, 3 groups of ten, and so on.

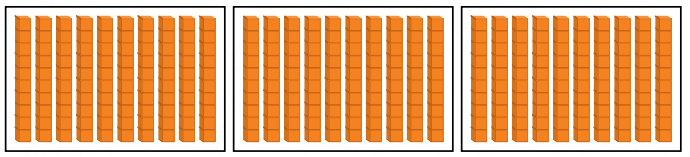
2 *Why doesn't it make sense to write 300 instead of 3 on the first blank, or 40 instead of 4 on the second blank?*

There aren't 300 groups of one hundred, but 3; and there aren't 40 groups of ten, but 4 groups of ten.

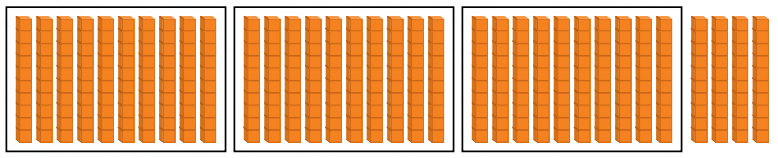
Let's Talk About It

Work with a partner.

6 This model shows 300 in tens. 300 = 30 tens

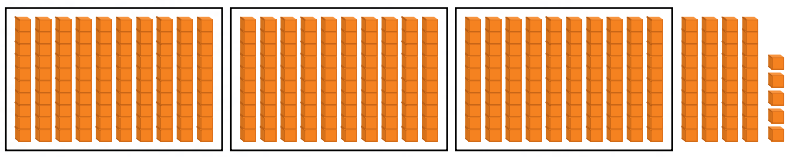


7 This model shows 340 in tens. 340 = 34 tens



8 This model shows 345 in tens. There are ones left over.

345 = 34 tens and 5 ones



Try It Another Way **Write hundreds, tens, and ones in a chart.**

Example

3 hundreds + 5 tens + 8 ones

Hundreds	Tens	Ones
3	5	8

9 5 hundreds + 3 tens

Hundreds	Tens	Ones
5	3	0

10 7 hundreds + 8 ones

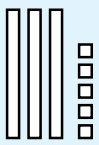
Hundreds	Tens	Ones
7	0	8

Visual Model

Draw models to show the importance of placeholders.

- Tell students that you will draw some simple models to help them understand placeholders. Draw the following on the board:

- Write 100 inside each square and 10 under each rectangle. Then write 3 hundreds + 5 tens = 350.
- Draw the following:



- Ask students to write the number shown by the model. [35] Compare the models to show that they are not equal.

Mathematical Discourse

3 *Why do you think there is a box around some of the tens? What does it represent?*

Students should recognize that there are 10 tens in each box, which represents 100. The boxes make it easier to count the groups.

4 *How do the models help you think about the number 345?*

It is easy to see the 10 tens in each hundred, and the extra tens and ones. In 345, there are 3 hundreds, 4 tens, and 5 ones, which is equal to 34 tens and 5 ones. Or 345 could be broken apart into 345 ones.

Step By Step

Let's Talk About It

- Organize students in pairs to answer Problems 6–8 on this page. You may choose to work through Problem 6 together.
- Walk around to each pair. Listen to and join in on discussions at different points. Use Mathematical Discourse questions 3 and 4 to help support or extend students' thinking.

▶ **Mathematical Discourse 3 and 4**

Try It Another Way

- Direct students' attention to **Try it Another Way**. Instruct them to continue to work in pairs to fill in the charts.
- Invite volunteers to come to the board to show how they completed the charts for Problems 9 and 10.
- Make sure students include a zero as a placeholder in each of the problems. Discuss that in the chart, it may not seem important to include the zero, but when the number is written out of the chart, it is very important.
- Write 260 on the board and ask students to read the number. Then write the number 26 on the board and ask them to read it. Ask: *Why is it important to add the zero on the end of 260?* [It makes the 26 mean 26 tens, not 26 ones.]

▶ **Visual Model**

Ready **Mathematics** PRACTICE AND PROBLEM SOLVING

Assign *Practice and Problem Solving* **pages 105–106** after students have completed this section.

Guided Practice

At a Glance

Students demonstrate their understanding of three-digit numbers by analyzing different ways to represent them. Then students represent quantities in different ways.

Step By Step

- Discuss each problem as a class using the discussion points outlined below.

Evaluate

- Ask students to explain the error Lana made. [She didn't write a zero in the tens place to show there are no separate tens.]
- Then ask: *How would you help Lana understand what she did wrong?* Encourage volunteers to share their ideas with the class.

Analyze

- Write the way each student represented the number 572 on separate sections of the board. Ask students to talk to a partner about what each student did.
- Encourage volunteers to come to the board to draw models showing what Sam and Lev did. You may want to ask students to draw □ for 100, | for 10, and • for one. Make sure that for the 57 tens, groups of 10 tens are boxed to represent a group of 100. This will make the models more visually similar.

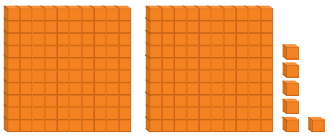
Identify

- Draw the completed chart from the student page on the board. Add several blank rows to the bottom of the chart.
- Ask: *Can you think of another way to show 256?* If there are no viable responses, make suggestions such as: *How would you complete the rest of the row if there were 20 tens?* Or: *What if I put 126 in the ones column?*
- Write those numbers in additional rows at the bottom of the chart and allow students to determine how they might complete each row.

Connect Ideas About Place Value in Three-Digit Numbers

Talk about these questions as a class. Then write your answers.

11 Evaluate Lana did this homework problem.
What did she do wrong?



2 hundreds + 6 ones = 26

Possible answer: Lana didn't put a 0 in the tens place. So she wrote the 2 hundreds as 2 tens.

12 Analyze Look at how Sam and Lev wrote 572.
Explain what each person did.

Sam 572 = 57 tens + 2 ones

Lev 572 = 5 hundreds + 7 tens + 2 ones

Sam used only tens and ones to write the number. 57 tens is 570.

570 + 2 = 572. Lev used hundreds, tens, and ones. 500 + 70 + 2 = 572.

13 Identify Fill in the blanks to show 256 in different ways.

Hundreds	Tens	Ones
0	0	256
0	25	6
2	5	6

Scoring Rubrics

Part A

Points	Expectations
2	The student draws an accurate model to represent the situation.
1	The student is partially correct. Some elements of the model may be accurate but not all of them.
0	The student is not able to accurately complete the model.

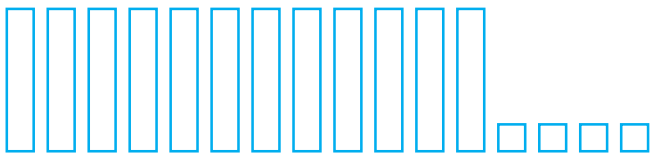
Apply Ideas About Place Value in Three-Digit Numbers

Put It Together **Use what you have learned to complete this task.**

14 Nate puts his coins in stacks of ten. He has 12 stacks of coins with 4 coins left over.

Part A Draw a picture to show Nate's coins.

Possible drawing:



Part B How many coins does Nate have? Write the answer in two different ways.

Possible answer: 12 tens + 4 ones; 120 + 4, or 124 coins

Part C Nate gets 30 more coins from a friend. Nate says that he now has 190 coins. Do you agree or disagree? Explain.

Possible answer: I disagree. Nate had 124 coins and got 30 more.

124 + 30 = 154, not 194. So Nate now has 154 coins.

Independent Practice

Step By Step

Put It Together

- Direct students to complete the **Put It Together** task on their own.
- Have counters or tiles available for students to stack, if necessary, to make sense of the problem.
- Suggest that students draw rectangles or simple cylinders to represent the stack of coins. It is not necessary to show the ten coins in each stack; however, some students may need to do this. Encourage students to focus on the task rather than on making an artistic drawing.
- For Part C, students may use a drawing or equation to solve. Remind them to explain why they agree or disagree.
- As students work on their own, walk around to assess their progress and understanding, to answer their questions, and to give additional support, if needed.
- If time permits, have students share the strategies they used in completing the task.

Ready Mathematics PRACTICE AND PROBLEM SOLVING

Assign *Practice and Problem Solving* **pages 107–108** after students have completed Guided Practice.

Part B

Points	Expectations
2	The student answers correctly and writes the number in two different ways.
1	The answer is correct, but only one written representation is accurate.
0	The student is not able to accurately answer or write the number in two ways.

Part C

Points	Expectations
2	The student disagrees with Nate and justifies this response by using an accurate model, correct equation, or logical reasoning.
1	The student disagrees with Nate but does not fully justify this response with an accurate model, correct equation, or logical reasoning.
0	The student agrees that Nate now has 190 coins or disagrees and does not provide a logical reason.

Differentiated Instruction

▶ Intervention Activity

Break apart numbers.

Materials: base-ten blocks, Place-Value Mat (Activity Sheet 6), Three-Digit Cards (Activity Sheet 7), and a blank card

- Provide each student with base-ten blocks, a blank card, and a place-value mat. Place the three-digit number cards facedown. Each student draws a card.
- Have students use the blank card to cover the tens place and ones place on the three-digit number card. Then students place hundreds blocks on the mat to represent the hundreds digit in the number. Slide the blank card to show the number of tens blocks to place on the mat. Finally, slide the blank card again and place the number of ones shown. You may want to repeat this activity several times.

▶ On-Level Activity

Play three-digit number "around the table."

Materials: For each student: base-ten blocks and Place-Value Mat (Activity Sheet 6); For each group: Three-Digit Cards (Activity Sheet 7)

- Place students in groups of 3. Provide each student with a place-value mat and base-ten blocks. Place the cards facedown in a pile. Allow one student to pick a card and use blocks to represent the number on the mat. The student to the right must represent the same number in a different way, and then the last student must represent the number in another way.
- The only rule is that no one can use *all* ones to represent the number. Once students have agreed that all the representations are accurate, they record each representation. The second student in the group picks a card and play resumes as in the first round. Continue until time is up or the cards have all been used.

▶ Challenge Activity

Find all the ways to show a three-digit number.

Materials: paper and pencil

- Refer back to the **Identify** activity students did as a class during Guided Practice. Help students draw a similar chart, or have one drawn for each of them. Ask them to label the columns Hundreds, Tens, and Ones. (You will need to have extra paper or extra charts available.)
- Tell students you want them to try to find *all* the ways to show 127 on the chart. Encourage them to think of possible strategies they may use before beginning. Allow students to discuss those strategies with each other or with you.
- After students have completed the task, evaluate their charts to determine if they have included all the ways to show 127. Then have them present their charts to the class. Ask them to discuss the patterns they used and then display the charts on the wall or bulletin board.

Teacher Notes

LESSON OVERVIEW

Lesson 11
Read and Write Three-Digit Numbers

CCSS Focus

Domain
Number and Operations in Base Ten

Cluster
A. Understand place value.

Standards
2.NBT.A.3 Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.

Standards for Mathematical Practices (SMP)
2 Reason abstractly and quantitatively.

4 Model with mathematics.

7 Look for and make use of structure.

Lesson Objectives

Content Objectives
- Identify the place value of each digit in a three-digit number.
- Model three-digit numbers.
- Interpret a model and write the number value.

Language Objectives
- Read aloud three-digit numbers.
- Write three-digit numbers in expanded form.
- Write a three-digit number shown with base ten blocks.

Prerequisite Skills
- Understand two-digit numbers.
- Count by tens and hundreds.
- Add two-digit numbers.

Lesson Vocabulary
- **digit** any one of the ten symbols used to write numbers: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9

Review the following key term.

- **place value** the value assigned to a digit based on its position in a number. For example, the 2 in 324 is in the tens place and has a value of 2 tens or twenty.

Learning Progression

In Grade 1 students explore the concept of place value by bundling 10 ones to make groups of ten. They learn to read numbers between 9 and 99, and write them using proper digit placement.

In this lesson this concept is extended to include the hundreds place as a group of 10 tens. Through active involvement, students make sense of the place-value system, recognizing a digit as a symbol that tells the number of groups of hundreds, tens and ones in a number. They then learn to read the numbers accurately.

In Grades 3 and 4 a firm grasp of this concept is essential for students to fully understand addition and subtraction of numbers with more than three digits, as well as to understand multiplication and division of multi-digit numbers. Place-value concepts are then extended to decimal places in Grade 5.

Lesson Pacing Guide

Whole Class Instruction

Day 1
45–60 minutes

Toolbox: Interactive Tutorial
Place Value and Writing Numbers in Standard Form

Introduction
- Opening Activity *10 min*
- Use What You Know *10 min*
- Find Out More *10 min*
- Reflect *10 min*

Practice and Problem Solving
Assign pages 111–112.

Day 2
45–60 minutes

Modeled and Guided Instruction

Learn About Finding the Value of Three-Digit Numbers
- Picture It/Picture It/Model It *10 min*
- Connect It *25 min*
- Try It *10 min*

Practice and Problem Solving
Assign pages 113–114.

Day 3
45–60 minutes

Guided Practice

Practice Reading and Writing Three-Digit Numbers
- Example *5 min*
- Problems 7–9 *15 min*
- Pair/Share *15 min*
- Solutions *10 min*

Practice and Problem Solving
Assign pages 115–116.

Day 4
45–60 minutes

Independent Practice

Practice Reading and Writing Three-Digit Numbers
- Problems 1–6 *20 min*
- Quick Check and Remediation *10 min*
- Hands-On or Challenge Activity *15 min*

Toolbox: Lesson Quiz
Lesson 11 Quiz

Small Group Differentiation

Teacher-Toolbox.com

Reteach
Ready Prerequisite Lessons *45–90 min*

Grade 1
- Lesson 21 *Understand* Tens and Ones
- Lesson 22 Compare Numbers

Teacher-led Activities
Tools for Instruction *15–20 min*

Grade 1 *(Lessons 21 and 22)*
- Compare Two-Digit Numbers

Grade 2 *(Lesson 11)*
- Model Three-Digit Numbers

Student-led Activities
Math Center Activities *30–40 min*

Grade 2 *(Lesson 11)*
- 2.15 Three-Digit Number Vocabulary Match
- 2.16 Ways to Write a Number

Personalized Learning

i-Ready.com

Independent
i-Ready Lessons *10–20 min*

Grade 1 *(Lessons 21 and 22)*
- Grouping into Tens and Ones
- Comparing Numbers to 100 Using Symbols

Opening Activity

Put Together Hundreds, Tens, and Ones

Objective Express three-digit numbers in terms of hundreds, tens, and ones.

Time *10–15 minutes*

Materials for each student

- base-ten blocks
- Activity Sheet 6 (Place-Value Mat)
- Activity Sheet 1 (Digit Cards)

Overview

Students build numbers involving hundreds, tens, and ones and express the value of each one.

Step By Step

1 Build a number.

- Provide students with base-ten blocks and a place-value mat.
- Ask students to place 3 hundreds blocks, 2 tens blocks, and 7 ones blocks in their proper locations on the mat.

2 Read a number.

- Hold up a hundreds block. Ask: *What does this show?* [one hundred ones] *How many hundreds are on your mat?* [3] Have students place the digit card "3" under the hundreds place.
- Display a tens block. Ask: *What does this show?* [10 ones] *How many tens blocks are on your mat?* [2] Have students place the digit card "2" under the tens place.
- Ask: *What does a ones block show?* [one] *How many ones blocks are on your mat?* [7] Have students place the digit card "7" under the ones place.

3 Put it all together.

- Ask: *What number is used to show 3 hundreds?* [300] *What number is used to show 2 tens?* [20] *What number is used to show 7 ones?* [7]
- Now put together the numbers you just used for hundreds, tens, and ones. How do you say this new number? [three hundred twenty-seven]

4 Repeat with other numbers.

- Repeat the steps above using other numbers such as 452, 691, and 758.
- Tell students that in this lesson, they will learn more about reading and writing numbers in the hundreds.

Teacher Notes

Introduction

At a Glance

Students use what they know about hundreds, tens, and ones to solve a problem. Then students determine the value of a digit based on its placement in a number.

Step By Step

- Work through **Use What You Know** as a class.
- Tell students that this page shows them how to think about and write a three-digit number.
- Have students read the problem at the top of the page. Ask: *Is the number of packs Jan buys the same as the number of balloons she buys? Explain*. Students should recognize that since each pack contains more than one balloon, she buys many more balloons than packs.
- You may wish to show hundreds blocks, tens blocks, and ones blocks to represent the balloons in the problem. Discuss that each hundreds block contains 100 ones just as each pack of 100 contains 100 balloons. The *value* of the block or the pack is in terms of ones. Repeat with the value of a tens block and ten pack.
- After students complete Part d, ask them to tell what numbers they wrote in the blanks and explain why.
- Instruct students to circle the 2, the 7, and the 5 that they wrote to fill in the first blank in Part a, Part b, and Part c. Discuss that in the sum of Part d, the 2 is in the hundreds place, the 7 is in the tens place, and the 5 is in the ones place.

SMP TIP Reason Abstractly and Quantitatively
Seeing three-digit numbers in a variety of contexts enables students to make sense of the values represented by digit placement and the quantity as a whole. *(SMP 2)*

▶ Real-World Connection

Read and Write Three-Digit Numbers

Use What You Know

Write three-digit numbers with hundreds, tens, and ones.

Jan buys 2 packs of 100 balloons. She also buys 7 packs of 10 balloons and 5 single balloons. How many balloons does Jan buy?

a. 2 packs of 100 = 2 hundreds
The number of balloons in 2 packs of 100 is 200.

b. 7 packs of 10 = 7 tens
The number of balloons in 7 packs of ten is 70.

c. 5 single balloons = 5 ones
The number of single balloons is 5.

d. Complete the equation to find the total number of balloons.

200	+	70	+	5	=	275
100s		10s		1s		

▶ Real-World Connection

Show students a ten dollar bill (you may use realistic play money). Ask: *How many bills do you see?* [1] *If I traded this in for one dollar bills, how many would I get?* [10] Hold the ten dollar bill in one hand and 10 one dollar bills in the other and ask which is more—the 1 ten or the 10 ones. Students should recognize that they represent the same amount of money. Then show a one hundred dollar bill and ask how many ten dollar bills you would get if you traded it in for tens. How many ones? Reinforce the concept that one bill can have a value of more than one dollar.

Find Out More

The **digits** 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9 make up all numbers. The digit's place in a number tells its value.

The same digit can have different values.
Look at the value of each 4 in this number.

Hundreds	Tens	Ones
4	4	4
↓	↓	↓
400	40	4

Reflect **Work with a partner.**

1 **Talk About It** When does the digit 8 have a value of 8? 80? 800? What are some three-digit numbers that show these values?

Write About It Possible answer: 8 has a value of 8 when it is in the ones place, like in 218. 8 has a value of 80 when it is in the tens place, like in 281. 8 has a value of 800 when it is in the hundreds place, like in 812.

Step By Step

- Read **Find Out More** as a class.
- Use the Concept Extension and Mathematical Discourse question 1 to reinforce the concept of digits.

▶ Concept Extension

▶ Mathematical Discourse 1

- Help students interpret the information in the place-value chart. Explain that a 4 in the tens place means 4 tens, or 40. A 4 in the ones place means 4 ones, or 4. You may want to use base-ten blocks to support these ideas.
- Ask students to work with a partner to answer the *Talk About It* questions. After students complete *Write About It*, have them share their numbers, evaluating them for accuracy.

▶ Mathematical Discourse 2

Ready Mathematics PRACTICE AND PROBLEM SOLVING

Assign *Practice and Problem Solving* **pages 111–112** after students have completed this section.

▶ Concept Extension

Discuss digits as symbols.

- Explain to students that we use many symbols in our world. For example, they might see a  on a bike trail to tell them to turn right. In math, we use symbols like + and = to tell us what to do or what something means.
- A digit is a symbol that tells how many groups of ones, tens, hundreds, and so on, there are in a number. The digits we use are 0–9.
- In a two-digit number, such as 37, the digits 3 and 7 tell how many groups there are within the number—the "3" means there are 3 groups of 10, and the "7" means there are 7 groups of one.
- Write several two- and three-digit numbers on the board. Ask students to tell you what the number is and identify the digits and their values.

▶ Mathematical Discourse

1 *Why isn't the number 23 called a digit?*

Students should respond that 23 uses two symbols or digits. A digit is only one symbol.

2 *Why might a student write two hundred seventy-five as 200705? Why is it incorrect?*

The student just wrote all the values next to each other. It is not correct because the number is too great. The 7 is in the hundreds place instead of the 2, and the zero is in the tens place instead of the 7.

Modeled and Guided Instruction

At a Glance

Students examine a three-digit number represented in pictures and in a chart. Then students revisit this problem by connecting the digits to the values they represent.

Step By Step

- Read the problem at the top of the page as a class. Refer back to the Real-World Connection in Part One, reminding students that 1 ten dollar bill is equal to 10 one dollar bills, so its value is ten dollars. Then remind them of the value of a one hundred dollar bill in a similar manner.

▶ English Language Learners

Picture It

- Draw students' attention to **Picture It**. Ask them to describe what the picture shows. Ask how many bills they see. [6] Ask: *Do the number of bills tell how much money Amir has? Explain.* [Students should be able to articulate that since each one hundred dollar bill is equal to 100 ones and the ten dollar bill is equal to 10 ones, Amir must have more money than 6 dollars.]

Picture It

- Connect the quick drawing to the bills by asking students to write 100, 10, or 1 next to each part of the quick drawing.

▶ Visual Model

Model It

- Help students connect the place-value chart in **Model It** to the picture and quick drawing.

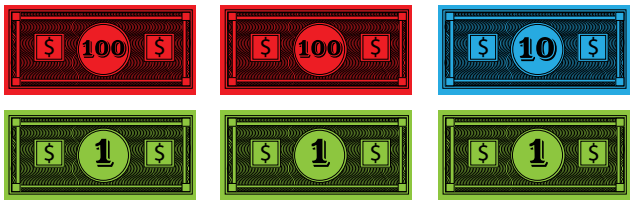
SMP TIP Model with Mathematics
To reinforce modeling, use the problem on this page, but change Amir's winnings to 6 hundreds bills, 3 tens bills, and 5 ones bills. Draw on the board the bills of play money that Amir wins. Instruct students to make a quick drawing to represent the winnings and then show the amount in a place-value chart. *(SMP 4)*

Learn About **Finding the Value of Three-Digit Numbers**

Read the problem. Then you will show hundreds, tens, and ones in different ways.

Amir plays a board game that uses play money.
He wins 2 hundreds bills, 1 tens bill, and 3 ones bills.
What is the total value of the bills Amir wins?

Picture It You can draw a picture to show the problem.



Picture It You can make a quick drawing to show hundreds, tens, and ones.

Model It You can show hundreds, tens, and ones in a chart.

Hundreds	Tens	Ones
2	1	3

▶ English Language Learners

For students who are not familiar with American dollars, use money from their native country whose denominations are in powers of ten, such as the Mexican 1 peso coin, 10 peso coin, and 100 peso bill.

▶ Visual Model

Use quick drawings as a visual model of base-ten blocks.

Materials: base-ten blocks

- Distribute base-ten blocks to students and ask them to show the amount of money Amir wins using the blocks.
- Have students tell the blocks they used and justify their choices.
- Ask how they know each of the hundreds blocks is equal to 100. [Students should see that each hundreds block is divided into 100 units.] Point out the similar shape of the hundreds blocks and the quick drawing squares, and the similar shape of the tens blocks and the vertical line.
- Tell students that the quick drawings are like the blocks but without all the ones shown, to make them "quick" to draw.

Connect It Write the number as hundreds, tens, and ones.

2 Look at the models on the previous page. How many hundreds, tens, and ones are there?

2 hundreds 1 ten 3 ones

3 What is the value of the hundreds bills? 200 dollars

What is the value of the tens bill? 10 dollars

What is the value of the ones bills? 3 dollars

4 Write an equation to find the total value of all the bills.

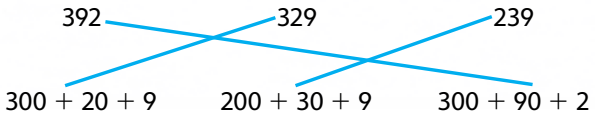
200 + 10 + 3 = 213 dollars

5 **Talk About It** Amir wins 2 more tens bills. How would you write the new total value of Amir's play money? Explain how you found your answer.

Write About It 233. Possible answer: Amir has 2 more tens. I added 2 to the tens digit. The value of Amir's bills was 213. When I added 2 to the tens digit, the value became 233.

Try It Try another problem.

6 What is another way to show each number? Draw lines to connect each number to another way to write the number.



▶ Hands-On Activity

Connect base-ten blocks and digit placement.

Materials: base-ten blocks, Activity Sheet 6 (Place-Value Mat), and Activity Sheet 1 (Digit Cards)

- Distribute the materials and ask the students to show the number 324 with base-ten blocks. (Do not write the number.)
- Have them place the digit cards in the proper places on their chart to show the number. To connect the digits and their placement with the 3 hundreds blocks, 2 tens blocks, and 4 ones blocks, have students write the expanded form and sum 300 + 20 + 4 = 324.
- Repeat as necessary to solidify the concept. Include numbers such as 420 and 205 to reinforce the concept of 0 as a placeholder.

Step By Step

Connect It

- Read **Connect It** as a class. Make sure students understand that the questions refer to the problem on the previous page.
- For Problem 3, ensure students understand that the value they are finding is the combined value of each kind of bill, not the value of only one bill.
- As students complete Problem 4, ask them why it makes sense to add all the values together.

▶ Hands-On Activity

- For Problem 5, make sure students understand that the 2 tens Amir wins are in addition to the money he has already won.

Try It

- Tell students that they may use a picture or other model to help solve the **Try It** problem. Have students explain the thinking they used in solving the problem.

6 **Solution**

392 = 300 + 90 + 2; 329 = 300 + 20 + 9; 239 = 200 + 30 + 9

Error Alert Watch for students who may invert the 9 and 2 in 329 and 392.

SMP TIP Look for Structure

Ask students to describe the structure that is inherent in our place-value system. In a three-digit number, the first digit represents the number of hundreds, the second digit represents the number of tens, and the third digit represents the number of ones that together equal the number. *(SMP 7)*

Ready Mathematics PRACTICE AND PROBLEM SOLVING

Assign *Practice and Problem Solving* **pages 113–114** after students have completed this section.

Guided Practice

At a Glance

Students connect various representations to three-digit numbers.

Step By Step

- Ask students to solve the problems individually and show all their work. Tell students to describe their thinking.
- For Problem 7, encourage students to describe how they found each digit. For students who are struggling with Problem 9, suggest that they draw a place-value chart.
- **Pair/Share** When students have completed each problem, have them Pair/Share to discuss their solutions with a partner.

Solutions

Example A place-value chart is used to help students organize the digits in a number that is described in written form. Students could also write the number in expanded form: $500 + 90 + 4 = 594$.

7 Solution
The secret number is 942; 9 is one more than 8, 40 equals 4 tens, and 2 ones is 2.
DOK 2

Practice Reading and Writing Three-Digit Numbers

Study the model below. Then solve Problems 7–9.

Example

Mrs. Cole wrote this number on a check.

five hundred ninety-four

What is this number?

You can show your work in a chart.

Hundreds	Tens	Ones
5	9	4

five hundred ninety-four

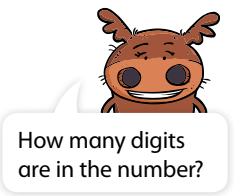
Answer The number is 594.

7 Pat wrote these clues about his secret number.

- The hundreds digit is 1 more than 8.
- The tens digit has a value of 40.
- The number has 2 ones.

What is the secret number?

Show your work.



Possible work: 9 is 1 more than 8. 40 is 4 tens. 2 ones is 2.

Hundreds	Tens	Ones
9	4	2

Answer The secret number is 942.

Teacher Notes

8 Jim is playing a board game. This is Jim's play money. Write the amount in two different ways.

What is the value of each kind of bill in the problem?

100 dollars + 30 dollars + 2 dollars

132 dollars

9 Which number is the same as 700 + 6?

A 76

B 607

C 706

D 760

How many tens does the number have?

Zoey chose **A** as the answer. This answer is wrong. How did Zoey get her answer?

Possible answer: She didn't put a zero in the tens place to show that there are 0 tens.

Solutions

8 Solution

100 dollars + 30 dollars + 2 dollars is 132 dollars.

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9 Solution

C; 700 + 6 = 706.

Explain to students why the other choices are not correct:

B is not correct because 607 = 600 + 7 ≠ 700 + 6.

D is not correct because 760 = 700 + 60 ≠ 700 + 6.

DOK 3

Ready **Mathematics** PRACTICE AND PROBLEM SOLVING

Assign *Practice and Problem Solving* **pages 115–116** after students have completed this section.

Teacher Notes

Independent Practice

At a Glance

Students solve problems about three-digit numbers that might appear on a mathematics test.

Solutions

1 Solution
A 2 hundreds = 200, and 5 ones = 5;
D The 2 is in the hundreds place, and the 5 is in the ones place.
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2 Solution
3, 4, 6; 300, 40, 6; 346
DOK 2

3 Solution
B 36 tens = 360 ones; **C** 300 + 60 = 360;
D 360 = 300 + 60 or 3 hundred and 6 tens.
DOK 2

Practice Reading and Writing Three-Digit Numbers

Solve the problems.

1 What is another way to show 2 hundreds and 5 ones? Circle all the correct answers.

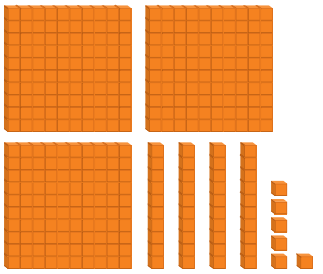
(A) 200 + 5

B 25

C 200 + 50

(D) 205

2 What does the model show? Fill in the table and the blanks.



Hundreds	Tens	Ones
3	4	6

Value: 300 + 40 + 6

Total: 346

3 A bear at the zoo weighs 360 pounds. What is true about this number? Circle all the correct answers.

A It is 300 + 6.

(B) It equals 36 tens.

(C) It is 300 + 60.

(D) It has 3 hundreds and 6 tens.

Quick Check and Remediation

- Jamie is collecting coins. She has 4 jars with one hundred coins in each jar and 7 more coins. How many coins does Jamie have? [407]
- For students who are still struggling, use the chart to guide remediation.
- After providing remediation, check students' understanding using the following problem: Sam is the banker for a board game. Each player gets $240 to start the game. How many hundreds bills and tens bills could he give each player? [Possible answer: 2 hundreds bills and 4 tens bills]

If the error is . . .	Students may . . .	To remediate . . .
47	have placed the digits 4 and 7 together.	Provide students a place-value chart. Help them model the situation by writing in the chart the digit that represents the number of jars and the number of extra coins Jamie has. Assist students in writing the number correctly.
470	have written the 7 in the tens place instead of the ones place.	Help students write the value of the total number of coins in the jars and the extra coins in expanded form: 400 + 7. Help them see that there are no groups of ten, so they should write 400 with a 7 in the ones place.
11	have added the two numbers shown.	Use base-ten blocks to model the situation, ensuring the student recognizes the 100 ones in each hundreds block. Have students count by 100s to find the total in the 4 hundreds blocks (or 4 jars) and then add the additional ones. Write the total in a place-value chart and as a sum.

4 Here are clues about a number.

- The number has 7 hundreds.
- The tens digit has a value of 30.
- The ones digit is less than any other digit in the number.

What could the number be? Explain.

Possible answer: The number could be 732. The number has 7 hundreds, so the hundreds digit is 7. 30 is 3 tens, so the tens digit is 3. The ones digit is less than 7 and less than 3. So the ones digit could be 2.

5 Write the value of each digit in the two numbers.

275	527
200 + 70 + 5	500 + 20 + 7

6 Look at Problem 5. Why do the 2, 5, and 7 have a different value in each number? Explain.

Possible answer: The 2, 5, and 7 are in different places in each number. So, the values are different in each number.

Self Check **Now you can write three-digit numbers. Fill this in on the progress chart on page 59.**

Solutions

4 Solution
7 hundreds = 700, 30 is 3 tens, 1 and 2 are less than both 3 and 7. So students may list 731 or 732. Check students' explanations.
DOK 3

5 Solution
200 + 70 + 5; 500 + 20 + 7
DOK 1

6 Solution
Possible answer: The 2, 5, and 7 are in different places in each number. The place it is in gives the digit its value.
DOK 2

▶ Hands-On Activity

Race to 500.

Materials: [For each student] Activity Sheet 6 (Place-Value Mat); [For each pair] base-ten blocks, at least 2 sets of 0–9 cards from Activity Sheet 1 (Digit Cards), and 2 number cubes (1 white and 1 colored)

- Organize students into pairs and distribute the materials. Instruct students to take turns rolling the number cube and using base-ten blocks to model what they roll.
- The number on the white cube tells how many ones blocks they take, and the number on the colored cube tells how many tens blocks. They place digit cards on the place-value mat to show the total.
- On the next and subsequent rolls, students add the number of blocks rolled to what they already have, organize their blocks into groups of ones, tens, and hundreds, and display with digit cards on the place-value chart. Continue until one player reaches 500.

▶ Challenge Activity

Explore beyond hundreds.

Materials: place-value chart showing at least 6 place-value positions with only the Ones, Tens, and Hundreds columns labeled

- Challenge students to explore numbers greater than 999 by giving them a place-value chart showing at least 6 place-value positions.
- Ask them to fill in the place values they already know. They should be able to fill in ones, tens, and hundreds.
- Tell them that their task is:

1. to find out what label belongs in the remainder of the place-value positions on the chart (using whatever resources they need).
2. to figure out the value of each of the labels.
3. to write numbers with six or more place values in expanded form and read them using the proper place-value names.