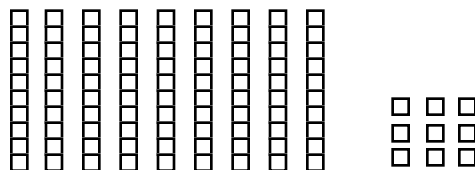


## Lesson 9 Place Value: Units and Tens

I define this important subject as "Every value has its own place!" To an older child I would add, "Place determines value!" Both are true. There are ten symbols to tell you how many, and many values to represent what kind or what value. 0 through 9 tell us how many; unit and tens tell us what kind. For the sake of accuracy, units will be the word used to denote the first value, instead of ones. One is a counting number which tells us how many, and units is a place value which denotes what kind. This will save potential confusion when saying ten ones or one ten. Remember, 1 is a number and units is a place value. The numerals (0, 1, 2, ...9) tell us how many tens, or how many units. We begin our study focusing on the units and tens, but there are other values such as hundreds, thousands, millions, billions...

When teaching this, I like to use a street since I'm talking about a place. I call the street Decimal Street and have the little green units house and the tall blue tens house next door. We don't want to forget what we learned from counting - that we only count from zero to nine and then we start over. To make this more real, begin by asking, "What is the largest number of units that can live in this house?" You can get any response to this question from 0 to 9, and you might say "yes" to all of them, but remind the student that the largest number is 9! So we imagine how many little green beds, or green toothbrushes, or green chairs there would be in the house. Ask the student what else there would be nine of. Do the same with the tens. Remember that in the unit house all the furniture will be green, and in the tens house it will be blue (tens).



Decimal Street

Throughout the program, whenever we teach, we will employ the following strategy: Build - Write - Verbalize. To teach place value, we will first build the number, then count how many in each place, then write the number, and read what we've written.

Let's build 42 - (4 tens, 2 units). Then count how many are "home" at each house. I like to imagine going up to the door of each home and knocking to see how many are "home" in each place. Then write the numeral 42 as you count (beginning with the units always) to show the value on paper. Then say "Four tens and two units, or forty-two." Build another one and have the student write how many are home. When they understand this, then you write how many on paper, and have them build it! Try 37. After they build it, then read what they have built. Keep practicing back and forth with the teacher building and the student writing, and vice versa.

Here is another exercise I do to reinforce the fact that every value has its own place. I like to have the student close his/her eyes as I move the pieces around by placing the blue tens where the units should be and vice versa. I then ask the student to make sure they are all in the right place! You might call this "scramble the values" or "walk the blocks home". As the student looks at the problem and begins to work on it, I ask, "Is every value in its own place?"

You've probably noticed the important relationship between language and place value. Consider 42, read as forty-two. We know that it is four blue ten bars (for-ty, ty for ten) and two units. When pronouncing 90, 80, 70, 60, and 40, work on enunciating clearly so that 90 is ninety, not "ninedee". 80 is eighty, not "adee". When you pronounce it accurately, not only will your spelling improve, but your understanding of place value as well. 70, seventy, is seven tens; 60, sixty, is six tens. 40 is pronounced correctly but spelled without the "u". Carrying through on this logic, 50 should be pronounced "fivety" instead of fifty. Thirty and twenty are similar to fifty, not completely consistent but close enough so we know what they mean. The teens are the real problem.

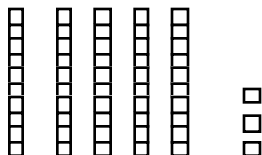
Some researchers have concluded that one of the chief differences between western (American and Canadian) and eastern (Chinese and Japanese) students is their understanding of place value. The culprit, in the researchers' eyes, is the English language. In eastern culture, when a child can count to 9, with a few minor variations, they can count to one hundred. This is not so in English with such numbers as ten, eleven, twelve and the rest of the teens. Not only are these numbers difficult to teach, because there doesn't seem to be rhyme nor reason for their origin, but more importantly, they do not reflect and indicate place value. To remedy this serious deficiency, I'm suggesting a new way to read the numbers 10 through 19. You decide whether this method reinforces the place value concept and restores logic and order to the decimal system.

10 is "onety", 11 is "onety-one", 12 is "onety-two", 13 is "onety-three", ...19 is "onety-nine". Now it is not that the student can't say ten, eleven, twelve, but learning this method enhances their understanding, makes math logical again, and they think it is neat.

When presenting place value, or any other topic in this curriculum, model how you think as you solve the problems. As you the teacher work through a problem with the manipulatives, do so verbally, so as the student(s) observes, he also hears your thinking process. Then record your answer.

### *Example 1*

given visually



As you look at the picture, slowly say it, proceeding from left to right, "fifty-three." Then count, beginning with the units, "1-2-3" and write a 3 in the units place. Then count the tens, "1-2-3-4-5" and write a 5 in the tens place. Do several of these, then give the student the opportunity to do some.

### *Example 2*

74 (given the number)

Read the number "seventy-four", then say "seven-ty or seven tens" and pick up 7 blue ten bars. Then say "four" and pick up 4 green unit pieces. Then place them in the correct place as you say "every value has its own place". Do several of these, then give the student the opportunity to do some.

### *Example 3*

"sixty-five" (given verbally)

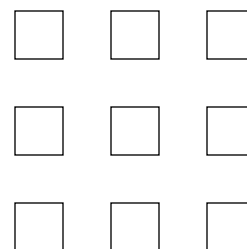
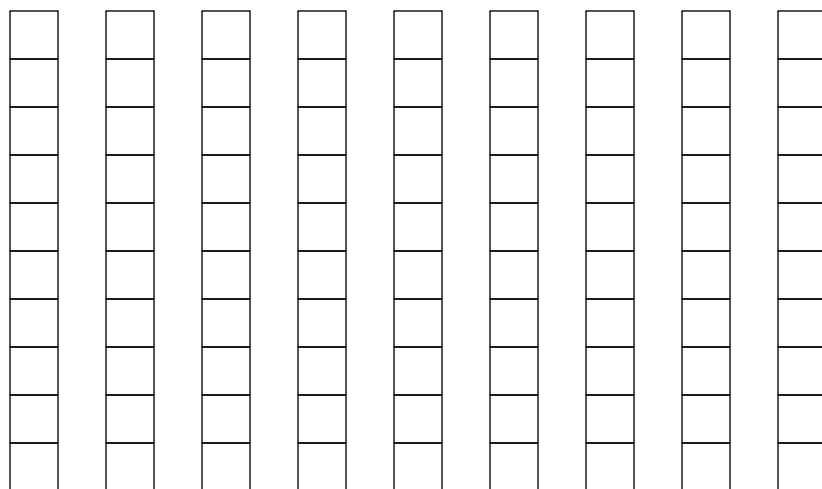
Read the number out loud slowly. Then pick up 6 blue ten bars as you say, "six-ty or six tens". Then say "five" and pick up 5 green unit pieces. Then place them in the correct place as you say "every value has its own place." Then write the number 65. Do several of these, then give the student the opportunity to do some.

### *Game*

*Pick a Card* Make up a set of cards with 0 through 9 written in green. Then make another stack of cards written in blue with the same numbers 0 through 9. Shuffle the green cards, pick one, and show that number of green unit blocks. If a child picks a green 4, then count out four green unit blocks and show them.

When the child is proficient at this game, then try it with the blue cards and do the same as before, except choose blue ten blocks instead of the green unit bars. When they can do the tens well, add the green cards with the blue cards. Have the child choose one card from the green pile and one card from the blue pile and then pick up the correct number of blue ten blocks and green unit blocks.

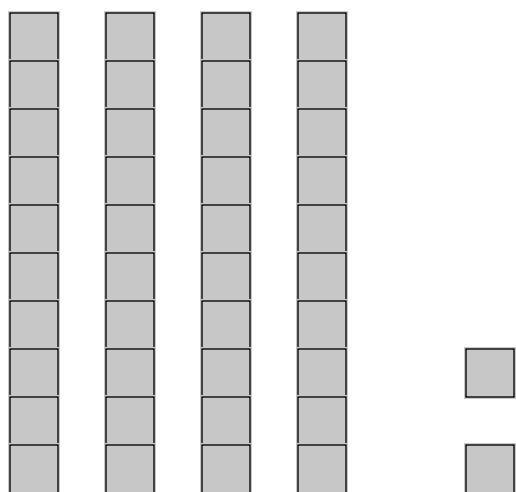
Color the correct number of blocks and say the answer.



3

1

Count and write the number, then say it.



\_\_\_\_\_

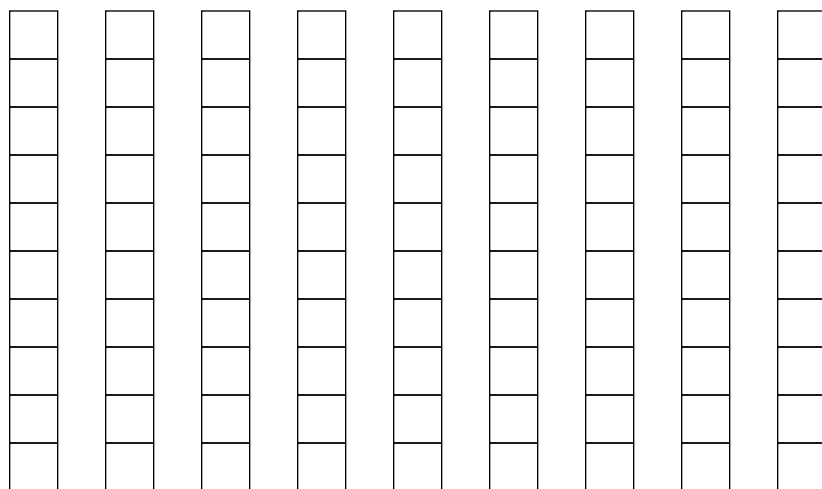
\_\_\_\_\_

Build and say the numbers.

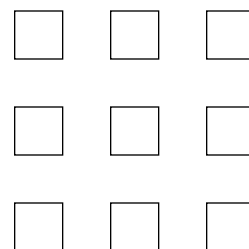
89

57

Color the correct number of blocks and say the answer.

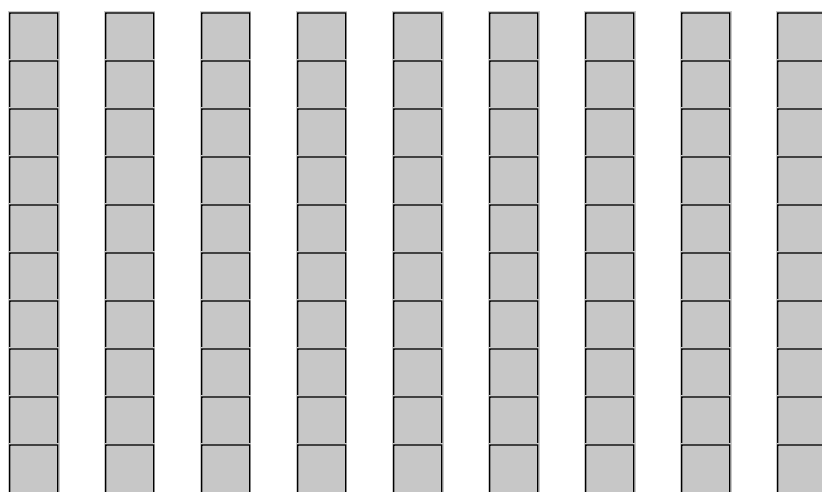


6

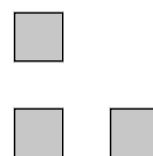


8

Count and write the number, then say it.



\_\_\_\_\_



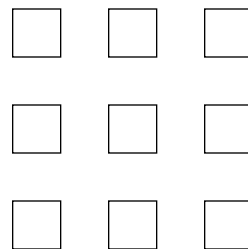
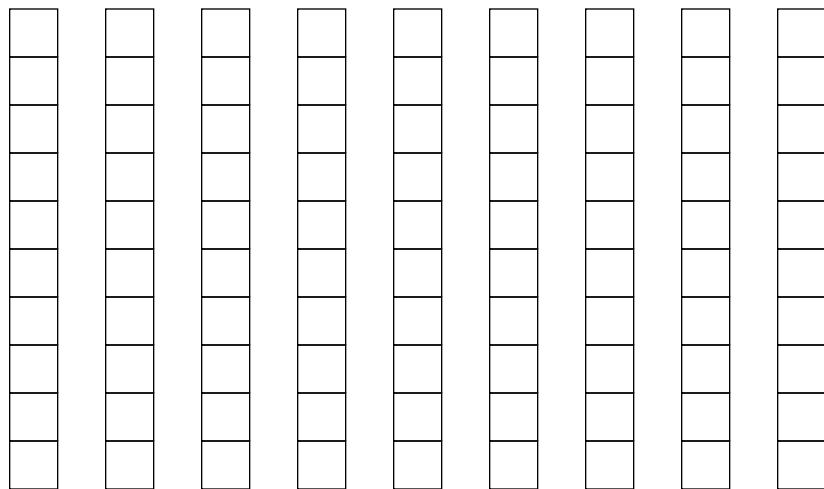
\_\_\_\_\_

Build and say the numbers.

25

71

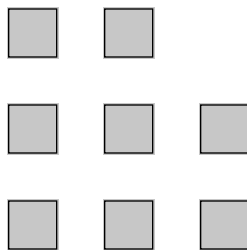
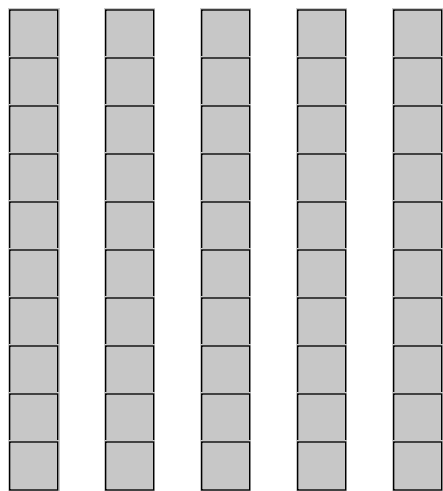
Color the correct number of blocks and say the answer.



7

3

Count and write the number, then say it.



\_\_\_\_\_

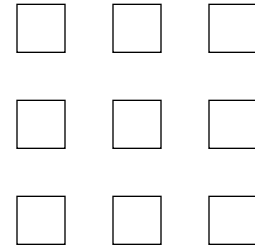
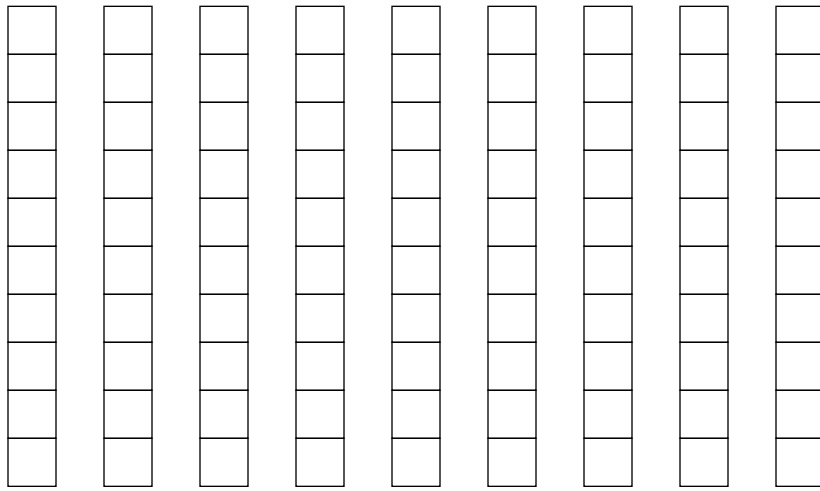
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Build and say the numbers.

46

32

Color the correct number of blocks and say the answer.



2

9

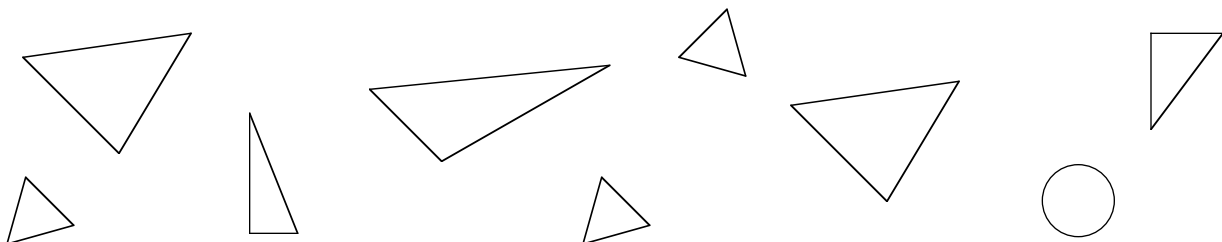
Build and say the numbers.

81

74

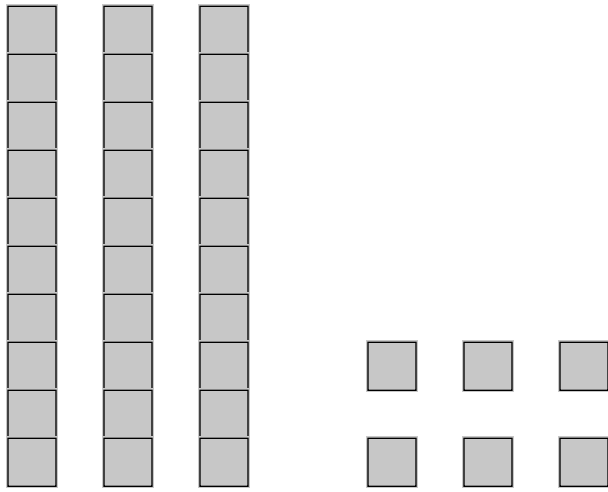
Count the shapes. Circle and say the correct number.

How many triangles are there?



0   1   2   3   4   5   6   7   8   9

Count and write the number, then say it.



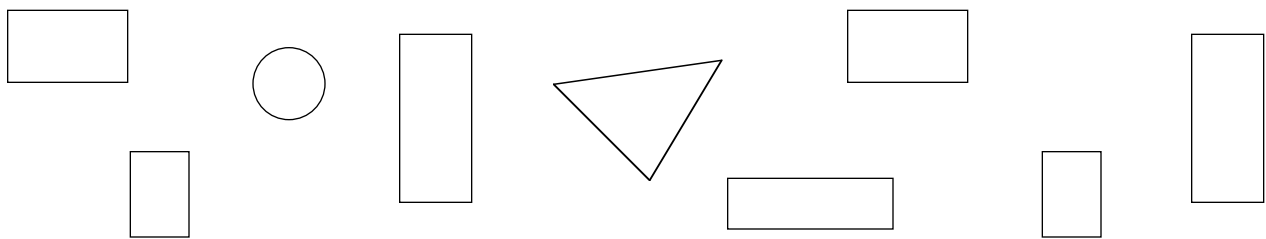
Build and say the numbers.

55

63

Count the shapes. Circle and say the correct number.

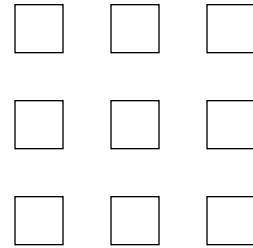
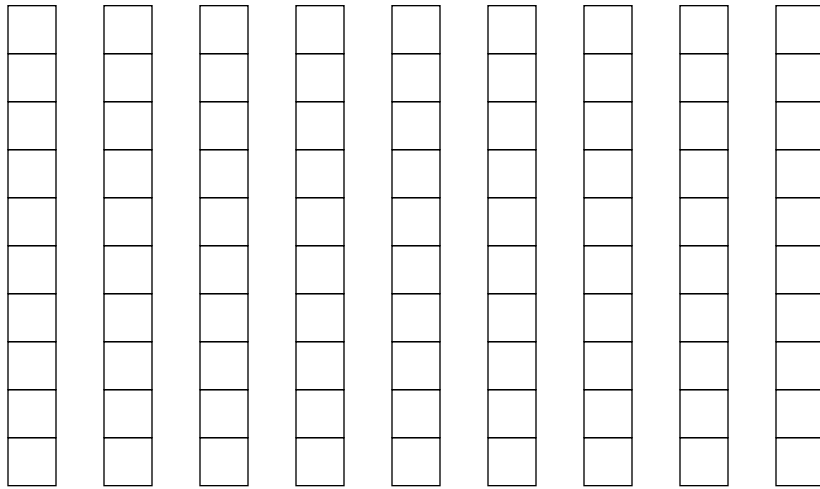
How many rectangles are there?



0 1 2 3 4 5 6 7 8 9



Color the correct number of blocks and say the answer.



4

7

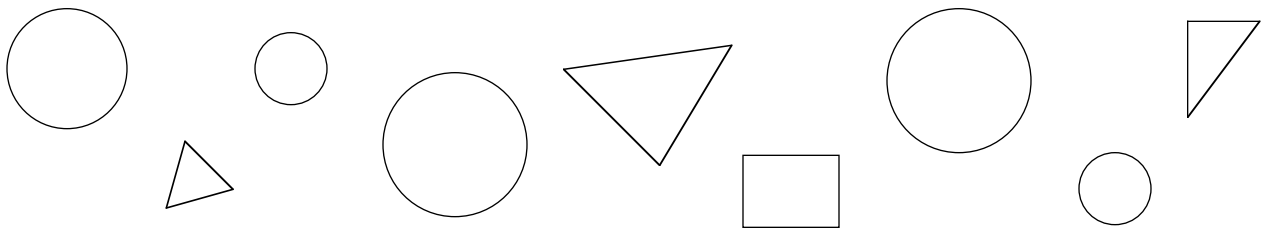
Build and say the numbers.

92

28

Count the shapes. Circle and say the correct number.

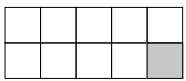
How many circles are there? ○



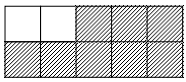
0 1 2 3 4 5 6 7 8 9

Lesson Practice 7A

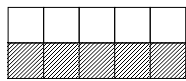
Color the squares or write the number.



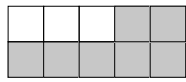
1



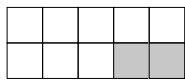
8



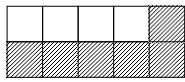
5



7



2

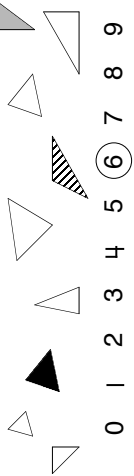


6

Lesson Practice 8A

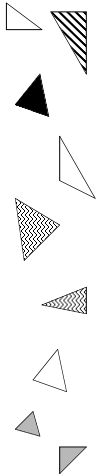
Count the triangles that match the picture. Circle and say the correct number.

How many triangles are white?



- 0 1 2 3 4 5 6 7 8 9

How many triangles are black?



- 0 1 2 3 4 5 6 7 8 9

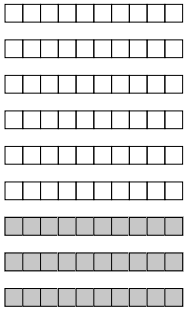
How many triangles have stripes?



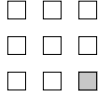
- 0 1 2 3 4 5 6 7 8 9

Lesson Practice 9A

Color the correct number of blocks and say the answer.

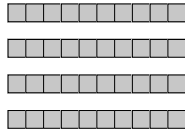


3



1

Count and write the number, then say it.



4



2

Build and say the numbers.



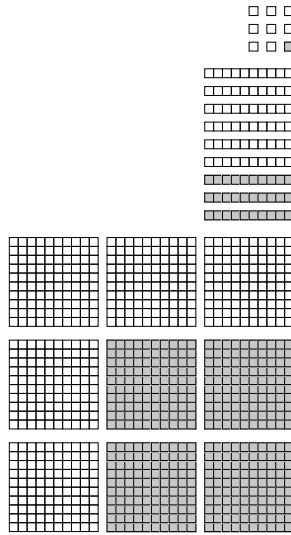
89



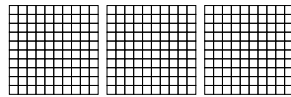
57

Lesson Practice 10A

Color the correct number of blocks and say the answer.



4

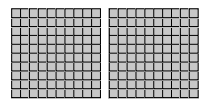


3

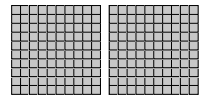


1

Count and write the number, then say it.



6



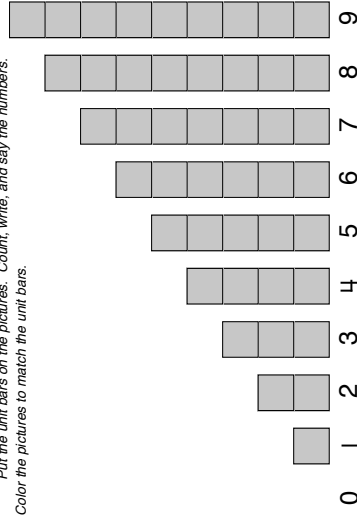
3



8

Lesson Practice 11A

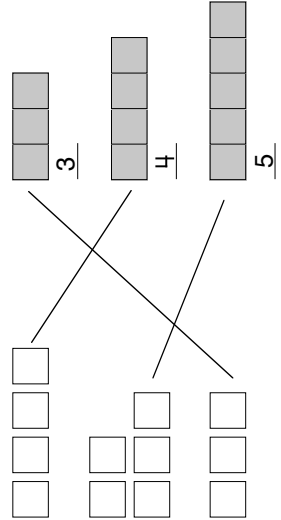
Put the unit bars on the pictures. Count, write, and say the numbers.



- 0 1 2 3 4 5 6 7 8 9

Color the pictures to match the unit bars.

Use the blocks. Count, match, and color. Write the number and say it.



Lesson Practice 12A

Build each addition problem. Say it and write it. Color the picture to match the unit bars.



$$5 + 2 = 7$$



$$2 + 3 = 5$$



$$4 + 4 = 8$$



$$5 + 1 = 6$$



$$3 + 6 = 9$$