# Number and Operations in Base Ten

The **base ten number system** is an efficient "place value" system representing all real numbers. Any numeral (such as 6) can represent different values depending on where it is placed in the number (6, 26, 652, etc.).

Children' learning builds from work on tens and ones in first grade to numbers in the 100s, 1,000s, and beyond in upper grades. A thorough, deep understanding of the base ten number system is critical for developing computational and algorithmic fluency.

As children deepen their understanding of the base ten number system, they realize that its power stems from the process of repeatedly bundling by ten. That is, they develop the understanding that ten tens make one hundred, and that repeatedly bundling additional groups of ten eventually creates hundreds, then thousands, ten thousands, and so on.

**The Grade 1 Common Core State Standards for Number and Operations in Base Ten specify that children should–**

- Extend the counting sequence.
- Understand place value.
- Use place value understanding and properties of operations to add and subtract.

The following hands-on activities enable teachers to help children learn the concepts of the base ten number system in a rich and meaningful way. As children work through the activities, teachers will want to coach children to share their thinking and communicate their understanding. Children will become proficient in using numbers by reasoning and communicating about the structure and patterns in the number system.

Additionally, as children use manipulatives to model mathematical situations, teachers will want to watch closely. It is important that children represent each situation accurately within the context of the problem.

# Number and Operations in Base Ten

## Contents

LESSON 1

## Objective

Explore place-value concepts for tens and ones.

## Common Core State Standards

- **1.NBT.2a** 10 can be thought of as a bundle of ten ones — called a "ten."
- **1.NBT.2b** The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.
- **1.NBT.2c** The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).

Number and Operations in Base Ten

# Exploring Place Value

Prior to learning how to add and subtract two-digit numbers, children need to establish a solid understanding of place value, a skill that lends itself to grasping the concept of regrouping. In preparation for these operations, children need to understand the position of the number 10 within the base ten system. They need to see that the word *ten* represents one entity as well as 10 separate units.

**Try It!** *Perform the Try It! activity on the next page.*

## Talk About It

Discuss the Try It! activity.

- **Say:** *Look at your Place-Value Chart (BLM 3).* **Ask:** *What number is in the ones place? In the tens place?*
- **Ask:** *Could you have put all 17 Base Ten Block units in the ones place on your chart? Why or why not?* Emphasize that the ones place can show the numbers 0–9, but that higher numbers must be regrouped and moved to the tens place.
- Discuss larger numbers. To start, have children model the tens numbers 20–90. Then introduce ones.

## Solve It

With children, reread the problem. Have children draw a picture of Matt's basket of tennis balls and write the addition sentence that corresponds to the story. Then have children show the sum on a place-value chart.

## More Ideas

For other ways to teach about place value—

- Use Cuisenaire® Rods to model place value. Assign a value of 1 to the white rods and a value of 10 to the orange rods. Have volunteers use combinations of rods to build numbers. Exchange as many rods as necessary to make an orange 10, and put it in the tens place on a place-value chart (BLM 3). Leave the other rods in the ones place.
- Have children make sets of 10 Snap Cubes® and put the sets into small bags. Announce a two-digit number and have children show the number on place-value charts using the sets of 10 cubes and single cubes.

## Formative Assessment

Have children try the following problem.

*There were 12 children in the library. Then 4 more children came in. Draw a circle around the place-value chart that shows how many children in all.*

**A.**

| Tens | Ones |
|---|---|
| ■ | ■ ■ ■<br>■ ■ ■ |

**B.**

| Tens | Ones |
|---|---|
| ■ ■ ■<br>■ ■ ■ | ■ |

**C.**

| Tens | Ones |
|---|---|
| ■ | ■<br>■ |

## Try It! 20 minutes | Pairs

Here is a problem about working with place value.

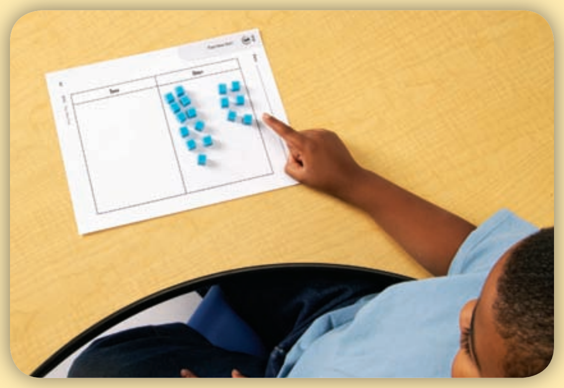
*Matt has 11 tennis balls in a big green basket. His friend Paul didn't know Matt had so many tennis balls, and he went to the store and bought 6 tennis balls so he could play tennis with Matt. When he added his 6 tennis balls to Matt's basket, how many tennis balls did they have in all? In how many different ways can you show this number?*

Introduce the problem. Then have children do the activity to solve the problem.

Distribute Base Ten Blocks and the Place-Value Chart (BLM 3) to pairs. Display a place-value chart for modeling. Explain that a place-value chart helps show the number of tens and ones that make up a number.

### Materials

- Base Ten Blocks (20 units and 9 rods per pair)
- Place-Value Chart (BLM 3; 1 per pair)



**1.** Hold up a unit. **Say:** *This block stands for one unit. Make a group of units to show 11. Make another group to show 6.* Explain that counting all the units is just one way to show how many you have in all.

**2.** Explain that children can show how many in another way. **Say:** *Look at this rod. It has 10 sections, so it is the same as 10 units together.* Have children exchange 10 units for one rod by placing the 10-unit rod in the tens column on their charts. Point out that the "1" in the number 10 is in the tens place. **Ask:** *How many tens are in 17?*

**3. Ask:** *How many more units are there?* **Say:** *Count units in the ones column of your chart.* **Ask:** *How many ones are in 17?*

### ⚠ Look Out!

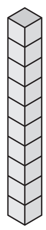
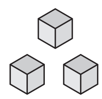
Some children might have difficulty visualizing that 10 ones (Base Ten units) together make one 10 (Base Ten rod). Have children put a set of Base Ten units into a bag. If they put this one set in the tens column of a place-value chart, then there will be zero in the ones column. Have them write the 1 under the tens column and 0 under the ones.

**Answer Key**

## Use Base Ten Blocks. Build each number. Write the number.

(Check students' work.)

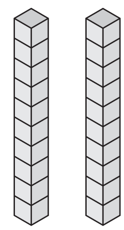
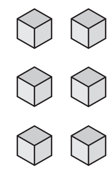
**1.**

| Tens | Ones |
| --- | --- |
|  |  |

1 tens 3 ones

13

**2.**

| Tens | Ones |
| --- | --- |
|  |  |

2 tens 6 ones

26

## Use Base Ten Blocks. Build each number. Draw the model. Write the number.

**3.** 17

| Tens | Ones |
| --- | --- |
| | |

1 tens 7 ones

17

**4.** 32

| Tens | Ones |
| --- | --- |
| | |

3 tens 2 ones

32

## Write the number described.

**5.** 2 tens 5 ones 25

**6.** 4 tens 2 ones 42

Answer Key

**Challenge!** How would you build the number 80? Why is only one type of Base Ten Block used?

Challenge: (Sample) Use 8 tens and 0 ones. The digit in the ones place is 0, so there are no ones to model.

LESSON 2

Number and Operations in Base Ten

# Comparing Two-Digit Numbers

## Objective

Compare two-digit numbers using the symbols > and <.

## Common Core State Standards

- **1.NBT.3** Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.

The ability to compare is essential for problem solving. As children compare quantities, they develop logical reasoning as well as number sense. Children need opportunities to connect quantities with the numerals that represent them. Hands-on learning experiences provide these opportunities and help children gain proficiency in comparing, both visually and mentally. Moreover, employing the symbols for greater than (>) and less than (<) allows children to practice using symbols to represent mathematical ideas.

**Try It!** *Perform the Try It! activity on the next page.*

## Talk About It

Discuss the Try It! activity.

- **Say:** *I have two numbers: 22 and 33.* **Ask:** *Where do I look first to find out which number is larger?*
- **Say:** *I have 32 and 33. They have the same number in the tens column.* **Ask:** *Where should I look to find out which number is larger?*

## Solve It

With children, reread the problem. Ask children to write the number sentences about the number of stickers, one using > and one using <. Then have children write or draw how they can remember which sign is the greater than sign and which is the less than sign.

## More Ideas

For other ways to teach about comparing numbers—

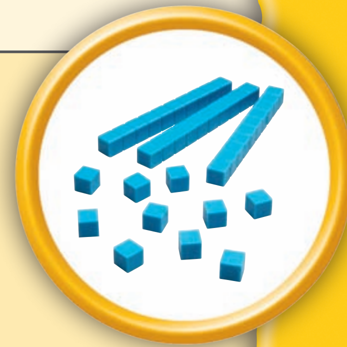
- Have two children play a game using Base Ten Blocks and a sheet of paper with a line drawn down the middle. Give children two numbers, such as 58 and 43. Have them use blocks to show one number on one side of the line and the other number on the other side. Then have children work together to decide which symbol (> or <) should be placed between the numbers.
- Write number sentences with greater than or less than symbols on the board (for example, 86 > 64). Challenge children to model both numbers with Base Ten Blocks and write a sentence to tell why the number sentence is true. (The number sentence is true because 86 has two more tens and two more ones than 64.)

## Formative Assessment

Have children try the following problem.

*Ray read 32 books last year. Pat read 38 books last year. Circle the sentence that shows how the numbers of books compare.*

**A.** 32 < 38 **B.** 32 > 38 **C.** 32 < 64



## Try It! 20 minutes | Pairs

Here is a problem about comparing numbers.

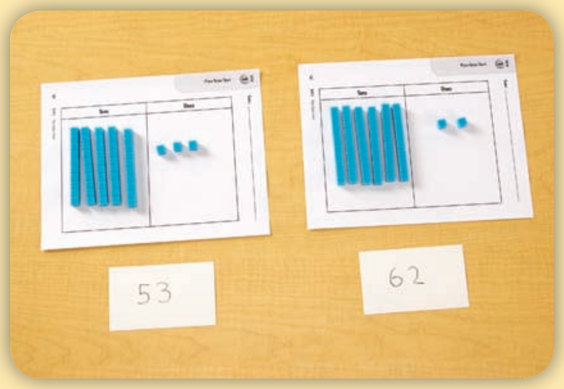
*Jan and Michelle are best friends who like to collect stickers. Jan has 53 stickers in her collection and Michelle has 62. Who has more stickers, Jan or Michelle? How can you show who has more stickers?*

Introduce the problem. Then have children do the activity to solve the problem.

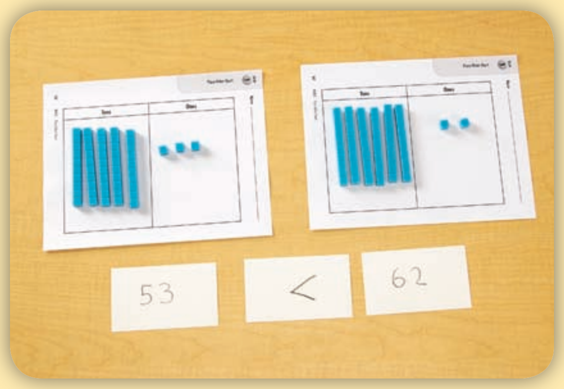
Give Base Ten Blocks, the Place-Value Chart (BLM 3), index cards, and pencils to pairs. Display a place-value chart for modeling.

### Materials

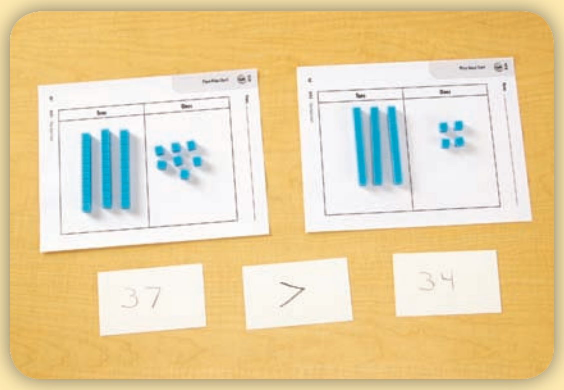
- Base Ten Blocks (11 rods and 11 units per pair)
- Place-Value Chart (BLM 3; 2 per pair)
- index cards (6 per pair)
- pencils (2 per pair)




**1.** Have one child in each pair use the blocks to show 53 on a place-value chart. Have the other child show 62. Then have children write the numbers on index cards and place them below the corresponding charts. **Ask:** *Which number has more tens? Which is the larger number?* Make sure children understand that we first look at the tens to find the larger number.




**2.** Display greater than (>) and less than (<) symbols, and explain what they mean. Write the numbers 53 and 62 on the board or overhead, leaving room for the correct symbol. **Ask:** *If we compare 53 to 62, which symbol should we place between the two numbers? Is 53 greater than or less than 62?* **Say:** *Draw the symbol on a card and place it between the numbers.*




**3.** Have children repeat steps 1 and 2 with 37 and 34. **Say:** *I see that the tens columns for both numbers are the same.* **Ask:** *What do we do now?* Guide children to compare the ones. Have children insert the correct symbol.

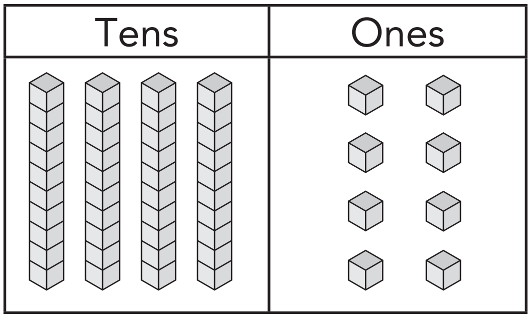
### ⚠ Look Out!

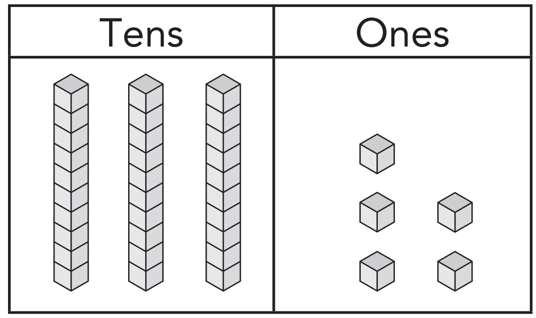
Children might confuse the > and < symbols. You might draw a simple outline of a baby bird with its beak wide open in the form of a <. Say that the symbol is like the little bird that always has its hungry mouth open to eat the greater number. Also, some children might make an incorrect exchange of tens when using blocks, for example, having 62 = 5 rods and 12 units. Encourage these children to continue to exchange units for rods until they have 9 or fewer units.

## Use Base Ten Blocks. Build each number. Compare the numbers. Write the numbers with > or < between them.

(Check students' work.)

**1.**




48 ____ > ____ 35

## Use Base Ten Blocks. Build each number. Draw the models. Write the numbers with > or < between them.

**2.** 24

| Tens | Ones |
|---|---|
| | |

32

| Tens | Ones |
|---|---|
| | |

24 ____ < ____ 32

## Write > or < between the numbers.

**3.** 22 __>__ 15

**4.** 51 __<__ 65

Answer Key

**Challenge!** What place value did you compare first with the numbers in the lesson? Why?

Challenge: (Sample) tens place; Numbers are compared starting with the greatest place value.

LESSON 3

## Objective

Count and order numbers 0–20.

## Common Core State Standards

- **1.NBT.2b** The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.

### Number and Operations in Base Ten

# Ordering Numbers

Counting numbers and ordering them is a requirement for performing most mathematical concepts. A number doesn't mean anything to a child until he or she knows how many the number represents and where it goes on a number line or how it relates to other numbers. Children learn to interpret the count sequence as a list of numbers arranged in order of increasing magnitude. This understanding is a conceptual starting point for comparing numbers and working with the concepts of less than and greater than.

**Try It!** *Perform the Try It! activity on the next page.*

## Talk About It

Discuss the Try It! activity.

- Have children look at the DecaDots® tiles used in the Try It! activity.
- **Ask:** *Which tile did you put down first? next? last?*
- **Ask:** *Which tiles did you replace with a ten tile? What did you do after you had placed the ten tile? Which tiles did you replace with a zero tile?*
- **Ask:** *How did you know which tiles were missing?*

## Solve It

With children reread the problem. Ask children to write a sentence using ordered numbers. Encourage them to say 1 more and 1 fewer in their descriptions.

## More Ideas

For other ways to teach about counting and ordering numbers—

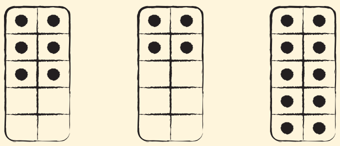
- Have children use Snap Cubes® and number cards to count and order groups to 10. For each number card, have children build a corresponding cube tower. Children then place the cube towers and number cards in order from 0–10.
- Create a number line and use Snap Cubes to count and order groups to 20. Have them arrange their cubes in ascending order in the appropriate number line position.
- Use Cuisenaire® Rods and have students build a staircase with the rods to help them see the correct ordinal position.

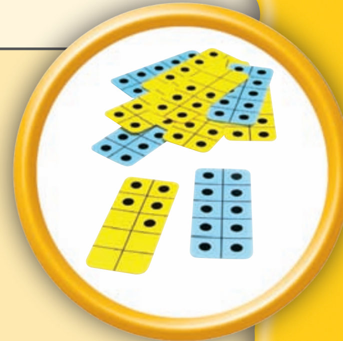
## Formative Assessment

Have children try the following problem.

*Match the pictures to the numbers.*

**10** **6** **4**





## Try It! 30 minutes | Pairs

Here is a problem using ordering.

*Jeremy has a set of cards labeled 0–20 on his desk. He counts them and notices that three of the cards are missing. How can Jeremy determine which cards are missing?*

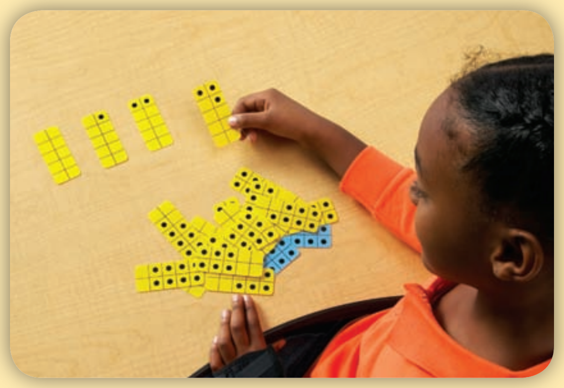
Introduce the story problem. Then have children do the activity to solve the problem.

**Say:** *Let's show Jeremy how to determine which cards are missing.*

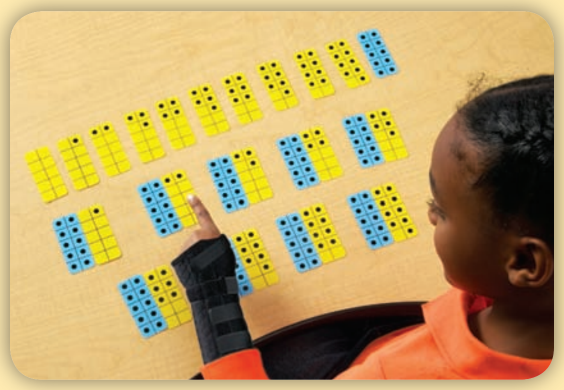
### Materials

- DecaDots® wallet (1 per pair)


**1.** To begin, give each pair of children a DecaDots wallet set, and have them remove the tiles.



**2.** Have children arrange the tiles in a row in ascending order from 0–20. **Ask:** *How do you show a number past 10?*



**3.** Finally, have the children touch each DecaDot as they recite the corresponding number. **Ask:** *How would we know if one were missing?*

### Look Out!

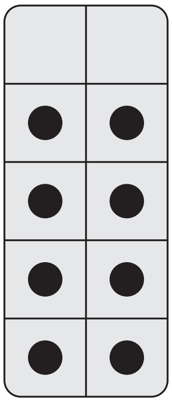
Watch for children who have difficulty placing the numbers in the correct order. Assist these children by placing numbered cards in order and then have them place the corresponding DecaDot tile(s) above the numbered card.

**Answer Key**

## Use DecaDots. Write each number modeled. Write the three numbers that come next.

(Check students' work.)

**1.**



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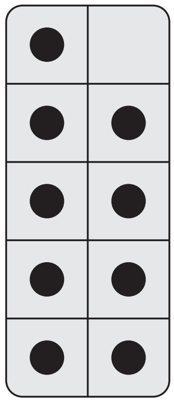

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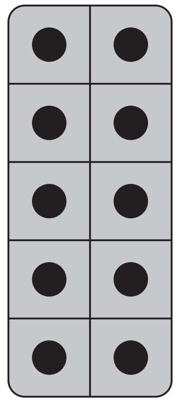

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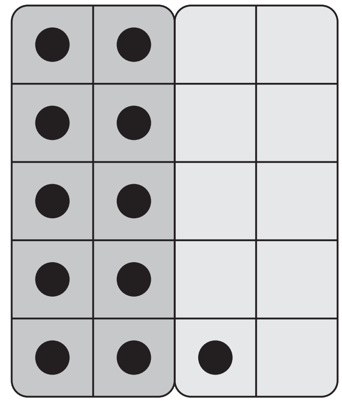
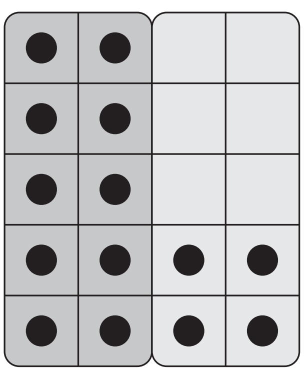


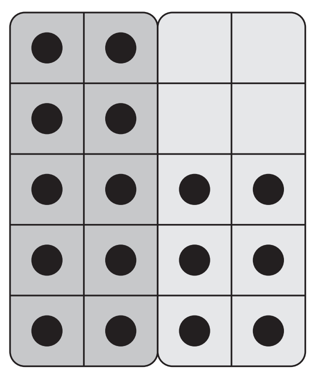
11

Next three numbers: 12 13 14.

## Use DecaDots. Make the missing number. Draw the model. Write the numbers.

**2.**





14 15 16

Missing number: 15

*Answer Key*

**Challenge!** What numbers between 0 and 20 use two DecaDots tiles?

Challenge: 11 to 20

LESSON 4

## Objective

Use models to add two-digit numbers without regrouping.

## Common Core State Standards

- **1.NBT.4** Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.



# Adding Without Regrouping

Using concrete objects to introduce and practice addition without regrouping provides children with a solid foundation upon which to build higher-level mathematical skills later on. Providing ample opportunity to practice allows children to gain a better understanding of the addition process. As they learn to recognize small groups within larger groups, children start to develop strategies they will use for estimating.

**Try It!** *Perform the Try It! activity on the next page.*

## Talk About It

Discuss the Try It! activity.

- **Ask:** *Which column do we add first when we add two-digit numbers?*
- **Ask:** *What are two important steps we need to remember when we add two-digit numbers?*
- **Say:** *We just added two numbers with two digits each.* **Ask:** *How is adding two-digit numbers different from adding single-digit numbers? How is it the same?*

## Solve It

With children, reread the problem. Have children draw a "before and after" picture of Scott's marbles on a Place-Value Chart (BLM 3). Beneath it, have them write a sentence or two telling what happens when they combine the marbles and what it means. **Say:** *Remember that Scott needed 32 marbles.* **Ask:** *Does he have enough?*

## More Ideas

For other ways to teach about adding two-digit numbers without regrouping—

- Write several two-digit addition problems on index cards and allow children to select cards at random. Have children use Base Ten Blocks and the Place-Value Chart (BLM 3) to solve the problems.
- Distribute 10 Two-Color Counters to each child. Have children use the counters with the red side up to show tens and the yellow side up to show ones. Have children build two-digit numbers and then use a column chart to add them. Then have them use Snap Cubes® to build the sum.

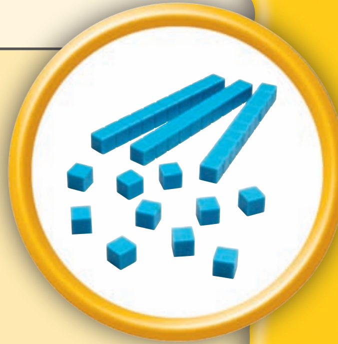
## Formative Assessment

Have children try the following problem.

*Last week, Mr. Smith bought 20 cookies for the children in his club. This week, he bought 24 cookies. On the line below the problem, write how many cookies Mr. Smith bought in all.*

$$\begin{array}{r} 24 \\ +\ 20 \\ \hline \end{array}$$

_____ cookies in all



## Try It! 20 minutes | Pairs

Here is a problem about adding without regrouping.

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*Scott needs 32 marbles to play a game. He poured his yellow marbles and his orange marbles on the floor and counted them. He counted 14 yellow marbles and 20 orange marbles. How many marbles does Scott have in all? Does he have enough to play the game?*

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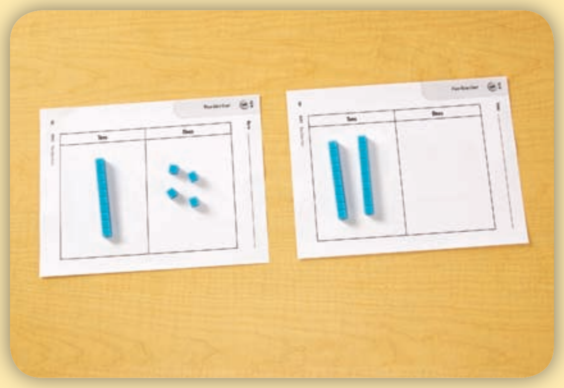
Introduce the problem. Then have children do the activity to solve the problem.

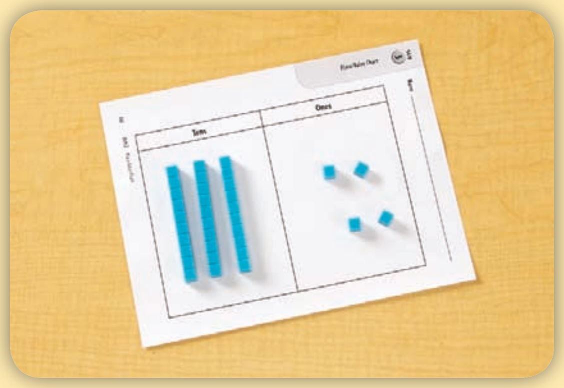
Give each pair the Base Ten Blocks, Place-Value Chart (BLM 3), paper, and pencils. On the board, display a place-value chart for modeling.

### Materials

- Base Ten Blocks (3 rods and 10 units per pair)
- Place-Value Chart (BLM 3; 2 per pair)
- paper (1 sheet per child)
- pencils (1 per child)



**1.** Have one child in each pair place Base Ten rods and units on one place-value chart to show 14. **Ask:** *How many tens does this number have? How many ones?* Have the other child use the other place-value chart to show 20. **Ask:** *How many tens does this number have? How many ones?*




**2.** Have children move the blocks from the 20 chart to the 14 chart. Make sure children have the tens and ones in the correct columns. **Ask:** *How many ones are in the "14 + 20" chart? How many tens?* Guide children to realize that they just added the numbers together. **Say:** *20 blocks added to 14 blocks gives me 34 blocks in all.* Have the children count the blocks to check their answer.

**3.** On the board, write the activity as a number chart in columns. Have children copy it onto their recording paper. Tell them to be sure to line up the numbers so that the tens and ones columns match.

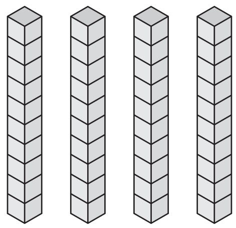
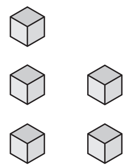
### ⚠ Look Out!

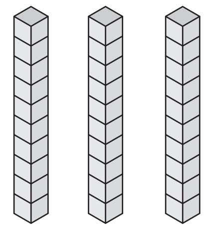
Some children may have trouble grasping the importance of accuracy in lining up the numbers in column addition problems. Remember to emphasize that they should add the ones column first!

*Answer Key*

## Use Base Ten Blocks. Build each number. Write the numbers and the sum. (Check students' work.)

**1.**

| Tens | Ones |
|---|---|
|  |  |

| Tens | Ones |
|---|---|
|  | |

45 + 30 = 75

## Use Base Ten Blocks. Build the numbers. Draw the models. Add.

**2.** 20 + 61 = 81

| Tens | Ones |
|---|---|
| (Check students' work.) | |

| Tens | Ones |
|---|---|
| (Check students' work.) | |

## Add.

**3.** 34 + 10 = 44

**4.** 44 + 30 = 74

**5.** 16 + 20 = 36

Answer Key

**Challenge!** What if you want to add 24 and 35? Both numbers have some ones. How would you add?

Challenge: (Sample) I would add the ones to get the ones digit and add the tens to get the tens digit.

LESSON 5

## Objective

Use models to add with regrouping.

## Common Core State Standards

- **1.NBT.4** Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.



# Adding with Regrouping

Using concrete objects to introduce and practice addition with regrouping provides children with a solid foundation upon which to build higher-level math skills later on. Providing ample opportunity to practice allows children to gain a better understanding of the methodical structure of the addition process. Practicing regrouping also aids in improving efficiency and accuracy in computation with pencil and paper. It also helps develop skills such as estimating and using mental math.

**Try It!** *Perform the Try It! activity on the next page.*

## Talk About It

Discuss the Try It! activity.

- **Say:** *Remember that when we did addition without regrouping we added the ones column and the tens column.* **Ask:** *What do we do differently when we solve addition problems where we need to regroup? What do we do that is the same?*
- **Ask:** *What is the "new rule" we need to remember when we solve some addition problems?* Lead children to recall that they should never have more than 9 single units in the ones column.

## Solve It

With children, reread the problem. Then have children draw a place-value chart that shows the 13 points together in the ones column. Have them write a sentence or two telling what they need to do with 10 of the points.

## More Ideas

For other ways to teach about adding with regrouping—

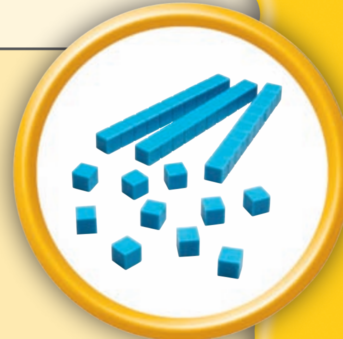
- Have children use Color Tiles to show regrouping. Give children a random group of two colors of tiles and instruct them to sort the two colors into two groups. Have children separate each color group into tens and ones. Children should make stacks of 10 tiles. Have them count the stacks and single tiles and tell how many they have of each color. Then have children add the two groups together to find how many tiles they have in total.
- Build one tower of 16 Snap Cubes® and one tower of 8 cubes and have children build the sum. Make sure that children separate out towers of 10 cubes so they are manually regrouping.

## Formative Assessment

Have children try the following problem.

*Kathy wants to buy socks that cost $7 and a red shirt that costs $24. How much money does she need? Circle the correct answer.*

**A.** $11 **B.** $21 **C.** $31



## Try It! 20 minutes | Pairs

Here is a problem about adding with regrouping.

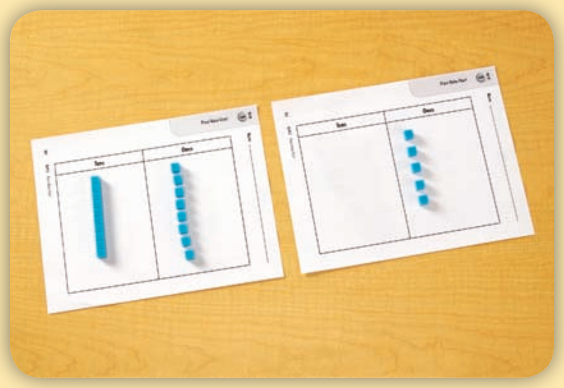
*Erika plays basketball for the Tigers, her first-grade team. She scored 18 points in the first half of a game. She scored 5 points in the second half. How many points did Erika score in the game?*

Introduce the problem. Then have children do the activity to solve the problem.

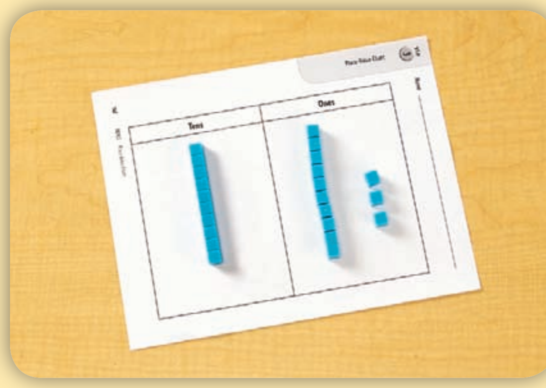
Give each pair of children Base Ten Blocks and the Place-Value Chart (BLM 3). Model the rule that when the ones column has 10 units, children should exchange the units for a rod and then move it to the tens column. Write the addition problem 18 + 5 in column form on the board or overhead.

### Materials

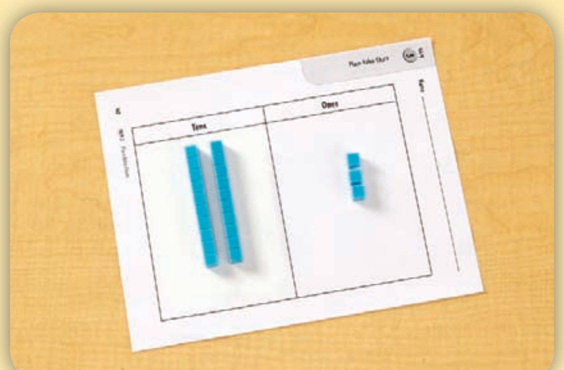
- Base Ten Blocks (4 rods and 33 units per pair)
- Place-Value Chart (BLM 3; 2 per pair)



**1.** Have one child in each pair use Base Ten rods and units to show 18 on a place-value chart. Have the other child show 5.



**2. Say:** *Let's see what happens when we add these numbers. Move the ones from one chart to the other.* **Ask:** *How many ones do we now have in all?*



**3. Say:** *Now we can exchange ten units for a tens rod. Put the rod in the tens column.* **Ask:** *How many tens and ones do we have in all?* (2 tens and 3 ones) **Say:** *18 blocks added to 5 blocks is 23.*

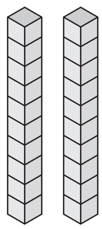
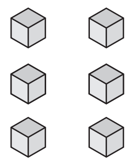
### ⚠ Look Out!

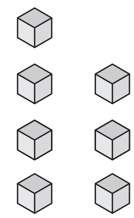
Some children might understand the algorithm (using paper and pencil) but can't show the regrouping using manipulatives. This could indicate a child's lack of number sense and reliance on following the algorithm. Have these children write the number sentence first and then model the problem with blocks.

## Use Base Ten Blocks. Build each number. Add and regroup. Write the numbers and the sum.

(Check students' work.)

**1.**

| Tens | Ones |
|---|---|
|  |  |

| Tens | Ones |
|---|---|
| |  |

Can you exchange 10 ones for 1 ten? yes

26 + 7 = 33

## Use Base Ten Blocks. Build the numbers. Draw the models. Add.

**2.** 36 + 5 = 41

| Tens | Ones |
|---|---|
| (Check students' work.) | |

| Tens | Ones |
|---|---|
| (Check students' work.) | |

## Add.

**3.** $\begin{array}{r} 17 \\ +\ 5 \\ \hline 22 \end{array}$

**4.** $\begin{array}{r} 54 \\ +\ 7 \\ \hline 61 \end{array}$

**5.** $\begin{array}{r} 17 \\ +\ 9 \\ \hline 26 \end{array}$

Answer Key

**Challenge!** How do you know when you have to exchange 10 ones for 1 ten?

Challenge: (Sample) When you have 10 or more unit blocks.

LESSON 6

## Objective

Find 10 more or 10 less than a given two-digit number.

## Common Core State Standards

- **1.NBT.5** Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.

Number and Operations in Base Ten

# 10 More, 10 Less

An understanding of the base ten system is critical in the development of a child's number sense, because it is the foundation for any attempt to perform multi-digit operations flexibly. For example, a child learns early on that 10 can be added to or subtracted from a two-digit number without changing the number of ones. Using concrete objects to practice finding 10 more and 10 less helps children visualize these operations in terms of place value and helps them learn to mentally find 10 more or 10 less without having to count.

**Try It!** *Perform the Try It! activity on the next page.*

## Talk About It

Discuss the Try It! activity.

- Have children build a train of 3 Base Ten rods and 7 units on the Number Line (BLM 4), starting at 0. **Ask:** *What number does this model stand for? How many groups of 10 are in 37?* Then have the children find 10 more (by adding another rod). **Ask:** *What does this model stand for? How many groups of 10 are in 47?*
- Repeat using 5 Base Ten rods and 4 units and having children find 10 less.

## Solve It

With children, reread the problem. Instruct children to draw a picture showing how many cards Trey has after he buys one pack of cards. Then have children write the addition sentence for the problem.

## More Ideas

For other ways to teach finding 10 more and 10 less than a given two-digit number—

- Distribute the Hundred Chart (BLM 5) to each child. Point to 15 on the Hundred Chart. Have children slide their finger straight down to find 10 more than 15 (25). Repeat with other numbers. To find 10 less, have children slide their finger straight up.
- Give random numbers of Base Ten rods and units (less than 9 each) to children. Have pairs count them and decide what they represent—trading cards or beads, for example. Have children give 10 to a partner and tell what 10 less is. The partner should tell what 10 more is.

## Formative Assessment

Have children try the following problem.

*Circle the correct answer.*

67 + 10 = ______

**A.** 57 **B.** 68 **C.** 77

## Try It! 20 minutes | Pairs

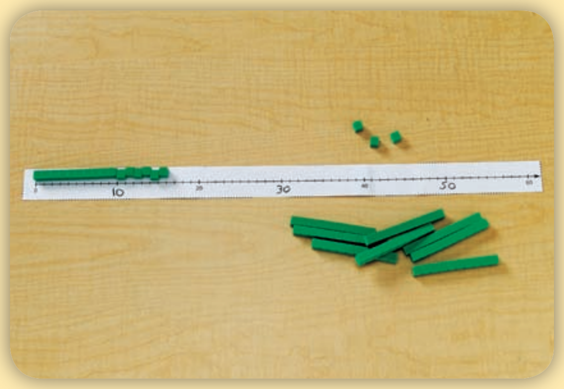
Here is a problem about finding 10 more and 10 less.

*Trey buys baseball cards in packs of 10 cards. He had 16 cards. Then he buys one new pack of cards. So now he has 10 more cards. How many baseball cards does Trey have now? How many cards will Trey have if he gives the new pack to his brother?*

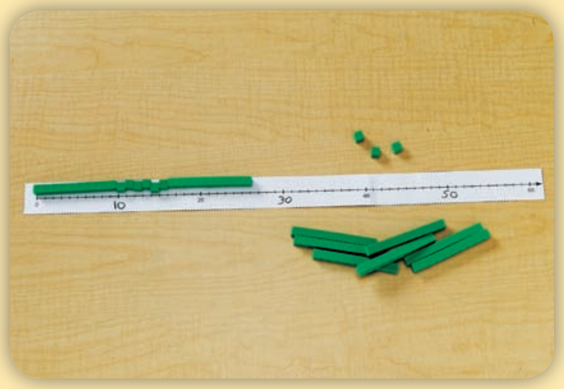
Introduce the problem. Then have children do the activity to solve the problem. Distribute Base Ten Blocks and the Number Line (BLM 4) to children. Help children assemble number lines or prepare number lines before the lesson.

### Materials

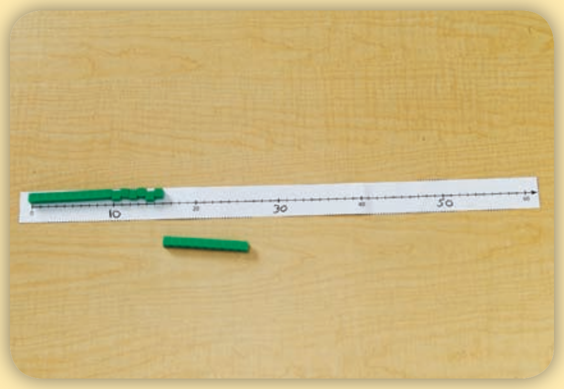
- Base Ten Blocks (9 rods and 9 units per pair)
- Number Line (BLM 4; 1 per pair)
- pencils (1 per pair)
- scissors and tape



**1.** Have children label the missing tens (10, 30, 50) on the number line. They can use a Base Ten rod as a measuring guide. Have one child in each pair place a Base Ten rod and 6 units on the number line to show 16. **Ask:** *How many tens does this number have? How many ones?*



**2.** Have the other child add a Base Ten rod to show 10 more. **Ask:** *How many tens does this number have? How many ones? Has the number of ones changed? How has the number of tens changed?* Guide children to realize that finding 10 more is the same as adding a ten, and write 16 + 10 = 26 on the board.



**3.** Have a child remove the second Base Ten rod to show 10 less. **Ask:** *How many tens does this number have? How many ones? Has the number of ones changed? How has the number of tens changed?* Guide children to realize that finding 10 less is the same as subtracting a ten.

### Look Out!

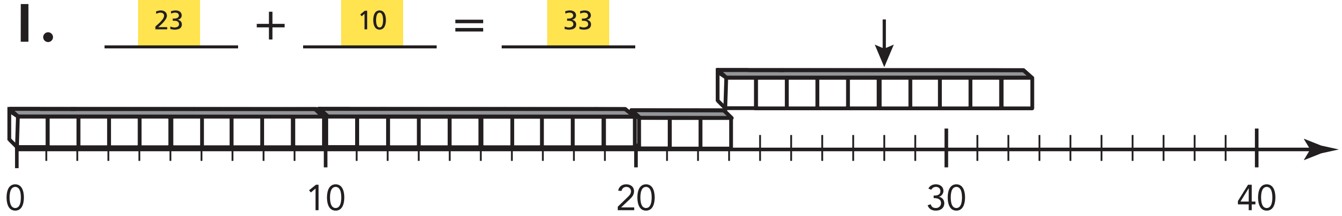
Watch for children who struggle to distinguish tens and ones. Have them align 10 units next to 1 rod to show correspondence. Then have them use rods and the number line to count by tens to twenty, thirty, forty, fifty, and sixty.

**Answer Key**

## Use Base Ten Blocks. Build each number. Write the numbers and the sum.

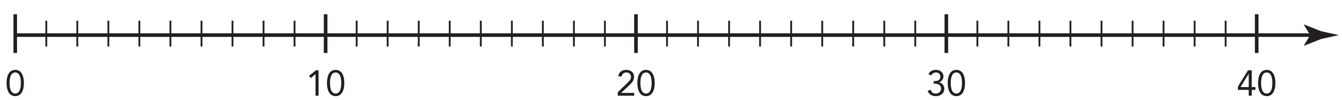
(Check students' work.)

**1.** 23 + 10 = 33




## Use Base Ten Blocks. Build the numbers. Draw the models. Subtract.

**2.** 35 – 10 = 25




## Add.

**3.** 17 + 10 = 27

**4.** 42 + 10 = 52

## Subtract.

**5.** 29 – 10 = 19

**6.** 58 – 10 = 48

Answer Key

**Challenge!** Why do the ones not change when you find 10 more or 10 less?

Challenge: (Sample) 10 more or 10 less only changes the number of tens because I'm jumping 10 spaces on the number line.

LESSON 7

## Number and Operations in Base Ten

# Subtracting a Multiple of 10

### Objective

Subtract a multiple of 10 from a multiple of 10.

### Common Core State Standards

- **1.NBT.6** Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

By utilizing what they have learned about place value and the base ten system, children can identify a multiple of 10 as the number of tens it is. Using concrete objects to practice subtracting multiples of 10 from multiples of 10 helps children expand their understanding of place value, the base ten system, the concept of zero, and properties of operations.

**Try It!** *Perform the Try It! activity on the next page.*

## Talk About It

Discuss the Try It! activity.

- Have children continue the Try It! activity with three Base Ten rods on the number line. **Say:** *Eva has 30 beads. She uses 20 more beads to make another necklace to give her mom.* **Ask:** *How many beads does she have left now?* Have pairs remove two Base Ten rods from the number line to show 10.
- Have children continue the Try It! activity with one Base Ten rod on the number line. **Say:** *Eva has 10 beads. She uses the 10 beads to make a bracelet.* **Ask:** *How many beads does she have left now?* Have pairs remove the Base Ten rod from the number line to show 0.

## Solve It

With children, reread the problem. Instruct children to draw a picture showing how many beads Eva has left after she makes the necklace. Then have children write the subtraction sentence for the problem.

## More Ideas

For other ways to teach subtracting a multiple of 10 from a multiple of 10—

- Distribute the ¾ Inch Grid (BLM 6) to children and have them turn it sideways. Have children count the number of squares in one row (10). Have children write 10, 20, 30, 40, 50, 60, 70, 80 in the far right boxes. Have them slide their fingers up the appropriate number of tens to find 70 – 20, 50 – 40, and 60 – 30.
- Give 9 Base Ten Block rods in a small bag to pairs of children. Have pairs take a handful, count them, and then subtract 20. Have children write the number sentence. Repeat with other numbers.

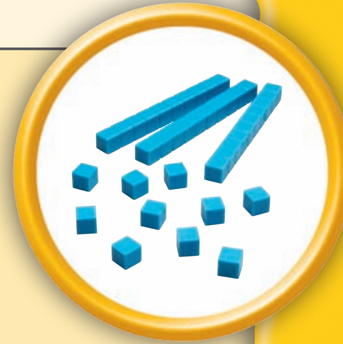
## Formative Assessment

Have children try the following problem.

*Circle the correct answer.*

80 – 30 = ______

**A.** 60 **B.** 50 **C.** 40



## Try It! 20 minutes | Pairs

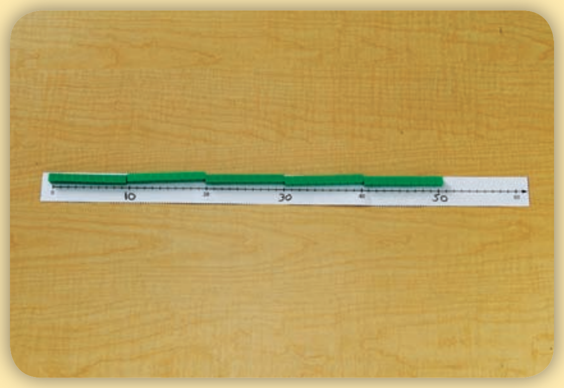
Here is a problem about subtracting a multiple of 10 from a multiple of 10.

*Eva has 50 beads. She uses 20 beads to make a necklace. How many beads does she have left?*

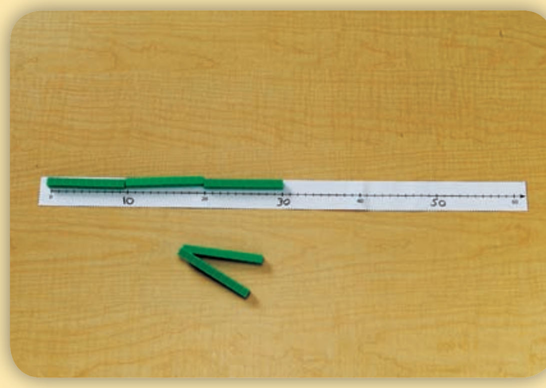
Introduce the problem. Then have children do the activity to solve the problem. Distribute Base Ten Blocks and the Number Line (BLM 4) to children. Help children assemble number lines or prepare number lines before the lesson.

### Materials

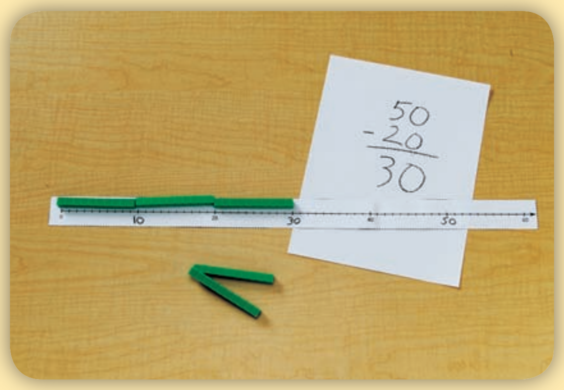
- Base Ten Blocks (9 rods and 9 units per pair)
- Number Line (BLM 4; 1 per pair)
- pencils (1 per pair)
- scissors and tape
- paper (1 sheet per child)




**1.** Have children label the missing tens (10, 30, 50) on the number line. They can use a Base Ten rod as a measuring guide. Have one child in each pair place Base Ten rods on the number line to show 50, the number of beads Eva has to start. **Ask:** *How many tens does 50 have? How many ones?*




**2. Say:** *Eva uses 20 beads to make a necklace.* **Ask:** *How many tens does 20 have? How many ones? Do we need to add or subtract two tens from 50?* **Say:** *The problem asks how many she has left, so we need to subtract.* Have the other child remove two Base Ten rods from the number line.




**3.** Relate the activity to the written method. On the board, demonstrate the problem as a number chart in columns. Have children copy it onto their recording paper. Tell them to be sure to line up the numbers correctly in the tens and ones columns.

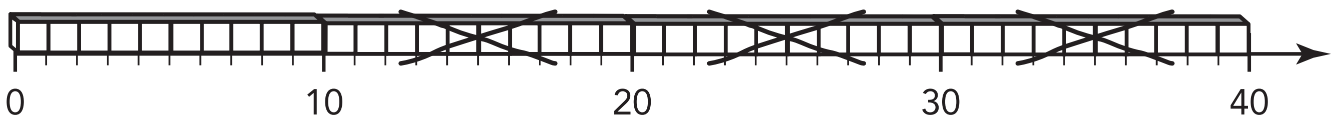
### ⚠ Look Out!

Watch for children who are still struggling with the concept of tens. Provide extra practice for these children, building 20, 30, 40, 50, 60, 70, 80, and 90, and then removing rods to make 80, 70, 60, 50, 40, 30, 20, and 10. Elicit that only the tens place changes as the number of rods is changed.

## Use Base Ten Blocks. Build each number. Write the numbers and the difference.

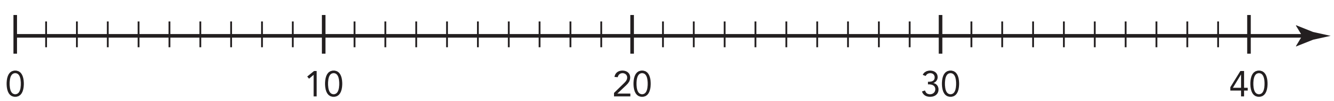
(Check students' work.)

**1.** 40 – 30 = 10




## Use Base Ten Blocks. Build the numbers. Draw the models. Subtract.

**2.** 30 – 30 = 0




## Subtract.

**3.** 70 – 50 = 20

**4.** 90 – 40 = 50

**5.** 60 – 20 = 40

*Answer Key*

**Challenge!** Does the number in the tens place or the ones place change when you subtract 20 from 50? Why?

Challenge: (Sample) The number in the tens place changes because there are no ones, only tens to subtract.