LESSON OVERVIEW

Lesson 18
Add Within 10

Lesson Objectives

Content Objectives

- Solve addition word problems with sums from 6 to 10, using pictures or objects.
- Recognize both put-together and add-to situations as addition problems.
- Relate an addition number sentence to an addition problem.
- Add within 10.
- Find pairs of addends to make a given total.

Language Objectives

- Tell put-together and add-to addition problems to match a given picture.
- Count pictures to find the total for an addition sentence.
- Model addition problems with counters.
- Write the total for an addition sentence.

Prerequisite Skills

- Solve addition word problems with sums to 5, using pictures or objects.
- Count up to 10 objects.
- Read addition number sentences.

Lesson Vocabulary

There is no new vocabulary. Review the following key terms.

- **add** to put together two or more quantities, to find the total of two or more numbers, or to find how many in all.
- **plus, +** the math term and symbol that mean add.
- **equals, =** the math term and symbol that means *is equal to* or *is the same as*.
- **number sentence** equation.
- **total** altogether. The result of adding two or more groups or quantities.

Learning Progression

In Kindergarten children learn to add and subtract within 10 using objects and pictures, initially focusing on addition and subtraction within 5. They learn to recognize both add-to and put-together situations, as well as take-away situations. Children associate number sentences with all of these situations and apply these skills to solving word problems.

In this lesson children explore real-world story situations that involve adding with sums from 6 to 10. Children continue to develop their understanding of addition by relating the context of the problem to the numbers and the other symbols used in number sentences.

In Grade 1 children will develop fluency with addition facts to 10 and will apply their understanding of addition to solve word problems involving sums beyond 10.

Lesson Pacing Guide

Whole Class Instruction

Day 1
45–60 minutes

Introduction

Use What You Know
- Activity *35 min*
- Building Fluency *10 min*

Day 2
45–60 minutes

Modeled Instruction

Explore Together
- Problem *15 min*
- Talk About It *5 min*
- Hands-On Activity *10 min*
- Problem Solving Connection *15 min*

Practice and Problem Solving
Assign pages 151–152.

Day 3
45–60 minutes

Guided Practice

Practice Together
- Problems *20 min*
- Talk About It *10 min*
- Hands-On Activity *15 min*

Practice and Problem Solving
Assign pages 153–154.

Day 4
45–60 minutes

Guided Practice

Practice Together
- Problems *15 min*
- Talk About It *5 min*
- Hands-On Activity *15 min*
- Fluency Practice *10 min*

Practice and Problem Solving
Assign pages 155–156.

Day 5
45–60 minutes

Independent Practice

Practice by Myself
- Problems *10 min*
- Talk About It *5 min*
- Hands-On Activity *10 min*
- Quick Check and Remediation *10 min*
- Hands-On or Challenge Activity *10 min*

Teacher-Toolbox: Lesson Quiz
Lesson 18 Quiz

Materials for Lesson Activities

Per child: 20 counters (10 each of two different colors), paper with "5 + 3 = 8" on one half and "9 = 4 + 5" on the other half, piece of string
Activity Sheet 3, Activity Sheet 5**, Activity Sheet 14**, Activity Sheet 16**

Per pair: Activity Sheet 1**, Activity Sheet 5**, Activity Sheet 16**

For display: 7 chairs

**Used for more than one activity.

Small Group Differentiation

Teacher-Toolbox.com

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

Grade K *(Lesson 18)*
- Sums of Ten
- Missing Numbers
- Count On to Add

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

Grade K *(Lesson 18)*
- K.24 Tell Addition Stories

Personalized Learning

i-Ready.com

Independent
i-Ready Lessons* *10–20 min*

Grade K *(Lesson 18)*
- Joining Sets to Add
- One More

*We continually update the Interactive Tutorials. Check the Teacher Toolbox for the most up-to-date offerings for this lesson.

Introduction

Activity Act Out Addition to 10

Objective

Recognize addition situations and solve word problems with sums to 10 using objects, and read corresponding number sentences.

Materials for each child

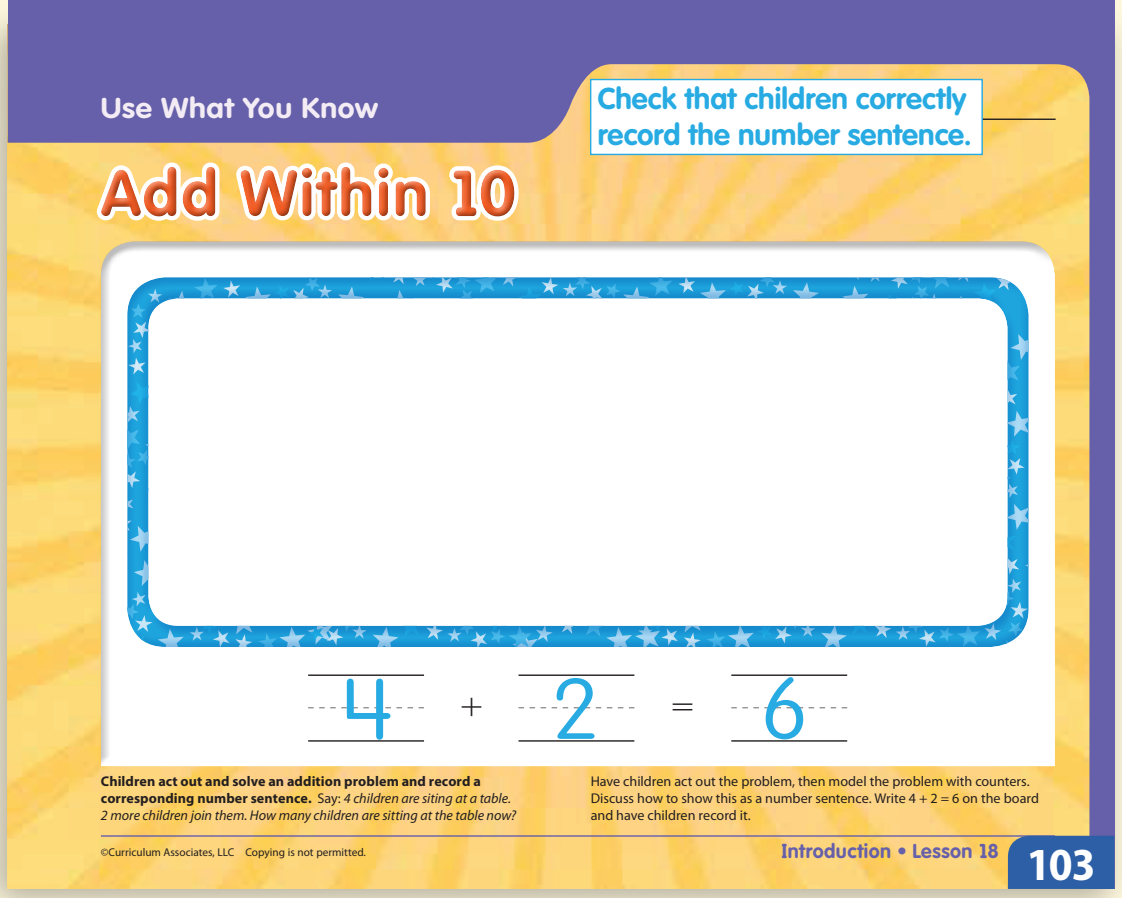
- 10 counters

Materials for display

- 7 chairs around a table

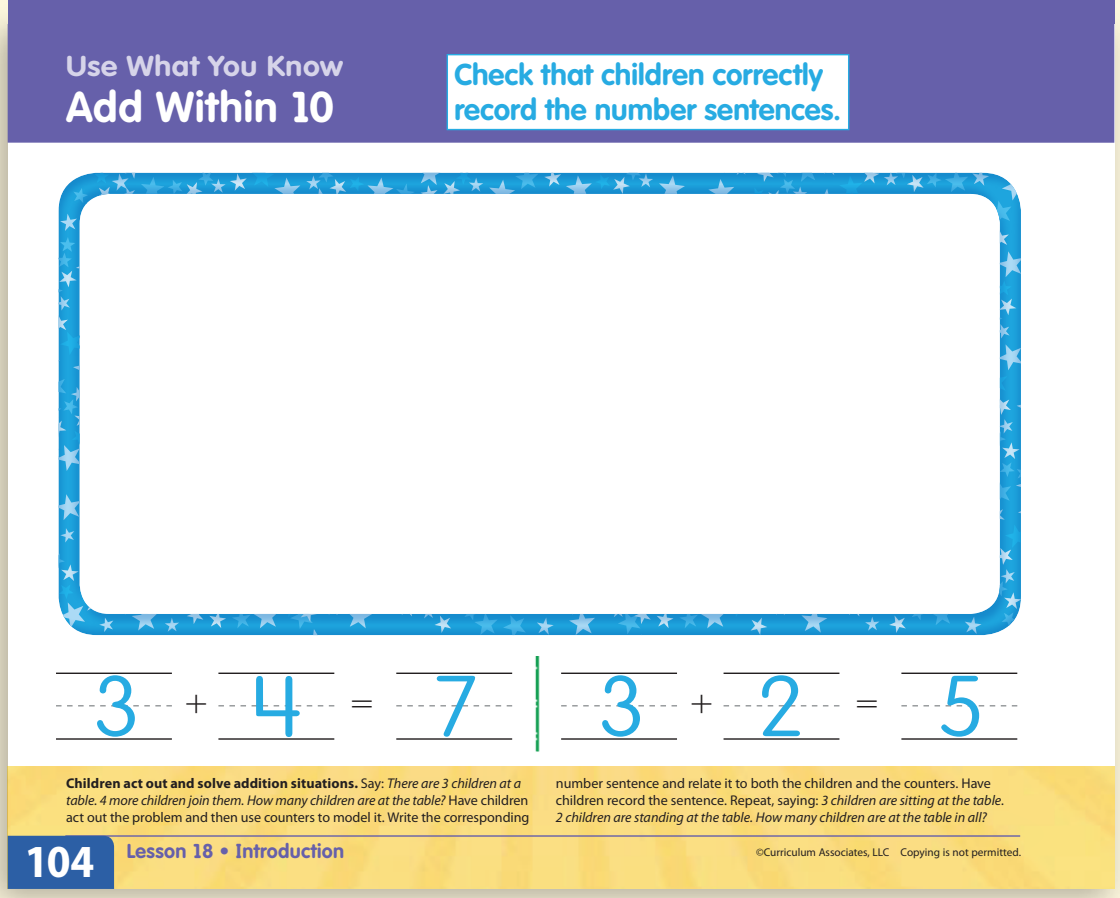
Overview

Children act out and solve an addition word problem and record a corresponding number sentence. Then children act out and solve add-to and put-together addition situations and record corresponding number sentences.



Step By Step

- **Pose the problem.** Tell children to imagine that they work in the school lunchroom and that they will use number sentences to describe the number of children having lunch.
- **Act out the situation.** Arrange 7 chairs around a table. Ask a volunteer to be the worker and to stand facing the table. Invite 4 children to sit at the table.
- Have children act out the problem. Count the 4 children at the table and present this add-to addition problem: *4 children are sitting at the table. Then 2 more children join them.* (Invite 2 children to join the 4 at the table.) *How many children are sitting at the table now?*
- Guide children to count the groups of 4 and 2 children and say the total. [6 children] Have the "worker'" count the children to verify the total.
- Have children use counters to model the problem on the workmat on the Student Book page. Guide children to show 4 counters to represent the 4 children sitting at the table and then show 2 more counters joining to represent the 2 children joining the table.
- **Write the number sentence.** Write "___ + ___ = ___" on the board. With the children's help, complete the number sentence. [4 + 2 = 6] Guide children to connect each number to the number of children sitting at the table and to the number of counters on the workmat.
- Have children record the number sentence on the Student Book page.


Use What You Know
Add Within 10

Check that children correctly record the number sentences.

3 + 4 = 7 | 3 + 2 = 5

Children act out and solve addition situations. Say: *There are 3 children at a table. 4 more children join them. How many children are at the table?* Have children act out the problem and then use counters to model it. Write the corresponding number sentence and relate it to both the children and the counters. Have children record the sentence. Repeat, saying: *3 children are sitting at the table. 2 children are standing at the table. How many children are at the table in all?*

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Step By Step

- **Present a new add-to situation.** Say: *There are 3 children at a table. 4 more join them. How many children are at the table now?*
- Ask different children to act out the situation.
- Then have children model the problem using counters on the workmat on the Student Book page. Encourage children to explain their reasoning as the work.
- Guide children to count the groups of 3 and 4 counters to verify the total. [7]
- **Write the corresponding number sentence.** Write "___ + ___ = ___" on the board. With the children's help, complete the number sentence. [3 + 4 = 7] Have children explain how each number in the number sentence relates to the children at the table and to the counters. Then have children record the number sentence on the Student Book page.
- **Present a put-together problem.** Say: *3 children are sitting at the table. 2 children are standing at the table. How many children are at the table in all?* [5]
- Ask a different group of children to act out the situation, then have all children model the situation using counters. Repeat writing the number sentence on the board and having children record it.
- Repeat with other addition problems for both add-to and put-together situations as time allows.
- As you present the different problems, note which children have difficulties with put-together situations and which struggle with add-to situations. When you do the Hands-On Activities throughout the lesson, provide add-to and put-together contexts to reinforce that both situations use addition.

▶ Building Fluency

Practice reading numbers to 20.
Write or post the numbers 1–20 on the board. Read them aloud together during circle time or other moments when you have the children's attention.

Practice adding and subtracting within 5.
Find opportunities throughout the day to use children, objects, or pictures to tell addition and subtraction stories. Have children solve the problems.

Modeled Instruction

Step By Step

- **Encourage children to tell addition story problems for various groups of objects.**
- **Ask children to discuss the addition facts shown by each group of objects, in more than one way if possible.** Invite discussion about quantities of items in the picture. Ask children to count and describe the different objects they see, such as 5 spotted dogs and 3 black dogs. Ask questions to encourage children to think about the different ways to group the objects.
- Ask: *How many dogs are sitting?* [7] *How many are standing?* [1] *How many have tails pointing up?* [7] *Pointing down?* [1] *How many big collars are there?* [4] *Small collars?* [6]
- Have children create word problems using the answers to the questions discussed above. Read this example aloud: *7 dogs are sitting and waiting for treats. 1 dog is standing and waiting for treats. How many dogs are waiting for treats?*
- Together, write a number sentence and discuss how it represents the problem. [7 + 1 = 8] Continue, inviting children to pose problems about other things they see in the picture.
- **Have children circle the group that shows 4 + 3 = 7.**

▶ Mathematical Discourse 1 and 2

▶ Hands-On Activity

▶ English Language Learners

Ready Mathematics PRACTICE AND PROBLEM SOLVING

Assign *Practice and Problem Solving* **pages 151–152** after students have completed this section.

Explore Together
Add Within 10

Children circle the 7 bowls (4 with paw prints and 3 with stripes).

Encourage children to tell addition story problems for various groups of objects. Ask children to discuss the addition facts shown by each group of objects, in more than one way if possible. Have children circle the group that shows 4 + 3 = 7.

Talk About It How many dogs will there be if one more comes into the store? How do you know?

▶ Mathematical Discourse

1 **Talk About It** When children have completed the page, ask: *How many dogs will there be if one more comes into the store? How do you know?*

If 1 more dog comes into the store there will be 9 dogs. Children might recognize that 9 is 1 more than 8 or they might count all the dogs.

2 *What are some different ways you can group the dog collars to get the total? How are these ways different? How are they the same?*

Children may suggest grouping by size (4 large and 6 small) and color (5 red and 5 black). The addends are different, but the total is the same (10 collars).

▶ Hands-On Activity

Model addition and subtraction problems with fingers.

- Write the number sentences "4 + 2 = 6," "4 − 2 = 2," and "4 + 4 = 8" on the board.
- Present children with word problems (include add to, put together, and take from) that match the number sentences.
- Have children use their fingers to model each problem. Ask: *Do you add or subtract to find the answer? Why?* Then ask them to identify the corresponding number sentence.

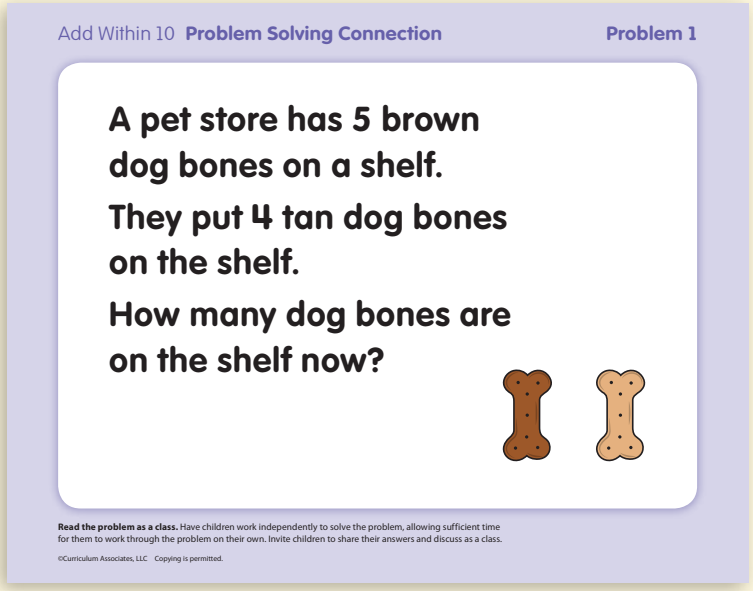
▶ English Language Learners

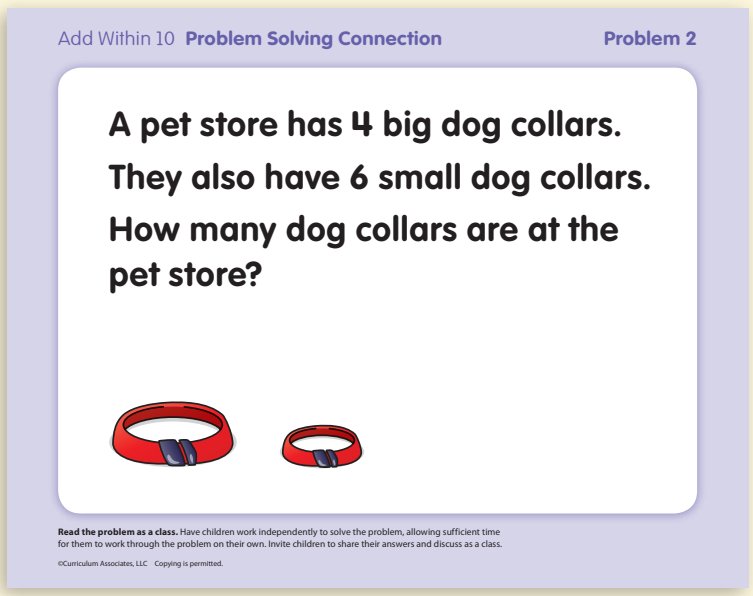
Some children may have trouble recognizing that words such as *a, an,* and *another* represent the quantity "one." When one of these words is used in a word problem, call attention to it and elicit how the problem can be rephrased using the word *one*. For example, say: *6 kittens are playing. Another kitten comes to play. How many kittens are playing now?* Rephrase it by saying: *6 kittens are playing. 1 kitten comes to join them. How many kittens are playing now?* Point out that the meaning stays the same.

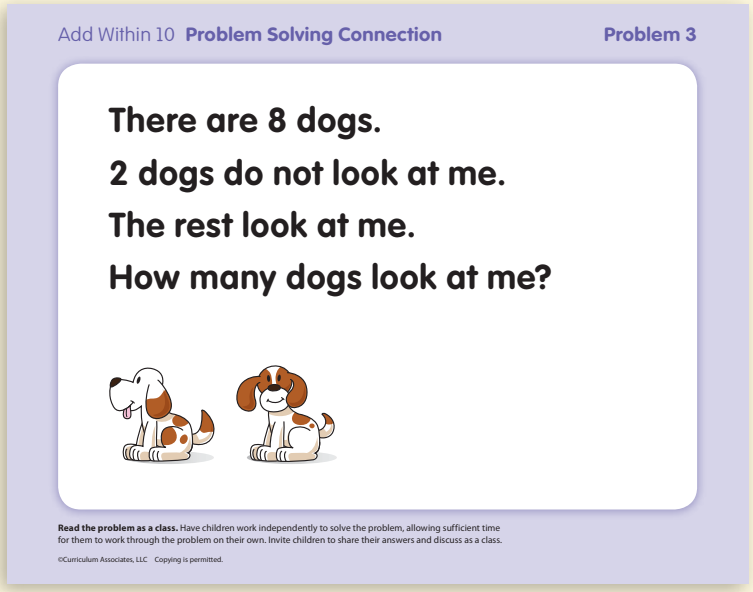
Problem Solving Connection

Modeled Instruction

Teacher-Toolbox.com







At A Glance

Children solve and discuss addition problem-solving situations. The problems are located on the online Teacher-Toolbox as individual PDFs for use as whole class instruction.

These provide problem-solving opportunities beyond the Student Book. They may be used along with the *Explore Together* scene in the Student Book. They may also be used with the corresponding black-and-white scene in *Practice and Problem Solving* for a more open-ended approach.

Step By Step

- **Read the problem as a class.** Display a problem and read it aloud. Discuss the problem with children to make sure they understand what it is asking before having them think about ways to solve it.
- **Have children work independently to solve the problem, allowing sufficient time for them to work through the problem on their own.**

SMP TIP Persevere in Problem Solving
Allowing children sufficient time to think through the problem on their own encourages them to try different approaches if their first or second attempt does not work. This builds confidence in finding ways to use what they learned from those attempts to revise their thinking on subsequent attempts. *(SMP 1)*

- **Invite children to share their answers and discuss as a class.** Encourage children to explain how their answers are alike and how they are different. Ask if anyone got a different answer to assess understanding and help children avoid common errors.

Solutions

Problem 1
Add To, result unknown
$5 + 4 = \boxed{9}$

Problem 2
Put Together, result unknown
$4 + 6 = \boxed{10}$

Problem 3
Put Together, result unknown (Challenge)
$8 = 2 + \boxed{6}$

Guided Practice

Step By Step

- **Guide children to compare each picture to the addition sentence, then count and write the total.** First, provide opportunities for children to relate number sentences to real-life situations with activities such as Hands-On Activity 1.

▶ Hands-On Activity 1

- Direct children's attention to the first problem. Ask: *What does the plus sign tell you to do?* [add 7 and 1]
- Guide children to connect the number sentence to the picture. Ask: *What does the number 7 show?* [7 brown dogs] *The number 1?* [1 black dog] Have children circle the 2 groups of dogs and draw lines to match each group to the corresponding number.

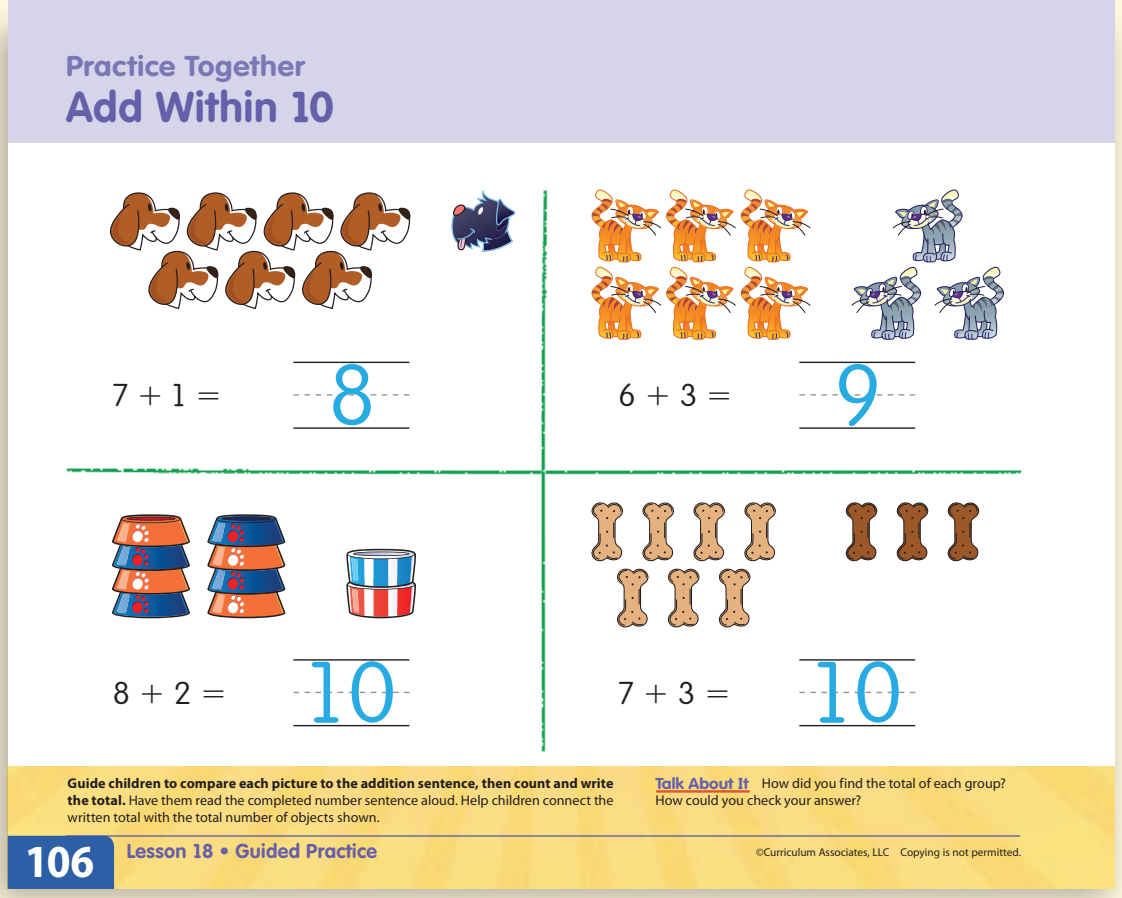
SMP TIP Model with Mathematics
When children draw lines from the pictures to the addends, they are seeing the relationship between two models used to represent a situation. *(SMP 4)*

- Tell children to count all the dogs, then complete the number sentence.
- **Have them read the completed number sentence aloud. Help children connect the written total with the total number of objects shown.** Children should recognize that 7 brown dogs plus 1 black dog equals 8 dogs. Guide children in completing the other 3 problems.

▶ Mathematical Discourse 1 and 2

Ready Mathematics PRACTICE AND PROBLEM SOLVING

Assign *Practice and Problem Solving* **pages 153–154** after students have completed this section.



▶ Mathematical Discourse

1 Talk About It When children have completed the page, ask: *How did you find the total of each group? How could you check your answer?*

Children may describe a range of addition strategies, for example counting pictures or fingers. Although it's not expected at this level, some children may count on from one of the addends. They may suggest checking by using a different strategy or by repeating the same strategy.

2 *Aisha says that 8 plus 2 and 7 plus 3 are both ways to show 10, and that you can write 8 + 2 = 7 + 3. Is she right? Why do you think so?*

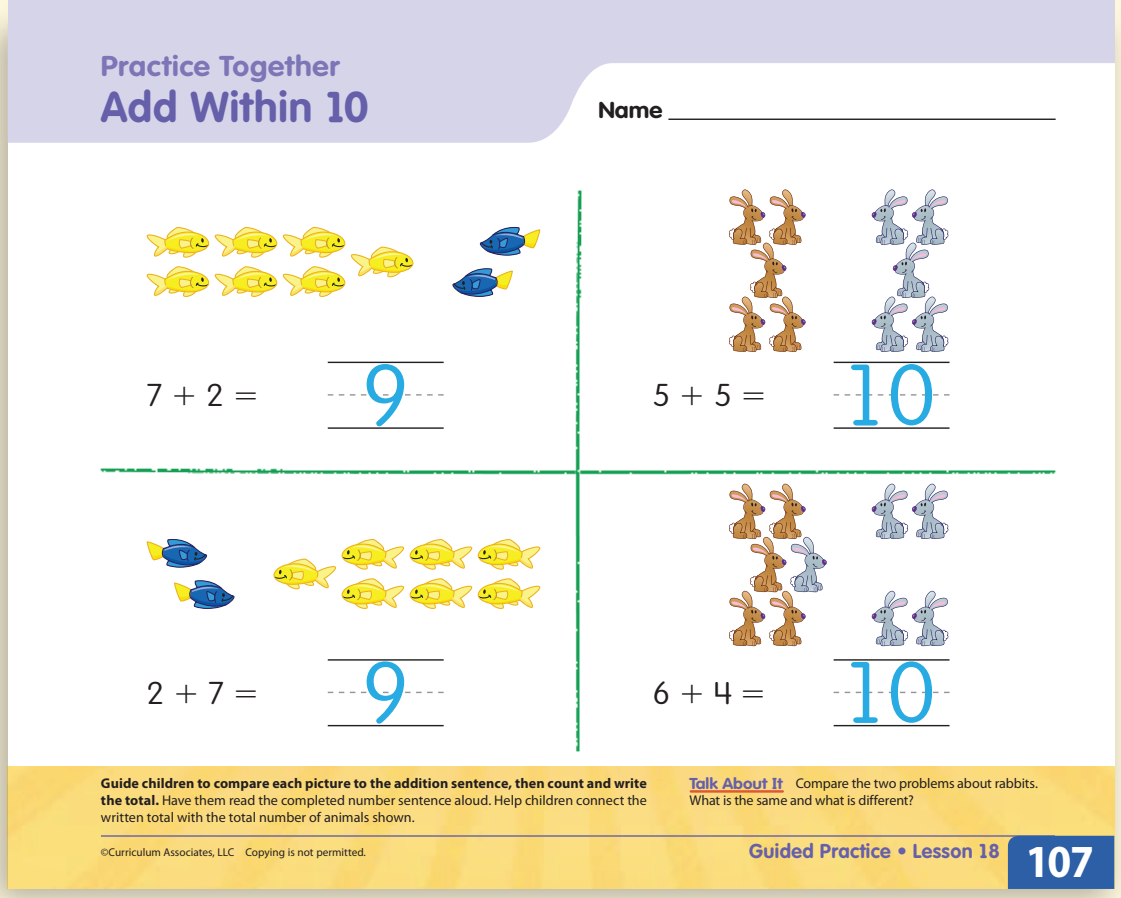
Encourage children to discuss why they agree or disagree with Aisha. Then guide the discussion toward the equal sign as meaning *is the same as*. Since the quantity or total on each side is the same (10), Aisha is right.

▶ Hands-On Activity 1

Model addition sentences with counters.

Materials For each child: paper with 5 + 3 = 8 at the top and 9 = 4 + 5 in the middle, 10 counters (5 each of two different colors), crayons

- Tell an addition problem for 5 + 3 = 8. For example, say: *Raj buys 5 cans of dog food. He buys 3 cans of cat food. How many cans does he buy in all?*
- Guide children in modeling the problem with counters on the top half of their papers, using a different color for each addend.
- Then have them draw counters to record each group and draw lines matching the groups to the addends in the number sentence.
- Ask children to count all the cans to verify the answer is 8 cans. Repeat with a similar problem for 9 = 4 + 5.


Practice Together
Add Within 10

Name _____

7 + 2 = 9

5 + 5 = 10

2 + 7 = 9

6 + 4 = 10

Guide children to compare each picture to the addition sentence, then count and write the total. Have them read the completed number sentence aloud. Help children connect the written total with the total number of animals shown.

Talk About It Compare the two problems about rabbits. What is the same and what is different?

Step By Step

- **Guide children to compare each picture to the addition sentence, then count and write the total.** First, provide opportunities for children to explore turn-around facts with Hands-On Activity 2.

▶ Hands-On Activity 2

- Invite children to create addition problems about the fish in the first problem. Then say: *I have 7 yellow fish. I get 2 blue fish. Now how many fish do I have?*
- Guide them to count the fish and complete the number sentence.
- **Have them read the completed number sentence aloud. Help children connect the written total with the total number of animals shown.** Ask them to point to the picture with 1 finger and to the matching number with another as you say: *7 yellow fish plus 2 blue fish equals 9 fish.*
- Work through the rest of the problems in a similar manner. Look for children who recognize the second fish problem as a turn-around fact and write the total without counting.

▶ Mathematical Discourse 3

▶ Fluency Practice

SMP TIP Reason Abstractly
By exploring turn-around facts in **Hands-On Activity 2,** children are learning about the commutative property of addition. Helping them identify these facts promotes the use of this property as a strategy for finding totals. *(SMP 2)*

Ready Mathematics PRACTICE AND PROBLEM SOLVING

Assign *Practice and Problem Solving* **pages 155–156** after students have completed this section.

▶ Hands-On Activity 2

Model turn-around facts with 10-frames.

Materials For each child: 10-Frames (Activity Sheet 14), 20 counters (10 each of two different colors)

- Ask children to represent the following problem on the 10-frame. Say: *There are 8 frogs in the water and 1 frog in the mud. How many frogs are there altogether?*
- Explain that the frame shows 8 and 1 for a total of 9. Turn a 10-frame upside down, discussing that it now shows 1 and 8 for a total of 9.
- Write the number sentences "8 + 1 = 9" and "1 + 8 = 9" on the board. Guide children to see that both show the same number pair for 9, but the order of the addends is different.
- Continue, posing other problems and, together, writing the turn-around fact for each number sentence used to solve a problem.

▶ Mathematical Discourse

3 Talk About It When children have completed the page, say: *Compare the two problems about rabbits. What is the same and what is different?*

Both problems have a total of 10 and show 5 brown and 5 gray rabbits, but the groupings are different. One shows the number pair 5 and 5, the other 6 and 4. Some children may see you get 6 and 4 when you move 1 gray rabbit from the group of 5 gray rabbits to the group of 5 brown rabbits. Write "5 + 5 = 6 + 4" on the board and say: *5 plus 5 is the same as 6 plus 4.*

▶ Fluency Practice

Practice finding addend pairs for 4–10.

Materials For each pair: Dot Cards 1—Small (Activity Sheet 1), Number Cards 0 to 9—Small (Activity Sheet 5), Number Cards 10 to 20 (Activity Sheet 16)

- Place dot cards for 1–10 in an array, faceup. Mix up the number cards for 4–10 in a stack facedown.
- One partner turns over a number card. The other partner chooses 2 dot cards that make that total. Partners alternate roles and repeat.

Independent Practice

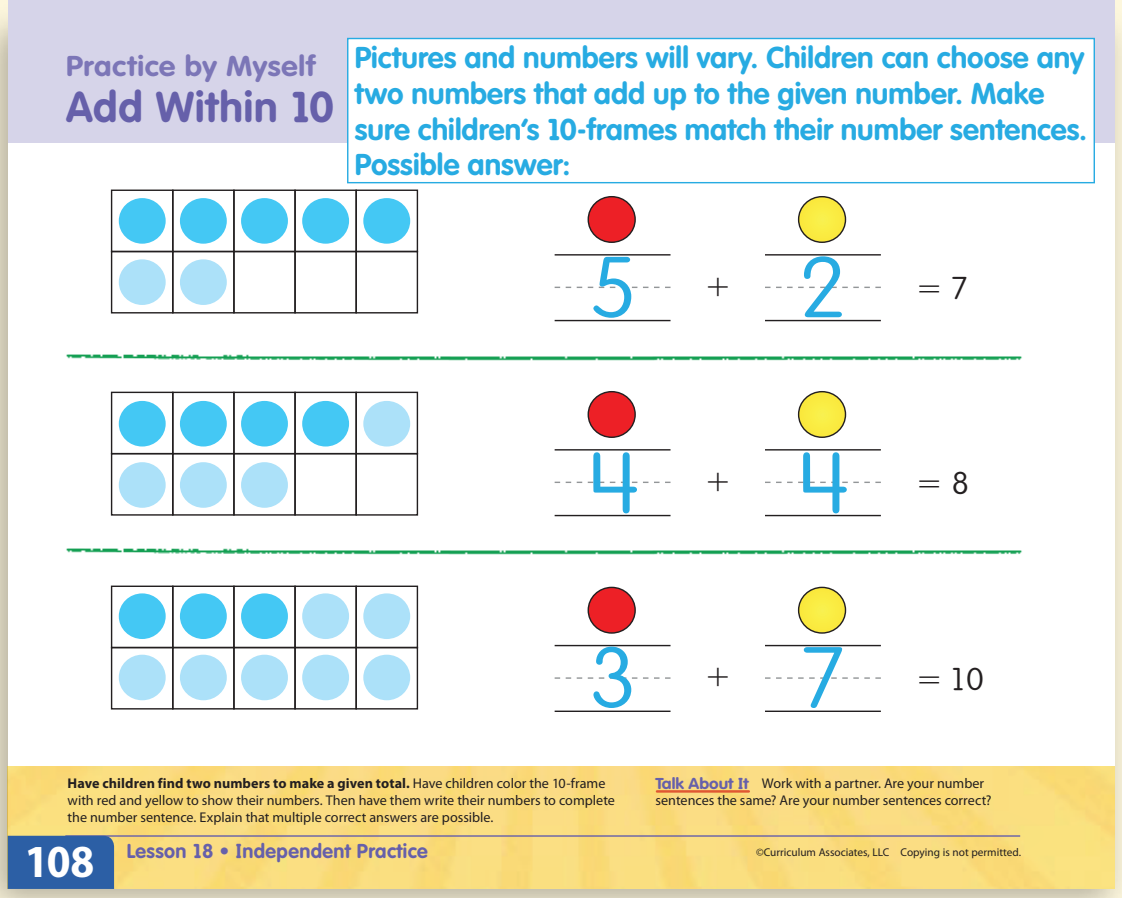
Step By Step

- **Have children find two numbers to make a given total.** First, provide opportunities for children to practice word problems with both addends unknown with activities such as the Hands-On Activity.

▶ Hands-On Activity

- Direct attention to the first problem. Guide children to use the counters and 10-frames as they did in the Hands-On Activity to find number pairs for 7. Have children explore the different possible number pairs, then pick one to show on the page.
- **Have children color the 10-frame with red and yellow to show their numbers. Then have them write their numbers to complete the number sentence. Explain that multiple correct answers are possible.**
- Have children share number sentences and record on the board. Use their work to emphasize the multiple possible answers. Ask children to identify any turn-around facts they see.
- Instruct children to complete the page.

▶ Mathematical Discourse



▶ Mathematical Discourse

Talk About It When children have completed the page, say: *Work with a partner. Are your number sentences the same? Are your number sentences correct?*

Responses will vary. Children should realize that because different number pairs can be used for each total, partners can have different sentences but both be correct.

▶ Hands-On Activity

Model unknown addends with counters.

Materials For each child: 10-Frames (Activity Sheet 14), 20 counters (10 each of two different colors)

- Pose this problem aloud: *Ben has pennies and dimes in his bank. He has 9 coins in all. How many pennies and how many dimes can he have?*
- Discuss that the problem tells how many in all, but not how many of each. Have children show 9 counters of the same color on the 10-frame.
- Ask them to explore different combinations of counters, keeping the total 9 and at least 1 of each color counter on the frame.
- Invite children to share their results. Relate their answers back to the question. (1 penny and 8 dimes, 2 pennies and 7 dimes, etc.)

Differentiated Instruction

▶ Quick Check and Remediation

Materials For each child: 10 counters; Number Cards 0 to 9—Small (Activity Sheet 5), Number Cards 10 to 19—Small (Activity Sheet 16)

- Pose an addition word problem (total unknown) to children, encouraging them to use their fingers to find the answer. For example, say: *8 children are sitting at a picnic table. 2 more children sit down. How many children are sitting at the table now?* $8 + 2 = \_\_\_$. Ask them to first answer orally and then write the answer to complete a written number sentence. [10 children; $8 + 2 = 10$]
- For children who are still struggling, use the chart below to guide remediation.
- After providing remediation, check children's understanding by posing another addition word problem (total unknown) and having children repeat the steps described for the assessment task above.

If the error is . . .	Children may . . .	To remediate . . .
answering 2, 6, or 8 children	not recognize that the problem requires joining the two groups of children together.	Restate the problem slowly. As you do, have children count 2 groups of the counters (different color for each group) to show the children already seated and the ones who join them. Name each addend, then move the 2 groups of counters together. Ask children to count all to find the total.
answering 9 or 11 children	have miscounted.	If the children did not struggle with sums to 5, they may understand the concept but need more practice with greater numbers. Allow them to try the problem again, using counters to find the total.
saying 10, but writing a different numeral	not correctly relate quantities with written numbers.	Provide practice matching quantities with number cards (Activity Sheet 5) and writing numbers for quantities stated orally.

▶ Hands-On Activity

Match number sentences to pictures.

Materials For each pair: Dot Cards 1—Small (Activity Sheet 1), paper and crayons

- Give each pair dot cards for 1–10.
- Write "$2 + 6 = \_\_\_$" on the board. Have each pair find 2 dot cards to match the addends and draw the 2 groups of dots on a piece of paper. Tell them to write the complete number sentence with the drawing.
- Repeat with the number sentences "$6 + 3 = \_\_\_$" and "$7 + 2 = \_\_\_$."

▶ Challenge Activity

Explore missing addend problems

Materials For each child: Dot Cards 2—Small (Activity Sheet 3), piece of string

- Give children a dot card for 10. Pose the following problem aloud: *There are 10 granola bars in a box. 4 are apple, and the rest are cherry. How many cherry bars are there?*
- Elicit that there are 10 bars in all. Ask: *How many of them are apple?* [4] Guide children in placing the string on the dot card to show a group of 4 dots. Guide children to recognize that the 6 remaining dots represent the cherry bars.
- Repeat, posing other missing addend problems with sums of 10.

LESSON QUIZ

Lesson 18
Add Within 10

Teacher-Toolbox.com

Overview

Assign the Lesson 18 Quiz and have children work independently to complete it.

Use the results of the quiz to assess children's understanding of the content of the lesson and to identify areas for reteaching. See the Lesson Pacing Guide at the beginning of the lesson and the Differentiated Instruction activities for suggested instructional resources.

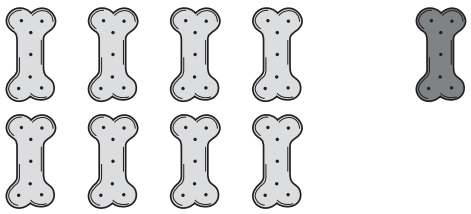
Tested Skills

Problems on this quiz require children to be able to solve addition situations with sums from 6 to 10 using pictures and find pairs of addends to make a given total. Children will also need to be familiar with counting up to 10 objects.

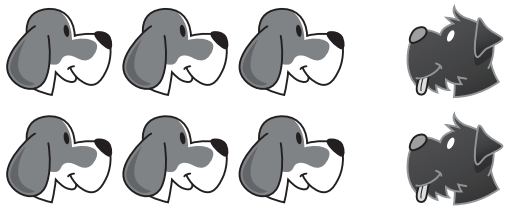
***Ready*® Mathematics**

Lesson 18 Quiz Answer Key

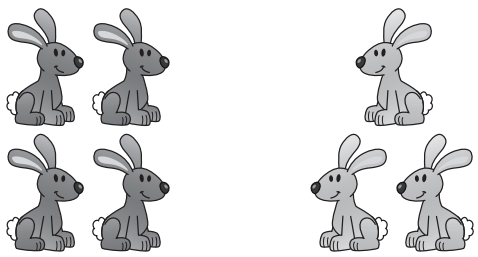
Name _____



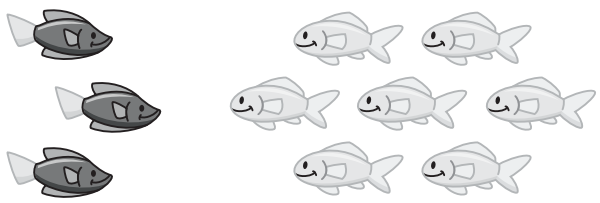
$8 + 1 = 9$



$6 + 2 = 8$



$7 = 4 + 3$



$10 = 3 + 7$

Have children compare each picture to the addition sentence. Then have children count and write the total to complete the addition sentence.

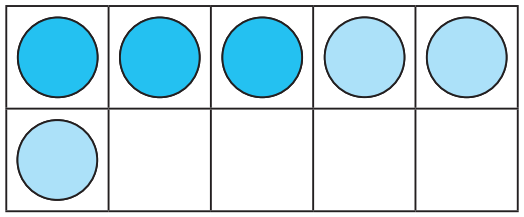
Common Misconceptions and Errors

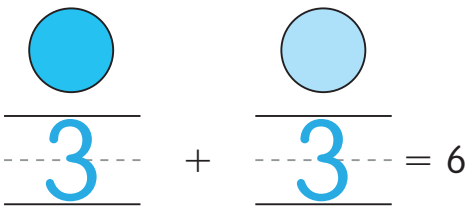
Errors may result if children:

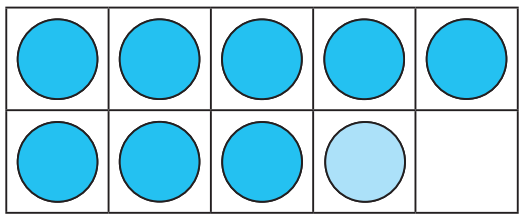
- do not recognize that an addition problem requires joining two quantities together to find a total.
- cannot correctly associate quantities with their written numbers.
- do not realize that different addend pairs can make a given total.
- do not keep track while counting objects.

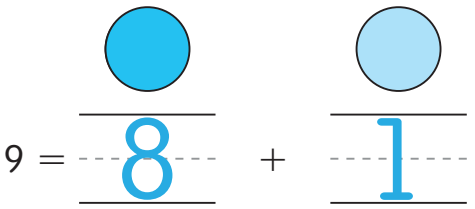
Name _____

Answers will vary. Check that the colors of the counters children draw match the numbers they write in the number sentence. Also, check that children choose numbers that add up to the given total. Possible answers:









Have children color the first counter blue and the second counter yellow in each problem. Then have children draw blue and yellow counters in each 10- frame to show one way to get the total in the number sentence. Ask children to complete each number sentence to match their model.