Materials  red and blue connecting cubes

- Write $6 + 7 = \underline{\hspace{2cm}}$ on the board. Say: You can use $6 + 6 = 12$ to help find the sum of $6 + 7$. Have children put cubes together to make two 6-cube trains of the same color. Have them say the doubles fact that the cubes represent.

- Now change the model to show $6 + 7$. 7 is one more than 6. Demonstrate adding one more cube of a different color to one of the 6-cube trains.

- The cubes show $6 + 6 + 1$. Why is $6 + 6 + 1$ the same as $6 + 7$? Have children use their cubes to explain their answer. Possible answer: because 7 has the same value as $6 + 1$

- Have a similar discussion to find the sum for $6 + 7$ using $7 + 7 - 1$. Demonstrate making two 7-cube trains and then breaking off one cube.

Materials  two-color counters

- Write $5 + 6$ on the board. Have children model the problem by placing 5 red counters in a row and 5 red counters and 1 yellow counter directly below the first row.

- How can you describe the number of red counters in the two groups? Both groups have 5 red counters.

- Below $5 + 6$, write $5 + 5 + 1$, using an arrow to show that 6 is written as $5 + 1$.

- Circle $5 + 5$. Have children use their two groups of red counters to find the sum. Discuss that just as 6 is one more than 5, the sum of $5 + 6$ is one more than the sum of $5 + 5$.

- Write $10 + 1$ on the board below $5 + 5 + 1$, using an arrow to show that $5 + 5$ is written as 10. Then have children find the sum.
Practice Addition Facts

Materials: connecting cubes in two colors

- Write 4 + 8 on the board. Have children make a connecting cube train to show this problem. Tell them to use two colors of cubes, one for each number.

- Have children explain how their cube train shows 4 + 8 = 12. Possible answer: I have 4 cubes of one color and 8 cubes of another color. There are 12 cubes in all.

- Have children turn the cube train around.

- What addition fact does your cube train show now? 8 + 4 = 12. Write 8 + 4 on the board.

- Have children add to check their work. Have children describe how the cube train changed and how it stayed the same when they turned it around.

Materials: connecting cubes in two colors

- Write 7 + 2 on the board. Model how to make a cube train to show this problem with a 7-cube train of one color and a 2-cube train of another color. Discuss how the cubes show the problem.

- Then have children make the same model. Ask them to connect the two trains.

- Ask: What is the sum of 7 + 2? How can you tell from your train? 9. My train is 9 cubes long.

- Have children turn the cube train around. What is the sum of 2 + 7? How can you tell from your train? 9. My train is 9 cubes long.

- Point out to children that the sum stayed the same even though the order of the numbers changed.
LESSON 3.3
Algebra • Make a Ten to Add

Materials  blue and red paper clips, egg carton with 10 compartments

• Write $8 + 7 = \_\_\_$. Ask children to gather 8 red paper clips and 7 blue paper clips. Have children place each red paper clip into a single compartment in the egg carton. Then have them place 1 blue paper clip in each remaining compartment.

  ![Egg carton with paper clips]

• Ask: How many paper clips are in the carton? 10 paper clips  How many paper clips are left over? 5 paper clips  What is $10 + 5$? 15 Guide children to see that 15 is the number of red and blue clips in all, so $8 + 7 = 15$.

Materials  Ten Frames (see eTeachers Resources), two-color counters

• Have a volunteer fill the ten frame using 10 red counters.

• Remove 2 counters from the ten frame. Have a volunteer use yellow counters to fill the ten frame. Write $8 + 2 = 10$. Flip over 2 red counters so there are 4 yellow counters in the ten frame. Ask: What addition fact does this show? $6 + 4 = 10$, or $4 + 6 = 10$

• Write $7 + 4 = \_\_\_$ on the board. Have a volunteer put 7 red counters in the ten frame. Then have the child take 4 yellow counters and fill the ten frame. Ask: How many extra counters do you have? 1 counter  How many counters are there in all? 11 counters Write $7 + 4 = 11$. 
LESSON 3.4
Algebra • Add 3 Addends

Materials connecting cubes in three colors

• Write this number sentence on the board.
  \[ 2 + 7 + 3 = \text{___} \]

• Have three children use cubes to model the three addends in the number sentence. Ask the first two children to put their cubes together and name the sum. Write the sum on the board. Have the third child add the cubes and name the sum. Write the sum on the board.

• Have children change positions and repeat the activity. Ask: Does the sum change when you change the order of the addends? No

Materials connecting cubes in three colors

• Write this problem on the board.

  John has 4 stickers. Maria has 2 stickers. Rachel has 5 stickers. How many stickers do they have in all?

• Read the problem together. Have children model the three groups of stickers using three colors of cubes.

• If you add the 4 cubes and 2 cubes together first, how many cubes is this? 6 cubes Then add the 5 cubes to the 6 cubes. What does this total show? \[ 5 + 6 = 11; \text{they have 11 stickers in all.} \]
LESSON 3.5
Algebra • Relate Addition and Subtraction

Materials 2 sheets of paper, two-color counters

- Ask children to fold a sheet of paper in half and draw a line on the fold to separate the paper into two sections.
- Write \(7 + 5 = \) on the board. Have children place 7 red counters on the left and 5 yellow counters on the right. Then have children find how many counters there are in all. Write the answer on the board.
- Then write the subtraction sentence \(12 - 7 = 5\) on the board. Have children cover the red counters with the other sheet of paper to model the subtraction sentence.
- Then have children repeat the activity, this time modeling the related facts \(8 + 3 = 11\) and \(11 - 8 = 3\).

Tier 2
- Ask a group of 3 girls and a group of 4 boys to stand in the front of the classroom.
- Have each group count on by ones and tell the number in their group. Write \(3 + 4\) on the board.
- Have both groups stand together. Ask: How many children are there in all? 7 children Complete the fact on the board: \(3 + 4 = 7\).
- To relate this addition fact to subtraction, write 7 on the board. Then ask the group of girls to move to the side. Write \(-3\) next to 7. Ask: How many children are left? 4 children Complete the fact on the board: \(7 - 3 = 4\).
- Repeat the activity to model the related number sentences \(5 + 3 = 8\) and \(8 - 5 = 3\).
LESSON 3.6
Practice Subtraction Facts

Materials  two-color counters

• Write $9 - 3 = \_\_\_\_$ on the board. Ask: How can you use counters to model this fact? Possible answer: Count out 9 red counters and take away 3 counters.

• Model using the counters to find the difference by counting back. Start with 9 counters. Say “9” as you point to the ninth counter. As you take away one counter at a time, count back aloud 8, 7, 6. So, $9 - 3 = 6$.

• Now model for children how to think of a subtraction fact as an addition fact with a missing addend. Write $3 + \_\_\_\_\_ = 9$ on the board. With the 9 counters organized as a group of 3 and a group of 6, have children identify the missing addend. 6

• So, to find the difference for $9 - 3$, we can think 3 plus what number is 9? The missing number in the addition fact is the difference between 9 and 3.

Materials  two-color counters

• Remind children that in subtraction you take away a part from the whole to find the other part and that in addition you put parts together to make a whole.

• Write $6 - 2$ on the board. Ask: What is the whole? 6 Model 6 with counters. Then ask: How many counters are you taking away? 2 counters Point to the sixth counter and say “6.” Take away one counter at a time and count back aloud 5, 4. How many counters are left? 4 counters

• Then explain that the same subtraction problem can be solved in a different way. The parts that make a whole in an addition fact can be used to find the missing part in a subtraction problem.

• Model 6 as a group of 2 counters and a group of 4 counters. These counters show that $2 + 4 = 6$. So, the difference between 6 and 2 is 4.
**LESSON 3.7**  
**Use Ten to Subtract**

**Materials** Number Lines (blank) (see eTeacher Resources)

- Write $14 - 6 = \_\_$ on the board. Display a number line labeled from 0 to 20.
- Draw a point at 14. Explain that you will break the 6 apart and subtract in steps. Draw a loop to show a “jump” from 14 to 13 and count 1. Continue until you reach 10 and count 4.
- **What was subtracted from 14 to get to 10?** 4 Circle 14 to 10 on the number line and label the section 4.
- Draw two more loops from 10 to 8 on the number line and count aloud: 1, 2. **What was subtracted from 10 to get to 8?** 2 Discuss with children that once they got to 10, they used a tens fact to solve. Show children how they subtracted 6 in all on the number line. So, $14 - 6 = 8$.

**Tier 2**  
**Materials** Ten Frames (see eTeacher Resources), two-color counters

- **We have subtracted 5 from 15. How many counters are there now?** 10 counters Write $15 - 5 = 10$.
- **We need to subtract 3 more counters to subtract 8 counters in all.** Move 3 counters off the ten frame. Put them with the pile of 5 counters. **How many counters are there now?** 7 counters Write $10 - 3 = 7$.
- Allow children to count the pile of 8 counters to confirm that 8 counters in all were taken away from the 15 counters. Write $15 - 8 = 7$.
- Have children use ten frames and counters to repeat the activity and reinforce their understanding.
Materials  two-color counters

• Write these two problems on the board.

_Marla has 4 marbles. Jake has 9 marbles. How many marbles do they have in all?_

_Sue has 13 books. She gives 4 books to Joe. How many books does Sue have left?_

• Model the first problem as 4 red counters and 9 yellow counters. Describe that the red counters show Marla’s marbles and the yellow counters show Jake’s marbles. The problem asks us to find how many marbles in all. So, we can add the groups to solve, \(4 + 9 = 13\).

• For the second problem, model 13 with red counters. Ask: _What do these counters show?_ the 13 books Sue has. How can we model Sue giving away 4 books? Take away 4 counters. Our model shows that Sue has 9 books left, \(13 - 4 = 9\).

Materials  connecting cubes

• Write these two problems on the board.

_Jo has 4 apples and 3 pears. How many pieces of fruit does she have?_

_Mark has 7 buttons. He gives 4 buttons to Carla. How many buttons does Mark have left?_

• Read the first problem. Have children model the problem with 4 red and 3 green cubes. Explain that their cubes show Jo’s 4 apples and 3 pears. Point out that the problem asks how many pieces of fruit Jo has in all. Ask: _How many cubes do you have in all?_ 7 cubes So, Jo has 7 pieces of fruit in all.

• Read the second problem. Have children model the 7 buttons with red cubes. Ask: _How can you show the buttons Mark gives away?_ Take away 4 cubes. How many cubes are left? 3 cubes So, Mark has 3 buttons left.
LESSON 3.9
Algebra • Use Equations to Represent Problems

Materials  connecting cubes

• Write this problem on the board.

_Olivia has 12 stickers. She gives 5 stickers to Anna. How many stickers does Olivia have now?_

• Read the problem aloud. Make a 12-cube train to model the stickers Olivia starts with. Write 12 on the board. Count 5 cubes from one end of the cube train and remove them. Explain that the removed cubes model the 5 stickers Olivia gave to Anna. Write $-5$ next to 12.

• Show the remaining cubes. Discuss that these cubes model the stickers Olivia has now. Count the cubes with children. Then write $= 7$ after $12 - 5$. Have children explain in their own words how the number sentence shows the problem.

Materials  connecting cubes

• Write the following problem on the board.

_Esteban has 9 connecting cubes. He gives 4 cubes to Van. How many cubes does Esteban have now?_

• Have each child count 9 connecting cubes and make a cube train.

• Ask: Are cubes being added together or are cubes being taken away? Cubes are being taken away. Guide children to act out the problem by removing 4 cubes from the cube train of 9 cubes.

• Write the subtraction sentence $9 - 4 = 5$ on the board. Explain that the model children made represents this subtraction problem because it shows how some of the cubes are taken away from the whole group.
LESSON 3.10
Problem Solving • Equal Groups

Tier 1

Materials  two-color counters

• Write this problem on the board and read it aloud.

_Mrs. Bronson has some counters in 3 rows. She has 4 counters in each row. How many counters does she have?_

• Help children model the problem using counters.

_How many rows of counters does Mrs. Bronson have? 3 rows_
_How many rows of counters should you make? 3 rows_

_How many counters does Mrs. Bronson have in each row? 4 counters_
_How many counters should you put in each row? 4 counters_
_Have children make 3 rows with 4 counters in each row.

• _We have 3 rows of 4 counters. Now skip count by fours to find how many counters there are in all. Have children point to each row as they skip count. 4, 8, 12; Mrs. Bronson has 12 counters._

Tier 2

Materials  connecting cubes

• Write this problem on the board and read it aloud.

_Ms. Jane has 3 rows of cubes. Each row has 2 cubes. How many cubes does she have?_

• Show children 3 rows of cubes with 2 cubes in each row.

• Review with children what a row is. Have children point to a row of cubes. _How many rows of cubes are there? 3 rows_
_How many cubes are in each row? 2 cubes_
_Expla_in that this model shows the cubes that Ms. Jane has._

• Guide children to skip count by twos to find the total number of cubes in the model. 2, 4, 6; 6 cubes

• You may wish to have children count the cubes by ones to check their answer.
Materials connecting cubes

- Have children make 4 rows of cubes with 3 cubes in each row. Say: **We will write an addition sentence to show how many cubes there are.**

- Have children count the number of cubes in the first row. **3 cubes** Write the number on the board. Repeat for the other 3 rows, writing a plus sign between each 3 to show the repeated addition: $3 + 3 + 3 + 3$.

- Then have children count the number of rows. Discuss that there are four 3s in the addition sentence on the board because the model has 4 rows of 3 cubes each.

- Guide children to find the sum for the addition sentence. **12** You may wish to have children count the individual cubes to check the answer.

Materials connecting cubes

- Show children 3 rows of cubes with 2 cubes in each row.

- Ask: **How many cubes are in the first row?** 2 cubes **How many cubes are in the second row?** 2 cubes **How many cubes are in the third row?** 2 cubes Record children’s answers on the board as repeated addition: $2 + 2 + 2$.

- Have children skip count by twos to find the sum. Write $= 6$ on the board to complete the repeated addition sentence. Have children count the individual cubes to check the answer.

- Discuss with children that there are three 2s in the addition sentence on the board because the model has 3 rows of 2 cubes each. Read the addition sentence aloud and say: **3 rows of 2 cubes each are 6 cubes in all.**