

# *Mathematics!*



## ***A Story of Units Parent Handbook***

### ***GRADE K MODULE 4***

## Grade K • Module 4

# Number Pairs, Addition and Subtraction to 10

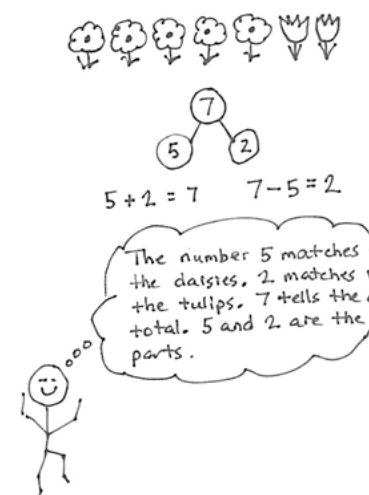
## OVERVIEW

Module 4 marks the next exciting step in math for kindergartners, addition and subtraction! They begin to harness their practiced counting abilities, knowledge of the value of numbers, and work with embedded numbers to reason about and solve addition and subtraction expressions and equations.

In Topic A, decompositions and compositions of numbers to 5 are revisited to reinforce how a whole can be broken into two parts and how two parts can be joined to make a whole. Decomposition and composition are taught simultaneously using the number bond model so that students begin to understand the relationship between parts and wholes before adding and subtracting, formally addressed in Topics C and D.

Topic B continues with decomposing and composing 6, 7, and 8 using the number bond model. Students systematically work with each quantity, finding all possible number pairs using story situations, objects, sets, arrays,  $5 + n$  patterns, and numerals.

Topic C introduces addition to totals of 6, 7, and 8 within concrete and pictorial settings, first generating number sentences without unknowns (e.g.,  $5 + 2 = 7$ ) to develop an understanding of the addition symbol and the referent of each number within the equation. Next, students graduate to working within the addition word problem types taught in kindergarten, *add to with result unknown* ( $A + B = \underline{\quad}$ ), *put together with total unknown* ( $A + B = \underline{\quad}$ ), and *both addends unknown* ( $C = \underline{\quad} + \underline{\quad}$ ). Students draw a box around the total to track the unknown.



Topic D introduces subtraction with 6, 7, and 8 with no unknown. The lessons in Topic D build from the concrete level of students acting out, crossing out objects in a set, and breaking and hiding parts to more formal representations of decomposition recorded as or matched to equations ( $C - B = \underline{\quad}$ ).

Topics E, F, and G parallel the first half of the module with the numbers 9 and 10. Topic E explores composition, decomposition, and number pairs using the number bond model. It is essential that students build deep understanding and skill with identifying the number pairs of 6 through 10 as this is foundational to Grade 1's fluency with sums and differences within 10 and Grade 2's fluency with sums and differences to 20. Topics F and G deal with addition and subtraction, respectively. Students are refocused on representing larger numbers by drawing the  $5 + n$  pattern to bridge efficiently from seeing the embedded five to representing that as addition.

5 + n pattern				
$6 = 5 + 1$	$7 = 5 + 2$	$8 = 5 + 3$	$9 = 5 + 4$	$10 = 5 + 5$

After addition and subtraction have been introduced, Topic H explores the behavior of zero: the additive identity. Students learn that adding or subtracting zero does not change the original quantity. Students will also begin to see patterns when adding 1 more and the inverse relationship between addition and subtraction ( $8 + 2 = 10$ , and  $10 - 2 = 8$ ). Finally, students will begin to formally study and explore partners to 10, though this essential work has been supported throughout Module 4 during Fluency Practice.

The culminating task of this module asks students to demonstrate their understanding of addition as *putting together* and *adding to*, and subtraction as *taking apart* and *taking from*. Students use mathematical models and equations to teach a small group of students, administrators, family members, or community partners about a decomposition of 10.

# Terminology

## New or Recently Introduced Terms

Addition (specifically using *add to with result unknown*, *put together with total unknown*, *put together with both addends unknown*)

Addition and Subtraction sentences (equations)

Make 10 (combine two numbers from 1–9 that add up to 10)

Minus (–)

Number bond (mathematical model)

Number pairs or partners (embedded numbers)

Part (addend or embedded number)

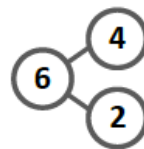
Put together (add)

Subtraction (specifically using *take from with result unknown*)

Take apart (decompose)

Take away (subtract)

Whole (total)



Number Bond

## Familiar Terms and Symbols

5-group

Equals (=)

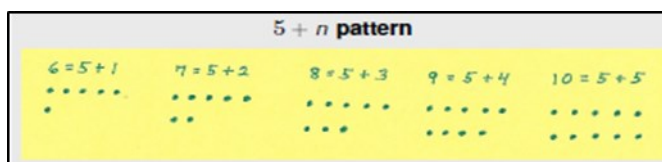
Hidden partners (embedded numbers)

Number sentence ( $3 = 2 + 1$ )

Number story (stories with *add to* or *take from* situations)

Numbers 0–10

Plus (+)



5-groups highlight the  $5 + n$  pattern

## Suggested Tools and Representations

5-group dot cards

Linking cubes

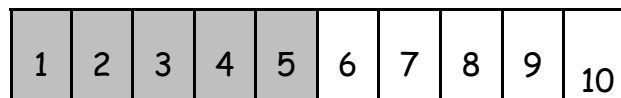
Number bonds

Number path

Number towers

Sets of objects

Showing fingers the Math way



Number Path

## Lesson 1

Objective: Model composition and decomposition of numbers to 5 using actions, objects, and drawings.



How many



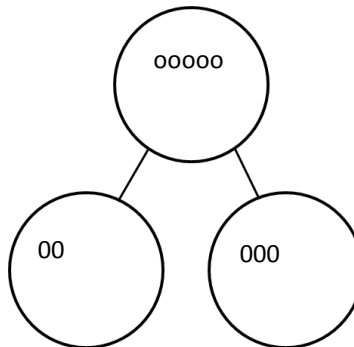
2

How many



3

Draw to show how to take  
show 2 groups, the ones



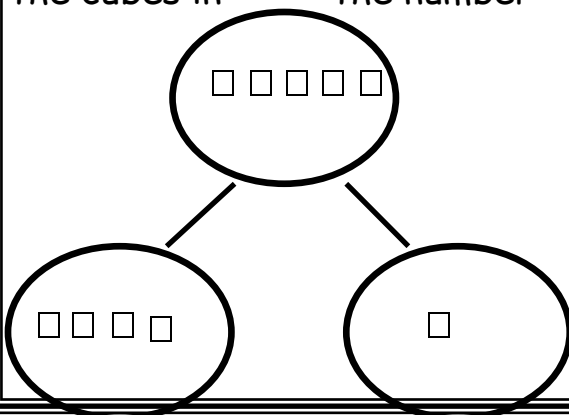
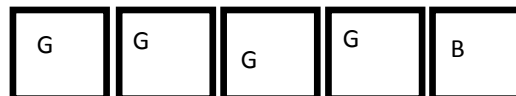
apart the group of cats to  
sleeping and the ones awake.

## Lesson 2

Objective: Model composition and decomposition of numbers to 5 using fingers and linking cube sticks.



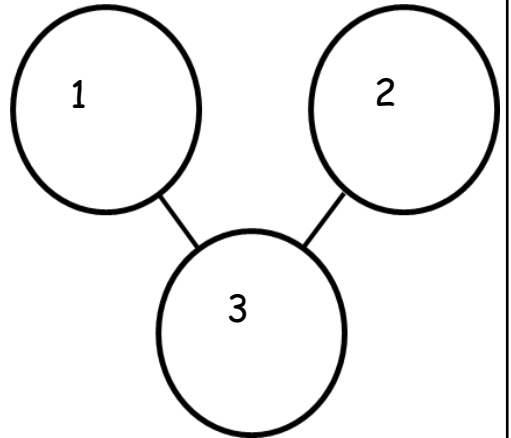
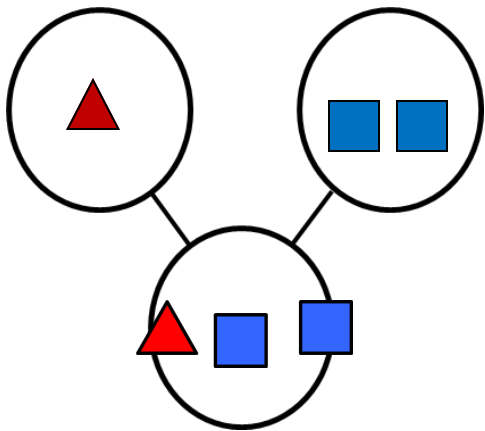
Color the cube stick to match the rabbits. 4 cubes gray. 1 cube black. Draw  
the cubes in the number bond.



### Lesson 3

Objective: Represent composition story situations with drawings using numeric number bonds.

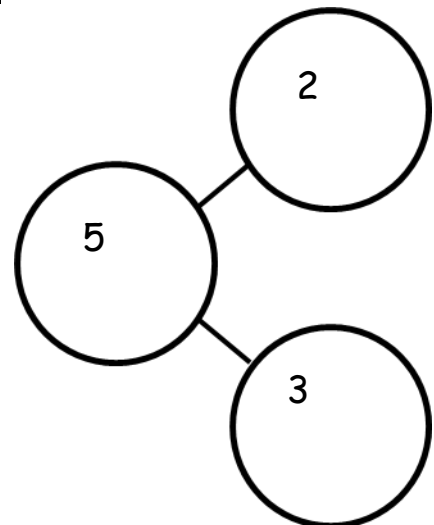
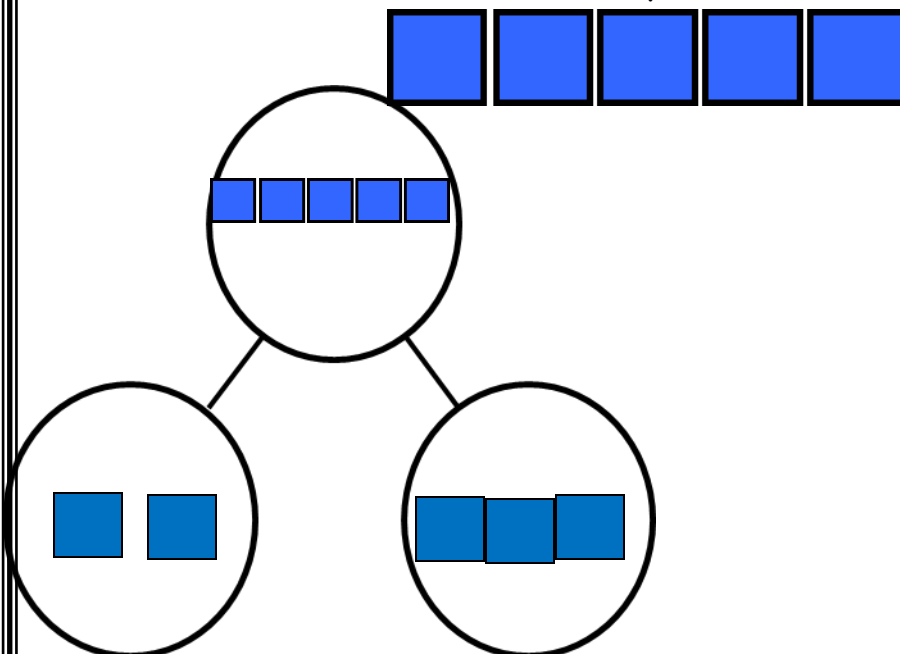
Draw and write the numbers to complete the number bonds.



### Lesson 4

Objective: Represent decomposition story situations with drawings using numeric number bonds.

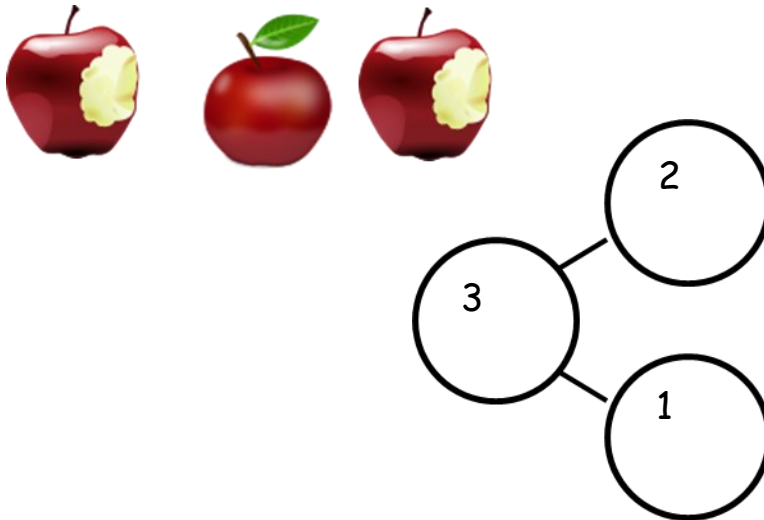
Draw and write the numbers to complete the number bonds.



## Lesson 5

Objective: Represent composition and decomposition of numbers to 5 using pictorial and numeric number bonds.

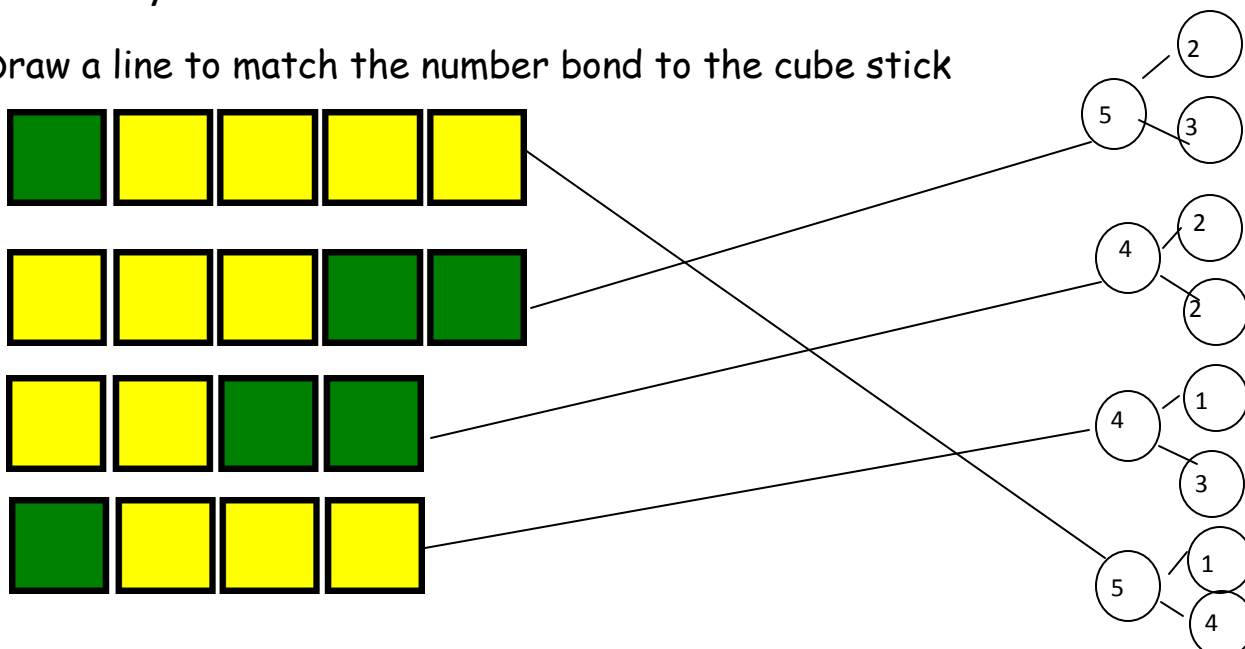
Write numbers to fill in the number bonds.



## Lesson 6

Objective: Represent number bonds with composition and decomposition story situations.

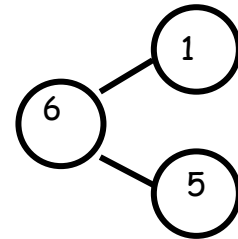
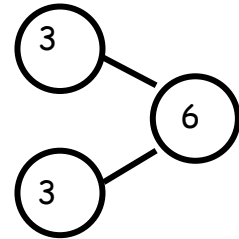
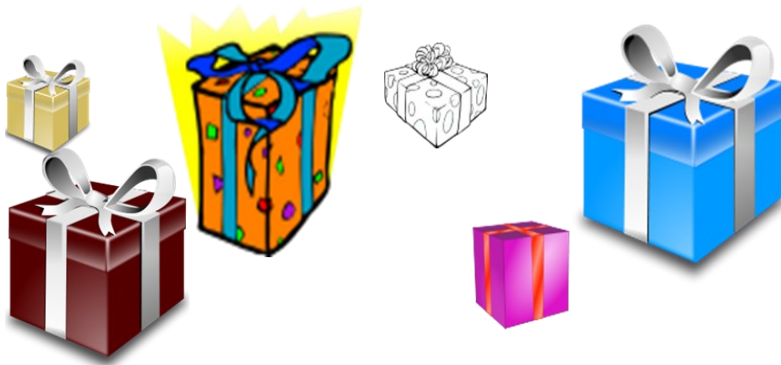
Draw a line to match the number bond to the cube stick



## Lesson 7

Objective: Model decompositions of 6 using a story situation, objects, and number bonds.

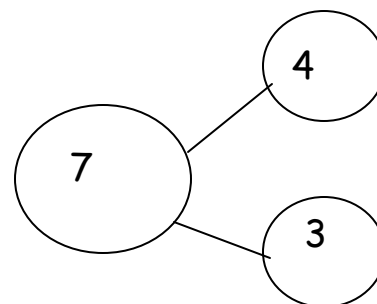
Look at the presents. Make 2 different number bonds. Tell an adult about the numbers you put in the number bonds.



## Lesson 8

Objective: Model decompositions of 7 using a story situation, sets, and number bonds.

Color the cube stick to match the number bond

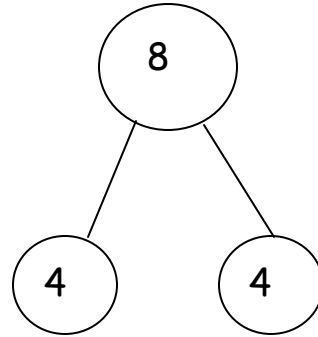
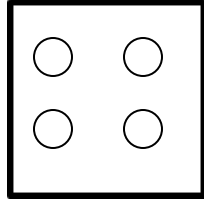
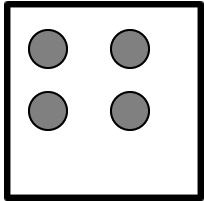




## Lesson 9

Objective: Model decompositions of 8 using a story situation, arrays, and number bonds.

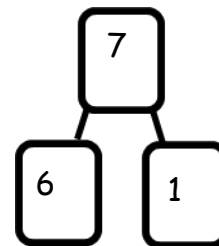
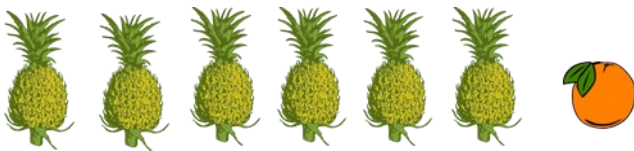
Fill in the number bond to match the picture.



## Lesson 10

Objective: Model decompositions of 6-8 using linking cubes to see patterns.

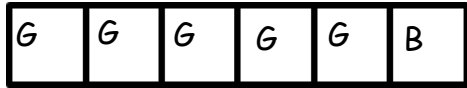
Fill in the number bond to match.



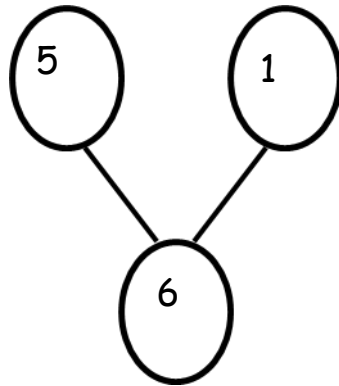
## Lesson 11

Objective: Represent decompositions of 6-8 using horizontal and vertical number bonds.

Color 5 cubes green and 1 blue. Fill in the number bond.



6 is  and



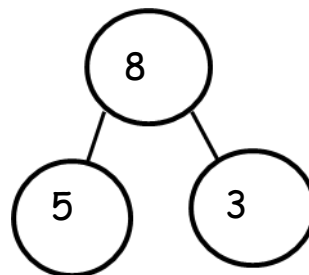
## Lesson 12

Objective: Use 5-groups to represent the  $5 + n$  pattern to 8.

5 boxes are colored. Color 3 more boxes to make 8. Complete the number bond.



and  more is



## Lesson 13

Objective: Represent decomposition and composition addition stories to 6 with drawings and equations with no unknown.

Fill in the number sentences.

There are 6 cars on the road. 2 cars are big and 4 are small.



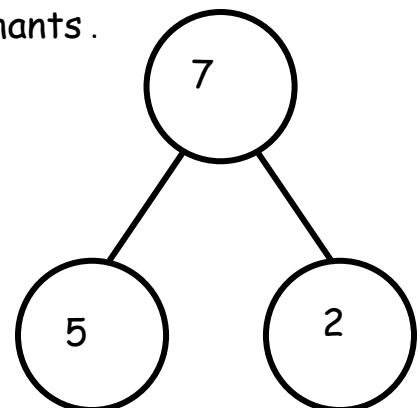
$$\boxed{6} \text{ is } \boxed{4} \text{ and } \boxed{2}$$

$$\boxed{6} = \boxed{4} + \boxed{2}$$

## Lesson 14

Objective: Represent decomposition and composition addition stories to 7 with drawings and equations with no unknown.

There are 7 animals. There are 5 giraffes and 2 elephants.



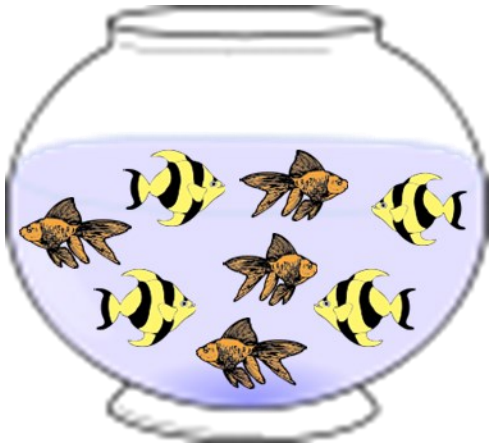
$$\boxed{7} = 5 + 2$$

## Lesson 15

Objective: Represent decomposition and composition addition stories to 8 with drawings and equations with no unknown.

Fill in the number sentences.

There are 8 fish. There are 4 striped fish and 4 goldfish.

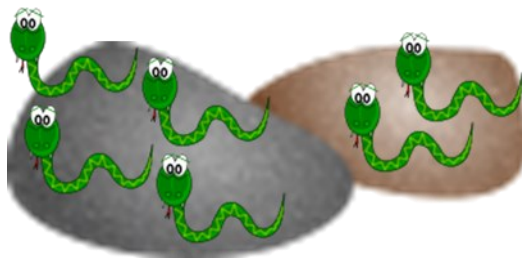


$$\boxed{8} = \boxed{4} + \boxed{4}$$
$$\boxed{4} + \boxed{4} = \boxed{8}$$

## Lesson 16

Objective: Solve *add to with result unknown* word problems to 8 with equations. Box the unknown.

There are 4 snakes sitting on the rocks. 2 more snakes slither over. How many snakes are on the rocks now? Put a box around all the snakes, trace the mystery box, and write the answer inside it.

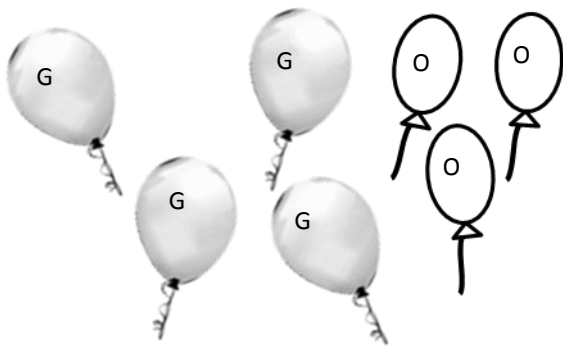


$$4 + 2 = \boxed{6}$$

## Lesson 17

Objective: Solve *put together with total unknown* word problems to 8 using objects and drawings.

There are 4 green balloons and 3 orange balloons in the air. How many balloons are in the air? Color the balloons to match the story, and fill in the number sentences.



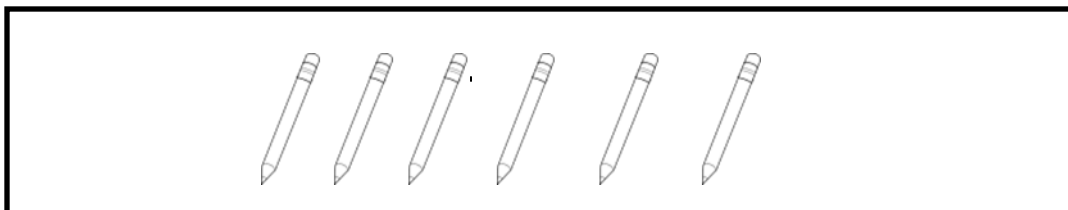
$$\boxed{4} + \boxed{3} = \boxed{7}$$

$$\boxed{7} = \boxed{4} + \boxed{3}$$

## Lesson 18

Objective: Solve *both addends unknown* word problems to 8 to find addition patterns in number pairs.

Devin has 6 Spiderman pencils. He put some in his desk and the rest in his pencil box. Write a number sentence to show how many pencils Devin might have in his desk and pencil box.



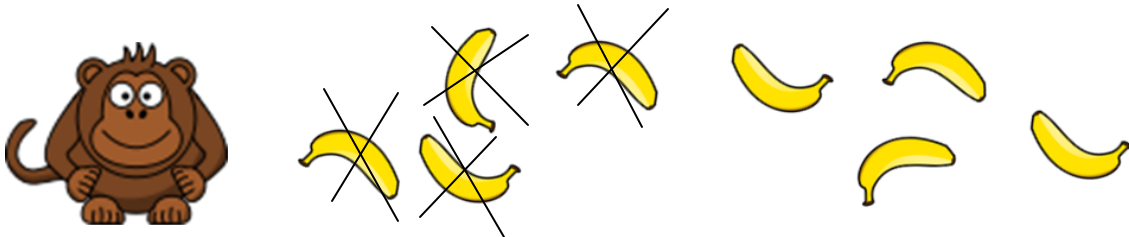
$$6 = \boxed{3} + \boxed{3}$$

Answers may vary.

## Lesson 19

Objective: Uses objects and drawings to find *how many are left*.

The monkey ate 4 bananas. Cross out 4 bananas. Write how many bananas are left.

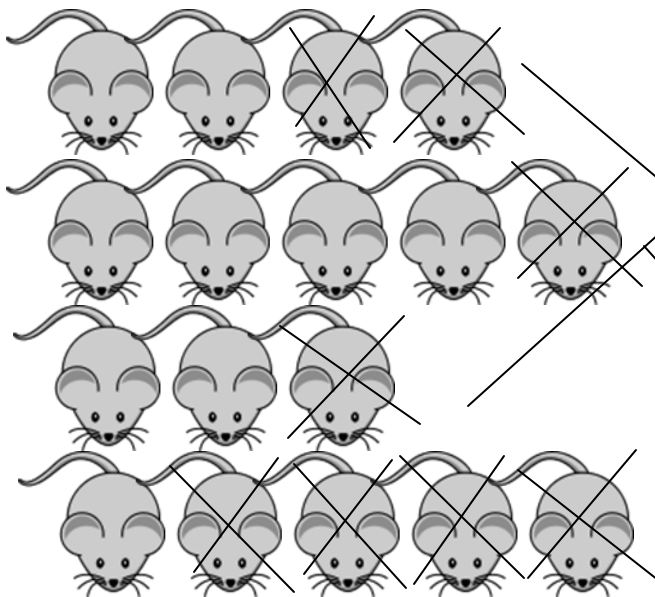


4

## Lesson 20

Objective: Solve *take from with result unknown* expressions and equations using the minus sign with no unknown.

Draw a line from the picture to the number sentence it matches.



$$3-1=2$$

$$5-4=1$$

$$4-2=2$$

$$5-1=4$$

## Lesson 21

Objective: Represent subtraction story problems using objects, drawings, expressions, and equations.

There were 4 bottles. 3 of them broke. How many were left?



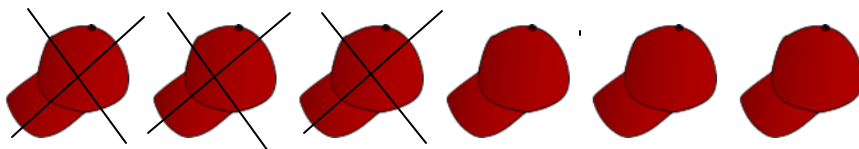
$$4 - 3 = \boxed{1}$$

## Lesson 22

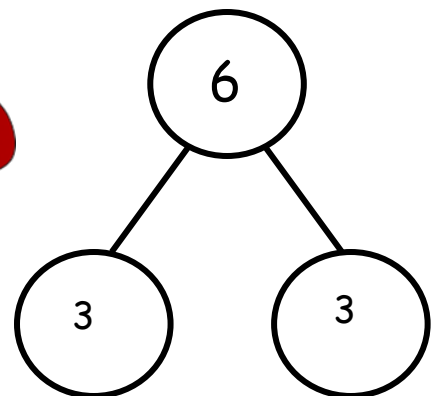
Objective: Decompose the number 6 using 5-group drawings by breaking off or removing a part, and record each decomposition with a drawing and subtraction equation.

Fill in the number sentences and number bond.

Take away 3 hats.



$$\boxed{6} - \boxed{3} = \boxed{3}$$

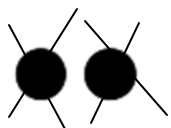


## Lesson 23

Objective: Decompose the number 7 using 5-group drawings by hiding a part, and record each decomposition with a drawing and a subtraction equation.

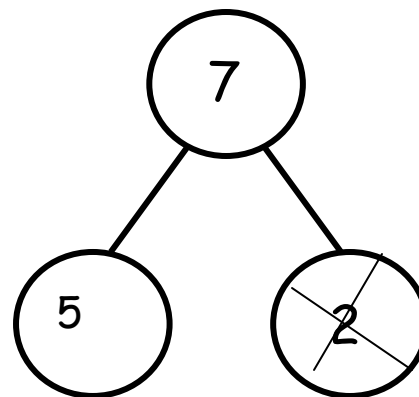
Say the number sentence. Fill in the blanks. Cross out the number.

Cross out 2 dots.



$$7 - 2 =$$

5

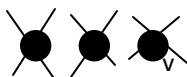


## Lesson 24

Objective: Decompose the number 8 using 5-group drawings and crossing off a part, and record each decomposition with a drawing and a subtraction equation.

Fill in the number sentences and number bond.

Put an X on 3 dots.



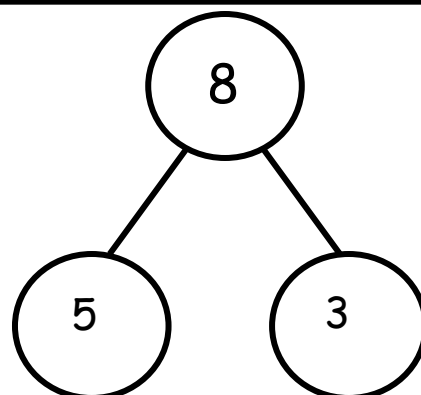
8

-

3

=

5

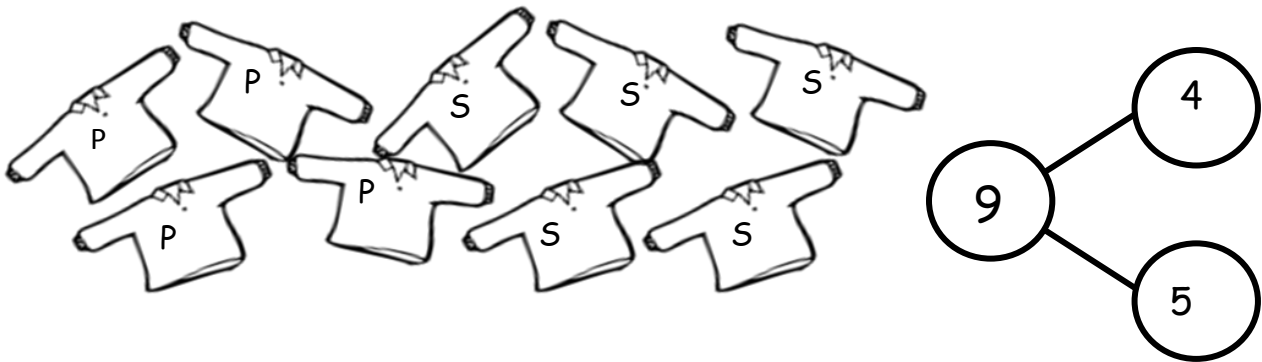




## Lesson 25

Objective: Model decompositions of 9 using a story situation, objects, and number bonds.

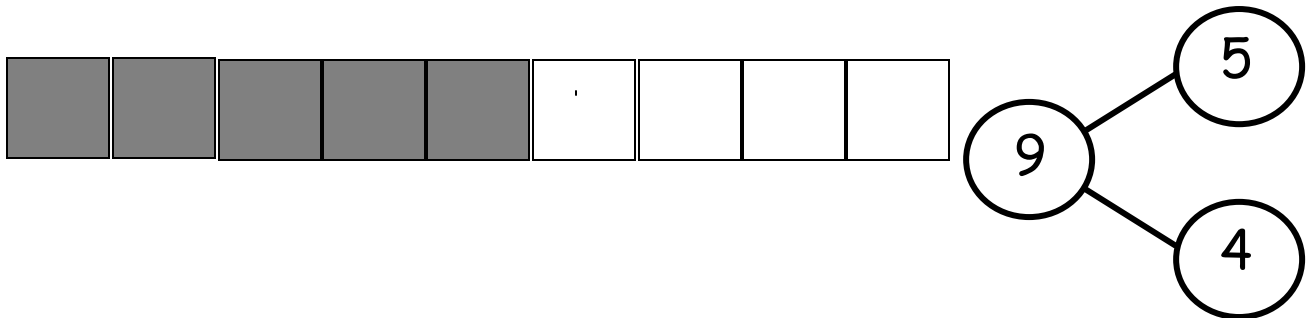
There are 9 shirts. Color some with polka dots and the rest with stripes. Fill in the number bond.



## Lesson 26

Objective: Model decompositions of 9 using fingers, linking cubes, and number bonds.

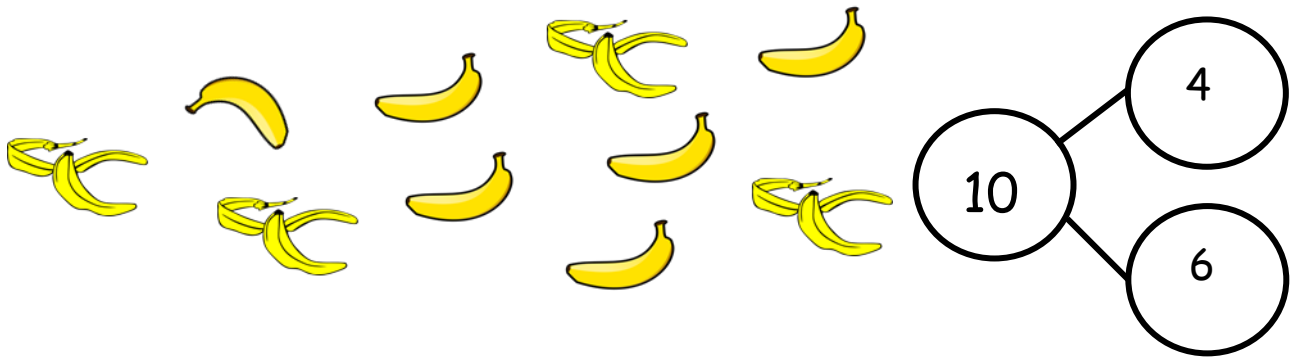
Draw and color cube sticks to match the number bonds. Fill in the number bond if it isn't complete.



## Lesson 27

Objective: Model decompositions of 10 using a story situation, objects, and number bonds.

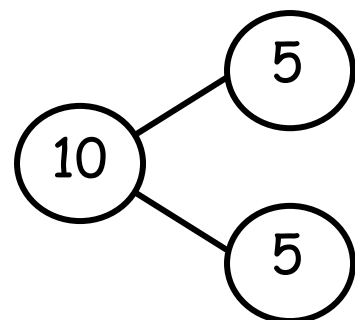
Benjamin had 10 bananas. He dropped some of the bananas. Fill in the number bond to show Benjamin's bananas.



## Lesson 28

Objective: Model decompositions of 10 using fingers, sets, linking cubes, and number bonds.

Draw and color cube sticks to match the number bonds.

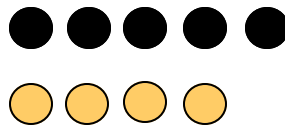
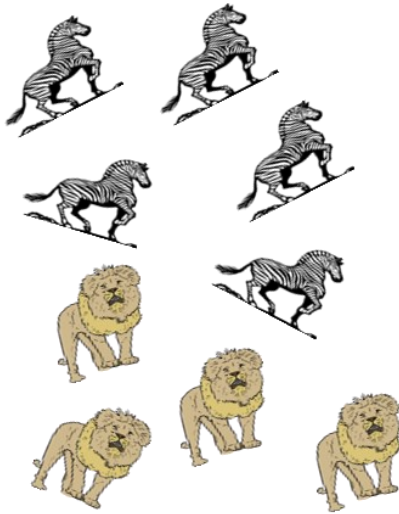


## Lesson 29

Objective: Represent pictorial decomposition and composition addition stories to 9 with 5-group drawings and equations with no unknown.

Shane played with 5 toy zebras and 4 toy lions. He had 9 animal toys in all.

Draw black and tan circles to show the zebras and the lions in the 5-group way. Fill in the number sentence.

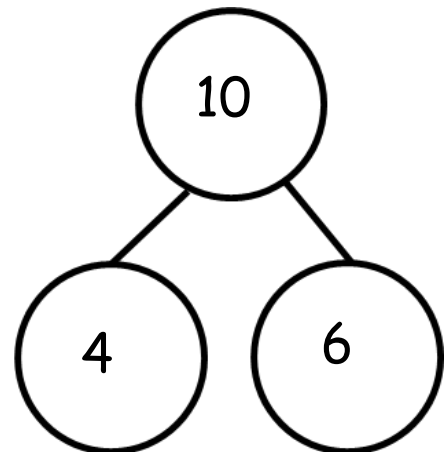
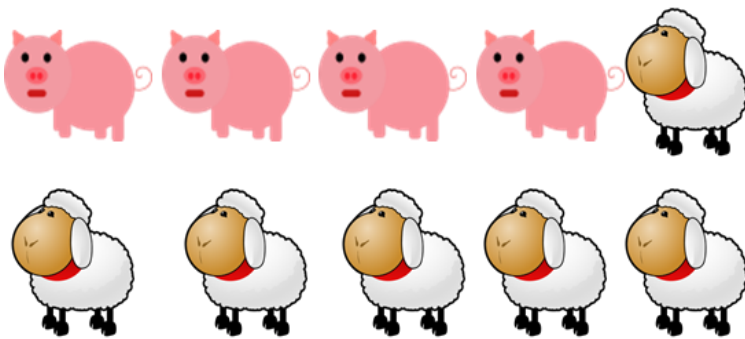


$$\boxed{5} + \boxed{4} = \boxed{9}$$

## Lesson 30

Objective: Represent pictorial decomposition and composition addition stories to 10 with 5-group drawings and equations with no unknown.

Bianca had 4 pigs and 6 sheep on her farm. She had 10 animals all together.

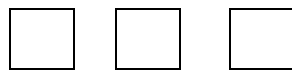
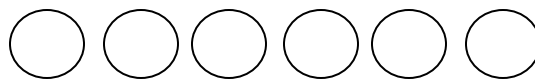


## Lesson 31

Objective: Solve *add to with total unknown* and *put together with total unknown* problems with totals of 9 and 10.

**Draw the story. Fill in the number sentence.**

Zayne had 6 round crackers and 3 square crackers. How many crackers did Zayne have in all?



$$\begin{array}{r} 6 \\ \hline \end{array} + \begin{array}{r} 3 \\ \hline \end{array} = \begin{array}{r} 9 \\ \hline \end{array}$$

## Lesson 32

Objective: Solve *both addends unknown* word problems with totals of 9 and 10 using 5-group drawings.

**Listen to the word problem. Fill in the number sentence.**

Cecilia has 9 bows. Some have polka dots and some have stripes. How many polka dot and how many striped bows do you think Cecilia has?

Answers will vary



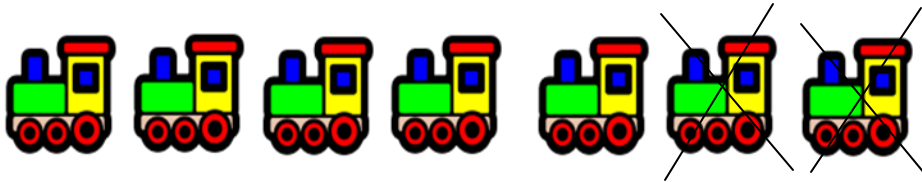
$$9 = \boxed{3} + \boxed{6}$$

## Lesson 33

Objective: Solve *take from* equations with no unknown using numbers to 10.

Fill in the number sentence to match the story.

There were 7 trains. 2 trains rolled away. Now there are 5 trains



$$\begin{array}{ccccccc} 7 & & - & 2 & = & 5 \\ \hline & & & & & & \end{array}$$

## Lesson 34

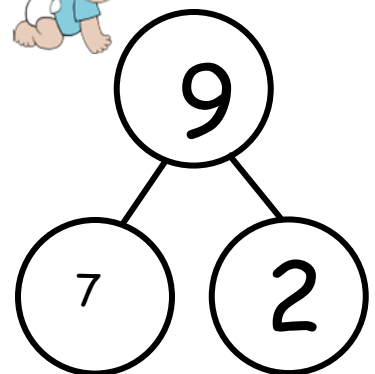
Objective: Represent subtraction story problems by breaking off, crossing out, and hiding a part.

Fill in the number sentences and number bonds.

There are 9 babies playing. 2 crawl away. How many babies are left?



$$9 - 2 = 7$$

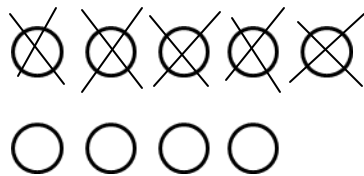
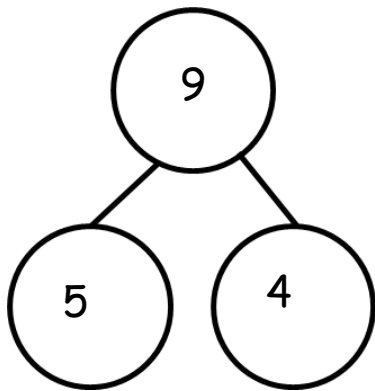


## Lesson 35

Objective: Decompose the number 9 using 5-group drawings, and record each decomposition with a subtraction equation.

Fill in the number bond and number sentence. Cross off the part that goes away.

Jeremy had 9 balls. He took 5 baseballs outside to play, and they got lost. How many balls are left?



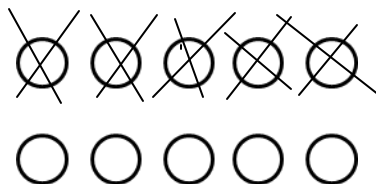
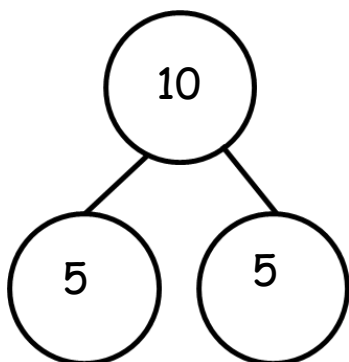
$$\begin{array}{ccccccc} 9 & - & 5 & = & 4 \\ \hline & & & & \end{array}$$

## Lesson 36

Objective: Decompose the number 10 using 5-group drawings, and record each decomposition with a subtraction equation.

Fill in the number bond and number sentence. Cross off the part that goes away.

Stan had 10 blueberries. He ate 5 berries. How many blueberries are left?

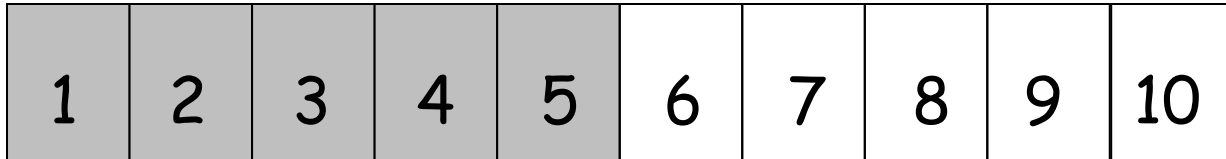


$$\begin{array}{ccccccc} 10 & - & 5 & = & 5 \\ \hline & & & & \end{array}$$

## Lesson 37

Objective: Add or subtract 0 to get the same number and relate to word problems wherein the same quantity that joins a set, separates.

Listen to each story. Show the story with your fingers on the number path.



Logan had 7 frogs. 2 frogs hopped away. How many frogs does Logan have now?

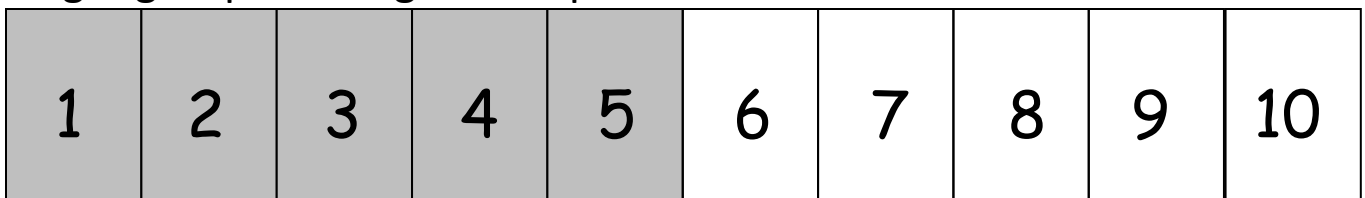
$$\begin{array}{r} 7 \\ \hline \end{array} - \begin{array}{r} 2 \\ \hline \end{array} = \begin{array}{r} 5 \\ \hline \end{array}$$

Pretend that Logan's 2 frogs hopped back. How many frogs does he have now?

$$\begin{array}{r} 2 \\ \hline \end{array} + \begin{array}{r} 5 \\ \hline \end{array} = \begin{array}{r} 7 \\ \hline \end{array}$$

## Lesson 38

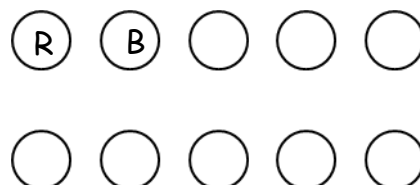
Objective: Add 1 to numbers 1-9 to see the pattern of *the next number* using 5-group drawings and equations.



Use the number path to add. Write the number in the box. Color the circles to match. Use a different color to show 1 more. Use a different color to show 1 more.

$$1 + 1 =$$

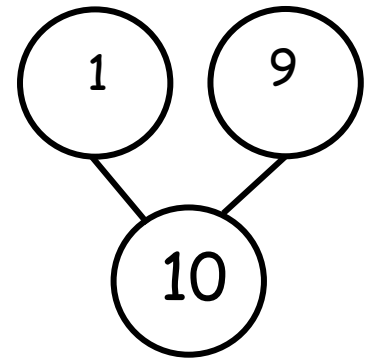
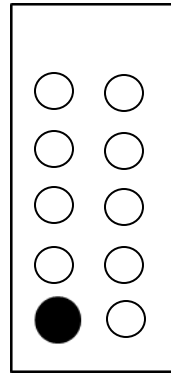
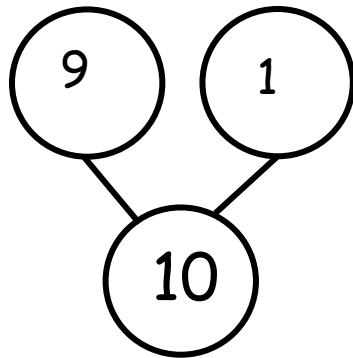
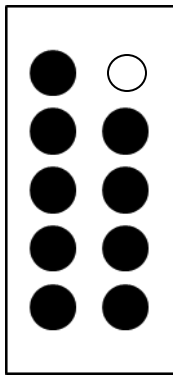
2
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## Lesson 39

Objective: Find the number that makes 10 for numbers 1-9, and record each with a 5-group drawing.

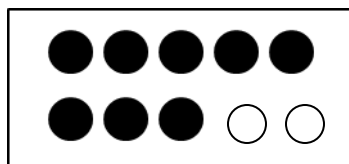
Draw dots to make 10. Fill in the number bond.



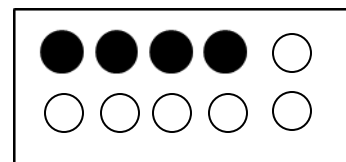
## Lesson 40

Objective: Find the number that makes 10 for numbers 1-9, and record each with an addition equation.

Look at the 5-group cards. Draw dots to make 10. Fill in the number sentences.



$$\boxed{8} + \boxed{2} = 10$$



$$\boxed{4} + \boxed{6} = 10$$



## Lesson 41

Objective: Culminating task—choose tools strategically to model and represent a stick of 10 cubes broken into two parts.

Complete a number bond and number sentence for each problem.

Color 6 blocks blue. Color the rest red. All of the blue blocks fell off the table. How many blocks are still on the table?

B	B	B	B	B	B	R	R	R	R
---	---	---	---	---	---	---	---	---	---

$$\begin{array}{r} 10 \\ \hline \end{array} - \begin{array}{r} 6 \\ \hline \end{array} = \begin{array}{r} 4 \\ \hline \end{array}$$

