Kenmore-Town of Tonawanda UFSD

We educate, prepare, and inspire all students to achieve their highest potential

Grade K Module 4
Parent Handbook

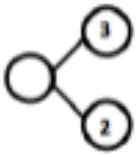
The materials contained within this packet have been taken from the Great Minds curriculum Eureka Math.

Eureka Math™ Tips for Parents

Grade K
Module 4

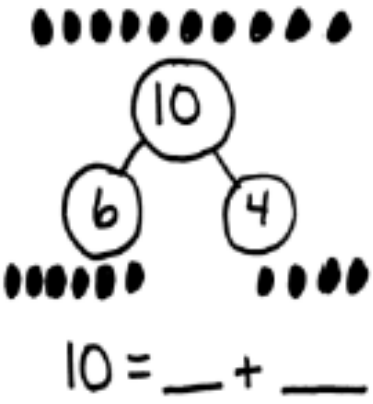
Number Pairs, Addition and Subtraction to 10

Module 4 marks the next exciting step in math for kindergarten students: addition and subtraction! We will start with composing and decomposing numbers using number bonds (see reverse), and move toward work with addition and subtraction equations.



5 = ____ + ____ 3 + 2 = ____

Number bonds, seen above, are models that help students see the part/part/whole relationships within a given number.



What Came Before this Module: We compared lengths, weight, and capacity, and then worked with comparing numerals.

What Comes After this Module: Students will work on their understanding of teen numbers, and work on counting to 100 by ones and by tens.

Words we will use in this module:

- Addition
- 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)
- Number sentence (3 = 2 + 1)
- Part (addend or embedded number)
- Plus (+)
- Put together (add)
- Subtraction
- Take apart (decompose)
- Take away (subtract)
- Whole (total)

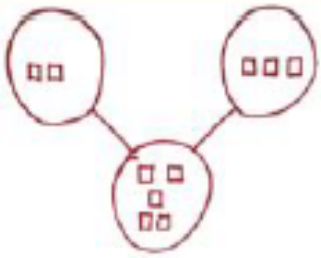
How you can help at home:

- Continue to compare groups of objects up to 10, asking more- and less-than questions
- Give your child some Cheerios and ask her to show how many more are needed to make 10
- Review and practice counting numbers up to 30, or as high as possible

Key Common Core Standards:

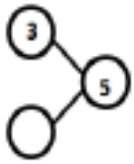
- Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.
  - Represent addition and subtraction with objects, fingers, mental images, drawings, sounds, etc.
  - Solve addition and subtraction word problems, and add and subtract within 10.
  - For any number from 1 to 9, find the number that makes 10 when added to the given number.
  - Fluently add and subtract within 5.

Prepared by Erin Schweng, Math Coach



Some sample types of number bonds seen in Kindergarten. Note how the number bonds can use either drawings or numerals to show the number relationships.

2 + 3 = ___



5 − 3 = ___

Spotlight on Math Models:

Number Bonds

Students will use this model to show part/part/whole relationships within numbers.

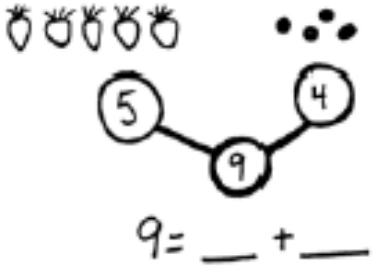
A Story of Units has several key mathematical "models" that will be used throughout a student's elementary years.

The number bond is a pictorial representation of part/part/whole relationships showing that smaller numbers (the parts) make up larger numbers (the whole). The number bond is a key model for showing students how to both take apart (decompose) and put together (compose) numbers with ease. This in turn leads directly to their emerging addition and subtraction skills.

In Kindergarten, students first become fluent with number bonds to 5, and then build understanding of the very important number 10. As students become more comfortable using number bonds, the bonds may be presented in different orientations (e.g. the whole not always on top).

Sample Problem from Module 4:
(Example taken from Lesson 29)

Toby had 9 tasty berries. Five were strawberries and 4 were blueberries. How many berries did he have in all?



Grade K • Module 4

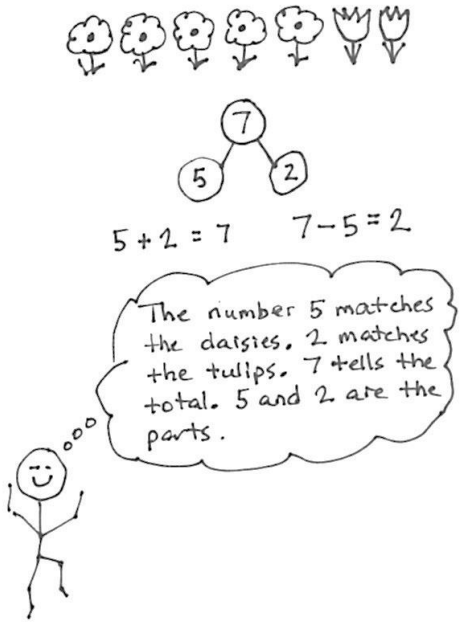
Number Pairs, Addition and Subtraction to 10

OVERVIEW

Module 4 marks the next exciting step in math for kindergartners—addition and subtraction! Students 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 (K.OA.1, K.OA.2).

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 students begin to understand the relationship between parts and wholes before adding and subtracting, formally addressed in Topics C and D.

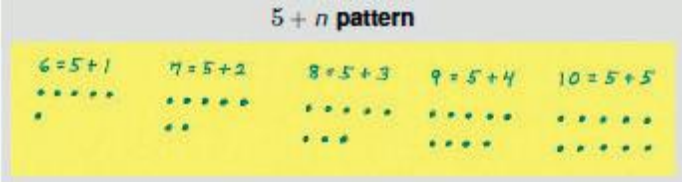
Topic B continues with decomposing and composing 6, 7, and 8 using the number bond model. Students systematically work with each quantity, finding all possible number pairs using story situations, objects, sets, arrays, 5 + n patterns, and numerals (K.OA.3).



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 = ____), put together with total unknown (A + B = ____), and both addends unknown (C = ____ + ____) (K.OA.2). 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 = ____).

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 (K.OA.3). It is essential that students build deep understanding and skill with identifying the number pairs of 6 through 10 because this is foundational to Grade 1's fluency with sums and differences within 10, as well as 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.



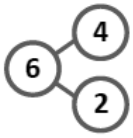
After addition and subtraction have been introduced, Topic H explores the behavior of zero: the additive identity. Students learn that adding or subtracting zero does not change the original quantity. Students also begin to see patterns when adding 1 more and the inverse relationship between addition and subtraction (8 + 2 = 10 and 10 – 2 = 8). Finally, students begin to formally study and explore partners to 10 (K.OA.4), 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, or adding to, and subtraction as taking apart, or 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 to 9 that add up to 10)
- Minus (–)
- Number bond (mathematical model)

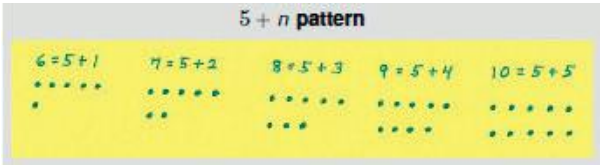


Number Bond

- 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)

Familiar Terms and Symbols

- 5-group

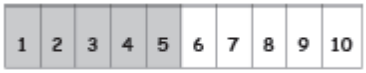


5-groups highlight the 5 + *n* pattern

- Equals (=)
- Hidden partners (embedded numbers)
- Number sentence (3 = 2 + 1)
- Number story (stories with add to or take from situations)
- Numbers 0–10
- Plus (+)

Suggested Tools and Representations

- 5-group dot cards
- Hula hoops
- Linking cubes
- Number bonds
- Number path



Number Path

- Number towers
- Sets of objects
- Showing fingers the Math Way

Grade K Module 4 Topic A

Compositions and Decompositions of 2, 3, 4, and 5

Focus Standards:

K.OA.1 Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations. (Drawings need not show details, but should show the mathematics in the problem. This applies wherever drawings are mentioned in the Standards.)

K.OA.3 Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., 5 = 2 + 3 and 5 = 4 + 1).

K.OA.5 Fluently add and subtract within 5.

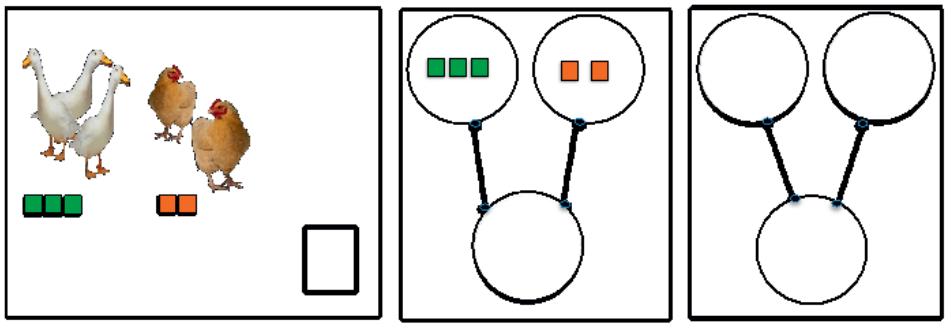
Instructional Days Recommended: 6

In Module 1, students found embedded numbers and experienced decomposition by finding hidden partners. Topic A formally teaches composition and decomposition using number bonds as students explore the relationships between numbers to set the foundation for addition and subtraction.

In the first two lessons, students play with composition (3 and 2 make 5) by talking about the number of birds, fingers, and cubes together and decomposition (5 is 3 and 2) by finding embedded numbers in a group. They learn to record the relationships between quantities by drawing pictures in the number bond model.

In Lesson 3, students explore composing number pairs and record their findings using drawings and numerals in the number bond model.

Lesson 4 then has students consider decomposition as a whole separated into number pairs and record their findings using drawings and numerals in the number bond model.



Lesson 5 allows students to use the number bond model as a tool to help them model composition and decomposition. The end goal of this topic is for students to be flexible with the number bond model oriented in various ways and to be able to understand the part–part–whole components. By the end of the module, students understand the number bond's relationship to the accompanying expression or equation.

The final lesson of the topic gives students opportunities to move from the abstract to the concrete by acting out and creating stories based on a given number bond. Throughout Topic A, a fluid movement between composition and decomposition provides a firm foundation for understanding the relationship between addition and subtraction.

**The sample homework responses contained in this manual are intended to provide insight into the skills expected of students and instructional strategies used in Eureka Math.*

Lesson 1

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

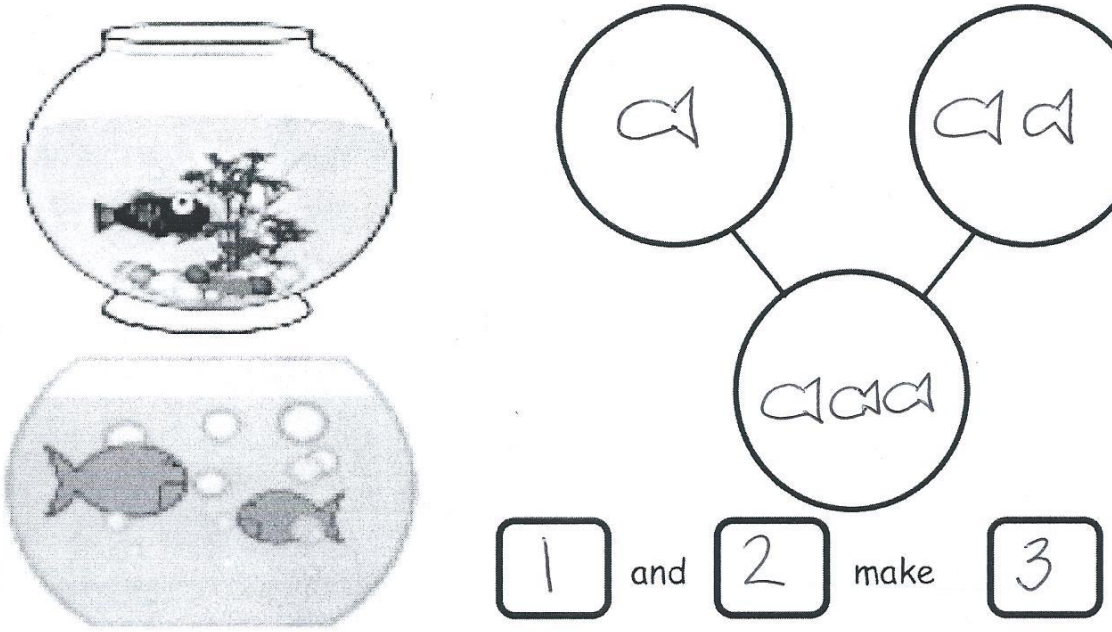
Homework Key

1 blue fish drawn; 2 orange fish drawn 3 fish drawn in all; 1, 2, 3

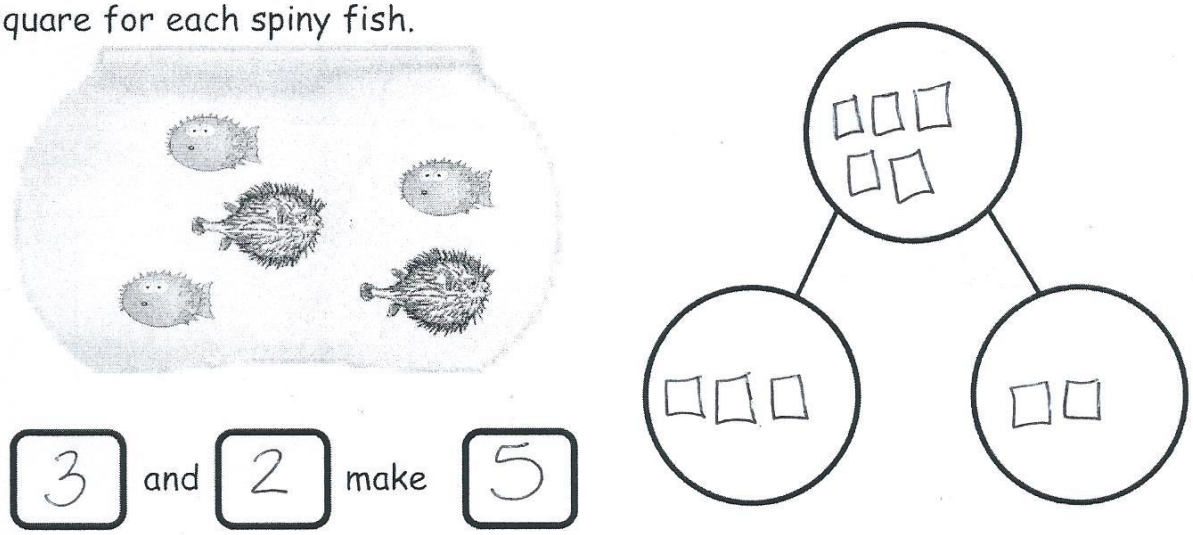
5 squares drawn; 3 squares drawn; 2 squares drawn; 3, 2, 5

Homework Samples

Draw the blue fish in the first circle on top. Draw the orange fish in the next circle on top. Draw all the fish in the bottom circle.



Draw a square for each fish in the top circle. Draw a square for each goldfish in the bottom circle. In the last circle on the bottom, draw a square for each spiny fish.



Lesson 2

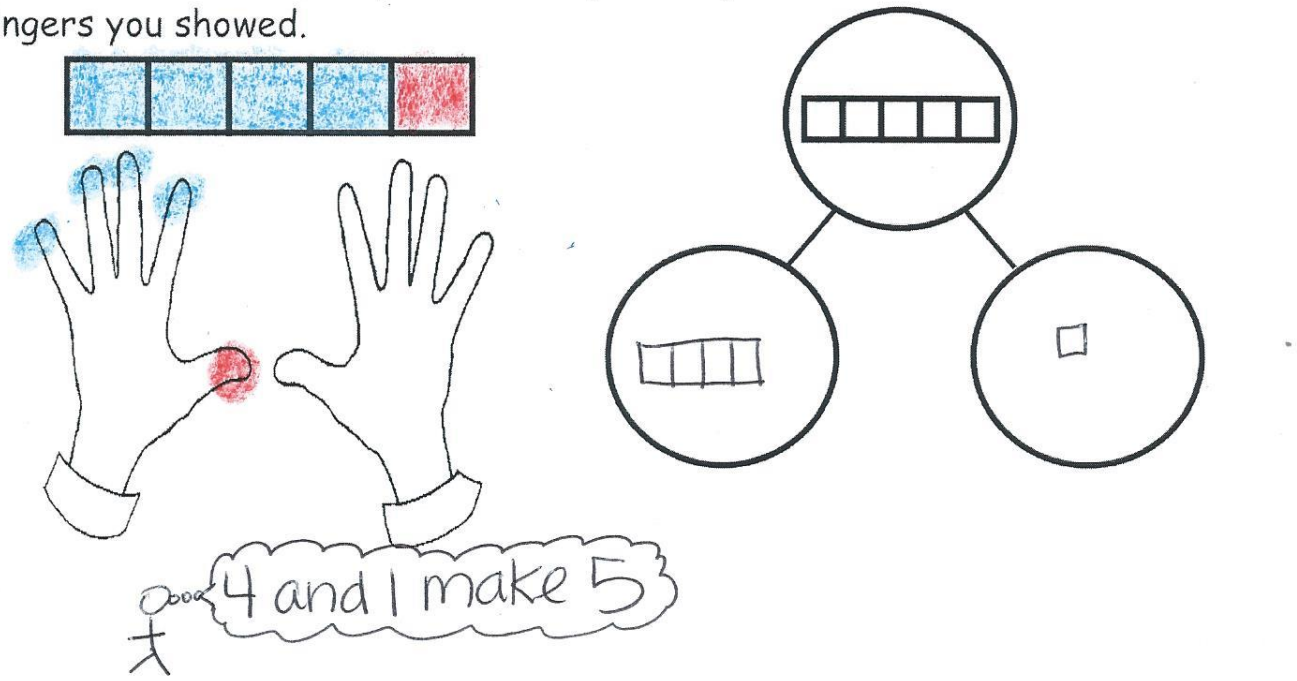
Objective: Model composition and decomposition of numbers to 5 using fingers and linking cube sticks.

Homework Key

Answers will vary.
Answers will vary.

Homework Samples

The squares below represent a cube stick. Color some squares blue and the rest of the squares red. Draw the squares you colored in the number bond. Show the hidden partners on your fingers to an adult. Color the fingers you showed.



Lesson 3

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

Homework Key

3

1, 4

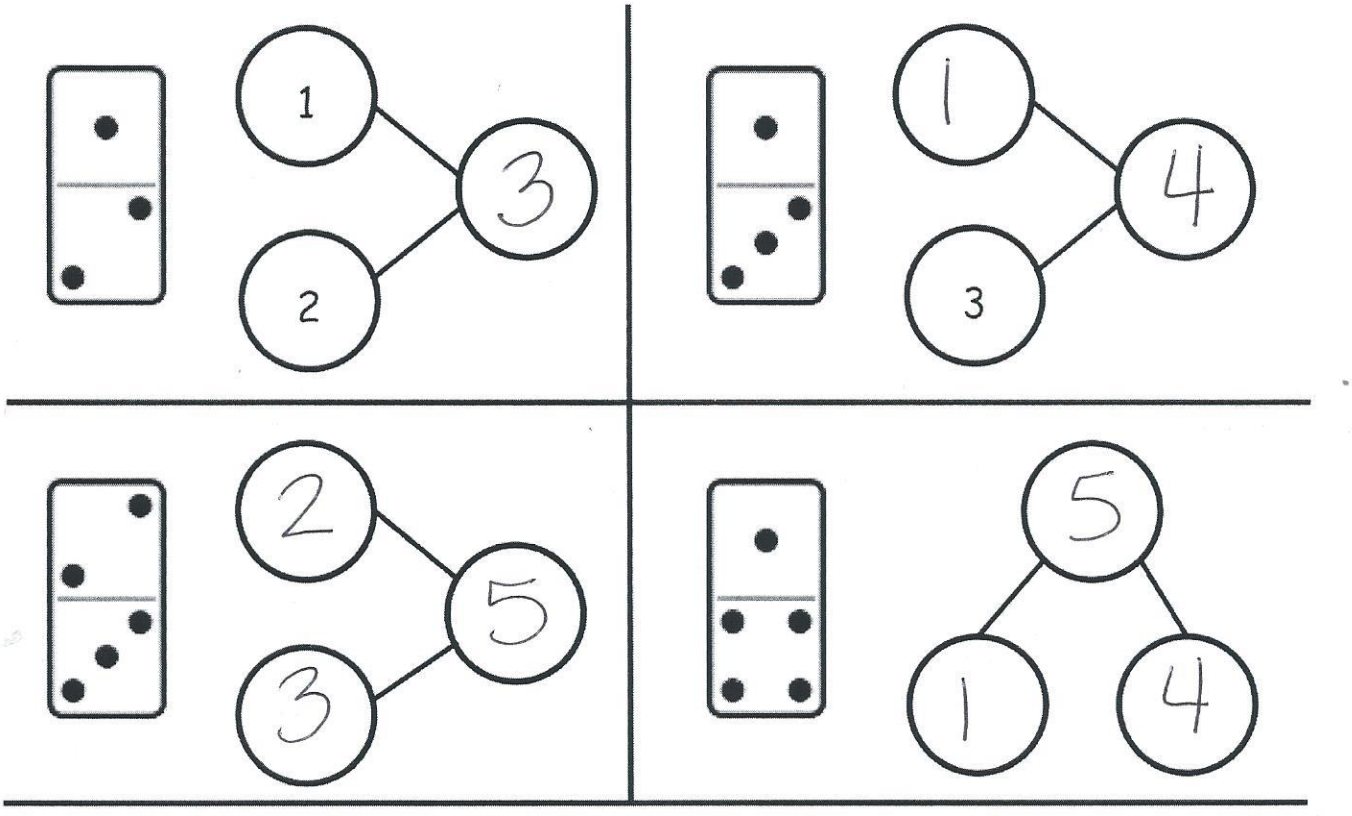
2, 3, 5

5, 1, 4

Answers will vary.

Homework Samples

Fill in the number bond to match the domino.



Lesson 4

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

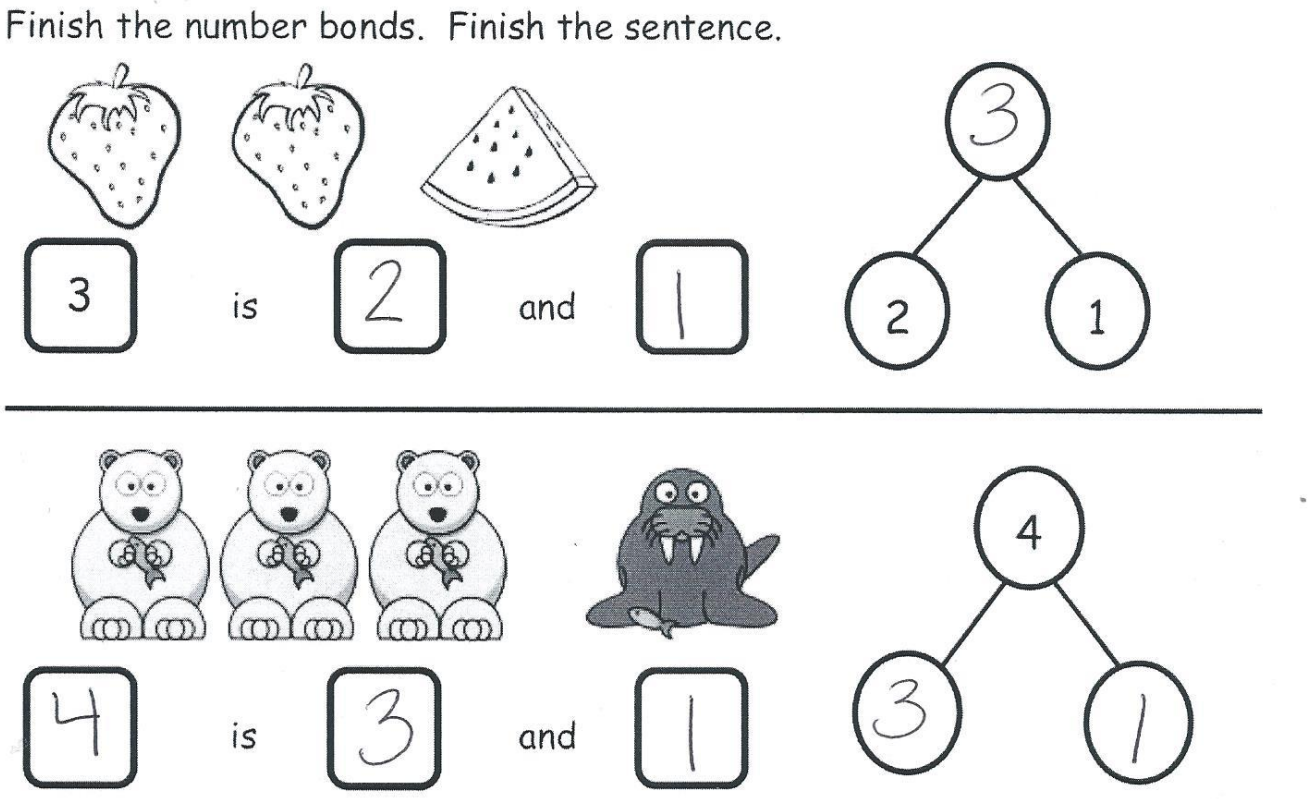
Homework Key

2, 1; 3

4, 3, 1; 3, 1

Answers will vary.

Homework Samples



Lesson 5

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

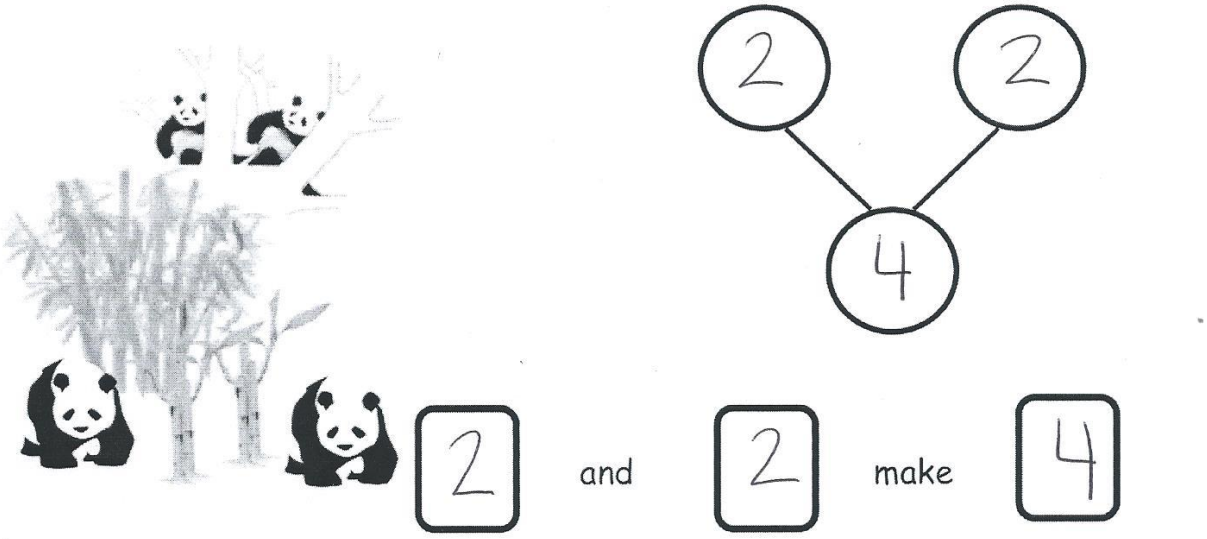
Homework Key

2, 2, 4; 2, 2, 4

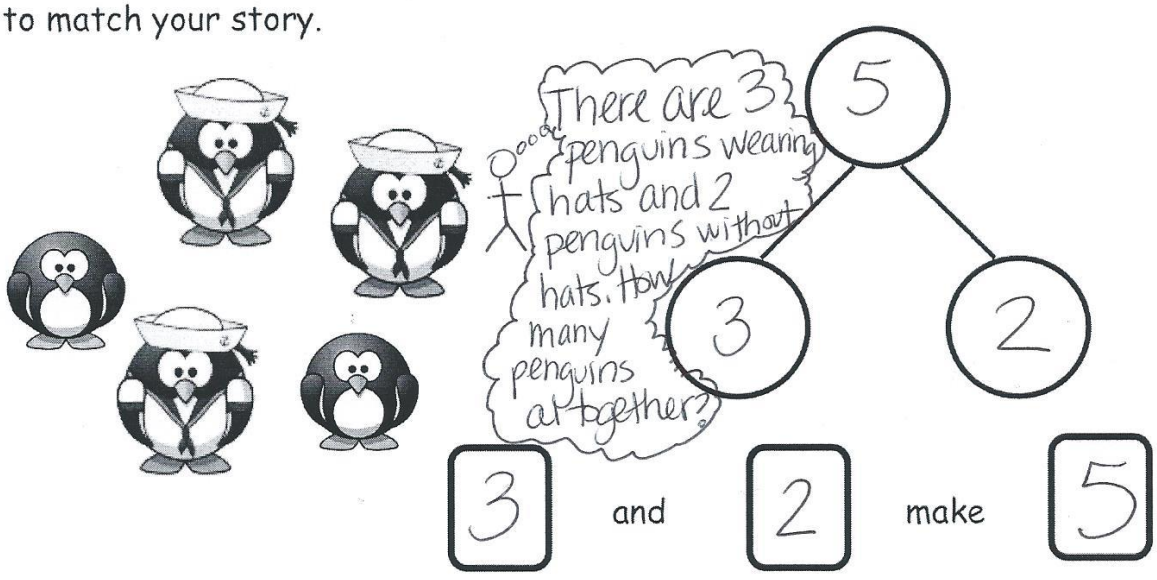
Answers will vary.

Homework Samples

There are 2 pandas in a tree. 2 more are walking on the ground. How many pandas are there? Fill in the number bond and the sentence.



Tell a story about the penguins. Fill in the number bond and the sentence to match your story.



Lesson 6

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

Homework Key

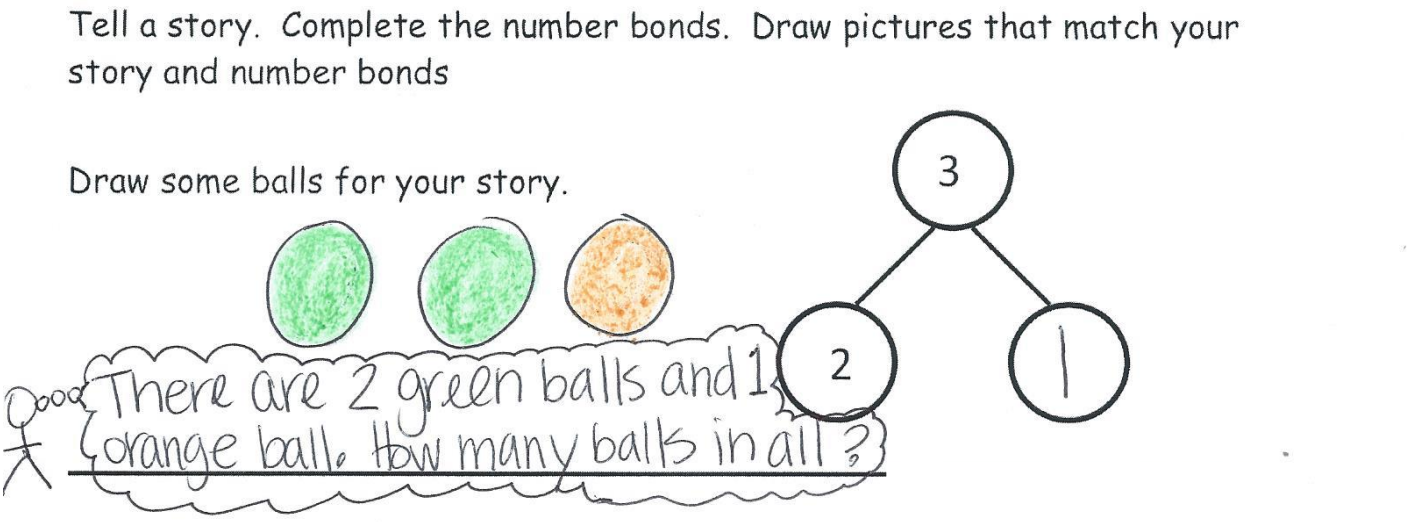
3 balls drawn; 1

4 crayons drawn; answers will vary.

Answers will vary.

Picture and number bond drawn on back of paper

Homework Samples



Grade K Module 4 Topic B

Decompositions of 6, 7, and 8 into Number Pairs

Focus Standard:

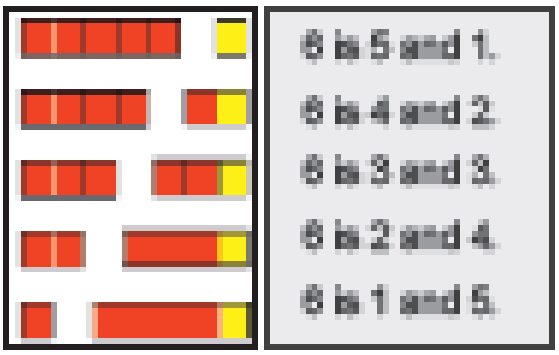
K.OA.3 Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., 5 = 2 + 3 and 5 = 4 + 1).

Instructional Days Recommended: 6

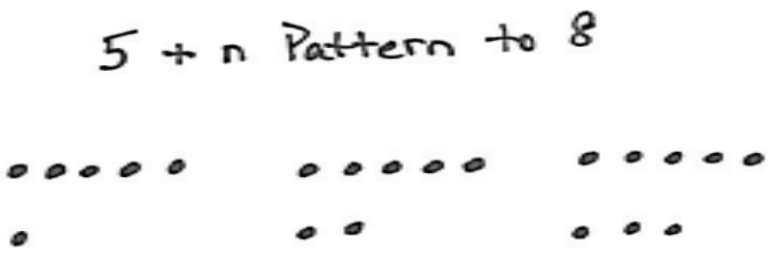
Topic B advances the work of Topic A, building students' skill with number pairs for 6, 7, and 8, which is cultivated and maintained throughout Topics B and C during Fluency Practice. In the first three lessons of this topic, students decompose 6, 7, and 8. These decompositions are modeled as *put together* situations and represented as addition expressions (C = ___ + ___), as opposed to the *take from* decomposition type (C – B = ___), which is taught in Topic D.

Lessons 7–9 provide intensive work with decomposing 6, 7, and 8 into number pairs. Students identify all of the pairs using story situations, objects, sets, arrays, and numerals.

In Lessons 10 and 11, students use linking cube sticks to again model the decompositions of 6, 7, and 8 to explore the patterns that emerge (pictured below). Throughout, they work with different configurations of the number bond model to support flexible thinking while moving from parts to whole and whole to parts: composition to decomposition.



Lesson 12 explores the important 5 + *n* pattern in 5-groups for 6, 7, and 8 (pictured below). Understanding and use of the 5-group is foundational for students moving from Level 1 (counting all) to Level 2 (counting on) addition and subtraction strategies.



By the end of this topic, students should have a solid understanding of the relationships between numbers 1–8 and be ready for more formal work with addition and subtraction.

**The sample homework responses contained in this manual are intended to provide insight into the skills expected of students and instructional strategies used in Eureka Math.*

Lesson 7

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

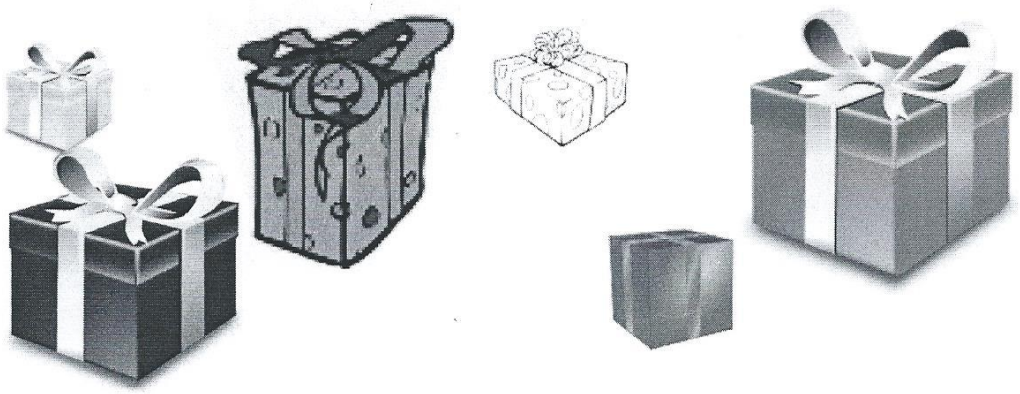
Homework Key

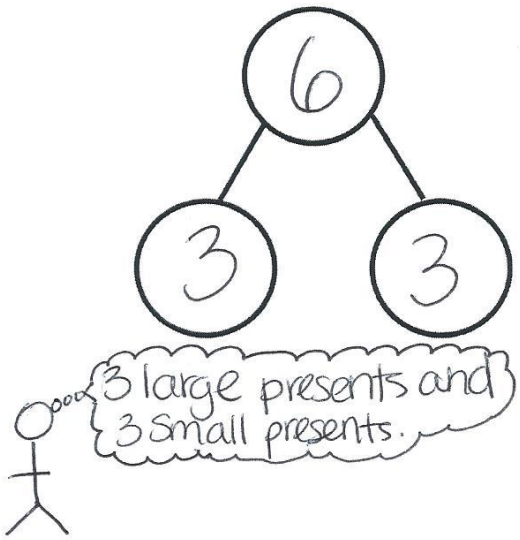
Answers will vary.

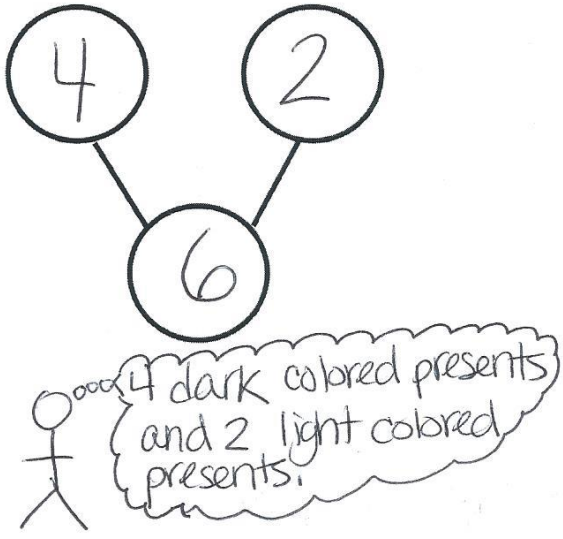
6 presents drawn and sorted into 2 groups; correct number bond drawn

Homework Samples

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.

Homework Key

4 circles and 3 triangles drawn; 7, 4, 3; 7, 4, 3

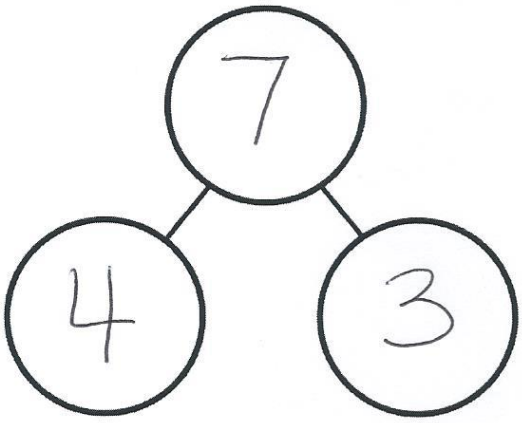
5 squares colored one color; 2 squares drawn a different color

Answers will vary.

7 shapes drawn; number bond and number sentence completed to match the drawing

Homework Samples

Draw a set of 4 circles and 3 triangles. How many shapes do you have?
Fill in the number sentence and number bond.



Lesson 9

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

Homework Key

4, 4

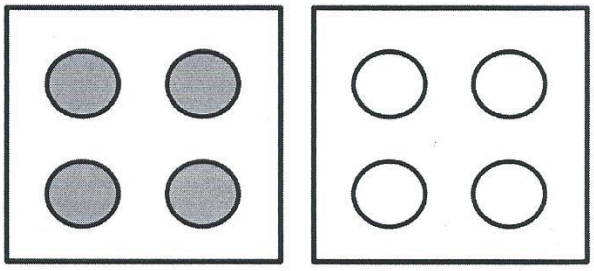
8, 7, 1

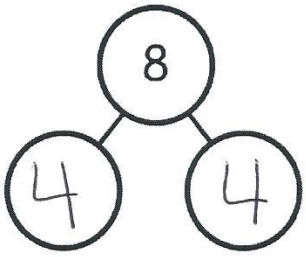
Answers will vary.

Number bonds for 4, 5, 6, and 7 drawn on back of paper. Answers will vary.

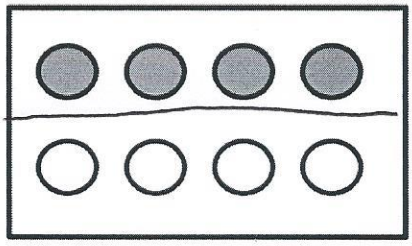
Homework Samples

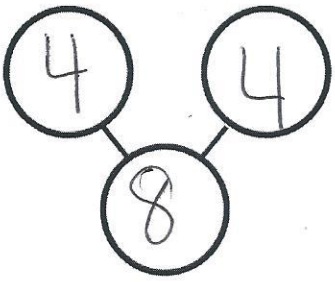
Complete the number bond to match the dot picture.





Draw a line to make 2 groups of dots. Fill in the number bond.





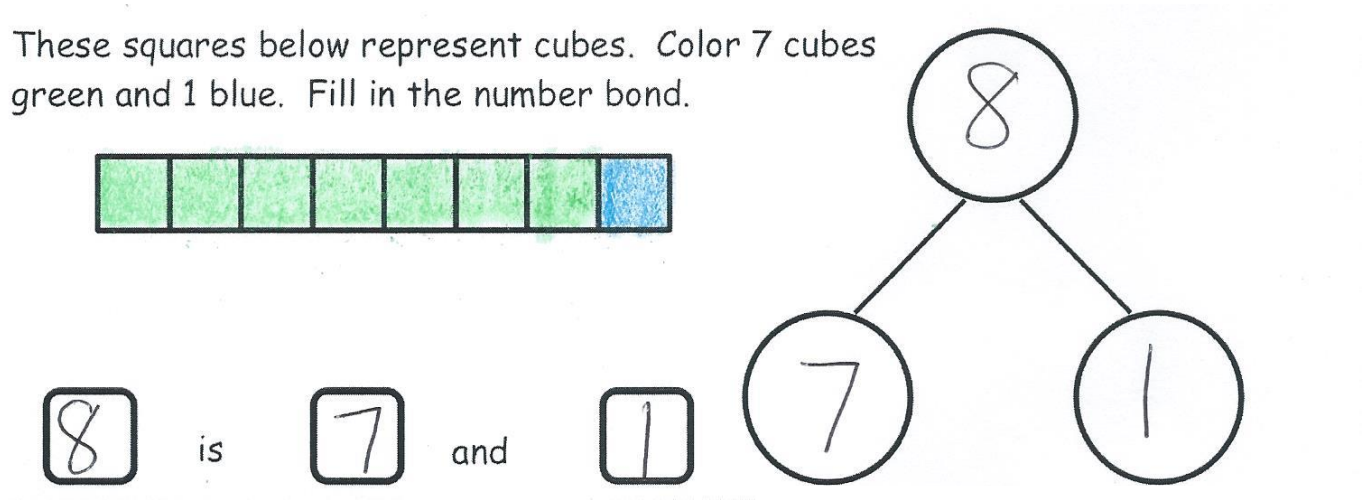
Lesson 10

Objective: Model decompositions of 6–8 using linking cube sticks to see patterns.

Homework Key

7 squares colored green; 1 square colored blue; 8, 7, 1; 8, 7, 1
6 squares colored green; 2 squares colored blue; 8, 6, 2; 8, 6, 2
Answers will vary.
4 squares colored green; 4 squares colored blue; 8, 4, 4; 4, 4, 8
3 squares colored green; 5 squares colored blue; 8, 3, 5; 3, 5, 8
Answers will vary.

Homework Samples



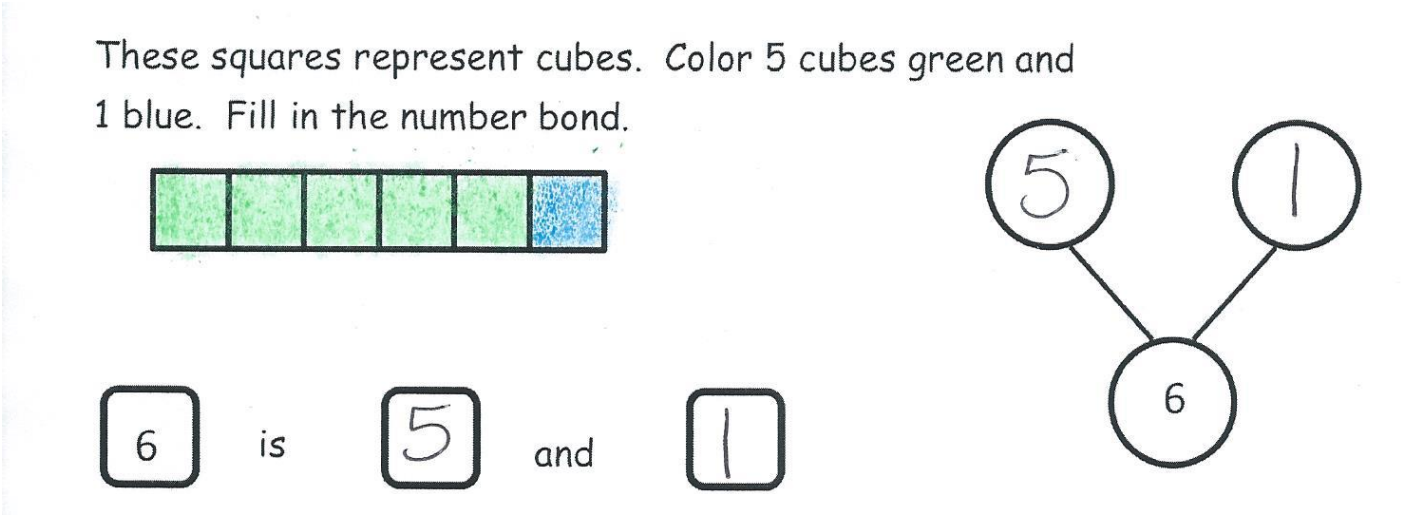
Lesson 11

Objective: Represent decompositions for 6–8 using horizontal and vertical number bonds.

Homework Key

5 squares colored green; 1 square colored blue; 5, 1; 5, 1
5 squares colored green; 2 squares colored blue; 7, 5, 2; 5, 7
4 squares colored green; 3 squares colored blue; 7, 4, 3; 7, 4
4 squares colored green; 4 squares colored blue; 8, 4, 4; 8, 4, 4
3 squares colored green; 5 squares colored blue; 8, 3, 5; 8, 3, 5
2 squares colored green; 6 squares colored blue; 8, 2, 6; 2, 6, 8

Homework Samples



Lesson 12

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

Homework Key

5; 5

5 squares colored blue in first row; 2 squares colored red in second row; 7, 2; 7, 2

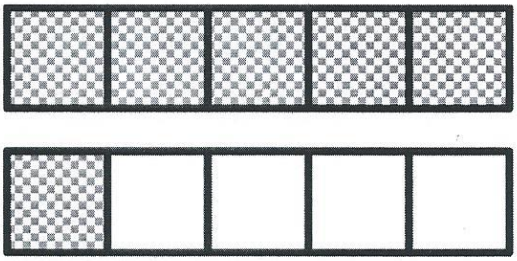
8 squares colored; 8, 3; 8, 3

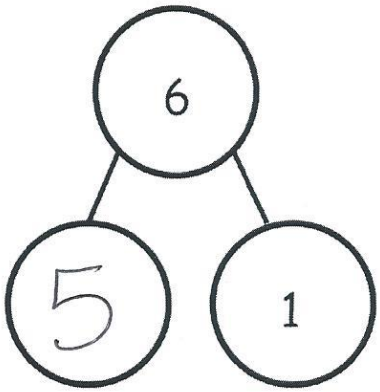
8 squares colored; 5, 3

9 squares colored; 9, 5, 4; 4

Homework Samples

Fill in the number bond to match the squares.

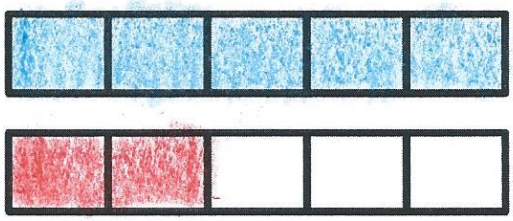


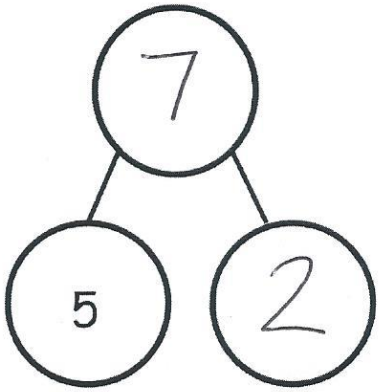


6 is 5 and 1 more

Color 5 squares blue in the first row.

Color 2 squares red in the second row.





7 is 5 and 2 more

Grade K Module 4 Topic C

Addition with Totals of 6, 7, and 8

Focus Standards:

K.OA.1 Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations. (Drawings need not show details, but should show the mathematics in the problem. This applies wherever drawings are mentioned in the Standards.)

K.OA.2 Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.

Instructional Days Recommended: 6

The first three lessons ask students to represent addition story problems involving decomposition and composition, modeled by A + B = C and C = A + B. In these first formal addition lessons, the stories are told with no unknown: "There are 7 apples in the bowl. Five of them are red, and 2 of them are green." Students write addition sentences and identify the referent of each number within the problem. Lessons 13–15 work with 6, 7, and 8, respectively, representing such addition stories with pictures, numbers, and equations.

In Lesson 16, students solve *add to with result unknown* (A + B = ___) word problems within 8: "There were 5 birds in the tree. 3 more birds flew to the tree. How many birds are in the tree now?" Students learn to put a box around the equation's unknown.

Lesson 17 teaches *put together with total unknown* (also A + B = ___) word problems. On the surface, these problems appear similar to those of Lesson 16, but they lack the embedded *action* of the previous problems. Instead, they focus on a set of objects and part–whole relationships: "There are 4 red toy cars and 3 blue toy cars on the table. How many toy cars are on the table?"

Lesson 18 deals with the last type of addition situation in kindergarten—*both addends unknown* (C = ___ + ___). Note that this *take apart* situation is modeled with an addition equation. Students are given a total and are asked to find a number pair in the context of addition story: "There were 8 toy cars. Some are on a shelf, and the rest are in a toy box. ' e an addition sentence to show how many could be in each place."

**The sample homework responses contained in this manual are intended to provide insight into the skills expected of students and instructional strategies used in Eureka Math.*

Lesson 13

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

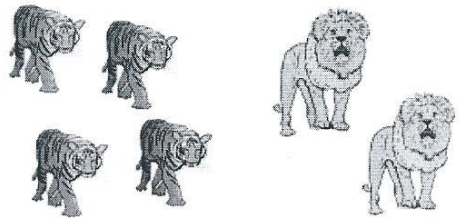
Homework Key

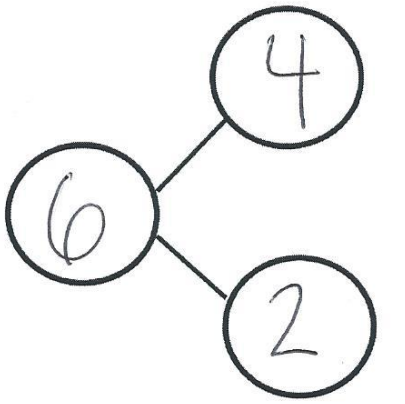
6, 4, 2; 6, 4, 2; 6, 4, 2

3, 3, 6; 3, 3, 6; 3, 3, 6

Homework Samples

There are 6 animals. 4 are tigers, and 2 are lions.
Fill in the number sentences and the number bond.





6 is 4 and 2

6 = 4 + 2

Lesson 14

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

Homework Key

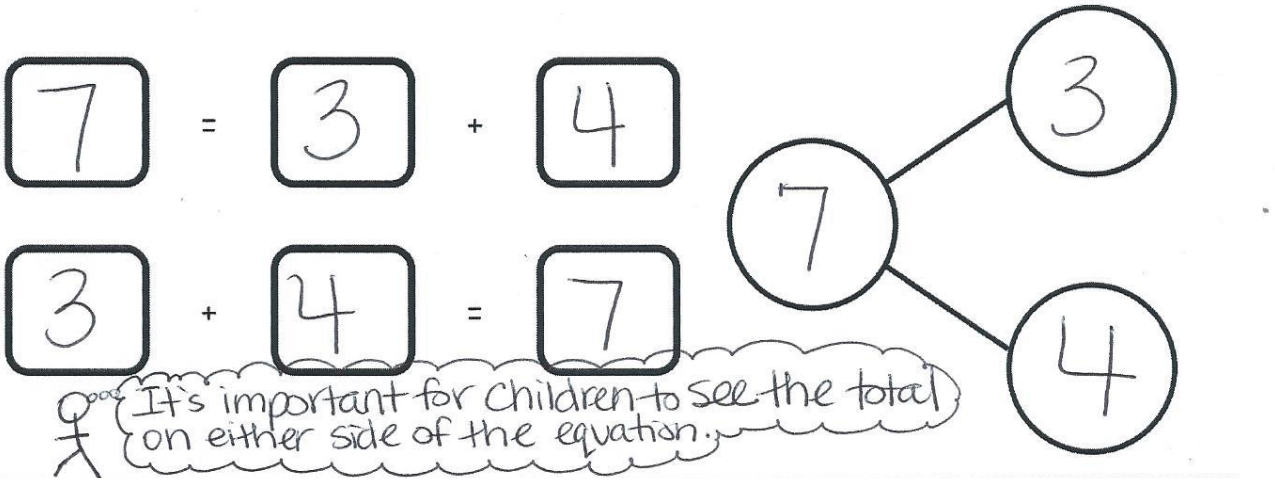
7, 3, 4; 3, 4, 7; 7, 4, 3

7, 5, 2; 5, 2, 7

Answers will vary.

Homework Samples

There are 7 bears. 3 bears have bowties. 4 bears have hearts. Fill in the number sentences and the number bond.



Lesson 15

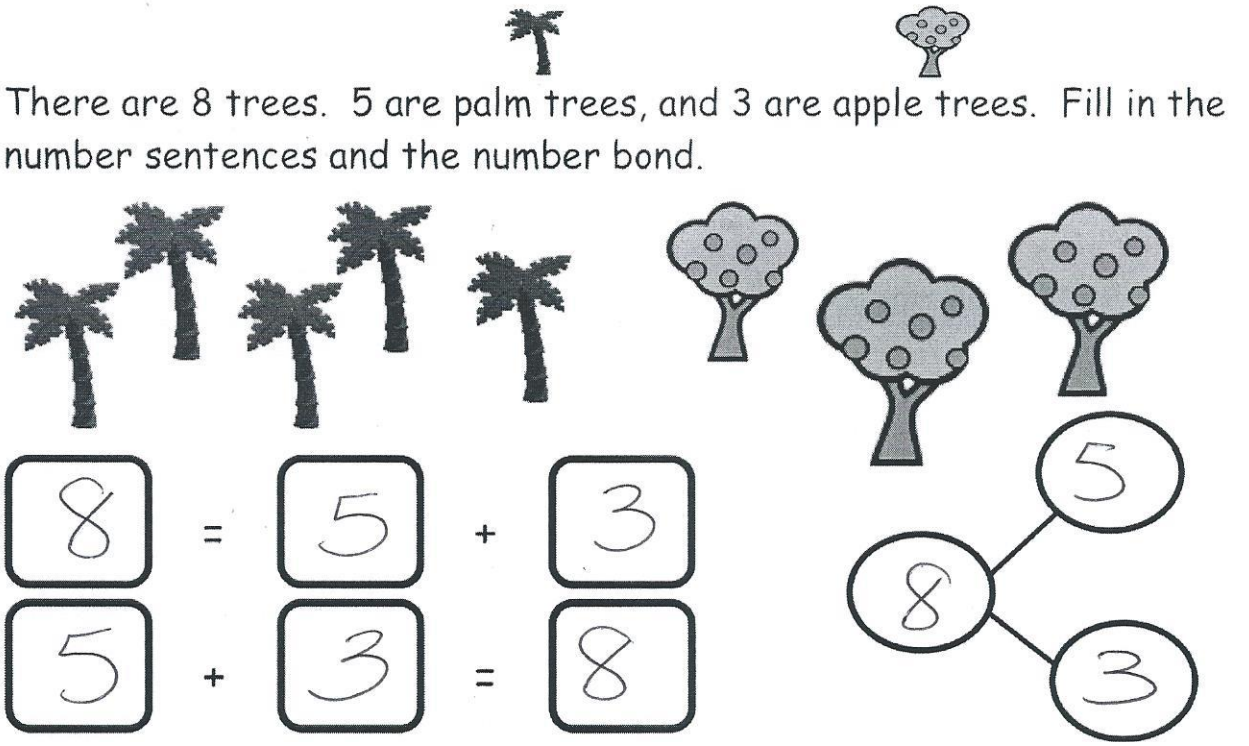
Objective: Represent decomposition and composition addition stories to 8 with drawings and equations with no unknown.

Homework Key

8, 5, 3; 5, 3, 8; 8, 5, 3

8, 4, 4; 4, 4, 8; 4, 4, 8

Homework Samples



Lesson 16

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

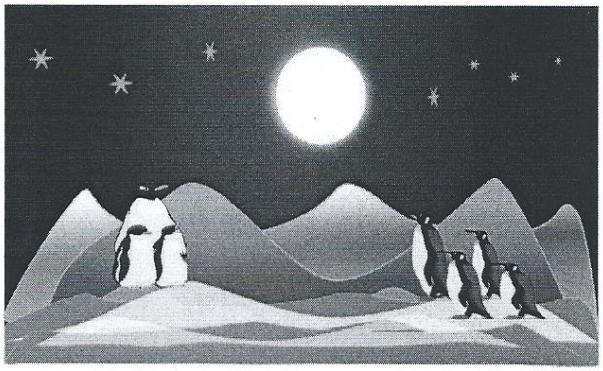
Homework Key

7

Box drawn; 6

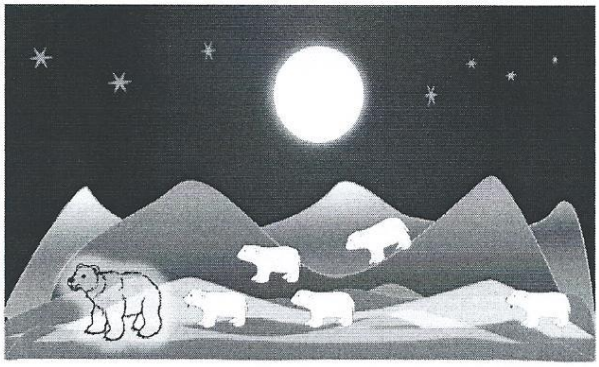
7 balls drawn in box; girl drawn putting 1 more ball in box; balls circled; box drawn for answer; 8

Homework Samples



There are 3 penguins on the ice.
4 more penguins are coming.
How many penguins are there?

3 + 4 = 7



There is 1 mama bear. 5 baby bears are following her. How many bears are there? Draw a box for the answer.

1 + 5 = 6

Lesson 17

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

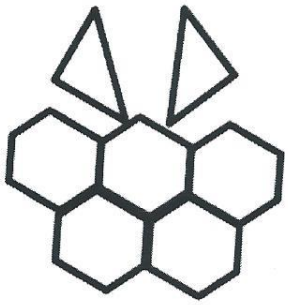
Homework Key

7, 5, 2; 5, 2, 7

8, 6, 2; 6, 2, 8

Answers will vary.

Homework Samples



There are 5 hexagons and 2 triangles. How many shapes are there?

7 = 5 + 2

5 + 2 = 7

Lesson 18

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

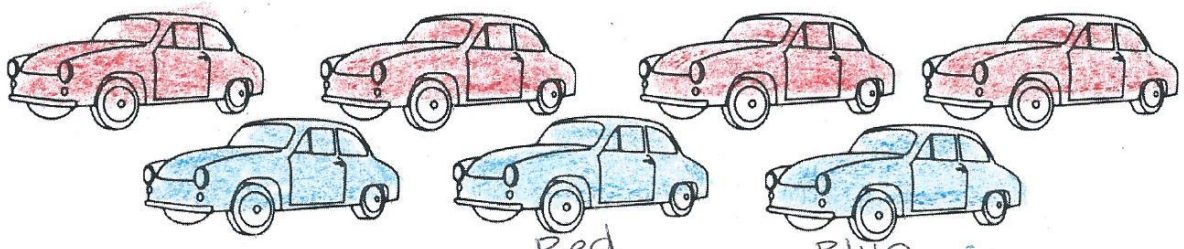
Homework Key

Answers will vary.

Answers will vary.

Homework Samples

Ted has 7 toy cars. Color some cars red and the rest blue. Write a number sentence that shows how many are red and how many are blue.



7 = 4 + 3

4 + 3 = 7

Grade K Module 4 Topic D

Subtraction from Numbers to 8

Focus Standards:

K.OA.1 Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations. (Drawings need not show details, but should show the mathematics in the problem. This applies wherever drawings are mentioned in the Standards.)

K.OA.2 Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.

K.OA.3 Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., 5 = 2 + 3 and 5 = 4 + 1).

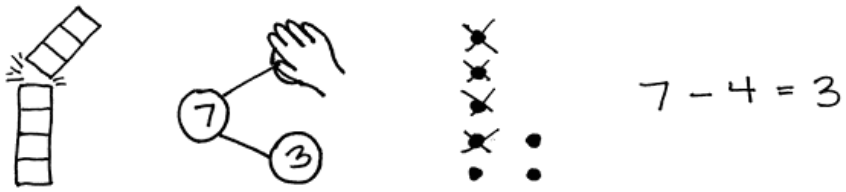
Instructional Days Recommended: 6

Topic D introduces formal subtraction concepts including writing and solving expressions and equations. Lesson 19 begins at the concrete level with students acting out *take away* stories and working at the pictorial level crossing off to see what remains.

In Lesson 20, the concrete objects and pictorial representations are tied to or matched to the representative subtraction expression or equation using the minus sign with no unknown. As in Topic C, this progression helps students move from concrete processes to reasoning abstractly and quantitatively (**MP.2**).

In Lesson 21, students solve subtraction story problems using concrete and pictorial representations and write the corresponding equation. As with addition, it is important that students understand what each numeral in the equation represents from the story situation.

Lessons 22–24 focus on decompositions of 6, 7, and 8, which are recorded as equations. These equations are described in the progressions as *take from with result unknown* situations (C – B = ___). These three lessons explore the decompositions of 6, 7, and 8 by breaking off a part, hiding a part, and crossing off a part. “There were 7 bears sleeping in a cave. 4 bears left to go fishing. How many bears are still in the cave?”



Lesson 19

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

Homework Key

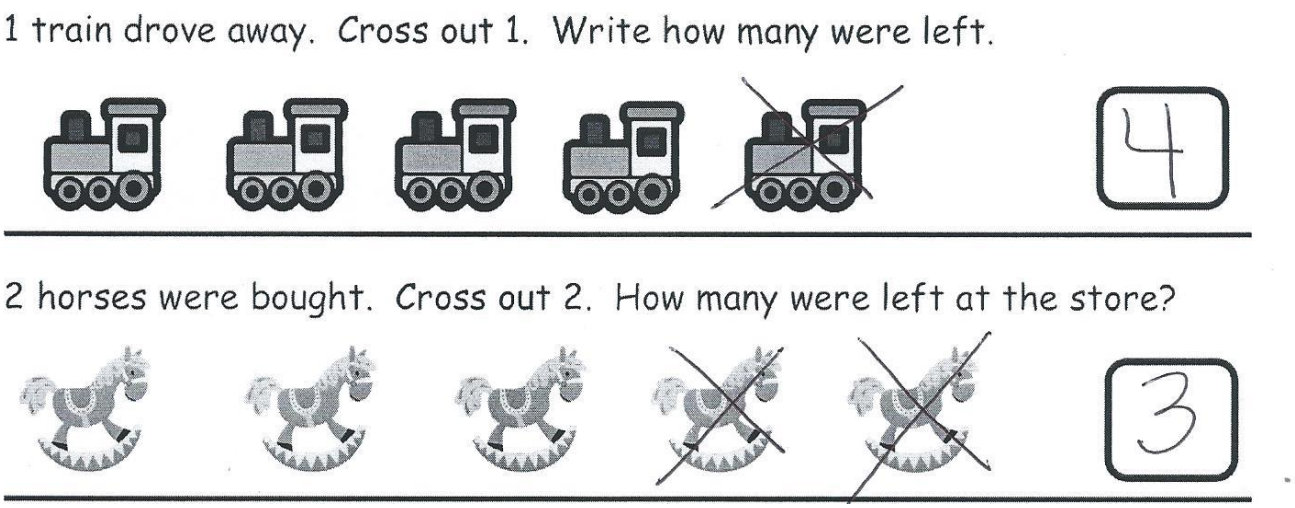
1 train crossed out; 4

2 horses crossed out; 3

4 ducks crossed out; 1

7 apples drawn in tree; 1 crossed out; 6

Homework Samples



Lesson 20

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

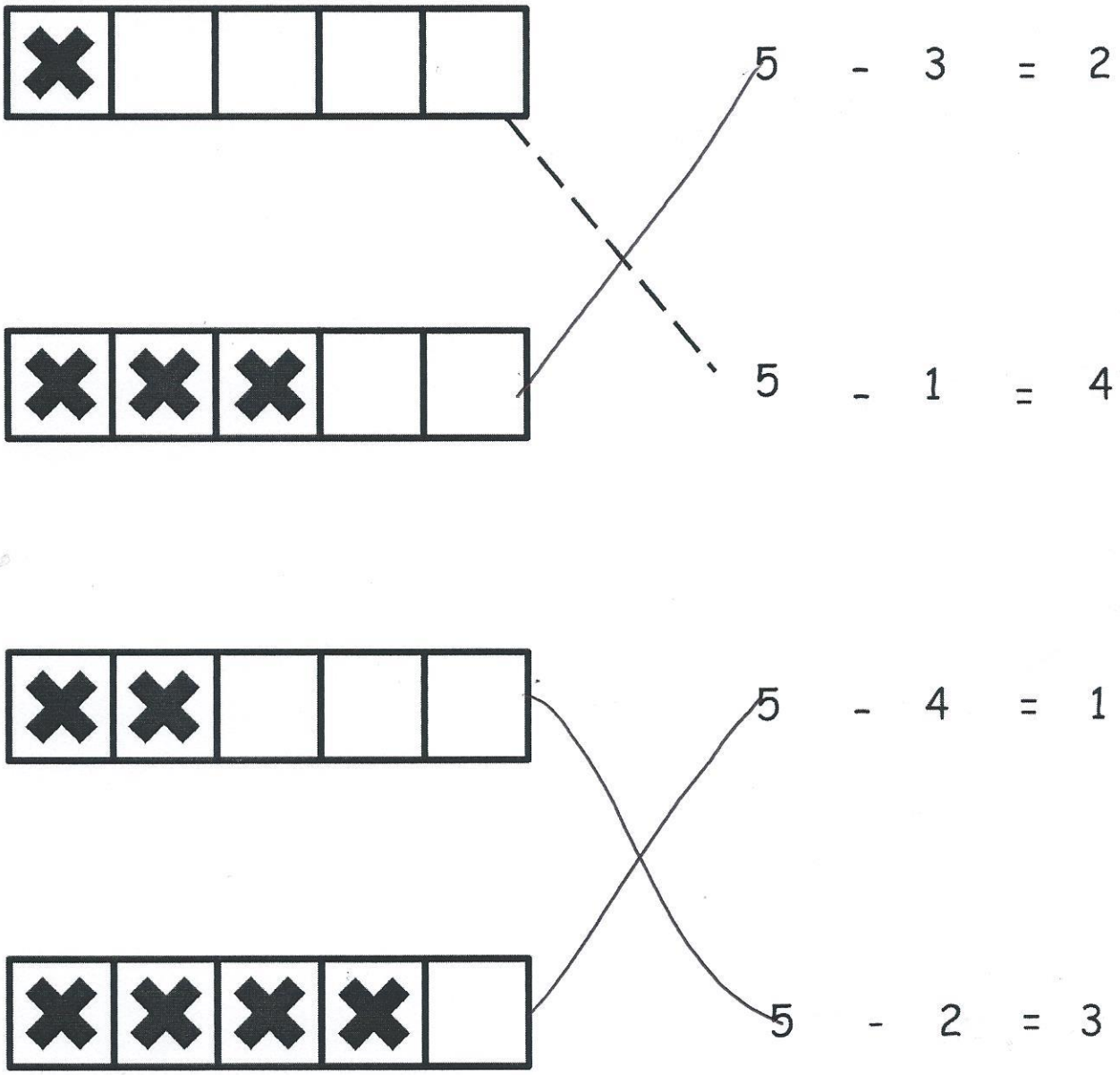
Homework Key

Line drawn from stick to correct number sentence

Answers will vary.

Homework Samples

The squares below represent cube sticks. Match the cube stick to the number sentence.



Lesson 21

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

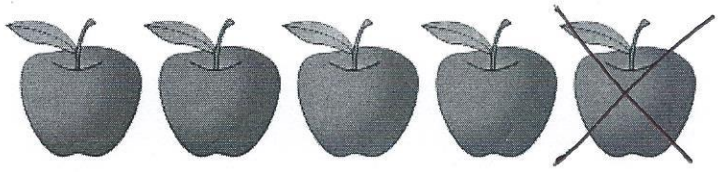
Homework Key

1 apple crossed out; 4; 4

5 oranges drawn; 2 oranges crossed off; 3; 5, 2, 3

Homework Samples

There were 5 apples. Bill ate 1. Cross out the apple he ate. How many apples were left? Fill in the boxes.



5 take away 1 is 4

5 - 1 = 4

Lesson 22

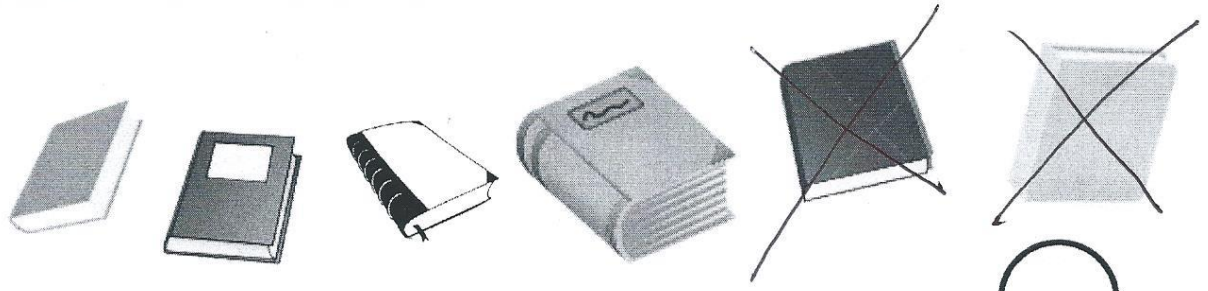
Objective: Decompose the number 6 using 5-group drawings by breaking off or removing a part, and record each decomposition with a drawing and subtraction equation.

Homework Key

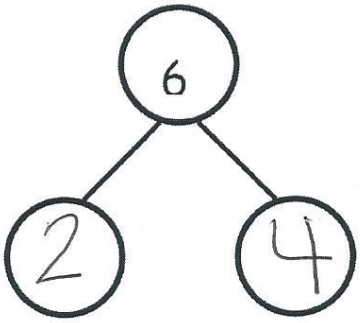
2 books crossed out; 2, 4; 2, 4
6 stars drawn; 4 stars crossed out; 2, 4, 6; 6, 4, 2
6 objects drawn; 5 objects crossed out; 1, 5, 6; 6, 5, 1
Answers will vary.

Homework Samples

Here are 6 books. Cross out 2. How many are left? Fill in the number bond and the number sentence.



6 - 2 = 4



Lesson 23

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

Homework Key

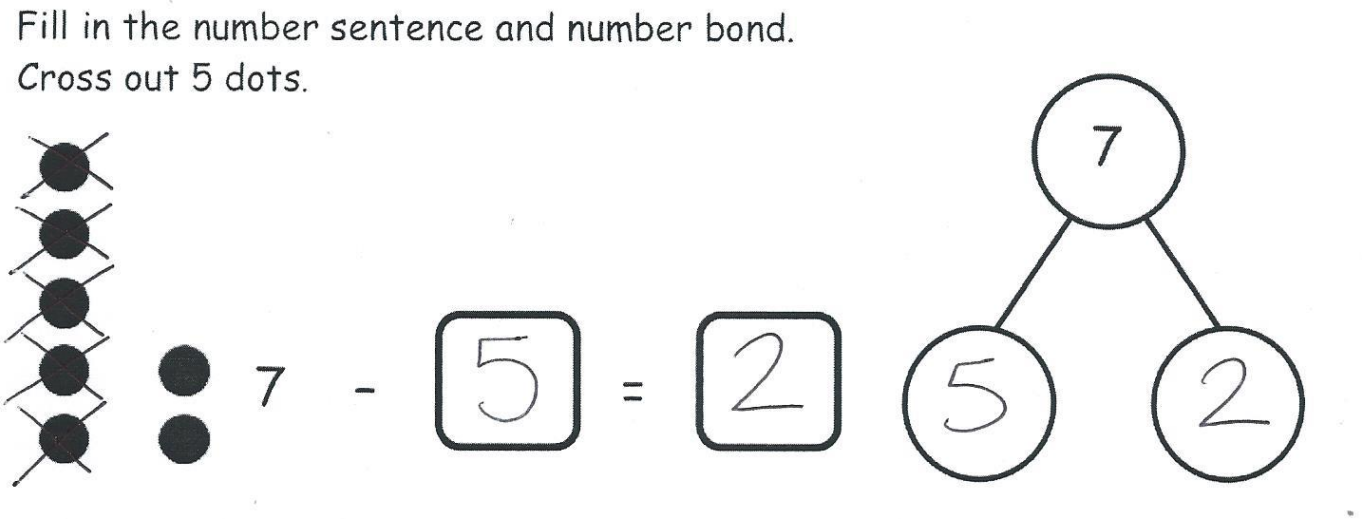
5 dots crossed out; 5, 2; 5, 2

7 dots drawn; 3 dots crossed out; 3, 4; 3, 4

7 dots drawn in 5-group; 4 dots crossed out; 4, 3; 4, 3

Answers will vary.

Homework Samples



Lesson 24

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

Homework Key

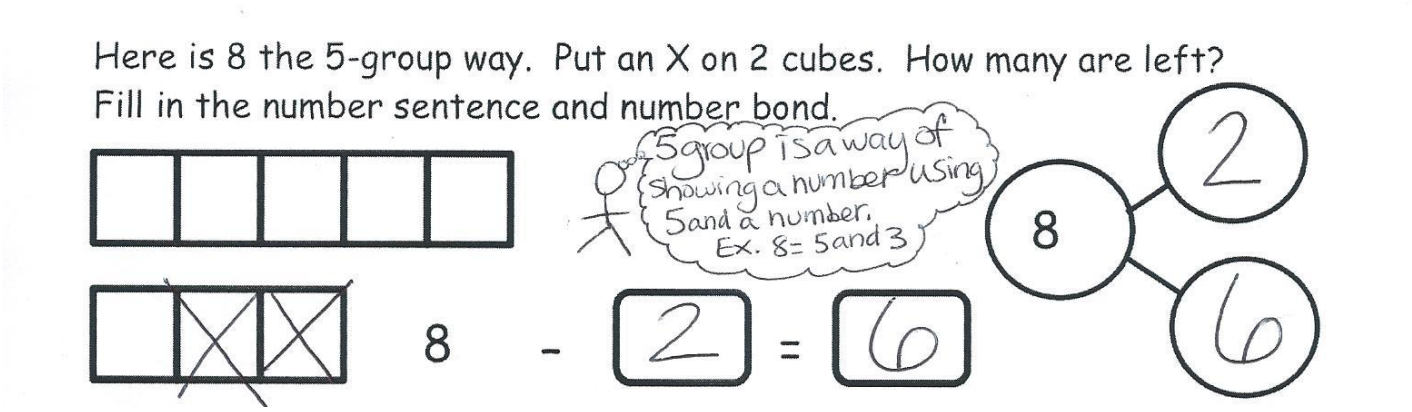
2 squares crossed off; 2, 6; 2, 6

4 squares crossed off; 4, 4; 4, 4

Answers will vary.

Answers will vary.

Homework Samples



Grade K Module 4 Topic E

Decompositions of 9 and 10 into Number Pairs

Focus Standard:

K.OA.3 Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., 5 = 2 + 3 and 5 = 4 + 1).

Instructional Days Recommended: 4

Topic E expands student exploration of numerical relationships to include 9 and 10. Returning to work with number bonds after introducing addition and subtraction reminds students about the part–part–whole relationships that underlie these operations. Students explicitly discuss the relationship between addition and subtraction in Topic H.

In Lesson 25, students work intensively with the number pairs of 9 as they demonstrate different combinations of sleeping bears and honey tree–hunting bears using counters and record with number bonds.

Lesson 26 gives students the opportunity to decompose 9 into number pairs using representations of fingers, linking cubes, and number bonds. In the Student Debrief, they explore patterns in the number pairs.

Lessons 27 and 28 follow this same lesson structure for the number 10. In all four lessons, the decompositions are discussed or recorded using number bonds, drawings, and number sentences.

This topic's decomposition situations, like those in Topic B, are *put together with both addends unknown* addition equations modeled by the equation C = ___ + ___ (**K.OA.3**).

**The sample homework responses contained in this manual are intended to provide insight into the skills expected of students and instructional strategies used in Eureka Math.*

Lesson 25

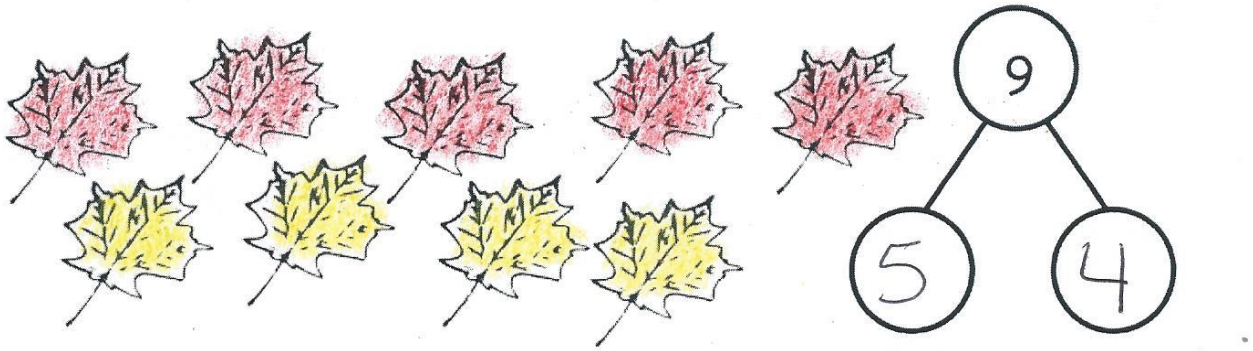
Objective: Model decompositions of 9 using a story situation, objects, and number bonds.

Homework Key

Answers will vary.
Answers will vary, 9 written in whole part of number bond
Answers will vary, 9 written in whole part of number bond
Answers will vary, 9 written in whole part of number bond

Homework Samples

There are 9 leaves. Color some of them red and the rest of them yellow.
Fill in the number bond to match.



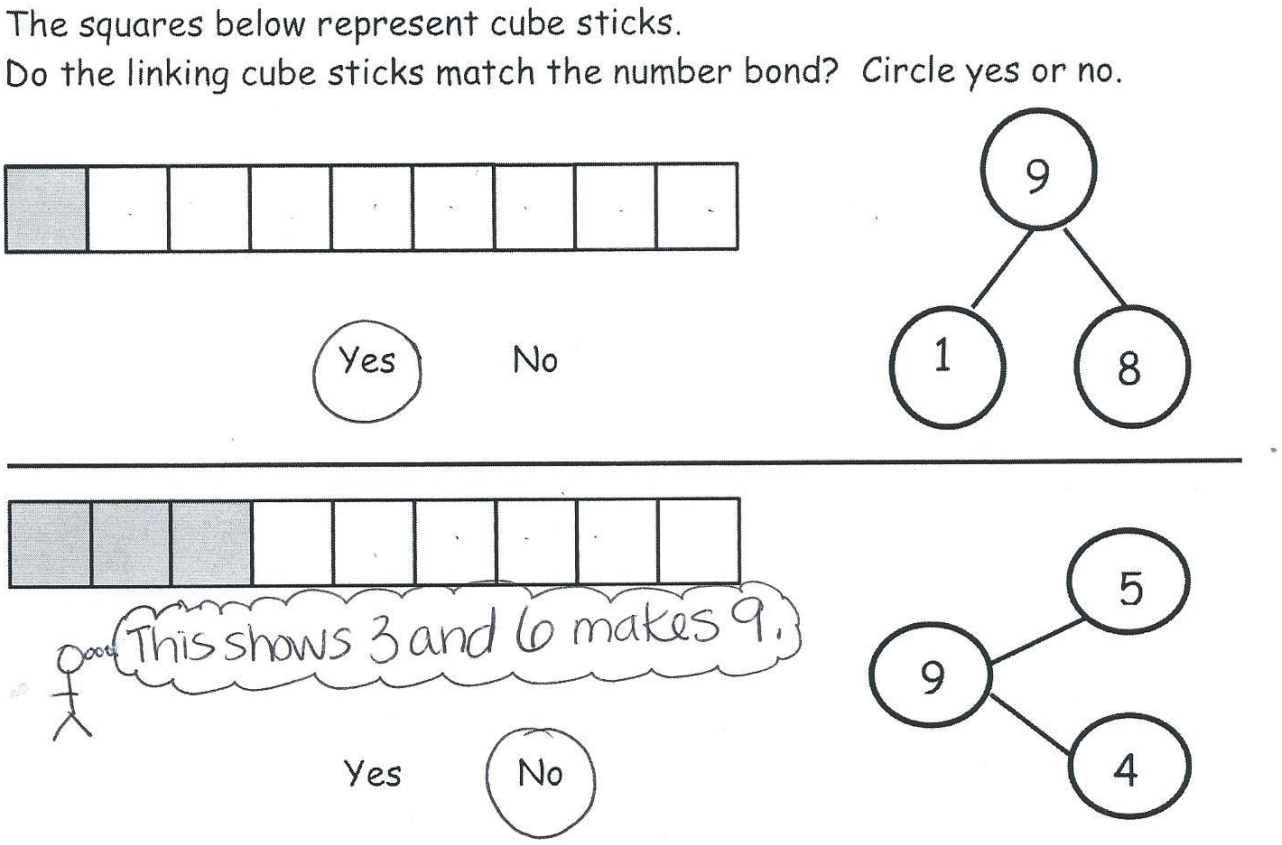
Lesson 26

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

Homework Key

Yes circled
No circled
Yes circled
4, 5
Number bond completed that shows that 7 and 2 make 9
Number bond completed that shows that 4 and 5 make 9
Number bond completed that shows that 2 and 7 make 9

Homework Samples



Lesson 27

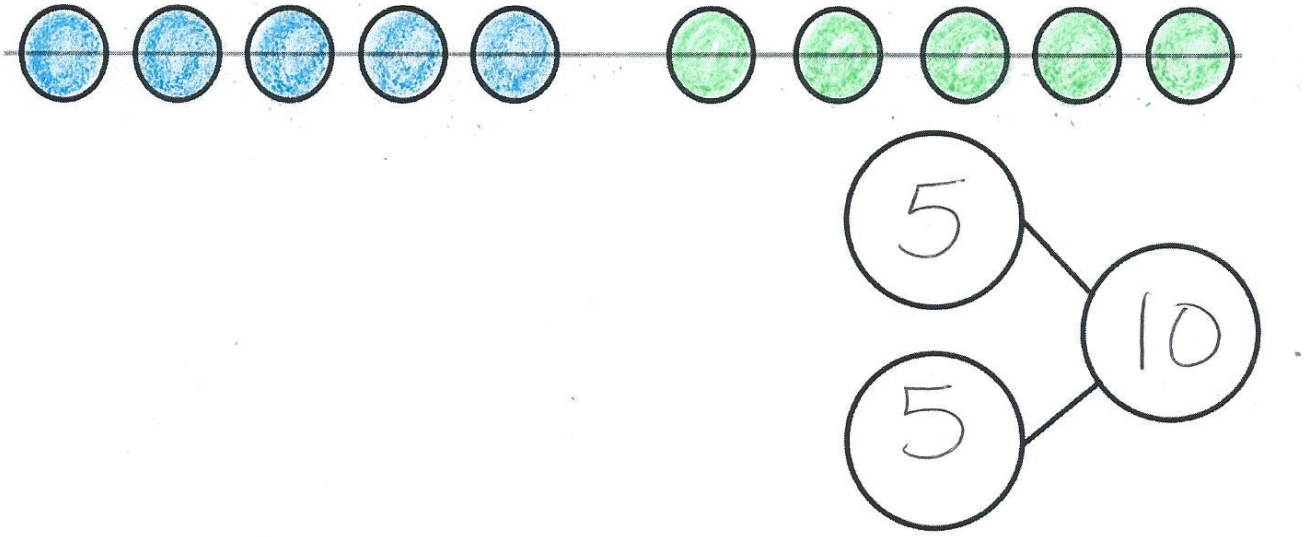
Objective: Model decompositions of 10 using a story situation, objects, and number bonds.

Homework Key

5 beads colored blue; 5 beads colored green; 5, 5, 10
Answers will vary.
Answers will vary.
Answers will vary.

Homework Samples

Pretend this is your bracelet.
Color 5 beads blue and the rest green. Make a number bond to match.



Lesson 28

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

Homework Key

5

1, 6

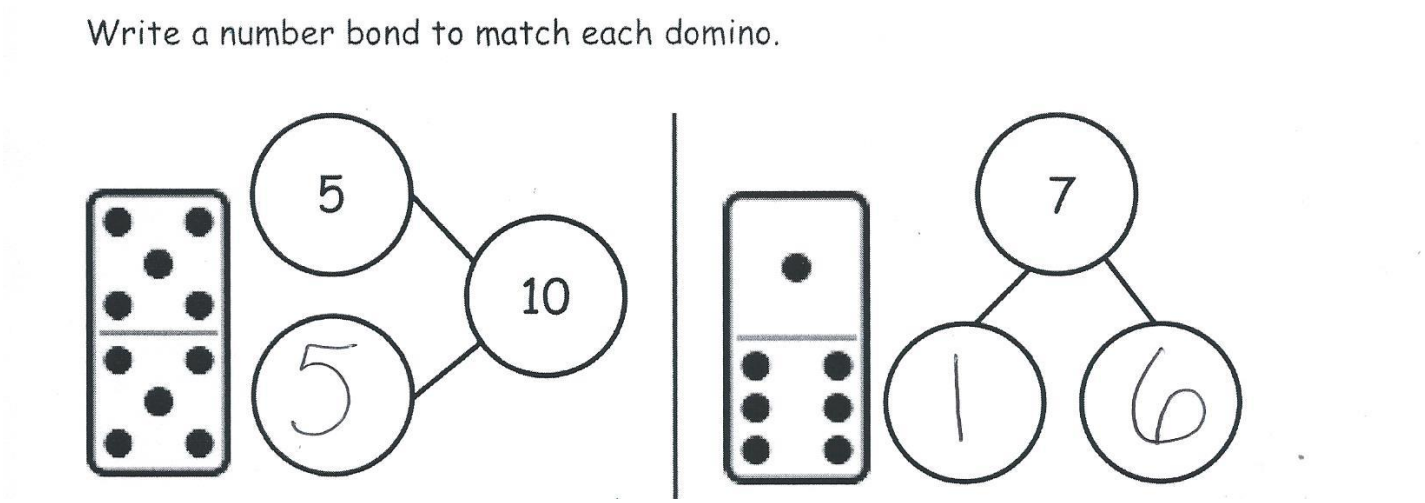
3, 7, 10

10, 4, 6

10, 2, 8

Answers will vary.

Homework Samples



Grade K Module 4 Topic F

Addition with Totals of 9 and 10

Focus Standard:

K.OA.2 Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.

Instructional Days Recommended: 4

Topic F asks students to connect their understanding of number pairs for 9 and 10 to addition expressions and equations. Core Fluency Practice Sets and Sprints are introduced in this topic to give students practice adding and subtracting numbers to 5 quickly and accurately (**K.OA.5**).

In Lessons 29 and 30, students pictorially represent composition and decomposition addition stories using 5-group drawings and equations with no unknown. Decomposition: "There were 9 flowers. 5 were red, and 4 were yellow." Composition: "Bob picked 6 red flowers. Then, he picked 4 yellow flowers. Now he has 10 flowers."

Lesson 31 has opportunities for students to solve *add to with result unknown* and *put together with total unknown* problems with totals of 9 and 10. Both of these problem types are represented by the same equation (A + B = C) with the difference being that *add to with result unknown* problem types embed an action within the story. Conversely, *put together with total unknown* problem types join parts with no action. The latter is a more complex problem type for kindergartners to consider because there is no movement of one of the parts to support the mental act of joining inherent in addition (e.g., counting on—one at a time—from one part to the next).

The final lesson in the topic deals with the last addition situation for kindergartners—solving *put together with both addends unknown* word problems (C = ___ + ___) with totals of 9 and 10 using 5-group drawings, pictures, and equations. All four lessons in this topic correspond to those of Topic C but with totals of 9 and 10.

This topic builds student understanding of addition within 10 while providing practice with multiple addition situations appropriate for kindergartners. Due to the length of this module, there is the option to take a day and a half to administer Topics E and F of the End-of-Module Assessment at the end of Lesson 32. This helps identify students who may need more support and allows more time to reassess these students throughout the module.

Lesson 29

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

Homework Key

6, 1; 6, 1

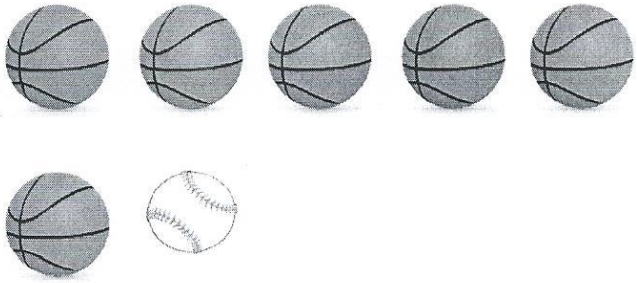
7, 2, 9; 7, 2, 9

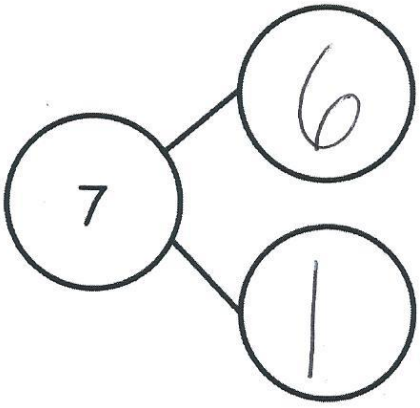
Hockey pucks and stick drawn the 5-group way; 9, 8, 1

Strawberries and grapes drawn the 5-group way; 5, 4, 9

Homework Samples

Jack found 7 balls while cleaning the toy bin. He found 6 basketballs and 1 baseball. Fill in the number sentence and the number bond.





7 = 6 + 1

Lesson 30

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

Homework Key

6, 4; 6, 4

Animals drawn the 5-group way; number bond showing 5 and 5 make 10; 5, 5, 10

3

Answers will vary.

Answers will vary.

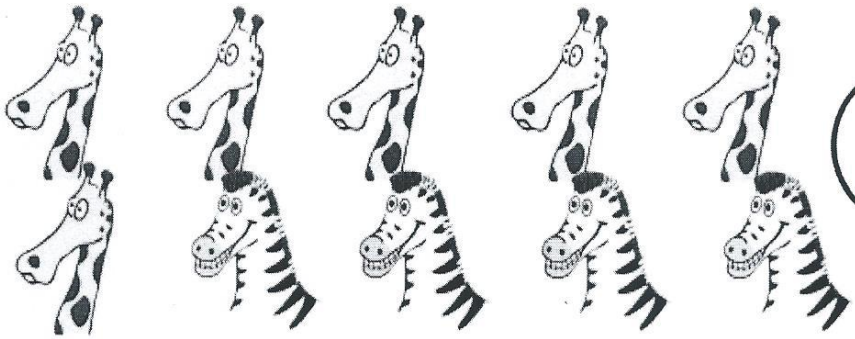
Answers will vary.

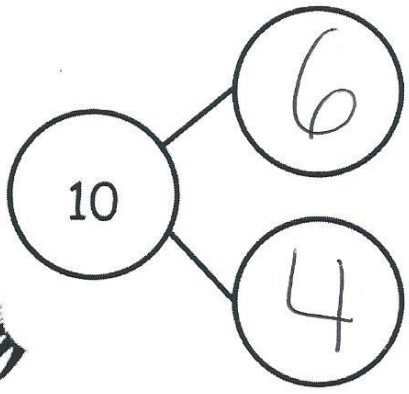
Answers will vary.

Homework Samples

Fill in the number bonds, and complete the number sentences.

Scott went to the zoo. He saw 6 giraffes and 4 zebras. He saw 10 animals altogether.





10 = 6 + 4

Lesson 31

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

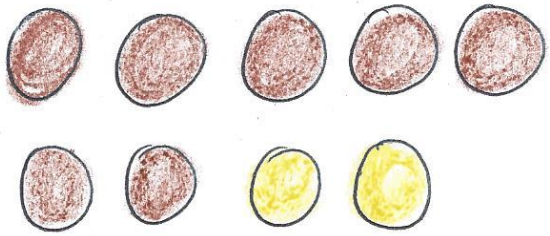
Homework Key

7 chocolate and 2 sugar cookies drawn; 7, 2, 9
4 apple juice and 5 orange juice boxes drawn; 4, 5, 9
5 celery sticks and 5 carrot sticks drawn; 5 + 5 = 10
Answers will vary.

Homework Samples

Draw the story. Fill in the number sentence.

Jake has 7 chocolate cookies and 2 sugar cookies. How many cookies does he have altogether?



7 + 2 = 9

Lesson 32

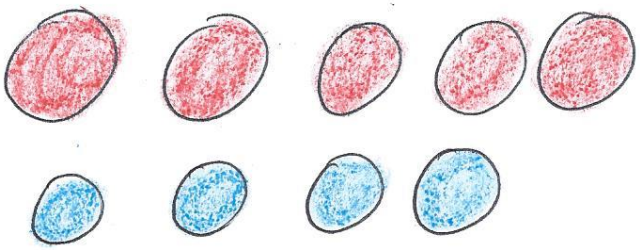
Objective: Solve *both addends unknown* word problems with totals of 9 and 10 using 5-group drawings.

Homework Key

9 hats drawn the 5-group way; answers will vary.
10 pencils drawn the 5-group way; answers will vary.
Answers will vary.
Answers will vary.

Homework Samples

Jerry has 9 baseball hats. Draw the hats the 5-group way. Color some red and some blue. Fill in the number sentence to match.



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

Grade K Module 4 Topic G

Subtraction from 9 and 10

Focus Standards:

K.OA.1 Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations. (Drawings need not show details, but should show the mathematics in the problem. This applies wherever drawings are mentioned in the Standards.)

K.OA.2 Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.

K.OA.3 Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., 5 = 2 + 3 and 5 = 4 + 1).

Instructional Days Recommended: 4

Topic G provides additional practice with formal subtraction concepts, including writing and solving number sentences with totals of 9 or 10.

Lesson 33 moves quickly through concrete and pictorial representations of subtraction with students representing *take from* equations (C − B = A) with no unknown for totals to 10. "There were 10 cars in the parking lot. 2 of them drove away. Now there are 8 cars left in the parking lot."

In Lesson 34, students solve subtraction story problems by breaking off, crossing out, and hiding a part and show their strategies with drawings and number sentences (**MP.5**). "I have 9 pencils. I'm going to hide 3 pencils in a box. How many pencils are not in the box?"

Lessons 35–36 focus on decompositions of 9 and 10 using 5-groups, which are recorded as number sentences (**K.OA.3**). These decompositions differ from those in Topic F because they are represented as subtraction number sentences (C – B = A) instead of addition sentences (C = __ + __).

Students continue to focus on the grade level fluency goal during Fluency Practice, improving the speed and accuracy with which they add and subtract numbers to 5 (**K.OA.5**).

**The sample homework responses contained in this manual are intended to provide insight into the skills expected of students and instructional strategies used in Eureka Math.*

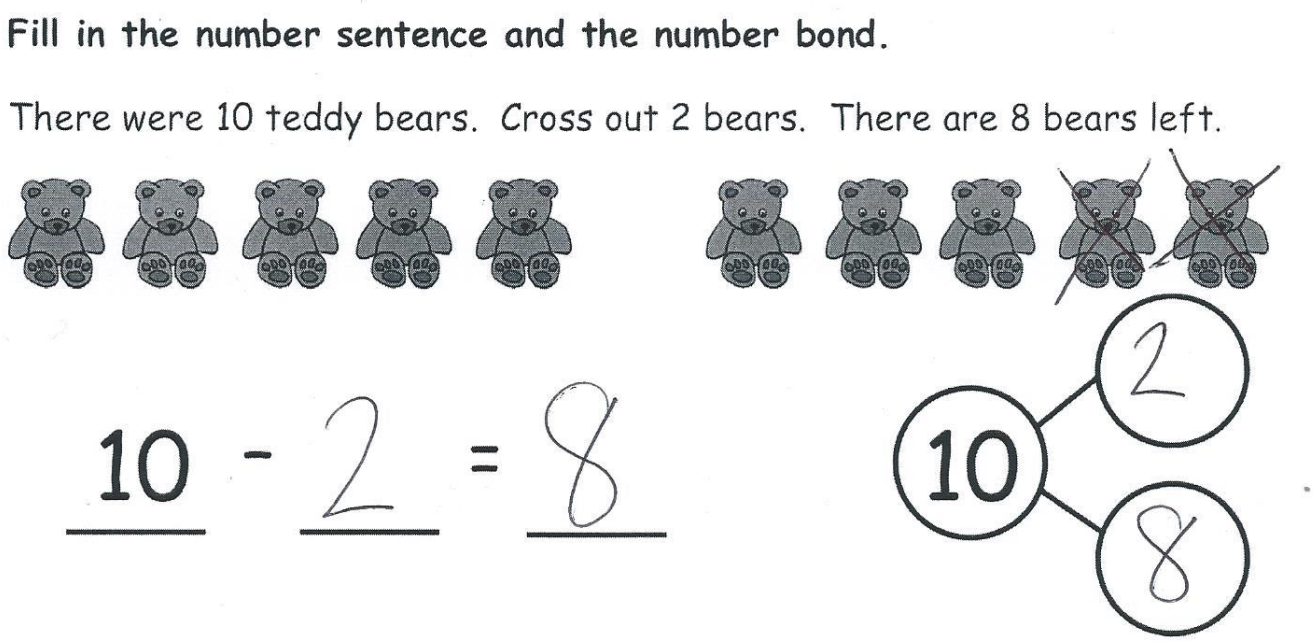
Lesson 33

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

Homework Key

2 bears crossed out; 2, 8; number bond showing that 2 and 8 make 10
9 bears crossed out; 10, 9, 1; number bond showing that 9 and 1 make 10
3 bears crossed out; 10, 3, 7
Lines drawn from the picture to the correct number sentence

Homework Samples



Lesson 34

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

Homework Key

2 penguins crossed out; 6; 6, 2

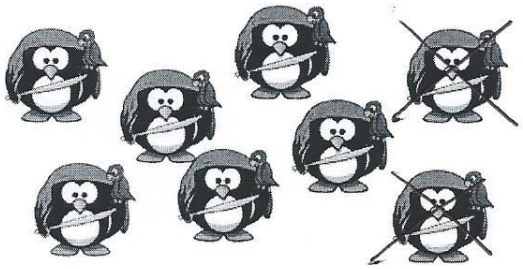
Line drawn after 3 cubes; 7, 4, 3; 4, 3

Answers will vary.

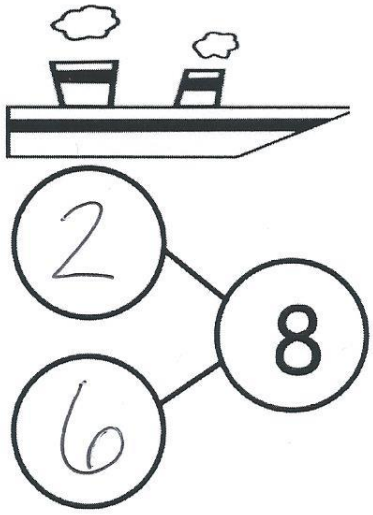
4	2
5	4
1	2
4	3

Homework Samples

There were 8 penguins. 2 penguins went back to the ship. Cross out 2 penguins. Fill in the number sentence and the number bond.



8 - 2 = 6



Lesson 35

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

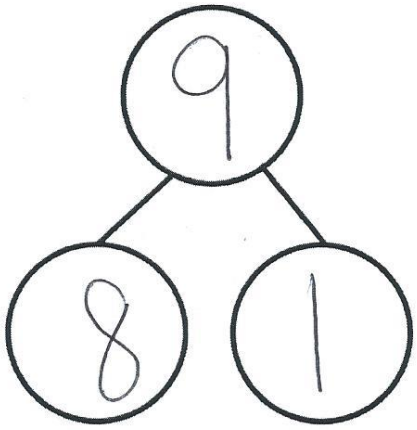
Homework Key

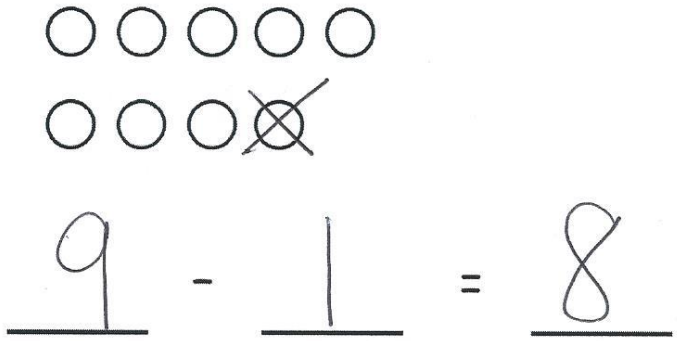
1 circle crossed out; number bond filled in to show that 1 and 8 make 9; 9, 1, 8
3 circles crossed out; number bond filled in to show that 3 and 6 make 9; 9, 3, 6
9 pencils drawn the 5-group way; 7 pencils crossed out; number bond filled in to show that 7 and 2 make 9; 9, 7, 2
9 balls drawn; 5 balls crossed out; number bond filled in to show that 5 and 4 make 9; 9, 5, 4
3; 2; 1; 1

Homework Samples

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

Mary had 9 library books. She returned 1 book to the library. How many books are left?





Lesson 36

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

Homework Key

2 circles crossed off; number bond filled in to show that 2 and 8 make 10; 10, 2, 8

6 circles crossed off; number bond filled in to show that 6 and 4 make 10; 10, 6, 4

10 butterflies drawn the 5-group way; 9 butterflies crossed out; number bond filled in to show that 9 and 1 make 10; 10, 9, 1

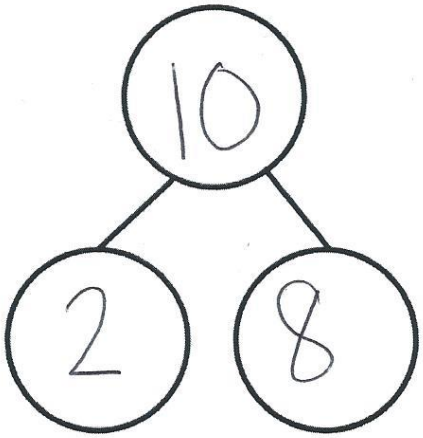
10 toy cars drawn; 4 cars crossed out; number bond filled in to show that 4 and 6 make 10; 10, 4, 6

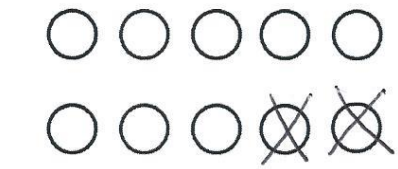
2; 3; 1; 4

Homework Samples

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

MacKenzie had 10 buttons on her jacket. 2 buttons broke off her jacket. How many buttons are left on her jacket?





10 - 2 = 8

Grade K Module 4 Topic H

Patterns with Adding 0 and 1 and Making 10

Focus Standards:

K.OA.1 Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations. (Drawings need not show details, but should show the mathematics in the problem. This applies wherever drawings are mentioned in the Standards.)

K.OA.2 Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.

K.OA.4 For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.

Instructional Days Recommended: 5

In Topic H, students begin to see patterns when adding 0 and 1. They also find the number that makes 10 when added to a given number (**K.OA.4**). Lesson 37 explores the additive identity: zero. Students learn that adding or subtracting zero does not change the original quantity. In this lesson, students also begin to see the inverse relationship of addition and subtraction. "There were 8 children playing. 2 more came to play. Then, there were 10. But then, 2 children had to go home. Then, there were only 8 children playing." (8 + 2 = 10; 10 – 2 = 8.)

Lesson 38 uses 5-groups to see patterns when adding 1. Once again, focusing on the 5-group helps move students to Level 2 counting on strategies. Lessons 39 and 40 focus on making compositions to 10. "How many more does 6 need to make 10? Draw a picture of 6 in a 5-group. How many do you need to draw to make 10? Let's make a record of that with an addition equation." (6 + 4 = 10.)

This module concludes with a culminating activity that calls on students to use what they have learned to teach others how to think about a part–part–whole situation. Students choose tools strategically to model and represent a stick of 10 cubes broken into two parts. This is an excellent opportunity to bring in another class, family members, administrators, or community volunteers to serve as enthusiastic *students* for individual student presentations.

**The sample homework responses contained in this manual are intended to provide insight into the skills expected of students and instructional strategies used in Eureka Math.*

Lesson 37

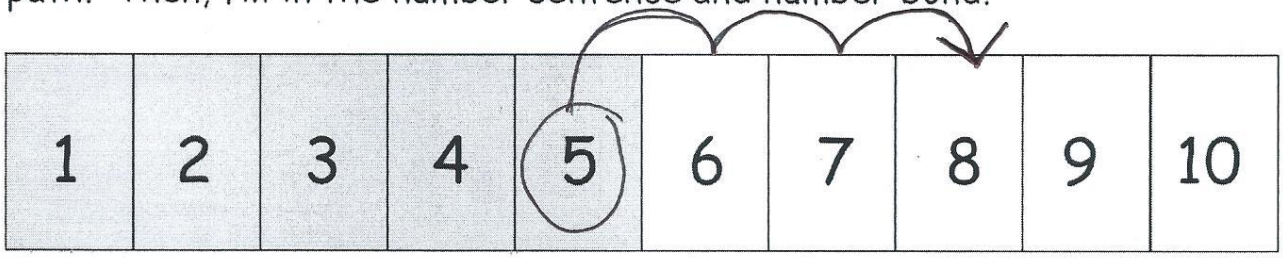
Objective: Add or subtract 0 to get the same number and relate to word problems wherein the same quantity that joins a set, separates.

Homework Key

5, 3, 8; number bond filled in to show that 5 and 3 make 8
8, 3, 5; number bond filled in to show that 3 and 5 make 8
9, 0, 9; number bond filled in to show that 9 and 0 make 9
8, 0, 8; number bond filled in to show that 8 and 0 make 8
1; 2; 3; 4
5; 4; 3; 2

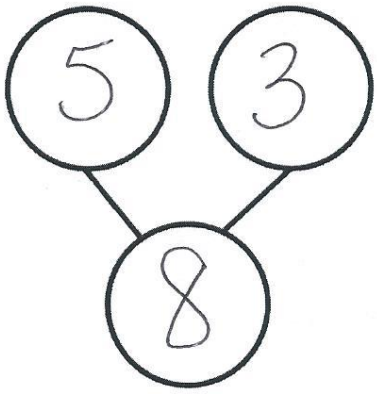
Homework Samples

Listen to each story. Show the story with your fingers on the number path. Then, fill in the number sentence and number bond.



Joey had 5 pennies. He found 3 pennies in the couch. How many pennies does Joey have now?

5 + 3 = 8



Lesson 38

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

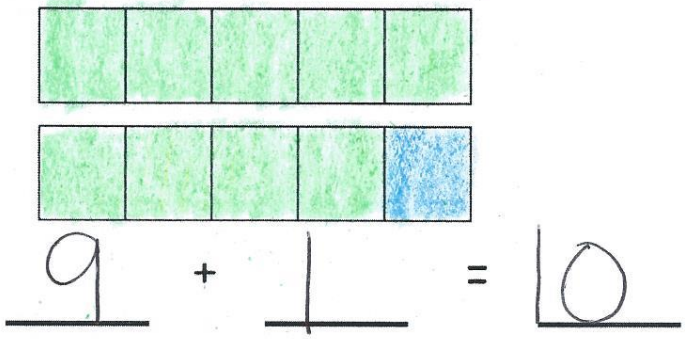
Homework Key

9 squares colored green, 1 square colored blue; 9, 1, 10; number bond filled in to show that 9 and 1 make 10
8 squares colored green, 1 square colored blue; 8, 1, 9
7 squares colored green, 1 square colored blue; 7, 1, 8; number bond filled in to show that 7 and 1 make 8
2 squares colored green, 1 square colored blue; 2, 1, 3; number bond filled in to show that 2 and 1 make 3
1 square colored green, 1 square colored blue; 1, 1, 2
1 square colored blue; 0, 1, 1; number bond filled in to show that 0 and 1 make 1
3; 2; 1; 0

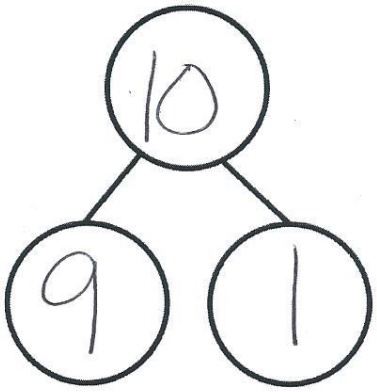
Homework Samples

Follow the instructions to color the 5-group. Then, fill in the number sentence or number bond to match.

Color 9 squares green and 1 square blue.



9 + 1 = 10



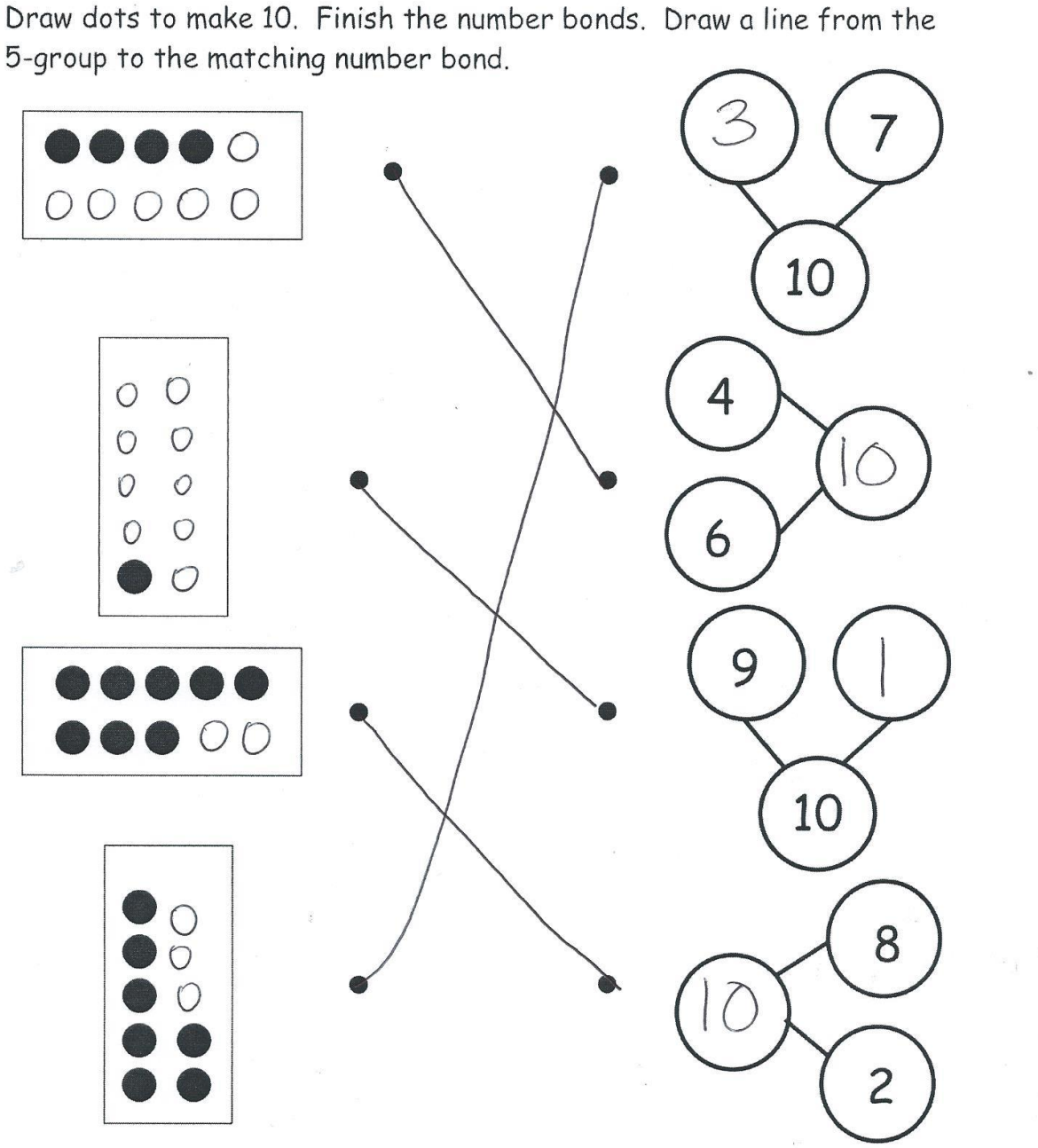
Lesson 39

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

Homework Key

6 dots drawn; line drawn to number bond showing that 4 and 6 make 10
9 dots drawn; line drawn to number bond showing that 1 and 9 make 10
2 dots drawn; line drawn to number bond showing that 8 and 2 make 10
3 dots drawn; line drawn to number bond showing that 7 and 3 make 10

Homework Samples



Lesson 40

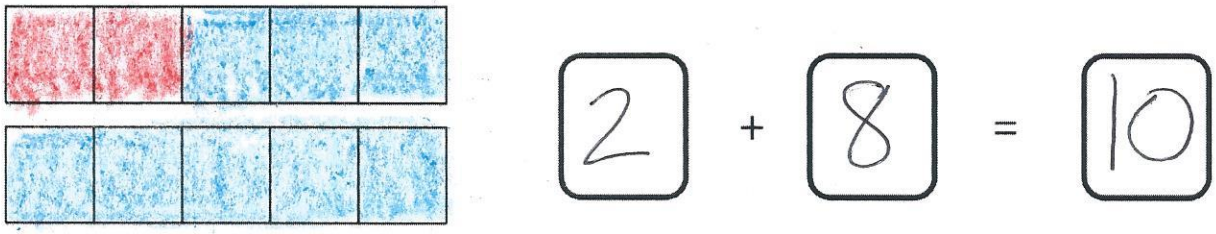
Objective: Find the number that makes 10 for numbers 1–9, and record each with an addition equation.

Homework Key

2 boxes colored red and 8 boxes colored blue the 5-group way; 2, 8, 10
5 cubes colored red and 5 cubes colored blue the 5-group way; 5, 5, 10
7 cubes colored red and 3 colored blue the 5-group way; 7, 3, 10
Number sentences matched to shaded cubes

Homework Samples

Color 2 boxes red the 5-group way. Color the rest blue to make 10.
Fill in the number sentence.



Lesson 41

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

Homework Key

6 blocks colored blue, 4 blocks colored red; 10, 6, 4; number bond filled in to show that 6 and 4 make 10

Answers will vary.

Answers will vary.

Answers will vary.

2	3
3	4
4	5
5	5
6	5

Homework Samples