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: 4

Coherence -Links from: GPK–M5 Numerals to 5, Addition and Subtraction Stories, Counting to 20
-Links to: G1–M1 Sums and Differences to 10

Topic E expands student exploration of numerical relationships to include 9 and 10. Returning to work with number bonds after introducing addition and subtraction provides students with a reminder about the part–part–whole relationships that underlie these operations. Students will 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 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 both addends unknown addition equations modeled by the equation $C = ___ + ___$ (K.OA.3).
A Teaching Sequence Towards Mastery of Decompositions of 9 and 10 into Number Pairs

**Objective 1:** Model decompositions of 9 using a story situation, objects, and number bonds.
(Lesson 25)

**Objective 2:** Model decompositions of 9 using fingers, linking cubes, and number bonds.
(Lesson 26)

**Objective 3:** Model decompositions of 10 using a story situation, objects, and number bonds.
(Lesson 27)

**Objective 4:** Model decompositions of 10 using fingers, sets, linking cubes, and number bonds.
(Lesson 28)
Lesson 25

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

Suggested Lesson Structure

- Fluency Practice (13 minutes)
- Application Problem (4 minutes)
- Concept Development (25 minutes)
- Student Debrief (8 minutes)
- Total Time (50 minutes)

Fluency Practice (13 minutes)

- Rekenrek Wave **K.NBT.1** (3 minutes)
- 5-Group Flashes **K.OA.5** (5 minutes)
- Take Apart the Array **K.OA.3** (5 minutes)

Rekenrek Wave (3 minutes)

Materials: (T) 20-bead Rekenrek

T: You’ve become very good at counting with the Rekenrek the Say Ten way. I want to teach you the regular way to say the numbers that come after 10. (Show 10 beads on the top row of the Rekenrek). Here is 10, 1 more than 10 is 11. (Slide over one more bead.) Say “eleven.”

S: Eleven.

T: How many beads do you see?

S: 11.

T: 1 more than 11 is 12. (Slide over one more bead.) Say “twelve.”

S: Twelve.

T: How many beads now?

S: 12.

Repeat this process to 13. Then continue with the following possible sequence: 11, 12, 11, 12, 13, 12, 13, 12, 11. Direct the students to gradually raise their hands as the numbers increase and lower their hands as the numbers decrease, mimicking the motion of a wave.

Note: This fluency anticipates the work of GK–Module 5. Developing automaticity with the counting sequence in conventional language will facilitate the work with teen numbers.
5-Group Flashes (5 minutes)

Materials: (T) Large 5-group cards (1–4) (S) 5-group cards

Note: This activity seeks to build on students’ understanding of comparison in order to see the relationship between partner numbers.

T: (Show 4 dots.) How many dots do you see?
S: 4.
T: How many more to make 5?
S: 1.
T: Say the number sentence.
S: 4 plus 1 equals 5.
T: Write the number sentence on your board. Get ready. Show me.
S: (Display 4 + 1 = 5.)

Continue with the following possible sequence: 3, 2, 1, 4, 2, 3.

Take Apart the Array (5 minutes)

Materials: (S) Array of 9 fluency template, personal white board

T: (Project or show a copy of the fluency template.) Let’s count the dots. Ready?
S: 1, 2, 3, 4, 5, 6, 7, 8, 9.
T: So our job is to take apart.
S: 9!
T: We can take apart the 9 dots by drawing a straight line like this. (Demonstrate.) How many dots are in this part? (Point to indicate which part to count.)
S: 3.
T: The other part? (Provide wait time and a signal, such as a clap of the hands, for the answer of 6 to allow time for those students who need to count all 6 dots).
S: 6.
T: (Record the number bond.) We can read it like this: 9 is 3 and 6. Echo me, please.
S: 9 is 3 and 6.
T: (Erase the line, but do not erase the number bond.) We can also take apart the 9 dots with a line that looks like an L. (Demonstrate.) How many dots are in this part? (Point to indicate which part to count.)
S: 2.
T: The other part? (Provide wait time and a signal, such as a clap of the hands, for the answer of 7 to allow time for those students who need to count all 7 dots.)
S: 7.
T: (Record the number bond.) We can read it like this: 9 is 2 and 7. Echo me, please.
Lesson 25:

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

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NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

Give students who are below grade level and those with disabilities linking cubes or counting sticks (or another manipulative) to show the Application Problem before asking them to draw their results. Manipulatives make the conceptual transference from concrete to abstract easier.

NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

Make partner work easier for English language learners by providing sentence frames such as, “I see ___ bears outside, so there are ___ bears sleeping.” Practice with them a few times so that they are more comfortable working with their partner.

S: 9 is 2 and 7.
T: Now, it’s your turn to take apart 9!

If necessary, complete another example with the class, or direct students to work independently on drawing lines and recording decompositions of 9 as number bonds. After some time, invite students to explain how they know they’ve found all of the ways to take apart 9.

Note: This activity prepares students to work with decomposing 9 at the pictorial level.

Application Problem (4 minutes)

There were 9 flowers in Casey’s beautiful garden. She had 2 vases. Draw one way she could have put all of the flowers into the vases. Show your picture to your partner. Did he draw the flowers in the vases the same way? Are both ways right? Are there other ways you could have shown the flowers?

Note: Thinking about different ways to decompose 9 and discussing them with a partner sets the stage for today’s lesson.

Concept Development (25 minutes)

Materials: (S) 9 teddy bear counters or other manipulatives and 1 paper bowl per pair, personal white boards

T: There were 9 bears in the forest. Some bears went to sleep in their cave, and some left to find a honey tree. Use your counters to show the bears. How many bears were there in all?

S: 9.

T: I wonder how many bears were sleeping. Who would like to share an idea?

S: I think that 3 bears were sleeping and the other ones went to the honey tree.

T: Great! Let’s use your set of counters show 3 sleeping bears and the rest of your counters to show the honey tree-hunting bears. Arrange your counters to show the different groups. (Allow time for the children to model the situation, circulating to ensure accuracy.)

T: Good work! Could we show this story in a number bond? How many bears are there in all? What number should go in the whole?

S: 9.
Lesson 25: Model decompositions of 9 using a story situation, objects, and number bonds.

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T: Good! Draw the number bond and the whole. What are our parts?
S: There are 3 sleeping and 6 hunting in the forest! \( \rightarrow \) The parts are 3 and 6.
T: (Demonstrate.) Yes! We can make our 9 bears into parts of 3 and 6. Finish the number bond on your board.
T: Did anyone think about the story in another way?
S: Yes! \( \rightarrow \) I imagined 7 sleeping and the rest hunting.
T: If more bears were sleeping in the story this time, do you think there will be more or fewer bears hunting for honey now? Let’s show this new situation with your bears to find out!
S: More bears sleeping mean that there aren’t as many hunting this time!

Allow time for other student ideas and discussion, modeling of the new situations, and creation of other number bonds representing the bears. Guide the discussion if necessary to find all of the partners making 9.

T: You are going to play a game with your 9 teddy bears and your partner. While she closes her eyes, hide some of your bears under the bowl to show the sleepy bears in the cave. Then tell your partner to open her eyes. How many bears are outside? Can she figure out how many bears are hiding in the cave? If not, show her. Draw a number bond to show your story, and then switch! How many partners for 9 can you find? (Allow time for play and discussion.)
T: Let’s show some of the number bonds you discovered on the board! What partners did you find?
S: We found 8 and 1! \( \rightarrow \) We found 4 and 5. \( \rightarrow \) 7 and 2 make 9, too! (Record student number bonds on the board.)

Problem Set (10 minutes)

Students should do their personal best to complete the Problem Set within the allotted 10 minutes.

Note: The teacher may first need to read each problem aloud, depending on the reading abilities of the students. After explaining the problem, allow time for the students to create the solution before moving on.

Student Debrief (8 minutes)

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

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.
You may choose to use any combination of the questions below to lead the discussion.

- What strategies did you use to fill in the number bonds in the problem set? Did you count each of the parts, or did you think in a different way?
- How did you figure out how many bears were in the cave during your partner game?
- How did you know you where you should write each part when you were drawing your number bonds on your personal board?
- Seven bears are sleeping and 2 are in the honey tree. Here is the number bond. What if there were 2 bears sleeping and 7 in the honey tree? Would the number bond change? Does the story change?
- Thumbs up if you think you are getting really good and putting together and taking apart numbers to 5. (Ask a few addition and subtraction questions such as 3 + 2, 5 – 1, 4 + 1, and 3 – 2.)
Lesson 25: Model decompositions of 9 using a story situation, objects, and number bonds.

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

There are 9 flowers. Color some yellow and the rest red. Fill in the number bond.

There are 9 hats. Color some brown and the rest green. Fill in the number bond.
There are 9 jellyfish. Color some blue and the rest a different color. Fill in the number bond.

There are 9 butterflies. Color some butterflies orange and the rest a different color. Fill in the number bond.

Draw 9 balloons. Color some red and the rest blue. Make a number bond to match your drawing.
Lesson 25 Homework

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

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

Draw 9 birds. Color some of them blue and the rest red. Fill in the number bond to match.

On the back of your paper, draw 9 triangles. Color some red and some brown. Draw and fill in a number bond to match.
Lesson 26
Objective: Model decompositions of 9 using fingers, linking cubes, and number bonds.

Suggested Lesson Structure
- Fluency Practice (12 minutes)
- Application Problem (5 minutes)
- Concept Development (25 minutes)
- Student Debrief (8 minutes)
- Total Time (50 minutes)

Fluency Practice (12 minutes)

- Rekenrek Wave K.NBT.1 (3 minutes)
- Race to 5 Addition Game K.OA.5 (4 minutes)
- Make 9 Matching Game K.OA.3 (5 minutes)

Rekenrek Wave (3 minutes)
Materials: (T) 20-bead Rekenrek

Count with the Rekenrek the Say Ten way as described in GK–M4–Lesson 25, but this time, continue to 15. After introducing each new number name, use the following sequence while students use the wave hand motions to indicate increasing and decreasing quantities: 10, 11, 12, 11, 12, 13, 12, 13, 14, 13, 14, 15, 14, etc.

Note: This fluency anticipates the work of GK–Module 5. Developing automaticity with the counting sequence in conventional language facilitates work with teen numbers.

Race to 5 Addition Game (4 minutes)
Materials: (S) Die with the 6-dot side covered

1. Both partners roll their dice and state their numbers respectively.
2. Both partners roll again, and add the previous number to the new number on the die. Both partners state their new equations.
3. Continue the addition race, rolling the die and adding with speed and accuracy until one of the partners reaches 5 as the total.
4. They must reach 5 exactly, so if either partner reaches a total more than 5, they can roll again.
Here is an example of how the game might unfold:

Partner A: Rolls a 2, and says 2.
Partner B: Rolls a 3 and says 3.
Partner A: Rolls a 1, and says 2 + 1 = 3.
Partner B: Rolls a 2, and says 3 + 2 = 5, and wins the race to 5.

Begin a new round if time permits.

Extension: The next time this fluency activity is done students can record the addition sentences on their personal boards.

Note: This activity develops automaticity with addition within 5, part of the fluency goal for this grade.

Make 9 Matching Game (5 minutes)

Materials: (S) Cards with quantities of 0–9 (use only dots, dice, and fingers) per pair (cards from GK–M4–Lessons 1 and 7)

Note: Students will find the hidden partners of 9 in support of the day’s work with composition and decomposition.

1. Shuffle and place the cards face down in two equal rows.
2. Partner A turns over two cards.
3. If the total of the numbers on both cards is 9, then partner A collects both cards. If not, then Partner A turns them back over in their original place face down.
4. Repeat for Partner B.

Scaffold: Provide each partner with a stick of 9 cubes to help them determine the missing part. For example, a student turns over 4, then breaks off 4 cubes, revealing 5 as the missing part, that way they know to look for the card with the number 5.

Application Problem (5 minutes)

Materials: (S) Paper, green and blue crayons

It is laundry day. We have 9 extra socks! Some are green and the rest are blue. Draw the set of green socks and the set of blue socks. Make a number bond to help tell about your picture.

Turn and talk to your partner about your drawings and number bonds. Do they look alike? Are your sets of socks different?

Turn your paper and show the story a different way.

Note: Use this time to see which students might need support finding partners for 9 prior to identifying decomposition patterns in today’s lesson.
Lesson 26

Lesson 26: Model decompositions of 9 using fingers, linking cubes, and number bonds.

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Notes on Multiple Means of Representation:
Make sure English language learners are clear about the meaning of the term pattern so that they can participate in that part of the lesson. Show examples of patterns and non-patterns so that when asked if anyone noticed a pattern, they will be able to answer.

Concept Development (25 minutes)

Materials: (S) 9 linking cubes (groups of 5 blue and 4 red), personal white board

T: Lee had 9 blocks. Hold up 9 fingers to show how many blocks she had. Show me the Math way!
T: Five of her blocks were red and the rest were blue. Show me her red blocks with your fingers. How many?
S: (Show 5 fingers.)
T: Show me the blue blocks. How did you know how many blue blocks she had?
S: I needed the other 4 fingers to get to 9! 5 red and 4 more make 9 blocks in all. 9 is the same as 5 and 4 together.
T: Could we draw a number bond showing our story? Where would we put our whole and our parts in our number bond? (Demonstrate the number bond on the board and ask students to recreate the bond on their boards.)
S: 9 goes in the place for the whole number of blocks! The parts are 5 and 4 for the different colors.
T: Take out your linking cubes and put them in a stick. Use all of the blue cubes first, and then use the rest of the cubes. How many cubes are in your stick?
S: 9.
T: Take off 1 red cube. Do you still have 9 cubes in all? What are the parts now?
S: We still have 9 cubes. We made it into 8 and 1.
T: Draw the number bond on your board. (Demonstrate.)
T: Now take another cube off your long stick and put it together with the one cube. Do we still have 9 cubes? What are your new parts?
S: We still have 9 in all, but now we have a 7-stick and a 2-stick.
T: Great! Let’s make a number bond with the new parts. (Continue the exercise with new situations and number bonds, removing one cube at a time until the students end with 1 and 8.)
T: Did anyone notice a pattern while we did this with your cubes or with the number bonds?
S: Every time we take off a cube, the other part gets bigger! The other part gets smaller. One gets one less and the other gets one more. The 9 in the number bond doesn’t change!
T: Put your 9-stick together again. Using your cubes, turn and work with your friend to find hidden partners inside 9. Could you think of a story to tell about the cubes? Be sure to write each set of partners in number bonds on your personal board! (Allow time for sharing and discussion.)
Lesson 26

**Problem Set (10 minutes)**

Students should do their personal best to complete the Problem Set within the allotted 10 minutes.

**Student Debrief (8 minutes)**

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

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

You may choose to use any combination of the questions below to lead the discussion.

- How did you know which cube sticks matched the number bonds on the first page of the Problem Set?
- How did the cube sticks you colored help you to finish the number bonds on the second page of the Problem Set?
- How is using your fingers like using cubes to solve a problem?
- When you were working with the cube sticks in today’s lesson, did you notice any patterns?
- What are some of the partners you found to make 9? Tell me using an *addition sentence* starting with 9. (As students list the partners, write them on the board to help them see the pattern.)

\[
\begin{align*}
9 &= 8 + 1 \\
9 &= 7 + 2 \\
9 &= 6 + 3 \\
9 &= 5 + 4 \\
9 &= 4 + 5 \\
9 &= 3 + 6 \\
9 &= 2 + 7 \\
9 &= 1 + 8 \\
\end{align*}
\]
Draw a line from the cube stick to the matching number bond. Fill in the number bond if it isn’t complete.

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1. Draw a line from the cube stick to the matching number bond. Fill in the number bond if it isn’t complete.

2. 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.

Create your own 9-cube stick and fill in the number bond to match.
Lesson 26: Model decompositions of 9 using fingers, linking cubes, and number bonds.

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Do the linking cubes sticks match the number bond? Circle yes or no.

1. 9
   - Yes
   - No

2. 5
   - Yes
   - No

3. 3
   - Yes
   - No
Make the number bond match the cube stick.

Make the number bond match the cube stick.

Make the number bond match the cube stick.

Make the number bond match the cube stick.

Make the number bond match the cube stick.
Lesson 27

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

Suggested Lesson Structure

- Fluency Practice (12 minutes)
- Application Problem (5 minutes)
- Concept Development (25 minutes)
- Student Debrief (8 minutes)
- Total Time (50 minutes)

Fluency Practice (12 minutes)

- Rekenrek Wave K.NBT.1 (3 minutes)
- What Is Less? K.OA.1 (5 minutes)
- Take Apart the Array K.OA.3 (4 minutes)

Rekenrek Wave (3 minutes)

Materials: (T) 20-bead Rekenrek

Count with the Rekenrek the Say Ten way as described in GK–M4–Lessons 25, but now continue to 20 if students are ready. After introducing each new number name, use a similar sequence as before, while students use the wave hand motions to indicate increasing and decreasing quantities.

Consider showing the numbers in the 5-group orientation as well, so that students can gain flexibility in recognizing the quantities. For example, 13 would be 5 red on the top row, 5 red on the bottom row (mimicking a 5-group arrangement of 10), plus 3 white beads on the top row.

Note: This fluency anticipates the work of GK–Module 5. Developing automaticity with the counting sequence in conventional language facilitates work with teen numbers.

What Is Less? (5 minutes)

Materials: (S) Personal white boards

T: (Write 2 on the board.) Think of a number that is less than 2. Write it on your board and show me.

S: (Write 1 or 0.)

T: Write this subtraction sentence on your board: 2 minus 1.
Lesson 27:

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

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S: (Write 2 – 1.)
T: Write the answer and show me.
S: (Write 2 – 1= 1.)
T: Say the subtraction sentence.
S: 2 minus 1 equals 1.

Repeat with 3, 4, and 5. Use each of the smaller numbers students identify to build a subtraction equation (e.g., 3 – 1, 3 – 2). Invite students who choose zero to write a subtraction equation using zero and show it to the class. Addition and subtraction of zero will be covered in GK–M4–Lesson 37.

Note: This activity builds on students’ understanding of comparison and builds fluency with subtraction facts for numbers to 5.

Take Apart the Array (4 minutes)

Materials: (S) Array of 10 fluency template inserted into personal white boards

Conduct as described in GK–M4–Lesson 25, but now with decompositions of 10.

Note: This activity prepares students to work with decomposing 10 at the pictorial level.

Application Problem (5 minutes)

Materials: (S) Paper, crayons

You are having a birthday party! You need to have 10 party hats for your friends. Draw 10 simple hats. Color some hats red and some blue. Make a number bond about your picture.

Turn and talk with your partner. Do your pictures look the same? Explain to your partner how you decided which way to color your hats. Talk about how your number bonds are the same or different.

Note: Thinking about different ways to decompose 10 serves as the anticipatory set for the lesson.

Concept Development (25 minutes)

Materials: (T) White board and colored markers (S) 1 chenille wire stem, 10 pony beads of one color, personal white board

T: We were just talking about birthday parties! What if you had a birthday party and received 10 presents? Let me draw squares on the board to show your presents. (Demonstrate.) I have 10 presents on the board. I want to color some yellow and some red. Who has an idea to help me?

S: This is like the party hats! → Let’s make 5 yellow and 5 red. → We can show them both on our fingers that way.
Lesson 27:

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

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T: OK, we will make 5 yellow and 5 red. (Demonstrate.) How could I make a number bond about my picture?

S: Put a 10 in the place for the whole because there are 10 presents. → We have 5 yellow and 5 red. → Each of the parts would be 5!

T: Yes, our parts are both 5 this time and we have 10 altogether. Would someone like to come up and make the number bond on the class board for us? The rest of you can show your work on your personal boards. (Allow a student to volunteer to demonstrate. At this point, students should be confident enough in their ability to create number bonds that they should be enthusiastic about demonstrating their work, though offer encouragement and assistance freely!)

T: Did anyone think about the picture in a different way? (Allow several opportunities to create other visual situations with the gifts; each time either demonstrating or allowing individual students to play the role of teacher and model the coloring of the squares and the number bonds on the class board.)

T: Ten is a very special number, isn’t it? What seems different about this number from the other ones we have looked at so far?

S: It is bigger! → There are two numerals now! → It takes all of our fingers.

T: Yes! Now, we have 10 ones! You have some beads on your table. Count your beads.

S: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10.

T: We are going to make bracelets to celebrate this very special number! Count your beads again while you lace them onto the chenille stem. I will come around to help you finish your bracelets. (Assist students in tying the bracelets, circulating to ensure accuracy in counting.)

T: Your bracelets are beautiful! Let’s play with the beads. What happens if we slide 1 bead to this side and all of the other beads to the other side of the bracelet? Show me on your bracelets.

S: We still have 10 beads on our bracelet. → Now we have 9 on 1 side and just 1 on the other.

T: Interesting! Let’s make the number bond for what you just did. Please write it on your personal board while I do it up here. (Demonstrate.) Can anyone help me fill in the parts?

T: I wonder if we could make a number sentence.

S: 10 is 9 and 1. → 10 = 9 + 1.

T: Great job! What if we slide another bead over?
Lesson 27:

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

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S: Now we have 8 on one side and 2 on the other. → We made our 10 into parts of 8 and 2 this time.

T: Let’s think about the number bond. What are our parts now? Did our whole change? Draw the new number bond on your personal board.

Repeat the activity, discussion, and drawing of the number bonds on the boards for the whole sequence of partners to 10.

T: With your friend, spend some time being number detectives with your bracelets. Practice this again. Talk about the groups of bead partners you find hidden in 10, and practice drawing the number bond each time. Do you notice any patterns? (Allow time for sharing and discussion.)

T: You may take your bracelets home to show your friends and family. Don’t forget to tell them about the number partners! Be sure to bring them back so we can work with them again tomorrow.

Problem Set (10 minutes)

Students should do their personal best to complete the Problem Set within the allotted 10 minutes.

Note: Encourage students to use circles when drawing dragons. They can use the cloud and grass to show which dragons are flying and which are on the ground.

In this lesson, it may again be beneficial for the teacher to read each problem aloud and then to allow the students to work on that exercise. Students with higher-level reading ability could be encouraged to make additional decomposition pictures for 10 on the back of their papers if they finish early.

Student Debrief (8 minutes)

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

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

You may choose to use any combination of the questions below to lead the discussion.

- Look at the baseball problem. How did you know which numbers to write in the parts of the number bond? Are there other ways you could have done it?
Lesson 27: Model decompositions of 10 using a story situation, objects, and number bonds.

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- What strategies did you use when you were making up your own story?
- How did the bracelets help in finding the partners to 10?
- Who can use this bracelet to teach someone how to make number bonds at home tonight? Tell me how you will do it.

There were 10 dragons playing. Some were flying and some were running. Draw the dragons. Fill in the number bond.

Create your own story of 10. Draw your story and a number bond to go with it.
Lesson 27: Model decompositions of 10 using a story situation, objects, and number bonds.

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

Savannah had 10 pairs of glasses. 5 are green and the rest are purple. Color and fill in the number bond.

Xavier had 10 baseballs. Some were white and the rest were gray. Draw the balls and color to show how many may be white and gray. Fill in the number bond.
There were 10 dragons playing. Some were flying and some were running. Draw the dragons. Fill in the number bond.

Create your own story of 10. Draw your story and a number bond to go with it.
Pretend this is your bracelet.

Color 5 beads blue and the rest green. Make a number bond to match.

Color some beads yellow and the rest orange. Make a number bond to match.
Color some beads yellow and the rest black. Make a number bond to match.

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Color some beads purple 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.

Suggested Lesson Structure

- Fluency Practice (12 minutes)
- Application Problem (5 minutes)
- Concept Development (25 minutes)
- Student Debrief (8 minutes)

Total Time (50 minutes)

Fluency Practice (12 minutes)

- Race to 0 Subtraction Game K.OA.5 (4 minutes)
- Number Bond Bracelet K.OA.4 (3 minutes)
- Make 10 Memory Game K.OA.3 (5 minutes)

Race to 0 Subtraction Game (4 minutes)

Materials: (S) Die with the 6-dot side covered

1. Both partners roll their dice and subtract the number on their die from 5. Both partners state their equations respectively.
2. To win the game, subtract a number from 5 that equals 0 (only by rolling a 5). If neither partner rolls a 5 they both state their subtraction sentence out loud.
3. Both partners roll again and subtract the new number on the die from 5. Both partners state their respective new equations.
4. Continue the subtraction race, rolling the die and subtracting with speed and accuracy until one of the partners rolls a 5 and says, “5 – 5 = 0.”
5. They must reach 0 exactly, stating each subtraction equation before they roll again.

Here is an example of how the game might unfold:

Partner A: Rolls a 2, and says 5 – 2 = 3.
Partner B: Rolls a 3, and says 5 – 3 = 2.
Partner A: Rolls a 4, and says 5 – 4 = 1.
Partner B: Rolls a 5, and says 5 – 5 = 0, and wins the race to 0.

Begin a new round if time permits.
Note: This activity develops automaticity with subtraction within 5, part of the fluency goal for this grade.

**Number Bond Bracelet (3 minutes)**

Materials: (S) Number bonds of 10 bracelet from GK–M4–Lesson 27, personal white board

T: Do you remember how many beads are on your number bond bracelets?
S: 10!
T: Is 10 the whole (emphasize with hand gesture, two hands clasped together) or part of the beads? (Pull two hands apart to reinforce the meaning.)
S: Whole.
T: Yes. Take 1 of the beads, and slide it away from the rest. Is 1 the whole, or a part? (Emphasize with gestures as before.)
S: Part.
T: Good. Raise your hand when you know the other part. (Wait for all hands to go up, then signal.) Ready?
S: 9.
T: Yes, now write the number bond.

Continue to provide guidance as necessary, then direct students to work independently through the partners of 10 using their bracelets.

Note: This activity helps students develop automaticity with partners to 10, crucial to learning more efficient methods of addition in Grade 1.

**Make 10 Memory Game (5 minutes)**

Materials: (S) Cards with quantities of 0–10 (use only dots, dice, and fingers) per pair, 1 extra 5-card (so one of the partners can be 5 and 5), (cards can be found in GK–M4–Lessons 1 and 7)

Conduct activity as outlined in GK–M4–Lesson 26 but now have students find partners of 10.

Scaffold: Provide each partner with a stick of 10 cubes to help them determine the missing part. For example, a student turns over 4 then breaks off 4 cubes, revealing 6 as the missing part. Students then know to look for the card with the number 6.

Note: Students will find the hidden partners of 10 in support of the day’s work with composition and decomposition.

**Application Problem (5 minutes)**

Materials: (S) Small ball of clay, personal white board

Use your clay to make 10 tiny grapes. With your marker, draw a pretty plate on your board. Now, put some of the grapes on the plate.
Lesson 28:
Model decompositions of 10 using fingers, sets, linking cubes, and number bonds.

Date: 11/12/13

NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

Challenge above grade level students by asking them how they would complete their number bond if all the grapes were placed on the plate, and as a follow-up, if all the grapes remained on the table.

NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

As students are invited to imagine the picnic story, scaffold for English language learners by pointing to or showing a visual of an ant, and illustrate how the ants crawled away from the picnic blanket. Students will be able to tackle the math if they understand the story situation being created.

How many grapes do you have in all? How many grapes are on the plate? How many are not on the plate?

Draw a number bond about your work and talk about it with your partner. Did she do it in the same way?

Take the grapes off and try it again!

Note: Continuing yesterday’s practice with the decomposition of 10 leads into further work with this topic in the Concept Development.

Concept Development (25 minutes)

Materials: (S) 2 linking cube 5-sticks, a half sheet of red construction paper to represent a picnic blanket, personal white board

T: You just did a lot of work with your grapes! Who can tell me one way they grouped them?
S: I had 8 on my plate and 2 not on the plate.
T: Everyone, show me a pretend set of 8 grapes using your fingers. Show me in the Math way. How many fingers are you still holding down?
S: I have 2 down!
T: How many fingers are up?
S: There are 8 fingers up. → 8 up and 2 down. → That is just like the parts in the number bond.
T: You are right! You have 10 fingers in all, but you showed the 8 and the 2 in different ways with your fingers. This time, the up-and-down fingers make the parts of 10. Who arranged their grapes in a different way? Could you show your idea to us with your fingers?
S: I made 1 and 9. → I had 5 and 5.
T: Let’s practice showing these number partners with our fingers, too. (Allow time for practice and discussion.) How are your fingers like number bonds for 10? (Allow students to describe the relationship.)

T: You have some cubes in front of you. Count your cubes.
S: There are two 5-sticks. → I just counted mine all up: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10. → Fives are partners to 10! I had a 5-stick and 5 more.
T: Put all of your linking cubes together. Now imagine with me for a minute. It is a beautiful summer day at the park, and you are having a picnic with your friends. Now imagine that 10 ants come to share your picnic!
T: Let’s pretend your paper is a little picnic blanket. It is not wise to play with real ants, so we will act
Lesson 28:
Model decompositions of 10 using fingers, sets, linking cubes, and number bonds.

Date: 11/12/13

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

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

You may choose to use any combination of the questions below to lead the discussion.

- How did you know which number bond to match with which linking cube stick in your Problem Set?
- What did you think about when you had to draw your own linking cube sticks?
Lesson 28: Model decompositions of 10 using fingers, sets, linking cubes, and number bonds.

Date: 11/12/13

- How is what we did today like what we did yesterday with our bracelets?
- How are your fingers like number bonds of 10?
- How can you show 6 and 4 as partners of 10 on your fingers? Is 6 a part or a whole? (Part.) What is the other part? What is the whole?
Look at the linking cube sticks. Draw a line from the cube sticks to the number bond that matches. Fill in the number bond if it is not complete.
Draw and color cube sticks to match the number bonds.

Create your own 10-cube stick and fill in the number bond.
Write a number bond to match the domino.

On the back of your paper, draw one of the dominoes and a blank number bond. Pretend you are the teacher and ask an adult at home to fill it in.