PARCC Mathematics Performance Tasks

PAIRS THAT MAKE 10

Overview

At a Glance

Students choose a number—by drawing a card, rolling a cube, or holding up fingers—and find a card with a number so that together, the two numbers have a sum of 10. Cards represent the numbers both as numerals and as ten-frames.

Grade Level

Kindergarten

Task Format

- Partner game (2 students); modeled whole class
- Played over a series of 3–5 days

Materials Needed

For each pair of students

- Part 1: Ten-Frame Template (template provided); 10 reversible two-color counters or 10 counters each of two different colors for each student; dot or numeral cube
- Part 2: 1 complete set of Set 1 cards (Sun/Circle Deck), which are reversible quantity/numeral cards 0–10, copied 2-sided and cut out (templates provided)
- Student Recording Sheet A or B (provided); 2 or 3 copies per group, depending on the number of rounds played
- Counters (approximately 20 per pair), available to students upon request
- 1 pencil
- *Extension/Elaboration:* Set 2 cards: Star Deck—reversible quantity/numeral cards 10–20; Moon Deck—reversible quantity/numeral cards in non-standard ten-frame layouts

For the teacher

- Observation Checklist

Prerequisite Concepts/Skills

- Counting with one-to-one correspondence
- Cardinality
- Recognizing and naming written numerals 0–10
- Representing addition problems through 5 using fingers, drawings, or physical manipulatives

Content Standards Addressed in This Task

K.OA.A.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.

Extension(s) or Elaboration(s)	
1.OA.C.6	Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14); decomposing a number leading to a ten (e.g., 13 – 4 = 13 – 3 – 1 = 10 – 1 = 9); using the relationship between addition and subtraction (e.g., knowing that 8 + 4 = 12, one knows 12 – 8 = 4); and creating equivalent but easier or known sums (e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13).

Standards for Mathematical Practice Embedded in This Task	
MP2	Reason abstractly and quantitatively.
MP7	Look for and make use of structure.

GET READY: Familiarize Yourself with the Mathematics

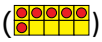
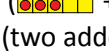
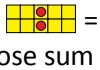
This task assesses students' understanding of number pairs whose sum is 10 and their ability to express their findings mathematically. This task is divided into two parts at two levels of difficulty.

Part 1: Students begin exploring pairs whose sum is 10 by constructing them on a ten-frame with physical objects, such as counters or buttons. It is useful to have two colors of these objects.

Part 2: Students progress to a game in which they use ten-frame cards to make pairs whose sum is 10. They begin with conventional arrangements of dots on a ten-frame: building up to five and then adding more (e.g., ). Later they find such pairs using only the numerals.

Throughout both parts of this task, students continually pair a specific quantity with a numeral and the spoken word as recommended in the IES Practice Guide, *Teaching Math to Young Children*, which says students should be encouraged to label collections with number words and numerals (U.S. Department of Education, 2013). For example, four dots  , the numeral 4, and the spoken word "four" all represent the same thing, and students need to relate these until the relationships are automatic.

This task begins with representing pairs of numbers whose sum is 10 using objects, so you can observe *how* your students approach this task and how they move on to seeing numbers represented pictorially in Part 2. Each part can easily be used as its own subtask. You can choose to have all students start with Part 1 and, depending upon your observations, move some students to Part 2. Or, you may return to Part 2 at a later date with your whole class. Or, you might start all of your students on Part 2.

Using both conventional and non-conventional arrangements of dots helps build familiarity with various decompositions of numbers. "Children must…understand that they will always end up with the same amount when a number is broken apart and recombined in various ways" (Richardson, 2012). Proficiency includes being able to recognize 6 as 5 + 1 () and *also* as 2 + 2 + 2 () or 2 + 4 (). Sums of 10 may also include more than two addends. For example, 10 = 6 + 2 + 2 ( +  +  = 10). While standard K.OA.A.4 requires knowledge only of *pairs* of numbers (two addends) whose sum is 10, it is important to validate any of the ways in which a sum of 10 can be composed. Working with various non-conventional decompositions of numbers 0–10 broadens students' understanding of *how*

numbers can be "chunked" and rejoined. These non-conventional arrangements are included as a template, though it is suggested that these be used only as an extension for your students who are ready.

Students are periodically asked to represent their sums by drawing a picture or writing an equation, and they vary in their choices and readiness. They also vary in their use of the symbols +, –, and =. Some choose to write instead of draw, but write only the numbers 7310 (7, 3, 10) and not the full equation 7 + 3 = 10. Some also form an incorrect pair, a sum that is not 10. This is valuable information to note for the specific student, and also allows other students to justify the reasonableness of the student's idea.

Standards for Mathematical Practice Embedded in This Task

During this task, students build their "habits of mind" around two Standards for Mathematical Practice: *MP2: Reason abstractly and quantitatively* and *MP7: Look for and make use of structure*. Young students develop their ability to reason abstractly and quantitatively (MP2) when they move from physical objects or pictures to symbolic notation. Students often begin by creating number pairs whose sum is 10 using physical objects (e.g., counters) on a ten-frame, then represent that with pictures of dots on a ten-frame. Finally, they learn to record the combinations they make in writing, as an equation. Figuring out how to make 10 using 6 counters plus 4 counters, and then writing 6 + 4 = 10, gives experience in reasoning both quantitatively and abstractly.

Students look for and make use of structure (MP7) when they use one pair of addends to help them find find other pairs whose sum is 10. For example, a student may say, "I know that 5 + 5 = 10… So I know that I can add 1 to 5 and subtract 1 from the other 5... 6 + 4 = 10."

Getting started. While the guide below starts with students using counters and pictorial representations, feel free to use your own understanding of your students' knowledge and skills to decide when to skip to using only the numeral cards. Many students *prefer* the numerals, even while they remain shaky about counting out of pure curiosity about writing and numbers or because it feels more grown up. Allow whatever you feel works best for your students, even varying the task, if you like, by making pairs that combine one quantity card and one numeral card. For students who are proficient at forming pairs whose sum equals 10 with numeral cards, you may want to extend the task. More specific information can be found in the "Extension(s) and Elaboration(s)" section on page 6.

For More Information

Richardson, K. (2012). *How children learn number concepts: a guide to the critical learning phases.* Bellingham, WA: Math Perspectives Teacher Development Center.

U.S. Department of Education, Institute of Education Sciences, What Works Clearinghouse. (2013). *Teaching math to young children*. Retrieved from http://ies.ed.gov/ncee/wwc/PracticeGuide.aspx?sid=18.

GET SET: Prepare to Introduce the Task

1. Gather the materials listed on page 1. For Part 2, you will want to copy each set of quantity/numeral cards 2-sided, so that each ten-frame representation with its matching numeral are back-to-back.

Note: There are two sets of quantity/numeral cards. Set 1 (Sun/Circle Deck) includes the most standard arrangement of dots on a ten-frame with one dot in each space in the array for numbers within 10. This arrangement builds up to 5 in the top row, then adds to that in the bottom row for 6–10. This helps students understand the structure of 5 + something for those numbers. For example, Set 1 includes arrangements such as  . Set 2 (the Star Deck) moves into representing numbers 11 to 20 on a ten-frame. In a similar fashion, this deck fills one ten-frame completely so that students can see the 10 + something structure of the numbers 11–20.

2. Pair students ahead of time as partners. (If necessary, you may modify this task to include three students in a group.) You may choose to switch students' partners for each subtask or you may switch partners over the series of days played.
3. Have each pair of students next to each other at a table. Model the activity to the whole class or a single pair to start. This task may also be used within the context of a Math Workshop model.
4. At any point of your choosing, have students record the pairs of numbers they discover. This can be captured on either Student Recording Sheet A or B. It is recommended that you do this after students have played any of the versions of the game a few times, but while they are still working within 10.

Introducing the Task

Introduce the game to students. Explain that their goal is to find number pairs whose sum is 10. For Part 2, periodically prompt students to represent the number pair that they have discovered by either drawing a picture or writing an equation. To maintain curiosity and attention, both subtasks are set up as a game. Below is a sample exchange between the teacher and students of how to play Part 1 and Part 2. Suggested teacher text is written in *italics*.

PART 1: Exploring "Pairs that Make 10" using objects on a ten-frame

1. *Today you'll explore pairs of numbers whose sum is 10. Let's play!*
2. To Player 1: *Roll a dot (or numeral) cube. What number did you roll? Next, build that number on your ten-frame board by placing one object (counter or button) in each space of the ten-frame.*

   Alternatively, ask one student to hold up any number of fingers and use that number as the first addend.
3. To Player 2: *How many more objects do you need to equal 10? Next, explain how you figured out that ____ plus ____ equals 10?*
4. To Player 1: *Do you agree or disagree with Player 2's thinking? Explain how you know.*
5. *Keep playing until time is up to find as many pairs as you can whose sum is 10!*

At any point of your choosing, have students record the pairs they find using the templates provided. Keep in mind that having them record every pair every time could disrupt the flow of the "game," so use discretion in how often you have them do this.

PART 2: Playing "Pairs that Make 10" using quantity and numeral cards.

Note: Be sure to use a complete set of cards which contains 2 copies of each numeral/quantity card.

1. *Today we'll play a game finding pairs of numbers whose sum is 10. I'll teach you how to play.*
2. *Each of you choose 5 cards from the deck. Lay them out so you can see all of your cards. What do you notice about the cards?* (Allow students the opportunity to explore. Facilitate the conversation, so they observe that there are always 10 spaces arranged in two rows of 5 spaces each).
3. To Player 1: *Choose one card from the deck and say what number you get. Then figure out what number you'd need to add to that to make 10 and see if you have that number. If you do, you can make a pair! If not, then* (turning to speak to Player 2) you *check* your *cards to see if* you *can complete the sum. If no one has the card you need, the card you picked goes to the bottom of the deck and you choose another card. The game ends when you have matched all of the cards or I tell you time is up.*

Based upon the students' performance, you may want to continue to play the game using the quantity side of the cards *or* you might choose to switch to the numeral side of the cards once a few rounds have been played—or after a few days of playing. Your decision on how to proceed will be based entirely on how your students respond to the game. For example, if students correctly and consistently form pairs whose sum is equal to 10 using quantity cards on Day 1, start Day 2 by introducing them to using numeral cards. Alternatively, if you observe that students need more practice forming pairs that make 10, have them continue to play using quantity cards.

4. *Now that you have played this game, let's change how we play. Instead of using pictures of dots, let's turn the cards over and use only numbers to find pairs whose sum is equal to 10.*

The game continues with students collecting all number pairs whose sum is equal to 10.

Preparing to Gather Observation Data and Determine Next Steps in Instruction

As students engage in the task, the notes in the next section will help you identify students' current strengths and possible next steps for instruction. As you observe, use whichever form of the Observation Checklist that best helps you record your observations of students and other relevant evidence as you see it: Individual, Partner, or Class. These varied forms, available at the end of this document and in a separate MS Excel file, are intended to give you a choice about how to collect notes on your students and determine possible next steps for instruction.

Addressing Student Misconceptions/Errors

- Students may be able to count or even subitize (the ability to instantly recognize a collection of objects) the number of dots missing from a conventional quantity card. For example, a student may see  and think, "Well, I'm not sure how many there are without counting, but I know that 2 dots are missing." This student was able to instantly recognize the 2 missing dots without counting, but possibly without recognizing that there are 8 dots there. Here, students are building their understanding of pairs to 10, but it may be misleading to think that they really know this combination.
- It is very possible that, throughout this task, students may generate incorrect combinations to 10. It is important that you pay careful attention to *which* strategies the students use and *how* they use them. Is the incorrect pair to 10 caused by a counting error? An error in subitizing? The student's

misunderstanding of the operation of addition? It is essential to pinpoint why this error took place by asking the students to explain their strategies.

Extension(s) and Elaboration(s)

One variation to this task is to have students play by applying the rules to Go Fish. To be successful playing the Go Fish version of this task, students must have had some prior work with forming pairs of numbers whose sum is 10. To play, have each player select 5 cards. Player 1 picks a card from his or her pile and asks Player 2 if he or she has the number needed to complete the sum of 10. For example, Player 1 may ask, "I have 6. Do you have 4?" If Player 2 has 4 in her pile, she must give the card to Player 1 to make a pair. If not, Player 2 responds, "Go fish" and Player 1 chooses a card from the face down deck. The game continues until they have matched all the cards or time is up.

Some students may demonstrate fluency in forming pairs whose sum is equal to 10 using numeral cards quickly and accurately as well as representing those pairs as equations. Therefore, you may extend the game by having students find pairs whose sums equal 20. To do so, add the deck of reversible quantity/numeral cards of 11–20 (Star Deck) to the previous deck of cards. A student makes a "match" for any pair whose sum equals 10 *or* 20. When playing this extension, it may make sense to start again with quantity cards; however, in certain cases, you may choose to skip immediately to working with numeral cards. The purpose is to assess if the students generalize their understandings of number pairs to 10 when forming number pairs to 20. For example, if the student already knows 7 + 3 = 10, does the student connect this to 17 + 3 = 20? Does the student know that 17 is composed of 10 + 7 () and, therefore, that 17 + 3 = 20 is also true?

Finally, the third set of cards, the Moon Deck, encourages students to see quantities in different decompositions, such as  or  for numbers within 10. In some instances, the dot is on the "line" of the array, prompting students to be flexible with their thinking. This deck is provided as a tool for playing any of the games described in this task, but with the numbers laid out in a non-conventional way.

GO: Carry Out the Task

Part 1: Exploring "Pairs that Make 10" with objects on a Ten-Frame

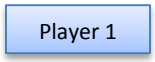
Task Steps	Keep in Mind	Observations of Students
1. Explain to students the purpose of this subtask: to represent pairs of numbers that equal 10 using counters and buttons.	It is useful to have students use either reversible two-colored counters (e.g., ) or two different colored counters or buttons. Providing students only two color options will help to highlight the two addends, which sum to 10. It important that students play this game in short "bursts" of time, so as to maintain a high level of engagement and focus. It is recommended that students play no longer than 10–15 minutes per day.	
2. Tell Player 1 to roll a dot (or numeral) cube. Alternatively, you could ask either student to hold up any number of fingers. Once Player 1 rolls or holds up fingers, SAY to PLAYER 1: *What number do you have?* It may be useful for some students to use a sentence starter to scaffold their explanation. *"The number that I have is…"*	**Note:** You may want to have students start by using a dot cube. This will allow students the additional scaffold of counting the quantity rolled. Eventually, switch students to using a numeral die. If using a *dot* cube, • Do students need to count the number of dots to determine the number rolled? • If so, do students count with one-to-one correspondence? • Do students know "how many" after counting (cardinality)? • Do students just "know" the number rolled by subitizing the collection?	A. Student counts the number of dots to determine the number rolled. B. Student counts the dots with one-to-one correspondence. C. Student knows "how many" after counting (cardinality). D. Student "knows" the number of dots rolled by subitizing. E. Student recognizes and names the numeral rolled.

Task Steps	Keep in Mind	Observations of Students
	If using a *numeral* cube, • Do students recognize the numeral rolled? • Can students independently read the number aloud? If having students hold up fingers, • Can students count the number of fingers accurately? How are the fingers counted?	
3. Ask Player 1 to count out that number of objects (counters or buttons) and place them on the ten-frame template. SAY to PLAYER 1: *Now, count out _____ counters and place each one in a space on your ten-frame template.* Once Player 1 is finished counting, ASK to PLAYER 1: *How many counters do you have?*	• *How* do students count the counters? • Do students accurately count the correct number of objects? – Do students count with one-to-one correspondence? – Do students count by grouping (e.g., counting by 2s)? – Do students know "how many" after counting (cardinality)?	F. Student counts incorrectly or appeals for support (teacher or peer) in counting the number of objects. G. Student counts objects with one-to-one correspondence. H. Student counts by grouping. I. Student accurately counts out the correct number of objects. J. Student knows "how many" after counting.
4. Next, explain to Player 2 that his or her job is to determine the unknown number, which when added to the previous addend, will equal 10. SAY to PLAYER 2: *How many more counters do you need to equal 10?* *You can use different colored counters, your fingers, drawings, or any other way to*	• *How* do students determine the unknown number? • Do students correctly find the unknown number? • Do students use objects by placing them in the empty spaces on the ten-frame? • If so, do students accurately count the correct number of objects to determine the unknown number? • Do students count the empty spaces on the ten-frame board (no objects needed)?	K. Student solves for the unknown number by filling in the remaining spaces on the ten-frame with objects. L. Student accurately counts the number of objects. M. Student counts the number of empty spaces on the ten-frame (no objects needed). N. Student "sees" the unknown number of spaces on the ten-frame and just "knows"

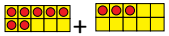
Task Steps	Keep in Mind	Observations of Students
figure this out.	• Do students just "see" the number of empty spaces and "know" the unknown number? • Do students count on their fingers? • Do students make drawings to represent the pair to 10?	the unknown number. O. Student correctly solves for the unknown addend.
5. Once Player 2 completes the pair, have both players turn and talk to explain their understanding as to why both addends equal ten. SAY to PLAYER 2: *How did you figure out that ____ plus ____ equals 10?* Again, it may benefit students to use a sentence starter to scaffold their explanation. *I know that ____ plus ____ equals 10 because…*	• Do students provide an explanation as to why the two addends equal 10? • If so, is that explanation thorough and complete?	P. Student provides little to no explanation for the reasoning used, even with the support of a sentence starter. Q. Student attempts to explain his or her reasoning and provide a justification for the rationale used. However, the justification is often incomplete or flawed. R. Student is able to explain his or her reasoning and provide a justification for the rationale used. Student's explanation is thorough and complete. Student requires no additional support (e.g., sentence starters) when responding.
6. Next, prompt Player 1 to check Player 2's thinking by agreeing or disagreeing and by providing an explanation. SAY to PLAYER 1: *Do you agree or disagree? Why or why not?* Again, it may benefit students to use a sentence starter to scaffold their explanation.	• Do students correctly agree or disagree with the other players' unknown addend? • Do students provide an explanation of why they agree or disagree? • Do students make use of a sentence starter as a scaffold?	S. Student incorrectly agrees or disagrees and provides little to no explanation. T. Student correctly agrees or disagrees, but the explanation given may often be incomplete or flawed. U. Student correctly agrees or disagrees and is able to explain his or her reasoning and provide an explanation for the rationale used.

Task Steps	Keep in Mind	Observations of Students
• *I know that ____ plus ____ equals 10 because…* • *I agree that ____ plus ____ equals 10 because…* • *I disagree that ____ plus ____ equals 10 because…*		
7. Players then switch roles and repeat the game until you deem that time is up, approximately 10–15 minutes.		

Part 2: Playing "Pairs that Make 10" using quantity and numeral cards

Task Steps	Keep in Mind	Observations of Students
1. Introduce the purpose of the task to students: to find pairs of numbers whose sum is equal to 10 and to represent pairs by drawing a picture or writing an equation. Tell students that the game ends when they have matched all the cards or time is up. You may want to have most students begin to play using Set 1, the Sun/Circle Deck. Eventually, you may choose to have students incorporate Sets 2 and 3 into the game by adding each set into the existing deck.	The sets of cards increase in level of difficulty: 1. Set 1: Sun/Circle Deck—includes standard arrangements of quantities on a ten-frame within 10, such as  . For extensions: 2. Set 2: Star Deck–includes teen numbers 11 to 20 on a ten-frame, such as  . 3. Set 3: Moon Deck—includes different decompositions of numbers within 10, such as  or  . It is important that students play this game in short "bursts" of time, so as to maintain a high level of engagement and focus. Therefore, use discretion in how long the students play the game.	
2. Shuffle the cards so they are a mixed deck, quantity-side down. Ask Player 1 to choose five quantity cards. Arrange the cards in a row, quantity-side up. Be sure to use a complete set of cards which contains 2 copies of each numeral/quantity card.   3. Have Player 2 repeat the same set-up.	• Do students accurately count five cards? • Do students automatically begin to count their cards? • If so, do students count… – with one-to-one correspondence starting at 1? – with one-to-one correspondence starting at another number? – with one-to-one correspondence at all? • Do students naturally choose to order their	A. Student requires teacher support in counting five cards. B. Student accurately counts five cards. C. Student makes errors in counting with one-to-one correspondence when counting quantities to determine the number of dots. D. Student instantly recognizes familiar arrangements of numbers. E. Student instantly reads some (or all) numerals.

Task Steps	Keep in Mind	Observations of Students
4. Place the remaining cards quantity-side down in a deck in between both players. As students choose their cards, ASK: *What do you notice about the cards?* Allow students a brief opportunity to explore. Guide them to see that there are always 10 spaces for 10 dots. **Note:** Alternatively, you may decide to start with cards numeral-side up, depending on the ability of the students in the group.	cards (least to greatest or greatest to least)? • Do students play using quantity cards? Numeral cards?	
5. Player 1 chooses a card from the deck. SAY to PLAYER 1: *What number do you have?*	• Do students need to count the quantity? If so, do they count with one-to-one correspondence? • Do students possess more efficient counting strategies, such as counting on from a number other than 1? If so, how do they count? • Do students know "how many" after counting (cardinality)? • Are students able to subitize the collection—quick instant recognition of familiar arrangement of objects? If so, how?	F. Student assigns *more than* one number name for 1 dot, which demonstrates developing one-to-one correspondence. G. Student counts with one-to-one correspondence starting from 1. H. Student counts on from a given number other than 1 (e.g., 5, 6, 7, 8…8!). I. Student knows many totals without counting (subitizing).
6. Prompt Player 1 to complete the pair whose sum equals 10 by looking at his or her cards. How does Player 1 go about selecting the quantity needed to make 10?	• Do students correctly determine the pair to 10? • If so, do students need to count individual dots to determine the pair to 10? If yes, how do they count (one-to-one correspondence starting at 1; one-to-one	J. Student does not correctly form any pairs that equal 10. K. Student correctly forms easier pairs, but may make *errors* in other combinations. For example, student sees  +  = 10, but may struggle with harder combi-

Task Steps	Keep in Mind	Observations of Students
SAY: • *How many more dots do you need to equal 10? Explain how you know.* • *Do you have the card that shows that number? Explain how you know.* • *How do you know that (pair of numbers) equals 10?* If it is not possible for Player 1 to make a combination, allow Player 2 the opportunity to check his cards to see if a pair can be made. If neither player can complete the pair whose sum equals 10, place the card at the bottom of the deck. 7. The same process is then repeated with Player 2.	correspondence starting with another number than 1)? • If students do *not* correctly determine the unknown number, what is their misconception? • Did they make an error in counting with one-to-one correspondence? • Do students instantly recognize the unknown number pair to 10?	nations, such as  . L. Student consistently and correctly forms pairs that equal 10 when given any number 1–9.

Task Steps	Keep in Mind	Observations of Students
Recording pairs. Ask each student to record his or her number pair *only* on a few (3–5) occasions throughout the game on the Student Recording Sheet(s). There are two Recording Sheets, A and B. "A" intentionally provides no scaffolds. This allows you to see what the student actually *does* with a blank canvas. "B" provides a structure of an equation. This sheet is intended for use when students are ready to record their various combinations to begin to look for patterns. (See #10).	While it is essential that students have the opportunity to record, doing so after each pair is made slows down the pace of the game. So, be mindful to keep the pace of the game lively and engaging. • Do students attempt to draw a picture? – Are the pictures accurate representations of the combinations? – What do the drawings look like? Are they repetitive of the quantity cards—or a different representation? • Do students attempt to write an equation? – If so, are only numerals used? – Do students attempt to use symbols? Are the symbols used correctly? **Note:** Number reversals are *not* considered incorrect responses. Your goal here is to see if the student understands the concept that varying amounts are each represented by a unique numeral.	M. Student draws a picture, but it does not represent the selected pair to 10. N. Student draws a picture and it accurately represents the selected pair to 10. Student may include symbols. O. Student attempts to write an equation using numbers only. Symbols are not included. For example, the student may write a list of numbers, such as 7310. P. Student attempts to record the equation with numbers and symbols. Q. Student accurately writes an equation with numbers and symbols to represent the selected pair to 10.
8. When recording pairs, if either player, after having sufficient time, appeals for support or makes no attempt, allow the student the opportunity to represent the pair to 10 with counters. SAY: *Use these counters to show the pair whose sum is equal to 10 that you just made.*	• With counters, how do students represent the pairs that make 10? • Are students able to accurately represent the pairs that make 10 with counters? • Do students count… – with one-to-one correspondence starting at 1? – with one-to-one correspondence at all?	R. Student does not count with one-to-one correspondence, even with counters. Requires teacher support. S. With counters, the student counts with one-to-one correspondence starting at 1. T. With counters, the student models the pair that makes 10 accurately.

Task Steps	Keep in Mind	Observations of Students
9. At any point during the game, you could skip directly to using the numeral cards with students. Initially, it is recommended that most students play using the quantity cards; however, this is not a strict guideline. It is most important that students have multiple opportunities to find pairs whose sum equals 10. SAY: *Now that you have played this game, let's change how we play. Instead of using pictures of dots, let's turn our cards over and use only numbers to find pairs whose sum is equal to 10.*	• Are students able to transfer from quantity to numerals? (e.g., students see 8, readily recognize a visual representation of  , and are able to name "eight") • Do students use the "counting on" strategy when finding pairs to 10 using numerals? (e.g., 8… 9, 10… 8 + 2 = 10) • Do students see relationships between the pairs of numbers? • Do students "know" some or all pairs to 10?	u. Student does not quickly recognize and name numerals 0–10. v. Student readily recognizes and names numerals 0–10. w. Student is able to move from "known" pairs of 10 (e.g., 5 + 5 = 10) to "unknown" pairs of 10 (e.g., 6 + 4 = 10) by understanding the relationships between numbers.
10. If time allows, have students reorder pairs whose sum equals 10, so that students see the pattern of numbers increasing and decreasing. Students may choose to do this using their cards by laying out their pairs in order, such as: 1 9 Alternatively, students may choose to order the equations generated on their Student Recording Sheet B.	• How do students order their pairs? Increasing order? Decreasing order? • Are the pairs ordered correctly? • Do students pick up on the inherent pattern of ordering the pairs?	

Student Recording Sheet A

Directions: In each box, draw a picture or write a number sentence for each pair that makes 10 when you add them.

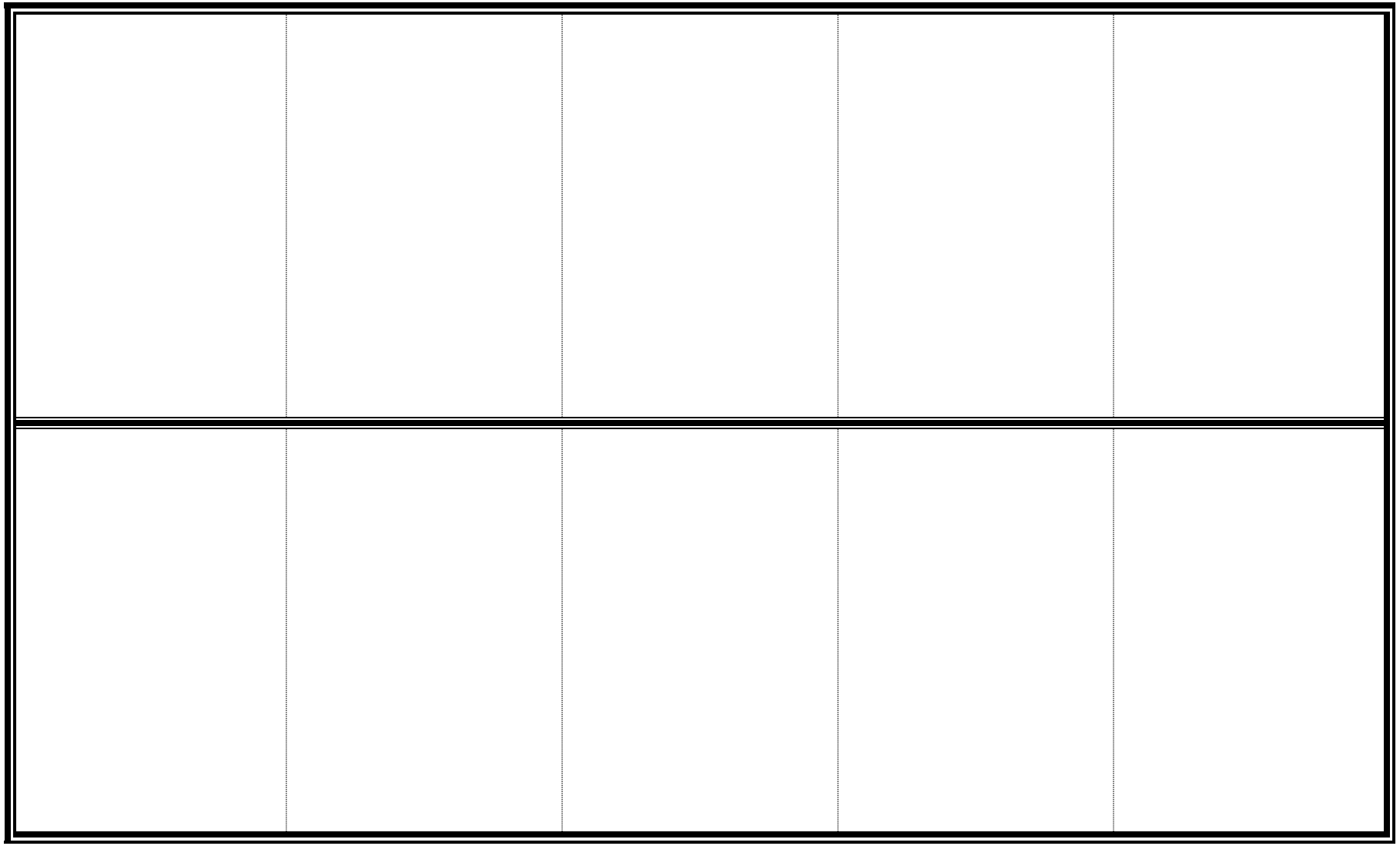
Student Name:	**Student Name:**

Student Recording Sheet B

Directions: In each box, write an equation for a pair of numbers whose sum is 10.

Student Name:	**Student Name:**
_____ + _____ = 10	_____ + _____ = 10
_____ + _____ = 10	_____ + _____ = 10
_____ + _____ = 10	_____ + _____ = 10
_____ + _____ = 10	_____ + _____ = 10
_____ + _____ = 10	_____ + _____ = 10

Ten-Frame Template



OBSERVATION CHECKLIST

ASSESSING STUDENT UNDERSTANDING: PAIRS THAT MAKE 10 (PART 1)

Use this page to record individual student observations. Use the letters to notate each event as you see it unfold. This record is intended to help you plan next steps in your instruction for your students.

Student Name	Observations of Student	Possible Individual Student Observations	
		COUNTING A. Student counts the number of dots to determine the number rolled. B. Student counts the dots with one-to-one correspondence. C. Student knows "how many" after counting (cardinality). D. Student "knows" the number of dots rolled by subitizing. E. Student recognizes and names the numeral rolled. **COUNTING** F. Student counts incorrectly or appeals for support (teacher or peer) in counting the number of objects. G. Student counts objects with one-to-one correspondence. H. Student counts by grouping. I. Student accurately counts out the correct number of objects. J. Student knows "how many" after counting. **STRATEGIES** K. Student solves for the unknown number by filling in remaining spaces on ten-frame with objects. L. Student accurately counts the number of objects. M. Student counts the number of empty spaces on the ten frame (no objects needed). N. Student "sees" the unknown number of the spaces on the ten-frame and just "knows" the unknown number. O. Student correctly solves for the unknown addend.	**EXPLAINING REASONING** P. Student provides little or no explanation for the reasoning used, even with the support of a sentence starter. Q. Student attempts to explain his or her reasoning and provide a justification for the rationale used. However, the justification is often incomplete or flawed. R. Student is able to explain his or her reasoning and provide a justification for the rationale used. Student's explanation is thorough and complete. Student requires no additional support (e.g. sentence starters) when responding. S. Student incorrectly agrees or disagrees and provides little to no explanation. T. Student correctly agrees or disagrees, but the explanation given may often be incomplete or flawed. U. Student correctly agrees or disagrees and is able to explain his reasoning and provide an explanation for the rationale used.

OBSERVATION CHECKLIST

ASSESSING STUDENT UNDERSTANDING: PAIRS THAT MAKE 10 (PART 2)

Use this page to record individual student observations. Use the letters to notate each event as you see it unfold. This record is intended to help you plan next steps in your instruction for your students.

Student Name	Observation of Student	Possible Individual Student Observations
		COUNTING and NUMERALS A. Student requires teacher support in counting five cards. B. Student accurately counts five cards. C. Student makes errors in counting with one-to-one correspondence when counting quantities to determine the number of dots. D. Student instantly recognizes familiar arrangements of numbers. E. Student instantly reads some (or all) numerals. **COUNTING** F. Student assigns *more than* one number name for 1 dot, which demonstrates developing one-to-one correspondence. G. Student counts with one-to-one correspondence starting from 1. H. Student counts on from a given number other than 1 (e.g., 5, 6, 7, 8…8!). I. Student knows many totals without counting (subitizing). **FLUENCY** J. Student does not correctly form any pairs that equal 10. K. Student correctly forms easier pairs, but may make *errors* in other combinations. For example, student sees  = 10, but may struggle with harder combinations, such as  . L. Student consistently and correctly forms pairs that equal 10 when given any number 1–9.

REPRESENTATION

M. Student draws a picture, but it does not represent the selected pair to 10.

N. Student draws a picture and it accurately represents the selected pair to 10. Student may include symbols.

O. Student attempts to write an equation using numbers only. Symbols are not included. For example, the student may write a list of numbers, such as 7 3 10.

P. Student attempts to record the equation with numbers and symbols.

Q. Student accurately writes an equation with numbers and symbols to represent the selected pair to 10.

MAKING MEANING

R. Student does not count with one-to-one correspondence, even with counters. Requires teacher support.

S. With counters, the student counts with one-to-one correspondence starting at 1.

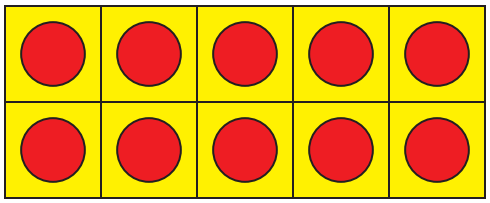
T. With counters, the student models the pair that makes 10 accurately.

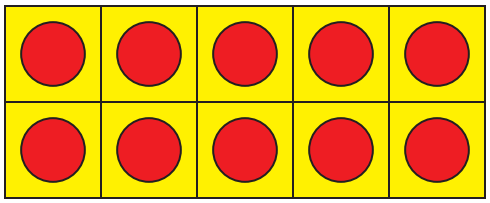
FLUENCY

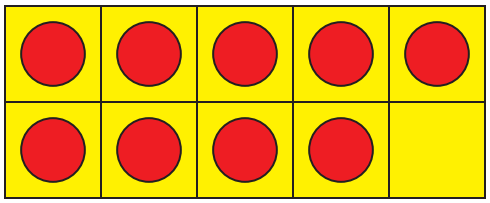
U. Student does not quickly recognize and name numerals 0–10.

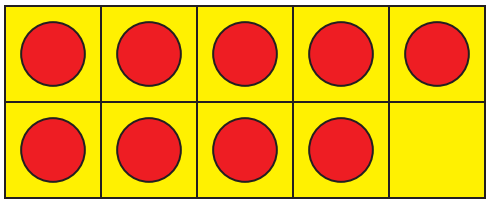
V. Student readily recognizes and names numerals 0–10.

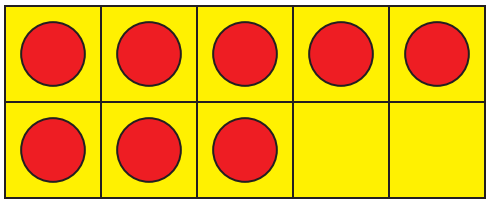
W. Student is able to move from "known" pairs of 10 (e.g., 5 + 5 = 10) to "unknown" pairs of 10 (e.g., 6 + 4 = 10) by understanding the relationships between numbers.

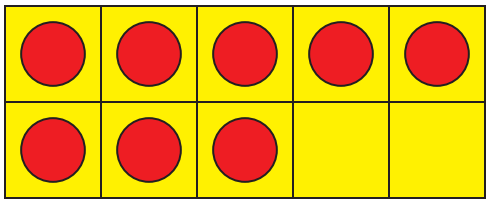


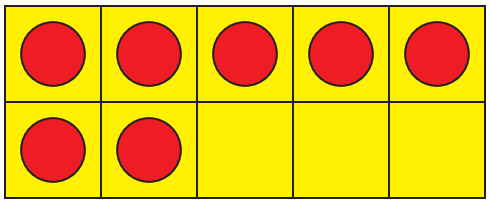


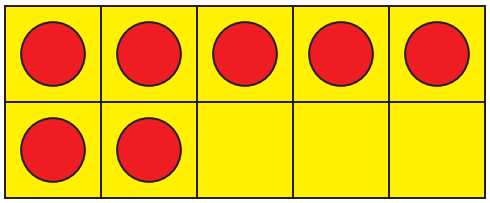












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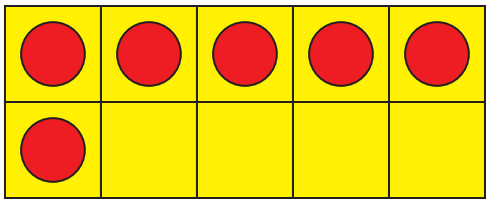

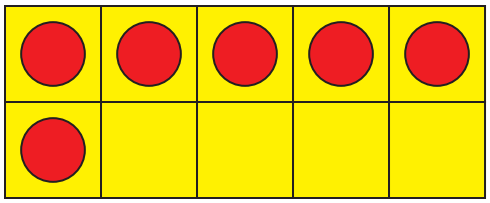

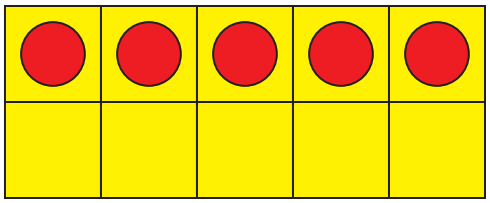

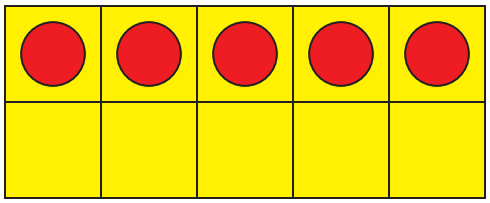

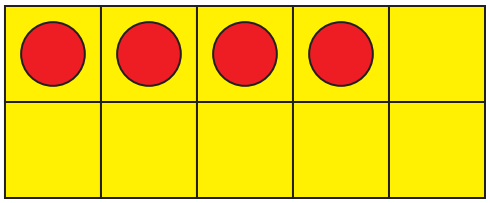

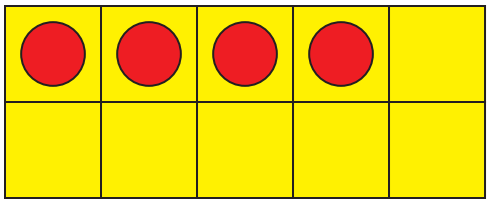

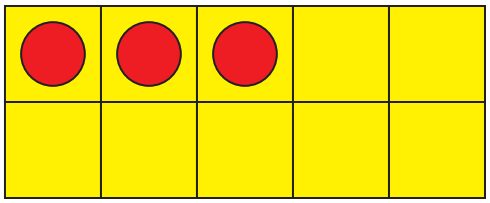

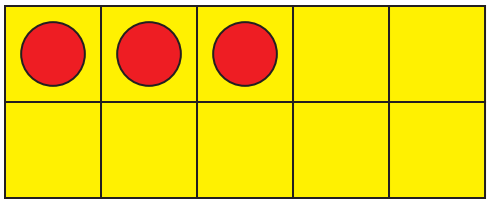

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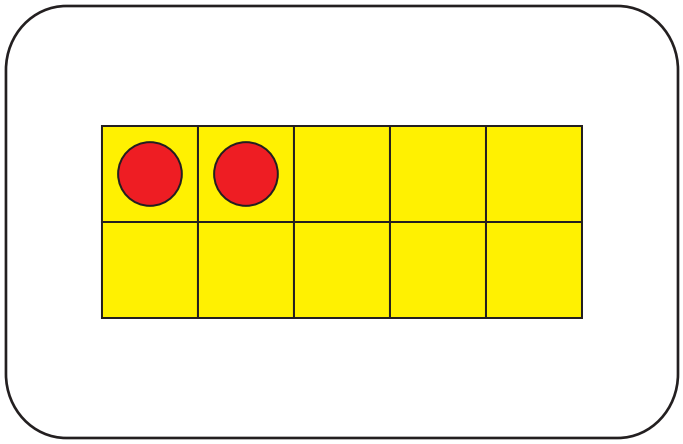

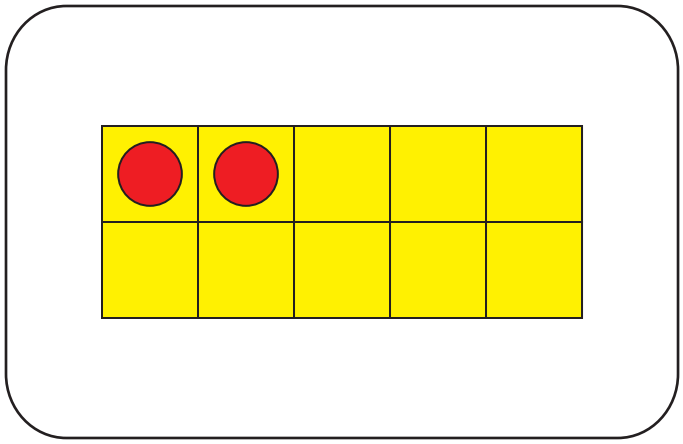

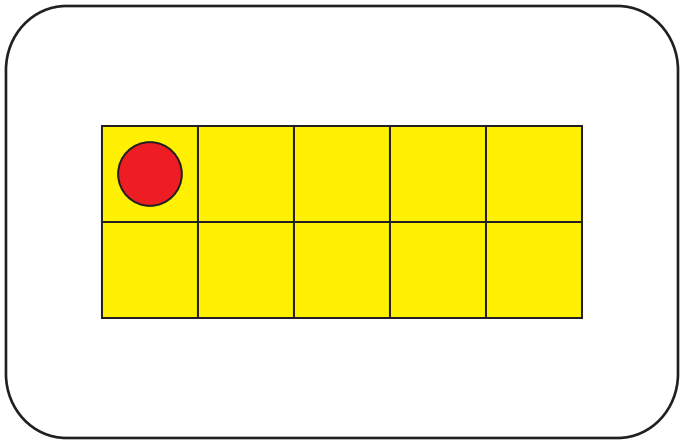

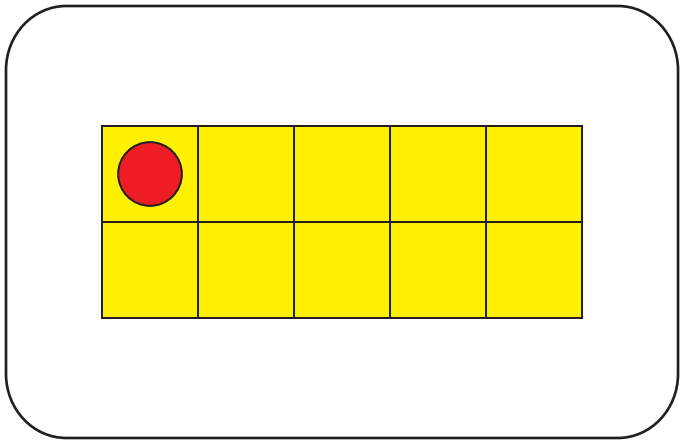

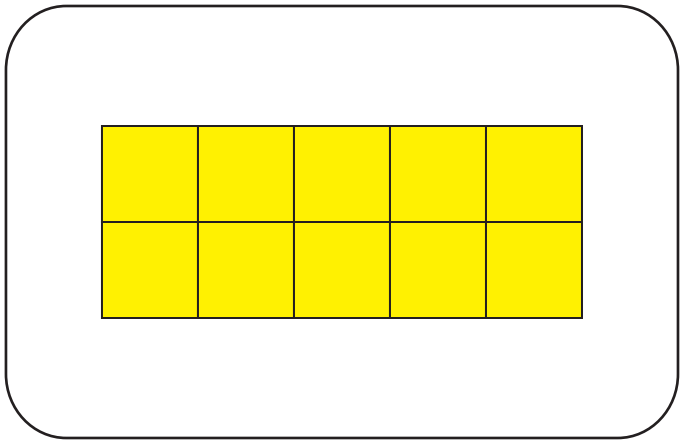

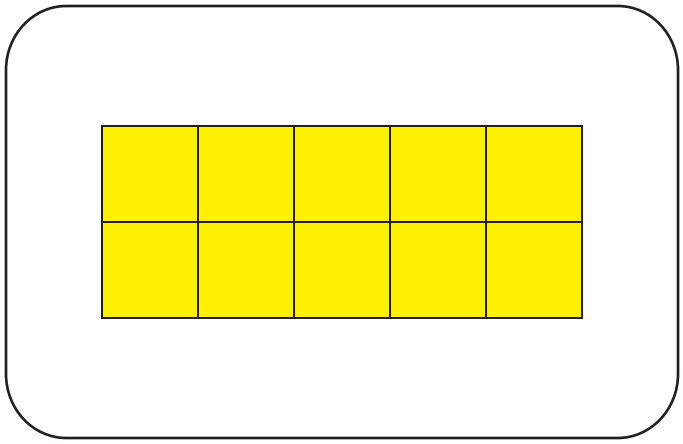

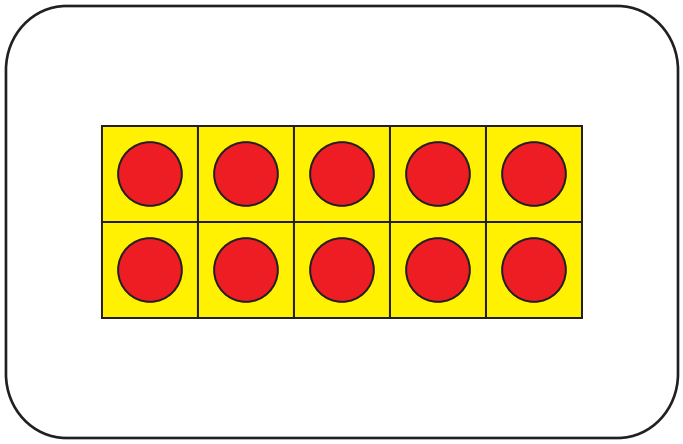

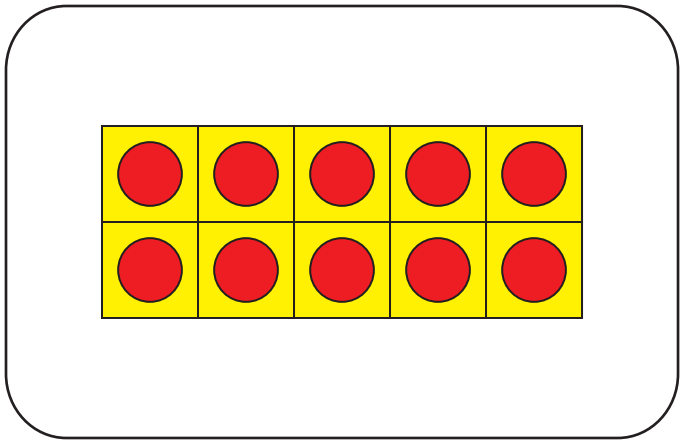

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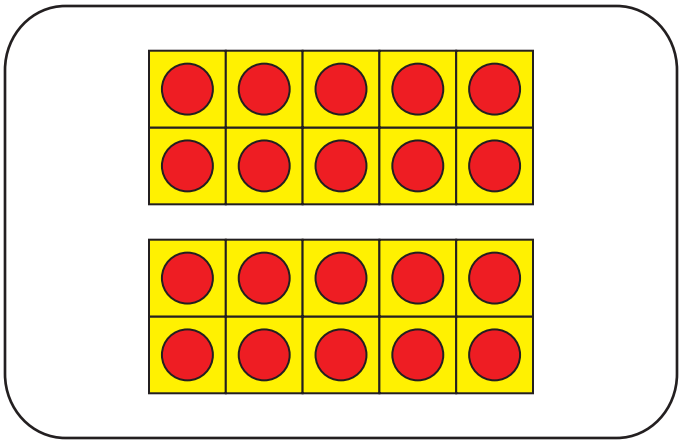

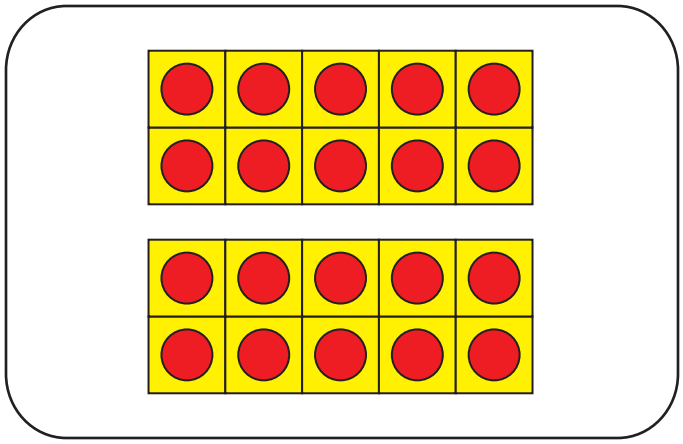

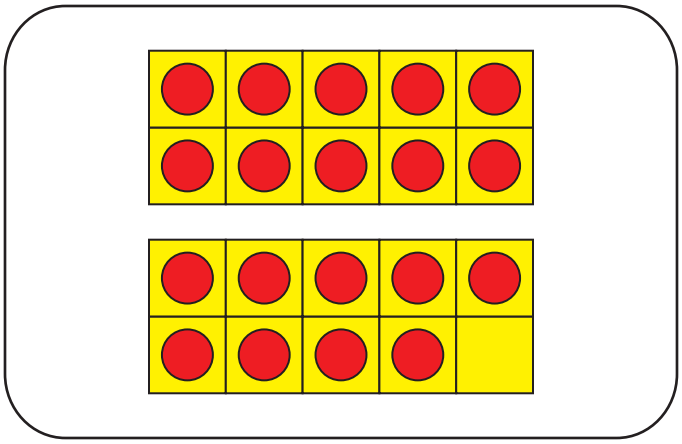

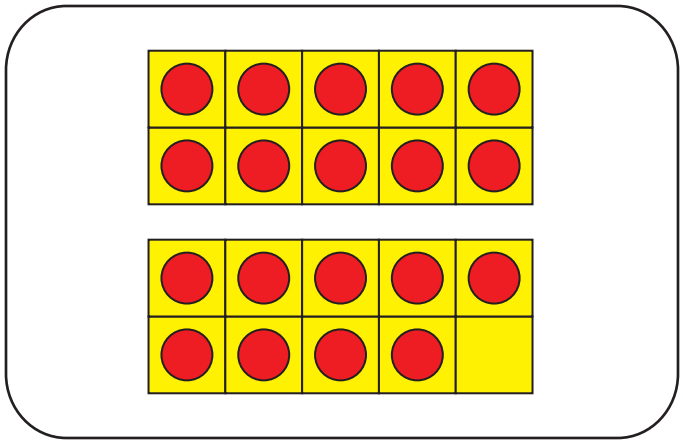

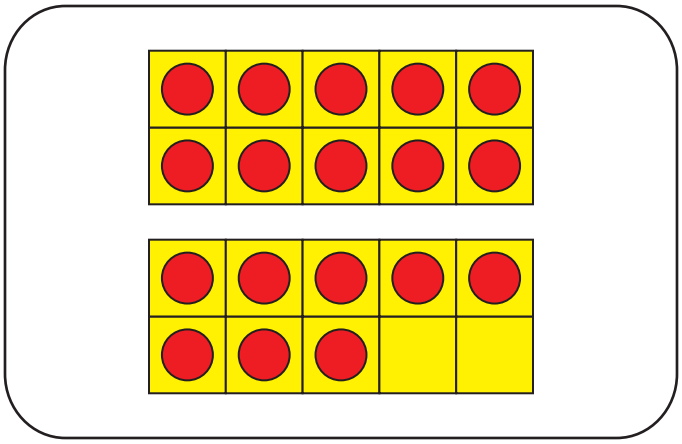

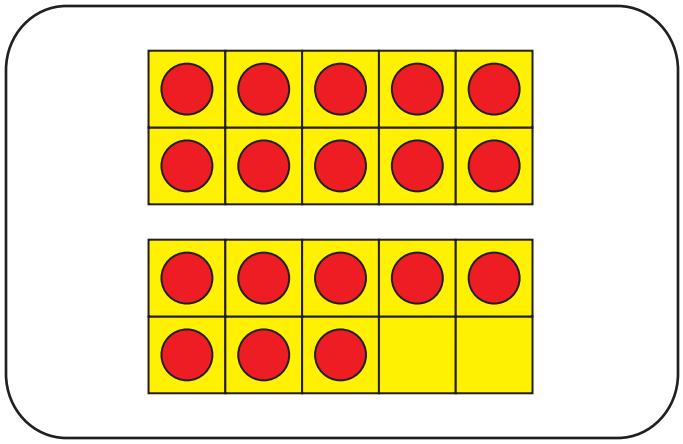

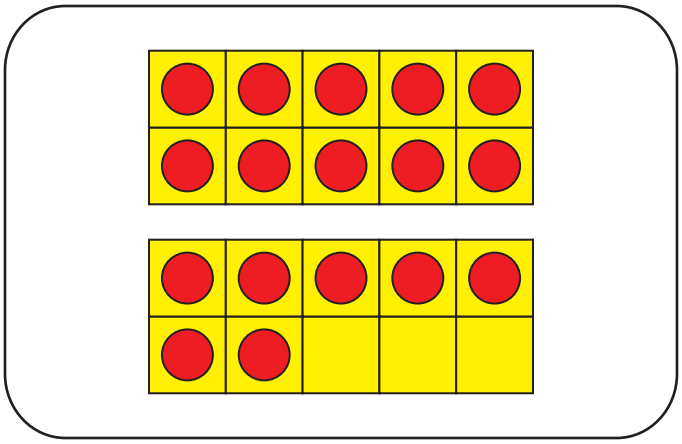

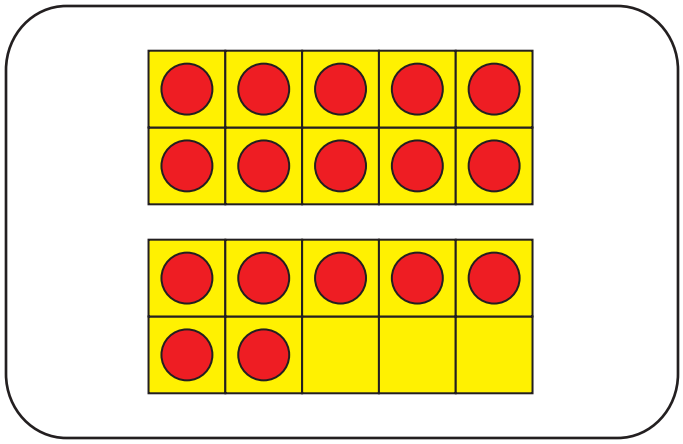

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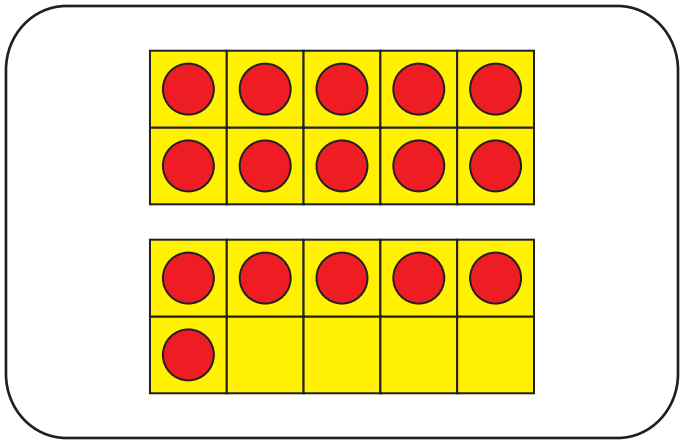

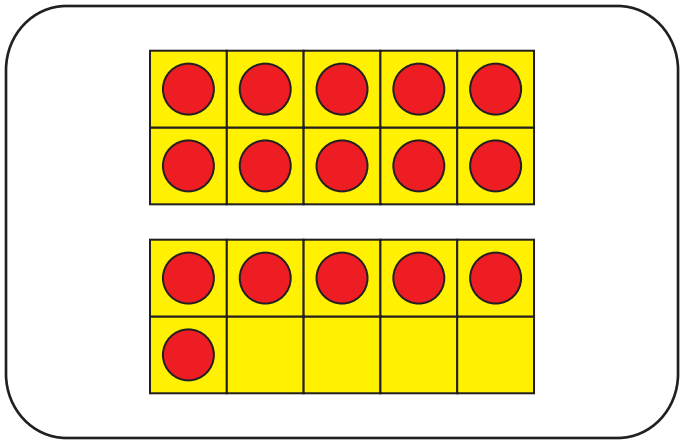

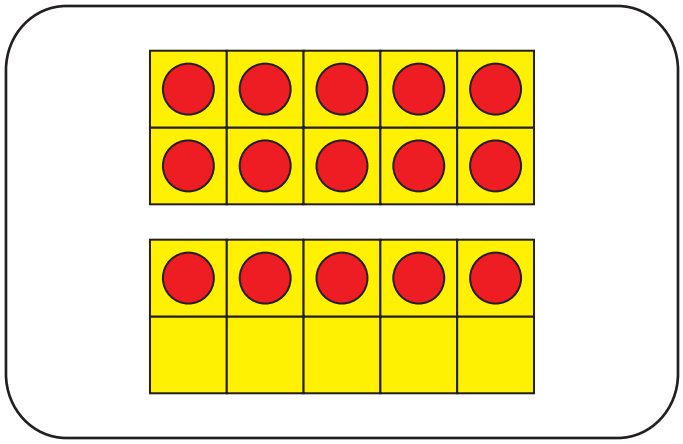

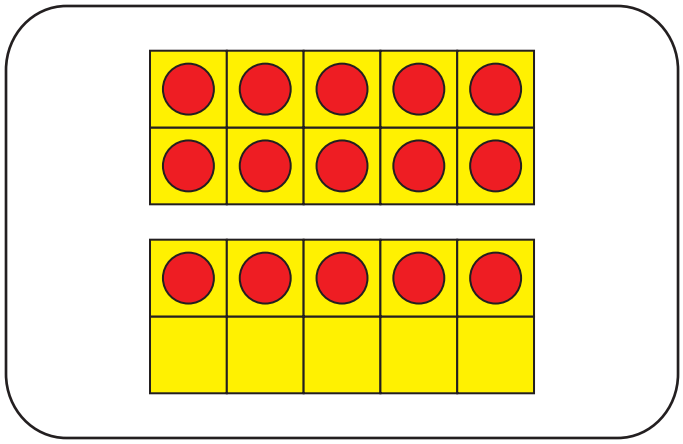

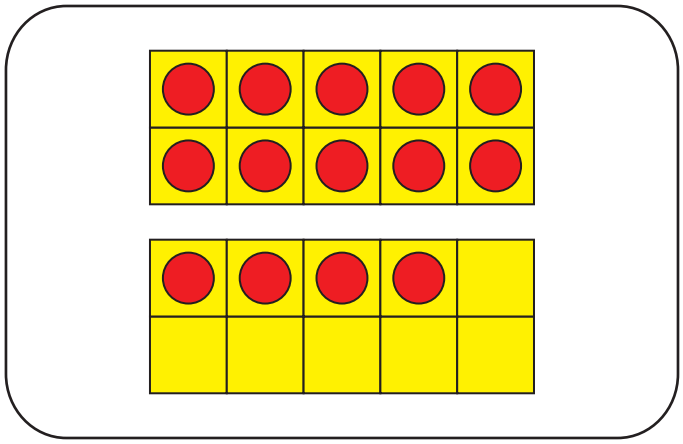

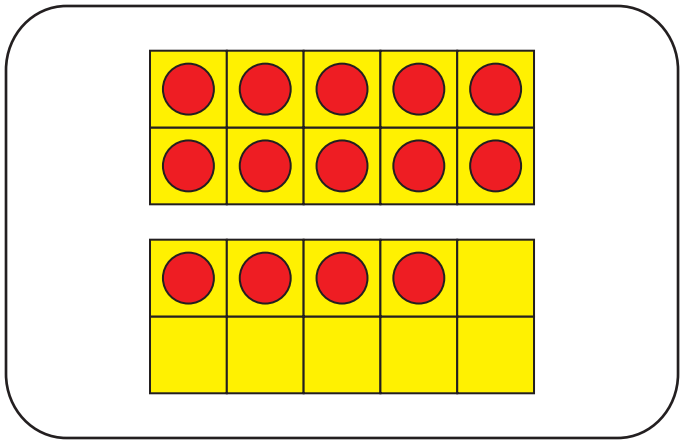

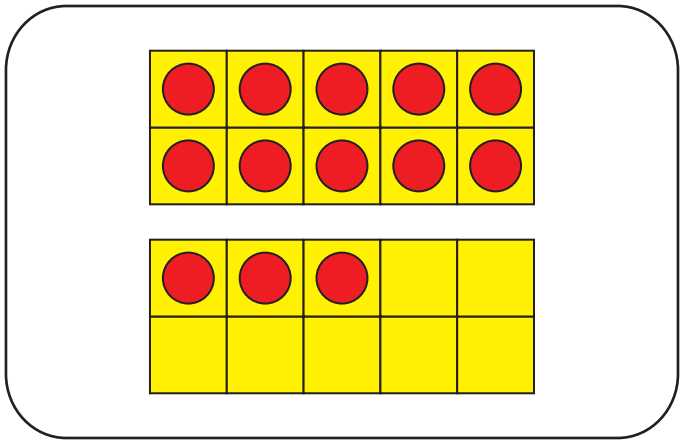

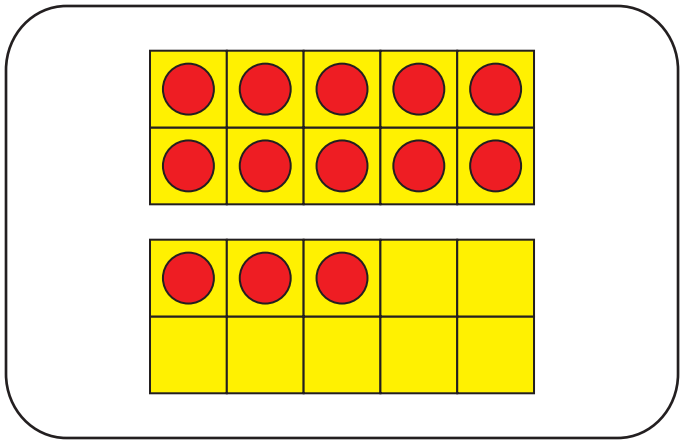

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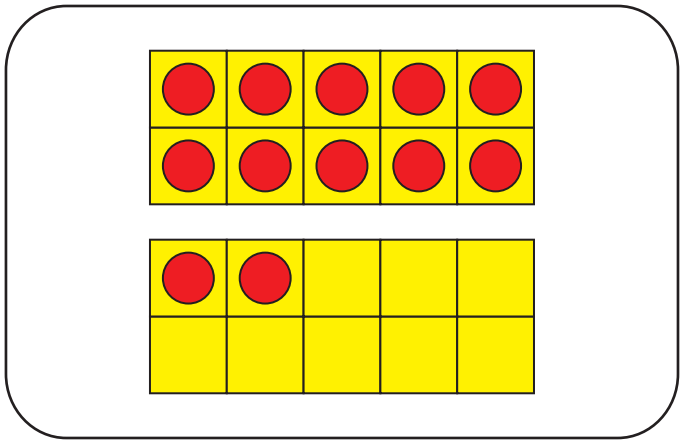

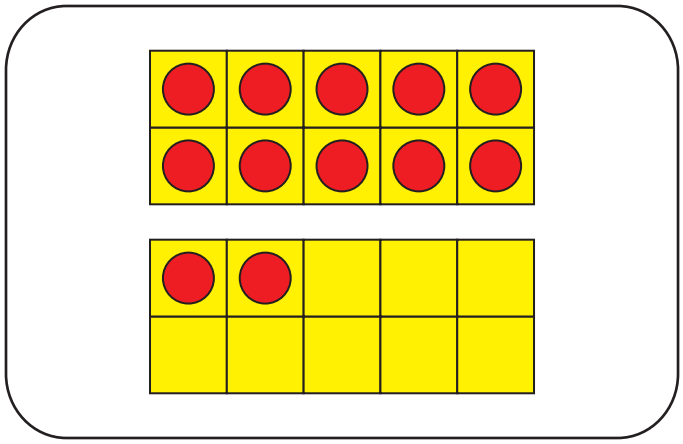

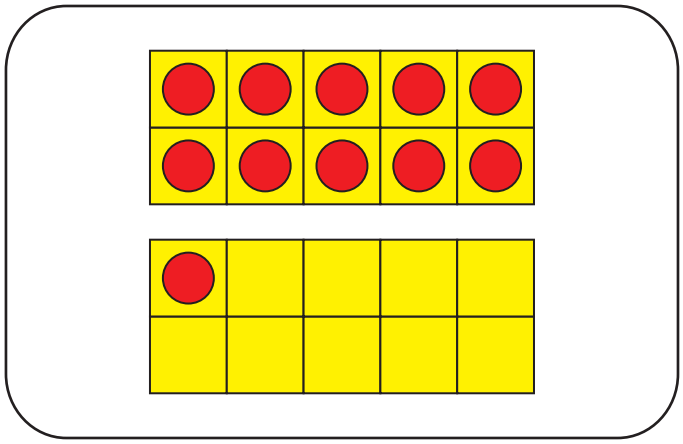

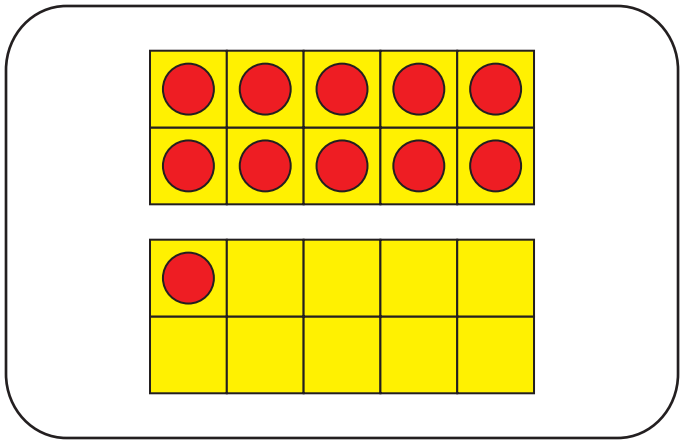

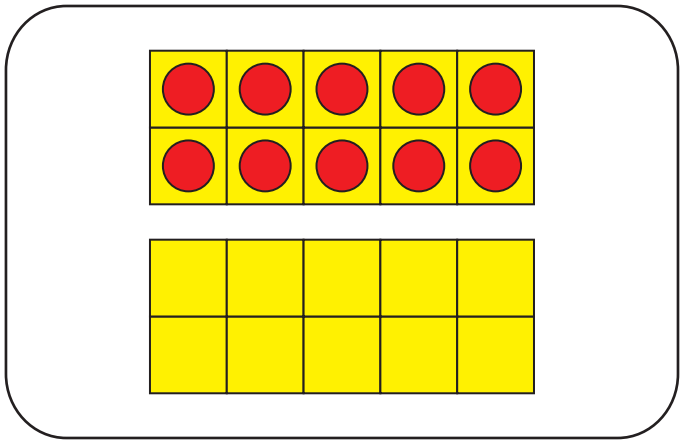

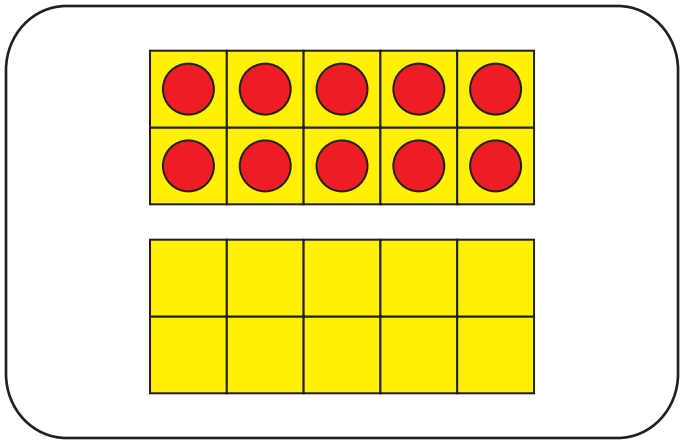

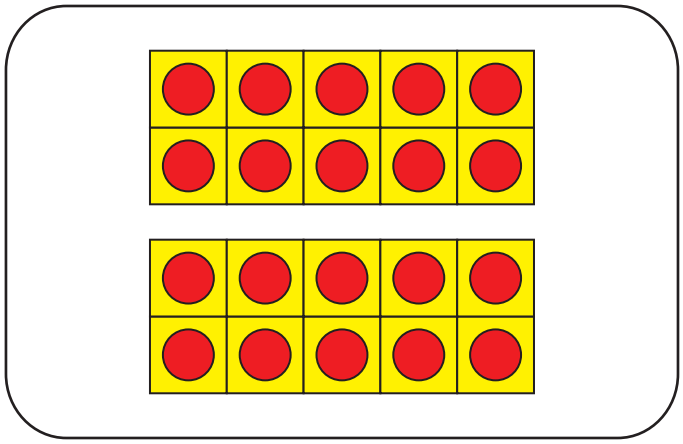

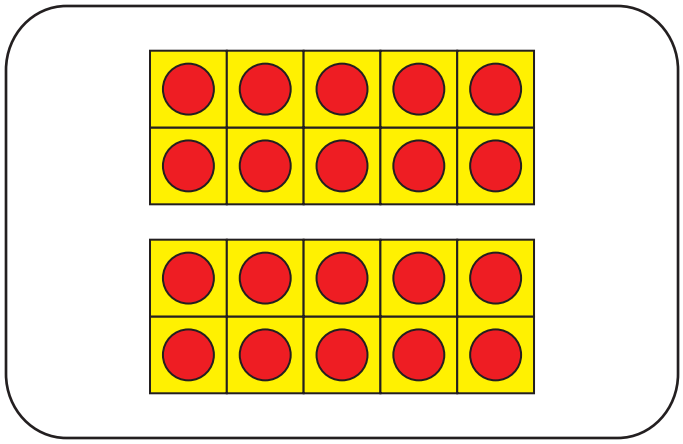

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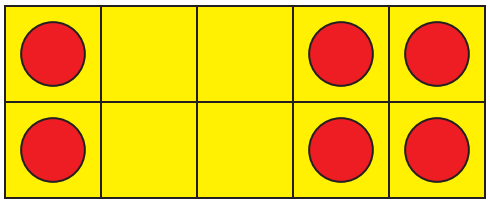

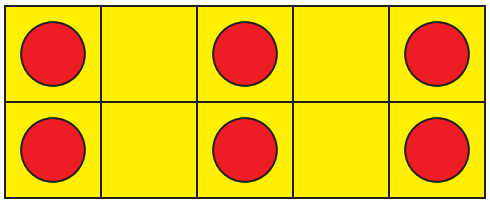

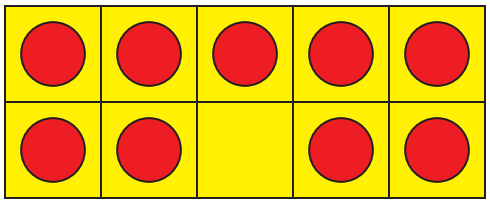

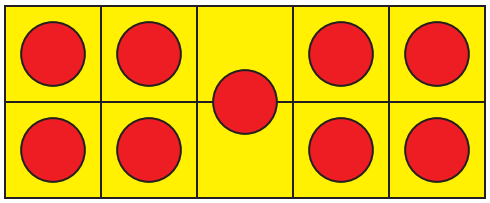

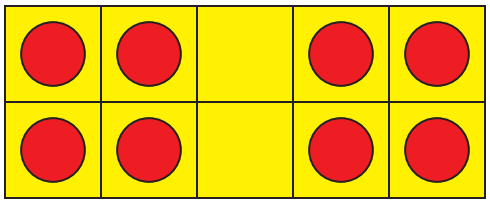

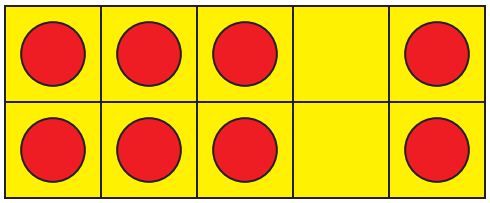

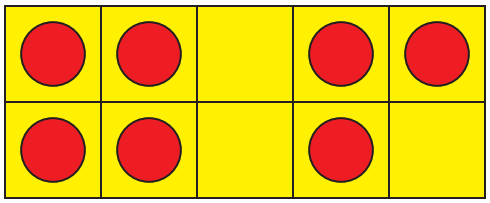

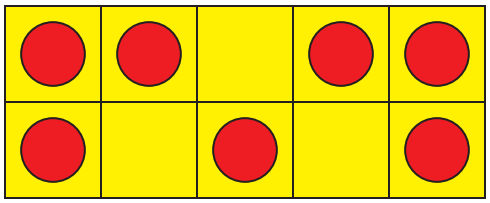

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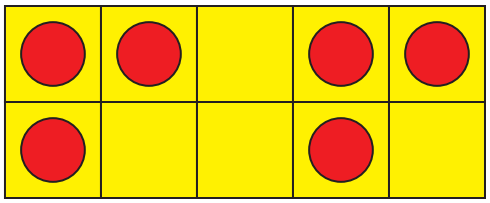

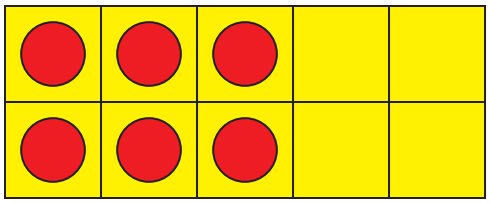

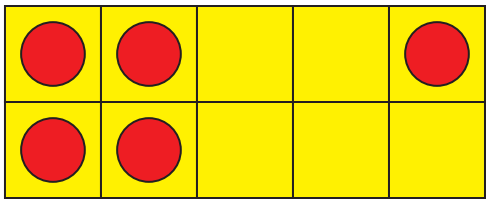

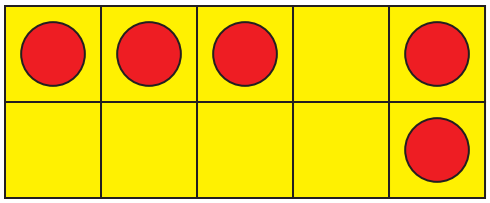

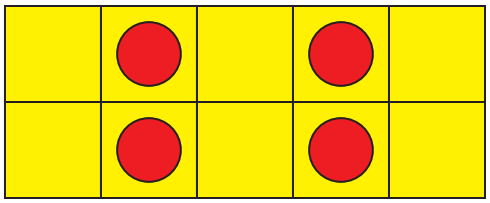

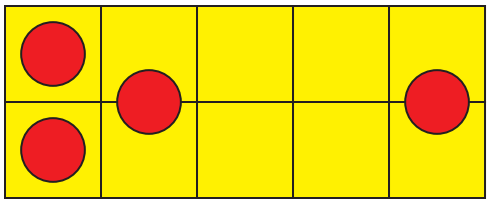

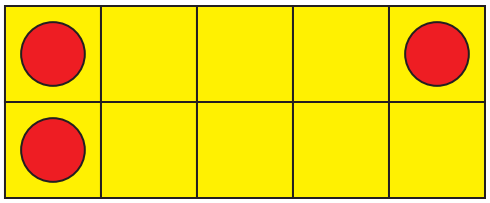

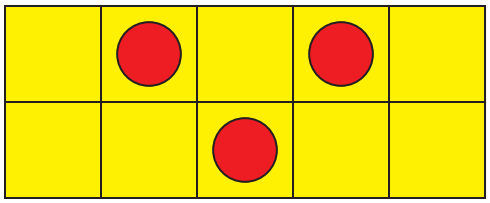

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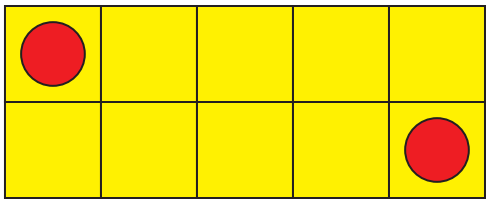

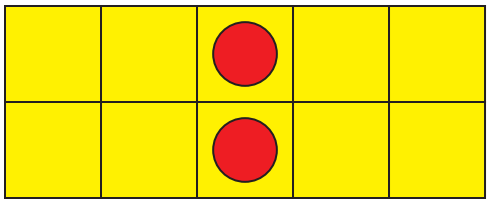

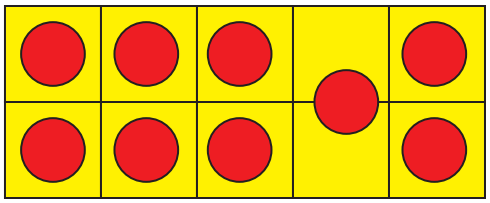

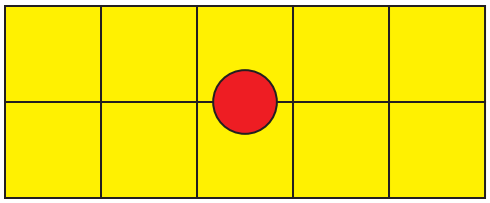

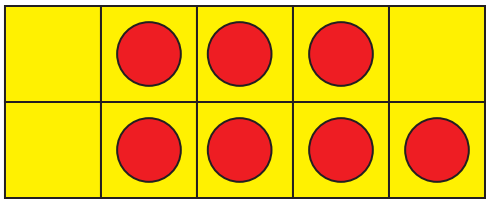

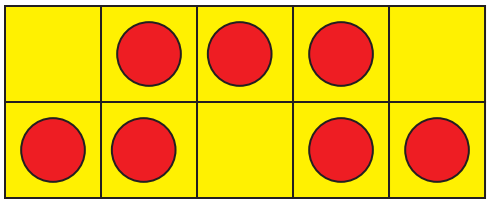

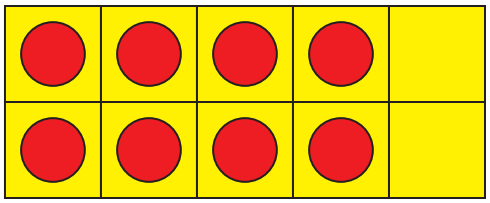

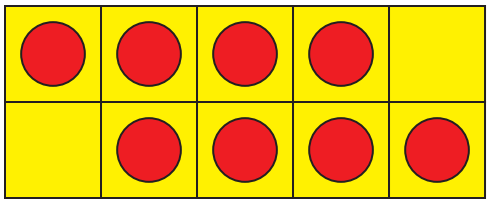

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