MISSISSIPPI DEPARTMENT OF EDUCATION

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Mississippi Mathematics Manipulatives Manual

Featured Activity

"Ten Frame Puzzle Match-up"

K.OA.4

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As we continue our efforts to develop high-quality instructional materials (HQIM) and resources, the Mississippi Department of Education (MDE), through the Academic Education Office, would like to showcase instructional practices and activities that foster conceptual understanding through the use of manipulatives in the mathematics classroom.

The **Mississippi Mathematics Manipulatives Manual** features activities meant to serve as short, hands-on procedures that may be implemented before, during, or after a lesson to support the teaching and learning process of the Mississippi College- and Career-Readiness Standards (MCCRS) for Mathematics. Alignment with the MCCRS Scaffolding Document has been included for additional support. Teachers may contact staff at the MDE if they would like to borrow manipulatives for classroom use.

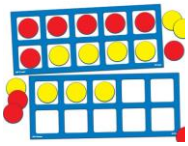
Teachers may modify these activities to meet the needs of the students they serve and their instructional delivery model (virtual, in-person, or hybrid).

Special Thanks:
Dr. Alice Steimle,
Center for Mathematics and Science Education, University of Mississippi

Ten Frame Puzzle Match-Up

MANIPULATIVE(S):

- Counters
- Ten Frame
- Ten Frame Puzzle Pieces (*Attached*)



GRADE LEVEL OR COURSE TITLE:

CCR Mathematics Grade K

DOMAIN AND CLUSTER HEADING:

Operations and Algebraic Thinking (OA):

Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.

STANDARD(S):

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

PREREQUISITE SKILLS:

- Have rapid recognition of numbers to 10 on their fingers.
- When counting, say the number names in order.
- Understand each object represents one number name (one to one correspondence).
- When counting a number of objects, the last number name tells the number of objects counted.
- Know what a Ten Frame is and what it looks like when it is completely filled in.
- Write a number sentence in which the sum is 10.

ACTIVITY:

Note: Activity Sheet Attached

1. Prior to the activity, during whole group instruction, provide students with a ten frame and 10 counters. Model the different addend combinations with a sum of 10. Then, provide students with an addend and allow students to use their ten frame and counters to assist them in determining the missing addend.
2. After the whole group instruction, ensure students have access to the Ten Frame Puzzle pieces in which they can manipulate. The puzzle pieces should create five complete ten frames that are split to create number pairs resulting in a sum of 10: 1 and 9, 2 and 8, 3 and 7, 4 and 6, and 5 and 5.

3. Have students work individually or in pairs to match 2 ten frame puzzle pieces to make a full ten frame.
4. Then, have students to write the equation or number sentence that matches each puzzle.

QUESTIONS TO CONSIDER:

- What does “equal to” mean?
- What symbol means to put “together” or “join”?
- What does “decompose” mean?
- What are “number pairs”?
- What are all the number pairs that equal 7?
- What if one group writes *1+9=10* and another group writes *9+1=10*? Are these the same or different?

RESOURCES:

- Mississippi Mathematics Scaffolding Document (Grade K, Page 13)
- 2016 MCCRS for Mathematics

Optional: The University of Mississippi's Center for Mathematics and Science Education has an extensive inventory of math (and science and technology) tools and manipulatives that teachers may borrow for classroom use at no charge. Click the link below to access the inventory list and complete a check-out request.

- CMSE Manipulatives

BEYOND THE ACTIVITY:

- **Accommodation(s):** If students are struggling or are just being introduced to number sentences, you can provide number sentences that are already written and have students match them to the completed puzzles.
- **Extension**: Have students make a ten frame using more than 2 puzzle pieces. Can it be done? How many combinations of numbers can be used?
- **Misconception(s):** Some students may try to put 2 pieces together to create a number sentence that does not equal 10. For example, a student may put the puzzle piece that contains 6 and the puzzle piece that contains 3 together. This may imply that a student does not recognize what a completed ten frame looks like and could benefit from using the ten frame Puzzle Guide for support. (This would be equivalent to looking at the puzzle box when building a puzzle).

Activity Sheet

Ten Frame Puzzle Match-Up

Teacher Page

Materials	Handouts
Ten Frames cut into puzzle pieces. • 5 total ten frames cut into different number pairs: 1 and 9 2 and 8 3 and 7 4 and 6 5 and 5	

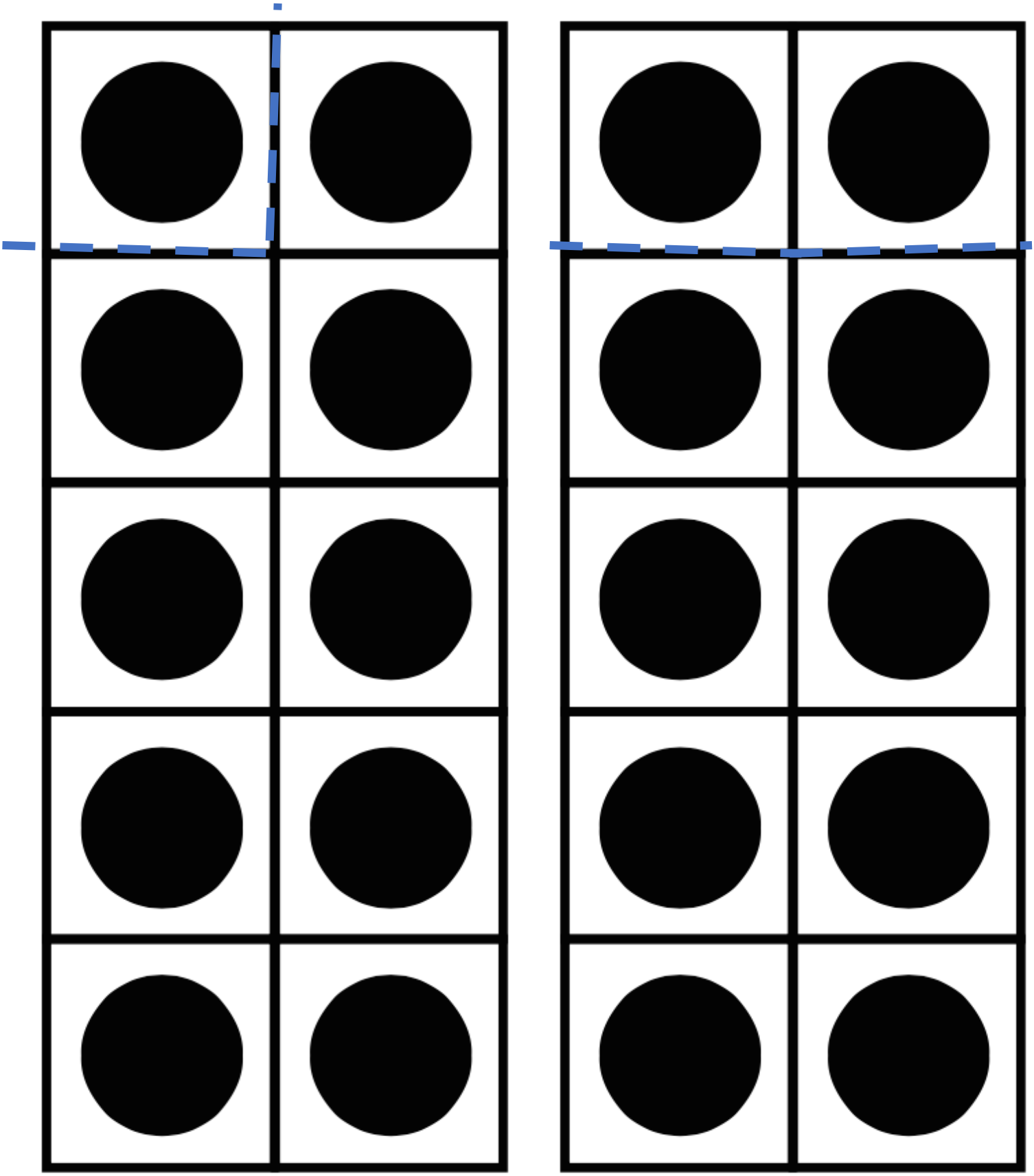
Idea: Students put together ten frame puzzle pieces to show how to make 10 and write the corresponding equations.

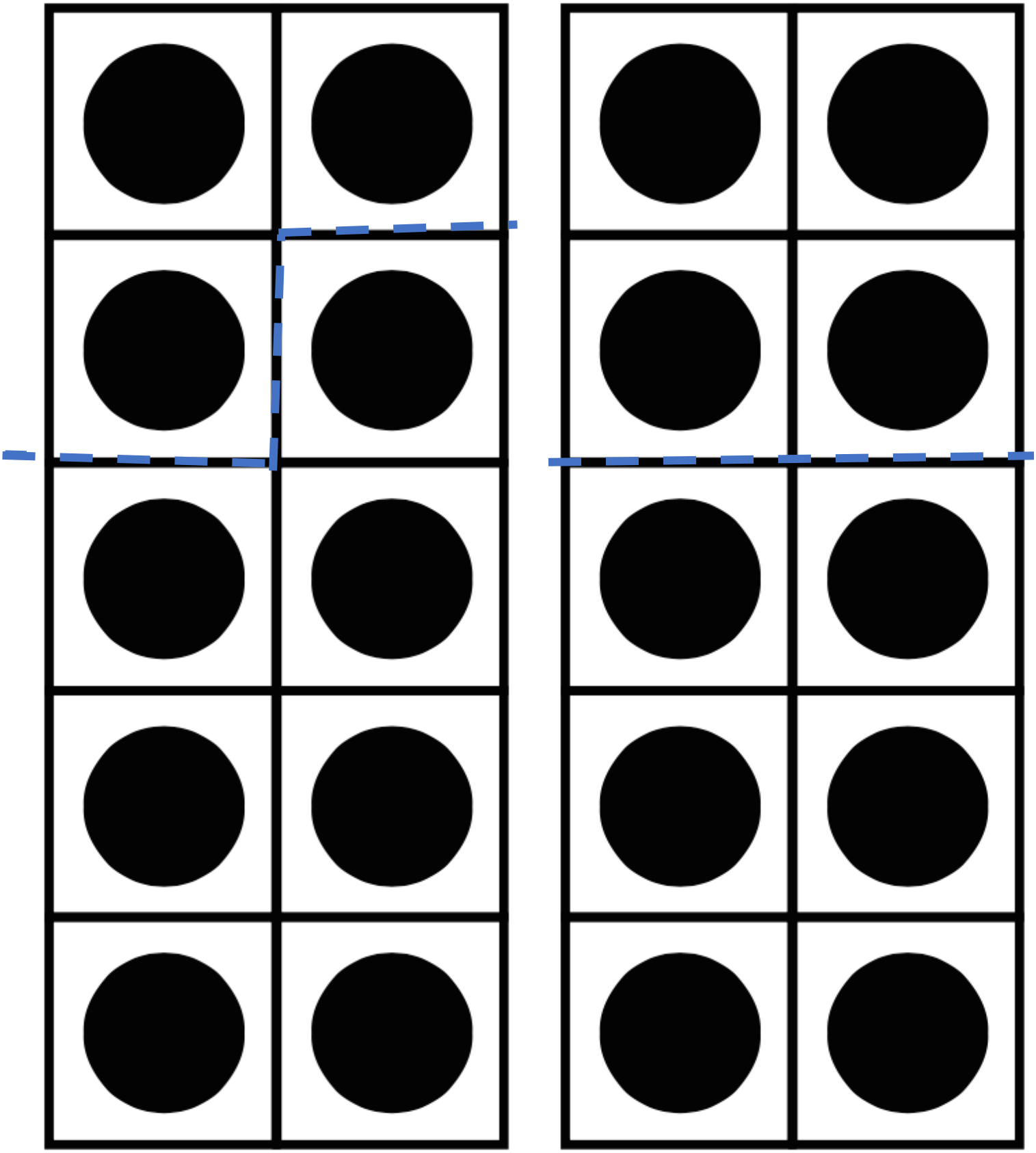
To make paper puzzle pieces: Cut apart the full ten frames into five number pairs. Students will be asked to match two ten frame puzzle pieces to make a full ten frame and write the equation to match each pair.

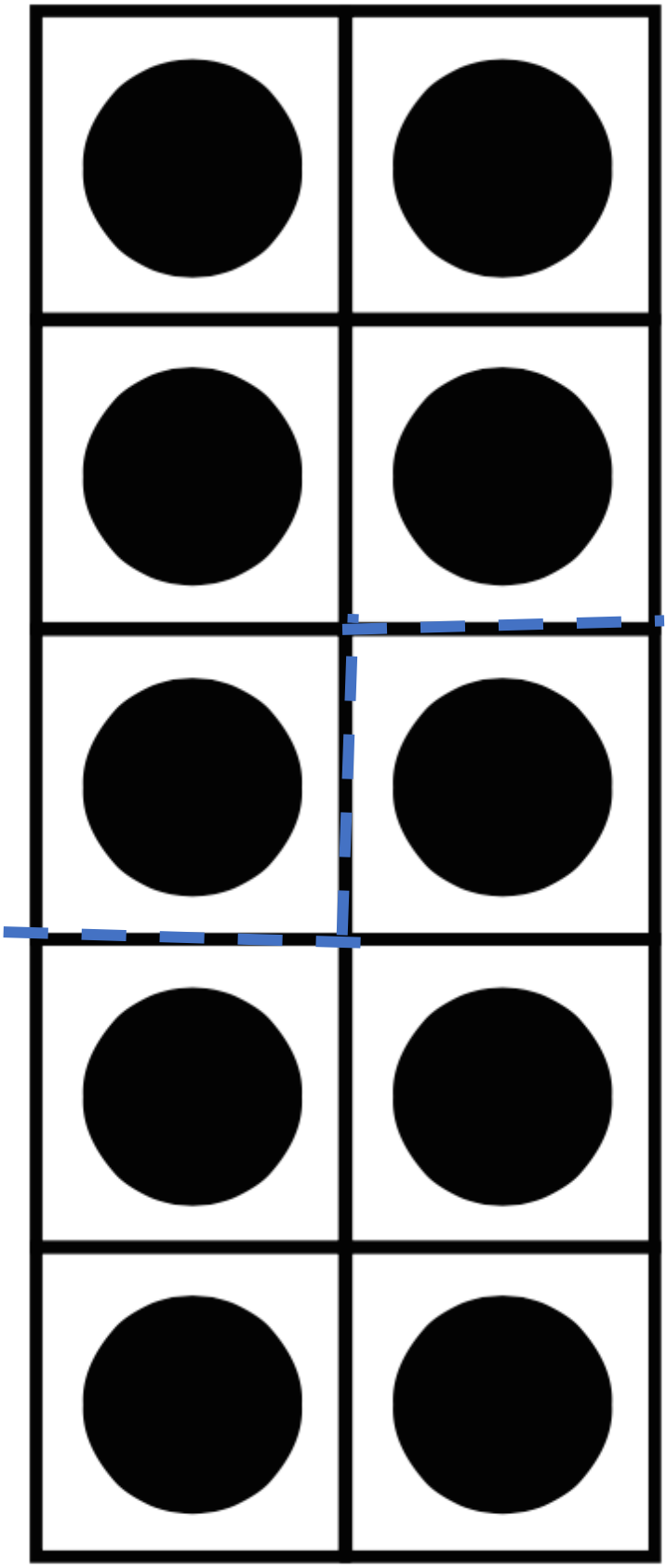
Extension – students can "flip" the puzzle pieces to record the commutative fact.

Additional Support: If students are struggling or are just being introduced to number sentences, you could provide number sentences that are already written and have students match them to the completed puzzles.

Be sure that the students understand that they are making "completed ten frames." Have students sort the puzzle pieces and create the ten frames.







Puzzle Guide

(for support if needed)