FILL, SHAKE, AND POUR

Strand: Number and Number Sense

Topic: Composing and Decomposing Numbers to 10

Primary SOL: K.4 The student will
a) recognize and describe with fluency part-whole relationships for numbers up to 5; and
b) investigate and describe part-whole relationships for numbers up to 10.

Related SOL: K.6

Materials

- Two-sided counters
- Cups
- Recording sheets (included)
- Two different colors of crayons or colored pencils
- Pencils

Vocabulary

number, part, whole, zero (0), one (1), two (2), three (3), four (4), five (5), six (6), seven (7), eight (8), nine (9), ten (10)

Student/Teacher Actions: What should students be doing? What should teachers be doing?

Note: This lesson can be done with however many total counters you wish to focus on as the "whole" for the day. Begin with three counters. Once this activity becomes familiar to students, it no longer needs to be a whole-class lesson but can become a station or center activity that students can complete several times a week, moving to bigger wholes to explore as they show proficiency with all the combinations or parts of a given whole.

1. Begin by showing the students a two-sided counter. Ask students: *"What do you notice about this counter?"* Students may say that the counter is round, a circle, small, etc. Be sure students notice the two colors.

2. Next, place one two-sided counter in a cup and ask students: *"What do you think will happen if I place the counter in a cup, shake it, and pour it out on the table?"* Model pouring the two-sided counter out a few more times for the students and allow them to make predictions about what they think will happen.

3. Next, fill a cup with three two-sided counters (the focus number for the day), shake the cup, and pour the counters onto the table. Discuss with students how many yellow and red counters they see**.** *(Note: While discussing the combinations for each number, be explicit about the "math language" you use with your students. For example: "One red and three yellow" or "One and three make four.")*

4. Repeat this several times with the same number of counters in the cup and record the results as both pictures of the counters and as numerals ("1 and 2") on chart paper so that students can become familiar with the numerals. Be sure that you do an example with zero counters of one color. *(Note: In kindergarten, we should be saying and writing "__ and __." We do not want students rushing into the symbolism of "+" and "-," but rather gaining a deeper understanding of number sense and what makes up a number.)*
5. Next, begin explaining and demonstrating how to complete the independent activity. Choose the recording sheet that matches the number for the day. Instruct students to write the numeral that represents the *whole* (the number of counters to be used) at the top of the page. Model how to fill, shake, pour, and record the results by coloring in the way the counters landed on the recording sheet. Explain that the different colors represent the *parts.* Model the language you expect them to use as they work (two yellow and one red, or zero yellow and three reds). Then pass out cups, counters, and recording sheets. Be sure students have pencils and crayons.
6. As students begin to work on the activity, remind them that you want to hear them say the parts out loud as they complete each row. As students work independently, observe whether they are recording the parts correctly and listen for them to say the parts and the whole. As you interact with children ask questions like: *Where are the parts? What number is the whole? If I have one yellow, how many reds will there be? If I have zero reds, how many yellows will there be?* Record students' responses after questioning and notice who completes the activity confidently and who struggles. Students who struggle may need more time working with the parts of that number. As you move on in later days to parts of bigger wholes, the children who still need to work on parts of smaller wholes can have some time for that.
7. After students have completed the independent activity, bring them back together and debrief the activity using some of the questions in the assessment section below. List all the combinations on the board and talk about the patterns that can be seen. Ask: *What happens to the number of red counters as the number of yellow counters increases? Why is this so?*

   (Note: Students need to spend an abundant amount of time exploring the different combinations for each number. Remember that the goal is for kindergartners to become fluent with part-whole relationships through five, but they should also investigate part-whole relationships through 10.)

Assessment

- **Questions**
  - What are some ways you can make_____?
  - How do you know __ and __ make __?
  - What goes with ___ to make___? How do you know?
  - I wonder how many I will have if I take __ away from ___? Why do think it's__?
  - I had five counters in my cup and I poured them out. If one of the counters is red, how many of the counters are yellow? How do you know?
  - How will you know when you have all the combinations for ____?

- **Journal/writing prompts**
  - Have students draw what their two-sided counters could have looked like with a particular number.
  - Have students draw two other ways their two-sided counters could have looked.
- **Other Assessments**
  - Have students tell you a story about the number____. (Example: "I have three dogs and one kitty. That makes four pets.")
  - Show students ___ counters and ask them how many more are needed to make___.
  - Bean assessment: Place some beans on the table and ask the students to hand you ___ beans. (Or use another manipulative that can be easily hidden in a cup.) Place all of the beans in a cup and then remove some of them from the cup. Show the removed beans to the student and ask, "How many are left in the cup?" Repeat until all combinations of that number have been given. A student who is fluent with part-whole relationships for a given number will quickly tell you the number of beans left in the cup for all combinations of that number, without having to figure it out. A student who is incorrect or must figure it out needs more practice to become fluent.

Extensions and Connections (for all students)

- Students can solve story problems where the whole is known but the two parts are unknown. "I have five crayons in all. Some are blue and some are purple. How many of each could there be?" Encourage students to find all of the ways.
- As students work toward fluency they can be encouraged to also write number sentences to represent the parts and the whole ("2 and 3 is 5," or "5 is 2 and 3").
- Math stations can be set up and differentiated for each student by the "whole" they will work with. The attached activity sheets can be used with Fill, Shake, and Pour to explore any whole through 10. Additional part-whole activities that can be introduced and placed at stations for independent or partner work or that can be done in a teacher led small group include:

  ***I Wish I Had*:** Show students a dot image of two and tell students, "I wish I had four." Allow students to discuss what needs to happen to the dot image to make four. You can differentiate this activity according to your students' needs.

  ***Break-Apart Trains*:** Students make a train of linking cubes for a specified number. They put the train behind their back and break it into two parts. The student then shows the two parts and says the combination. For more of a challenge, the student can keep one part behind their back and predict the unknown part, checking immediately to confirm that they are correct.

  ***Bears in a Cave*:** Students are given a specific number of number of counters (whichever number is the focus) and a plastic bowl. Students put some counters (bears) under their overturned bowl (the cave) and leave the rest outside the cave. When it is their turn, they lift their bowl and say the combination represented by

the number out of the cave and in the cave ("two and three"). For more of a challenge, you can have students begin to predict the number of bears under another child's bowl.

***Make a Wall*:** Each student places a set of counters (e.g., cubes, teddy bears) in a line in front of them. They use their hand or an index card to make a wall to separate the line of counters into two parts. Students say the combination, naming the part in front of their hand or index card first ("four and two").

***What's in the Bag?*:** Each student has a paper bag and the number of counters for the "whole." Have students place all of the counters in the bag. Students reach in the bag and take out some of the counters. Students predict how many are left in the bag. Students can peek in the bag to confirm their prediction and then say the combination ("two and five").

***Cube Towers*:** Students use two colors of linking cubes to make a tower of a given height. The student should then describe the combinations shown on each tower to a friend or to the teacher ("two and four"). Students can draw their towers on paper. As an extension to this activity, students can write the combinations under or near each tower (4 and 2).

Strategies for Differentiation

- Differentiate the "whole" with which each student will work.
- Have the students write the number of yellow and red two-sided counters.
- Have students use a number bond mat or part-part-whole mat to record the parts.
- Provide a number path to assist with writing numerals.

Note: The following pages are intended for classroom use for students as a visual aid to learning.

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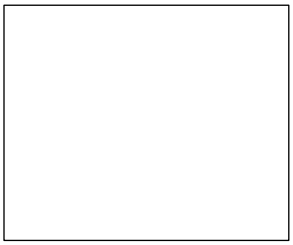
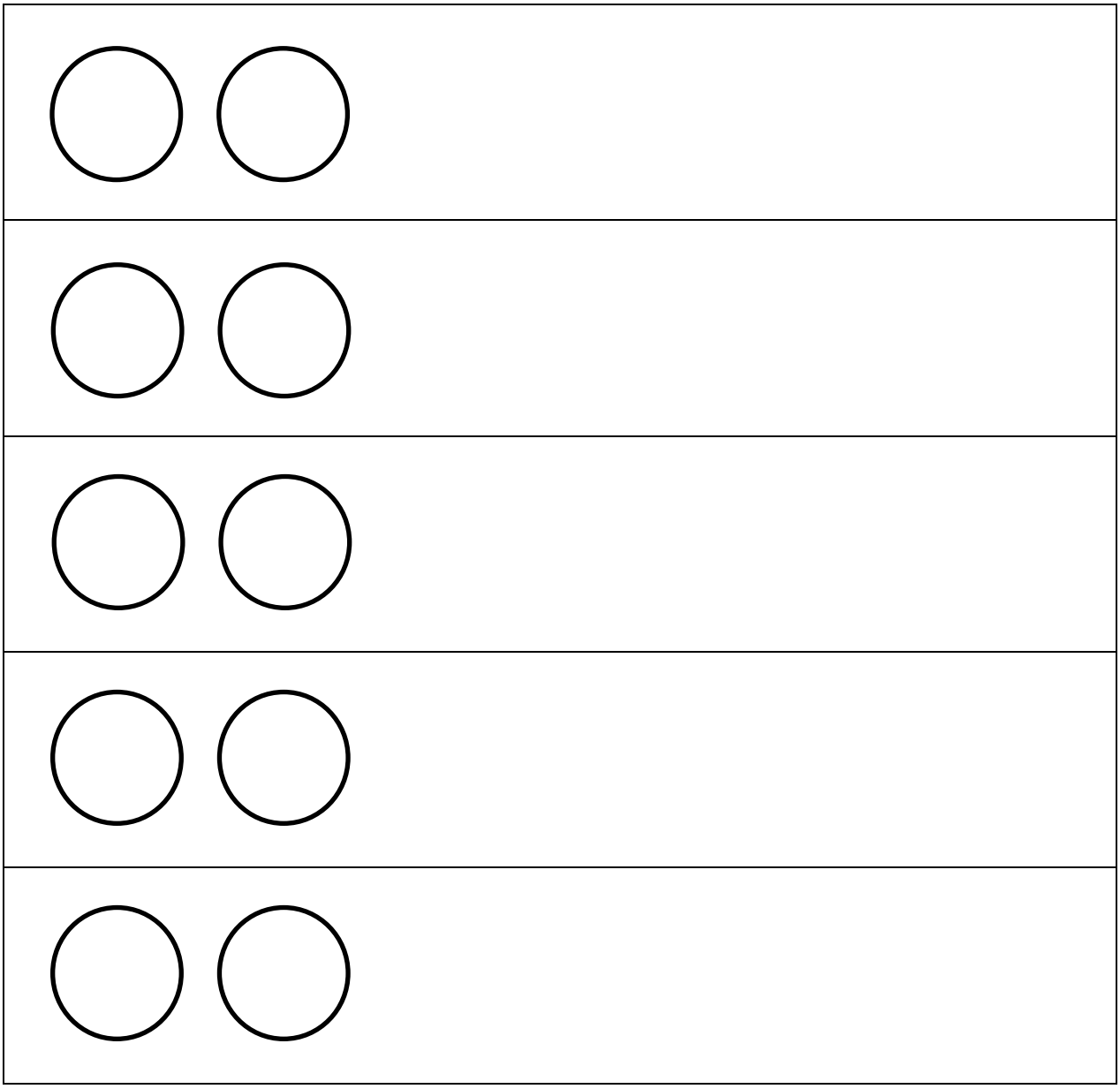
Fill, Shake, and Pour

Today I worked with





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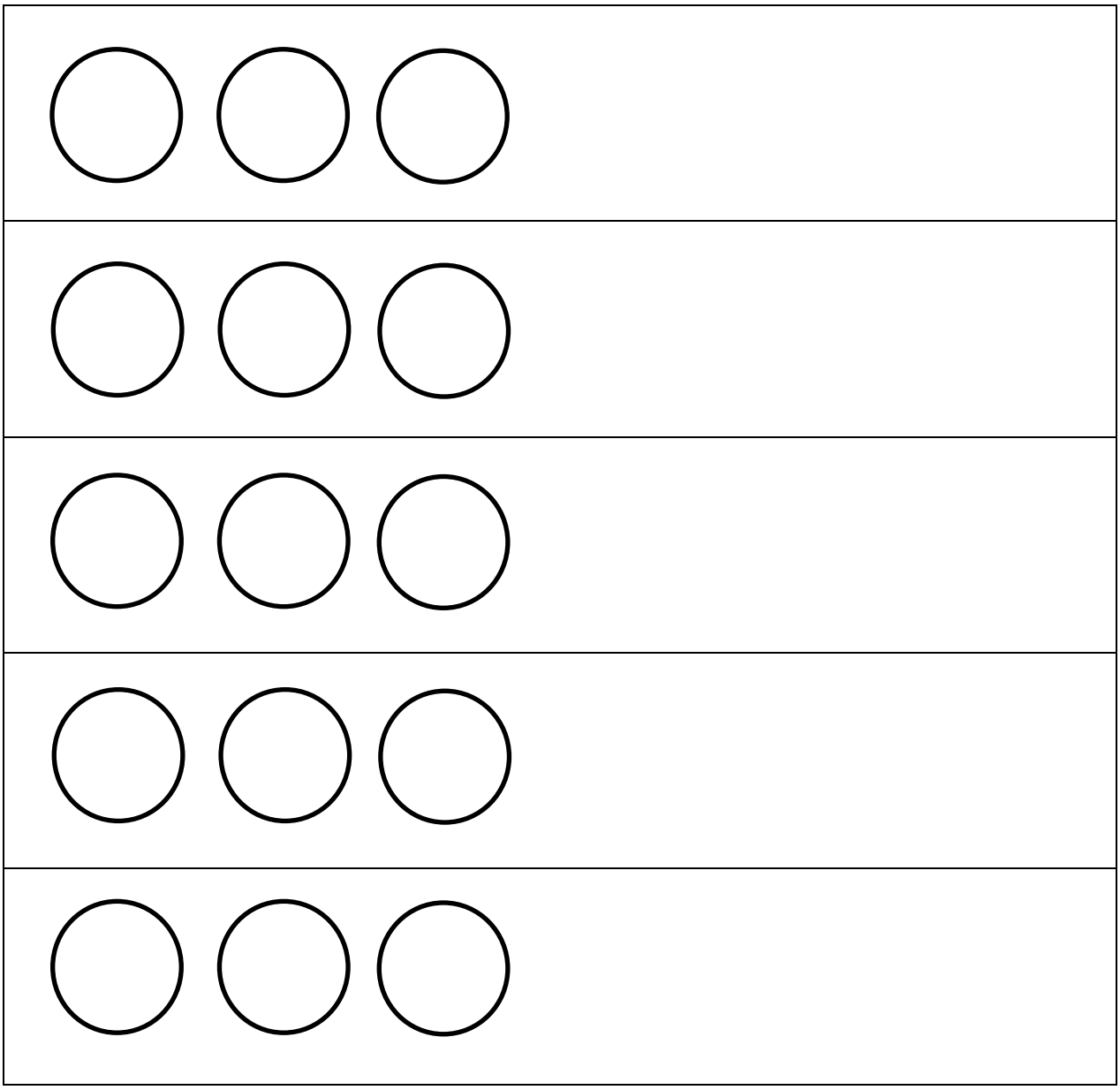

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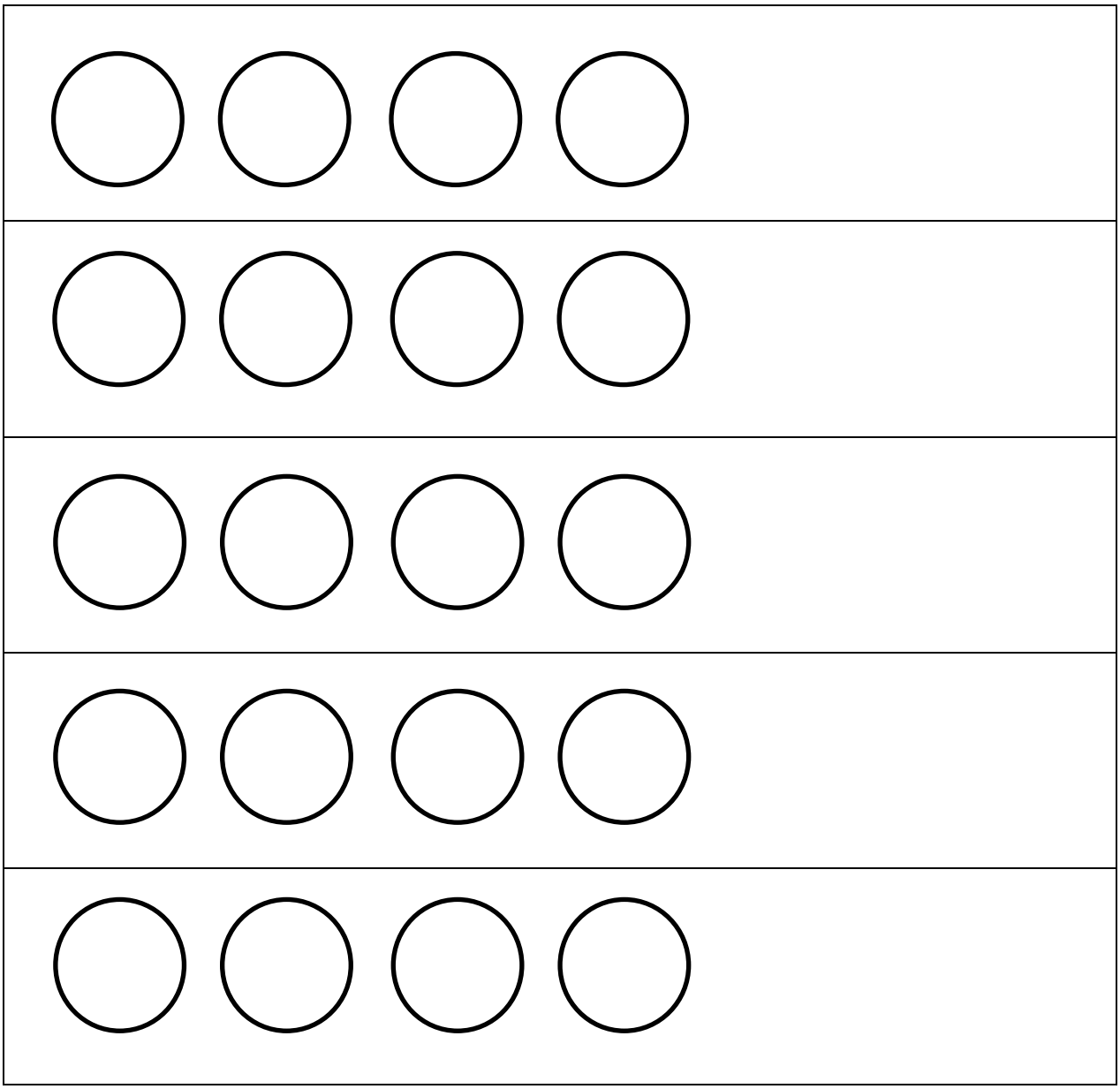

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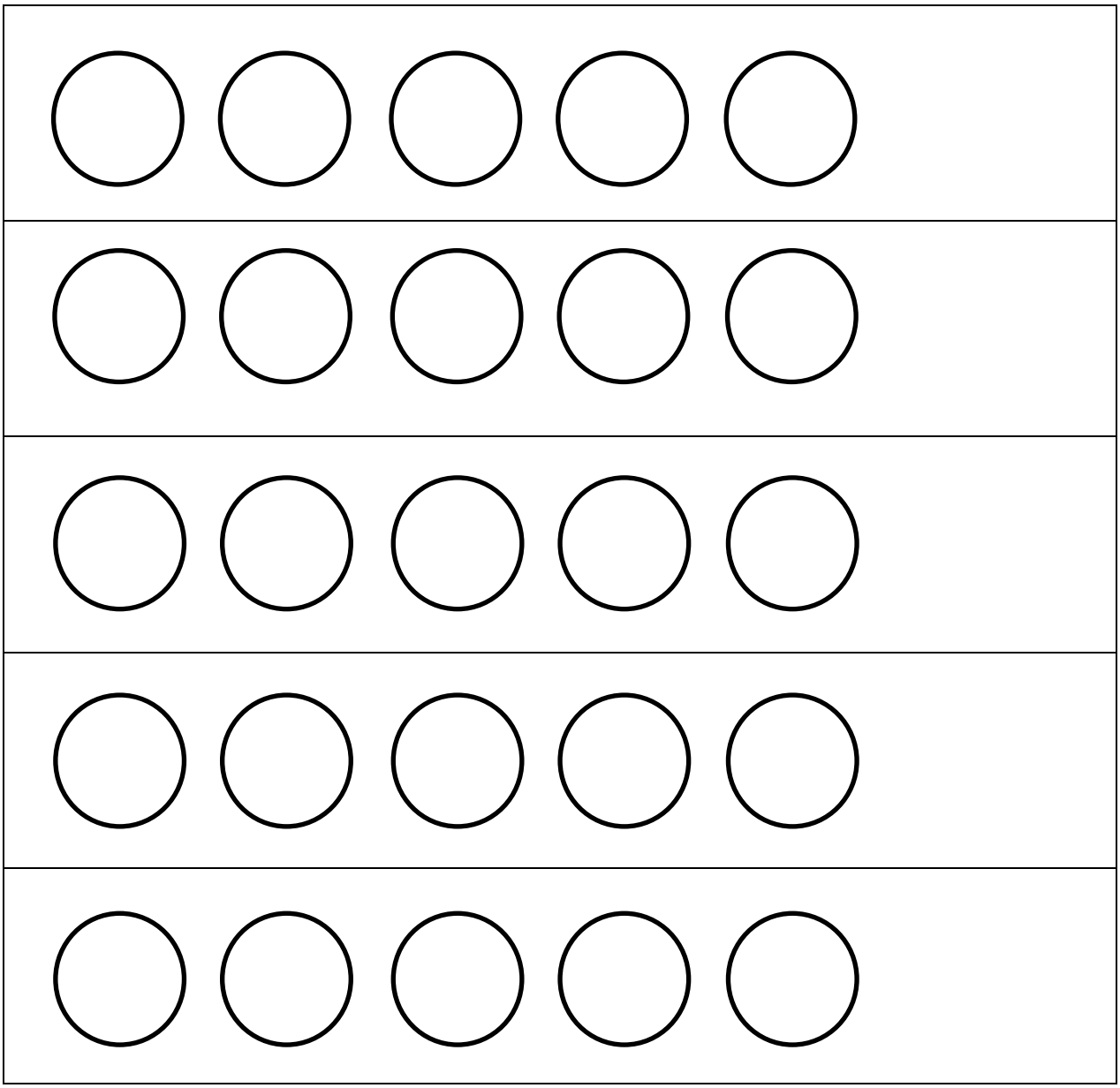

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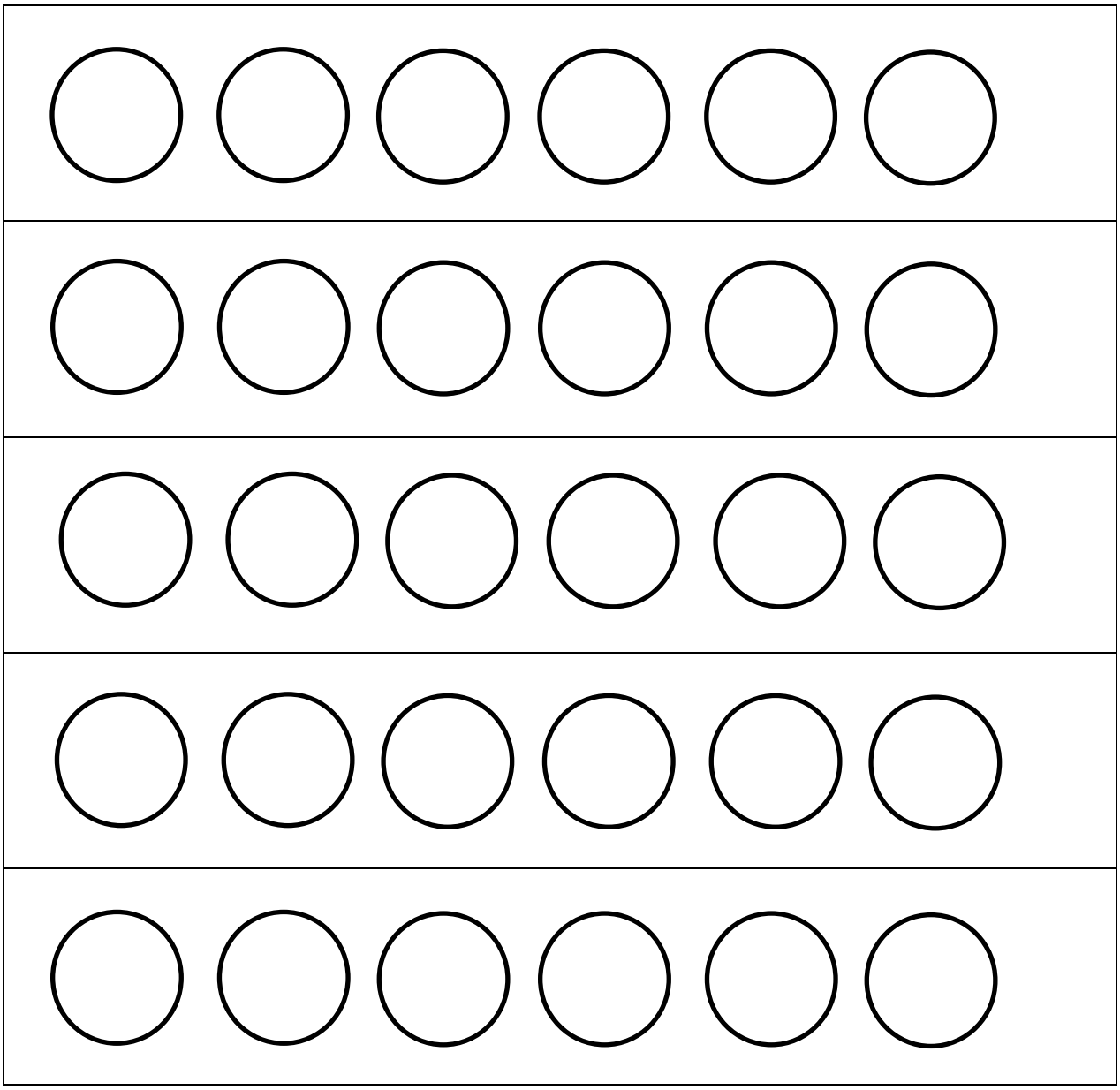

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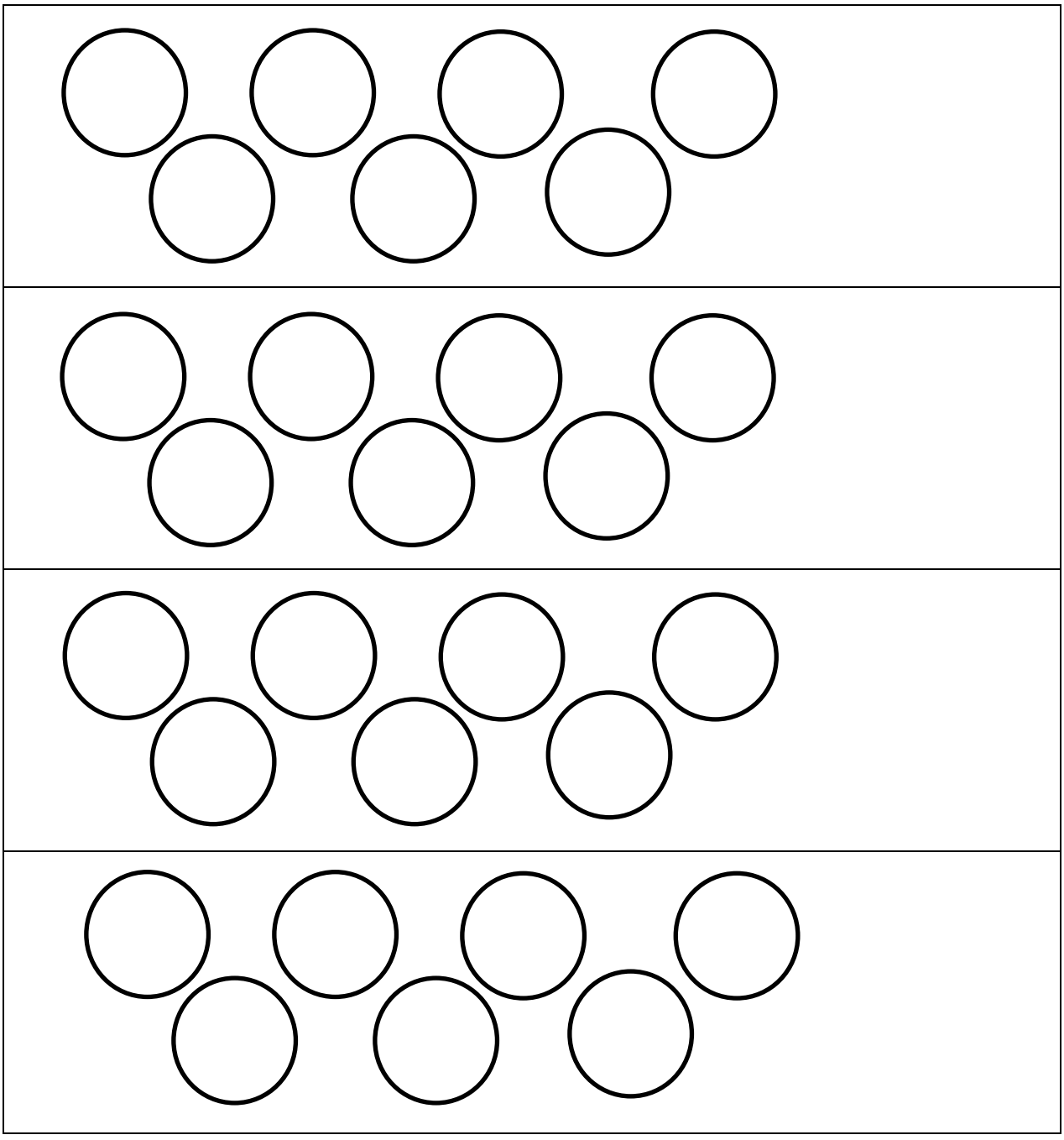

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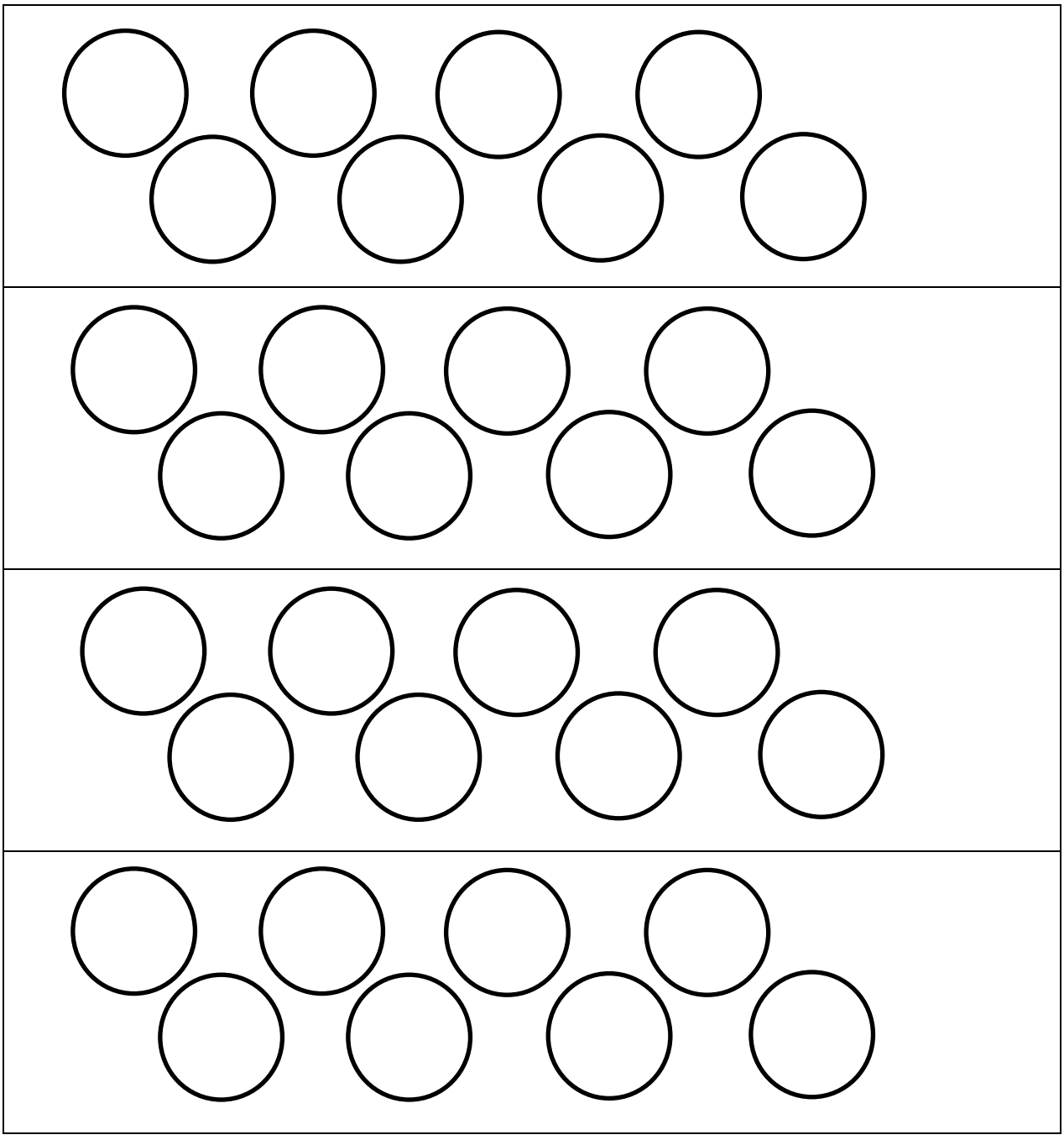

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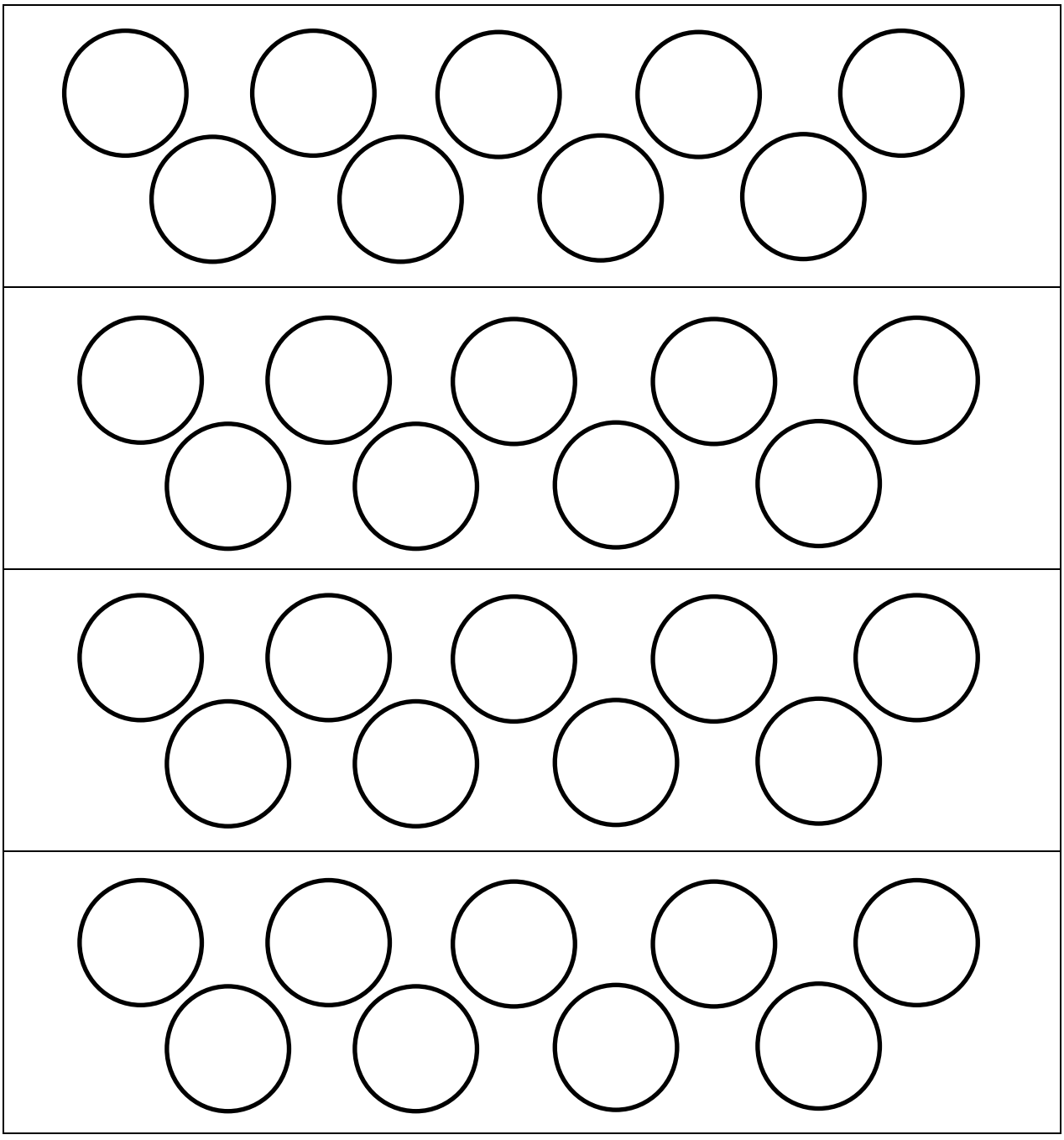

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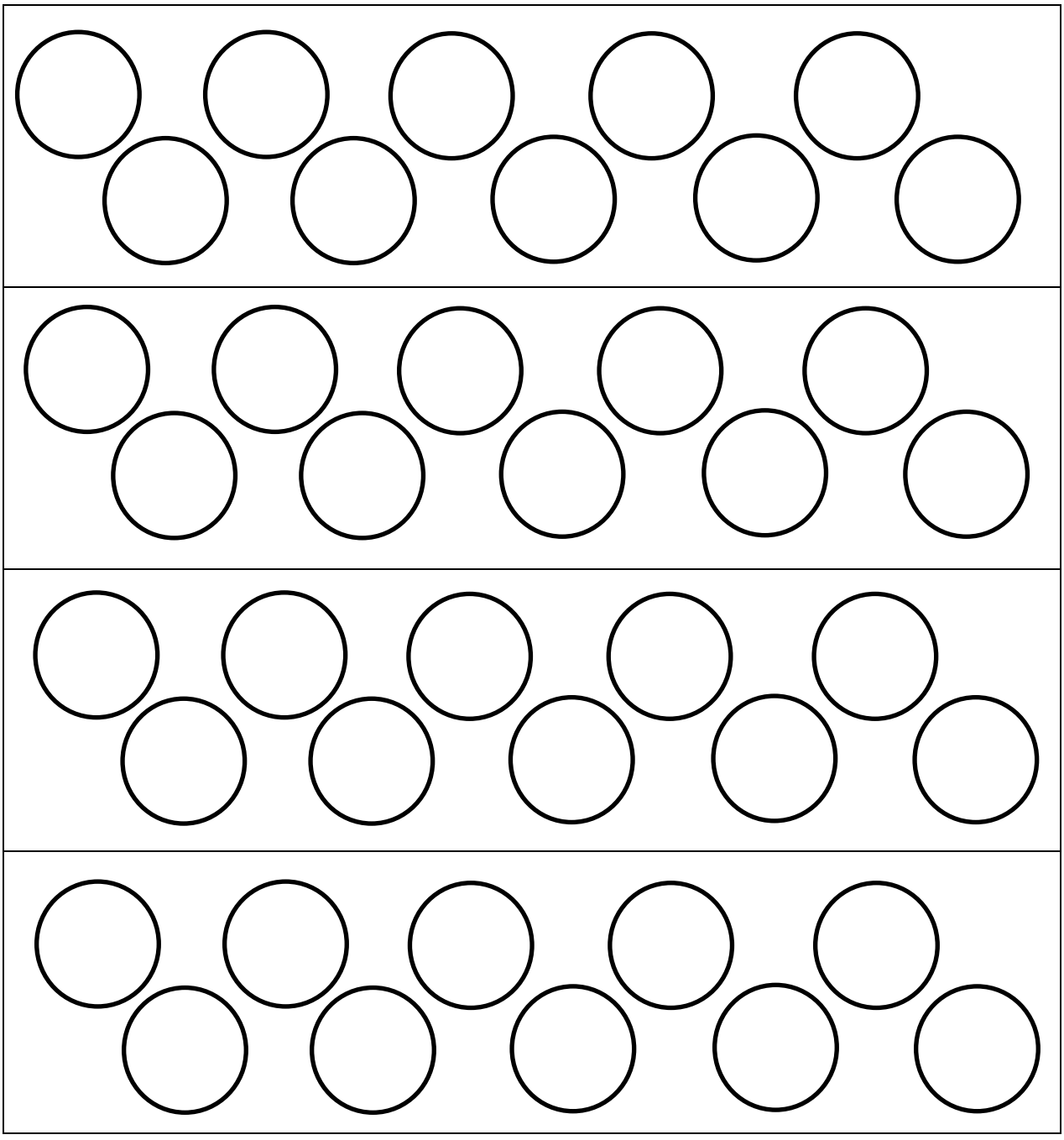
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