Who Can Jump Farther? (IT)

Overview

Students will measure a variety of objects to determine how much longer one object is than another. Then students will measure how far they can jump. Working in pairs, students will decide who jumped farthest and by how much.

Standards

Measure and estimate lengths in standard units.

2.MD.A.1 Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.

2.MD.A.4 Measure to determine how much longer one object is than another, expressing the difference in terms of a standard length unit.

Prior to the Task

Standards Preparation: The material in the chart below illustrates the standards and sample tasks that are pre-requisites for student success with this task's standards.

Grade Level Standard	The Following Standards Will Prepare Them	Items to Check for Task Readiness	Sample Remediation Items
2.MD.A.1	• 1.MD.A.2	1. http://standardstoolkit.k12.hi.us/which-tool-should-i-use-2-md-1/	• https://www.illustrativemathematics.org/illustrations/797 • https://www.illustrativemathematics.org/illustrations/688 • https://www.illustrativemathematics.org/illustrations/1086
2.MD.A.4	• 2.MD.A.3	1. http://standardstoolkit.k12.hi.us/the-longer-foot-2-md-4-2-md-1/ 2. http://standardstoolkit.k12.hi.us/how-much-longer-1/ 3. http://standardstoolkit.k12.hi.us/how-much-longer-2-2-md-4-2-md-1/	• http://standardstoolkit.k12.hi.us/measuring-your-body-2-md-1-2-md-3/ • http://standardstoolkit.k12.hi.us/measuring-around-the-class-2-md-1-2-md-3/

Task Materials

- Inch rulers (one per student)
- Meter sticks (one per pair)
- Measuring tape (one per pair)
- Masking tape (or painter's tape)
- Rolls of adding machine tape

- Pencils
- Safety scissors (one pair per student pair)
- One copy of Measurement Practice Sheet per student (three pages)
- One copy of Measurement Recording Sheet per student
- A variety of objects to measure (either around the classroom and/or in a brown paper sack)
- One copy of Who Can Jump Farther? Recording Sheet per student

Task Procedure

During this task, students will practice measuring objects to the nearest inch, foot, or meter. Students will use the measurements to determine how much longer one object is than another. Students will then apply their understanding of measurement to find which student of the pair can jump farther than the other. This task will take multiple days to complete.

Prior to the start of the task, scan the classroom to identify five objects of different lengths that students can measure using a variety of tools (see Task Materials list). Choose objects that allow students to decide which measurement tool would be best to use. Prior to the start of the task, measure the lengths of the objects so the accurate measurement is known. List the objects on the Measurement Recording Sheet (page 2) and label the objects in the classroom. Some suggested objects/lengths are paper clip, pencil-top eraser, school pencil box, the height of a chair, and the width of the classroom. Smaller objects can be placed in a bag and given to each pair. Students should have some prior experience with using a ruler or other tool to measure.

Part I

Discuss with students the different tools they can use to find the length of a variety of objects. Distribute the measurement tools listed in the Task Materials list. Have each pair of students discuss how the tools are similar and how they are different. Also ask students when they would choose one tool instead of the other. If they struggle, name two of the tools and ask when one would be better to use than the other. Give students a chance to share their thoughts with the rest of the class.

1. Give each student a copy of the Measurement Practice Sheet. Have students look at the side labeled Part A. Have students use their rulers to practice measuring the segments to the nearest inch. After students are finished measuring, have them compare their answers with their partner. *Note: Because of different printer settings, the segments may not be whole inches. If the measurement of any segment is between two whole inches, discuss with students how to decide which measurement to use.* Monitor students to make sure they are using the rulers correctly. Remind students to write the units in the box when recording the measurement.

2. After students have completed Part A, give them a copy of Part B. Explain that they will answer questions about how much longer one segment is than another by using the measurements from Part A. Using a document camera or other projection method, complete the first question on the practice sheet. Show students how they can use subtraction to find the difference between the measurement of one object and another. When students are responding be sure to use standard units of measure with the numerical response and discuss the importance of doing so. Students will then work together with their partner to answer the remaining questions. Once students complete the work, have each pair of students compare their answers and their thinking. After

students have compared their responses and thinking, bring the students together as a whole class to review the answers. Have students volunteer to explain their thinking. Using a document camera or other projection device may be helpful.

3. Give students Part C of the practice sheet. Guide students to independently select the tool they think is best to find the length of the listed objects. Students will discuss responses with their partners, state whether they agree or disagree, and explain why they chose the tool. This is an opportunity to have students explain their thinking, listen to another person's argument, and critique their argument or ask questions to better understand. Be sure to discuss with students the proper way to talk to each other to show respect when speaking and listening. If there is time, have pairs share their answers with another pair of students in the classroom. Allow the four students to discuss their choices. Bring the students together as a whole class and discuss the choices for each question.

Part II

For this part of the task, students will measure the five pre-identified and premeasured objects. Provide students with access to the same measuring tools they had in Part A.

1. Give each student a Measurement Recording Sheet, and give each pair of students the list and/or bag of objects to be measured. Have students take one object out of the bag and write the name of the objects on the recording sheet (the names of the objects may be included on the recording sheet prior to copying them for this task). Students should record the names of any objects/lengths labeled around the classroom as well.

2. Explain that each pair of students will start by deciding which measuring tool they will use to measure the object. Using the document camera, show students where to record the name of the measurement tool. Then guide the students to begin measuring the objects from the bag and/or classroom. Assign some pairs to begin with the objects located around the classroom while the remaining pairs stay at their desks to measure the smaller objects. Monitor the processes the students are using to ensure they are measuring the objects correctly. Remind students to write the units when they are recording the measurements.

3. Once all pairs have completed the measurement activity, have two pairs of students compare their work. They should discuss which measurement tool they chose and the length of each object. Encourage students to explain their thinking to their classmates. After the groups have had some time to discuss their work, bring the students together as a whole class to review and discuss the tools chosen and the measurements recorded for each item.

Part III

This part of the task should take place in the school's gym or another large open area and use the adding machine tape. Prior to beginning this part of the task, mark the starting line with a piece of masking tape. This is the line from which students will jump. If possible, put multiple pieces of tape down so more than one pair of students can complete this part of the task at the same time. This may be a great opportunity to engage the physical education teacher in a mathematical task.

1. Explain the task to the students. Tell students they will work with their partners to see who can jump farther.

2. Show students the mark on the floor where they will begin and demonstrate how to do a broad jump (stand with both feet together, swing your arms, jump, and land with both feet together). Allow some time for students

to practice jumping. Explain that once Partner A has jumped, Partner B will place one end of the adding machine tape on the starting line and unroll it until it reaches the heels of Partner A. Students should tear or cut the adding machine tape and use a piece of masking tape to secure it to the floor. Walk around to help students with this part of the task. Partner A should use a pencil to write his/her name on the piece of tape.

3. Partner B and Partner A will change roles and repeat Step 2.

4. Once both students in each pair have completed Step 2, give each student a copy of the Who Can Jump Farther? Recording Sheet. Provide each pair of students with a meter stick or measuring tape. Tell students to measure the length of the adding machine tape in inches and record the measurement on the recording sheet. Remind students to use the correct units when recording the measurement. Monitor students to be sure they are using the measurement tool correctly and recording the measurement in the correct place.

5. After students have measured the adding machine tape, have students figure out who jumped farther. Students also need to figure out how many more inches one person jumped than the other. Remind students that they can use subtraction to help find this answer. Model for students how they would complete the sentence given on the recording sheet. After all students have completed the recording sheet, bring the students together as a whole class. Have pairs of students share the lengths of their jumps and how they determined the difference in inches between the jumps. Discuss different strategies used to find the differences.

Task Notes

Having students measure the objects in only centimeters and meters is a possible modification to the task. Also, each part of this task can be administered independently.

Part III of this task was adapted from ***http://standardstoolkit.k12.hi.us/how-far-can-you-jump-2-md-4-2-md-1-2-oa-1/***

Measurement Practice Sheet

Part A

Measure each of the following segments to the nearest inch. Write your answer in the box.

1)

2)

3)

4)

5)

Measurement Practice Sheet

Part B

Answer the following questions. Use the segments and measurements in Part A to help you. For each question, show your work to find your answer.

1) How many inches longer is segment 1 than segment 2?

2) How many inches longer is segment 3 than segment 4?

3) How many inches longer is segment 5 than segment 4?

4) How many inches longer is segment 3 than segment 1?

5) How many inches longer is segment 3 than segment 2?

Measurement Practice Sheet

Part C

Choose the best tool for measuring each object in the questions below.

1) Which tool would you use to measure how tall a chair is?

ruler meter stick measuring tape

2) Which tool would you use to measure the length of a book?

ruler meter stick measuring tape

3) Which tool would you use to measure the width of the desk?

ruler meter stick measuring tape

4) Which tool would you use to measure the height of the door?

ruler meter stick measuring tape

5) Which tool would you use to measure the length of a paper?

ruler meter stick measuring tape

Measurement Recording Sheet

Measure the objects in the bag. Measure the objects labeled in the classroom.

You can measure the objects using inches, feet, or meters.

Object	Which Unit Is Best? (inches, feet, or meters)	Measurement

Who Can Jump Farther? Recording Sheet

Measure the length of each partner's jump in inches. Record the length in the box next to their name.

Name	Measurement of Jump
Partner A:	
Partner B:	

Who jumped farther? Complete the sentence below:

_____ jumped _____ inches farther than

_____.

Draw a picture or use a number sentence to show your work to find the number of inches.

Exploring Three-Digit Numbers (IT)

Overview

Students will practice use base ten blocks to represent three-digit numbers in different ways to demonstrate an understanding of place value.

Standards

Understand place value.

2.NBT.A.1 Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:

a. 100 can be thought of as a bundle of 10 tens—called a "hundred."

b. The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).

Prior to the Task

Standards Preparation: The material in the chart below illustrates the standards and sample tasks that are pre-requisites for student success with this task's standards.

Grade Level Standard	The Following Standards Will Prepare Them	Items to Check for Task Readiness	Sample Remediation Items
2.NBT.A.1	• 1.NBT.B.2 • 2.NBT.A.2	1. https://www.illustrativemathematics.org/illustrations/97 2. https://www.illustrativemathematics.org/illustrations/156 3. https://www.illustrativemathematics.org/illustrations/144 4. https://www.illustrativemathematics.org/illustrations/192 5. https://www.illustrativemathematics.org/illustrations/71	• https://www.illustrativemathematics.org/illustrations/987 • https://www.illustrativemathematics.org/illustrations/1309

Task Materials

- Part A Numeral Cards (one set per pair of students)
- Part A Base Ten Cards (one set per pair of students)
- Document camera (or other means of projection)
- Base Ten blocks (one set per pair of students)
- Part B Recording Sheet (one per student)
- Part C Recording Sheet (one per student)

Task Procedure

During this task, students will use base ten blocks to model three-digit numbers in different ways. Students will demonstrate an understanding of composing and decomposing of a hundred and a ten. By the end of the task, students should be able to recognize that, for example, 24 tens and 3 ones = 243.

If needed, sets of base ten blocks can be made by copying the template in this task on cardstock and laminating the copies before cutting out the flats, rods, and units. Each pair of students should only need the blocks made from two copies of the template.

Prior to the task, copy the numeral cards and base ten cards for Part A on cardstock. Laminate the cards before cutting them to make them more durable.

Begin by reviewing place value with two-digit numbers. Then show students the base ten blocks and review the value of the flat, rod, and unit. Show students two flats, five rods, and six units using a document camera (or other projection device). Ask, "What number is represented with these blocks?" Students should respond "256." Then show students two flats, four rods, and 16 units. Ask, "What number is represented with these blocks now?" Students should again respond "256." Have students share their reasoning with the class. Then explain that in the task, students will use base ten blocks to help them represent three-digit numbers in different ways.

Part A

Organize students to work in pairs. Give each pair of students a set of Part A Numeral Cards and a set of Part A Base Ten Cards. Say, "You will work as a team. Take turns matching each of the base ten cards to the correct numeral card. Each time you make a match, explain your thinking to your partner. If your partner disagrees with your match, ask him/her to explain why."

Monitor groups to listen to the way students are explaining their thinking when they match the cards. If you notice that students are matching cards based on the hundreds place only, ask them to show you how they are keeping track of all of the blocks that are to be counted.

Part B

As students finish matching the card sets in part A and can explain their work, hand out the base ten blocks (one set per pair of students) and the Part B Recording Sheet (one for each student). Do not collect the card sets from part A. Say, "In this part of the task, you will continue to work as a team. You will use the set of base ten to build the number given on the recording sheet. Then you will write how many hundreds, tens, and ones you used to build the number. You will build the same number in two different ways. Let's complete 248 together."

Using the document camera, model 248 with the base ten blocks. Ask students to tell you which pieces you should use to represent the number. Ask students how they know the blocks that have been chosen represent the number 248. Once the class agrees that the number is correct, record the representation in the "First Way" column using the digits and the place value, e.g., 2 hundreds, 4 tens, and 8 ones. Then ask students, "How can we show 248 a different way using the base ten blocks?" Remind students that they can decompose a ten or a hundred. Model the decomposition and record the second representation in the "Second Way" column. After modeling the first problem, allow students to work together to complete the rest of the recording sheet.

Remind students to take turns building each of the given numerals. Students should explain their thinking to their partner. If the partner disagrees with the representation, students should ask their partner to explain why they disagree.

Monitor the groups to be sure they are creating two different representations and recording their work correctly. You may have to ask students to explain how they are keeping track of the total number of blocks to be sure they have counted correctly. As you monitor their work, listen to their discussions and guide them to look for patterns and generalizations.

Part C

When students have completed the recording sheet for Part B, collect the base ten blocks and hand out the Part C Recording Sheet to each student. Explain that students will work independently for this portion of the task. Students will match the given base ten numeral in the left column to the correct representation in the right column. Tell students that when they are finished they will compare their answers with their partner. Partners who disagree should take turns explaining their thinking to each other.

After all three parts of the task have been completed, bring students back together as a whole class. Conclude the lesson by discussing and generalizing what has been learned. Allow students to share some of their work samples and show how they built the numbers in Part B. Have students explain the process they used to match the numbers to the representations in Part C.

Task Notes

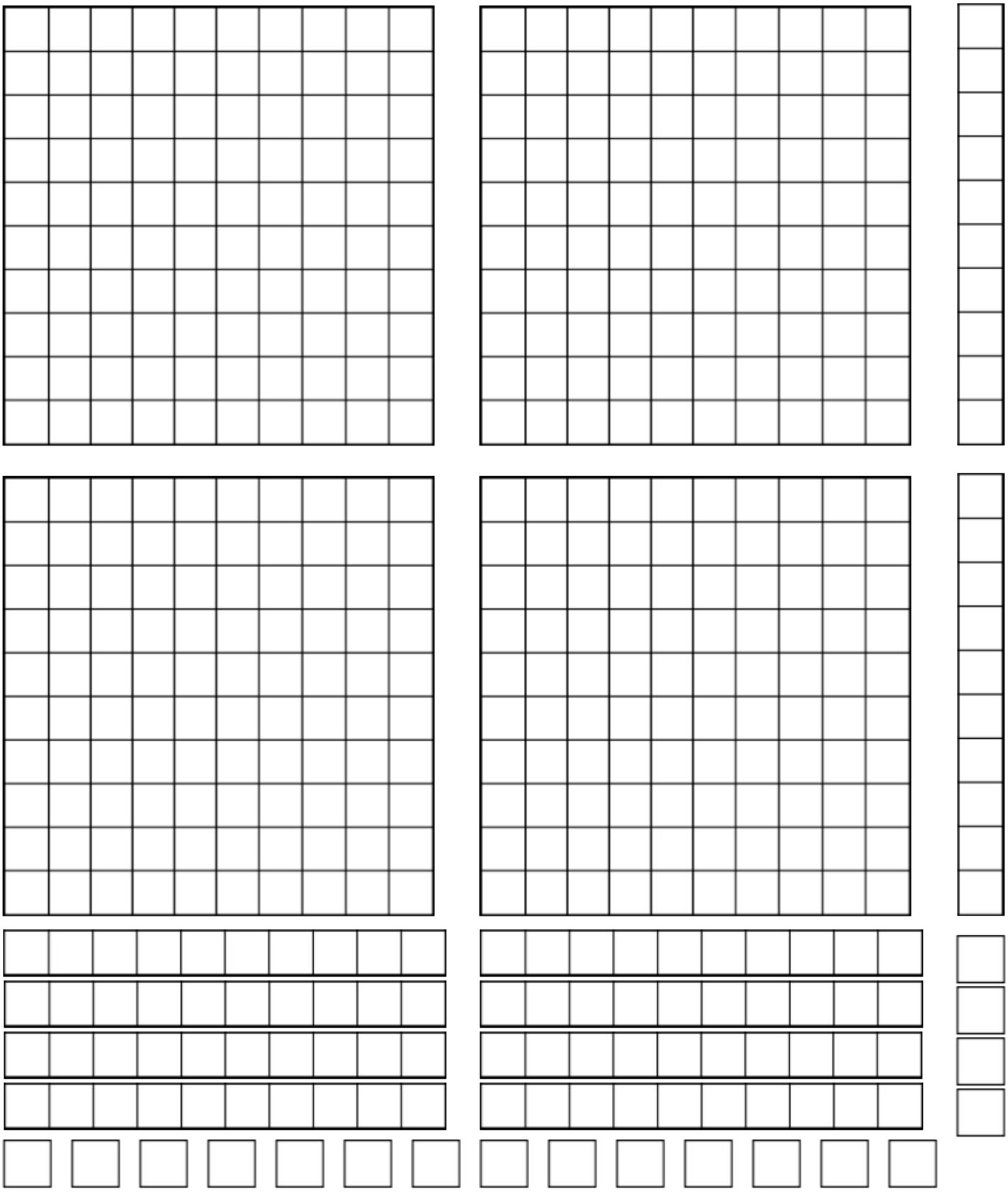
This task may take more than one class period to complete. As students progress throughout the year, the task can be repeated with larger numbers (no greater than 1,000).

It is important that students recognize different representations of base ten numerals by composing and decomposing hundreds and tens. This establishes the foundation for the standard algorithm for addition and subtraction of multi-digit numbers.

As an extension, if students complete Part B while other students are still working, challenge the students to find a third way to represent the numbers.

Parts of this task have been adapted from ***http://www.debbiewaggoner.com/uploads/1/2/9/9/12998469/2nd_grade_place_value_whats_the_value_of_place.pdf****.*

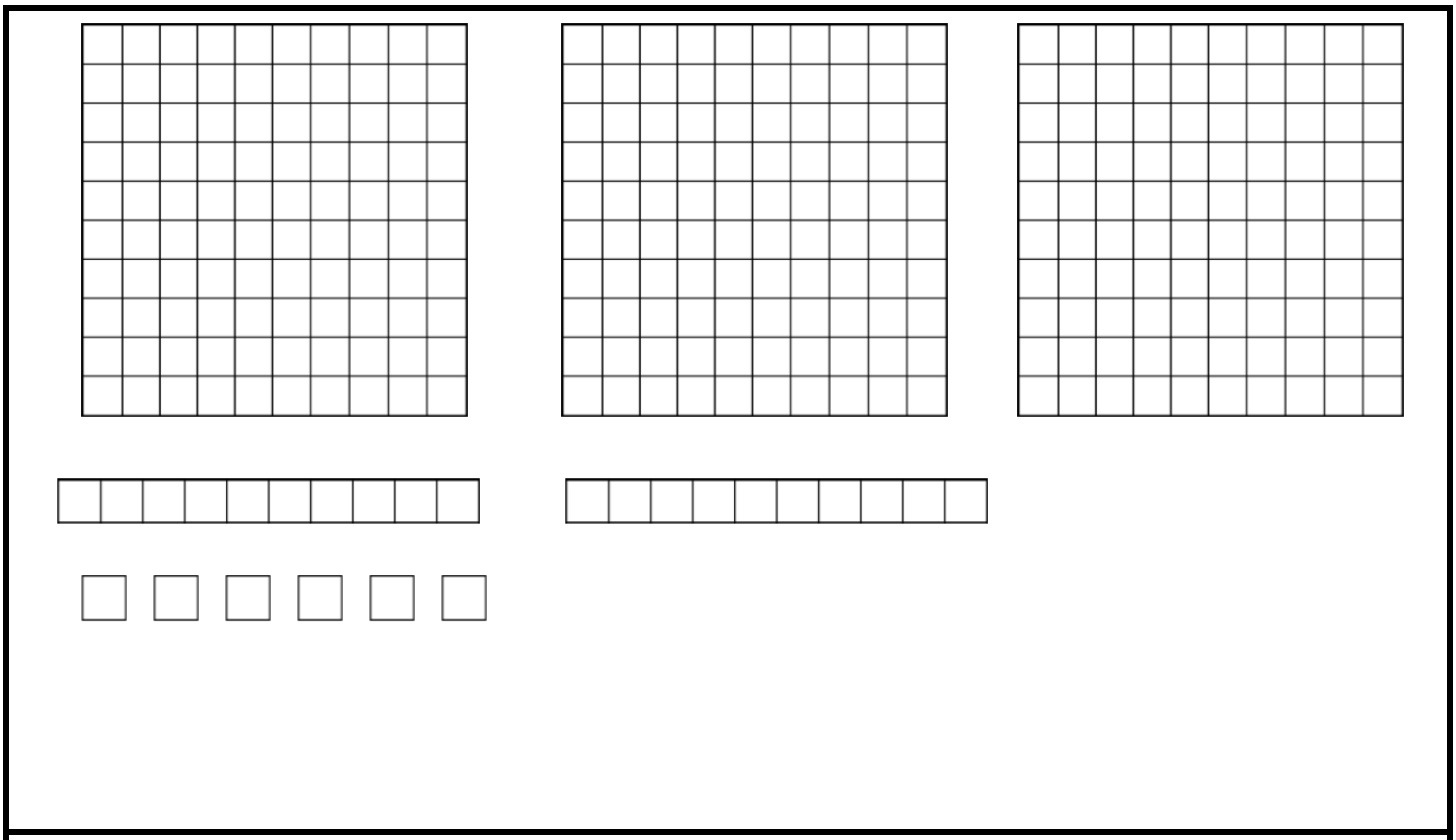
Base Ten Blocks

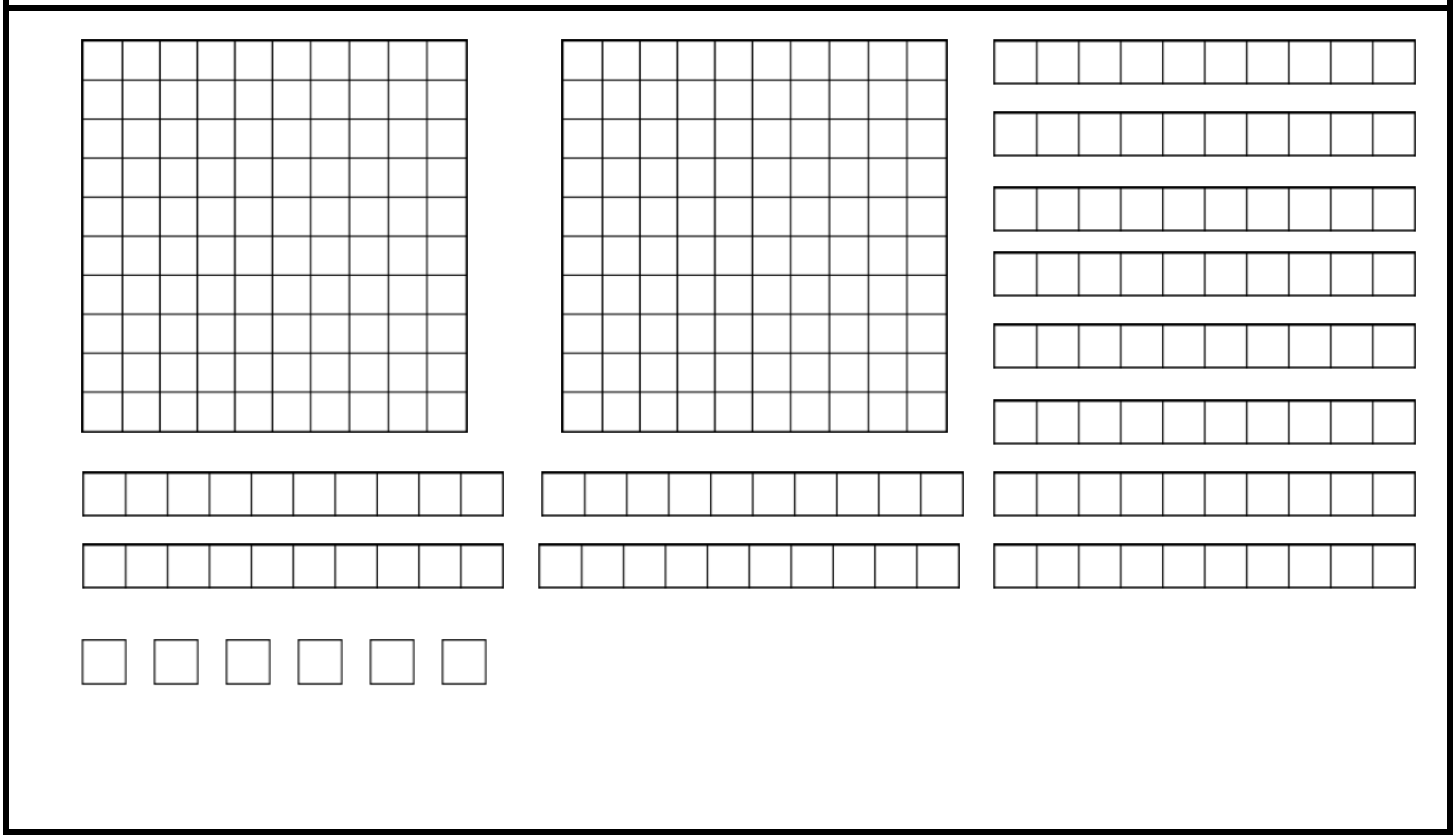


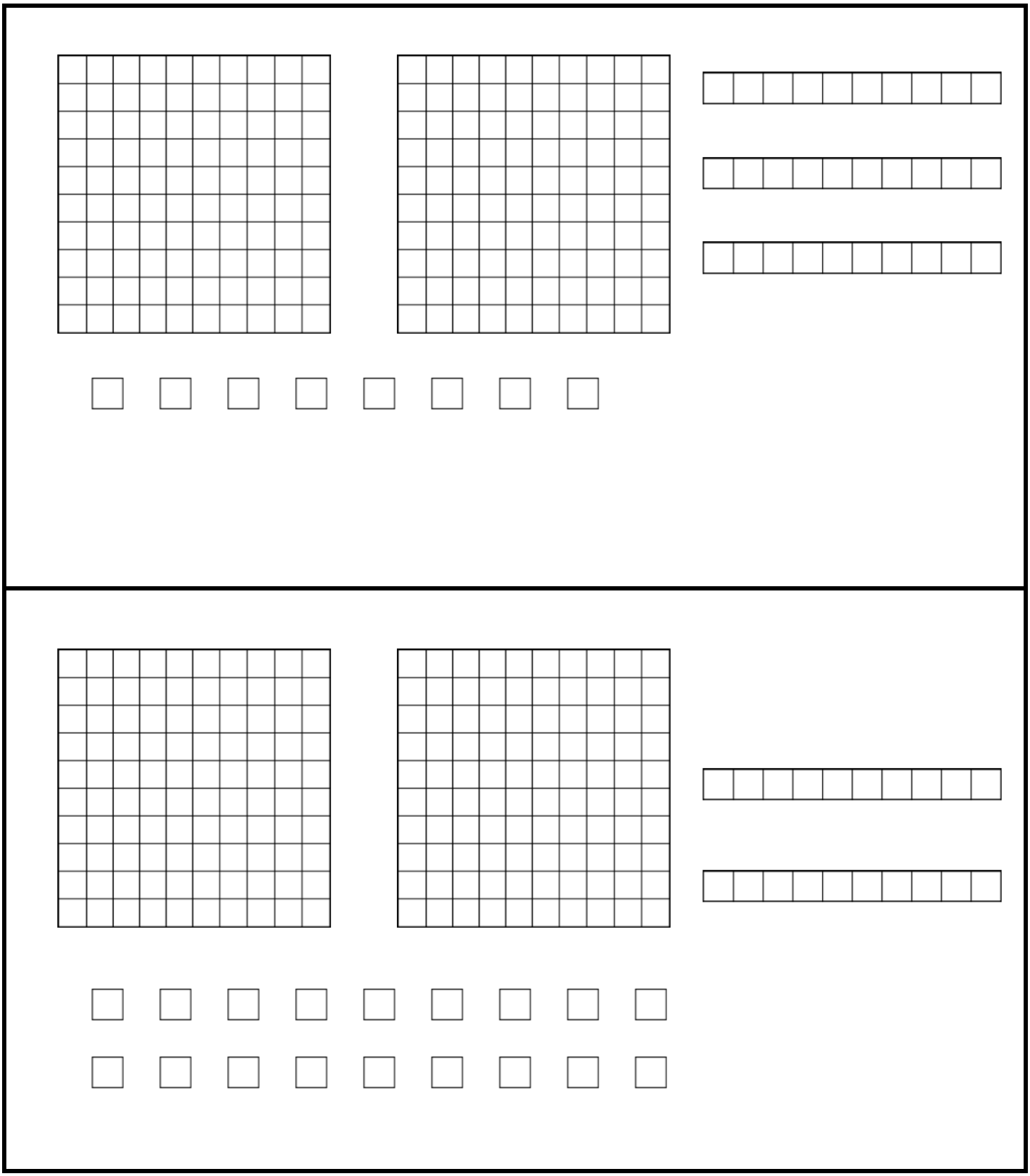
Part A Numeral Cards

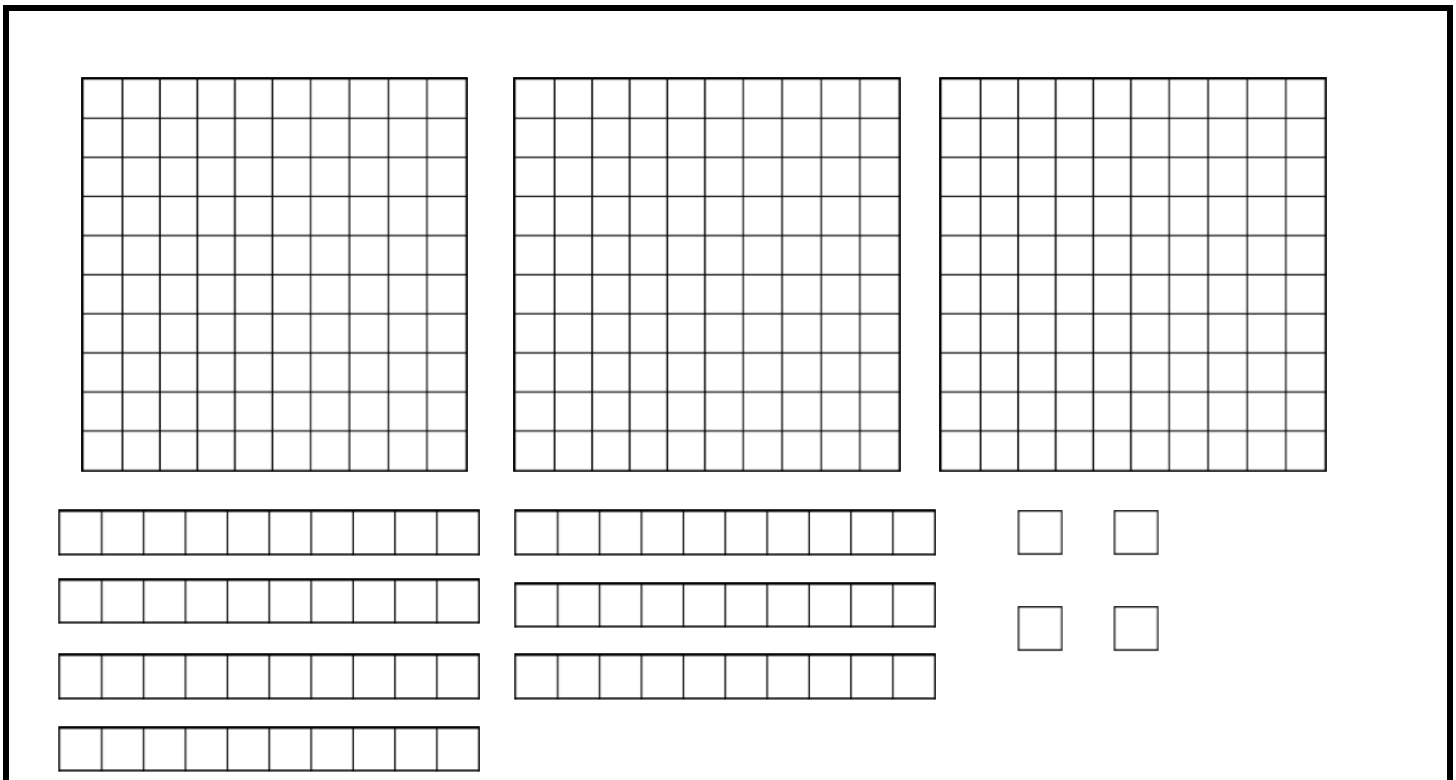
326	238
374	423

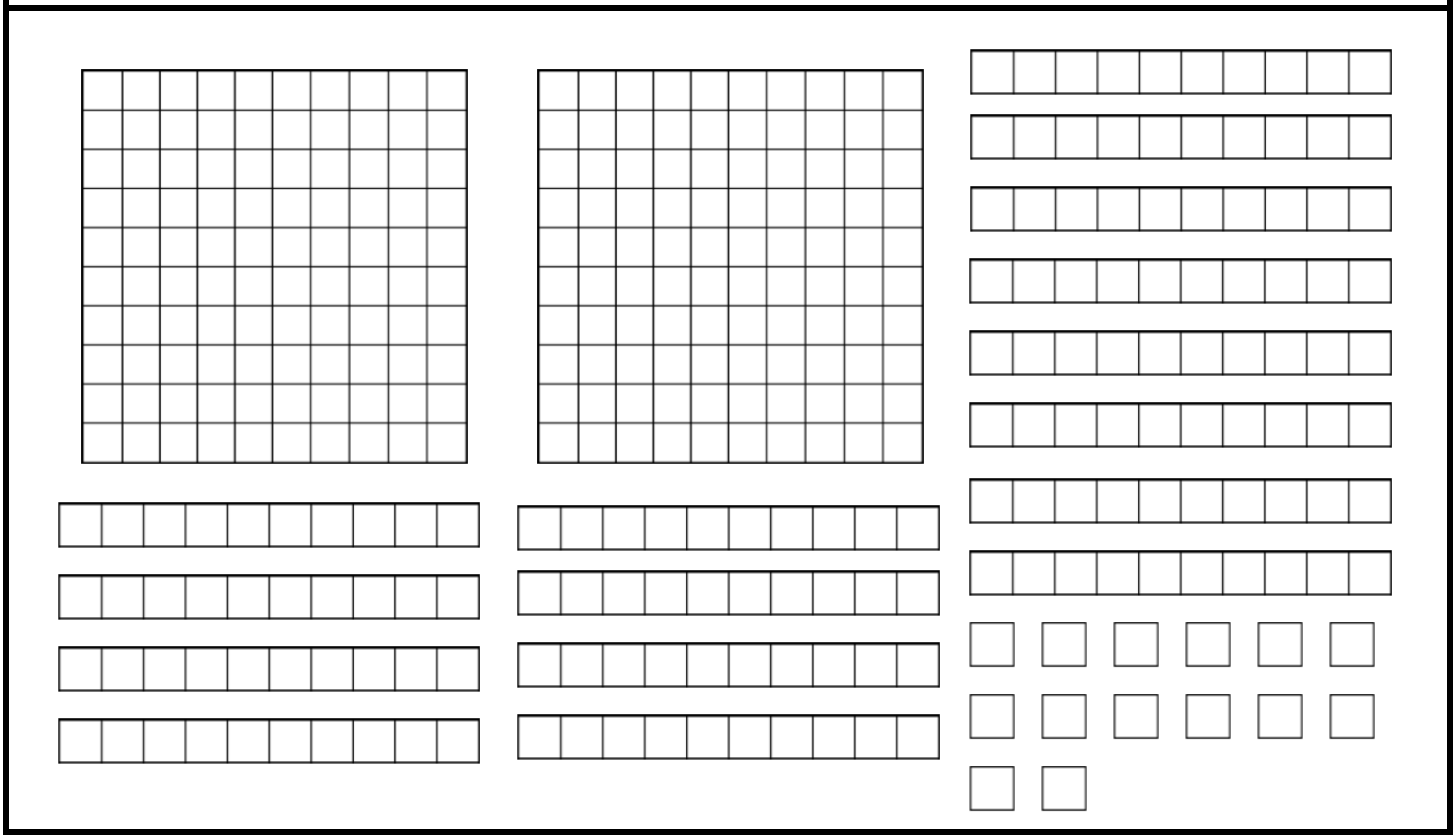
Part A Base Ten Cards

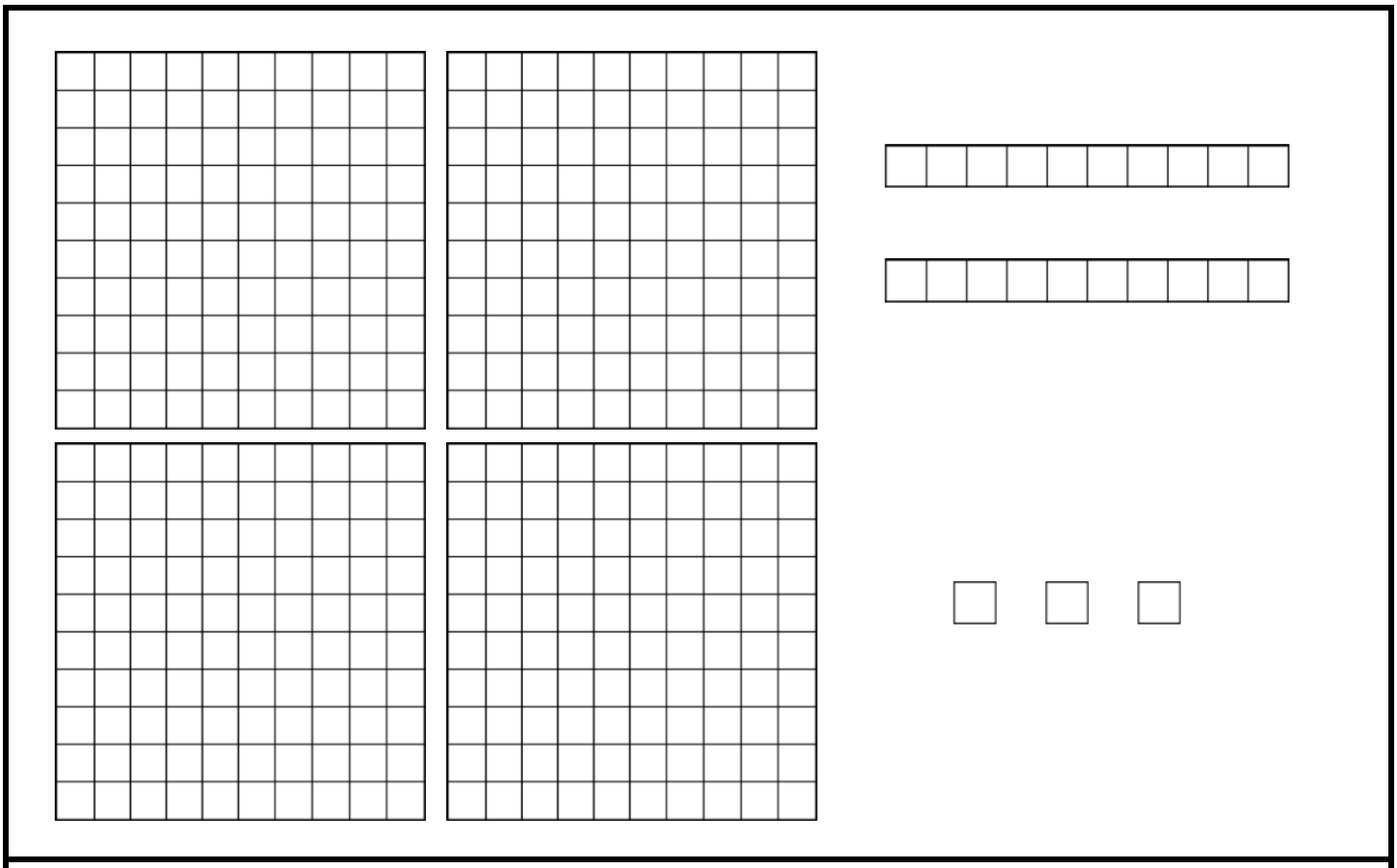


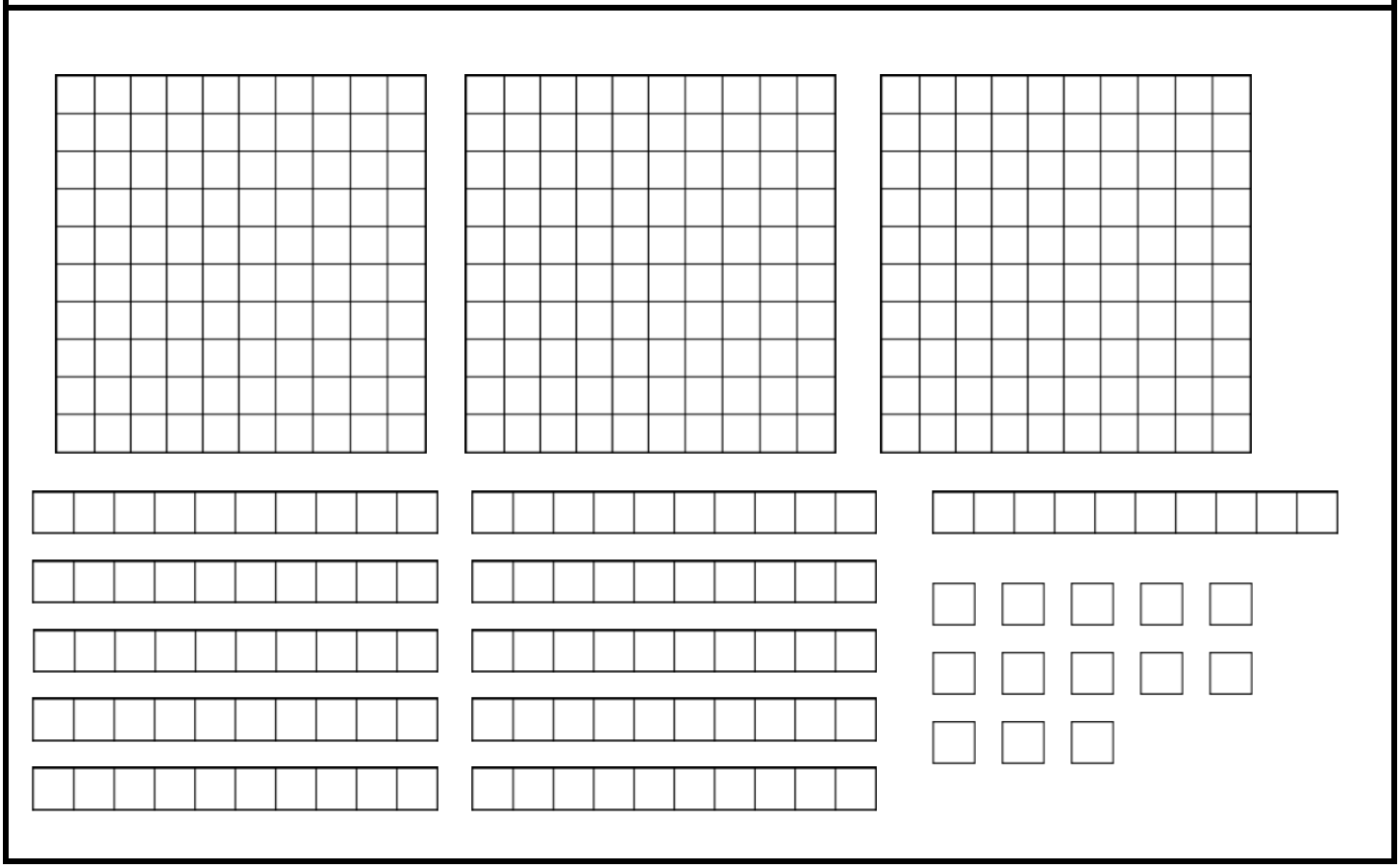












Part B Recording Sheet

Use the base ten blocks to build the given number in two different ways. Record each different way in the chart.

Numeral	First Way	Second Way
248		
562		
477		
304		
222		

Part C Recording Sheet

Match the base ten numerals on the left with the correct representation on the right. Write the letter of the correct choice in the space provided.

_____ 1) 329	A. 4 hundreds + 9 ones
_____ 2) 812	B. 4 hundreds + 17 tens + 2 ones
_____ 3) 409	C. 6 hundreds + 5 tens
_____ 4) 650	D. 3 hundreds + 29 ones
_____ 5) 572	E. 7 hundreds + 10 tens + 12 ones
_____ 6) 418	F. 4 hundreds + 1 ten + 8 ones

Adding Two-Digit Numbers (IT)

Overview

Students will practice adding two-digit numbers using manipulatives as they visit different stations.

Standards

Use place value understanding and properties of operations to add and subtract.

2.NBT.B.6 Add up to 4 two-digit numbers using strategies based on place value and properties of operations.

2.NBT.B.7 Add and subtract within 1,000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding and subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.

Prior to the Task

Standards Preparation: The material in the chart below illustrates the standards and sample tasks that are pre-requisites for student success with this task's standards.

Grade Level Standard	The Following Standards Will Prepare Them	Items to Check for Task Readiness	Sample Remediation Items
2.NBT.B.6	• 2.NBT.A.1 • 2.NBT.B.7	1. https://www.illustrativemathematics.org/illustrations/755	• https://www.illustrativemathematics.org/illustrations/97 • https://www.illustrativemathematics.org/illustrations/156 • https://www.illustrativemathematics.org/illustrations/144 https://www.illustrativemathematics.org/illustrations/192 • https://www.illustrativemathematics.org/illustrations/147 • https://www.illustrativemathematics.org/illustrations/71
2.NBT.B.7	• 2.NBT.A.1	1. https://www.illustrativemathematics.org/illustrations/1063 2. https://www.illustrativemathematics.org/illustrations/1628	

Task Materials

- One copy of Student Example Worksheet per student
- Zipper bag of base ten blocks for each group
- Document camera (or other means of projection)
- One set of numeral cards 1-9
- Spinner with 0-9 on each section (copy on cardstock and laminate for durability)
- Two 6-sided number cubes (one cube has numbers 1-6; second cube has numbers 4-9)
- Directions for each station
- One copy of student worksheet for each student for each station
- Timer
- Pencils

Task Procedure

During this task students will practice adding up to 4 two-digit numbers. Students will use numeral cards, number cubes, or a spinner to create two-digit numbers. Then students will add the numbers created for each round of each activity. Students will use base ten blocks to model the addition and relate the model to a written method of recording the addition. Students should be familiar with adding 2 two-digit numbers prior to working on this task.

If necessary, provide students with time to practice adding 2 two-digit numbers. Also review the base ten blocks that will be used in this task.

This task will take multiple days to complete.

Part A

Explain to students that they will be adding two-digit numbers. Engage the students in a discussion about two-digit numbers. Have students identify the place value for each digit of a two-digit number. Have students identify examples of two-digit numbers (i.e., 12 eggs, 25 pennies, etc.). After the discussion, model the three stations for the whole class.

1. Have the students work in groups of four. Give each student a Student Example Worksheet. Give each group a set of base ten blocks.

2. Say, “At the Pulling Cards station, you will use the set of numeral cards to create 4 two-digit numbers. Then you will add the four numbers.” Have a volunteer come up to pull two cards. Ask the students to name a two-digit number that could be written using the two numerals. Write the two numbers on the board. Discuss with students whether the two numbers are the same (e.g., the numbers pulled are 2 and 3; students can create 23 or 32). Have the class decide which number they want to use and write the number on the Student Example Worksheet. Use the document camera (or other means of projection) so students can see how and where you are recording the response. Have students write the number on their papers as well.

3. Next, have another student pull two new cards. Have the class decide on a number using the two selected numerals and write the number on the worksheet. Align the numbers vertically. Then ask two more volunteers to pull two more cards each. Have students decide on the two additional two-digit numbers and write them on the worksheet.

4. Say, “We are going to add these four numbers.” Ask students to discuss with their group how they would begin trying to add the numbers. After allowing students time to discuss, have some students share their thoughts with the class.

5. Have students work as a group and use their base ten blocks to model the total of the four numbers. Have a student volunteer model the total using the document camera.

6. Ask, “What is the total number of ones?” Have groups compare their work with other groups. Then ask, “Can we compose any groups of ten with the total of ones?” Guide students to trade ten units for one rod until there are less than ten units left. Use the document camera to model the actions. Guide students to record their work with the total number of ones by writing the remaining number of units under the ones digits and the number of rods that were created in the box above the tens digits.

7. Next ask, “What is the total number of tens?” Have groups compare their work with other groups. Remind students to count the tens that were regrouped in the total number of tens. Then ask, “Can we compose any groups of hundreds with the total number of tens?” Guide students to trade ten rods for one flat until there are less than ten rods left. Use the document camera to model the actions. Guide students to record their work with the total number of tens by writing the remaining number of rods under the ones digits and the number of flats that were created to the left of the tens digit. Discuss with students how the final number written represents the total of the four numbers.

8. Repeat Steps 2 through 7 two more times to complete Examples 2 and 3 on the worksheet.

Part B

This will likely be day two of the task. Students will use what they learned in Part A to complete the activities they will do in Part B. Explain that students will work in the same groups as they did in Part A and will rotate through three different stations. Set up stations in the classroom prior to lessons. The groups will visit each station for 10 minutes.

Set up three stations as follows:

Station A: Pull and Add

Materials: This station will need a deck of numeral cards and a set of base ten blocks. Each student will need a Pull and Play Student Handout.

Student Directions: Working in groups, each student will take a turn pulling a card. The group or pair will create 4 two-digit numbers. Each student will write the numbers on their handout and work individually to add the numbers. Once each group member has finished, the students will compare answers and discuss any answers that are not the same. While working, the students can use the base ten blocks as needed to model the problem. The students will continue working until the timer goes off. The students will collect their handout and move to the next station.

Station B: Roll and Add

Materials: This station will need two number cubes and base ten blocks. One of the number cubes should have the numbers 1-6. The second number cube should have the numbers 4-9. If necessary, write the numbers 4-9 on

white stickers and cover the six sides of one of the number cubes. Each student will need a Roll and Add Student Handout.

Student Directions: Working in groups, each student will take a turn rolling the number cubes. The group will create 4 two-digit numbers. Each student will write the numbers on his or her handout and work individually to add the numbers. Once each group member has finished, the students will compare answers and discuss any answers that are not the same. While working, the students can use the base ten blocks as needed to model the problem. The students will continue working until the timer goes off. Then the students will stand, collect their student work page, and move to the next station.

Station C: **Spin and Add**

Materials: This station will need a spinner and base ten blocks. Each student will need a Spin and Add Student Handout.

Student Directions: Working in groups, each student will take a turn spinning the spinner twice. The group will create 4 two-digit numbers. Each student will write the numbers on his or her handout and work individually to add the numbers. Once each group member has finished, the students will compare answers and discuss any answers that are not the same. While working, the students can use the base ten blocks as needed to model the problem. The students will continue working until the timer goes off. Then the students will stand, collect their student work page, and move to the next station.

As students are working, walk around to check for understanding. Pay attention to the way students are aligning the problems.

Part C

Once the students have had a chance to visit all stations, have them return to their seats. Call on a volunteer to share one of the problems their group created by writing it on the board. Allow the student to lead the class through discussion to help him/her add the numbers. Close the lesson by leading a discussion about real-life events that would require you to add two-digit numbers.

Task Notes

In this task, students will make a connection between adding using place value and a written method. However, second-grade students are not required to master the standard algorithm for adding numbers. The focus is on the student's understanding of place value and how to use place value to add two-digit numbers. This task can be modified by removing the column addition and having students draw pictorial representations of the base ten blocks to represent their understanding of addition. Students can also record their work using number sentences showing how they can add tens to tens and ones to ones.

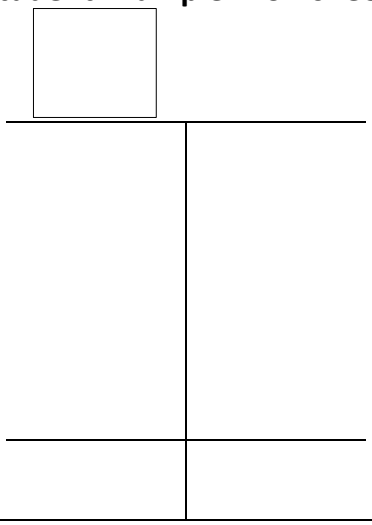
This task focuses on having students add all four numbers at one time. Modify the task by having students add two of the four numbers first, then adding the third, and finally adding the fourth to highlight the properties of addition (namely the commutative and associative properties). Students do not have to know the names of the properties.

The activities in this task can also be modified to have students learn to add 2 three-digit numbers within 1,000, which would focus only on 2.NBT.B.7.

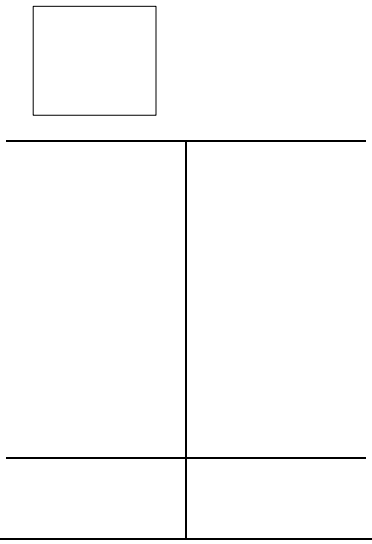
Name:_____ **Date:**_____

Student Example Worksheet

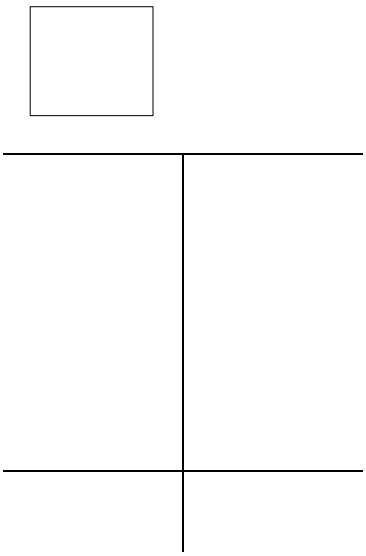
Example 1:



Example 2:



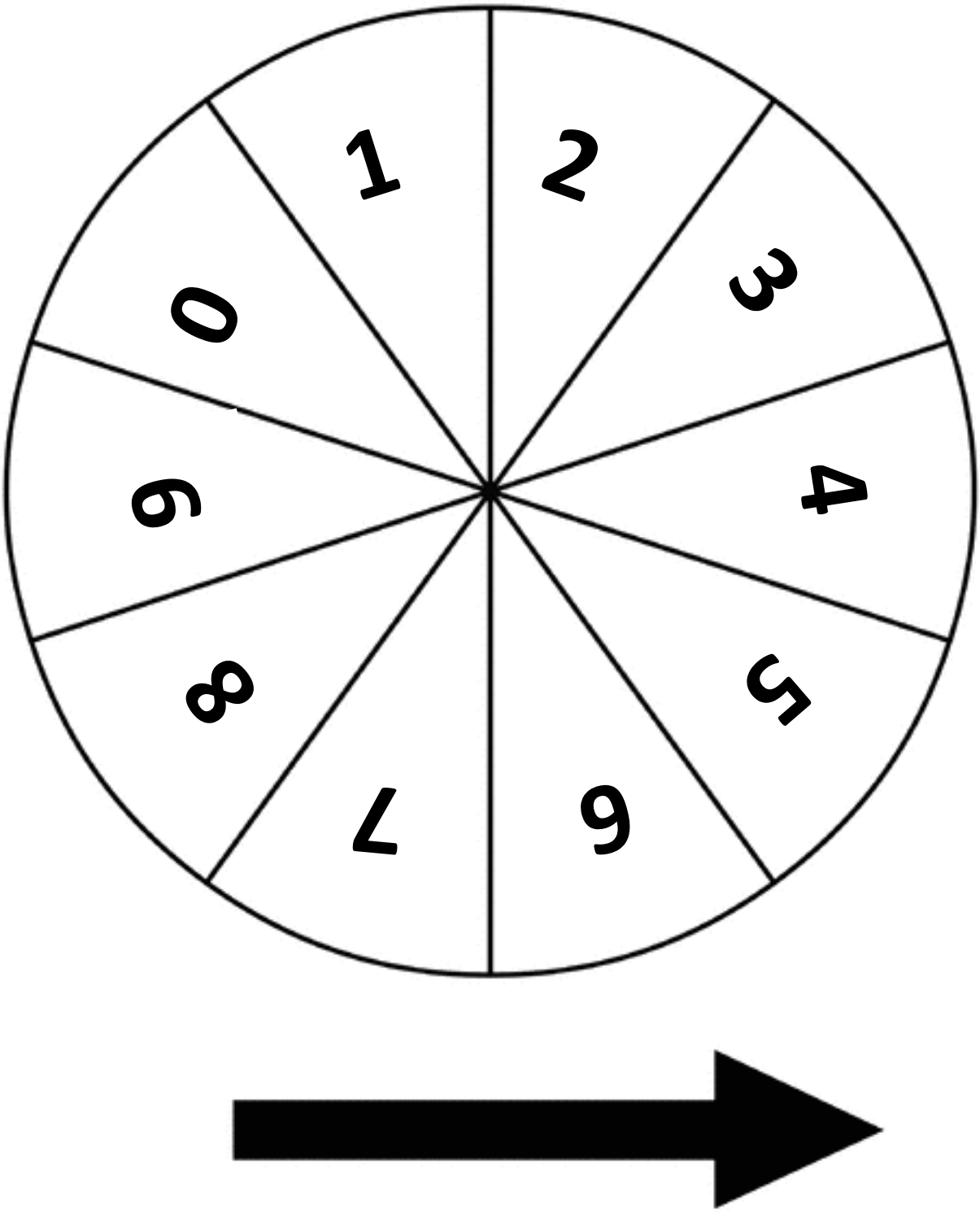
Example 3:



Numeral Cards

1	2	3
4	5	6
7	8	9

Spinner



Directions for Pull and Add

1. Place all cards in deck face down.
2. The first group member pulls two cards and creates a two-digit number.
3. Each member will write the two-digit number on the handout.
4. Each member will take turns pulling cards and creating a two-digit number until all four group members have created a number.
5. Work on your own to add the four numbers. You may use the base ten blocks to help.
6. After everyone is finished, compare your work to see if everyone has the same answer. Work together to find the correct answer if someone has a different answer.
7. Once all team members have the correct answer, begin creating a new set of four numbers and continue working until time is up.

Directions for Roll and Add

1. The first group member will roll the two number cubes and create a two-digit number.
2. Each member will write the two-digit number on the handout.
3. Each member will take turns rolling the number cubes and creating a two-digit number until all four group members have created a number.
4. Work on your own to add the four numbers. You may use the base ten blocks to help.
5. After everyone is finished, compare your work to see if everyone has the same answer. Work together to find the correct answer if someone has a different answer.
6. Once all team members have the correct answer, begin creating a new set of four numbers and continue working until time is up.

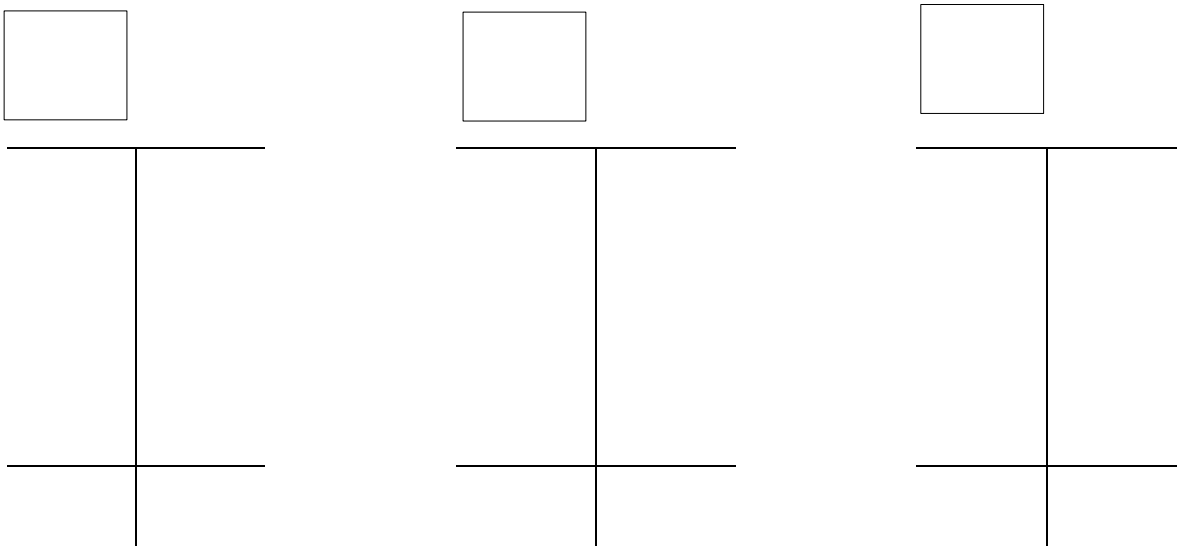
Directions for Spin and Add

1. Place the spinner in the middle of all four members.
2. The first group member will spin the spinner twice and create a two-digit number.
3. Each member will write the two-digit number on the handout.
4. Each member will take turns spinning the spinner two times and creating a two-digit number until all four group members have created a number.
5. Work on your own to add the four numbers. You may use the base ten blocks to help.
6. After everyone is finished, compare your work to see if everyone has the same answer. Work together to find the correct answer if someone has a different answer.
7. Once all team members have the correct answer, begin creating a new set of four numbers and continue working until time is up.

Pull and Add Handout

Name: _____

Directions: As a group, create 4 two-digit numbers by pulling cards from the deck. Then add the four numbers on your own. Use the base ten blocks to help if needed. After you add the numbers, check your work with the members of your group.

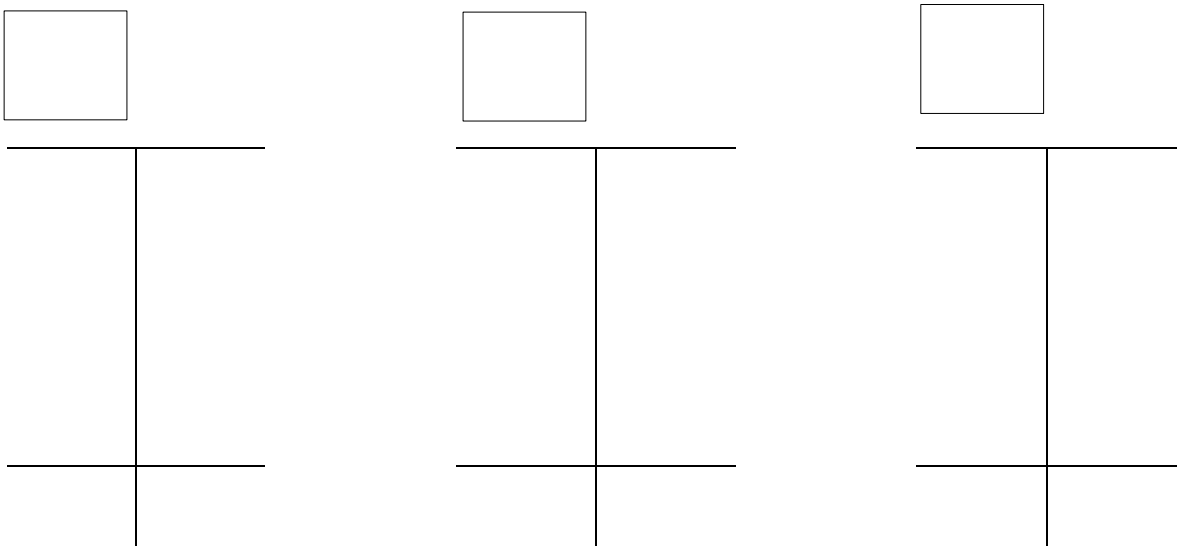


Challenge: Create a problem with 5 two-digit numbers. Add the five numbers.

Roll and Add Handout

Name: _____

Directions: As a group, create 4 two-digit numbers by rolling the number cubes. Then add the four numbers on your own. Use the base ten blocks to help if needed. After you add the numbers, check your work with the members of your group.

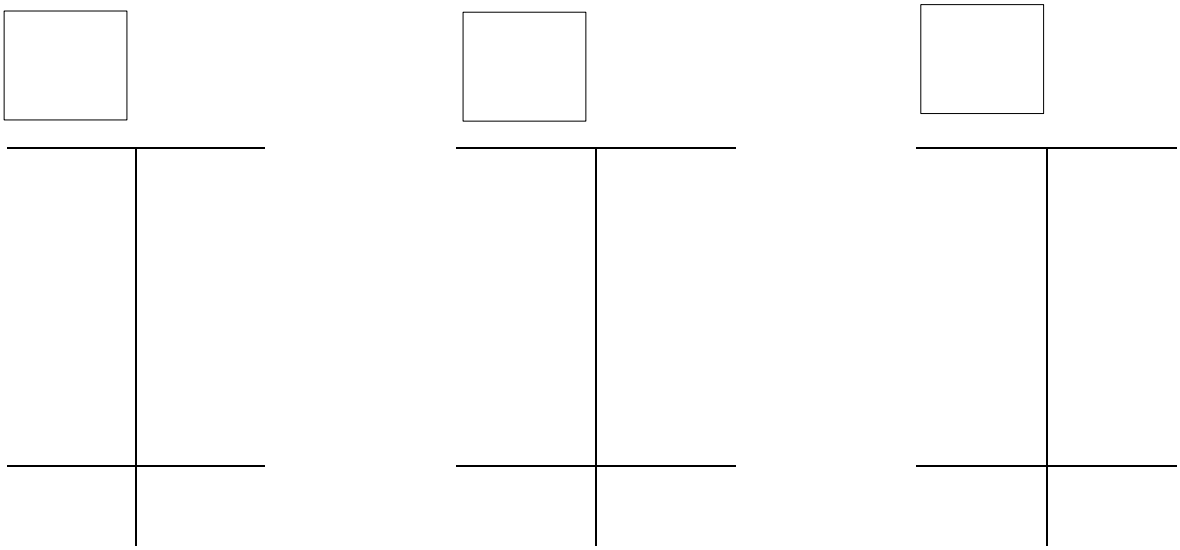


Challenge: Create a problem with 5 two-digit numbers. Add the five numbers.

Spin and Add Handout

Name: _____

Directions: As a group, create 4 two-digit numbers by spinning the spinner. Then add the four numbers on your own. Use the base ten blocks to help if needed. After you add the numbers, check your work with the members of your group.



Challenge: Create a problem with 5 two-digit numbers. Add the five numbers.

School Bake Sale (IT)

Overview

Students will apply their understandings of addition and subtraction, and work in groups to make sure they have all of the sweets needed for the School Bake Sale. Students will keep track of their work on their recording sheets.

Standards

Use place value understanding and properties of operations to add and subtract.

2.NBT.B.5 Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.

Prior to the Task

Standards Preparation: The material in the chart below illustrates the standards and sample tasks that are pre-requisites for student success with this task's standards.

Grade Level Standard	The Following Standards Will Prepare Them	Items to Check for Task Readiness	Sample Remediation Items
2.NBT.B.5	• 1.NBT.C.4 • 1.NBT.C.5 • 1.NBT.C.6 • 2.OA.B.2	1. https://www.illustrativemathematics.org/illustrations/1071 2. https://www.illustrativemathematics.org/illustrations/1309 3. https://www.illustrativemathematics.org/illustrations/1292	• https://www.illustrativemathematics.org/illustrations/1394 • https://www.illustrativemathematics.org/illustrations/1396 • http://standardstoolkit.k12.hi.us/going-to-the-store-1-nbt-11-nbt-41-nbt-6/ • http://standardstoolkit.k12.hi.us/how-many-pencils-1-oa-11-nbt-11-nbt-6/ • http://standardstoolkit.k12.hi.us/how-many-10-10-1-nbt-5/ • http://standardstoolkit.k12.hi.us/four-in-a-row-1-nbt-11-nbt-21-nbt-5/ • http://standardstoolkit.k12.hi.us/scoops-1-nbt-11-nbt-4/

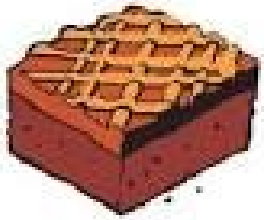
Task Materials

- Group lists of bake sale items (one copy for every student)
- Small boxes (one per group)
- Copies of bake sale items (four pages—13 copies of each page)
- Document camera (or other means of projection)
- Pencils
- Tickets
- Bake Sale Recording Sheet (one per group)

Task Setup

1. Determine the maximum quantity of each item (cookies, brownies, cupcakes, and pies) that the class will provide for the bake sale. For example, the class may bring 100 cookies, 75 brownies, 84 cupcakes, and 65 pies. The range of the total for each item should be 60 to 100 (do not make each total 100, nor should each total be a multiple of 10). Keep this total in mind when creating the lists and boxes for each group.

2. Use the Group List Template to create a list of items for each group. This list will tell the group how many of each bake sale item they will need to bring to the bake sale (see the example below). Each group will be asked to bring a different number of each item. For example, Group 1 is asked to bring 21 cookies, Group 2 might be asked to bring 20, Group 3 would be asked to bring 19, and so on. Be sure that the **total** number of each item, when combined from all groups, is between 60 and 100.

What to Bring		We Have	What Do We Need to Do?
21			**Bake** **Trade**
15			**Bake** **Trade**
19			**Bake** **Trade**

14			**Bake** **Trade**

3. Create a box for each group that has some number of each of the bake sale items inside. Each group should have a different number of each item in their box. For each group, at least one item should have too many in the box. Make 13 copies of each page of the Bake Sale Pictures to sufficiently "stock the kitchen".

4. Set up the classroom so there is an area called the "kitchen" where students will go to get the items they need to prepare for the School Bake Sale. After creating the lists and the boxes for each group, put all extra copies of the items in the kitchen area. During the task, when the groups determine how many more of each item they need, they will visit the kitchen and request the correct number from the teacher.

Task Procedure

Groups will be given a certain number of cookies, brownies, cupcakes, and pies to bring to the school bake sale. They will also be given a box of some of these items (all paper cutouts), which they will have to count to determine the starting number for each item. Using addition and/or subtraction, students will determine how many of each item they will need to request from the kitchen and whether they can trade any items with another group (or with the kitchen). Students will then find the total number of cookies, brownies, cupcakes, and pies the class will be bringing to the bake sale. The task finishes with special guests buying some of the items from the students and the groups finding the total number of each item sold.

PART A

1. Tell the class that they are going to plan for a school bake sale and will be responsible for bringing the sweets to be sold. Briefly explain how a bake sale functions.

2. Divide the class into groups with no more than four students in each group. Give each group the materials they will need:

    a. a list of items they are to bring to the bake sale (each student should have a copy of the list to record their work); and

    b. a box partially filled with some of the items.

3. Explain that students will work together with their group to make sure they have the correct number of sweets based on the list they are given.

4. Tell students to sort the items and then count the number of each item in the group's box. As students finish counting the number of each item, have them record the number on their list in the column labeled "We Have." Monitor the groups to be sure students sort and count the number of items correctly. Use a document camera or other projection device to show students where they should record the number of each item on the list they were given.

5. Next, students will need to determine whether they need to "bake" or trade items in order to have the correct number. Explain that if the group has too many of any item, it will trade some of those items with other groups. If the group does not have enough of an item, students will pretend to bake the correct number of items by visiting the kitchen and counting out the correct number of items from what the teacher has stocked in the kitchen.

6. Explain that students should record their thinking with a number sentence in the column labeled "What Do We Need to Do?" Students should circle whether they should bake or trade items. Have manipulatives available in case students need to use them to determine the unknown amount. The number sentences can be either addition or subtraction. Model this step using a document camera.

7. Groups should trade items first. All trading should take place before students visit the kitchen. For instance, if a group is asked to bring 19 cupcakes and 14 pies, and they get a box that has 25 cupcakes and 10 pies, they would determine they have 6 extra cupcakes to trade. After talking to other groups, they might find a group that needs only 4 cupcakes. They could trade 4 of the cupcakes for 4 pies, but they would still have 2 extra cupcakes. They would then trade these 2 cupcakes with another group or with the bakery. If students still have extra items after trading with other groups, they should return the extra items to the kitchen.

8. After groups have traded items, they should determine how many items they need to bake. Students will need to recount how many items they have and record new number sentences for items they traded. Once they find the number of each item they need to bake, they will visit the kitchen. The teacher will supervise the kitchen.

    a. Students will visit the kitchen and show the teacher their number sentences. They will ask for the number of each item they need. *(It is recommended that each person in the group visit the kitchen for one of the items. For example, Jimmy will bake the brownies, Mariah will bake the cupcakes, Donald will bake the cookies, and Amy will bake the pies.)*

    b. The teacher will check the students' work, ask clarifying questions if necessary, and then let the students count out the required number of items.

9. After all groups have completed the task, discuss the work students did with the whole class. Ask students to share their thinking and discuss how they found their answers. Encourage students to ask questions of each other and offer alternate methods for arriving at the same result.

PART B

Teacher Note: This will likely be day two of this task depending on the time allotted to complete Part A.

1. Set up four stations in the classroom: a cookie station, a brownie station, a cupcake station, and a pie station. Have one student from each group choose to work at one of the four stations. Students will then divide the contents of each group's box among the four stations. Students who choose to work at the cupcake station will bring all of their group's cupcakes to the cupcake station. The same is true for the other sweets.

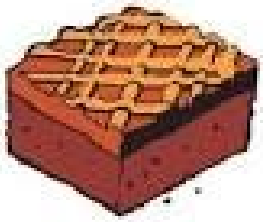
2. Once each station has all of the sweets from each group, explain that students should work together to find the total number of items at the station to add larger numbers using various strategies they have learned. Depending on the number of groups in the class, students may be adding four to six numbers. Students might choose to make groups of 10 and count the groups of 10. They may also decide to use benchmark numbers. For

example, if students have 19 brownies from one group and 26 brownies from another group they might take one brownie away from the group of 26 and add it to the group of 19 to have 20 brownies and 25 brownies for a total of 45 brownies. Students should record their thinking with drawings or number sentences. Based on the setup of Part A, the total for each station should range from 60 to 100 items.

3. Then have the teacher and some other special guests (i.e., the principal, other teachers, aides, etc.) visit the bake sale and buy items from the students. The cost for the items should be 1 ticket. Once all of the buyers have visited the bake sale, have students determine how many items were sold. Students should record their thinking with number sentences, drawings, or words.

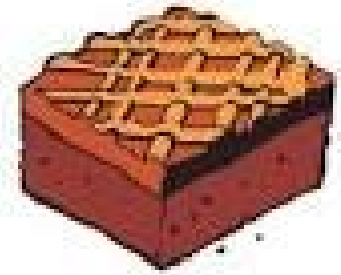
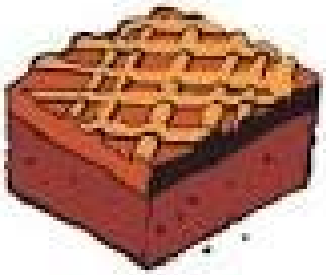
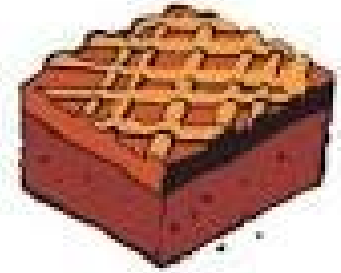
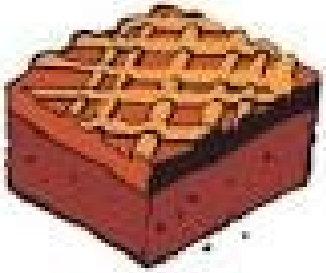
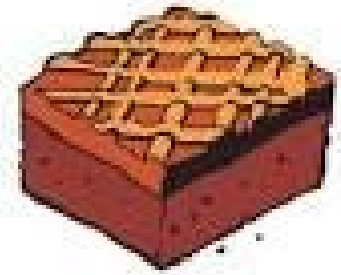
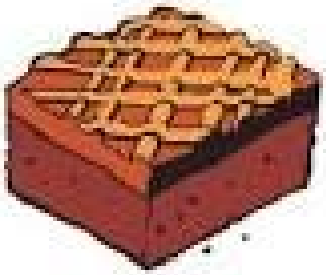
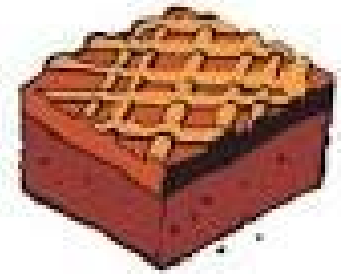
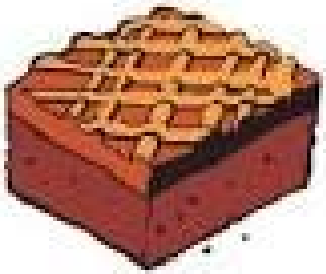
4. Have each group share with the class how they determined how many items were sold. This is an opportunity to discuss different strategies as well as have students critique each other's work or ask questions to clarify their own understanding.

Group List Template

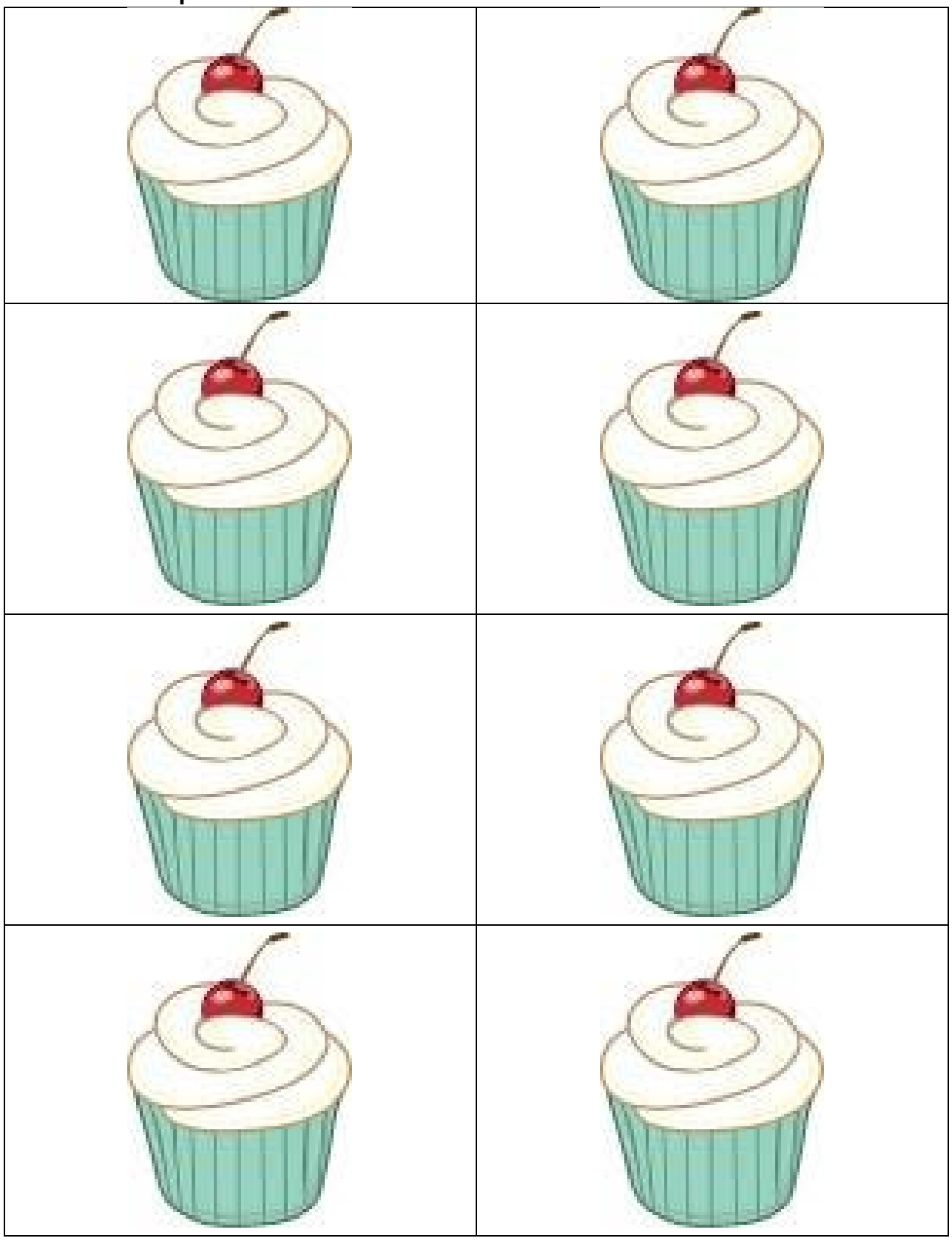
What to Bring		We Have	What Do We Need to Do?
			Bake Trade
			Bake Trade
			Bake Trade
			Bake Trade

Bake Sale Items—Cookies

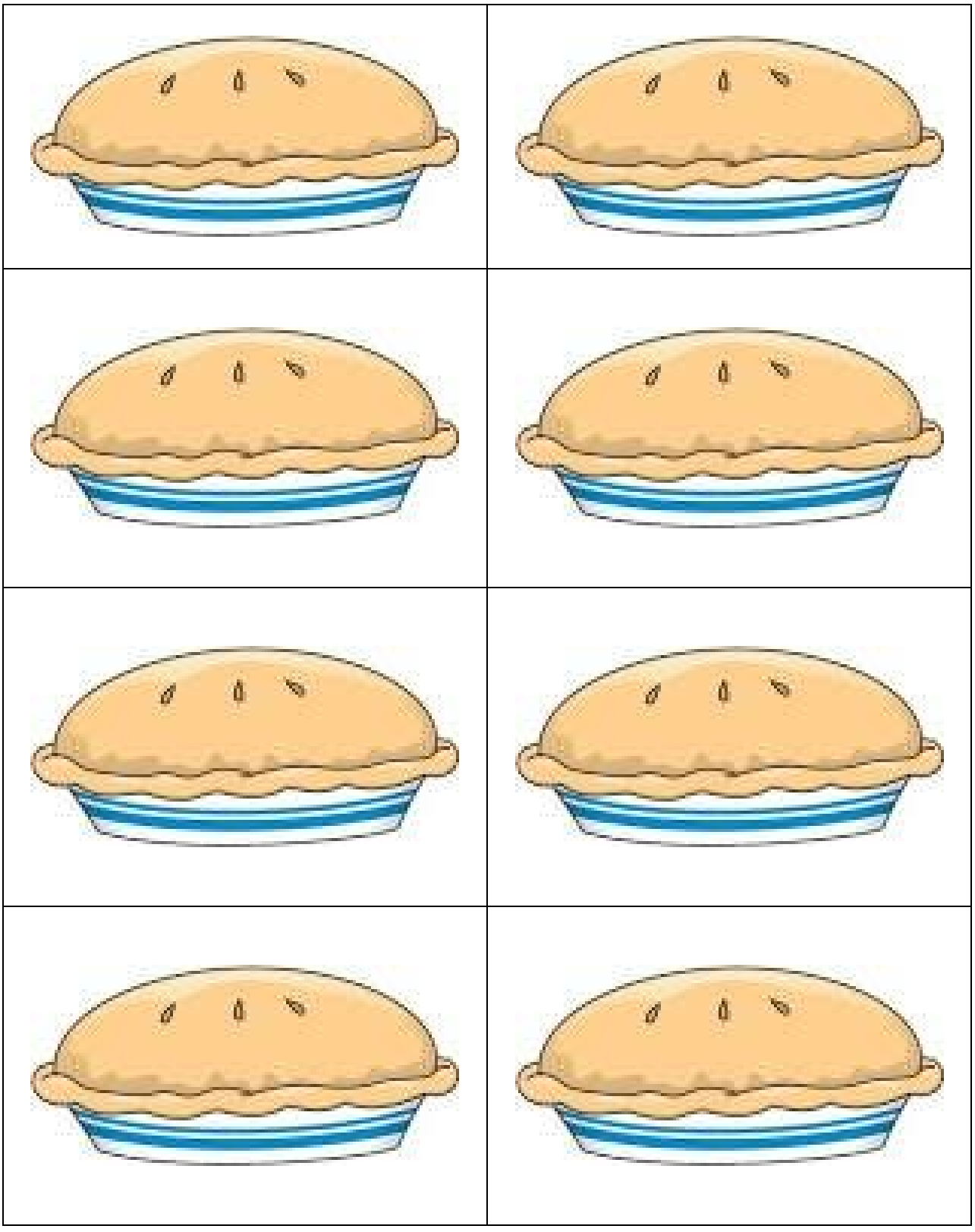
Bake Sale Items—Brownies

Bake Sale Items—Cupcakes



Bake Sale Items—Pies



Bake Sale Recording Sheet

_____ Station

How many items does your group have to sell? Use drawings or number sentences to show your work.

How many items did your group sell? How many items does your group have left? Tell how you found your answers.

Adding Equal Groups (IT)

Overview

Students will write equations with sums of equal addends to find the total number of objects arranged in a rectangular array.

Standards

Work with equal groups of objects to gain foundations for multiplication.

2.OA.C.4 Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.

Prior to the Task

Standards Preparation: The material in the chart below illustrates the standards and sample tasks that are pre-requisites for student success with this task's standards.

Grade Level Standard	The Following Standards Will Prepare Them	Items to Check for Task Readiness	Sample Remediation Items
2.OA.C.4	• 1.OA.D.7	1. https://www.illustrativemathematics.org/illustrations/3	• https://www.illustrativemathematics.org/illustrations/466 • https://www.illustrativemathematics.org/illustrations/475 • https://www.illustrativemathematics.org/illustrations/1152

Task Materials

- Document camera (or other means of projection)
- Array Dot Cards (copy on cardstock and laminate prior to use)
- Dry erase board, marker, and eraser (one set per student)
- Array Worksheet (for Part B; one per student)
- Equal Groups Worksheet (for Part C; one per student)
- Counters (up to 25 per pair of students)

Task Procedure

During this task students will use addition to find the total number of objects arranged in rectangular arrays. Students will understand how to represent the array with an equation for the total as a sum of equal addends. Students will use an array to represent word problems and use addition to find the answer.

Begin by reviewing addition facts with sums of one-digit numbers. This can be done through the use of a set of flash cards or by having students chorally respond to an oral prompt. Explain that in this task students will use addition to find the total number of objects in a group.

Part A: Whole-Class Instruction

1. Show students the dot card representing the number six using a document camera (or other means of projection) so that there are two rows and three columns. Explain to students that the dots are arranged in a rectangular pattern called an array. Ask, "How many groups do you see in this array?" Allow students to answer. Students should answer either two or three groups (two rows or three columns—students are not required to use the terms "row" and "column").

2. If the Array Dot Cards are laminated, use a dry erase marker to draw rectangles around each row to show two groups. Have students count the number of dots in the first group. Record the number on the side of the row. Then have students count the number of dots in the second group. Again record the number. Ask, "What is true about these two groups?" Students should respond that the number of dots in each group is the same. Encourage students to use appropriate math vocabulary and have them state that the total number of dots in one row is **equal** to the total number of dots in the other row.

3. Ask, "How can we find the total number of dots in this array?" Allow students to offer their ideas. Lead them to see that the number of dots in each group can be added together. Write the expression 3 + 3 under the array. Then ask students to state the total number of dots. (*6*) Have students share their reasoning. Then complete the equation 3 + 3 = 6. Lead students in a discussion to connect the number of threes in the equation to the number of groups in the array.

4. Erase the card and draw new rectangles around each column to show three groups. Ask, "Did the number of dots in this array change?" After students have answered, have them state how many groups there are and count the number of dots in each group. Write the number of dots in each group under each column. Then ask students if the groups have an equal number of dots. (*Yes*)

5. Ask, "What addition equation can I write to represent the new groups?" Guide students to state the equation 2 + 2 + 2 = 6 and write the equation under the array. Lead students in a discussion to connect the number of twos in the equation to the number of groups in the array.

6. Give students a dry erase board, marker, and eraser. Show the students a different array (one suggestion is the 3 x 4 array to practice adding more than two numbers) and have students draw the array on their dry erase boards. Tell them to leave room to write an addition equation on their board. Have students draw rectangles around the groups they see. Then have students write an addition equation for the array they were given. After students have had time to write their equation, have them compare their work with their partner and encourage them to agree/disagree while discussing their reasoning. Then ask some students to share their work with the class.

7. Repeat Step 7 with at least four additional dot cards or until the majority of the students are demonstrating success with writing correct addition equations for the arrays.

Part B

Give each student a copy of the Array Worksheet. Have students sit next to their partner. Say, "You will work independently first to write equations to find the total number of objects in each picture. Use equal groups for each equation you write. You will also find the total number of objects in each picture. After you have completed the problems, compare your work with your partner. Explain your thinking to your partner. If your partner disagrees with an answer, ask him/her to explain why. Then work to decide who is correct."

Monitor groups to listen to the way students are explaining their thinking as they create the groups and write addition sentences. Correct any misconceptions by asking guiding questions.

When students have completed the worksheet, ask some to share their work with the whole class. Allow students to explain their thinking to the class and encourage students who are listening to ask questions if they disagree with the student's explanation. Also, provide opportunities for students to offer alternate paths to the same solution.

Part C

Next students will apply their understanding from Parts A and B to a different situation. Students will be given a number of groups with an equal number of objects in each group (e.g., 4 groups of 5 dots). Students will be asked to create a rectangular array to represent the problem they are given. Then they will write an addition equation to represent the total and find the total number of objects. Students will work with a partner for this portion of the task.

1. Give each pair of students a set of 25 counters.
2. Say, "I have 4 equal groups of 5 counters. How can I show the total number of counters I have? Working with your partner, use the counters to show 4 equal groups of 5 counters." Give students some time to think about and start placing counters. Some groups will put the counters in random arrangements of four groups. Some may start making an array. Walk around to monitor student work.
3. After allowing groups to work, ask for a volunteer to share their thinking with the class. Have the student use the document camera to demonstrate how they would show four equal groups of five counters. Ask, "In the work we did before, how were the dots arranged on the cards? Can we use that arrangement to show 4 equal groups of 5 counters?" Guide students to arrange the counters into four rows with five counters in each row.
4. Once students have created the array, have them write the addition sentence they would use to find the total number of counters. (*5 + 5 + 5+ 5 = 20*).
5. Explain the next part of the task. Say, "You will work with your partner to draw an array to represent a given problem. Once you have your array drawn, you will write an addition equation to find the total number of objects in the array. Use the counters to help you when you are drawing the array."
6. Give each student a copy of the Equal Groups Worksheet. Walk around to offer assistance to students as needed.
7. Once the pairs are finished with the problems, have them work with another pair (to create a group of four students) to compare the work each group did. Say, "When you compare your work with another pair, explain

your thinking about each problem. If the other pair disagrees with your work, ask them to explain why. Work together to find the correct answer."

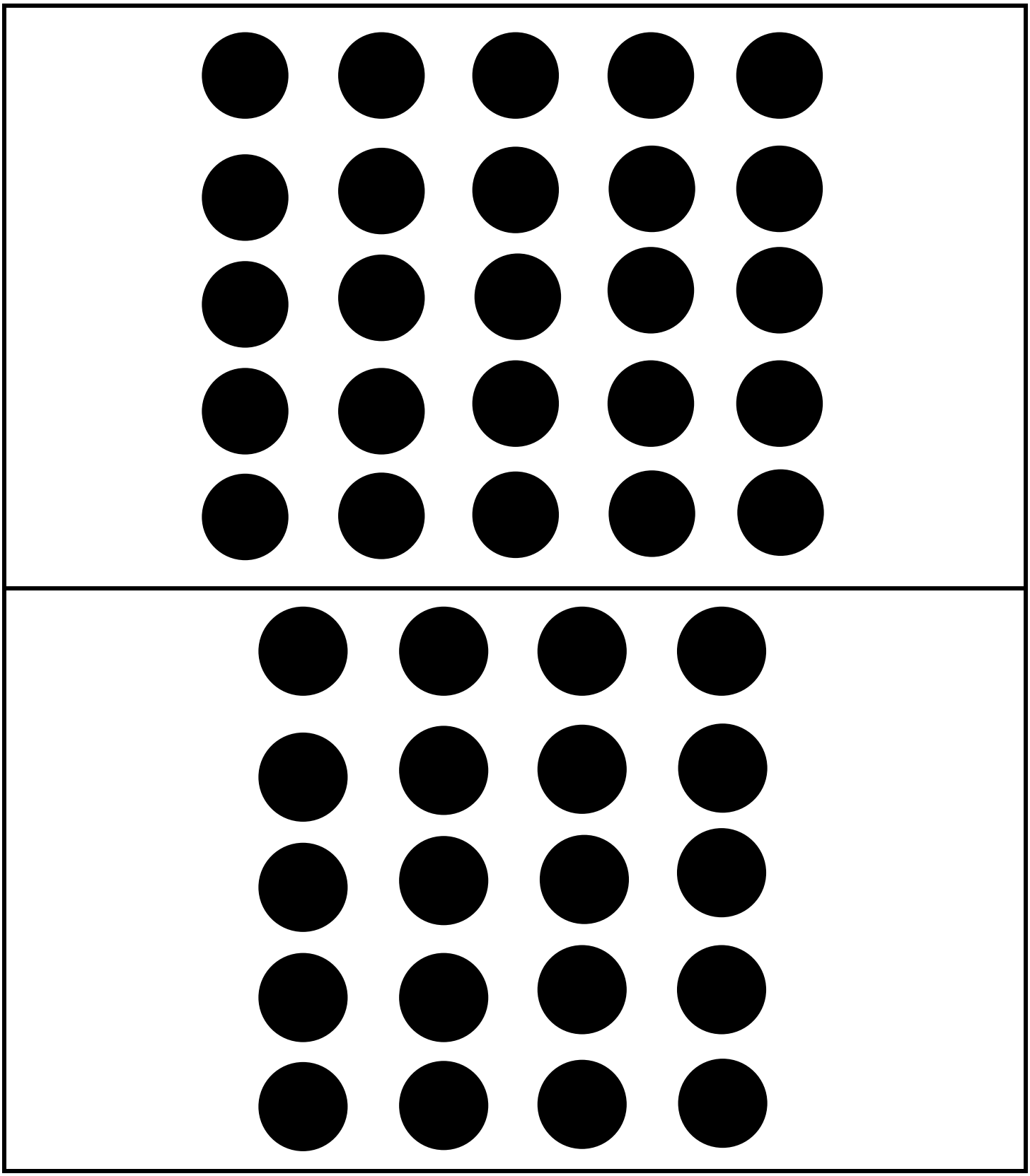
8. Monitor the groups to listen to the way students are explaining their thinking and to ensure that they have solved the problems correctly. After the groups have had a chance to discuss their work, ask some students to share their work with the whole class. Have them explain their thinking and answer questions other students may have.

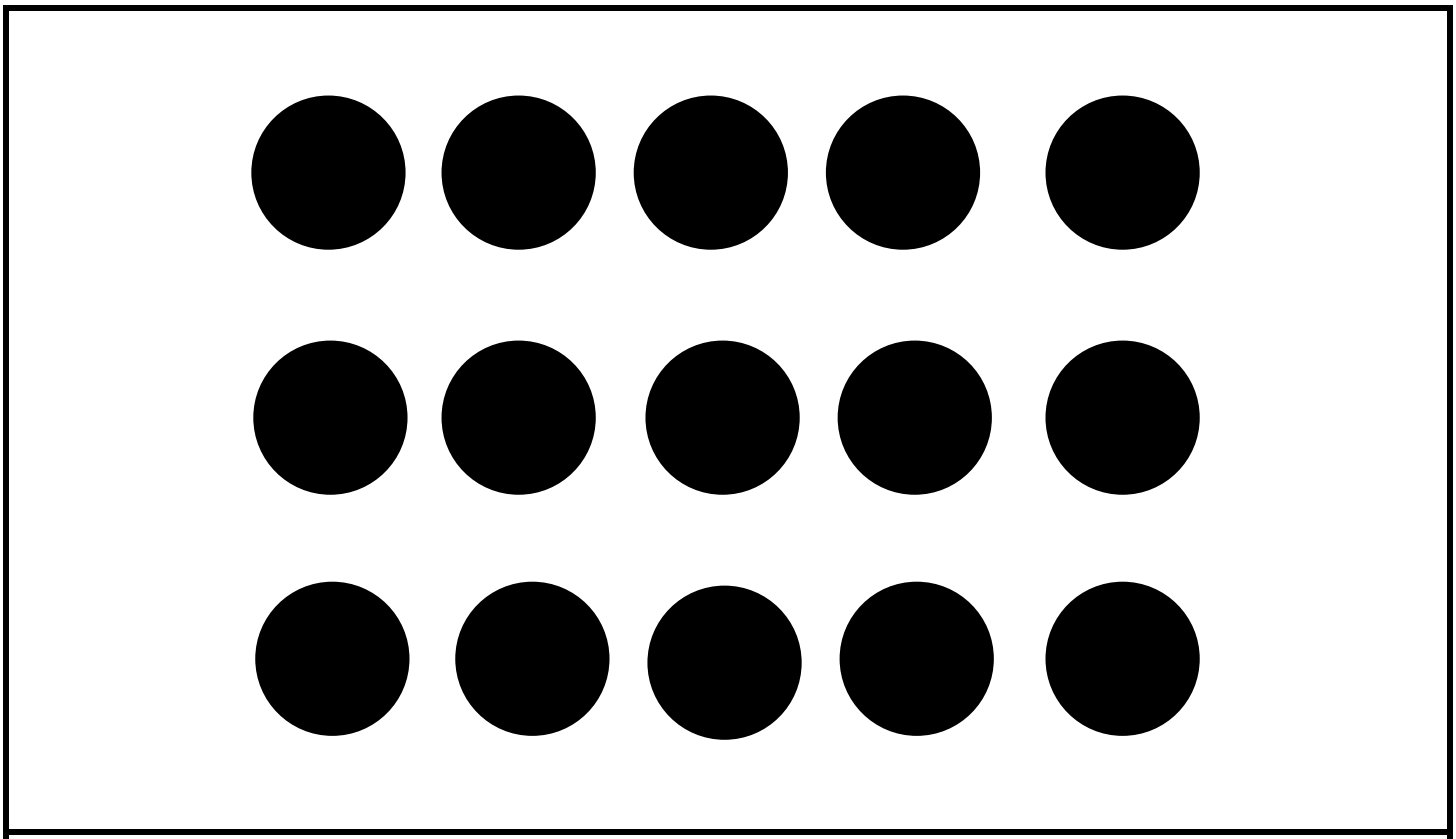
Task Notes

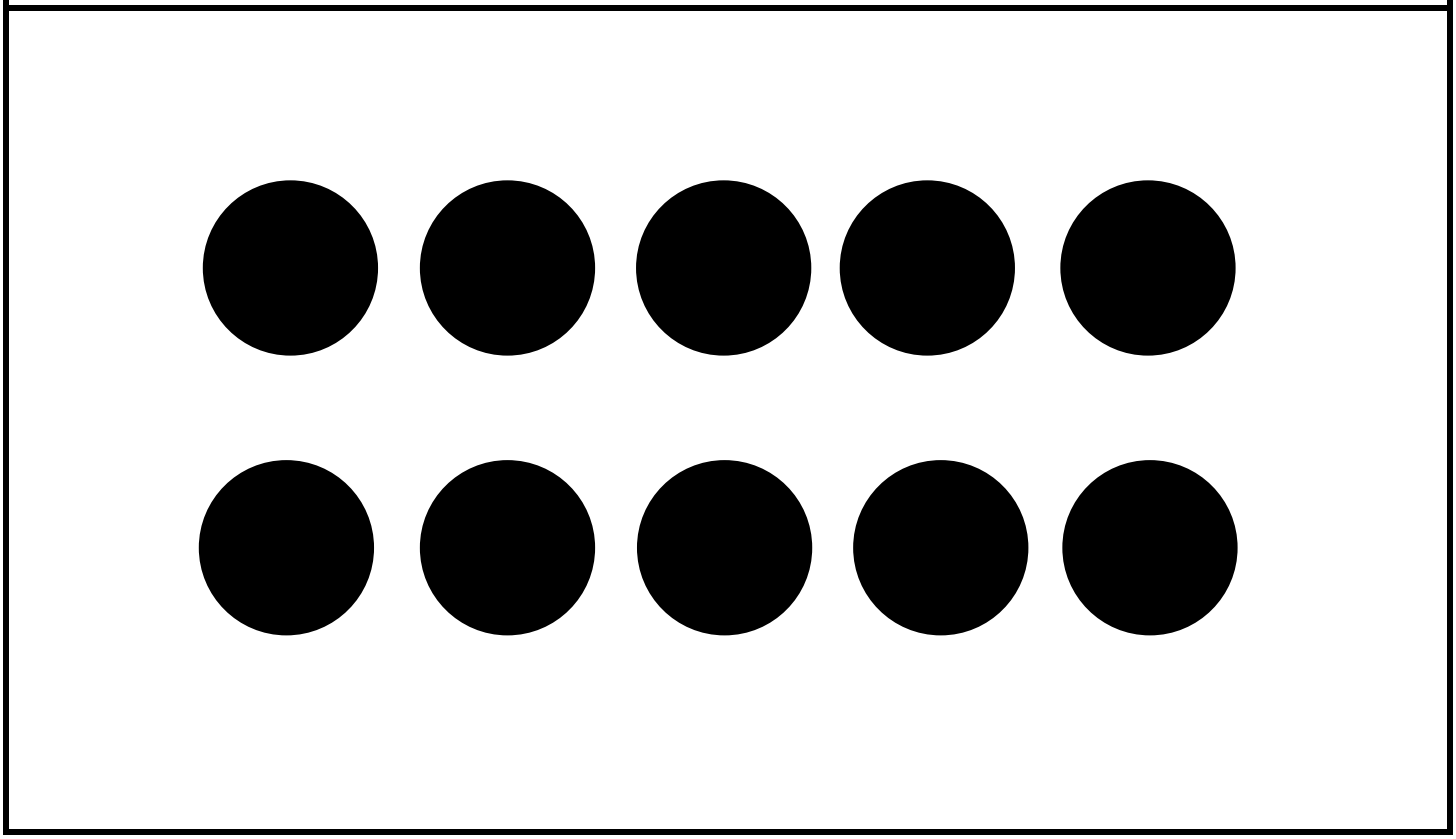
This task may take more than one class period to complete. As students use drawings throughout the rest of the year to solve other addition problems, encourage them to use arrays where possible. This will help set the foundations for multiplication that students will do in third grade.

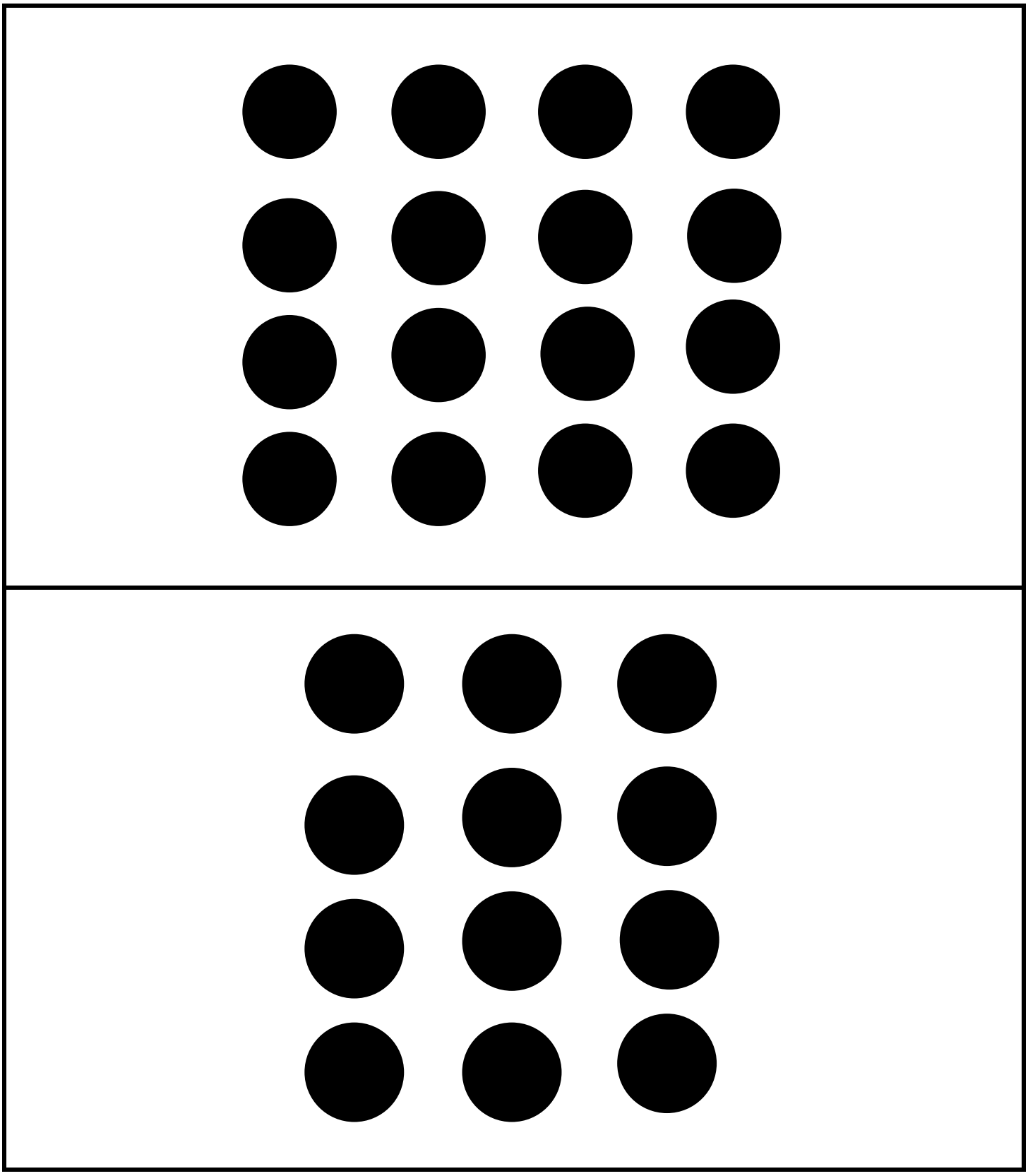
Part C of this task is beyond the scope of the standard in that it is asking students to solve a word problem involving the "equal group" concept. This is acceptable for instructional purposes; however the types of word problems included in this task should not be assessed formally for standard 2.OA.C.4.

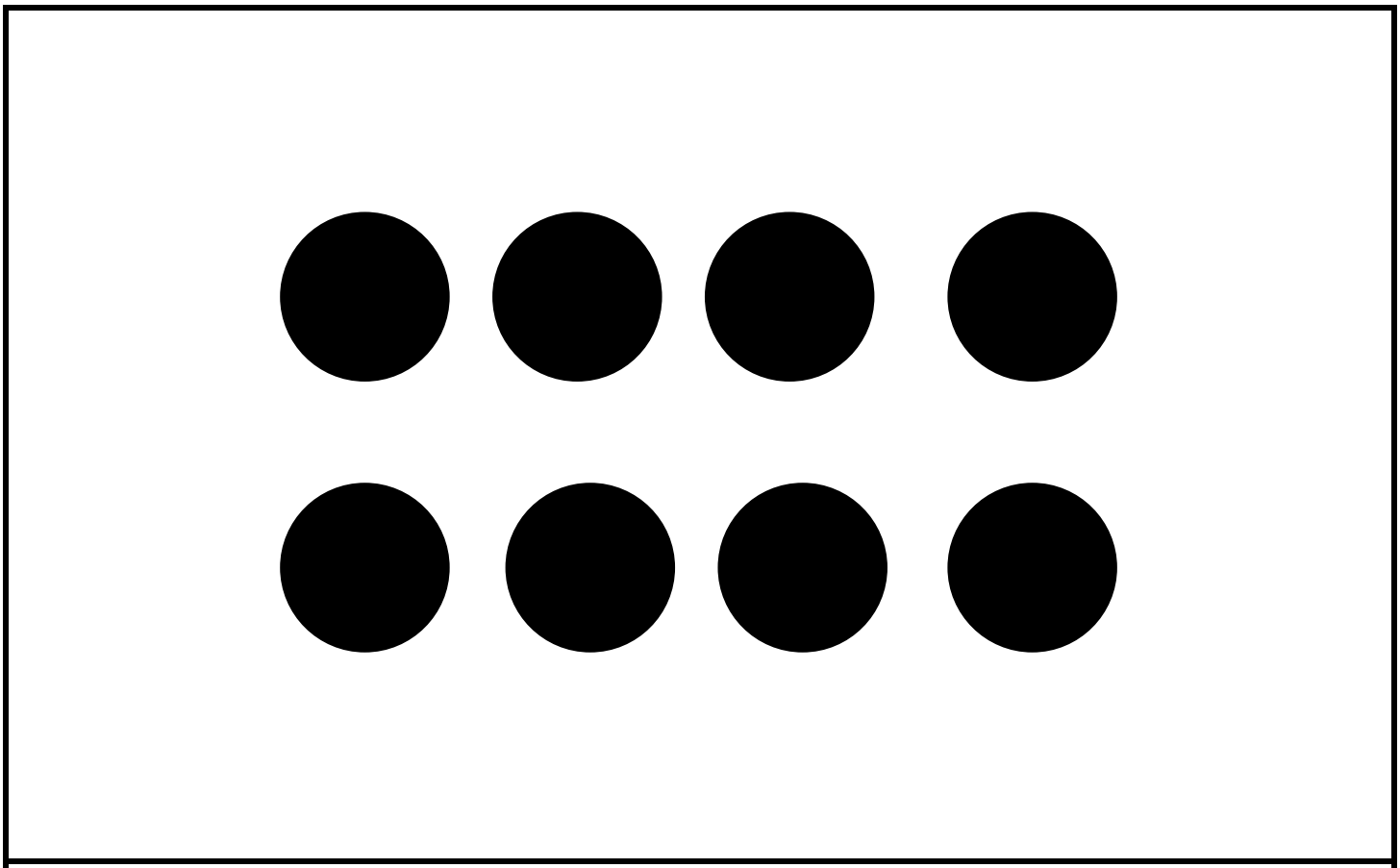
Array Dot Cards

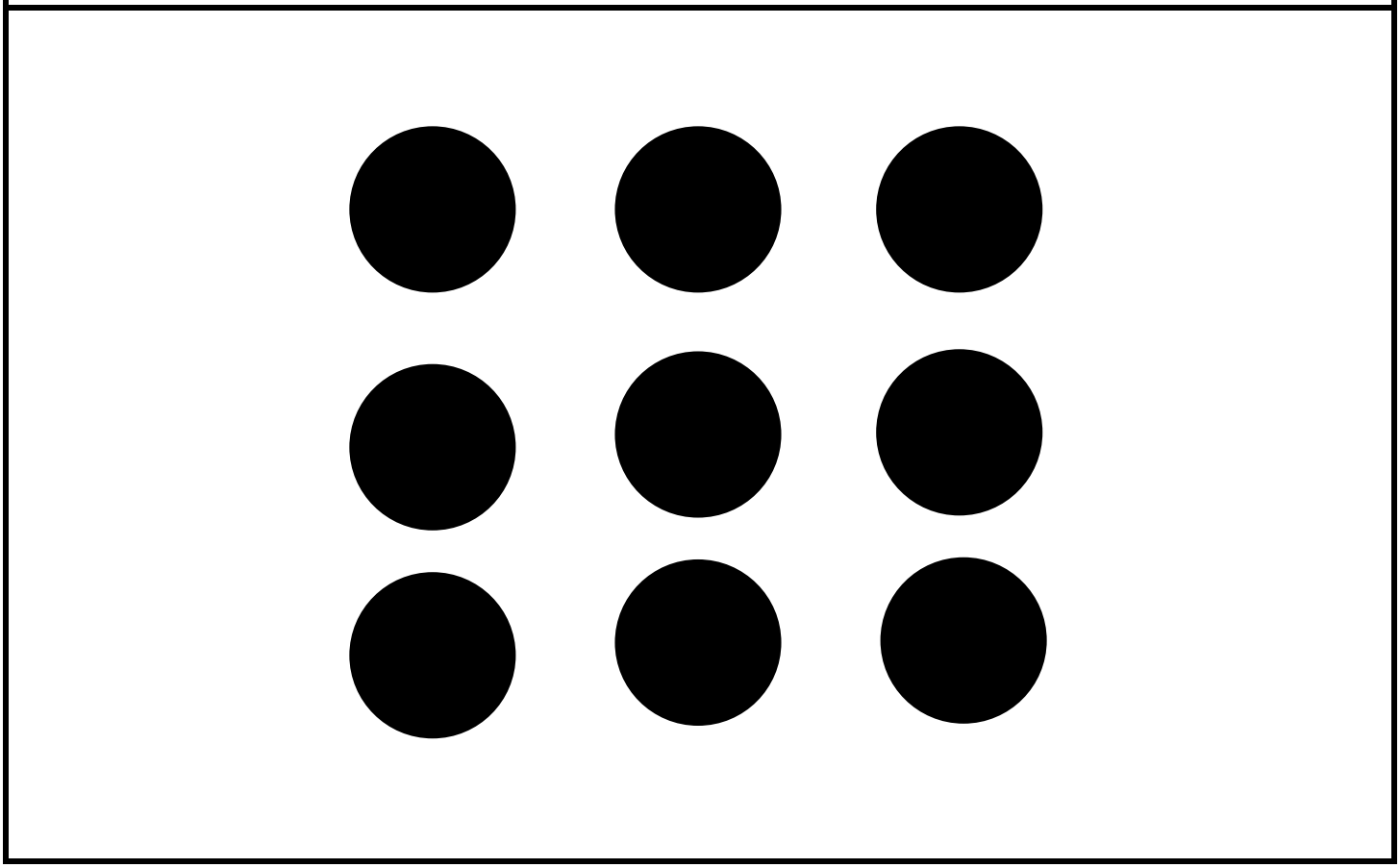


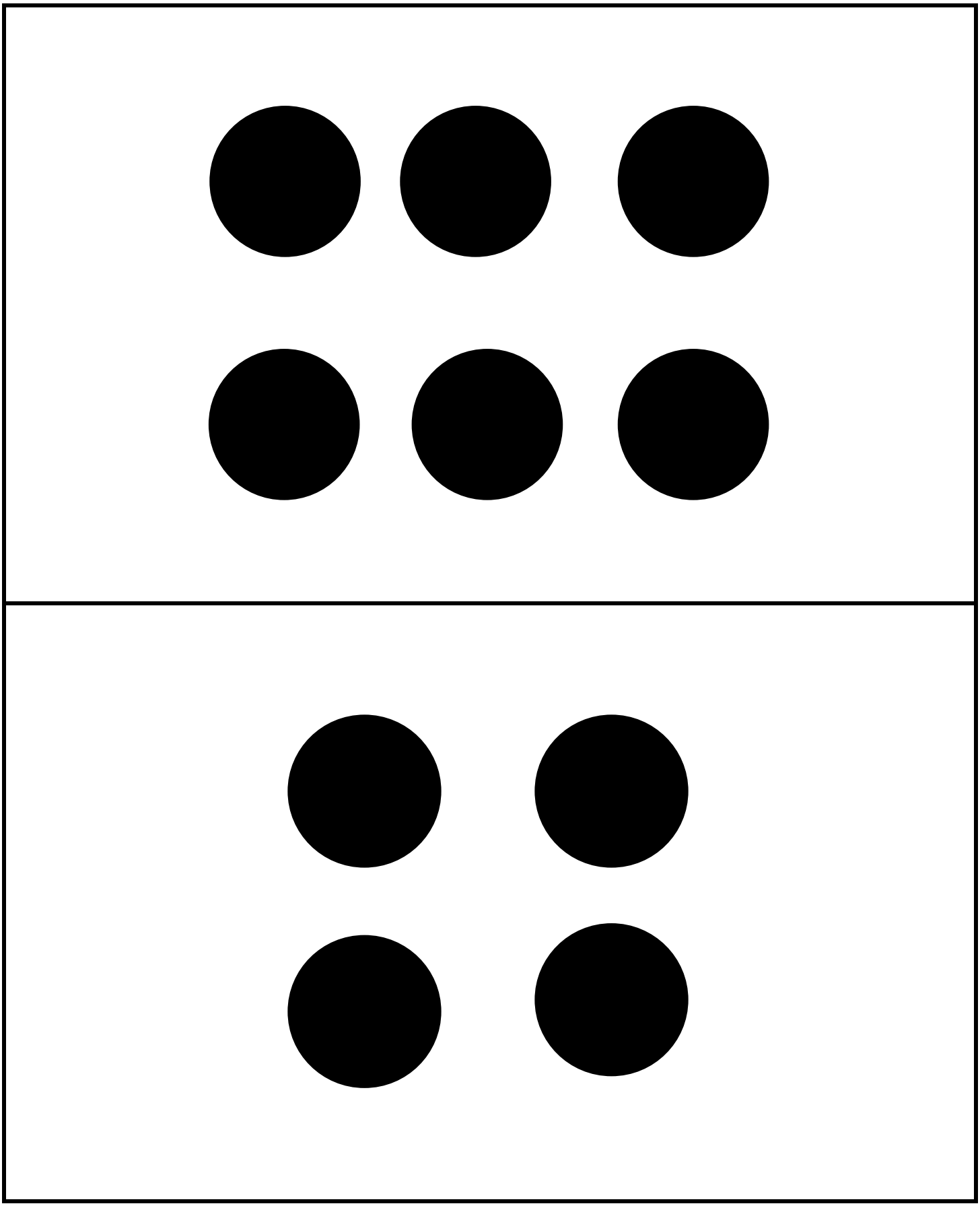






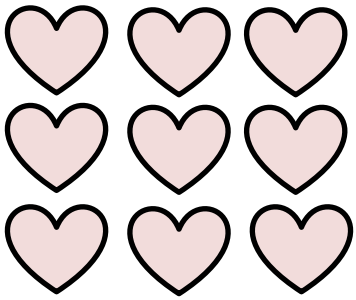
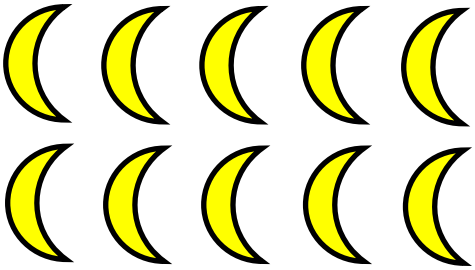
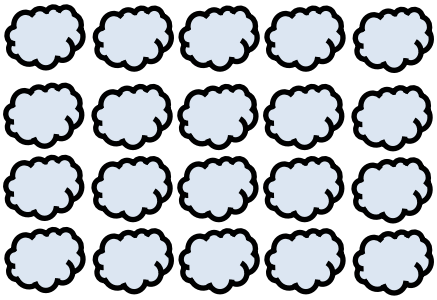
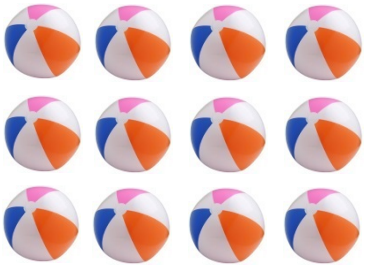






Part B: Array Worksheet

Write an equation using addition of equal groups to find the total number of objects in each picture.

Picture	Equation
	How many hearts are in the picture?
	How many bananas are in the picture?
	How many clouds are in the picture?
	How many beach balls are in the picture?

Part C: Equal Groups Worksheet

Draw an array to represent each problem. Then write an equation using addition of equal groups to find the total number of objects in each problem.

1) Jamal found cupcakes on the table in his house. There were 4 rows of cupcakes with 3 cupcakes in each row. What was the total number of cupcakes on the table?

2) Rosa gave 4 friends 5 stickers each. How many stickers did Rosa give out in all?