Appendix 3
Tasks

This book examines rich tasks that have been used in the classroom to bring to the surface students' understandings and misunderstandings about addition and subtraction. Many of these tasks are offered here, in the order in which they appear in the book, for the reader's personal or classroom use. Some tasks include blackline templates to facilitate hands-on work with students.

Count, Sort, Compare

Instructions for the teacher: Put objects in bags (no more than 10 items for very young students). Each collection of objects should have multiple "copies" of some objects. Give students time to organize and count the items. Then pose questions to help them reflect on their counting and sorting and make comparisons of numbers of objects:

- "How did you organize your items?"
- "Why did you organize your items that way?"
- "What item do you have the greatest number of in your bag?"
- "What item do you have the smallest number of in your bag?"
- "Who has the same number of [*particular items*] as [*a particular student*]?"
- "Who has more [*particular items*] than [*a particular student*]? How many more?"
- "Who has fewer [*particular items*] than [*a particular student*]? How many fewer?"
- "How many items do you and [*a particular student*] have together?"
- "Does anyone have two more [*particular items*] than [*a particular student*]?"

How Can You Show _____?

Instructions for the teacher: Give each student or small group of students a small collection of blocks, counters, or other objects (no more than 10 items for very young students), along with a number that is less than or equal to the total number of objects. For example, you might give your students collections of 10 objects along with the number 7. Ask them to use the objects to make two groups that can be combined to produce the given number.

How Many Ways Can They Land?

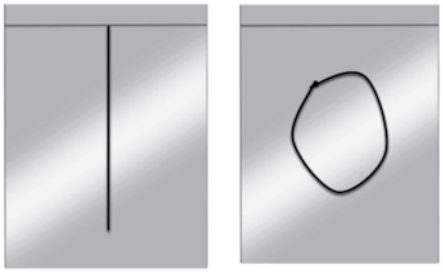
Instructions for the teacher: Find a clean, empty can, and put in it a small collection of two-color counters (no more than 10 for very young children). If two-color counters are unavailable, spray-paint dried beans on one side (or color one side with a marker).

Have students shake the counters and roll them out onto a table or the floor.

Ask (if you are working with beans), "If you toss _____ beans, how many different ways can they land?"

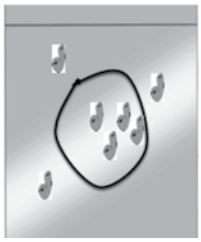
Macaroni Squeeze Game

Instructions for the teacher: Let students explore unknown addends by "squeezing" uncooked, small noodles into two different-sized groups in small, clear, sealed sandwich bags. To make each bag, affix a piece of colored tape or draw a line with a permanent marker down the middle of the bag, as shown on the left below, or draw a circle on it, as shown on the right.



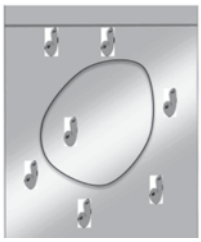
Put 7 noodles (or another number, up to 10) in each bag and seal it. Make as many bags as you need for your students.

Place the bags flat on a table or desk for the task. Have students move noodles to either side of the line (or in or out of the circle), as shown below, and record their results.



4 inside
and
3 outside

4 + 3 = 7



1 inside
and
6 outside

1 + 6 = 7

4 on the left
and
3 on the right

4 + 3 = 7

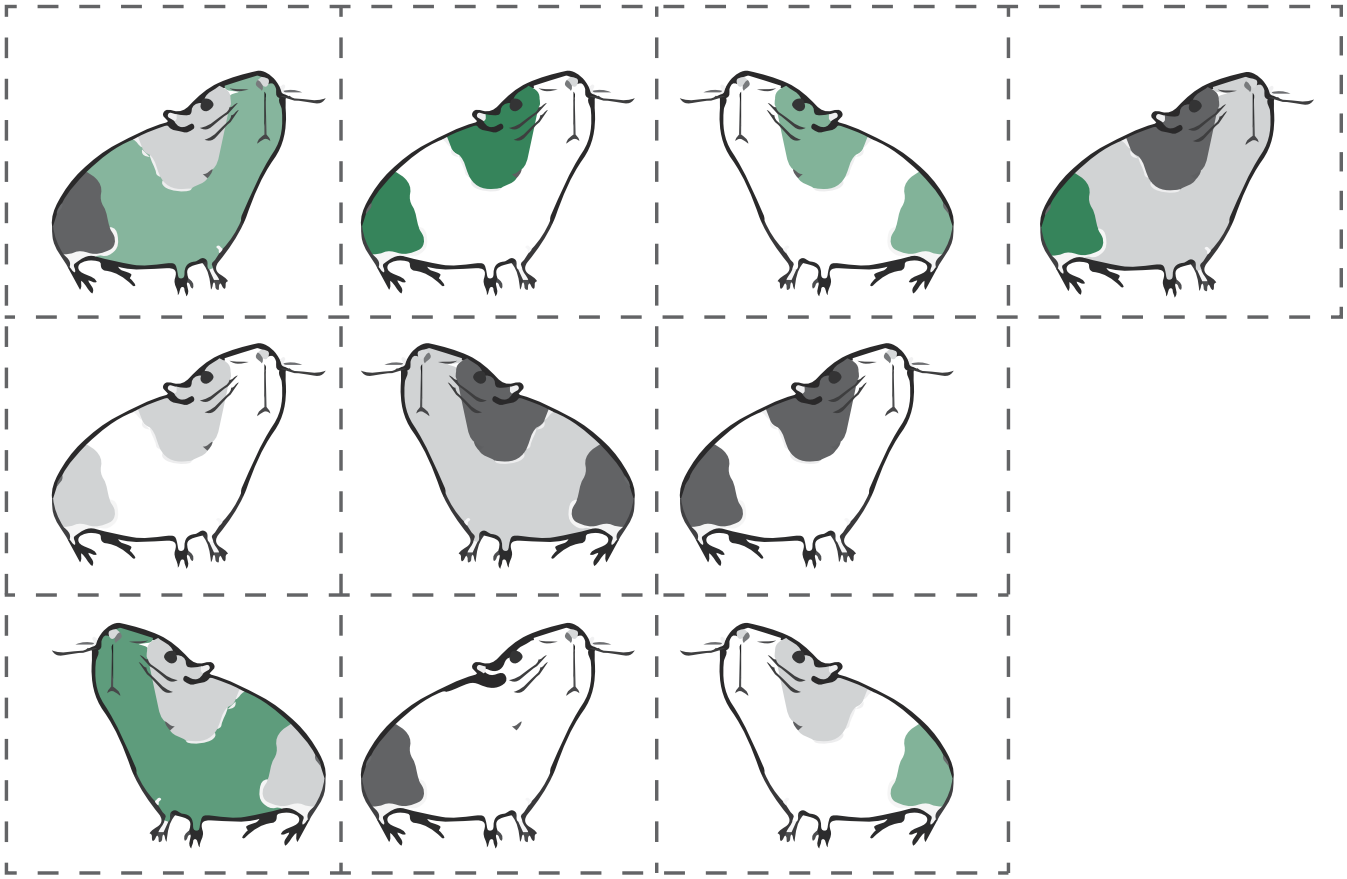
2 on the left
and
5 on the right

2 + 5 = 7

Where Are the Guinea Pigs?

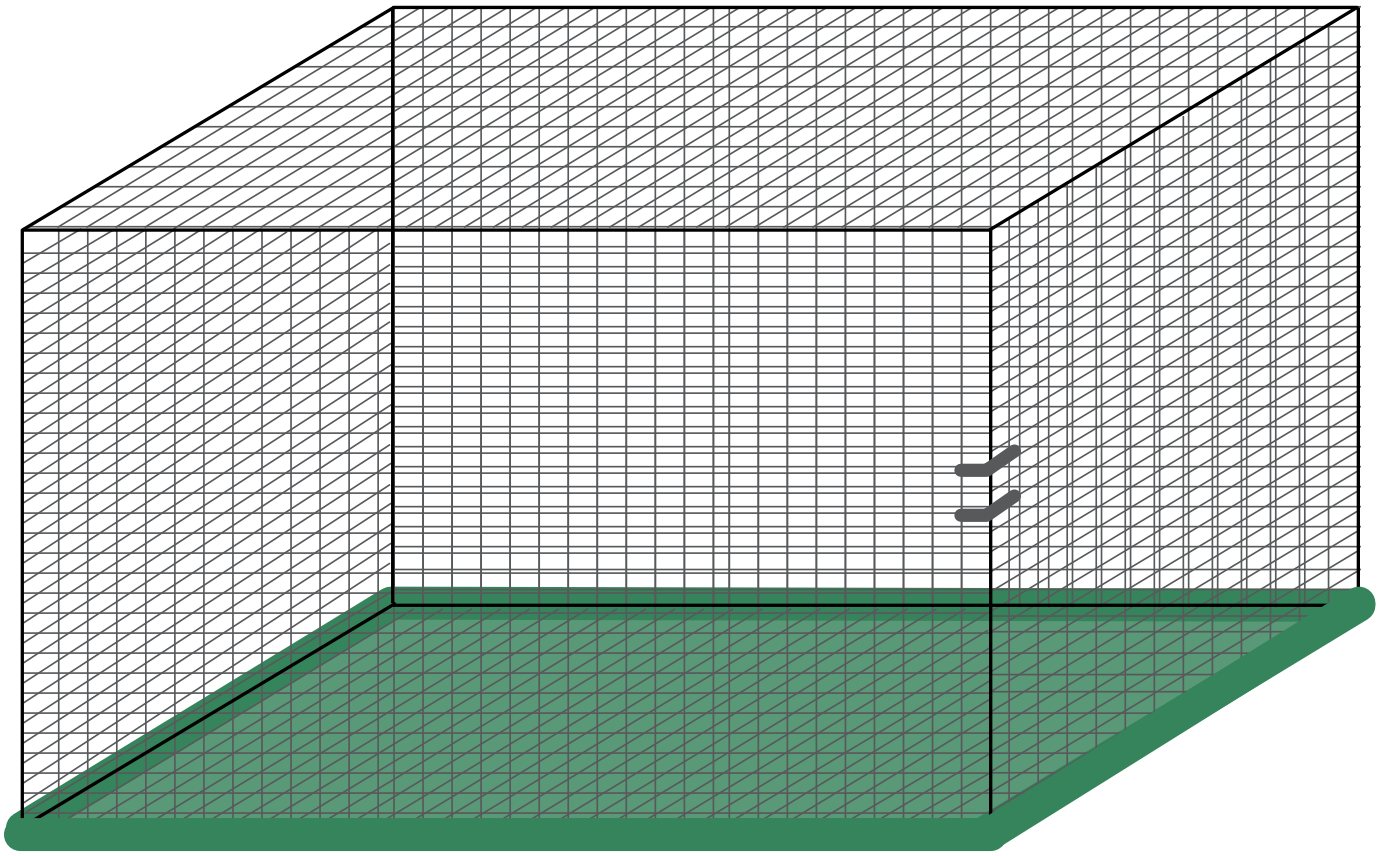
Instructions for the teacher: Use the template below to cut out sets of 10 guinea pigs for each student or small group of students. Use the template on the next page to make two cages for each set of 10 guinea pigs.

Distribute guinea pigs and cages, and say, "There are 10 guinea pigs in 2 cages. Write number sentences to show how many guinea pigs are in each cage. How do you know that you have all the possible arrangements?"



Based on *Guinea Pigs Add Up* by Margery Cuyler (New York: Walker 2010).

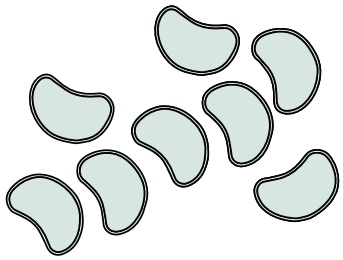
Where Are the Guinea Pigs? (continued)



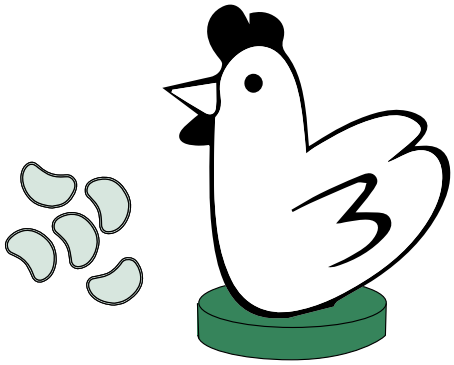
Based on *Guinea Pigs Add Up* by Margery Cuyler (New York: Walker 2010).

Hen and Egg Game

Instructions for the teacher: Use beans or other counters to represent eggs and a cup or a paper cutout of a chicken to represent a hen. Decide on a target number up to 10—say, 8—and arrange that number of beans, as eggs, on a table (see below).



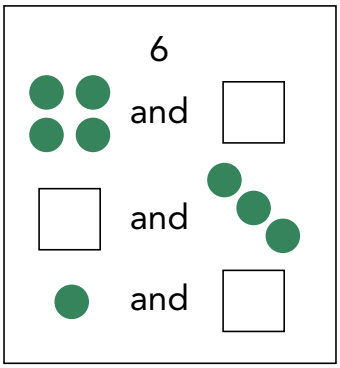
To begin, say, "There are 8 eggs in the whole nest," and count them aloud or ask a student to count them. Then move the "hen" to "sit on" some number of the "eggs," hiding them completely from view, as shown below.



Ask, "How many eggs is the hen sitting on?" Help your students to connect the language of part-part-whole to what they are seeing by saying, "You can count one of the parts, and you know what the whole is, but now you need to find the value of the missing part." Ask the students to name the part and the whole and find the missing part. Students can play this game in pairs, with one student using the cup or hen cutout to hide some of the eggs and asking the partner to name the missing part.

Dot Cards

Instructions for the teacher: Dot cards give students strong visual support for finding a missing addend. Make dot cards that give the whole and show one of the parts, as in the sample below.



For a particular number on a dot card—say, 6, as in the sample above—ask,

Can you make 6 by adding two parts so that this sentence is true?

The part on the card + the missing part = 6

Corduroy's Pocket, Inside and Out

Instructions for the teacher: Give each student or small group a copy of the template below, along with eight pennies, buttons, counters, or other small objects. Read the words on the template aloud, and let students work on the task. Bring them together to talk about their work.

Corduroy's Pocket

Corduroy has 8 pennies in his pocket. Some are inside his pocket, and some are out. What could be inside his pocket?

Based on *A Pocket for Corduroy* by Don Freeman (New York: Penguin, 1978).

How Are They Alike?

Instructions for the teacher: Make a copy of the set of addition and subtraction problems below for each student, along with a copy of the chart on the next page. Cut the problems apart, or have students cut them apart. Ask the students to work individually or in groups to decide whether any problems are "alike." Have them tape or paste these on the chart and explain why they grouped them together.

Jimmy loves to eat fruit snacks! He counts 36 fruit snacks in his bag. He eats 17 fruit snacks. How many fruit snacks are left in his bag?	Keisha has 32 comic books. She gives 14 to her cousin. How many does Keisha have now?	Raida loves puzzles. On Saturday she put 9 puzzles together, and on Sunday she put 15 puzzles together! How many more puzzles did Raida put together on Sunday than on Saturday?
I had some belts. I gave 3 to my friend Katherine. I still had 14 belts. How many belts did I start with?	Sari can play 17 songs on the piano. Adolfo can play 44 songs on the piano. How many more songs can Adolfo play than Sari?	Lana ate 9 pieces of candy last night and 6 pieces of candy today. How many pieces of candy has Lana eaten in the last two days?
Sara ran 31 miles last week. Stephanie ran 42 miles last week. How many more miles did Stephanie run last week than Sara?	Some friends were at a party. Then 4 friends left early because they were tired. After they left, 18 friends were still at the party. How many friends were at the party before the 4 friends left?	Molly counts 12 flowers blooming in her garden! The next day she counts 7 more! How many flowers are blooming in Molly's garden now?

How Are They Alike? (continued)

These problems are alike:
Explain why these problems go together:

How Many *Won't Get*?

Azita's Forks

Azita has 4 forks to use to set the table for the dinner. The dinner will have 9 guests. How many more forks does Azita need so that each guest will have a fork? If Azita doesn't find more forks, how many guests won't get a fork?

Translation Task

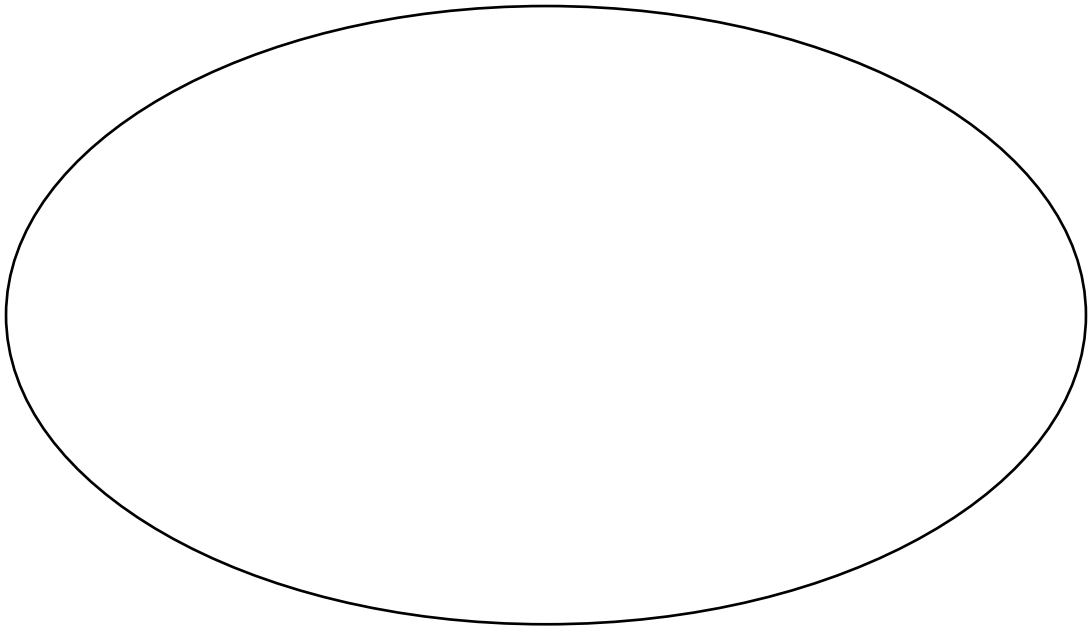
Instructions to the teacher: Give students an equation, a word problem, or a model such as a number line. Distribute copies of the template below, and ask the students to complete the chart by filling in the other representations and explaining their work.

Equation	Word problem
Model	**Explanation**

Sort and Group Basic Facts

Instructions to the teacher: Give students a set of basic fact cards and a copy of the mat below. Ask the students to sort the cards and group facts that they think "belong" together, writing them on the mat.

Choose some facts to group. Write your facts that belong together in the circle and then tell why you grouped them.



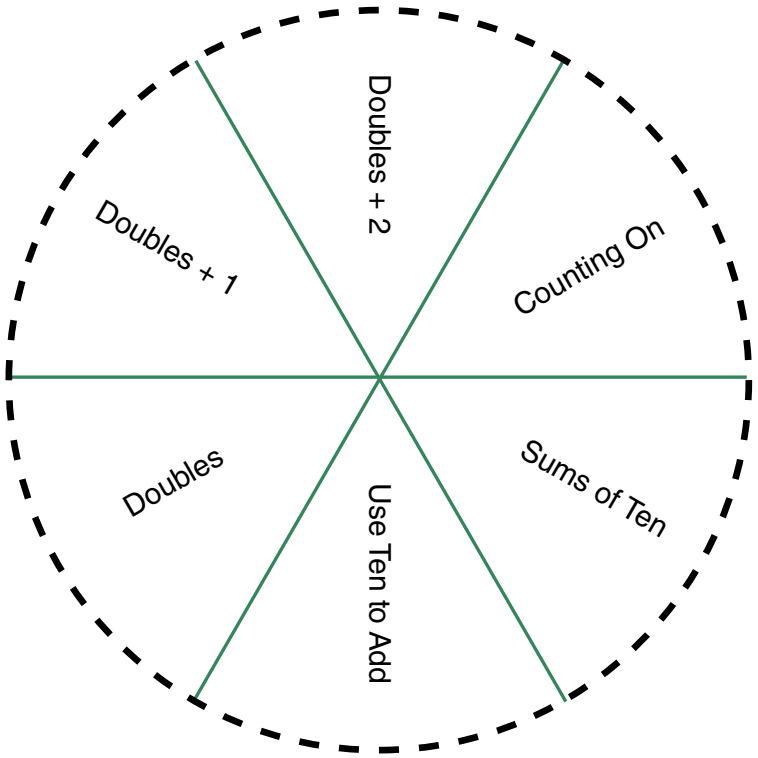
Why did you group these facts together?

Spin, Circle, and Solve

Instructions for the teacher: Give your students a sheet with 10–20 problems intended to build recall of basic facts. Have a student spin a "strategy spinner" to identify a particular strategy, such as "make 10," as the focus for the memory session. (The spinner template below is a sample that you can modify to include strategies that you are working on with your students.)

After the students have selected the strategy and before they have solved any of the problems, have them circle all the problems that they could solve by using that strategy. Then give the students a short period of time, such as three minutes, to solve those problems—and those only—that they have circled.

Wrap up each memory session by having the students discuss their work.



Adapted from *Elementary and Middle School Mathematics: Teaching Developmentally*, 8th ed., by John A. Van de Walle, Karen S. Karp, and Jennifer M. Bay-Williams (New York: Pearson, 2013).

Ring Facts

Instructions for the teacher: The rules of the game appear below. Use the template on the next page to make a game board for each student who is playing.

Students play in groups of 2 to 6.

Materials: A Ring Facts game board for each player; one to two sets of basic fact cards (addition and subtraction); smiley-face stickers or buttons for the players to use to mark their preselected numbers on their game boards.

Set up: Distribute game boards and sticky notes or buttons to all players, and stack basic fact cards facedown on each table, within everyone's reach.

Goal: Be the first player to draw rings around five preselected numbers on a game board after those numbers have occurred as sums or differences for problems on basic fact cards.

Rules:

1. Each player chooses five numbers to "ring" on his or her game board and puts a sticker or button on the corner of each of those numbered squares.

2. Players take turns turning over cards, with each player displaying the problem on his or her card and reading it aloud to the other players. All the players find the sum or difference to complete the fact, and then each player looks to see whether he or she marked that sum or difference on his or her game board. If so, the player "rings" the sum by drawing a circle around it. For example, if player 1 turns over the problem 4 + 1, all the players find the sum, 5, and then look to see whether they preselected 5. If they did, they "ring" the sum.

3. The first player to ring all five previously marked numbers wins the game.

Ring Facts (continued)

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20