Right-Brained Addition & Subtraction

Vol. 2

Adding & Subtracting Multi-Digit Numbers

Multiple-digit addition and subtraction made easy

a Forget Memorization book

Effortless learning through images, stories, hands-on activities, and patterns

by Sarah K Major

www.child1st.com

Right-Brained Addition & Subtraction Vol. 2

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Right-Brained Time, Money & Measurement
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The Illustrated Book of Sounds & Their Spelling Patterns
The Easy-for-Me™ Children's Readers
SnapWords® Sight Words Cards
Alphabet Tales
SnapWords® Spelling Dictionary, 2nd Edition

ABOUT THIS BOOK

This book is for children who are strongly visual, who learn all at once through pictures, are drawn to patterns, rely on body motions, and who need to understand the process behind each math problem they solve. Child1st teaching and learning resources all follow the principle of conveying teaching using a variety of right-brain-friendly elements. We take learning concepts that utilize symbols (numbers and letters) and abstractions, which are left-brained, and embed them in right-brained elements to beautifully integrate the left and right hemispheres in the brain.

Right-brained Elements:

1- We embed symbols in **VISUALS** so that the child can take a quick look, absorb the learning piece, and store it as an image to be retrieved intact later.

2- We use **PERSONIFICATION** which is a powerful element in teaching and learning. The use of personification makes for rapid learning because the very look and personality of the character conveys the substance of the learning.

3- We rely on **PATTERN DISCOVERY** as a way of making numbers come alive and as a means of conveying the amazing relationships between numbers. What results is number sense. Because the brain is a pattern seeking organ, it is drawn to material that follows patterns. It is my desire that through this teaching resource, many children who are overwhelmed or daunted by math might come to truly be fascinated by it instead.

4- We use **STORY** to contain and convey the meaning of what we are teaching. Stories, like visuals, make learning unforgettable. They explain the "why" behind math concepts and tie everything together, creating a vehicle for meaning and for recall.

5- We use **BODY MOTION**—both gesture and whole body movement that mirrors the symbol shape or the action in the math story (such as addition or subtraction). Again, body movement is a powerful agent for learning and remembering. For many people, body motion makes recall effortless if the idea in the lesson is directly tied to a unique motion.

6- We employ **VISUALIZATION**—a powerful tool for right-brain-dominant learners. If these learners are given time to transfer the image on the paper in front of them to their brains (prompt them to close their eyes and SEE it in their mind's eye), they will be able to retrieve that image later. If the image contains learning concepts, this is how they will remember what you want them to learn. So in this book, each time a visual is introduced, prompt the student(s) to "see" the image in their mind, eyes closed.

HOW TO USE THIS BOOK

Because this book builds on *Right-Brained Addition & Subtraction* (or Book 1), please familiarize yourself with Chapters 2-4 of that book first, including "Good Practice," "Assessments," "Visual Imprinting," and "Learning Numbers." You should also be familiar (from Book 1) with the 5-Frames, "My Two Hands," and Stony Brook Village.

For students just finishing Book 1, who are fluent with computation to 10, skip to Chapter 3 to begin new material.

For students unfamiliar with Right-Brained computation, teach Book 1 Chapters 5-7 before beginning this book.

For students needing a review of Book 1, skip to Chapter 2 for a quick review of Book 1. Make sure the children are completely fluent with computation to 10 before beginning this book, meaning that they see a problem and know the answer without counting on fingers or counting on.

For remediation, determine whether the students lack skills in computation to 10. If they do, use Chapter 2 of this book first, or if they need more practice, use Book 1, Chapters 5-7.

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CHART of LEARNING STYLES

Traditional Methods are

designed for these learners	but not for these learners!

How do I learn? (Dr. Anthony F. Gregorc)

I perceive the world

Concrete
I use my senses to take in data about the world. What I see is what is real to me.

Abstract
I visualize, intuit, imagine, read between the lines, and make connections. I pick up subtle clues.

I order the information I perceive

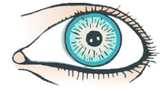
Sequential
I organize my thoughts in a linear, step-by-step manner. I prefer to follow a plan.

Random
I organize my thoughts in segments. I will probably skip details and even whole steps, but I will still reach the goal. I like to make up my own steps.

How do I remember? (Raymond Swassing & Walter Barbe)

Auditory
I listen to directions. I need to hear the sounds.

Visual
I need to see it. I make visual associations, mental maps or pictures, and see patterns.



Kinesthetic
I remember well what I learn through my body. I learn best by actually doing the job.

How do I understand? (Herman Witkin)

Analytic
I am good with details, can follow steps and hear instructions, and like to finish one thing at a time.

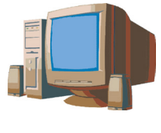
Global
Show me the big picture! I need to see how all the parts fit in. I can hear directions after you show me the goal.

How am I smart? (Howard Gardner)

Verbal/Linguistic
I am verbal! I can speak, write, debate, and express myself well through words. IQ tests love me!

Visual/Spatial
Show me a map and I'll have it! I make vivid mental images and can use these to recall associated information. I want to see how something fits into its environment or surroundings.

Logical/Mathematical
I rely heavily on my logic and reasoning to work through problems. I am a whiz on standardized tests.

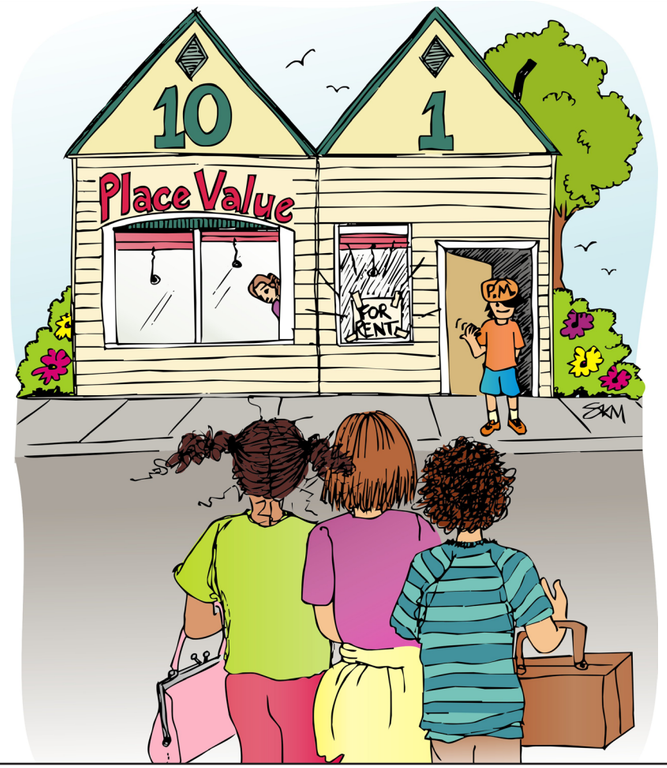


Body/Kinesthetic
I combine thinking with movement. I do well with activities that require precise motions. I learn by doing; my attention follows my movements.

3 PLACE VALUE

GOALS FOR THIS CHAPTER

1. To act out the concept of place value
2. To apply the concept of place value to real-life situations
3. To demonstrate understanding of place value using concrete materials

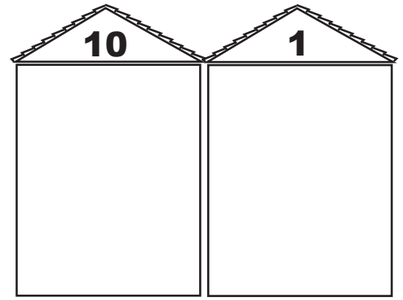


Although place value traditionally is not introduced until middle elementary grades, I teach place value early as a key element of computation with multi-digit numbers. Using the visual/kinesthetic approach of Right-Brained Computation, students will first see what place value means in concrete terms, to enable them to utilize this concept as they work through the lessons in this book. Because place value is demonstrated in concrete terms using attic numerals 1 and 10, children can embrace the concept as early as kindergarten.

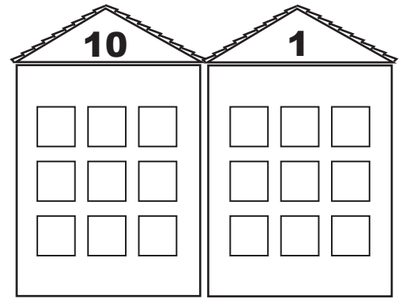
CONCRETE PRACTICE WITH PLACE VALUE

Just as simple sums were introduced using a story to place them in a real-world context, I extend the Stony Brook story to introduce the concept of place value.

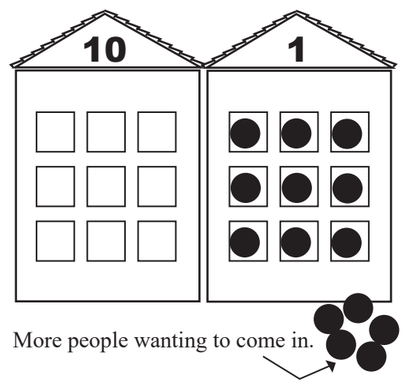
In Stony Brook Village, just over the brook from the residential area, there is a town square with office buildings all around it. Each building is new and clean and shaded by big trees. Pointed roofs crown each building, and attic numbers (1 and 10, which represent place value) are painted on the attics like this. (Show an overhead of the empty buildings; use 3.1 on page 91.)



The planning commission has hired you as the property manager for one of the office buildings, and it is your job to rent office space to people who want to work inside your building. (Point to the side of the building labeled 1.) There are nine desks in this office. That means on this side you can rent desks to nine people, and no more. (Point to the side labeled 10.) On this side are big tables, each seating ten people. (Note: In this context the 10 and 1 represent place values, not a numerical total of the number of workers.)

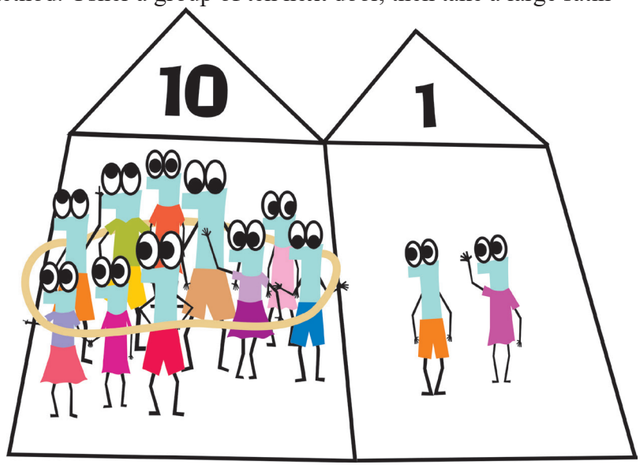


Ten people exactly—no more, no less—must sit around each table. Once you have rented all the desks on the 1s side of the building, if more people come in looking for a place to work, you will need to take ten people from the 1s side and move them over to a big table on the 10s side. Then you can fill up the desks on the 1s side again. Each time you get ten or more people on the 1s side, you have to move a group of ten next door. If you don't, and you leave too many people on the 1s side, the commission will hear about it, and they will come with their sirens screaming to give you a ticket!

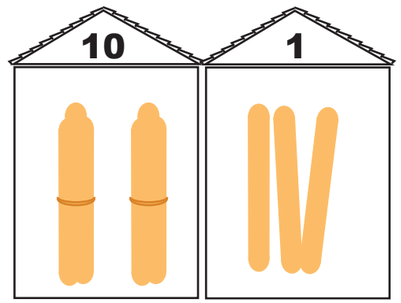


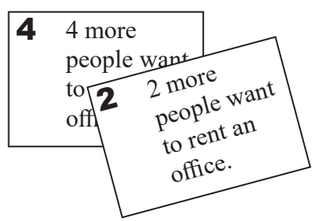
ACTIVITIES FOR PLACE VALUE

Act it out: Use masking tape to outline on the floor the two sides of the office, large enough that ten children can actually fit inside. (Make sure the 10s side is on the left, to mirror the order of the 10s place and 1s place in a written number.) Place nine chairs inside the 1s office and leave the 10s side empty. Tell a story in which you come to the office one day, unlock the door, and soon three children arrive, wanting to rent desks. Have three volunteers step forward, welcome them, and show them to their desks. Continue adding more occupants until the children tell you that you have reached the magic number of ten. Then have the class work out what to do next—don't tell them; let them talk it out. At this point introduce the phrase "make a ten," which you will use repeatedly throughout the method. Usher a group of ten next door, then take a large satin ribbon and gently tie the children together so they represent a group. They will not forget this object lesson! During the game, you want to reinforce the pattern of filling up the 1s side first; then, when the side fills up, making a group of ten and moving the group of ten next door. The motion is "in and to the left," which will be mirrored in written computation.



Rent-an-office game: This is a good game for children to play in the math center. Reproduce and laminate the game cards 3.2 (pages 92-93). Also photocopy the place-value mats 3.3a–b (pages 94-95). Place the two pages of 3.3 side by side and photocopy or glue onto 11" x 17" paper (making sure the 10s side is on the left). Either a pair or small group of children can play. Give the children a handful of rubber bands and a pack of wooden craft sticks. The children take turns drawing a game card and placing the corresponding number of craft sticks ("workers seeking office space") on the 1s place mat (the "office building"). As soon as the number of craft sticks exceeds nine, the children count out ten sticks, bundle them with a rubber band, and move them over to the 10s place-value mat. The purpose of this game is to practice the action of bundling ("making a ten") and then moving the bundle of ten next door. Encourage children to continue playing until they are fluent with the actions of bundling and moving sticks to represent the concept of place value.

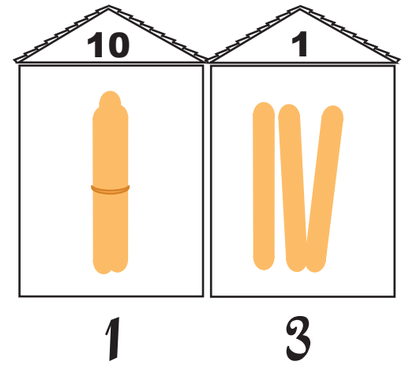




Place-Value placemats showing single and bundled sticks, and Rent-an-Office playing cards.

THE TRANSITION FROM CONCRETE TO SYMBOLIC

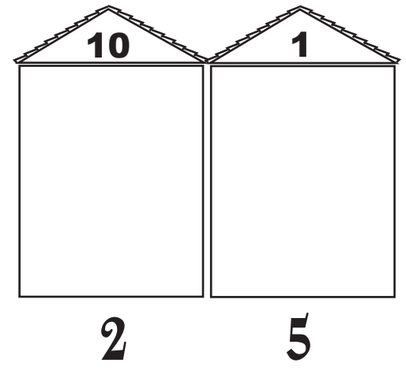
When you make the transition from the renting-an-office scenario to symbols, go slowly and explain what you are doing carefully, so the students do not become confused and think you are introducing a new concept. Talk out what the children have been doing in the rent-an-office game and how these actions can be represented with numbers. I like to use the place-value mat transparency and an overhead projector, but you could also draw on a whiteboard. First model for the class the action of renting out office space and making a bundle of ten using the craft sticks. Then stop and ask, "How many 10s do you have on this side?" As the children answer, write the number they say below the 10s office with a wipe-off marker. Then ask, "How many 1s do you have on this side?" and write that number below the 1s side (see illustration on the right).



Continue adding sticks to the 1s side, bundling them, and moving them over to the 10s side, until you have two bundles on the 10s side and some number of single sticks on the 1s side. Stop again and ask, "How many 10s? How many 1s?," writing the numbers below the corresponding place mats.

Next show the children a set of sticks arranged on the place-value mat and ask them to write the corresponding number. Do this several times until everyone can confidently write the correct symbols for the sets.

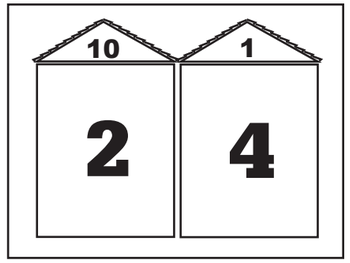
Last of all, show the children a number and have them draw the visual representation of that number in stick format (see illustration on the right). 3.4 (page 96) contains a set of blank place-value cards in which children can draw sticks. Repeat this step until the students have mastered it.



"What Is This?" Game

"What is this?" is a good activity for children to do in pairs in the math center. To prepare, duplicate the place-value cards 3.5a-c (pages 97-99) and laminate. These cards will have several uses in wrapping up this chapter.

1. One child holds up a card with numbers printed in the place-value houses. The second child identifies the number in terms of how many 10s and 1s it contains. For example, if the first child holds up 24, the second child would say, "Two 10s and four 1s."



2. Children can duplicate the numbers using craft sticks and the place-value mats 3.3a-b. Each child takes a turn drawing a card, then sets out sticks to represent that number on the mat.

3. Children can take turns setting out sets of sticks on the place-value mats for their partners to identify using written numerals.

TAKING IT FURTHER

Inevitably, some child will ask, "What if we keep getting more and more 10s?" In this case, you should introduce the 100s office and explain that only nine bundles of ten are allowed in the 10s office. Thus, the 10s office has the same rule as the 1s office: "no more than nine." Point out that as you move left, each attic number gains one more zero. My students loved working with base ten models and filling the offices for 1s, 10s, 100s, and 1,000s. They started with the 1s, bundled a ten, added nine more 10s so they could bundle 100, and kept on going. I wrapped up by asking, "How many?" for each office and writing the number below the office. In this way, they could see that the zero means "there is no one in this office."

Because the children were interested, we continued the exploration of the four offices. I set up a model using craft sticks, and the children wrote the number it represented. Then I changed the model, and they changed their number to reflect the new model. There is something about really big numbers that fascinates children, and this activity makes large numbers understandable and accessible to them.

ASSESSMENTS

An individual progress report and a whole-class record listing the skills covered in chapters 3 and 4 can be found in Appendix B (pages 210-211). Following are suggested activities for assessment.

Give me a ... : Call out a number and have the children write that number (in numerals) inside the appropriate office. (Use 3.6 on page 100; an example is preprinted on the worksheet.)

From sticks to numbers: Show a set of craft sticks in a place-value house and have the children write the number it represents. A prepared worksheet is provided (3.7 on page 101), or you could set up models using transparencies and craft sticks projected on an overhead projector.

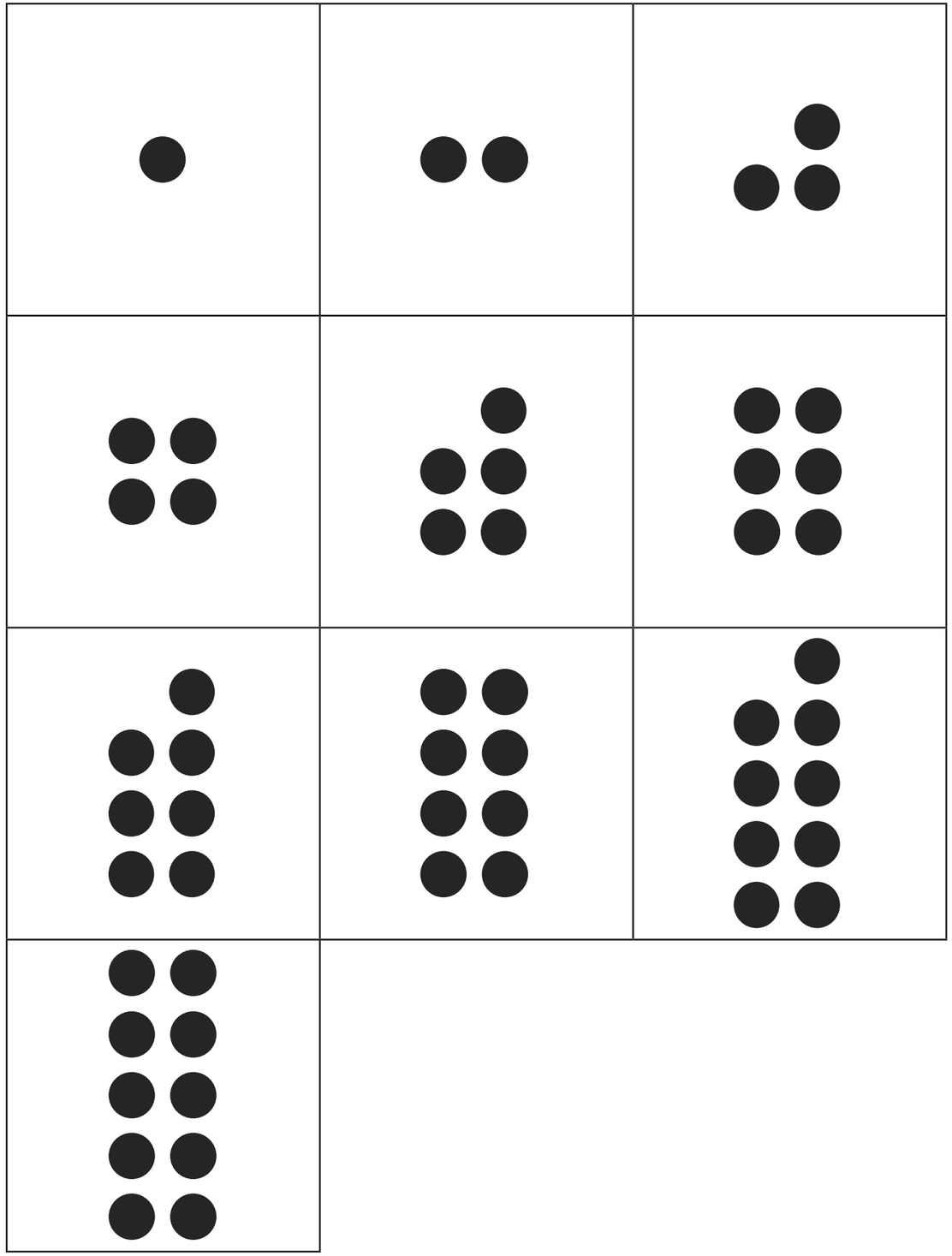
10s and 1s: Call out a number as sets of 10s and 1s; for example, "two 10s and five 1s." Have the children write the corresponding number in numerals on a sheet of paper.

This number looks like ... : Give each child a copy of 3.8 (page 102), which has blank place-value houses with numerals written underneath. The child draws sets of sticks to represent the numerals written below each house.

APPENDIX A

ACTIVITIES & RESOURCES

2.1. Dot cards



2.2. 5-frame number chart

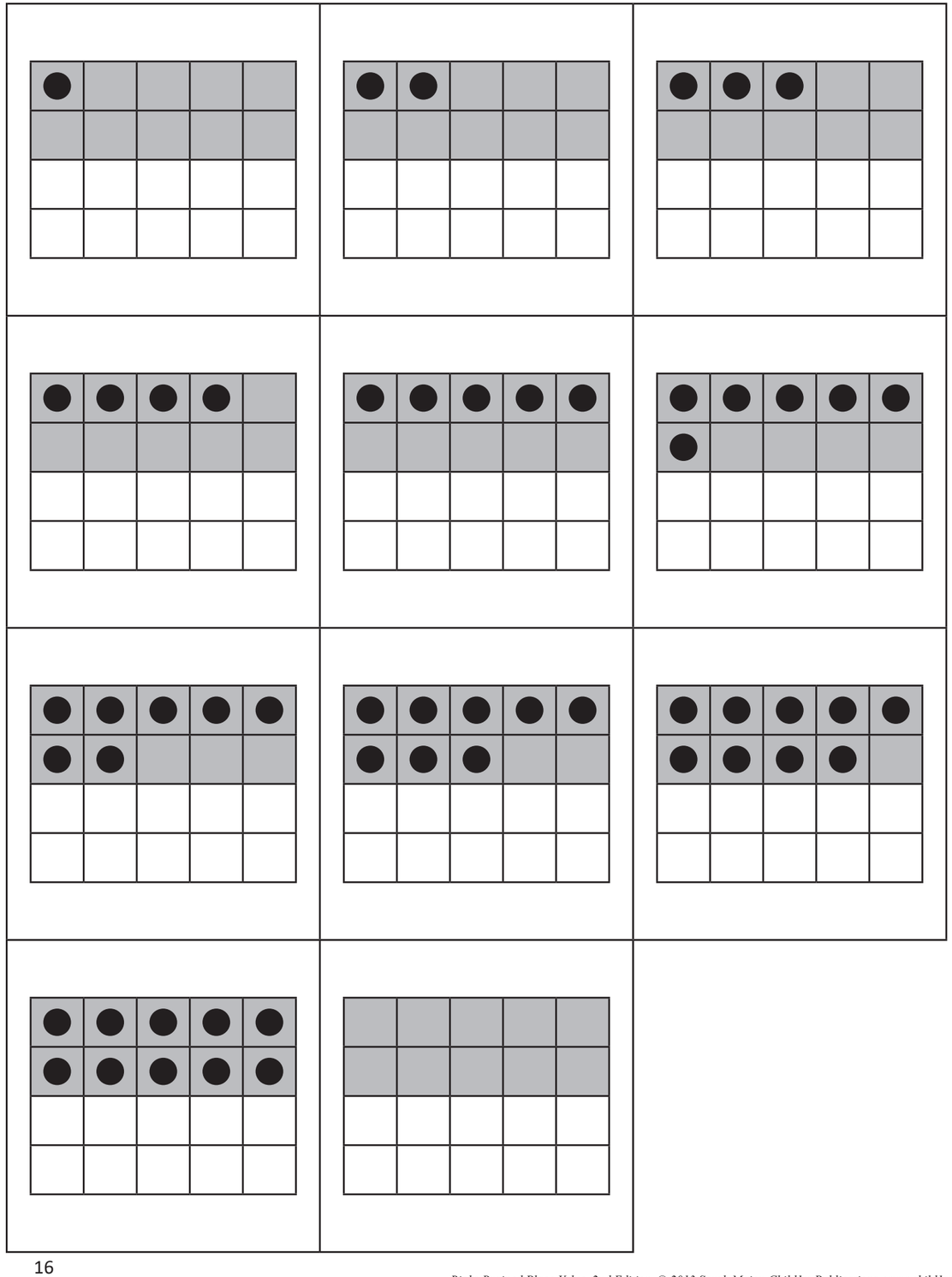
1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	23	24	25
26	27	28	29	30
31	32	33	34	35
36	37	38	39	40
41	42	43	44	45
46	47	48	49	50
51	52	53	54	55
56	57	58	59	60
61	62	63	64	65
66	67	68	69	70

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	23	24	25
26	27	28	29	30
31	32	33	34	35
36	37	38	39	40
41	42	43	44	45
46	47	48	49	50
51	52	53	54	55
56	57	58	59	60
61	62	63	64	65
66	67	68	69	70

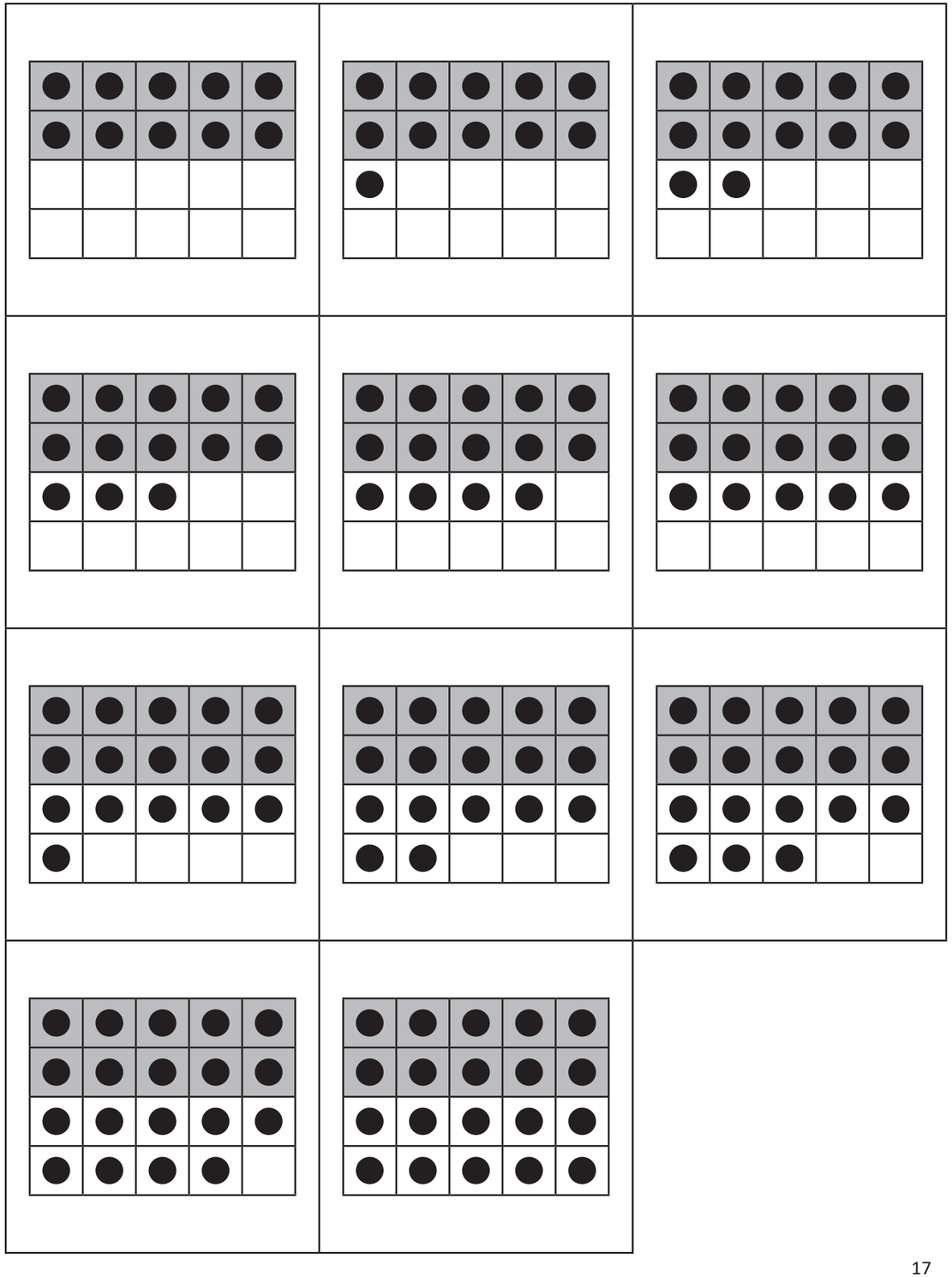
2.3 Blank 5-frame chart to 20

2.4. Blank 5-frame chart

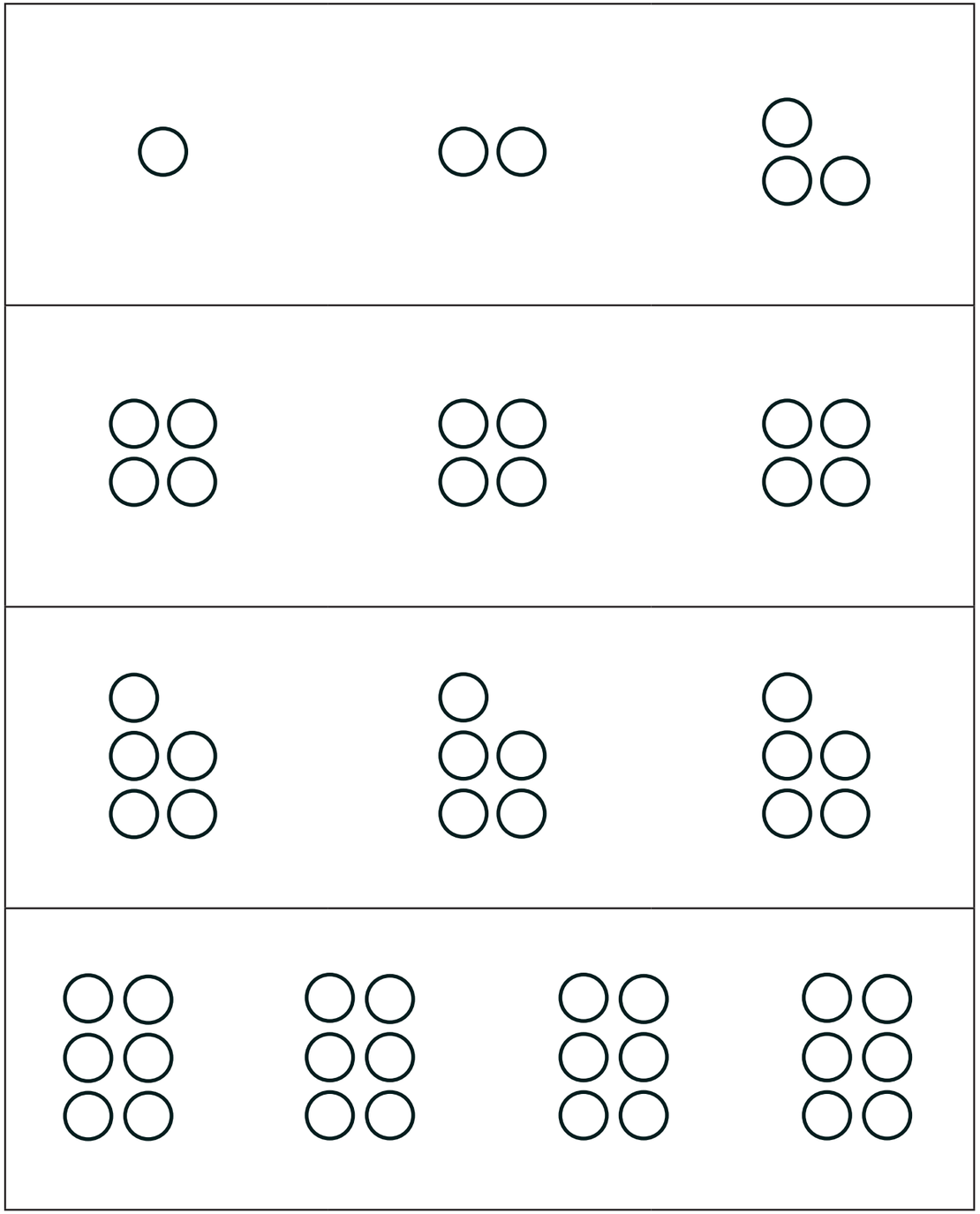
2.5a. 5-frame dot cards, page 1



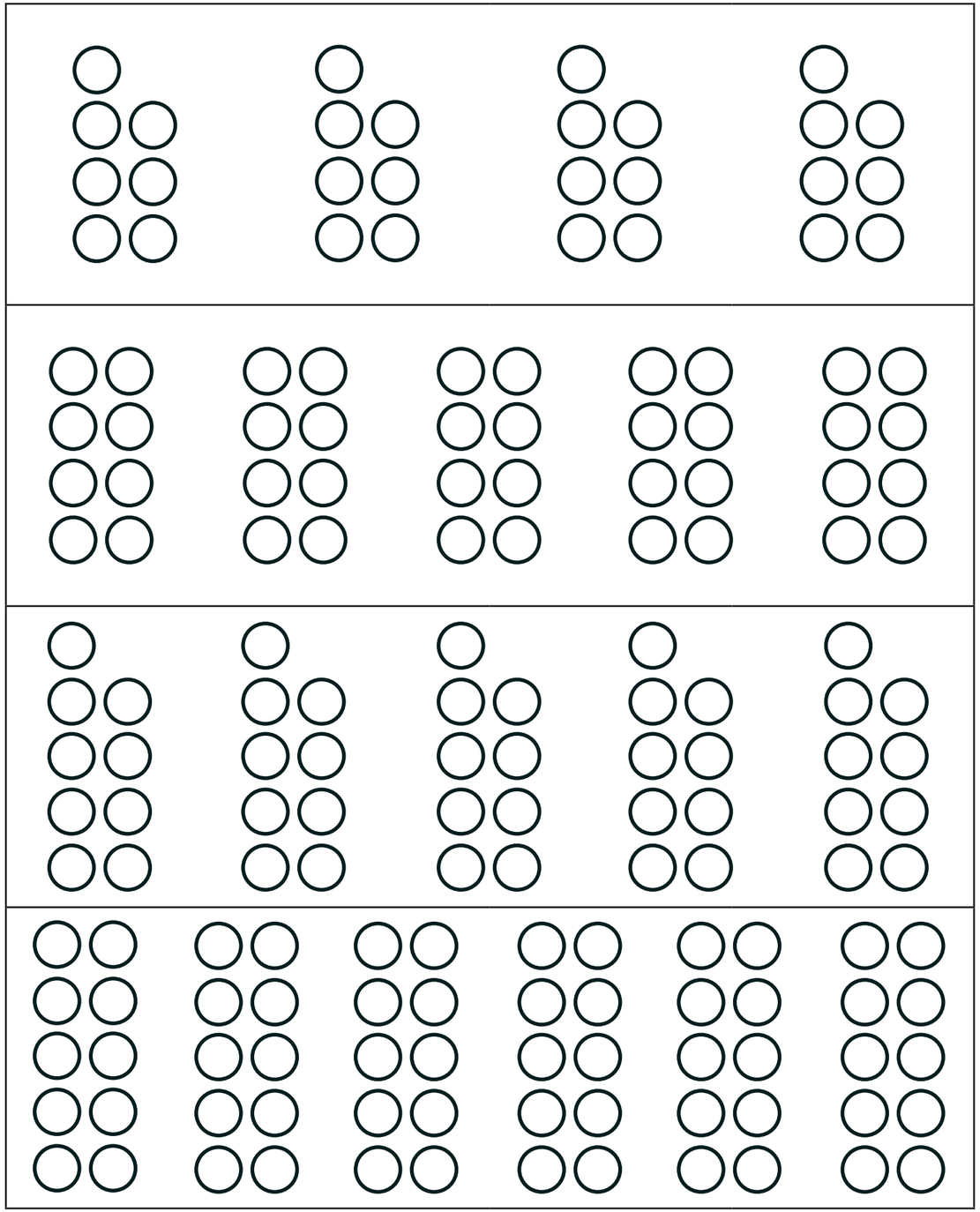
2.5b. 5-frame dot cards, page 2



2.6a. Hollow dot cards, page 1

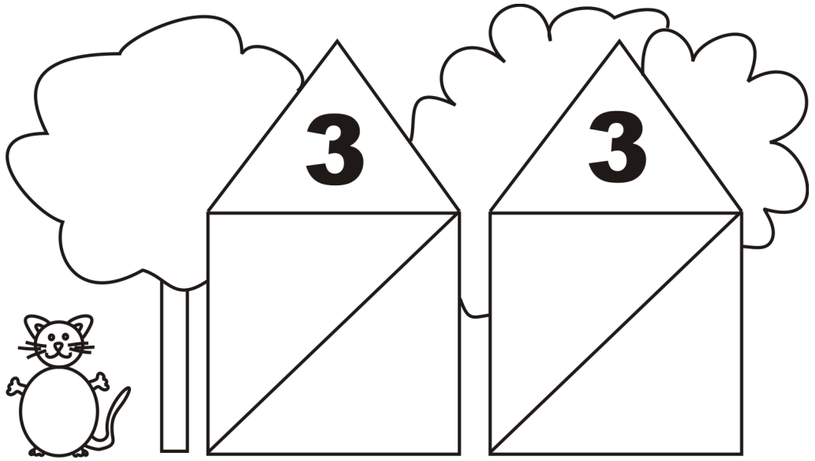


2.6b. Hollow dot cards, page 2



2.7a. Threes

Figure out which families can live in each house.

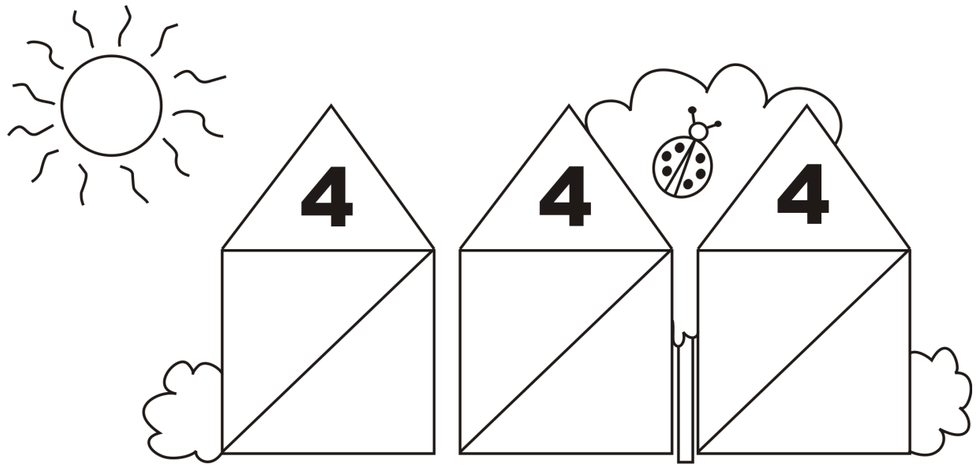


0 1 2 3

Name:_____

2.7b. Fours

Figure out which families can live in each house.

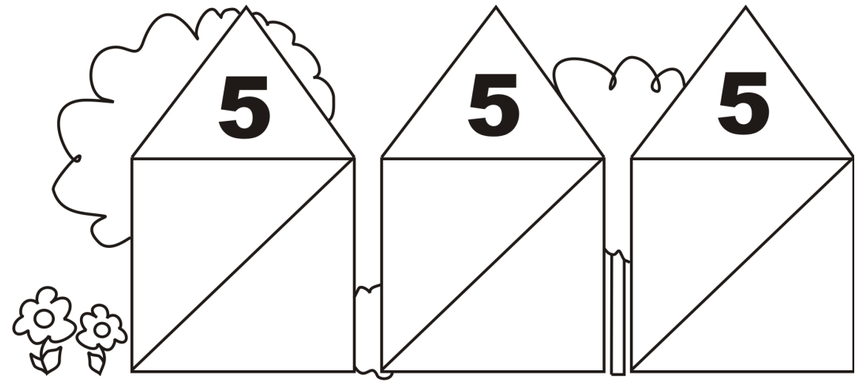


0 1 2 2 3 4

Name:_____

2.7c. Fives

Figure out which families can live in each house.

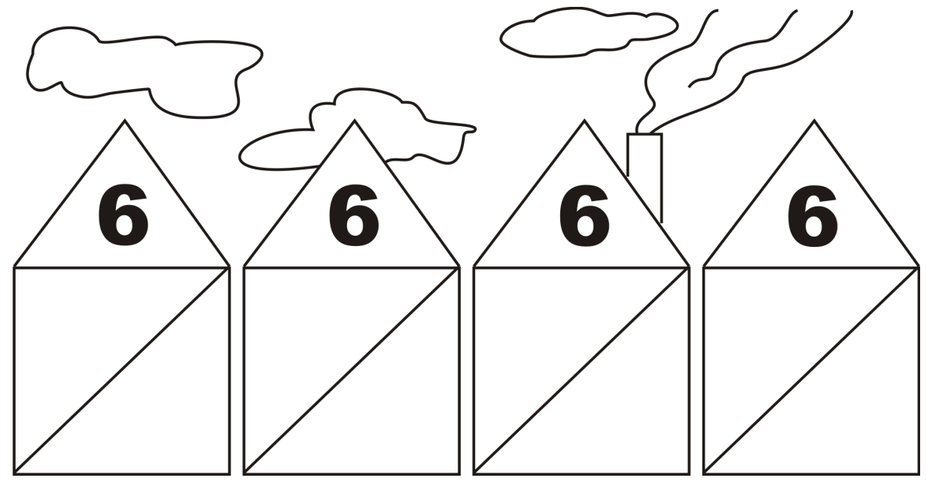


0 1 2 3 4 5

Name:_____

2.7d. Sixes

Figure out which families can live in each house.

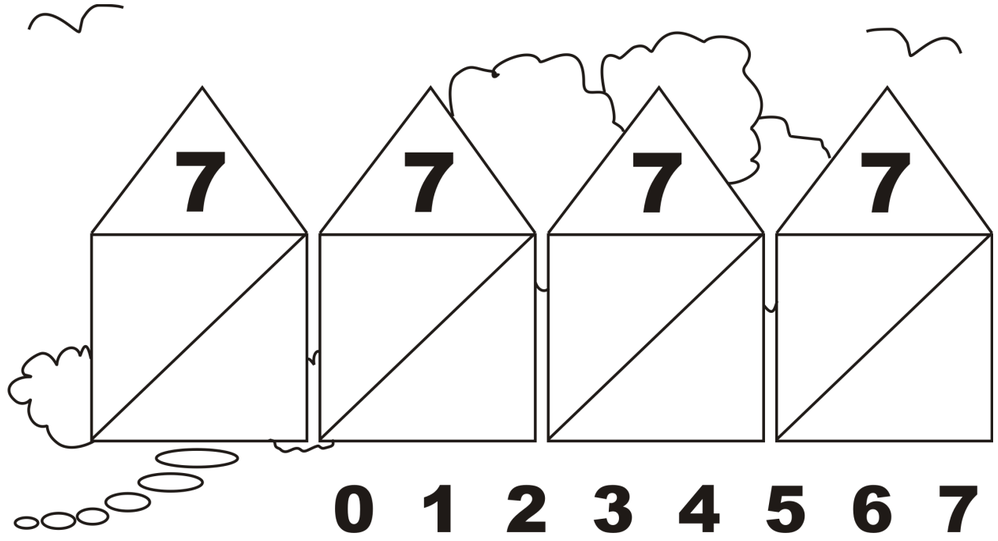


0 1 2 3 3 4 5 6

Name:_____

2.7e. Sevens

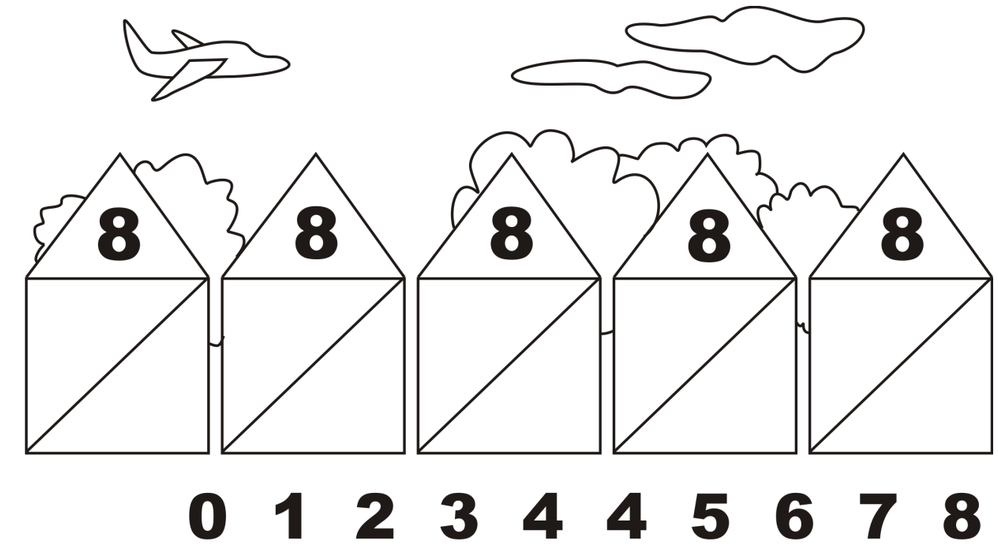
Figure out which families can live in each house.



Name:_____

2.7f. Eights

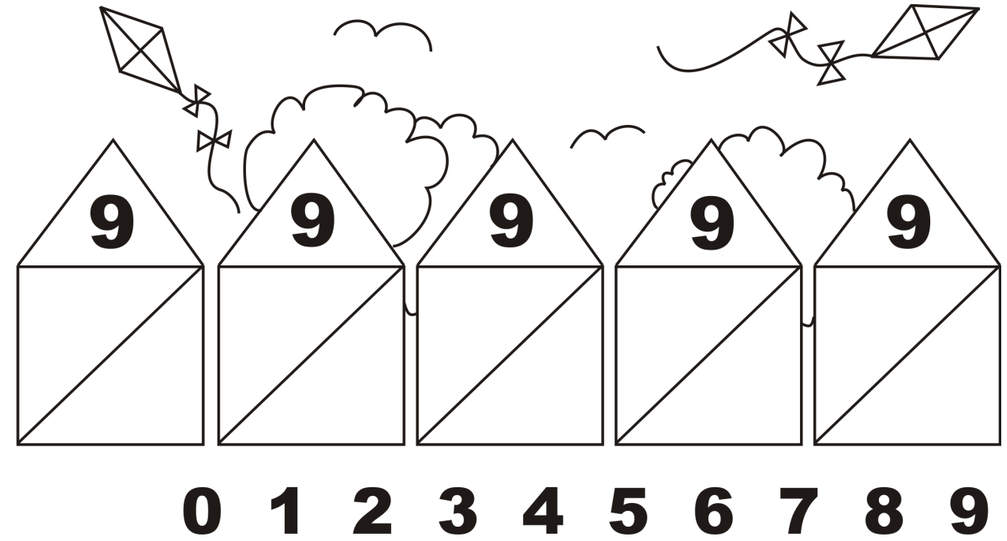
Figure out which families can live in each house.



Name:_____

2.7g. Nines

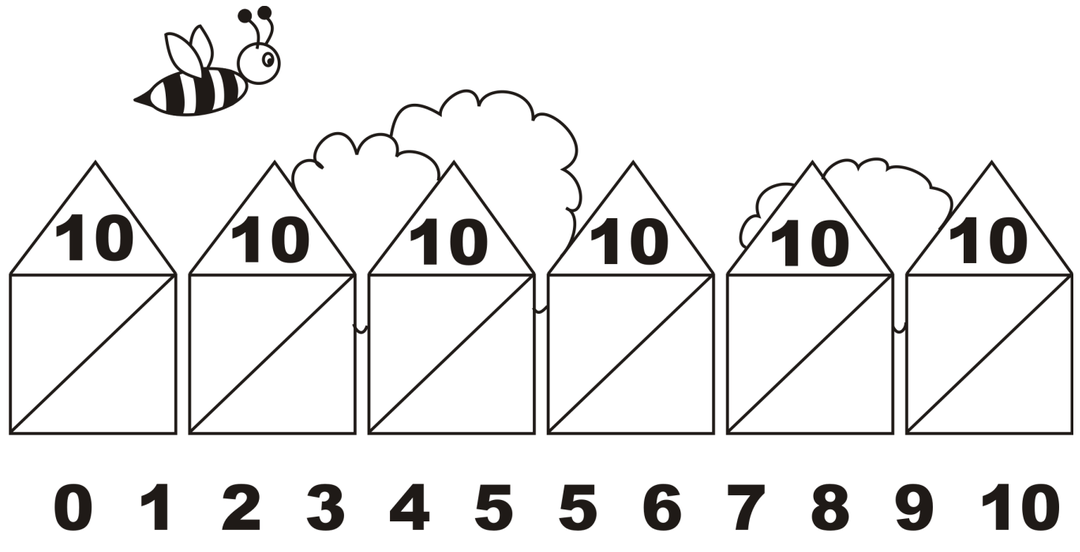
Figure out which families can live in each house.



Name:_____

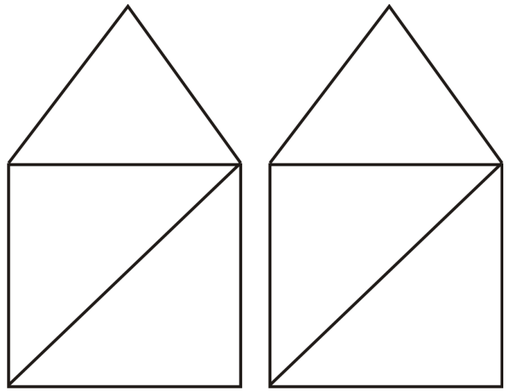
2.7h. 10s

Figure out which families can live in each house.



Name:_____

Name_____



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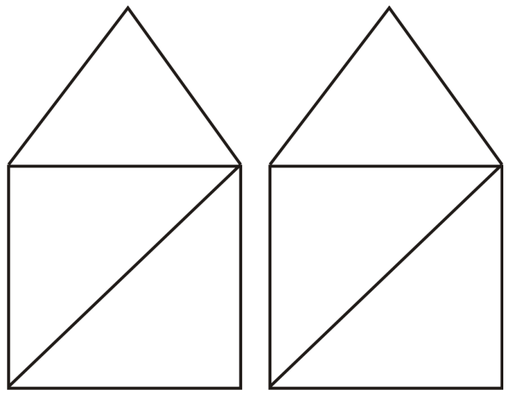
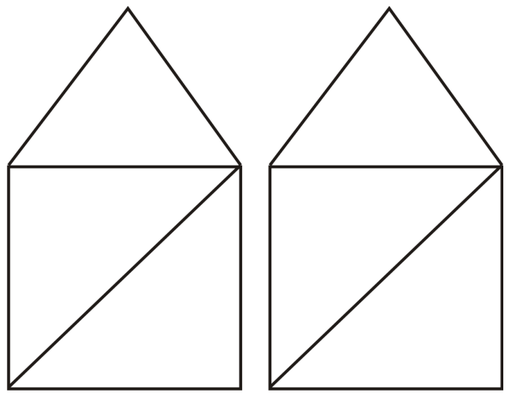
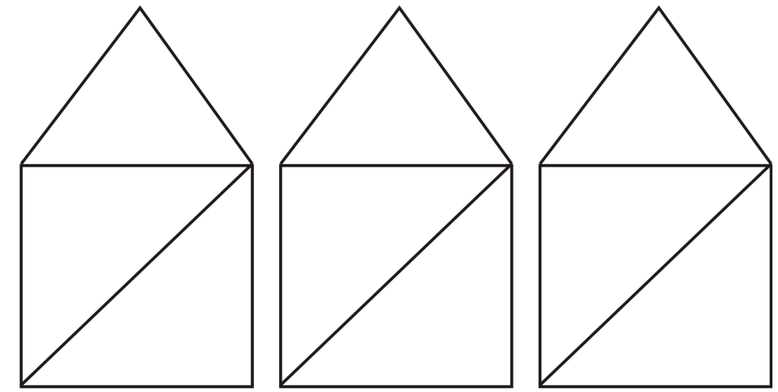


fold



2.8a. Third Street practice houses

Name_____



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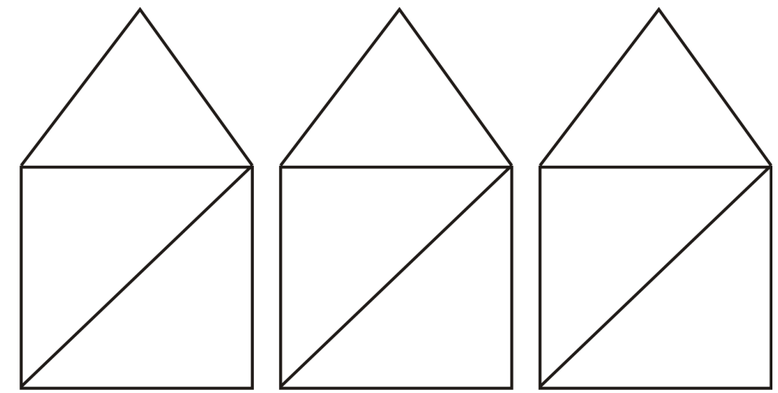

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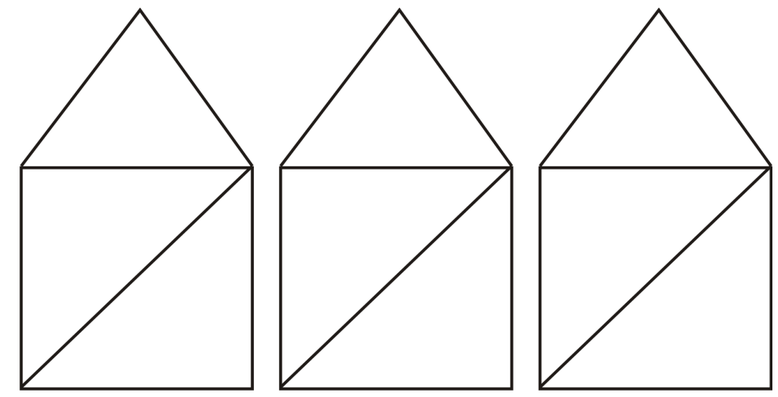

2.8b. Fourth and Fifth Street practice houses