

The Napping House

The Napping House, by Audrey Wood, is a beautifully illustrated book about a house full of napping inhabitants. The story begins with a granny snoring away on a dark and rainy day. One by one, she is joined in bed by a dreaming child, a dozing dog, a snoozing cat, a slumbering mouse, and finally, a wakeful flea. This last arrival begins a chain reaction that results in the whole group awakening just as the rain stops and the sun comes out. The story leads to a numerical problem-solving experience for which there are multiple answers.

1995). *Math and Literature (K-3)*, Book Two by Stephanie Sheffield

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As soon as I put the big book on the easel, I heard exclamations of recognition from the first graders.

"I remember that from kindergarten," Harlan said.

"This is a good book," Reggie added.

I didn't mind that the children were familiar with the book. Any good book is worth reading many times, and I planned to extend the story into a math activity.

After reading the book, I asked the children if they could describe something in the book that changed gradually. I noticed a couple of quizzical looks, so I asked, "Who knows what I mean by 'gradual'?"

Mark responded, "Does it mean a little at a time?"

"Yes," I answered. "When something changes gradually, it changes slowly over time, rather than suddenly or all at once."

Colleen raised her hand now. "At the beginning of the book, everything is dark, and at the end it's light."

"Did that happen a little at a time or all at once?" I asked. We checked the illustrations to confirm that it was a gradual change.

Lamar answered next. "The bed went downer and downer when everybody was on it." We returned to the book to look at the sagging mattress.

Next Maureen noticed that the rain stopped gradually as the sleepers woke up. Then Mary pointed out that characters began leaving the bed after the wakeful flea arrived.

I posed a question. "When all the sleepers were piled up, how many feet were in the bed?" I suggested that we make a list of the characters in the story as a way to answer this question. As the class recalled the characters, I recorded them on the board, along with the number of feet each one had.

<i>a snoring granny</i>	2
<i>a dreaming child</i>	2
<i>a dozing dog</i>	4
<i>a snoozing cat</i>	4
<i>a slumbering mouse</i>	4
<i>a wakeful flea</i>	6

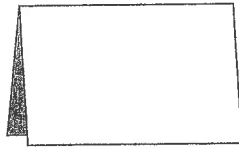
When the list was complete, some children immediately began counting on their fingers, while others seemed not to know how to figure out how many feet there were altogether. I offered a suggestion. "When I have to add a list of numbers like this, I look for pairs or groups of numbers that add up to 10. I'll show you." I drew a bracket connecting the 6 with the 4 and wrote 10 on the side. I explained what I was doing, as I put two 4s together to make 8 and added 2 to the 8 to get another 10. Now I had two 10s, and I added the 2 to the equation. Mark shouted, "22!"

<i>a snoring granny</i>	2	—	2
<i>a dreaming child</i>	2	}	10
<i>a dozing dog</i>	4		
<i>a snoozing cat</i>	4	}	10
<i>a slumbering mouse</i>	4		
<i>a wakeful flea</i>	6		

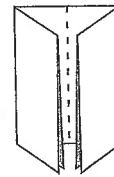
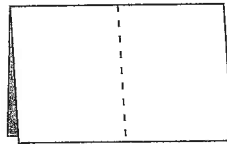
"Now you're each going to make a house and think about the number of feet in it." I gave each child a piece of white 8½-by-11-inch paper and demonstrated the origami folds to make a paper house, giving instructions as I folded. I took the students through the folds, one step at a time. At each step, I asked a question to help them check their work: "Does your paper look like mine?"

Below are the directions for making the paper house.

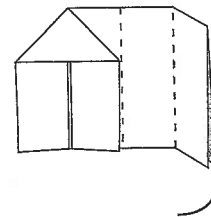
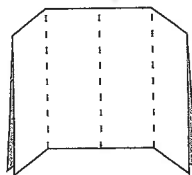
Fold the paper in half, bringing the two 8½-inch edges together. Then fold it in half again the other way.



Open the last fold. Hold the paper with the folded edge up. Then fold the outer sides into the middle fold.

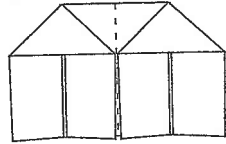


Open the last two folds. Then put your finger inside one fold to separate the two parts and fold the inner part into the middle fold, making a triangle appear at the top. Crease the paper so the two parts are open and there is a triangle at the top.



Put finger inside this fold

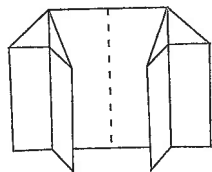
Do the same with the fold on the other side. The "house" should look like this:



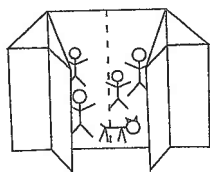
I heard exclamations of delight as the children made the final folds to create the triangles for the roof.

"It really looks like a house!" Kimberly said.

I held up my origami house and showed the children how to open the middle folds to see the inside of the house.



I took my marker and began to sketch as I talked. "I'm going to show you who lives in my house," I said. I drew stick figures inside my paper house to represent myself, my husband, my son, my daughter, and our cat.



"Now let's count to find out how many feet live in my house," I said. Together we counted 12 feet. I closed the doors of the house again and wrote 12 on the outside of one of the doors.

"Since we have 12 feet living in our house, my feet number is 12," I said. "The feet number you'll write on your house will tell how many feet live inside."

I showed them my house again and said, "Did you notice that I didn't spend a lot of time drawing my pictures? This kind of drawing is called sketching. A sketch is a quickly drawn picture that doesn't have a lot of details. I'd like you to make a sketch of the people who live in your house."

Mary raised her hand. "Can I draw my dog Boris?" she asked.

"Sure," I said. "You should draw all living things that live in your house and have feet."

"Can I draw my fish?" Tom asked with a smile.

"Not unless your fish have feet," I replied.

The children began drawing, and a hush fell over the room. They were intent on their work. Even Ken, who had been wiggling and squirming through the whole lesson, was still and focused as he sketched. The connection to their own lives made this problem come alive for the children.

I walked around and observed the children working. I noticed that Timothy had written a 4 on the outside of his house. I knew that there were four people in Timothy's family.

"What does this number mean?" I asked.

"Four people in my family," he replied.

"But how many feet live in your house? Your house number needs to tell that." Timothy still looked puzzled.

"Four would be the number of feet for just you and your brother Justin," I said. "What about your Mom's and Dad's feet? You need to write the total number of feet in your house." Timothy erased the 4 and opened his house to count the feet again.

When the children had finished, I called for their attention. "Raise your hand if you think you have the smallest number of feet in your house," I said, to begin a class discussion.

Cassie raised her hand. "Mine has 10 feet," she said.

"Does anyone have a number of feet smaller than 10?" I asked.

Amy answered, "I have 12."

"Is 12 smaller than 10 or larger than 10?" I asked.

"Bigger," she answered.

"We're looking for a number that is smaller than 10," I reminded her.

Kimberly reported that she had 6 feet living in her house. "Does anyone have a number of feet that is smaller than 6?" I asked. No one did, and we agreed that 6 was the smallest number of feet living in any of our houses. I asked Kimberly to bring her house to the

front of the room. I wrote the number 6 on the board and posted the house next to it. I asked other students with 6 feet in their houses to bring their houses to the front to post. We posted two more houses next to Kimberly's.

Then I asked, "Whose house might have the next larger number of feet?" Nina told us her house had 10 feet inside.

"Does anyone have a house with more than 6 feet and fewer than 10?" I asked. Around the room heads went down, as children looked at their numbers.

Alexandra said, "I have 8," and brought up her house. Brenda, Timothy, Eddie, and Carol also brought their houses up for me to post. Each had an 8 written on the outside.

"Does anyone have a number between 6 and 8?" I asked.

Maureen raised her hand. "You can't, because 7 is an odd number," she said.

"Can you explain what you mean, Maureen?" I asked.

"Legs are only even numbers," was her reply.

Mark shouted his agreement, "Legs come in twos and fours. You'd have to have a person with three legs to get seven."

I wrote an 8 on the board under the 6 and posted the five houses. "How many more houses do we have with eight feet than with six feet?" I asked. The question of how many more is difficult for many first graders. Whenever a situation comes up where comparing numbers makes sense, I try to ask this question. Children need to hear mathematical language spoken many times in order to learn to use it themselves. Also, they need to hear mathematical language used in contexts that allow them to make sense of the words.

When Lamar answered that there were two more houses with eight feet than with six feet, I asked him to explain how he figured that out. He came to the board and pointed to the two rows of houses. "These have matches on the six row," he said pointing to the first three houses next to the number 8. "These two don't have matches, so that's two more."

I continued to call children up to post their houses. We had rows marked 6, 8, 10, 12, 14, 16, 18, 20, and 24. I pointed to one house in the row marked 10.

"What could live in this house?" I asked.

"I don't know—that's not mine," Brenda said.

"Without peeking inside the doors, though, what might live in here?" I asked.

Cindy answered. As she spoke, I recorded what she said on another section of the board. "A mom, a dad, a sister, a brother,"

Cindy said and then stopped. On the board I recorded a list: *Mom—2, Dad—2, Sister—2, Brother—2*. Cindy looked at the board, her lips moving as she counted silently. Then she added, "And a baby." I added *Baby—2* to the list and had the children count together by 2s to verify that the number of feet was 10.

"Who can tell me another group of living things that could be in that house?" I asked. I called on Timothy.

"A dog," he said. I wrote: *Dog—4*. "A mom, a dad, and a cat," he added. I listed what he said, along with the number of feet for each.

"Let's add these to check," I said. I pointed to the two 4s and the class said, "8." As I pointed to the first 2, Eddie said, "Uh-oh. That's 10 and we haven't counted the dad."

"Well, we could get rid of the dad," I said, and I erased it.

Several children protested. "No, no." "Don't get rid of the dad." Apparently, I had hit a nerve. I wrote *Dad* again but accidentally put a 4 next to it instead of 2.

"Hey, dads don't have four feet!" Mary exclaimed. I replaced the 4 with a 2. Finally we decided to replace the cat with a sister.

I asked for other suggestions for the house with 10 feet. Penny offered this group: *mom—2, dad—2, cat—4, and bird—2*. Coleen suggested: *grandma—2, parrot—2, hamster—4, and grandpa—2*. I listed both of their suggestions on the board.

With four different groups of living things on the board, I asked, "Do you think this is all the ways that there could be 10 feet in this house?" Most of the class felt sure that there were more possible solutions.

"I agree that there are more solutions to this problem," I said. "But instead of continuing to work on this problem, you're going to solve one of your own. Each of you will choose one house number to investigate. You'll try to find all the different groups of living things that could live in a house with that number of feet."

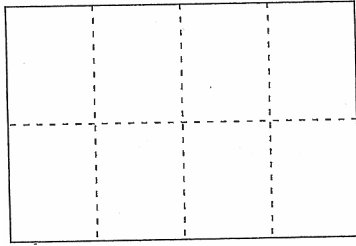
I then held up a sheet of 12-by-18-inch construction paper to demonstrate how they were to organize their work. "You need to fold a sheet of paper and write each new group you think of in a separate box." I demonstrated folding the paper in half, in half again the other way, and then in half once more.

"Stop before you open the paper," I said. "How many boxes do you think there will be when the paper is open?"

Children began shouting out numbers, so I asked for quiet. I heard the numbers four, five, six, and eight.

"Whisper to the person next to you what you think," I said. Whenever I have the opportunity, I want children to think about

numbers and their connections to little things the children do every day. I heard a sound of wonderment as they opened the paper and counted eight boxes.



The children worked intently. Some drew pictures of families, while others made lists like the ones on the board. I noticed that some students changed the number of living things in the house as they moved from box to box on their paper. I asked for the students'

<p>Sister-2 mom-2 dad-2 <u>dog-1</u> 12</p>	<p>dad-2 mom-2 Sister-2 baby-2 <u>cat-1</u> 12</p>	<p>dad-2 sister-2 mom-2 <u>butterfly-6</u> 12</p>	<p>Grandma-2 Grandpa-2 Auntie-2 ant-2 bird-2 <u>baby-2</u> 12</p>
<p>bird-2 butterfly-6 baby girl-2 <u>baby boy-2</u> 12</p>	<p>Mom-2 snake-0 boy-2 sister-2 dad-2 <u>fattib-2</u> boy-2 12</p>	<p>butterfly-6 bird-2 dad-2 <u>mom-2</u> 12</p>	<p>mom-2 dad-2 sister-2 grandma-2 grandpa-2 <u>friend-2</u> 12</p>

Sandi wrote lists and drew pictures of the people, animals, and insects.

attention and clarified the directions about choosing one number to explore. "Stick with one feet number for the whole page," I said. "If you choose the number 12, you need to find as many different solutions for 12 as you can."

The room was quiet as the children wrote and drew. Audrey raised her hand, and I went to her desk.

"I'm stuck," she told me.

"What's your feet number?" I asked. She pointed to the 6 on her paper.

"What can live in this house?" I asked.

"A bird," she replied.

"Write that in one box on your paper," I directed. Audrey wrote *bird* and also wrote a 2 next to it. This let me know that she basically understood the problem but just needed some reassurance that she was on the right track.

I continued asking Audrey what else lived in the house, and had her record her answers. After she completed one box, I left her to work on her own.

Alexandra found ways to show eight feet in a house.

dog 4 cat 4 8	bird mom 2 ses 2 me 2 8
dad 2 ses 2 me 2 ses 8	Cousin 2 uncle 2 dad 2 mom 2 8
Uncle 2 mom 2 dad 2 me 2 8	Rabbit 4 me 2 uncle 2 8
Mom 2 dad 2 to ses 4 8	mom 2 me 2 dad 2 sester 2 8

I noticed Eddie's hand up and walked over. "I have 19 feet already, and I can't think of anything alive that has only 1 foot," he said.

"Well, Eddie," I said, "I can't think of anything with only 1 foot either. What else might be the problem?" I asked.

"Maybe I counted wrong," Eddie sighed. "I'll try again." When I looked in Eddie's direction a little while later, he smiled and gave me a thumbs-up sign. He had found and fixed his counting error.

One of my goals for students in first grade is to help them develop a sense of self-sufficiency about their problem solving. I want them to understand that they are competent mathematicians in their own right, and can verify their own answers. This problem encourages that kind of confidence. The numbers are manageable, the problem can be solved in a number of ways, and children can check their own answers in a variety of ways. I also like that children have to decide for themselves when they are finished.

Ahmed found an efficient way to find 16 feet. In many of his examples, he included a spider (8) or a flea (6).

<p>16 3EE 36</p> <p>Mom 2 Dad 4</p> <p>Sister 2 me 4</p> <p>little brother 2 big brother 2</p> <p>Spider 8</p> <p>16</p>	<p>Mom 2 Dad 4</p> <p>brother 2 brother 2</p> <p>Spider 8</p> <p>16</p>	<p>16</p> <p>Mom 2 Dad 4</p> <p>brother 2</p> <p>Sister 8</p> <p>Flea 6</p> <p>16</p>	<p>Adbw + Kennis 2</p> <p>Mom 2 Dad 4</p> <p>Spider 8</p> <p>16</p>
<p>Mom 2 Dad 4</p> <p>Sister 2 brother 2</p> <p>Cat 4</p> <p>Cat 4</p> <p>16</p>	<p>Dad 2 Mom 4</p> <p>Spider 8</p> <p>Sister 2</p> <p>16</p>	<p>Dad 4 Cat 4</p> <p>Spider 8</p> <p>8 + 8 = 16</p>	<p>Mom 2 Dad 4</p> <p>Grandma 2</p> <p>Sister 2</p> <p>Rabbit 4</p> <p>Hamster 4</p> <p>16</p>