Learning Math with Kayla

Book 3 Learning Multiplication Facts

Vicki Meyer

Illustrator Sue Lynn Cotton

The Learning Math with Kayla Books

Book 1 Adding and subtracting like fractions
Book 2 Multiplying fractions
Book 3 Learning multiplication facts
Book 4 Place values, Multiplying large numbers
Book 5 Adding and subtracting unlike fractions
Book 6 Learning about improper fractions and mixed numbers
Book 7 Dividing fractions
Book 8 Adding and subtracting large numbers
Book 9 Solving long division problems
Book 10 Working with decimals and percents
Book 11 Learning about negative numbers
Book 12 Problem solving!

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About the Kayla Books

The Kayla books tell the story of a fourth grade girl who has gotten so far behind in her math class that she is not able to understand what her math teacher, Mr. Williams, is trying to teach her. He is aware of how poorly Kayla is doing and decides a tutor would be the best way for her to catch up.

In this third book, her tutor, Ms. Gibbs, introduces Kayla to the multiplication grid and Kayla is able to put 59 numbers into her grid! She also teaches her about our base ten system and Kayla learns how to multiply really big numbers that are multiples of ten. There are twelve books in this series. In these books, Ms. Gibbs teaches Kayla much of the math she needs to be more successful in school.

Whether you're a fourth grader, in middle school or in high school; a Mom or Dad or a Grandparent, you can learn along with Kayla.

About Kayla

I have been asked if Kayla is a real person. She and others in the books are composites of the many kids I have tutored, myself as a kid *and* as a tutor. I remember sitting in class and staring into space when a teacher was talking about something too hard for me to understand. I also remember students staring into space when *I* was trying to tutor them about something that was too hard for them, as Kayla does in this book.

About the Author

After Vicki raised six really smart kids, she began studying for her Ph.D. in order to keep up with them. She taught at the university level for about 25 years, then began tutoring elementary school students. Vicki soon found a new career for herself, tutoring math for at-risk kids, writing about her experiences, and putting together the Kayla books.

Vicki lives with her husband, Ed, in Sarasota, Florida.

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DEDICATION

To my mother, Phyllis Hurtova, who was prevented from going past the fourth grade by political unrest in Czechoslovakia, yet continued to be a life-long learner.

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Chapter 1

The fire drill

It was Wednesday morning. The fire alarm rang. Mr. Williams looked very serious. He said, “We must leave the school in an orderly fashion. Fold your arms in front of you, please follow me, and *please* do not talk.”

I wasn’t afraid because I kinda knew it was just a drill, not a real fire. I wasn’t completely sure though so I kept looking around and sniffing for smoke. I didn’t see any smoke and I didn’t smell any either.

I did hear the sirens from a fire truck though. I think the fire fighters are supposed to have a fire drill every year too.

I grabbed my backpack and followed Mr. Williams. We left the school and walked to another building. Then we went to a room with lots of tables and chairs. Mr. Williams told us to stay there until it was safe for us to return to our classroom.

I noticed Cleveland was sitting by himself at one of the tables. I walked up to his table and said, “Hi.”

He didn’t really say “Hi” back, he just nodded his head a little and then looked away. I sat down near him.

Then I took out some paper and my colored pencils and began drawing a fraction bar. I made it real big so Cleveland would be sure to see it.

“Hey Cleveland, would you like to color in some sections of my fraction bars with me?” I asked.

“Color fraction bars? Why would I want to do that?” he answered, kind of gruff-like. He then turned his head away.

“Well, it’s a good way to learn about fractions. That’s how I learned about them,” I answered.

“I hate fractions,” he said as he turned his head away again.

Hmm. I was trying to think of something to say. I sat quietly for a few moments. Then I said, “I got an idea, Cleveland. You color in just one section of my fraction bar with me and then we can draw some pictures together. You can use my colored pencils. I have some extra paper too.”

He grunted something; I think it meant, “OK.”

Chapter 2

Teaching Cleveland fractions

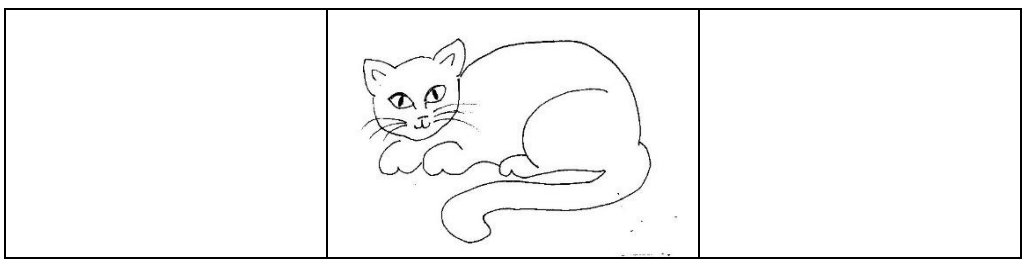
I tried to remember what Ms. Gibbs first taught me. I think the first thing we added was one-third plus one-third, so that's what I started with.

Oh, now I remembered: The first figure Ms. Gibbs showed me was a circle. Hmm, but I already started to draw a big fraction bar. Well it doesn't really matter. I divided the fraction bar into three sections.

"I'll color in one section," I said, trying to sound like Ms. Gibbs, "and you can color in another section." I colored my section green, just like Ms. Gibbs did that first day.

Cleveland took the black pencil and started coloring in his section. He was taking a long time. He was sitting to my right and he was using his left hand to color so I couldn't see what he was doing. Hmm, why was he taking so long?

When he finished, he showed me. Wow! He drew a cat in his section, just like the one he drew while we were in the Time-out Room, only much littler.



Reader, please color one section green for Kayla

I was so surprised! I tried not to show it though. I tried very hard to sound like Ms. Gibbs. You know, serious-like.

I explained to Cleveland what we just did. "We each colored one-third of the bar. I colored my section green and you colored a cat in your section." I wrote out the equation as I spoke:

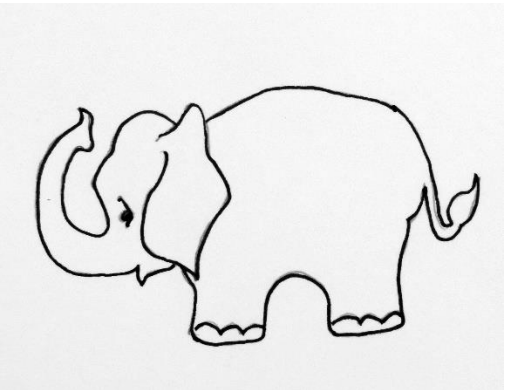
$$\frac{1}{3} + \frac{1}{3} = \frac{2}{3}$$

I pointed to the fraction bar as I said "Together we colored two-thirds of the bar." I tried to say it just like Ms. Gibbs did.

He looked at what I wrote. Then he looked at the fraction bar. Then he looked back at what I wrote again. He was quiet for a moment. He didn't say anything about the fraction bar or the equation. He just asked if he could have some paper.

I gave him a piece of paper and then moved around on the other side of him. Now I can watch him draw. Maybe I can learn how to draw that cat.

But he wasn't drawing a cat. "What is he drawing?" I wondered as I watched him. Wow, it looks like an elephant…it *is* an elephant! Cleveland drew an elephant and it was really good.



I would like to learn how to draw an elephant like that too. But first I want to learn how to draw that cat, Cleveland's cat!

I heard Mr. Williams's voice above all the noise in the room. "The fire drill is over. I want everyone to please go back to our room. And *please* walk quietly."

Chapter 3

Tutoring day

The next day was Thursday, tutoring day. I walk to the tutor room by myself now. Ms. Gibbs was already sitting at the table.

“Are we going to multiply more fractions today?” I asked when I entered the room. “I’m getting real good at it. And, Ms. Gibbs, guess what!” I said excitedly.

“What is it?” she asked.

“I’m helping a boy in my class. His name is Cleveland and he’s my new friend. I’m showing him how to add fractions just like you showed me. We’re using your colored pencils. I think he’s catching on.” Kayla’s voice trailed off as she said, “although he didn’t say he was.”

“Why that’s wonderful, Kayla. I’m proud of you. Maybe when you grow up, you might want to be a teacher. Would you like that?” Ms. Gibbs asked.

“Me? A teacher? I don’t know. I don’t think so. You have to be real smart to be a teacher, don’t you?” I asked.

“Well, Kayla, you *are* real smart. You can add, subtract, and now you can multiply simple fractions. And you’re teaching Cleveland too. If you weren’t smart, you wouldn’t be able to do all that,” Ms. Gibbs said.

Hmmm. I never thought of myself as smart but maybe I am. I never thought of being a teacher. I think you have to go to college or something like that. Hmm. I never thought of going to...

Chapter 4

The multiplication grid

Ms. Gibbs voice interrupted my thoughts. She said, rather loudly, "Kayla, I have something for you."

Ms. Gibbs took out a piece of paper from her folder. The paper had a lot of boxes on it. It had the words "Multiplication Facts" written across the top. I took one look at that paper and exclaimed, "Oh boy, that's a lot of boxes to color in!"

Reader, please turn the page to see the multiplication grid.

"Oh, no," Ms. Gibbs said, "this is not for coloring. This is called a multiplication grid. I want you to fill in all the boxes with numbers. I want you to learn your multiplication facts."

"All the boxes? With numbers?" I asked. "That's a lot of numbers!"

"Yes, there *are* a lot of boxes for you to put numbers in. There are 121 of them to be exact. Do you know how I know that?" Ms. Gibbs asked.

I shook my head, "No."

"I know that there are 121 because I know my multiplication facts. I looked down and noticed there were eleven rows and looked across and saw there were eleven columns." Ms. Gibbs pointed as she spoke.

"Since I know my multiplication facts I know that eleven times eleven equals one hundred and twenty-one. I learned this fact when I was young, about your age, and I remember it still."

Multiplication Facts

	1	2	3	4	5	6	7	8	9	10	11
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											

“I have to fill in ALL 121 boxes? - with *numbers*?” I exclaimed. I kept staring at that paper with all those boxes on it.

“Yes, there are a lot of boxes for you to put numbers into. But you know a lot of multiplication facts already so you can start filling some in right now.”

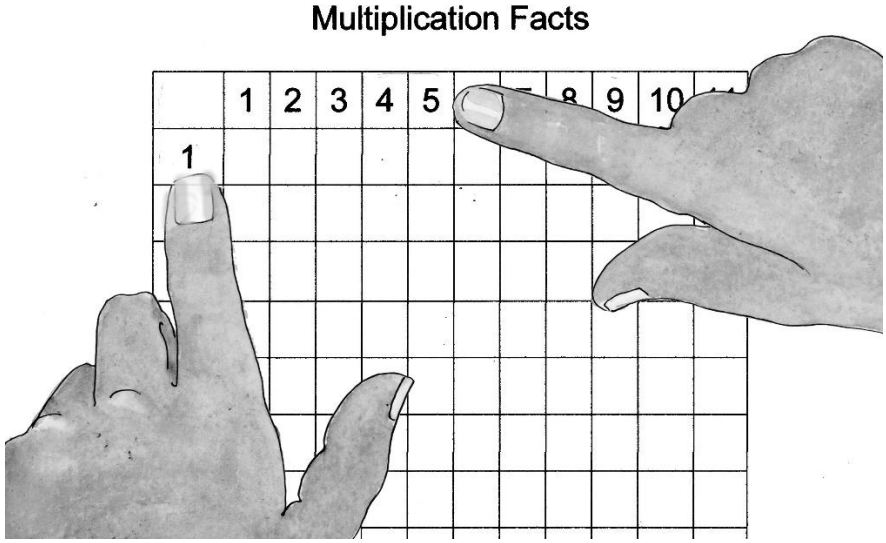
“I do? - I can?” I asked.

Yes, of course, you know how much five times one is, don’t you?” Ms. Gibbs asked.

I remember thinking that this was some sort of trick question. Of course I knew how much five times one is. I learned that in first grade, but all I said to Ms. Gibbs was, “Five.”

“I knew you knew that,” Ms. Gibbs said. “Now I’ll show you where to put that number on this grid.

“Here’s the number five in the top row.” She pointed to it with the finger on her right hand, “and here’s the number one in the very first column.” She pointed to the one with the finger on her left hand.



“See,” she continued, “I’m moving my right finger down to the row with the one in it, and my left finger across to the box under the five. They meet right at this box. Put a five right here.”

I did. I wrote a “5” in the box where her fingers met.

Reader, please turn back to page 11 and put a 5 where it belongs on the grid for Kayla.

“As you can see, the five is in the *fifth* box in the *first* row; five times one equals five.

“Now how much is one times five?” Ms. Gibbs asked.

Hmm. Ms. Gibbs usually asks me much harder questions.

“One times five equals five,” I answered, a little impatiently.

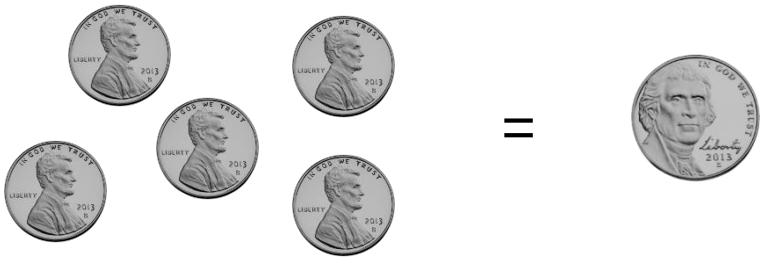
“Yes, of course. Now let’s go over to the one.” She took my right hand and had me point to the number one in the row of numbers at the top of the page, and took my left hand and had me point to the number five in the column of numbers on the left side of the page.

Then she moved my right finger down to the box next to the five and my left finger over just one space. Right where they met, Ms. Gibbs told me to put a five.

I did. I wrote another “5” in the box where my fingers met.

“Yes, one times five is five. If you count the boxes, you can see five ones equal five and one five equals five. It doesn’t matter which way you say it, they both equal five.

“Saying five ones equal five,” Ms. Gibbs explained, “is like saying five pennies equal one nickel:



“And saying one five equals five is like saying one nickel equals five pennies:

“Do you see that, Kayla?” Ms. Gibbs asked.

“Yes, I get it; I really get it!” I answered, and I really *did* get it.

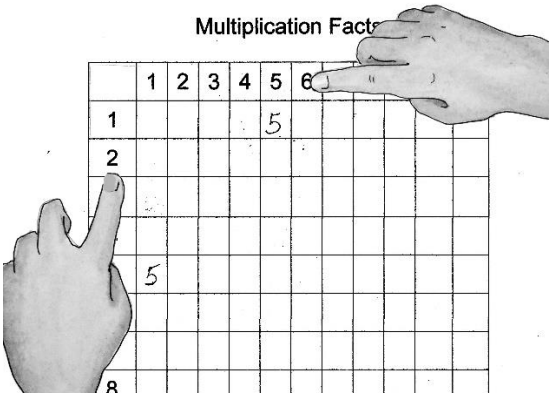
“Good,” Ms. Gibbs said. “Now what about two times six? Let me do this one.”

She put her right finger on the two on the top row and her left finger on the six on the left side. She moved her fingers like she did before to show me where to put the answer. Then she wrote a “12” in the box where her fingers met.

Ms. Gibbs looked pleased with herself. She turned to me and said, “Now it’s your turn. How much is six times two?”

I put my right finger on the six in the top row and my left finger on

the two on the left side. I moved my fingers down and across, just like Ms. Gibbs showed me, and then wrote another "12" in the box where they met.



Reader, please put a 12 in the correct box for Kayla. Then see if you can put another 12 in the box that Ms. Gibbs filled in before Kayla.

"Very good. See, there are two boxes across and six boxes down. If you counted all the boxes, you'd get twelve, but now you don't need to. You just *know* that two times six equals twelve.

"And six times two equals twelve," I said confidently.

"That's right. There are six boxes across and there are two rows of them." So we know that six times two is twelve, she said as she wrote:

	1	2	3	4	5	6
1						
2						

6 X 2 = 12

2 X 6 = 12

"You already filled in four boxes! Now let's see you do one by yourself. What about nine times two?" Ms. Gibbs asked.

I put my right finger on the nine in the top row, and my left finger on the two on the left. Then I moved down with my right finger and across with my left finger just as I saw Ms. Gibbs do. Where my fingers met, I wrote an "18" because I know that nine times two equals eighteen.

"That's very good. Now what are you going to do next?" she asked.

"Hmm, let's see. What if I do ten times three? I know my ten times tables too."

"But you didn't finish with what you were doing. What about two times nine?"

"It's eighteen," I answered.

"So why don't you put the eighteen in the other box it belongs in?"

"Oh, oh, that's right!" I found the two at the top with my right finger and the nine on the left with my left finger. I moved them down and across, and wrote "18" in the box where my fingers met. It was easy. I *am* getting it.

"I know you know all your one times tables and your two times tables so you can fill in lots of boxes. But it's better if you don't do them in order. Mix them up a bit," she added.

I filled in the boxes for the one and two times tables and I didn't do them in order. They were still easy.

"Now do you remember how much six times seven is?" Ms. Gibbs asked.

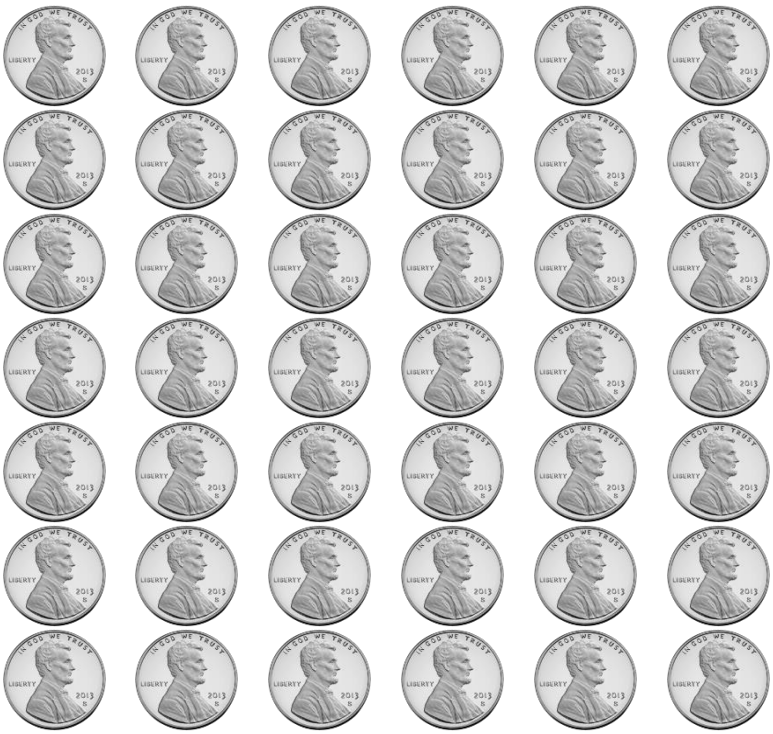
I didn't answer her in words. I answered her by writing the number "42" in the box where the sixth column and the seventh row met.

"Six times seven is forty-two," I said proudly.

"Very good," Ms. Gibbs exclaimed. "Now how much is..."

I already knew what she was going to ask. Before she finished her question, I found the box to put the other "42" in. It was where the seventh column and the sixth row met.

"Here is a picture of seven rows of pennies," Ms. Gibbs said as she pulled the picture from her folder. "As you can see, there are six pennies in each row, for a total of 42 pennies. Now if we turn the picture sideways, there will be six rows with seven pennies in each row.



Reader, if you turn the page sideways you will see six rows of seven pennies.

“As you can see, the total number of pennies can’t change just by turning the picture,” Ms. Gibbs explained, “and that helps us understand why six times seven equals forty-two and so does seven times six.” Then she wrote:

$$6 \times 7 = 42$$

$$7 \times 6 = 42$$

“Now you will no longer have to do repeat addition to find out what six times seven is or what seven times six is.”

Then Ms. Gibbs asked me this: “Now what if there were zero rows with seven pennies in each row, how much would that be?”

Zero rows? I tried to picture in my head zero rows with seven pennies in each row but I couldn't. Then I remembered one of my math teachers saying that if you multiply any number by zero, even if it’s a really big number, the answer is always zero. So the answer must be zero.

"Zero," I answered confidently.

“Yes, that's correct, Kayla,” Ms. Gibbs continued, “You’re learning your multiplication facts quickly. In no time at all, you’ll have all the boxes filled in.”

“I am learning fast,” I thought to myself. “Maybe I will fill in all the boxes.” But there’s an awful lot of boxes on that grid. Turn the page and you can see what my grid looks like right now.

Multiplication Facts

	1	2	3	4	5	6	7	8	9	10	11
1	1	2	3	4	5	6	7	8	9	10	11
2	2	4	6	8	10	12	14	16	18	20	22
3	3	6									
4	4	8									
5	5	10									
6	6	12					42				
7	7	14				42					
8	8	16									
9	9	18									
10	10	20									
11	11	22									

Chapter 5

Multiplying multiples of ten

“Oh, can I fill in my ten times tables now?” I asked. They’re so easy.”

“Yes, of course,” Ms. Gibbs replied. “Kayla, the reason why it’s so easy to multiply by ten is because our numbering system is in base ten. That makes it’s easy to multiply numbers that are *multiples* of ten too, like one hundred and one thousand.”

“Huh?” I wasn’t paying much attention to what Ms. Gibbs was saying because I was busy filling in the boxes with my ten times facts. I didn’t want to make any mistakes.

After I finished, Ms. Gibbs asked me, “Kayla, do you know how much sixty times seventy is?” Ms. Gibbs wrote it like this:

60 X 70 =

But then I wrote it like this:

$$\begin{array}{r} 60 \\ \times\ 70 \\ \hline \end{array}$$

because it’s easier for me to figure out.

Hmm. I’m getting mixed up. I know I’m supposed to put a zero somewhere, or is it two zeros? Let’s see... uhhh.

“Kayla, how much is six times seven?” Ms. Gibbs asked.

“Uh...oh, I know that! It’s forty-two.”

“That’s right. Well, sixty and seventy are both multiples of ten. So you just need to multiply six times seven and then multiply your answer by ten and then by ten again. I know you know how to multiply by ten, right?”

“Well, yes, but...” Then I added, kinda quiet-like, “but only little numbers.”

“It’s the same principle,” Ms. Gibbs explained. “Since seventy is ten times more than seven and sixty is ten times more than six, your answer has to be one hundred times more than forty-two. So multiplying 60 by 70 gives you ...”

She again wrote out:

60 X 70 =

and waited for me to finish the equation.

But I didn’t.

I just looked straight ahead. I didn’t say anything at all to Ms. Gibbs but I was thinking, “Oh boy, this is where things get really hard. Ms. Gibbs thinks I’m smart. Now she’s going to find out I’m pretty dumb. I just want to draw some flowers but I know I can’t right now. Maybe after I get back to my classroom...”

Ms. Gibbs was watching me. She said, “Kayla, I realize I’m making this much harder than it need be. Please accept my apology. Let me start all over again. I know you can do this. I just need to explain it better.

“You already know how to multiply small numbers by ten, you just put a zero at the end of the number you’re multiplying. Right?” Ms. Gibbs asked.

I nodded my head but I still didn't say anything.

"Well, I'm going to show you how you can do that with very large numbers too. But let's start with a very small number, let's start with one. One times ten is...?" Ms. Gibbs asked.

"Ten," I answered, kinda quiet-like.

"That's right," Ms. Gibbs said, "I'd like you to write out the equations for the problems I'm giving you."

So I began writing: **1 X 10 = 10**

"And ten times ten is...?" Ms. Gibbs asked.

Hmm...

"Kayla, you know how to multiply by ten. You just add a zero."

"Oh, one hundred?" I answered but I wasn't real sure.

"Yes, of course," Ms. Gibbs said.

So I wrote: **10 X 10 = 100**

"And ten times one hundred...?" Ms. Gibbs asked.

"Ten hundred," I answered. I wrote out ten hundred and then added a comma. I knew that I'm supposed to put it in three digits from the right, like this: 1,000. "Oh, it's one thousand!" Ten hundred is the same thing as one thousand! I looked up at Ms. Gibbs to see if I was right.

10 X 100 = 1,000

“Very good. Now let’s keep going. Ten times one thousand?” I added a zero to one thousand and remembered to put the comma in the right place. I finished the equation and said out loud, “Ten thousand.”

10 X 1,000 = 10,000

“Very good. When multiplying any number by ten, you just need to add a zero at the end.

“Now what if we multiply by one hundred? You need to add...?” Ms. Gibbs’ voice trailed off.

“Two zeros?” I answered. I was pretty sure I was right but not all the way sure.

Ms. Gibbs nodded and asked. “And when you multiply something by one thousand…?”

“Three zeros,” I answered, more confidently.

“Good, you just add the number of zeros that are at the end of each factor to your answer. As you know, the ‘factors’ are just the numbers you’re multiplying.

“A good rule,” Ms. Gibbs continued, “is to first ignore the zeros that are at the ends of each factor, multiply the other numbers, then add the *total* number of zeros to the end of your answer.

“In the problems we have just been doing, I used only ones and zeros. But this shortcut works with any multiples of ten. Try this one, and think about it a bit before you answer.” Ms. Gibbs wrote:

20 X 30 =

Hmm. Let me think. I'm supposed to first ignore the zeros, multiply the numbers that are left, and then add the zeros at the end.

OK. Two times three is six, that's easy. Then I add the zeros. I wrote:

20 X 30 = 600

And said the answer out loud, "Six hundred." I was pretty sure I was right but I looked at Ms. Gibbs to see if she thought so too.

She said, "Why Kayla, that's very good. I'm proud of you. Now let's keep going. What's 500 X 30?"

I quickly wrote down the number 15 because that's five times three. I counted the three zeros, put them at the end, and made sure I put the comma in. I wrote:

500 X 30 = 15,000

and then I read what I wrote, "Fifteen thousand."

"Very good, Kayla. Now here's another one." And Ms. Gibbs wrote:

6000 X 700 =

I quickly wrote 42, added five zeros, put the commas where they belonged – there were two of them - and finished the equation:

6,000 x 700 = 4,200,000

I read the number, "Four million, two hundred thousand and... Uh, oh, it's just four million, two hundred thousand. That's it!"

Wow! I didn't know I could multiply such big numbers. It's kinda fun.

“Ms. Gibbs,” I said excitedly, “I can hardly wait to show Cleveland this trick. I think he’s really going to like it.”

Ms. Gibbs corrected me, “Kayla, it’s not a trick. It’s a shortcut. Being able to multiply numbers ending in zeros shows an understanding of our base ten system.”

Well it sure seems like a trick to me. I didn’t say that to Ms. Gibbs though. I bet Cleveland will think it’s a trick. I can hardly wait to show him.

“Now let’s continue for just a little longer.” Ms. Gibbs asked, “How much is 70 times 60,000?”

I multiplied 7 X 6, added 5 zeros to the 42, put in the commas, and wrote:

$$70 \times 60{,}000 = 4{,}200{,}000$$

Hmm. I quickly looked back at the last equation I wrote right before this one. “Hey, I already did this one!” I exclaimed.

“The answers are the same, but the equations are different,” Ms. Gibbs replied. “That’s because these two problems have the same total number of zeros at the end and you multiplied the same first numbers, so the answers have to be the same. Do you understand?”

Hmm. I’m going to have to think about that a bit.

“Now remember,” Ms. Gibbs continued, “the zeros you count have to all be at the end of the number to use this shortcut. For example, for the number 1,020, you would count the zero at the end, but not the zero between the 1 and the 2.

So here's how we would multiply 1,020 by 20: We count the zeros at the ends - there are two of them - then multiply 102 times 2 to get 204. Then…"

"…we have to add the two zeros back to get our answer." I finished Ms. Gibbs' sentence because I knew what she was going to say. Then I wrote out the equation:

1,020 X 20 = 20,400

"OK. I'll be sure to remember to just count the zeros at the end but not the ones in the middle," I said, and then added, "That's pretty easy to remember."

"Yes, it seems easy to remember, but you still have to practice so you won't forget," warned Ms. Gibbs.

"Now here's an easy one for you," Ms. Gibbs said as she wrote:

60 X 70 =

This problem *was* easy. I did it all in my head, and quickly wrote out the equation:

60 X 70 = 4,200

I said the answer out loud, "Four thousand and two hundred," and then added, "That was easy."

"But you didn't think this problem was easy when I first gave it to you, now, did you?" Ms. Gibbs asked.

I was puzzled. "I don't remember you giving me this problem before," I answered.

“Look back here at the first problem I gave you. Do you remember it now?”

Reader, look back at page 20 to see the problem.

I looked back at the problem. “Yes, now I remember it,” I replied, “But now it’s so easy! I wonder why I thought it was so hard.”

“Yes, it’s easy now because you understand how to multiply multiples of ten,” Ms. Gibbs said.

“Now here is something that’s a little more challenging: Let me see what you can do with it. How much is six hundred and twenty times two hundred and seventy?” Ms. Gibbs asked. “I’ll write the problem this way to make it a little easier for you:”

$$\begin{array}{r} 270 \\ \times\ 620 \\ \hline \end{array}$$

First I ignore the two zeros, then multiply the numbers that are left, and then add the two zeros to my answer. That seems easy, but I sometimes get mixed up multiplying double-digit numbers. I know I’m supposed to start on the right so I did. I first multiplied by two and then, on the next line, I multiplied by six. Then I added the numbers, and put the two zeros at the end.

$$\begin{array}{r} {\scriptstyle 4} \\ {\scriptstyle \cancel{1}} \\ 27 \\ \times\ 62 \\ \hline 54 \\ 162 \\ \hline 21{,}600 \end{array}$$

But the answer just didn’t look right to me. I added the comma,

but it still didn't look right. Hmmm…

Reader, please put a big X through the problem Kayla just did because it's not right!

I said out loud, "Twenty one thousand six hundred?" I looked at Ms. Gibbs to see what she thought.

"Kayla, I think you're having trouble with place values. There isn't enough time right now to work on this. We'll do that next week. You'll see; it's not too hard.

"We just have time for one more question. Do you know how much nine times seven is?" Ms. Gibbs asked.

Uh, nine times seven? I wanted to write down the numbers on the side of the page but I know Ms. Gibbs doesn't like me to do that so I just answered, "I don't know."

"Nine times seven is sixty-three," Ms. Gibbs said. "Here's a small piece of paper. I'd like you to write nine times seven equals sixty three on it and right under it, please write..."

"Seven times nine equals sixty three." I already knew what she was going to say so I wrote:

9 X 7 =	63
7 X 9 =	63

"Fold the paper so you can't see the 63. Remember, look at this paper every morning and every evening and next week, when I ask you how much is nine times seven, and how much is seven

times nine, you'll be able to write the two answers in your grid," Ms. Gibbs said with a smile.

"Oh, and don't forget your homework papers," Ms. Gibbs added as she took some papers from her folder.

I took the papers, put them in my backpack and remembered to thank Ms. Gibbs for tutoring me. But I couldn't stop thinking of that new trick or whatever it was Ms. Gibbs called it. Maybe I can invite Cleveland for breakfast and we can multiply great big numbers after we're done eating.

I bet he'll think it's a good trick too, or whatever. And after we've multiplied lots of big numbers, maybe he can show me how to draw that cat.

Every night before I went to bed I looked at that small piece of paper. I only had to unfold it twice to look at the answer. After that, I could say, "seven times nine equals sixty-three," without looking. I just knew it!

Ms. Gibbs thinks I'll have my grid all filled up before I finish fourth grade. When I first started, I didn't think I would but now that I have lots of the boxes filled in, I just might. But then again, there's an awful lot of empty boxes left. Hmm...

Chapter 6

Review

Before I begin this review, I just have to tell you something first. I did finish my grid while I was still in fourth grade and I'm so glad I did! I use these facts all the time and I can do my math work so much faster now.

I sometimes see other kids struggling with their math. I wish I could encourage them to learn their multiplication facts like I did, but most of the time, they're not interested. I hope you are.

There's a blank multiplication grid right in this book, on page 10, so if you want, you can start filling in the multiplication facts you know. Or you can print a grid from my website. It's better to use a pencil to put the numbers in the right boxes.

Later on, I asked Ms. Gibbs for extra multiplication grids for Cleveland and Luz and she gave them to me. They're learning their multiplication facts fast. Oh, I forgot! You haven't met Luz yet. Just keep reading my books and you'll meet her.

It's best to go slow and learn your facts really well rather than go fast and forget some. It might help you a lot to write your facts out on a little piece of paper, and fold the answers back, like Ms. Gibbs showed me. And make sure you practice them. If you don't, you might forget one like I did once. I'll tell you about that later.

It's good to fill in the ones you know first. You probably know your ones and your twos and your tens like I did. If you're able to fill in some of the boxes right away, the multiplication grid will seem less daunting.

Now I want to show you something neat. I'm going to show you how to multiply by ten or a number that is a multiple of ten. A multiple of ten is something you get when you multiply any number by ten. You'll know a number is a multiple of ten because it ends in one or more zeros.

Now here's how to multiply these kinds of numbers: First ignore all the zeros that are at the end of the numbers, for now. Then multiply together the other numbers; that is, all the numbers in the problem except the zeros at the end. Now count the zeros at the ends of the numbers. Then put that many zeros at the end of your answer.

Sometimes using an example is a lot easier than explaining. In this problem: 20 X 20, first ignore the zeros, then multiply the twos - that's easy, it's four. Write down the four, then add the two zeros at the end and Presto!

20 X 20 = 400

Got it?

The numbers you're multiplying are called factors. So in this problem, the two twenties are factors. When Ms. Gibbs used that word, I think she thought I already knew it but I didn't. I didn't tell her that though. But now that she used it, I know it and I use it too.

Now remember, if the zeros are somewhere is the *middle* of the factor, you leave them alone and ***don't*** count them to be added later.

When there is more than one digit in the number you are multiplying by, it's a little harder. Then you'll have to know all about place values. That's what Ms. Gibbs is going to show me the next time I meet with her.

I kinda knew about place values already but Ms. Gibbs helped me understand them better. Now I can easily work all kinds of multiplication problems and other kinds of math problems too. You'll be able to, too, but first you have to practice what you've already learned.

Ms. Gibbs always says if I practice, I'll have the math I've learned "down pat." And if I have my math "down pat," learning harder stuff won't seem so hard. And that's been true so far.

Make sure you work the problems I have at the end of this review and on my web page. It's at **www.learningwithkayla.org**. You'll have to add, subtract, and multiply fractions and whole numbers too. You may not have to do all of them for each problem but you have to know which operations you'll need to do. Oh, operations are just math stuff, the basic operations are addition, subtraction, multiplication and division. I use these over and over again, even for real challenging problems like you'll have in high school.

So if you don't have them down pat, you're going to run into trouble. And if you run into serious trouble, you won't like math. And if you don't like math, you might want to do something else in math class like draw pictures like I did or knock down a chair like Cleveland did once. Or cry like Luz did. Oh, I forgot again! You haven't met Luz yet.

Practice Problems

Here are some problems for you. Make sure you use the shortcut like I did.

Finishing these equations will help you get multiplying multiples of ten down pat. I have them down pat and I never, *never* multiply these number the way I used to do it.

1a. 200 X 90 =

1b. 2,000 X 900 =

1c. 200 X 40 =

1d. 2,000 X 4 =

1e. 700 X 60 =

1f. 70,000 X 600 =

1g. 100,000 X 300 =

1h. 2,000 X 6,000 =

1i. 70,000 X 20,000 =

1j. 200,000 X 7,000 =

1k. 900 X 70 =

1l. 1,010 X 30 =

2. There are twelve eggs in one dozen. How many eggs are there in ten dozens?

3. What if 100 kids each had 100 pennies? How many pennies would they have altogether?

4. What if 100 kids each had two pairs of shoes. How many shoes would there be altogether? (This one is just a little tricky. Read the problem carefully!)

5. What if 60 kids had seven pencils each. How many pencils would there be altogether?

6. What if 12 kids were given 10 dollars each for a field trip? How much money would there be altogether for the trip?

7. A big pizza was divided into twelve pieces. Three kids ate two pieces each but the one grown-up in the group ate twice as many pieces as each one of the kids did.

Write the equation showing what fraction of the pizza was eaten:

_____

Write the equation showing what fraction of the pizza was left over:

_____

8. At Kayla's school, 1/6 of the students walk to school, 1/6 of the students have a parent drive them to school, and the rest take the school bus. Write the equation showing what fraction of the students take the bus to school:

_____

Write the equation showing what fraction of the students don't take the bus to school:

_____

9. Cleveland drew a picture of nine cats. Two of the cats were all black, three were all white, three were black and white, and one was a light shade of brown. Write an equation to show the fraction of the cats in his picture that were not all black:

_____

10. There were 32 kids in the middle school orchestra. One-fourth of the kids played viola, one-half played violin, one-eighth played cello, and one-eighth played bass.

How many kids played bass? _____

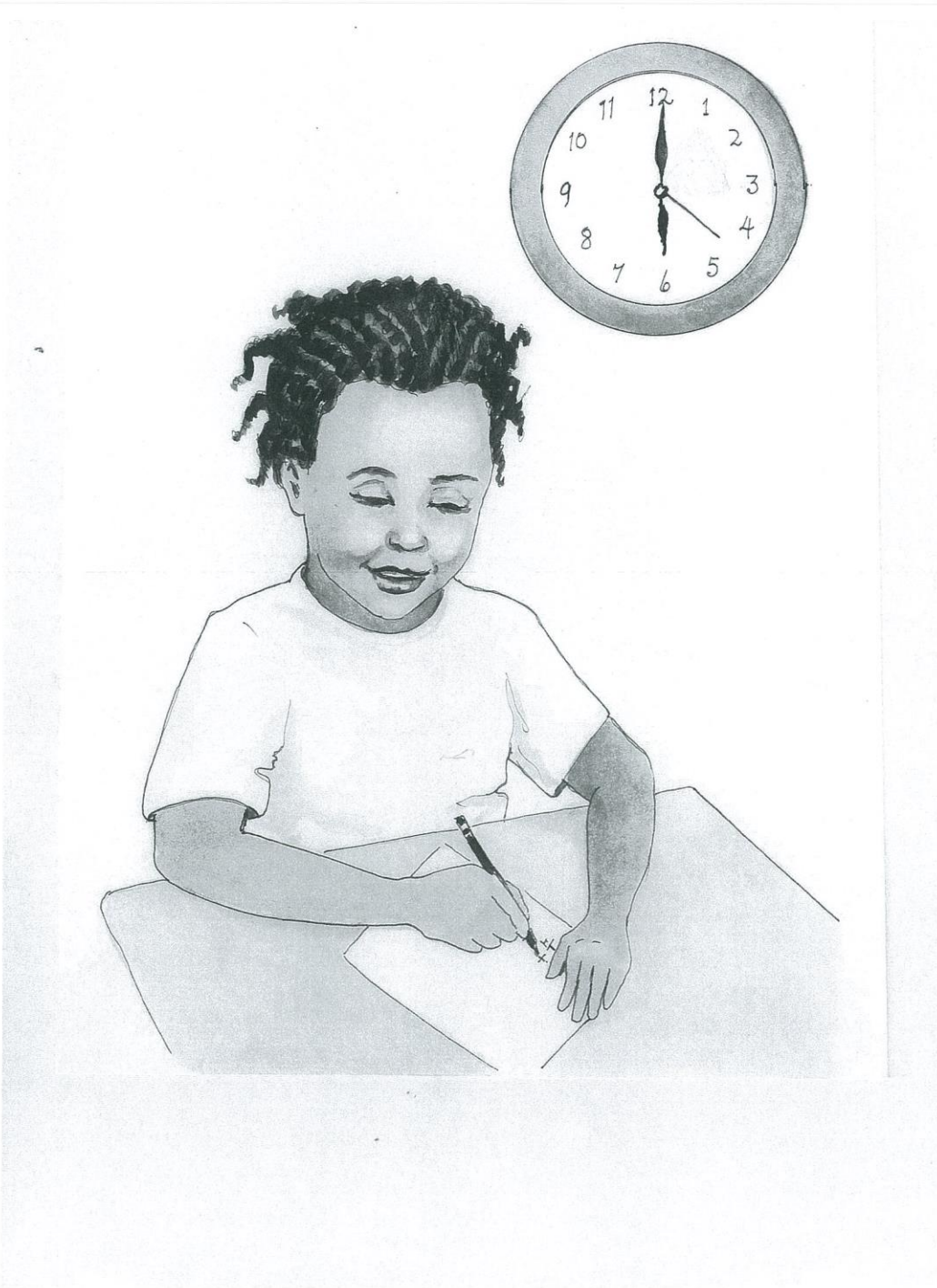
How many kids played viola? _____

Did you figure out my little trick in question #3? I asked about the number of *shoes*, not the number of *pairs* of shoes.

That's all for now. Don't forget to check my website:

www.learningwithkayla.org

for more problems. Remember to work on your math fifteen minutes a day. When you get these problems down-pat, join me in my next book and you can learn some neat multiplication facts with me. Don't worry; they're not too hard.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Something extra

Hey, how do you like that word “daunting” on page 29? It means something that could scare you off, something intimidating. Intimidating is another word for daunting. They mean pretty much the same thing.

When Ms. Gibbs showed me that multiplication grid, I was very intimidated. I was having fun coloring fraction bars and all of a sudden Ms. Gibbs wanted me to work on a multiplication grid. She said I had to fill in all 121 boxes. I remember how daunting that seemed to me.

It’s funny but I never heard anyone use the word “daunt.” I already graduated from elementary school, middle school, *and* high school, and I’ve heard a lot of words in my lifetime but never the word, “daunt.” I’ll be soon going off to college. That’s pretty daunting!

Answers

1a. 18,000

1b. 1,800,000

1c. 8,000

1d. 8,000

1e. 42,000

1f. 42,000,000

1g. 30,000,000

1h. 12,000,000

1i. 1,400,000,000

1j. 1,400,000,000

1k. 63,000

1l. 30,300

2. 120

3. 10,000

4. 400

5. 420

6. $120

7. $3 \times \frac{2}{12} + 2 \times \frac{2}{12} = \frac{6}{12} + \frac{4}{12} = \frac{10}{12}$

$\frac{12}{12} - \frac{10}{12} = \frac{2}{12}$

8. $\frac{6}{6} - \frac{1}{6} - \frac{1}{6} = \frac{4}{6}$ $\frac{6}{6} - \frac{4}{6} = \frac{2}{6}$ OR $\frac{1}{6} + \frac{1}{6} = \frac{2}{6}$

9. $\frac{9}{9} - \frac{2}{9} = \frac{7}{9}$ OR $\frac{3}{9} + \frac{3}{9} + \frac{1}{9} = \frac{7}{9}$

10. $\frac{1}{8} \times 32 = 4$ $\frac{1}{4} \times 32 = 8$

About tutoring math

Did you notice that Kayla tries to imitate Ms. Gibbs when she begins to tutor Cleveland? In later books, she learns to be herself and is more effective. If you choose to tutor, and I hope you will, just being yourself works best.

On page 20, Ms. Gibbs makes the mistake of teaching Kayla something that was too hard for her. She quickly recognizes her mistake and apologizes to Kayla. Making some changes, she continues teaching her what she needs to know. Because tutors usually work with just one student at a time, it easier for them to respond quickly to the students' needs.