Learning Math with Kayla

Book 8: Adding and subtracting large numbers

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 teacher is trying to teach her. Her math teacher, Mr. Williams, is aware of how poorly Kayla is doing. He decides a tutor would be the best way to help Kayla learn her math.

In this eighth book, Ms. Gibbs teaches Kayla about complements to help her add and subtract numbers quickly - and without using her fingers. She also reviews place values and regrouping using money. Kayla and Ms. Gibbs go on a pretend shopping trip to practice what she has learned.

There are twelve books in this series. 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.

The story is told by Kayla, right before she goes off to college.

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 plus myself as a kid. I often see kids - and even adults - use their fingers to add and subtract numbers. Being able to do this basic math quickly and easily builds the confidence needed to learn more complex math.

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 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.

Her older daughter, Mary, one of her really smart kids, has made suggestions about most of the books in this series. She is Professor of Mathematical Statistics at Colorado State University in Fort Collins. I know if I needed her, she would take a leave of absence to help me – just like Kayla's aunt, Maria, did.

Acknowledgements

Thanks to Charles Daniel for the excellent job he does in proofreading the text. His expertise in mathematics and grammar ensures that both kinds of errors are minimized in the Kayla Books.

And to Jason Yun for technical help with the printing of the book.

And a special thanks to my husband, Ed, for all of his great suggestions, his skillful editing, and especially his patience. I would not be able to complete the books without him.

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DEDICATION

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

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Chapter 1

Momma and the pizza order

Momma doesn't have to work today. And that means we're having omelets for breakfast! It's Saturday. And that means I don't have school! I can stay home all day with Momma if I want to. There are so many things I want to tell her - and there's stuff I want to ask her too.

After we ate our omelets and after we cleaned up the kitchen, Momma sat down on the couch. I sat down right next to her.

"Momma, I was wondering, am I half anything?" I asked.

"Why, Kayla, whatever do you mean?"

"Well, you know…," I tried to explain, "The other day I was over at Cleveland's house for a pizza party."

"Yes, and did you have a nice time?" Momma asked.

"Oh yes, it was a lot of fun - and do you know what?"

Before Momma asked me "What?" I answered her. "I asked Cleveland if I could ask everybody what kind of pizza they wanted and how much they wanted and Cleveland said I could. I was sort of like the person in the restaurant taking everyone's orders. But instead of standing behind a counter, I went around the house and asked everyone what they wanted. And - and I got to call the pizza man on the phone!"

"Why that's nice, Kayla, and did you do a good job?" Momma asked.

“Well … I thought I did, but … but the pizza man didn’t think so.”

“Why, Kayla, tell me what happened,” Momma said.

“I don’t know what happened,” I answered. “I thought I did everything right, but while I was telling the pizza man the pizza order, he hung up on me. He didn’t even let me finish. I don’t know why.”

Momma got a worried look on her face. I could see she was going to ask me something but before she did, I said, “But don’t worry, Momma, everything turned out all right,” and then I explained how everything turned out all right.

“You see, Cleveland’s father looked at my order sheet and he called the pizza man back and told him what kind of pizza we wanted and how much of it we wanted. When the pizza came, it was just the right amount. All the pizza was eaten and no one seemed to want any more or even a different kind of pizza. So the orders I took from everyone must have been right. Right, Momma?”

Momma nodded her head a little.

But then I quickly added, “Still, I must have done something wrong because - well, because the pizza man hung up on me.”

“Kayla, why don’t you tell me what you said to the man on the phone?” Momma asked and then she added, “Maybe I can help you with this.”

“I kept the pizza order sheet and I know exactly where it is. Momma, you wait right here,” I said. “I’ll run and get it.”

I ran and got the pizza order sheet and sat back on the couch - right next to Momma so I could show it to her. I explained to her everything I wrote down. “Cleveland told me there are eight pieces in each pizza, so I used eight for the denominator. I made two columns, the “C” stands for cheese and the “P” stands for pepperoni.”

Oh, and then I explained to Momma about improper fractions and how I converted them into mixed numbers on the order sheet.

“Before I called up the pizza store, I practiced what I was going to say. Then I called. Oh, Cleveland punched in the number.

“I said to the man who answered the phone, ‘I’d like to order one and five-eighths of a cheese pizza and one and one-eighth of a pepperoni pizza’ - just like it says on this paper, see, Momma? - only he didn’t let me finish. He just hung up on me.”

“Well, I think stores that deliver pizzas usually just deliver whole pizzas,” Momma explained. “Maybe that was the problem.”

“Oh! That’s it! That’s what the pizza man said, but I forgot he said it. But Momma, what was I supposed to do with the one-eighth and the five-eights?” I asked.

Momma looked at the sheet again and then said, “Well, I probably would have ordered two cheese pizzas and one pepperoni pizza.”

“Momma! That’s *exactly* what Cleveland’s father told the pizza man and it was *exactly* right! How did you know that?”

“Well, I know that everyone who likes pizza likes cheese because just about all pizzas have cheese on them. But not everyone who likes pizza likes pepperoni. So, it would be better to order extra cheese pizza rather than extra pepperoni. In that way, those who wanted an extra piece would have something they liked,” Momma explained.

Oh, now I remembered. Cleveland’s father said he liked both kinds of pizza. I didn’t have a column for that and I had to put his order down somewhere, now didn’t I?

Gee … Momma wasn’t even at the pizza party but she knew exactly what to order. I asked Momma how she knew.

Momma said: “Well, I may not know much about fractions but I do know how to order pizza.”

Chapter 2

Willie - my dad

I was still sitting on the couch next to Momma. I didn't feel like getting up. And besides, now that I know about ordering pizza, there was more stuff I wanted to know about. I'm so glad Momma will be home all day.

One was about that half-brother thing. I had already asked Momma but then we started talking about pizza and I never got an answer. I'll just ask again.

"Momma, I was wondering if I'm half anything?"

"Why Kayla, why would you ask that?

"Well, when I was taking orders for the pizza, I asked Cleveland's big brother, his name is TJ, what kind of pizza he wanted and … Wait! - I remember *exactly* what I said to him. I said, 'Your dad asked Cleveland to take pizza orders and I'm helping him.'

"And then he said, 'My father's not here.' He didn't say it mean-like or anything, he just said it. And - and then Cleveland said that TJ was his half-brother. So now I'm wondering if I'm half something - maybe a half-sister." Then I added, "I don't even know what it means to be a half-something."

"Kayla, when people use the term 'half-brother' or "half-sister' they just mean that they share one parent. Since TJ's father wasn't in Cleveland's house, then TJ and Cleveland must have the same mother. Do you understand?"

I nodded my head. I think I understand. But that got me thinking about what I was really thinking about - my own dad. I want to

know more about him. But Momma feels so sad when she talks about him, I almost never ask her. I don't like it when my momma feels sad.

Momma continued to explain about that half thing, "So, no, Kayla, you're not a half-sister. You know your father died right before you were born and I didn't have any more children. You have no sisters or brothers."

Momma said something about my dad so now maybe I can say something about him too. I never got to see my dad and he never got to see me. I know Momma has a picture of him in her drawer somewhere - I saw it once - but there are no pictures of him hanging on the wall.

And then I started thinking about all those pictures on the wall at Cleveland's house. "Momma, how come we don't have any pictures on our wall? How come, Momma?" I asked. Then I told her about the pictures on the wall in Cleveland house - there were lots of them.

"Well, Kayla, I keep pictures of our family in my drawer. The pictures of your grandma and your Auntie Maria are in the drawer in my room. And the picture of Willie is there too! I just never hung them up."

"Momma, can you tell me more about Daddy? I know he's dead but what was he like when he was alive … and Momma, can I see his picture again too?" And then I added, "Please?"

Momma nodded her head and said, "I'll go get the picture of Willie," - and then she added softly – "your dad." Momma went to her room and brought back the picture of my dad. It was in a real nice frame. She put it on her lap and started to tell me about him.

“As you can see, he was a very handsome young man and he was very funny - and athletic too. He played basketball a lot - Sometimes I would go to the playground and watch him play. He was good enough to play on the varsity team in high school but he never got to play. His grades were just not good enough. But that was not because he wasn’t smart - he was. It was because he almost never studied or did his homework.

“Willie and I loved each other very much, we were going to marry as soon as we graduated from high school – but we never did marry – or graduate from high school. I told you what happened.”

“Momma can you tell me again what happened?” And then I added, “Please?” I know Momma will start crying and I probably will too, but still - I want to know as much as I can about my dad.

“Kayla, it’s a very sad story. Shortly before you were born, your father and another boy - he was a little older than your dad - got into a great big fight. The other boy had a gun but your father didn’t know he had a gun. Well, this other boy used that gun to shoot your father. Your father was hurt so bad he didn’t even make it to the hospital. He died in the ambulance on the way there.

“The boy who shot your father had to go to prison for a very long time. I think he might still be there but I’m not sure. His family moved away soon after it happened.”

Momma’s voice began to crack. She looked so sad when she was telling me this. There were so many questions I wanted to ask her but I didn’t want her to cry so I didn’t ask her anything more.

But Momma continued talking about my dad anyway, “So one boy was dead and another boy in prison and they were friends before this ...” Momma’s voice trailed off. I could tell she was crying, but she kept talking.

“It was very, very sad for those of us who knew them both. If it wasn’t for that gun, they probably would have gotten over whatever it was they were fighting about and still be friends today. And then she said quiet-like but I heard her anyway - “I hate guns.”

I never heard my Momma say she hated something before. She always says we should never hate.

I was quiet for a bit, thinking of my dad, and then I said it too – but I just whispered it to myself. “I hate guns!” I don’t think Momma

heard me but I was thinking, if it wasn't for that gun, I would have my own dad.

My Momma was still crying but not real hard. I had just one more question to ask and then I'd be all done - for now.

"Momma, do you think Daddy would have loved me?"

"Of course, Kayla, he already loved you very much even before you were born. You see, we already knew you were going to be a little girl and he was looking forward to meeting you. Why, he was the one who picked out your name, 'Kayla'."

My daddy loved me even though he never met me - and he picked out my name! I bet he would have loved me more if he got to meet me. We could have played basketball together and maybe he could have taught me how to dribble and maybe, and just maybe...

I started to cry. I could hear Momma crying too.

Then Momma said, “And right after your Dad died, I learned that Grandma was real sick.”

Oh-oh, now Momma is going to cry – even harder!

“The doctor said she had cancer and wasn’t expected to live. I didn’t go back to school after Willie died and then after Grandma got sick, I stayed home to take care of her. *Your Aunt Maria took a leave of absence from work and came all the way from Colorado to stay with us. She and I took care of Grandma and after Grandma died, Auntie stayed with me because she knew you were coming soon and she wanted to meet you.

“You were born just a few weeks after Grandma died. Auntie took good care of you when you were just a tiny baby – and she also took good care of me. I should have been taking care of you but I couldn’t. Why, I couldn’t even take care of myself!”

Then Momma began to cry real loud. I started crying loud too because Momma was crying and because I never got to see Grandma – or my daddy - and I hardly ever get to see my auntie.

And then I got thinking about my dad again. He loved me even before I was born and he picked out my name. I was feeling so sad but I was also feeling something else. I was feeling kind of warm-like too. My daddy loved me even before I was born.

Pretty soon, I was all done crying. Momma was still crying, though, but not as hard. What could I say to make my momma feel better. While I was trying to think of something, I thought of something.

“Hey, Momma, guess what I learned!” My mom looked up, ready to ask me what I learned but before she got to ask me, I told her. “I learned all about turning fractions upside down and I know why you’re supposed to turn them upside-down. You see, it’s an algorithm.”

Momma wasn’t crying so much anymore. I could tell she wanted to know about those upside-down fractions and I bet she never even heard of the word, “algorithm.”

“Come on, Momma, sit at the kitchen table with me and I’ll tell you all about it.” I took Momma’s hand, walked with her to the kitchen…

and waited as she sat down at the table. I took some paper and a pencil from the drawer. And then I told her everything I knew about upside-down fractions. She even divided some fractions. I showed her how.

Chapter 3

Doubles and Halves

“Good afternoon, Kayla.”

“Good afternoon, Ms. Gibbs.” I was going to tell Ms. Gibbs all about my Momma and those upside-down fractions but I didn’t get a chance. You see, she had my multiplication grid on the table and I started to count the empty boxes I had left to fill in. I didn’t finish though because Ms. Gibbs asked me to fill all the four times boxes in my grid.

Since I already knew my two times tables, I just had to double each answer, because four is twice as big as two. When I first was practicing, I said my two times tables and then doubled my answer, but pretty soon I practiced saying them without doubling and *then* pretty soon - I knew them all. I didn’t have to double anything. That’s because I practiced.

$$4 \text{ X } 3 = 12$$
$$4 \text{ X } 4 = 16$$
$$4 \text{ X } 5 = 20$$
$$4 \text{ X } 6 = 24$$
$$4 \text{ X } 7 = 28$$
$$4 \text{ X } 8 = 32$$
$$4 \text{ X } 9 = 36$$
$$4 \text{ X } 10 = 40$$
$$4 \text{ X } 11 = 44$$

I already had some of the numbers filled in on my grid, but I practiced all of them anyway. It wasn’t so hard. And then I got to put ten new numbers in my grid. That was fun.

“Very good, Kayla. As you can see, you don’t have very many

boxes left to fill in. Now for next week, why don't you learn the rest of your five times tables?"

I still had the grid in front of me and I quickly counted the empty boxes for the five times tables. There were only five of them – well, ten boxes really, but only five facts.

"Learning your five times tables will be easy for you because you already know your ten times tables. Five times tables are simply half of the ten times tables."

"Huh?"

"Kayla, how much is ten times six?"

"Oh, that's easy," I said. It's sixty! All I had to do is put a zero after the number and that's what ten times anything is. That's a trick…oh I mean it's a short cut…and it works for really big numbers too," I explained to Ms. Gibbs.

Reader, Kayla learned about multiplying multiples of ten in Book 3. If you'd like to review them, now is a good time to do that. Then you can learn your five times facts with Kayla.

"I'm glad you're remembering what you've learned, Ms. Gibbs said. "You know that five is half of ten so your answer to five times facts is just half of what it would be if you multiplied the same number by ten. Since ten times six is sixty, five times six must be…

"Uh…thirty?" I asked. And then I said it more confidently, 'thirty!' because thirty is just half of sixty."

“That’s right,” Ms. Gibbs said with a smile. You’ll learn your five times tables in no time. Why, you might want to learn even more of your multiplication facts than that for next week!”

More of my facts? Hmm. I thought about it a bit but then said, “No, thank you, Ms. Gibbs. The five times facts are enough for me.”

Chapter 4

Complements

“Kayla, I noticed that you’re still using your fingers to add and subtract. Unless you know how to add and subtract single digit numbers in your head, it will take you much too long to add and subtract much larger numbers. I know you can add numbers that total nine without using your fingers, am I right?” Ms. Gibbs asked.

“I can? Oh, oh! Yes, I can. I remember practicing with those cards you gave me. That’s how I learned my nine times tables and I remember them still. Nine times five is forty-five because four is one less than five and four and five add up to nine.” I answered proudly.

Reader, do you remember the short-cuts for the nine times table? If not, please review them in Book 4.

“I remember them all. Seven times...” but Ms. Gibbs interrupted me. She asked me if I still had those cards.

“Uh … well … no. You see … I was using them to show a girl how to multiply by nines at lunch but then I think I might have left them in the cafeteria,” I answered. “I did go back the next morning but … well - they were gone. I don’t know what happened to them but they just weren’t there.”

I thought Ms. Gibbs would be angry with me, but instead she said, “Kayla, I’m glad you used those cards to teach someone else. Teaching isn’t just for teachers - or for tutors. If we all teach someone some of what we know, we would all know a lot more, isn’t that right?”

I nodded my head just a little because I was thinking about what Ms. Gibbs said.

She continued, “Now I’d like to talk to you a little about complements. You already learned the complements of nine when you learned your nine times tables, so let’s use nine as an example. The nines’ complement of any number is the number that has to be added to it to produce nine. The nines’ complement of four is five because four and five make nine. Do you understand, Kayla?”

I just nodded my head. I think I do.

“Knowing your complements will help you add and subtract numbers quickly and without using your fingers,” Ms. Gibbs said. “What is the nines’ complement of seven?”

“Two,” I answered right away, because I know that two and seven are nine.

“And what does nine minus two equal?”

“Nine minus two equals seven, because two plus seven equal nine, and subtraction is just the inverse of addition,” I answered with a smile.

“Yes, Kayla, that’s right. I think you understand about complements and how they help you add and subtract. You’re seeing the logic of math.”

The logic? I wondered what Ms. Gibbs meant, but she didn’t explain.

“Let’s continue with complements. Nine has several complements but the smaller a number is, the fewer complements it has,” Ms.

Gibbs explained. “The twos’ complement of one is just one, and that’s all there is!

“The threes’ complement of one is two, and the threes’ complement of two is one. I’m sure you don’t have to count on your fingers to know that two plus one is three and three minus two is one.”

I shook my head, “No.” I didn’t think I did.

Ms. Gibbs continued, “The fours’ complement of one is three and the fours’ complement of two is…?”

“Two!” I answered, “because two and two are four. Everyone knows that!”

“Well, maybe most people do, but not everyone,” Ms. Gibbs said. “Now let’s practice the complements you already know.”

Ms. Gibbs asked me the complements of the ones I already knew and I answered.

“The nines’ complement of four?”

“Five!”

“The fours’ complement of one?”

“Three!”’

“The nines’ complement of eight?”

“Uh…One! Just one.”

“The threes’ complement of two?”

“One!”

“The twos’ complement of one?”

“One!”

Hey, the last three answers were the same! I don’t think Ms. Gibbs noticed, at least she didn’t say anything.

“The nines’ complement of six?”

“Three!”

“The threes’ complement of one?”

“Two!”

“And the next few are just a tiny bit harder. Please say the math out loud, Kayla. Four minus two plus seven?”

“Four minus two is two plus seven is nine!” I answered. That wasn’t too hard for me!

“And nine minus six plus one?”

“Nine minus six is three plus one is four!” I answered. Hey, I’m adding and subtracting pretty fast and I don’t even have to use my fingers. I think Ms. Gibbs noticed.

“Very good Kayla, I see you’re using the complements of two, three, four, and nine to add and subtract. And I noticed you aren’t using your fingers.”

“Well, yes, but, you see, I already knew the complements of nine,” I said, “and the other numbers are just little tiny ones.”

Ms. Gibbs replied, “Yes, that’s true. But you *did* learn the complements of nine, and if you learn the rest of the complements you’ll be able to add and subtract much bigger numbers quickly and *without using your fingers*.”

The rest? All the rest? I wasn’t sure I could learn all the rest. “How many are there?” I asked.

Instead of telling me how many all the rest were, Ms. Gibbs just said, “Not too many.” And then she said it wouldn’t be too hard for me because I’ll only need to know how to add any two numbers less than ten. She explained why: “When you add up a column of numbers, you just add one digit at a time, and nine is the largest digit.”

Hmm. I’ll have to think about that for a bit, but I didn’t have a bit of time to think about it because Ms. Gibbs asked me how many ways can I add nine to something to get eighteen?

“Let’s see, nine and … it’s nine! There’s only one number to add to nine to make eighteen and it’s nine! There aren’t any more.”

“That’s right! The eighteens’ complement of nine is nine, and it’s the only complement of eighteen where both numbers are a single digit. Remember, when adding a column of numbers you always add single digits, and nine is the largest single digit.

“For the number seventeen, there are only two such complements: nine plus eight and eight plus nine, and they’re not really different.”

I was going to ask another question, but I wasn’t sure what it was I wanted to ask.

Ms. Gibbs noticed my confusion and said, “You’ll see, Kayla, it won’t be too hard for you to learn all the rest of your complements.

“I’ll teach you some card games that make learning them fun. And once you’ve learned them all, you’ll be able to add and subtract numbers much faster than you do now - and without using your fingers.”

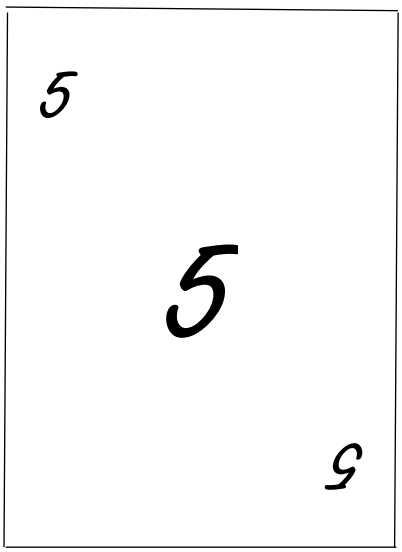
Chapter 5

The card games

Ms. Gibbs took some blank index cards from her folder and said, “I’d like you to learn how to play some little card games that will help you learn the rest of your complements. Once you know them you’ll be able to add and subtract very large numbers quickly, and also to add long columns of single digits in your head - all without using your fingers.”

Ms. Gibbs gave me a marker and some index cards and said, “Please write the numbers from one to nine on each of these cards and do it this way: Write each number big in the middle and write the same number but smaller in the top left corner of the card. Then rotate the card till the small number is in the lower right corner and write the small number once more in the top left corner of the card. While you’re doing that, I’ll make two sets of cards with the numbers one to nine on them.”

“Like this?” I asked:



Ms. Gibbs nodded her head. I finished right about the same time Ms. Gibbs did. She took one set of her cards, shuffled them and put them face down on the table between us and said, “This is the middle pile.”

Then she said that the other set she made will be for her hand and the set I made will be for my hand.

“Before we begin playing, you might want to arrange the cards in your hand so you can see all the corner numbers and they’re in order. Then you’ll know where they are quickly,” Ms. Gibbs said as she began arranging the cards in her hand.

After we were done arranging our cards, Ms. Gibbs said, “The name of this game is called, “The Complements of Ten.” Let’s practice a little. I’ll go first.” She took the top card from the middle pile and turned it over. It was a four.

Ms. Gibbs said we had to look at the cards in our hands for a card, if added to that four, would equal ten. I quickly counted on my fingers: five-six-seven-eight-nine-ten, that’s six fingers! I counted real fast. The answer is six because four and six make ten. That’s what the word “complement” means. Four and six are complements of ten and that’s the name of the game! Get it?

Oh, oh, I remember now, I wasn’t supposed to count on my fingers - next time I won’t. Anyway, we were just practicing.

I didn’t get a chance to put my six down though, because Ms. Gibbs already did. I heard her say, “Four and six make ten,” as she put a six from her hand down on top of the four. She picked them both up and started a pile of cards near her on the table. She called that pile her “winning pile.”

Oh! that's another rule. You're supposed to say the equation out loud while you're putting your card down and picking up the two cards for your winning pile. That's it, that's all the rules there are!

Now it was my turn. I turned over the next card from the middle pile; it was a three. Without thinking, I quickly counted on my fingers again, four-five-six-seven-eight-nine-ten, that's seven. I looked for the seven in my hand, but guess what! Ms. Gibbs was saying, "Three and seven make ten," as she picked up the two cards and put them in her winning pile. Humph! I don't like this game very much.

Then Ms. Gibbs turned over a nine. I had a one right on top of the cards in my hand and I know that one and nine equal ten. I managed to put my one down right before Ms. Gibbs did, but it was pretty close! Now I have a winning pile too. Hey, I think I like this game!

Oh, I didn't say, "Nine and one make ten." I forgot. It was because I was too excited. But I did say it afterwards. When I looked up at Ms. Gibbs, she just nodded her head so I guess it was OK. Next time I'll do it right. I'll say the equation *while* I'm putting my card down and picking up both cards, just like Ms. Gibbs did. - And I'll try not to count on my fingers.

Ms. Gibbs won the first game but I was getting better. We played a second game. I got two complements early in the game and one right near the end of the game. I did say the equation *while* I was putting the cards down but I was still counting on my fingers. It seems I couldn't help it. Pretty soon there were no more cards in middle pile so that meant the game was over.

We counted the cards in our winning piles. I had six. Ms. Gibbs had twelve. Ms. Gibbs won again! Next time I'll try real hard not to use my fingers.

But there was no next time. Ms. Gibbs was putting a rubber band on the cards and saying, “We’re all done playing cards for today. There are some other things I want to show you before our time is up.” But instead of showing me those other things, she kept on talking about my fingers.

“Kayla, it seems that counting on your fingers is just a habit with you. I’d like you to try to practice adding up numbers without using your fingers. Now it might take a little longer at first but don’t worry, you’ll get faster. And, more important, you’ll break that habit. Then the next time you play this game with someone, you’ll be more likely to win because you won’t be using your fingers,” Ms. Gibbs said with a smile.

And then she added this: “You know there are just ten digits and all numbers are made up of just these ten digits. Once you’ve learned the complements of ten, practice learning the complements of the other numbers. If you learn them all, you’ll be able to add and subtract large numbers and add long columns of numbers much faster than you do now. That’s because you won’t need to use your fingers.”

Ms. Gibbs handed me the cards and said, “Please take these cards and practice the complements of ten. After you know all the complements of ten, you can work on the complements of the other numbers up to eighteen. And don’t forget that the number of complements for eighteen is only one, for seventeen it’s two and so on. You’ll see that there are a lot fewer complements to learn than it seems to you right now. And it won’t seem like you’re practicing your math, especially if you play these games with a friend.

“Once you know your complements, whenever you add or subtract you’ll just need to keep track of the tens!”

“Keep track of the tens?” I asked.

“Why yes, of course. You may have to regroup,” Ms. Gibbs replied.

Chapter 6

Reviewing place values and regrouping using money

“Kayla, you learned to keep track of the tens a long time ago when we covered place values and regrouping, remember?”

I nodded my head. Yes, I remembered.

“As I said before, our money is based on the decimal system, so place values and regrouping apply to money too.”

Reader, if you'd like to review place values and regrouping, those topics are in Book 4.

Ms. Gibbs took a paper out of her folder and said. “When we talked about place values, we used a Table with columns for Ones, Tens, Hundreds, and so on. Since our money is based on the decimal system, I changed the names of these columns into something more familiar.”

I looked at the Table and saw that the word “Ones” was crossed out, and the word “Pennies” took its place. “Tens” was now “Dimes” and “Hundreds” was “Dollars.”

~~Ones~~ Pennies	~~Tens~~ Dimes	~~Hundreds~~ Dollars	~~Thousands~~ Ten Dollars	~~Ten Thousands~~ Hundred Dollars

“Hey!” I said, “That makes sense, because ten ‘Ones’ equals one ‘Ten’ and ten ‘Pennies’ equals one ‘Dime.’ And one hundred ‘Pennies’ equals ten ‘Dimes’ which equals one ‘Dollar.’ ”

“Good for you, Kayla!” said Ms. Gibbs, “Let’s look at some examples of Place Values using money.

“As you can see, there is no separate column for nickels. So if you have one nickel and three pennies, all eight of the cents would be in the Pennies column. If you had six dimes, all six of them would be in the Dimes column. So sixty eight cents would be written like this:

Ten Thousands Hundred Dollars	Thousands Ten Dollars	Hundreds Dollars	Tens Dimes	Ones Pennies
			6	8

“When we write 68 cents as money, we write 68¢, or sometimes $0.68.

“The period right before the six is a decimal point. At another time, we’ll talk more about decimals. For now, you just need to know that a decimal point separates the dollars from the cents.”

“What about the quarters?” I asked.

“There is no separate place value for quarters, either. If you had a quarter, you would have the equivalent of two dimes and five pennies, and in the place values chart, it would be written like this:

Ten Thousands Hundred Dollars	Thousands Ten Dollars	Hundreds Dollars	Tens Dimes	Ones Pennies
			6	8
			2	5

“Are you following me, Kayla?”

I nodded my head. I remembered my place values but this is with using money instead of just plain old numbers. Ms. Gibbs said it’s the same. Since I know about money, this should be easy for me.

“Now what if you had four dollars and two quarters and three nickels? Can you put that in the chart for me? I’m here to help if you need me.”

The four goes into the Dollars column. Two quarters is really fifty cents, which is the same as five dimes, so I’ll put a five in the Dimes column and three nickels is fifteen cents so I put the one in the … oh-oh, I already put a five in the Dimes column. I looked up at Ms. Gibbs.

“You can erase a number if you need to,” she said.

I erased the five and put a six in the Dimes column and then I put a five in the Pennies column. Yes, that’s right! “It’s four dollars and sixty-five cents,” I answered confidently.

Ten ~~Thousands~~ Hundred Dollars	Thousands Ten Dollars	Hundreds Dollars	Tens Dimes	Ones Pennies
			6	8
			2	5
		4	6	5

Ms. Gibbs nodded her head so she must think I’m right and I think I’m right too. You see, I know about money! And then she said, “You’re almost ready.”

Ready? Ready for what? I wondered but I didn’t ask.

Then Ms. Gibbs quickly reviewed Place Values and Regrouping. She said I have to remember the tens and I’m remembering them.

Reader, if you don't know what I mean about remembering the tens, here's an example:

Suppose I want to add up these numbers and suppose it's money:

```
  2 1 1
 $39.93
 $29.11
+$93.39
--------
$162.43
```

I'll add them out loud for you, starting with the Pennies column, and I'll start at the bottom.

9 and 1 equal 10 and 3 more is 13. I put the 3 in the Pennies column and regroup the 1 because that 1 is really a Dime. See, I'm remembering the tens because a dime is *ten* pennies!

Next I start at the top with that little 1. 1 and 9 make 10 and 1 more is 11 and 3 more is 14. Because it's in the Dimes column, I'll just put down the 4. There are 4 dimes and I need to regroup the 1 because that 1 is really one Dollar. And here is where I add the decimal point to separate the dollars from the cents.

Now I'll add the Dollars column and I'll start with that little 1 that I just regrouped. 1 and 9 make 10 and 9 more is 19 and 3 more is 22. I'll put down the 2 because that's really two Dollars and I regroup the other 2. That 2 is really two Ten Dollars. See, each time I regroup I'm remembering the tens.

I'm not done yet. I still have to add the Ten Dollars column. I start at the top again with that little 2. 2 and 3 make 5 and 2 more is 7 and 9 more is 16. Since there are no more columns to add, I won't

have to regroup. I can just put down the sixteen, and my answer is **$162.43**. Wow! - That's a whole lot of money!

Reader, that's what Ms. Gibbs meant by "remembering the tens." And even if you have a calculator, it's good to know how to add and subtract without it.

I bet you're surprised at how good I am now. Well, that's because I *am* good. You see, I know the complements of small numbers, and the nines and tens, too, because I practiced them with Ms. Gibbs.

If you practice, you can do it too.

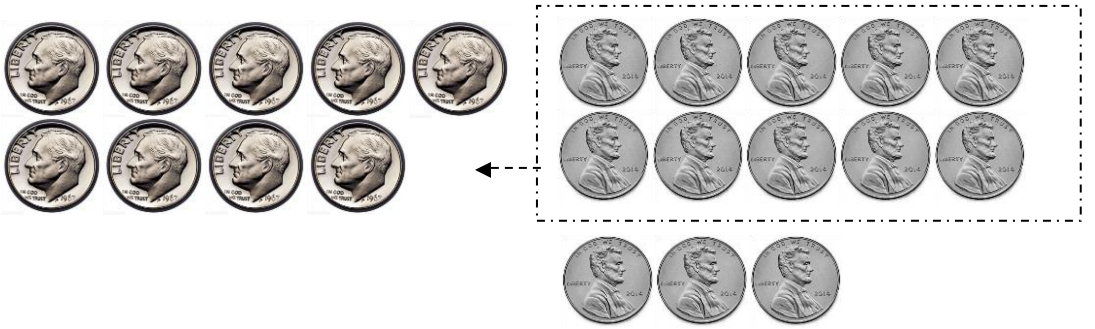
After Ms. Gibbs reviewed Place Values using money, she said, "Now suppose you went shopping, and you bought two items. One cost **56¢** and the other cost **47¢**. Let's find the total amount you spent.

"We can represent these two numbers with dimes and pennies:

56¢ = 

47¢ = 

“And since this is an addition problem, we can just add up all the coins, making sure we separate the dimes and pennies. This is what it would look like:



“But now we have **13** pennies, so we regroup **10** of these into one dime and put it with the pile of dimes:

“Now we have ten dimes, and since ten dimes equal one dollar, we really have one dollar and three cents, **$1.03**, so that’s how much you spent:

“Regrouping ten pennies into one dime is the same as regrouping ten ones from the ones column and adding one to the tens column when we do an addition with ordinary numbers. That’s because ten pennies equal one dime, the same as ten ones equal one ten.”

I nodded my head and said, “I think I get it.”

“Good,” Ms. Gibbs said, “Now why don’t you try this addition problem? I’ll write it out for you:

$$\begin{array}{r} {\scriptstyle 1} \\ 56 \\ +47 \\ \hline 103 \end{array}$$

OK, 6 and 7 is…uh…13 (I used my fingers again, but that’s OK for now.) I put down the 3 - Hey, that’s the three pennies in the picture Ms. Gibbs showed me! - and regroup the 1. I put a little 1 above the 5 in the tens column – and that’s the dime in that picture. Now I get it, I really do! I smiled as I looked up at Ms. Gibbs. But she didn’t smile back, she just said, “Kayla, finish the problem.”

Oh, I have to add that little 1 to the 4 plus 5, and that makes 10, so my answer is 103, and if these were pennies, the answer would be $1.03, just like the problem Ms. Gibbs did using money.

If we look at this answer using plain old math, the 1 is “Hundreds,” the 0 is “Tens,” and the 3 is “Ones.” If we look at this answer using money, the 1 is “Dollars,” the 0 is “Dimes,” and the 3 is “Pennies.”

After I wrote down the answer, I tried to explain to Ms. Gibbs about the pennies and dimes but she just smiled at me. I think she already knew about them.

I thought we were all done for the day, but Ms. Gibbs said, “Now let’s try a subtraction problem. Suppose we want to subtract **56¢** from $**1.03**.”

$**1.03** = 

56¢ = 


“We can’t subtract **6** pennies from **3** pennies, so we have to regroup the $**1.03**. But there are no dimes to regroup into pennies when we have just a one-dollar bill and three pennies. That means we have to first regroup the dollar into ten dimes. Then we can regroup one of those dimes into ten pennies. Of course the one-dollar bill doesn’t exist after we regroup it.

“Here is a picture of the $**1.03** after regrouping the one-dollar bill:

$**1.03** = 


“And here is a picture of the 56¢:

56¢ = 

“Can you finish this subtraction problem from here, Kayla?”

“Well, let’s see … I can’t subtract 6 pennies from 3 pennies, so I’ll have to regroup one of the dimes from the $1.03 into pennies. Then the $1.03 will still be $1.03, but it will be 9 dimes and 13 pennies:

$1.03 = 

“Now I just have to subtract 6 pennies from 13 pennies and 5 dimes from 9 dimes. That’s easy! 13 minus 6 is 7, and 9 minus 5 is 4, and 4 dimes plus 7 pennies is 47¢.”

Right after I saw 47¢, I looked up and saw that’s what I added to 56¢ to get $1.03. Of course, subtraction is just the inverse of addition!

I said to Ms. Gibbs, “If I’m going to add two numbers together to get $1.03, and then I subtract one of the numbers I just added, the

answer has to be the other number. It couldn't be anything else! I'm starting to see the logic in math."

"That's wonderful, Kayla," Ms. Gibbs said, "you are almost ready!"

Huh? Almost ready for what? I thought, but I didn't have time to ask. Ms. Gibbs said, "Let's do a subtraction problem with more regrouping and not using money:

$$\begin{array}{r} 8,273 \\ -5,614 \\ \hline \end{array}$$

"I've spread the numbers out so we'll have room to write down the numbers we have to regroup and make substitutions for.

"First, we see that we can't subtract 4 from 3, so we have to regroup the 7 in the Tens column, putting one of the tens in the Ones column, making 13 there, and leaving 6 tens in that column. Now the problem looks like this:

$$\begin{array}{r} {}^{6}\!\not{7}\,{}^{13}\!\not{3} \\ 8,2\not{7}\not{3} \\ -5,614 \\ \hline 59 \end{array}$$

"We have regrouped the 7, and subtracted the 4 from 13 in the Ones column and the 1 from the 6 in the Tens column.

"But now we have to regroup the 8 in the Thousands column, because we can't subtract 6 from 2 in the Hundreds column. After we take one thousand (which is the same as ten hundreds) from that column and put it into the Hundreds column, we have 7 in the Thousands column and 12 in the Hundreds column.

"Now our problem looks like this:

$$\begin{array}{r} {\scriptstyle 7\ 12\ 6\ 13} \\ 8,\not{2}\not{7}\not{3} \\ -5,614 \\ \hline 2,659 \end{array}$$

"We have regrouped the 8 from the Thousands column, and substituted 12 for the 2 in the Hundreds column. We also subtracted to get the answer. Notice that we did *not* have to regroup the 2 in the Hundreds column, because we could subtract the 1 from the 6 in the Tens column.

"I hope you understand what we're doing here, Kayla, because regrouping is such an important factor in understanding how to subtract large numbers."

I nodded my head, because I think I understand everything Ms. Gibbs did, but I can't be sure until I do it myself.

Ms. Gibbs continued, "Kayla, I'm sure you remember that algorithm we used for dividing fractions. There's another algorithm that you're ready for now, and I'm sure you'll like it.

"It's for figuring out how much change you should get when you pay for something at the store. Suppose I bought something for 57¢ and gave the clerk a five-dollar bill. How would I calculate my change? Here's what the subtraction problem looks like:

$$\begin{array}{r} \$5.00 \\ -\$0.57 \end{array}$$

"The algorithm says to decrease the digit on the left of the bill by one, then takes the nines' complement of all the numbers you're

subtracting, except the very last one. You take the tens' complement of that one.

"Applying the algorithm, we change the 5 in the $5.00 to a 4, then take the nines' complement of the 5, and the tens' complement of the 7. The answer is $4.43.

Ms. Gibbs continued to explain, "You can do this in your head, but it may help at first to see what this looks like by writing it down. You simply change the numbers in the bill as follows: the 5 becomes a 4, the next 0 becomes a 9, and the last 0 becomes a 10, like this:

```
    4 9 10
   $5.0 0
  -$0.5 7
  ------
   $4.4 3
```

"All you really need to know is your nines' and tens' complements and you can figure out how much change you should get at the store when you use this algorithm."

"Hmm," I said, "that's pretty tricky. I'm not sure I can do what you just did."

"Well I know it might seem difficult at first but here's one for you to do by yourself. I'll be right here if you need me," Ms. Gibbs said with a smile, and then she said, "Suppose the cost of what you bought came to $3.81. How much change should you get from a twenty-dollar bill?"

```
  $20.00
  -$3.81
  ------
```

"OK. Because I'm paying with a twenty-dollar bill, I change the 2 to a 1, then take the *nines*' complement of both the 3 and the 8,

and the *tens*' complement of the 1. After the 1 from the 2 in $20.00, that would give me a 6, a 1 and a 9, so I should get $16.19 in change."

"Good for you, Kayla," said Ms. Gibbs.

Reader, Kayla was able to do this in her head, but here's what it would look like if we wrote it down:

$$\begin{array}{r} {\scriptstyle 1\ 9\ \ 9\ 10} \\ \$2\not{0}.\not{0}\not{0} \\ -\$3.81 \\ \hline \$16.19 \end{array}$$

"Because I know my nines' and tens' complements, and this algorithm works without any regrouping, I can easily calculate *in my head* how much change I should get!" I said excitedly to Ms. Gibbs.

Ms. Gibbs added, "…and *without using your fingers*!"

And then - right after that - she said, "Why, Kayla, I think it's time. It's time to go shopping!"

Chapter 7

Going shopping

“Kayla, you can be the shopper and I’ll be the clerk first and then next, you can be the clerk and I’ll be the shopper. Is that all right?” Ms. Gibb asked.

I nodded my head. Hey, I get to shop! I started to think of all the things I’d like to buy but … but Ms. Gibbs gave me a list. She had already decided I should buy school supplies!

“And here’s the money you’ll need to buy your school supplies,” Ms. Gibbs said as she took a ten-dollar bill from her folder. It wasn’t real money, just pretend.

“Kayla, when you go shopping, you’ll need to keep track of how much you’re spending so you don’t pick out too much and you’ll be sure to get what you need,” Ms. Gibbs said. “And,” she added, “you need to make sure you get the correct change.”

I nodded my head. OK I can do this. I go shopping for my mom sometimes.

I looked at the list. I was supposed to buy three pens at 30¢ each, four pencils at 9¢ each, and five folders, one for each of my classes. The plain folders were $1.25 each but the ones with a picture of kids playing basketball were $3.50 each.

I hope I can buy all the folders with those kids playing basketball. That’s my favorite one. But I better see if I have enough money first. I reminded myself that I need to buy a folder for each of my five classes.

Reader, what kind of folders will Kayla be able to buy? Do the math and see. And can you figure out the change she'll get from her ten dollars?

I just need to add up what I'm spending on the pens and pencils. And then I need to subtract that total from the ten dollars I have. And *then* I can decide what folders I can buy.

Let's see:

3 pens at $.30: $.30 x3 $.90

4 pencils at $.09: $.09 x4 $.36

In case you're wondering, that zero in front of the nine for the pencils just means there is nothing in the Dimes column. They're just nine cents each.

The total for pens and pencils comes to:

$.90
+$.36
$1.26

Now I have to subtract this from the total amount I have for shopping, so I can see how much money I have left for my folders:

$10.00
-$1.26

Hey! I think can use that algorithm Ms. Gibbs showed me.

Reader, can you do it too?

I change the 1 in the 10 dollars to a 0, then take the nines' complement of the 1 and the 2 and the tens' complement of the 6. My answer is $8.74.

Wow! It seems like I have a lot of money. Maybe I can buy five basketball folders, but I better check to be sure.

So I multiplied the cost of one of those folders by five:

$$\begin{array}{r} \$3.50 \\ \times 5 \\ \hline \$17.50 \end{array}$$

Oh, no, that's way too much! I have only $8.74 after I pay for the pens and pencils.

Maybe I can buy one of the basketball folders and four plain folders. I have to see how much that would cost:

4 plain folders at $1.25: $\begin{array}{r} \$1.25 \\ \times 4 \\ \hline \$5.00 \end{array}$

Plus 1 basketball folder at $3.50 comes to

$$\begin{array}{r} \$5.00 \\ +\$3.50 \\ \hline \$8.50 \end{array}$$

Now I'll add the money for the pens and pencils to get the total cost:

$8.50
$1.26
$9.76

I'll have money for one basketball folder and four plain ones, and the pens and pencils, of course. I'll have a little change too. Oh, I'm supposed to figure out just how much change I should get. Let me see, I just have to subtract how much everything costs, $9.76, from the money I have, $10.00, and that will be my change:

$10.00
-$9.76
$00.24

I didn't really have to subtract, because I'm getting good at that algorithm Ms. Gibbs showed me. The 1 in the 10 dollars becomes a 0, and I take the nines' complements of 9 and 7 and the tens' complement of 6. (Remember, the nines' complement of 9 is 0.) I should get 24¢ in change.

After I figured everything out, I started thinking of those folders. Let's see, I think I'll put all my math stuff in the basketball folder because that's my favorite one, and I'll put my science stuff in the green one and I'll put all my writings in…

"Kayla, you need to pay for your purchases." Oh, I heard Ms. Gibbs - I mean the clerk - calling me. I better go pay.

I went to the check-out counter and gave the clerk my ten dollars. She added up what I was buying and gave me 24¢ change. Yes, that's what it's supposed to be.

Then I heard Ms. Gibbs say, "Kayla, now it's my turn to go shopping and you can be the clerk in the store."

Ms. Gibbs took a ten-dollar bill from her folder, the same as she gave me, but then she took some coins too. I didn't see how many or what kind they were.

"Kayla, our store doesn't have one of those cash registers that adds up the groceries and tells you how much change to give back," Ms. Gibbs said. "Since you're the clerk, you'll have to figure that out all that by yourself. Here's my shopping list. You can do the math while I'm shopping."

Ms. Gibbs had an extra copy of her shopping list and gave me one. She said she looked at the flyer from the store while making up her list so she knew how much the groceries would cost:

1/3 pound of salmon @ $**10.50** a pound
1/2 dozen eggs @ $**2.40** a dozen
1/3 pound of Broccoli @ $**1.50** a pound.
1/4 pound of cheese @ $**4.60** a pound
1/2 pound of butter @ $**4.04** a pound
1 orange @ $**1** each

I'm so glad that I remembered that "of" means to multiply, so 1/3 *of* a pound is just 1/3 times whatever the price of a pound of salmon is. Get it?

Since Ms. Gibbs bought just a fraction of the unit price for most of the items, I had to do a lot of multiplying. So, here is what Ms. Gibbs groceries cost:

$3.50
$1.20
$0.50
$1.15
$2.02
$1.00

Then I added up the cost of all the groceries, I made sure my columns were straight and – and I remembered the tens. The total came to $9.37.

Ms. Gibbs first gave me the ten-dollar bill but then she gave me two pennies too. I didn't know why she gave me those pennies but I took them anyway. Ten dollars would have been enough.

I subtracted the cost of all the groceries from the money she gave me:

```
    9 9 12
  $10.02
- $9.37
  $0.65
```

`

and gave Ms. Gibbs two quarters, a dime and a nickel in change.

Reader: do you know why Ms. Gibbs gave Kayla those two pennies? Kayla will explain why below.

Ms. Gibbs looked at the change I gave her, nodded her head and said, "Thank you." And then she left the store.

Oh, it wasn't a real store, just pretend. But I really do have a basketball folder. I keep all my math papers in it.

Reader, here is why Ms. Gibbs gave Kayla, oh, I mean the clerk, those two pennies: It was to avoid getting more pennies in change.

I'll do the math and show you. If Ms. Gibbs didn't give the clerk that extra 2 pennies, she would have gotten two quarters, one dime and three pennies as her change:

$10.00
-$9.37
$0.63

But because she gave the clerk that extra 2 pennies:

$10.02
-$9.37
$0.65

her change was two quarters, one dime, one nickel…and *no pennies!* Ms. Gibbs said she didn't want a lot of change, and because she gave the clerk those 2 pennies, she didn't get a lot of change.

You see, Ms. Gibbs knew that if she gave the clerk just ten dollars, the coins she would get back from the clerk would add up to 63¢. That would include three pennies. But 65¢ wouldn't have *any* pennies, and that's what Ms. Gibbs wanted.

You can think about what happened here in a different way:

Suppose Ms. Gibbs didn't give the clerk any pennies, but took the three pennies from the 63¢ in change. Then she said, "I don't like to have too many pennies; if I add two of my own pennies to the three you gave me, will you give me a nickel back for those five pennies?" And the clerk would be happy to do that.

Now that's easy to understand, isn't it? But if you think about it, what Ms. Gibbs did is exactly the same thing, except she didn't wait to get the three pennies in change first. What's the difference if she gives the 2 pennies to the clerk *before* or *after* the clerk gives her the 3 pennies? Nothing!

Reviewing what I learned

You would think that a book on adding and subtracting would be very short - and easy. After all, adding and subtracting are usually taught in first and second grades and that's when the easy stuff is taught.

Well this book is long and not so easy, and here is why: I found that there are a lot of kids - grown-ups too - that really don't understand how to add and subtract. And if you don't really understand this basic math, you might get into trouble.

For one thing, you might have difficulty learning harder stuff in school because addition and subtraction are basic. In my math classes, all through high school, I had to add and subtract - a lot. As I said, it's basic.

And this isn't just about school work - every time you go to buy something, you need to know how to add and subtract. You can't always be sure the clerk gives you the correct change because - sometimes, they don't. And that's because they don't understand the basics.

Why just the other day, I bought something and the total came to seven dollars and twenty six cents. I didn't want too much change so I gave the clerk a ten dollar bill and one penny. Oh, by the way, she had the kind of register that tells you how exactly how much change to give back. Well I got the wrong change!

I was standing just right of the register so I could see what the clerk punched in for the amount of money I gave her. She punched in eleven dollars! She didn't know what to do with the penny I gave her, so she punched it in as a dollar.

Reader, because of this mistake, how much change did she give me?
How much change should she have given me?
Look in the **Answers** *pages to check your answers.*

(Don't worry, I gave the change back to the clerk and told her the correct way to punch the money in. I don't think she understood all I said – but I did get the correct change.)

So even though the clerk had a cash register that calculated how much change a customer should get, she made a mistake.

A similar thing can happen when you use a calculator. There are two ways to get the wrong answer:

1) You may hit the button next to the one you meant to hit and the wrong number gets entered.

2) Sometimes you don't hit the button hard enough and the number doesn't get entered at all.

It pays to check your answer even when using a calculator!

When you're adding or subtracting large numbers, do all this:

1. Keep the columns straight cause if you don't, you won't get the correct answer. That's basic.

2. Learn all the complements. There aren't many to learn and once you learn them, you'll be able to add and subtract fast, and without using your fingers. My friend Liz is surprised how fast I

can add and subtract, so I told her about the complements game. She and I - oh, and Luz too - and sometimes Cleveland, play it after school. We can add and subtract so much faster - and we never, ever use our fingers! And besides, it's fun!

3. And if you're shopping and you want to know how much change you should get from a bill, use the new algorithm. You just need to know your nines' and tens' complements to do this in your head.

I'll give you a lot of practice problems so if you practice, you'll know how to add and subtract all kinds of numbers, so start practicing.

Practice problems

1. Add these numbers after you practice all the complements. Remember the tens – always!

1a.	1b.	1c.	1d.	1e.
64	53	69	45823	84276
17	47	22	+18376	+21086
55	21	76		
39	81	38		
+40	+49	+25		

2. Please add or subtract and *then* check your answer with a calculator *afterwards*. Are they the same? They should be!

2a. 17,894,473
-11,683,985

2b. 3,978,993
+3,858,229

2c. 679,655,399
+45,986,573

2d. 1,000,000.00
- .01

3. The population of a certain town is now 65,390. Five years ago it was 59,668. By how many people did the population increase over those five years?

_____ people

4. John's father wants to drive from Sarasota to Chicago, and he wants to stop either in Montgomery or Atlanta. He will take the shorter of the two routes. Here are the distances:

Sarasota to Montgomery	540 miles
Montgomery to Chicago	753 miles

Sarasota to Atlanta	508 miles
Atlanta to Chicago	716 miles

Which city will John's father stop in? _____

5. Cleveland went shopping and bought a shirt for $6.26 and a pair of socks for $1.57. He gave the clerk a ten-dollar bill. What was his change?

_____

6. Kayla went shopping and bought a sweater for $12.47 and 3 pairs of socks at $1.75 a pair. She didn't want extra pennies. She gave the clerk a twenty-dollar bill and how many pennies?

_____ pennies

What was her change? _____

7. Ms. Gibbs went shopping. She bought a nice pair of pants for $16.27 and a matching jacket for $19.25. She looked in her purse for pennies but she didn't have any so she gave the clerk two twenty-dollar bills. What was her change?

_____

8. And don't forget the stuff you learned about adding and subtracting like fractions:

8a. $\frac{1}{8} + \frac{3}{8} + \frac{2}{8} =$

8b. $\frac{1}{7} + \frac{3}{7} - \frac{2}{7} =$

9. And adding unlike fractions:

9a. $\frac{1}{4} + \frac{1}{2} =$

9b. $\frac{1}{5} + \frac{2}{3} =$

10. And what about multiplying and dividing fractions? Can't forget how to do these kinds of problems:

10a. $\frac{3}{4}$ x $\frac{2}{3}$ =

10b. $\frac{3}{4} \div \frac{2}{3}$ =

11. And improper fractions and mixed numbers? Convert the following mixed numbers to improper fractions:

11a. $1\frac{1}{2}$ =

11b. $3\frac{2}{3}$ =

11c. $5\frac{3}{4}$ =

11d. $2\frac{6}{10}$ =

Convert the following improper fractions to mixed numbers:

11e. $\frac{8}{3}$ =

11f. $\frac{15}{7}$ =

11g. $\frac{20}{6}$ =

11h. $\frac{33}{5}$ =

12. And finally, multiplying big numbers. If you forget how to do these problems, just look in Book 4 or ask someone, but make sure you do them.

12a.
$$\begin{array}{r} 482 \\ \times 537 \\ \hline \end{array}$$

12b.
$$\begin{array}{r} 537 \\ \times 619 \\ \hline \end{array}$$

Something extra

Complements and Compliments

When Ms. Gibbs first talked about complements, I thought she was talking about compliments. They're pronounced the same. You see, the word "compliment," that's with an "i," means saying something nice about something. "Hey, I like your coat," is a compliment about your coat. Get it?

But complement with an "e" means something different. After I got home from school I looked it up to see what it means. We don't have a computer at home so I look words up in our dictionary.

This is what the dictionary says complement with an "e" means: "something that completes or brings to perfection." I don't know about that perfection thing but when Ms. Gibbs asks me what is the nines' complement of four, the answer is five because four and five make nine. The five *completes* the four to make the nine. Get it?

And if I said you're smart because you know all your complements, I'm giving you a compliment. Now you got it. Right?

Answers

Answers to Readers question on p. 50: The clerk gave Kayla $3.74. She should have given her $2.75.

1. Add these numbers after you practice all the complements. Remember the tens – always!

1a.	1b.	1c.	1d.	1e.
64	53	69	45,823	84,276
17	47	22	+18,376	+21,086
55	21	76	64,199	105,362
39	81	38		
+40	+49	+25		
215	251	230		

2. Please add or subtract and *then* check your answer with a calculator *afterwards*. Are they the same? They should be!

2a.	2b.
17,894,473	3,978,993
-11,683,985	+3,858,229
6,210,488	7,837,222

2c.	2d.
679,655,399	1,000,000.00
+45,986,573	- .01
725,641,972	999,999.99

3. The population of a certain town is now 65,390. Five years ago it was 59,668. By how many people did the population increase over those five years?

5,722 people

4. John's father wants to drive from Sarasota to Chicago, and he wants to stop either in Montgomery or Atlanta. He will take the shorter of the two routes. Here are the distances:

Sarasota to Montgomery	540 miles	
Montgomery to Chicago	753 miles	This trip is 1,293 miles
Sarasota to Atlanta	508 miles	
Atlanta to Chicago	716 miles	This trip is 1,224 miles

Which city will John's father stop in? Atlanta

5. Cleveland went shopping and bought a shirt for $6.26 and a pair of socks for $1.57. He gave the clerk a ten-dollar bill. What was his change?

$2.17

6. Kayla went shopping and bought a sweater for $12.47 and 3 pairs of socks at $1.75 a pair. She didn't want extra pennies. She gave the clerk a twenty-dollar bill and how many pennies?

2 pennies

What was her change? $2.30

7. Ms. Gibbs went shopping. She bought a nice pair of pants for $16.27 and a matching jacket for $19.25. She looked in her purse for pennies but she didn't have any so she gave the clerk two twenty-dollar bills. What was her change?

$4.48

8. And don't forget the stuff you learned about adding and subtracting like fractions:

8a. $\frac{1}{8} + \frac{3}{8} + \frac{2}{8} = \frac{6}{8} = \frac{3}{4}$

8b. $\frac{1}{7} + \frac{3}{7} - \frac{2}{7} = \frac{2}{7}$

9. And adding unlike fractions:

9a. $\frac{1}{4} + \frac{1}{2} = \frac{3}{4}$

9b. $\frac{1}{5} + \frac{2}{3} = \frac{13}{15}$

10. And what about multiplying and dividing fractions? Can't forget how to do these kinds of problems:

10a. $\frac{3}{4} \times \frac{2}{3} = \frac{6}{12} = \frac{1}{2}$

10b. $\frac{3}{4} \div \frac{2}{3} = \frac{9}{12} = \frac{3}{4}$

11. And improper fractions and mixed numbers? Convert the following mixed numbers to improper fractions:

11a. $1\frac{1}{2} = \frac{3}{2}$

11b. $3\frac{2}{3} = \frac{11}{3}$

11c. $5\frac{3}{4} = \frac{23}{4}$

11d. $2\frac{6}{10} = \frac{26}{10} = \frac{13}{5}$

Convert the following improper fractions to mixed numbers:

11e. $\frac{8}{3} = 2\frac{2}{3}$

11f. $\frac{15}{7} = 2\frac{1}{7}$

11g. $\frac{20}{6} = 3\frac{2}{3}$

11h. $\frac{33}{5} = 6\frac{3}{5}$

12. And finally, multiplying big numbers. If you forget how to do these problems, just look in Book 4 or ask someone, but make sure you do them.

12a.
```
  482
 x537
 3374
1446
2410
258834
```

12b.
```
  537
 x619
 4833
 537
3222
332403
```

Always remember that calculators may not make mistakes in math, but you can make a mistake reading numbers in. It pays to check your answer even when using a calculator! If you do it twice and get the same answer, you can be more confident that it's correct.

About tutoring

Tutoring is just helping someone learn something they don't already know. Kayla probably doesn't think she was tutoring her mother but she was. She was teaching her mother something she didn't know - how to divide fractions.

You may see someone in your class or perhaps a younger sister or brother who may need help learning something you know but they don't. You can help them learn that something – you can tutor them!

Oh, and always remember the golden rule. You know what that is - always treat others the same way you'd like to be treated. That's what Ms. Gibbs does.