Life of Fred

Fractions

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Polka Dot Publishing

A Note to Students

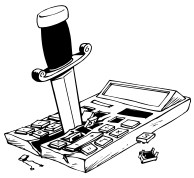
This is the story of one day in Fred's life. He's five years old, but he does some things that many fifty-five-year-olds have never done. Just turn to page 14 when you are ready to start reading about his adventures.

FOR NOW

When you read about what Fred is doing, go as fast as you like, but when you get to the math, please slow down. Math is more condensed than English. Most people have to read the math parts more than once in order to fully understand them. If you take your time, it will be enjoyable.

For now, put aside your calculators. Until you get to pre-algebra, one of the most important things you learn is your addition and multiplication facts. Adults who never learned what 7×8 equals are at a disadvantage.

Once you get to pre-algebra, you can take your calculator out of the drawer and use it all you like.



It is not necessary to get rid of your calculator. Just store it somewhere.

YOUR FUTURE

After this book, there are:

- ✯ Decimals and Percents
- ✯ Pre-Algebra
- ✯ Beginning Algebra
- ✯ Advanced Algebra
- ✯ Geometry
- ✯ Trigonometry and
- ✯ Calculus

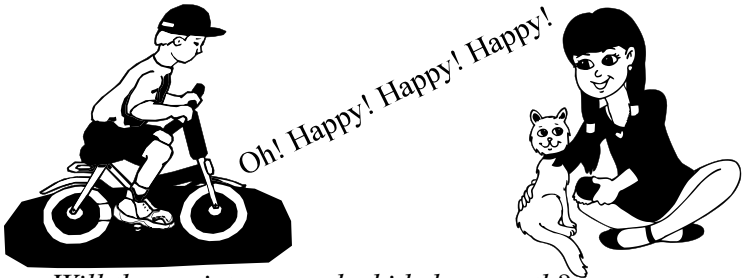
after which, you are ready for university math courses as a junior* and may declare a major in mathematics as soon as your university allows you to.

✶ A junior at a university is a third-year college student.

A Note to Parents

You know what arithmetic books look like. They are all pretty much alike. Using very few words, they give a couple of examples and then have the students do a hundred identical problems. Then they give another couple of examples and another hundred problems. And for students, arithmetic becomes as much fun as cleaning up their rooms, eating yams, or going to the dentist.

The authors often hope that they can fool their readers by throwing in a couple of irrelevant pictures of happy children at play.



Will these pictures make kids love math?

This book, *Life of Fred: Fractions*, takes a slightly✶ different approach. It tells a story—a story of one day in the life of a five-and-a-half-year-old boy. All of the math arises out of Fred's life. All of it is motivated—right down to when Fred (in Chapter 23) is working at the PieOne pizza place, and he's trying to decide whether to put the tomatoes on the pizza before or after it's cooked, and we get the commutative law.

FACTS ABOUT THE BOOK

Each chapter is a lesson. Thirty-two chapters = 32 lessons.

At the end of each chapter is a *Your Turn to Play*, which gives an opportunity for the student to work with the material just presented. The answers are all supplied. The questions are not all look-alike questions. Some of them require . . . thought!

✶ "Slightly" in the sense that fish swim slightly better than rocks.

In the Life of Fred series, your daily role in your children's math education is quite minimal. Just make sure that they are writing down the answers to the *Your Turn to Play* questions and encourage them not to cheat by just copying the answers out of the book. You do not need to check their *Your Turn to Play* answers.

As in all of the books in the *Life of Fred* series, the emphasis is on how to learn by reading. *Let the book do the math teaching.* Students of normal academic ability can learn mathematics from Fred without your tutoring the material. You can relax. As students progress through high school, college, and graduate school, they find that less and less is learned in the classroom lecture format. Increasingly, it's the written word that does the teaching. Things changed after Gutenberg.✶

Learning how to learn by reading
is a very valuable skill.

translation:
Don't short circuit
learning to learn by reading
by your tutoring.

Your more active part in their math education occurs at the end of every four or five chapters. It is called **The Bridge**.

The Bridge consists of ten questions which review everything learned up to that point in the book. Under your supervision, they take out a piece of paper and write the answers to those ten questions. Then, together, you look at the answers that are given in the back of this book.

If they have answered 9 or 10 questions correctly, they have shown that they have *mastery* over the material and have earned the right to go on to the next chapter.

If they don't succeed on the first try, there is a second set of ten questions—a second try—for them to attempt. And a third try. And a fourth try. And a fifth try. Lots of chances to cross the bridge.

✶ Johannes Gutenberg figured out how to use movable type to print books. In 1455 he printed the Bible.

At the end of the book is **The Final Bridge**, fifteen questions. Again, there are five tries offered.

Life of Fred: Fractions covers a lot more than just how to add, subtract, multiply, and divide fractions. If you'll take a peek at the table of contents, which begins on the next page, you'll see how much is covered. Have you ever wondered why, when you divide fractions,

$$\frac{2}{3} \div \frac{3}{4} \text{ becomes } \frac{2}{3} \times \frac{4}{3} ?$$

Very few arithmetic books tell you *why*—they just say that it's a rule. Fred will give you the reasoning behind the rule.

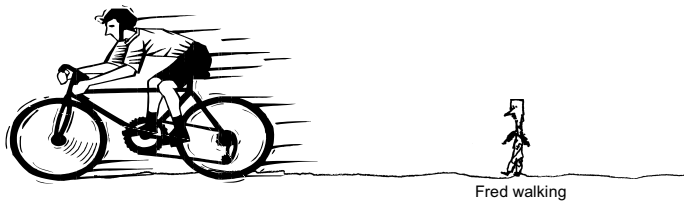
I guess I should also mention: this book is very silly.

Contents

Chapter One
Less Than

When Fred first arrived at KITTENS University he could barely walk. That was because he was only nine months old. A student named Betty became his friend, and she would often carry little Fred so that he could get to class on time.

But that was many years ago. Fred is now 5½ years old. He's no longer a baby who needs to be carried. He walks to class.


Fred walking

Now that he's 5½ years old, he sees things that he never noticed before. He notices that a lot of students ride bikes. They can go fast. They get to wear helmets, and that looks cool.

Fred thinks to himself, I want a bike!

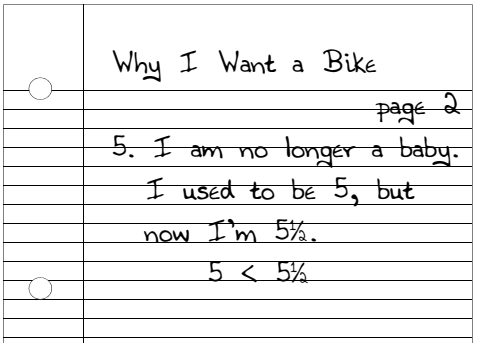
When he was only five years old, he was very happy just walking. But now that he is 5½, he is older.

Fred stopped and took a piece of paper out of his pocket. He started making a list.

Why I Want a Bike

1. I can get to class faster.
2. When I'm on a bike, I am taller.
3. I get to wear a helmet. It would look silly to wear a helmet if I'm just walking.
4. I will need a lock. Locks are fun.

Fred took out a second piece of paper and continued his list.



Wait! Stop! You, my reader, shout. ***I don't get it. What does 5 < 5½ mean?***

This is a very silly book. This is a book in which you, the reader, can talk back to me, the author. When you are talking to me you use ***this type font.*** When I am telling the story I use Times New Roman type font. When Fred is thinking, he uses this type font.

Fred knows a lot of math. Sometimes he uses math symbols instead of English words. Instead of writing "Five is less than five and a half," he wrote "5 < 5½."

The symbol "<" means "is less than."

For example, 3 < 8

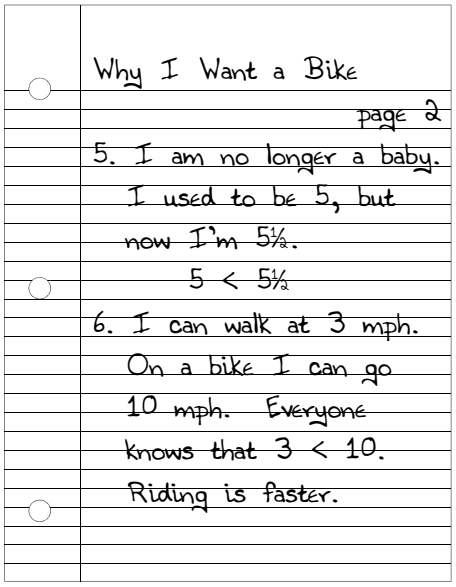
20 < 40

0 < 12 and

4 < 390724902304237230049.

It's NOT true that 9 < 7.

Now let's continue watching Fred make his list.


Why I Want a Bike

~~page 2~~

5. I am no longer a baby. I ~~used to be 5, but now I'm 5½.~~

$5 < 5\frac{1}{2}$

6. I can walk at 3 mph. ~~On a bike I can go 10 mph. Everyone knows that 3 < 10.~~ Riding is faster.

Before you yell ***stop!*** again . . .

mph
means
miles per hour

Now it is your turn, my reader, to do some writing. Please get out a piece of paper. When you were a baby, you may have had books that you wrote in. Those workbooks gave you a problem like 2 + 3 = ____ and you would write in the book: 2 + 3 = 5.

You are no longer a baby. If you write in this book, you will mess it up for any younger brothers or sisters who want to read it.

The rule for writing in books—and elsewhere—could be very complicated:

Don't write in books with hard covers. Don't write on the walls. Don't write in hymnals at church. Don't write in library books. Don't write on the TV screen. Don't write on your baby brother's tummy.

Instead, here is an easy rule:

Write only in books you bought with your own money.

Do you have your piece of paper yet?

At the end of every chapter in this book is *Your Turn to Play*. It is a chance for you to write.

There are three important ways that people learn: reading, hearing, and writing.

Just silently reading the math or just hearing someone read it aloud is not enough. *Your Turn to Play* gives you a chance to learn by writing.

Your Turn to Play

1. On your paper, write the three words that finish this sentence: *The symbol < stands for. . .*
2. Is $88 < 92$ true or false?
3. Is $100 < 12$ true or false?
4. Is $5 < 5\frac{1}{2}$ true or false? ☺☺☺☺☺ $\overset{?}{<}$ ☺☺☺☺☺☺
5. Fill in any number that makes this true: $14 <$ __?__.
6. Fill in any number that makes this true: __?__ < 3.
7. Add $389 + 772$.
8. Make a guess. If $<$ means "is less than," what does $>$ mean?

. . . . . COMPLETE SOLUTIONS . . . . . .

1. *The symbol < stands for "is less than."*
2. $88 < 92$ is true.
3. $100 < 12$ is false.

4. $5 < 5\frac{1}{2}$ is true.

5. Your answer might be different from mine. I wrote $14 < 397972$. You may have written 15 or 16 or 17 or 14½ or 14.001. Any of these is correct.

6. Your answer might be different from mine. I wrote $2\frac{1}{2} < 3$. You may have written 0 or 1 or 2.

7. Most people put one number on top of the other (arrange them vertically) before they add them.

$$\begin{array}{r} 389 \\ +\ 772 \\ \hline 1161 \end{array}$$

8. $>$ means the opposite of $<$. $<$ means "is less than."

$>$ means "is greater than."

All of these are true:

$8 > 4$

$1089723949237 > 2$

$2 < 1089723949237$

$9 > 0$

$5\frac{1}{2} > 5$

Have you ever heard the saying: *The pen is mightier than the sword*? This means that the written word is more powerful than a physical weapon. The saying first appeared in its present form in the play *Richelieu* in 1839:

> *Beneath the rule of men entirely great,*
> *The pen is mightier than the sword.* (Act II)

But many people expressed that idea before 1839:

"The tongue is mightier than the blade." —Greek poet Euripides in 400s BC.
". . . many wearing rapiers are afraid of goose quills." —Shakespeare in *Hamlet* in 1600.

In mathematics, we might express it:

Pen > Sword

Chapter Twenty-four
Adding Mixed Numbers

Fred hadn't read the instruction book: Prof. Eldwood's *Guide to Making Pizza*, 1851. It gives all the steps:

1. Make crust.
2. Smear with pizza sauce.
3. Add toppings and cheese.
4. Stick in oven.
5. Take out of oven.

Fred had missed the last step. Five chapters ago, he had "popped his 12" Wedding special pizza into the oven." That was a long time ago.

First, it cooked.
Then it dried out.
Then it blackened.
Then it caught on fire.*

Smoke poured out of the oven. The kitchen filled with smoke. Everyone in the restaurant started coughing. Even little lamb in the backyard was affected.

The smoke alarm went off.
The sprinkler system showered everyone.
The fire engines rolled up in front of PieOne.
And Fred was out of a job.

The reporters from the KITTEN Caboodle newspaper arrived. They interviewed Stanthony. They talked with the wet customers. And everyone was pointing at Fred.

The federal disaster-relief group arrived. Six members of Congress were with them. All six got their picture taken with little lamb.

✶ Did Smoky the Bear ever say, "Things burn better when they're dried out"?

One disaster worker handed Stanthony a package containing a moist little paper towel and told him it was for the lamb. Then the disaster relief group and the members of Congress left.

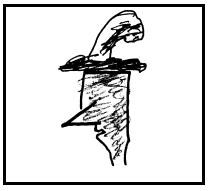
Fred didn't know what to do. He walked slowly down the street in a daze. The special edition of the newspaper was already published.

THE KITTEN Caboodle

The Official Campus Newspaper of KITTENS University — Monday 11:23 a.m. Edition 10¢

Disaster strikes!

Fred Makes Big Mistake



former pizza chef

KANSAS: Disaster struck PieOne at 11:15 this morning. An inattentive trainee named Fred Gauss had left a pizza in the oven for almost an hour. When it caught on fire, smoke and flames were everywhere. The customers all escaped alive, but many had very smoky clothes.

advertisement

KITTENS Laundry Special

We'll wash all your smoky clothes for $4.

advertisement

PieOne

Two slightly used, smoky pizzas. Half price.

Your choice:

14" Lamb with Tarragon

8" "Happy Face" Tomato

advertisement

PieOne

Competent Help Wanted

Need a pizza chef who knows when to take pizzas out of the oven.

What to do? I don't have any money in my checking account. I'm out of a job, except, of course, for my teaching at KITTENS. But my paycheck for teaching comes at the end of the month.

Fred put his hands in his pockets as he walked down the street. This wasn't the usual way that he walked. He didn't even feel like singing.

Like many five-and-a-half-year-old boys, his pockets were filled with stuff. He could hardly get his hands in his pockets. He stopped at a bench and emptied his pockets onto the bench. Out of his left pocket he pulled $3\frac{3}{4}$ sticks of gum. Out of his right pocket, $2\frac{1}{2}$ sticks of gum.

Well, at least I won't starve, he thought to himself.

Index

To see what other books
have been written
about Fred
please visit

FredGauss.com