Life of Fred

Ice Cream

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Polka Dot Publishing

A Note Before We Begin Life of Fred: Ice Cream

Grades, diplomas, trophies, degrees, money, pats on the head, extra time watching television, memberships in honor societies, math ribbons, valedictorian, applause, student of the week, the "I can do all the honey cards in less than 57 seconds" button, the Fields Medal,* assistant professor, associate professor, full professor, finishing a three-unit course in British literature—these are all ***performance goals***.

Mastering the multiplication tables, figuring out how to compute $\sum_{i=1}^{6} i$, understanding the differences between a formal letter and a personal letter, learning where Cypress is on a map of the Mediterranean Sea or which two countries make up the Iberian Peninsula, or how to count back change**—these are all ***learning goals***.

There is a world of difference between ***performance goals*** and ***learning goals***.

The only way that they are alike is that they are both pleasurable.

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* You can't get a Nobel prize in mathematics. Alfred Nobel, who lived in the 1800s, made his fortune in explosives. He was a practical sort of fellow. In his will, he established annual prizes in five areas: Physics, Chemistry, Medicine, Literature, and Peace. One story says that Nobel didn't think math was a practical subject—something you would ever use in everyday life.

It is an established fact that Alfred Nobel never read any of the Life of Fred series in which Fred experiences situations in his everyday life which require mathematics. Instead of Alfred Nobel prizes, there should be Fred Nobel prizes.

The Fields Medal isn't awarded annually, but quadrennially (a word you will encounter several times in this book). It is sometimes called "the Nobel Prize of Mathematics." On one side of the medal is a picture of Archimedes and his words: *Transire suum pectus mundoque potiri.* This is slightly weird since Archimedes didn't speak Latin. If your knowledge of Latin is like that of Archimedes, I will translate: *Rise above yourself and grasp the world.* Mathematics does a lot of world-grasping.

** These are all covered in *Life of Fred: Ice Cream.*

Performance Goals

If you have just been hired at Harry's Hamburgers, all day long you will flip hamburgers, and you will ask customers, "Would you like fries with that?" You put in the hours, and they offer you the rewards of salary (10¢/hour), raises (11¢/hour), and titles (Junior Associate Team Leader).

Many math curricula operate the same way. All day long you do routine problems, and you get the gold stars, a diploma, and the grade.

Learning Goals

You learn for the joy of learning. That's why kids play with toys. They don't do it to earn stuff. No one needs to get external encouragement to go play on the swings and slides.

WHAT DO YOU WANT FOR YOUR CHILD?

Is the whole point to get through the book? This is the classic performance goal. Does your praise revolve around how many were answered correctly or how fast the pages were turned? Do you offer a "paycheck" in the form of treats? If so, when they grow up they will be good little workers at Harry's Hamburgers.

Or is the whole point that the book goes through them? Do you encourage discussion of the things that are being learned? Is learning where the joy is?

Kids with ***performance goals*** want easy successes. If they encounter non-routine problems, they want to cry or quit. Working hard means that they are dumb.

For kids with ***learning goals,*** exertion is positive. They don't blame anything when they hit a problem that takes 15 minutes to figure out. It's part of the road to mastery. You have seen it when kids are playing with little plastic blocks. They will spend hours fiddling with them.

Mathematics is not easy but neither is water skiing or backpacking. The whole point is to enjoy the difficulties and challenges—not to say that you have done it.

At the dinner table, talk about what Fred is doing, not about how many lessons were finished.

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Chapter One
Sunshine

Fred's sleeping bag smelled good. Hanging it out on a tree in the Kansas air and sunshine was a good thing. Fred never knew that you were supposed to do something with a sleeping bag besides just sleep in it.

Fred owned an 85-year calendar. Since he was five years old, that calendar would last until he was 90. At that point, he imagined he would buy another calendar.

$$\begin{array}{r} 85 \\ +\ \ 5 \\ \hline 90 \end{array}$$

He had owned his sleeping bag for four years. Airing out his sleeping bag every four years seemed like a great idea. He was now five years old. He would air it out when he was 9. Then when he was 13. Then 17, 21, 25, 29, etc.

He wrote "air out sleeping bag" on every fourth year of his 85-year calendar. Then he wouldn't forget.

Fred flossed his teeth every evening, so that was easy to remember. He also easily remembered, "Six times eight is 48, and that is

really great." (One use of poetry is to help people remember things. "In fourteen ninty-two, Columbus sailed the ocean blue.")

But when something happens only once every four years, the safest thing to do is write it down so you won't forget it.

Fred had read a lot of books. He knew a lot about math, history, poetry, science, art, geography, vexillology (the study of flags), Shakespeare, the Bible, economics, and beekeeping. But he had never read a book about sleeping bags.

Fred Didn't Know . . .

1. He might not fit into his three-foot sleeping bag when he turned 13.
2. If you sleep in the same sleeping bag every night for twenty or thirty years, it just might wear out.
3. Kids' sweat and adults' sweat are different.* Many adults air out their sleeping bags every morning rather than quadrennially (quad-DREN-knee-al-lee—once every four years).

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* This is covered in more detail in *Life of Fred: Pre-Algebra 1 with Biology*

An 85-year calendar is hard to find in most stationery stores.* (An understatement.) One reason is that if you sell 85-year calendars, you will probably never have repeat customers.

Another reason is that 85-year calendars are pretty thick. They might be hard to hang on the wall.

How thick? How many months would be in an 85-year calendar.** There are 12 months in a year. Do we add, subtract, multiply, or divide? That's always **the big question in arithmetic**.

> **If you don't know whether to add, subtract, multiply or divide, first restate the problem with really simple numbers.**

Using really simple numbers—suppose there are 4 months in a year and we have a two-year calendar. Even without thinking, we know that would be 8 months. How did we get that? We multiplied.

So with an 85-year calendar and 12 months in a year, we need to multiply.

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* *Stationery* (with an *e*) means writing paper and envelopes.
Stationary (with an *a*) means not moving.
How can you remember which is which? One way is to remember that **e**nvelopes are station**e**ry.

** You may have also noticed that *calendar* is spelled *calendAr.* English is strange. The way I remember that it is . . . I can't remember how I remember that. I just do.

```
  85
× 12
```

We've never done this before. It is multiplying by a two-digit number.

12 = 10 + 2

It is multiplying by 2 and multiplying by 10.

Here's how it's done . . .

```
  1
  85
× 12
 170
```

First, you multiply by 2. That we have seen before.

```
  85
× 12
 170
 85
```

Next, we multiply by the 1. (Since it's really 10, and not 1, we move the answer over one space to the left.)

And then just total things up.

```
  85
× 12
 170
 85
1020
```

There are 1,020 months in an 85-year calendar.
There are 1,020 pages in an 85-year calendar.

One thousand, twenty pages!

Your Turn to Play

1. I buy my paper by the ream. One ream = 500 sheets. How many sheets would be in two reams of paper?

2. A ream of paper is about 5 cm thick. (I just measured it.) How thick would 2 reams be?

3. A ream of paper is about 2 inches thick. (I just measured it with the other side of my ruler.) How thick would 2 reams be?

More people in the world understand 5 cm than understand 2 inches.

Centimeters (cm) are part of the metric system. In the metric system (meters, liters, grams) everything is done by tens. For example, a centimeter is one-hundredth of a meter.

In the imperial system (feet, gallons, pounds) nothing is predictable.

36 inches = 3 feet = 1 yard
8 pints = 4 quarts = 1 gallon
16 ounces = 1 pound
12 troy ounces = 1 troy pound

(Gold is measured in troy ounces.)

A pound of hamburger weighs more than a pound of gold.

. . . . . ANSWERS . . . . . .

1. There are two ways you could have done this problem.

By addition:
$$\begin{array}{r} 500 \\ +\,500 \\ \hline 1000 \end{array}$$

By multiplication:
$$\begin{array}{r} 500 \\ \times\ \ 2 \\ \hline 1000 \end{array}$$

There are 1,000 sheets of paper in two reams.

2. By addition:
$$\begin{array}{r} 5 \\ +\ 5 \\ \hline 10 \end{array}$$

By multiplication:
$$\begin{array}{r} 5 \\ \times 2 \\ \hline 10 \end{array}$$

3. Two reams would be four inches.

A Row of Practice. *Do the whole row before you look at the answers.*

48	748	78	47
+ 75	− 9	× 2	× 13
123	739	156	141
			47
			611

"But, but, but . . ." she sputtered.

[It looks like we have run out of room. This is where the index of the book is supposed to start. We'll continue, I promise, right here in the next book.]

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