



**MATH  
WHISPERER**  
*Where math makes sense*

Research Edition

# The Connection between Fractions, Decimals and Percents

Math Whisperer is a program created and designed for math to make sense, so all students can learn math. For more information, please go to [www.mathwhisperer.com](http://www.mathwhisperer.com)

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## DEDICATION

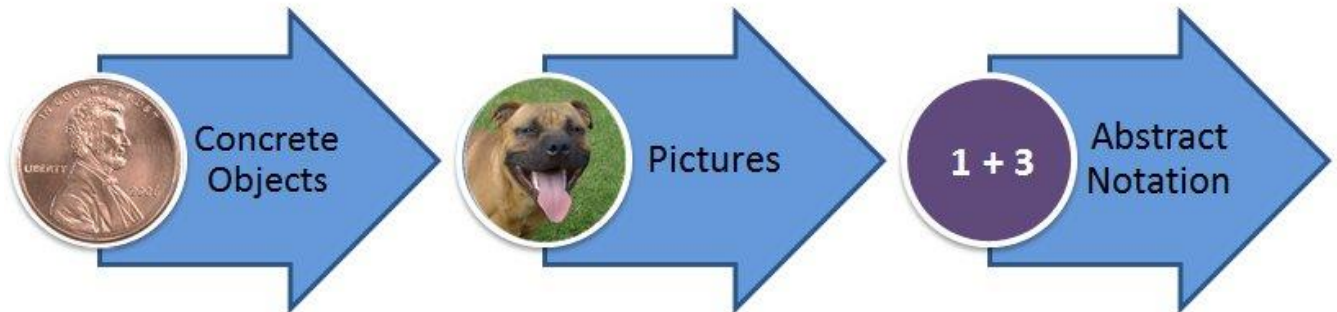
Math Whisperer materials are dedicated to each person who wants to be successful in math, including those who have struggled in the past. Our goal for our students is that they know the math they need to lead the lives they want.

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# 1. Introduction

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Math Whisperer lessons are based on scientific research about how people learn math. Math is actually supposed to make sense. When you start with hands-on objects, math can make sense.



You are probably used to starting with the third step of abstract notation, which means using symbols and maybe a formula. Some people are able to start at this third step, using a formula. Maybe they even understand why the formula works. Maybe they don't, but they get the right answers. These people will benefit from the hands-on objects, also, as they will understand the math at a deeper level. This three step progression works for everybody.

It may feel silly to you to use hands-on objects. My advice to you is: Try it, please. You will see for yourself how well the three step progression works. You are much more likely to remember the formulas this way. And if you forget them, you can reinvent them for yourself. Won't it feel great to never have to learn this again? The math will stick with you with the three step progression.



Hello. I'm Bernice, founder of Math Whisperer. I've worked with lots of students just like you, and they were all able to learn the math they wanted and needed to learn. So can you.

## The Connection between Fractions, Decimals and Percents

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So often students ask: When will I ever use this? Well, percents are the easiest part of math to give examples of “when you will use this.”

Credit cards, car loans, furniture loans, and home mortgages all depend on percents.

Medical treatment decisions can depend on understanding percents. At the end of the lessons are some real-life, adult problems that you will be able to solve.

## A Rose by Any Other Name: Fractions and Decimals

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In 1594 William Shakespeare wrote the play Romeo and Juliet. One of the lines is:

“What's in a name? that which we call a rose  
By any other name would smell as sweet;”

Fractions and decimals are different ways to describe the same quantity. The quantity or amount are the same.



with me and you and our names. I am the Math  
to some people, Bernice to others, Mom to a couple  
of people. I am the same person the whole time, just with  
different names.

# Activity 1: Division of Fractions Practice

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There are two ways to do this activity. If you have a partner, it's more fun. Sit back to back with your partner. Take turns reading the numbers. One partner writes the fraction form of the number and the other partner is writes the decimal form. Then check with each other for accuracy. After several turns, switch roles with your partner, so you each get practice with decimals and fractions.

Here is the list of numbers:

- a. two and four hundredths
- b. five and three tenths
- c. six and twelve hundredths
- d. seven hundredths
- e. seven tenths
- g. seven thousandths
- h. seven hundred
- i. six and two hundredths
- j. eight and thirty four hundredths
- k. nine and four tenths

Picture – students bac to back  
not touching

Picture of one student

If you don't have a partner, write both the fraction and decimal forms yourself.



# Practice 1: Fraction and Decimal Forms

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Complete the following:

Words	Fraction Form	Decimal Form
Three and twelve hundredths		3.12
Three and six hundredths		
Three and twenty five hundredths		
Forty two hundredths		
Six		
		3.14
		8.79
Thirty and fifty two hundredths		

Words	Fraction Form	Decimal Form
One hundred and three hundredths		
One hundred and three tenths		
Five and eight tenths		
Seven tenths		
Six thousand		
		3.142
		8.7
Thirty and fifty two hundredths		

# Converting Fractions to Decimals

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Fractions are written as  $\frac{a}{b}$  which means “a divided by b.” Fractions are a division problem.

The decimal equivalent of a fraction can be found by doing the division.

For example  $\frac{1}{2} = 1 \div 2 = .5$

You can check your work with the hundreds grid.

A different name for .5 is 0.50.

Using the hundreds grid, if this is:

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

**Rounding** You may have to “round your answer.” Hopefully you already know what this means. Here is a brief explanation. It’s not enough to really understand if you haven’t studied rounding before.

**Rounding down** Let’s look at the fraction  $1/3$ . When we divide, we get  $0.33333\dots$  and the 3’s go on forever. Seriously. We have to stop it somewhere. If we are rounding to the tenths place, we would say  $1/3 = 0.3$ . If we are rounding to the hundredths place, we would say  $1/3 = 0.33$ . We “rounded down” because 3 is less than 5, the number in the middle.

**Rounding up** Here is another example, the fraction  $2/3$ . When we divide, we get  $2$  (divided by sign)  $3 = 0.66666\dots$  and the 6’s go on forever. If we are rounding to the tenths place, we would say  $2/3 = 0.7$ . If we are rounding to the hundredths place, we would say  $2/3 = 0.67$ . We “rounded up” because 6 is greater than 5, the number in the middle.

## Practice 2: Converting Fractions to Decimals

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Fraction	Division problem	Hundred grid (use if you want)	Decimal Equivalent

<b>Fraction</b>			

# Solutions

## Help for Helpers

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I know how much teachers and parents want to help their students be successful at math. It can be upsetting to us as adults to see a student for whom we care being upset. However, the very very best way to help your student is to offer encouragement, such as “I know you can do this. I believe in you.” And then leave the student alone to do the

As a metaphor, if you yourself want to become physically fit and choose to run a mile, having someone drive you in a car isn’t going to really help you long term. Yes, you will cover the distance. But there is no substitute for the physical exertion, the sweating and huffing and puffing. Learning to be successful in math requires mental exertion, self-soothing during the frustrating times, and mental stamina.

The time of being a student is largely to prepare for adulthood. As an adult needing math in real life or on the job, there is no great answer book that falls from the sky. We don’t generally want to ask our boss or friend: “Am I right? Am I right?” As an adult, we have to know the answer is right ourselves. The time of being a student is the appropriate time to learn these skills. So, difficult as it may be for you, and it can be very difficult, I respectfully urge you to do nothing except offer encouraging words. These materials are carefully scaffolded and I guarantee you that your student is capable of doing the work himself or herself. The right answer is only half the goal—your student needs to know the answer is right independently.

My heartfelt wishes to you, the parent, teacher, or important grownup in your student’s life. You will gain confidence in your students as you watch them be successful on their own.

Fractions are a huge part of math. Also, they are useful in everyday life. But their major importance is that they are an absolutely critical part of algebra. All Algebra 1 consists of is: fraction operators and the distributive law, with positive and negative numbers and variables, like  $x$ . So understanding fractions and fraction operations is a key to Algebra success.