Study Guide

THE MATH MANIAC SHOW
with Max Millions ™

Watch **The Math Maniac** take your students to a new level of learning, keeping every child on the edge of their seat, eagerly participating in every **fun-framed minute!**

It's a fact! Kids learn more and retain more when they're having **FUN!**

Every performance is audience interactive and specifically tailored to each grade level. **Max Millions** a.k.a. **The Math Maniac** helps students in grades K-6 master their skills in *Place Values, Arithmetic, Integers, Fractions, Geometry, Measurement, Money,* and *Basic Probability*. You'll find these subjects highlighted on the following pages, organized into upper and lower level. This Study Guide, which you may reproduce at your school, provides teachers with a way to take the assembly experience back into the classroom. This enables students to get more value from the program by **INCREASING their RETENTION.**

Place Values

Numbers, such as 84, have two digits. Each digit is a different place value. The left digit is the **tens'** place. It tells you that there are 8 tens. The last or right digit is the **ones'** place which is 4 in this example. Therefore, there are 8 sets of 10, plus 4 ones in the number **84**.

Numbers, such as 6,495,784, have seven digits. Each digit is a different place value. The first digit is called the **millions' place value**. There are six millions in the number 6,495,784. The second digit tells you how many sets of **one hundred thousand** are in the number. The number 6,495,784 has four hundred thousands. The third digit is the **ten thousands'** place. There are nine ten thousands in addition to the six millions and four hundred thousands. The fourth digit is the **one thousands'** place which is five in this example. The fifth digit is the **hundreds'** place which is seven in the number 6,495,784. The next digit (8) is the **tens'** place. The last or right digit is the **ones'** place which is four in this example. Therefore, there are six sets of 1,000,000, four sets of 100,000, nine sets of 10,000, five sets of 1000, seven sets of 100, eight sets of 10, and 4 ones in the number **6,495,784**.

millions   ten thousands   hundreds   ones

1,000,000

Arithmetic

The Magic Number 9

Fun Trick #1: Adding number 9

You can use a little trick to solve problems when adding with the number 9. For example: 25 + 9 =___. Change the 9 to 10, and in your head you can quickly figure out that 25 + 10 = 35. Now, just subtract 1 from 35 (because 9 is 1 less than 10) and you get the answer, 34. So to add 9 in your head, a short cut is to **add 10 then take away 1**.

Fun Trick #2: Multiplying number 9

You can use a little trick to solve problems that ask you to multiply by 9. Take the one-digit number you are multiplying by nine, and insert a zero to its right. Then subtract that number from it.

For example: if the problem is 9 x 6, insert a zero to the right of the six, then subtract six: 9 x 6 = 60 - 6 = 54

Fun Trick #3: Checking your answer

You can use this fun trick to check your answers when you multiply by the number 9. Multiply any number by 9 for example: 9 X 6 = 54. Add the two digits of the product together and if the answer is correct they will equal nine: 9 x 6 = 54. To check your answer add 5 + 4 = 9. **This is true with all numbers multiplied by nine.**

Remember to keep adding the digits in the product until you arrive at the number 9.
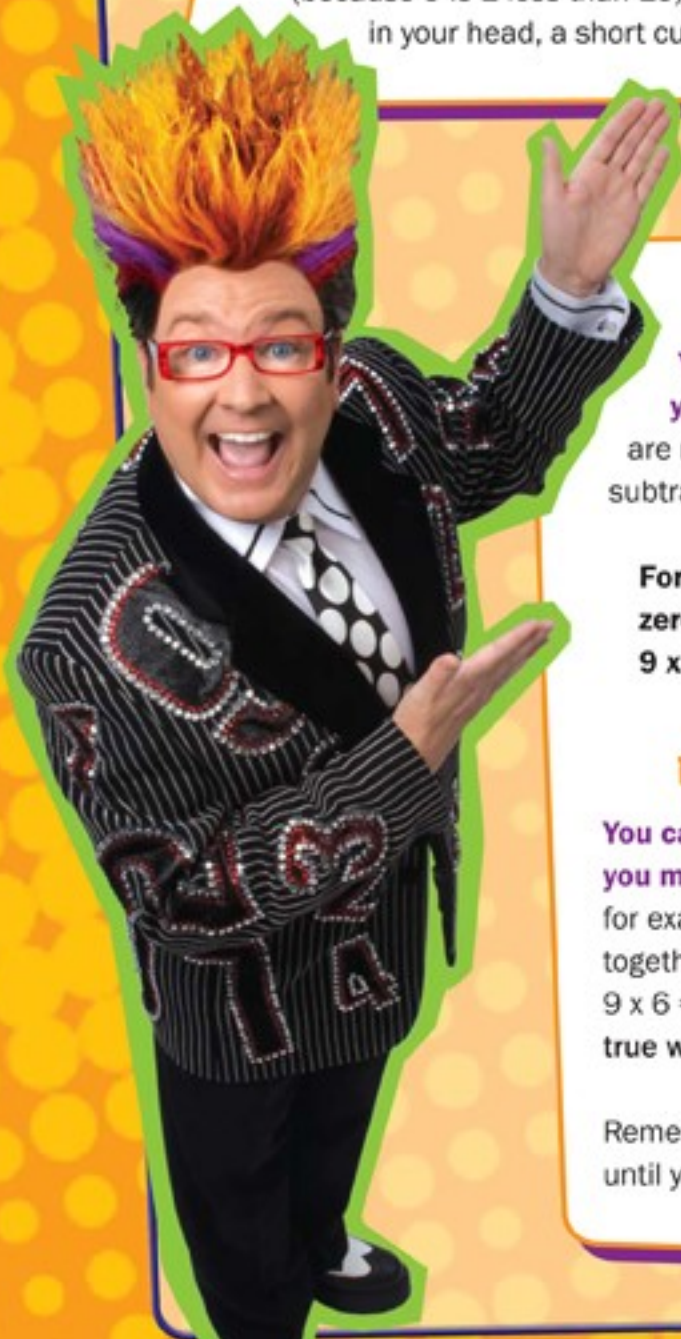
Integers

Whole numbers, as opposed to mixed numbers or fractions, are called integers. (The word integer means whole.) The set of numbers called integers is made up of the positive integers, the negative integers, and zero. This would include numbers such as; **3, 2, 1, 0, -1, -2, -3.**

Lower Level

Odd & Even Numbers

Any number that can not be divided exactly by 2 is an **odd number.** For example, all of the following numbers are odd numbers: 1, 3, 5, 17, and 29. If a number *can* be divided by 2 it is an **even number.** Examples of even numbers are: 2, 4, 6, 38, and 40.

Upper Level

Patterns
How to find a missing number in a sequence:

• Determine if the order of numbers is ascending (getting larger in value) or descending (becoming smaller in value).

• Find the difference between numbers that are next to each other.

• Use the difference between numbers to find the missing number.

Positive & Negative Numbers

A negative number represents a value less than zero. "Decimal Place Values" use a minus sign (-) to indicate **negative values.**
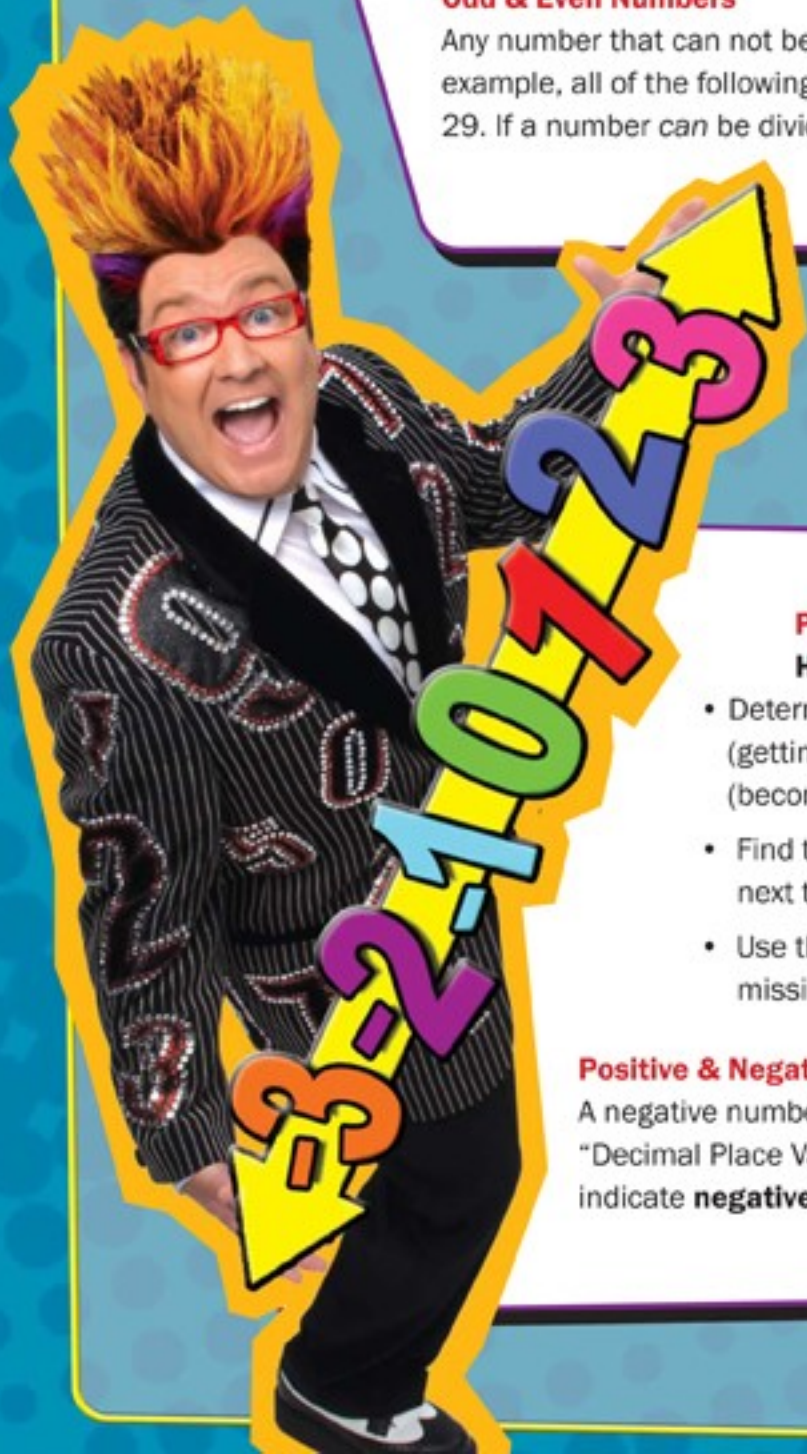
Fractions

A fraction represents a portion of a whole. It can be a part of one thing or a part of a group of things. For example, if something is divided into four equal parts, each part is ¼. The bottom number of a fraction, called the **denominator**, tells how many equal parts the whole was divided into. The top number of a fraction, called the **numerator**, tells how many of the equal parts you are talking about. When the parts are the same as the whole it equals ONE.

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

Upper Level

Percentages and fractions are related. A percentage is a fraction with a denominator of 100. When we write the percent, we are just writing the numerator of the fraction. The denominator of 100 is expressed by the percent symbol "%." Remembering that the percent symbol means "over one-hundred" can prevent a lot of confusion.

Fractions, decimals, and percentages are often used interchangeably: people sometimes use a fraction, sometimes a decimal, or sometimes a percent to mean the same thing.

Proper & Improper Fractions

A **proper fraction** has a numerator less than its denominator such as: . When the numerator of a fraction is equal to or greater than the denominator, the fraction is called an improper fraction. Some examples of **improper fractions** are: . When an improper fraction's denominator divides its numerator without a remainder, the fraction equals a whole number: $\frac{4}{4}, \frac{12}{4}, \frac{8}{4}$
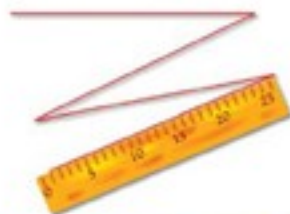
Measurement

LENGTH, WEIGHT, VOLUME

Lower Level

LENGTH

How long is it? Length is measured using different units dependent upon whether you are using U.S. customary or the metric system. The ruler and yardstick are used to teach the **inch**, **foot**, and **yard**. Similarly, the meterstick is used to teach centimeters and meters.

12 inches	=	1 foot
3 feet	=	1 yard
1760 yards	=	1 mile

Upper Level

WEIGHT / MASS

How heavy is it? Weight and mass are not exactly the same. Mass is a measure of how much matter an object contains. Weight is the pull of gravity on mass. Weight and mass on earth are basically the same, but weight and mass on the moon could be different because of the difference of gravity.

16 ounces	=	1 pound
2,000 pounds	=	1 ton

CAPACITY / VOLUME

How much does it hold? Capacity and volume are not exactly the same. Capacity is the amount a container can hold. Units of capacity are used for liquids such as gallons (gal), quarts (qt), pints (pt) and cups (c). It takes 16 cups to equal 1 gallon.

2 cups	=	1 pint
2 pints	=	1 quart
4 quarts	=	1 gallon