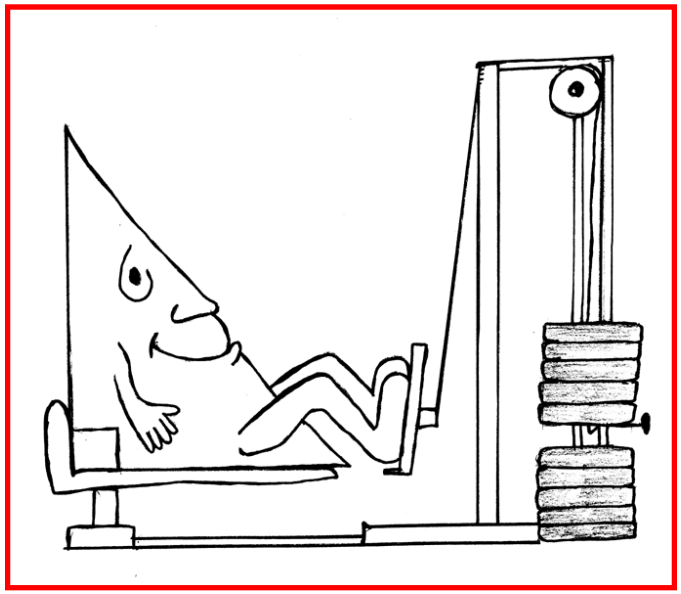
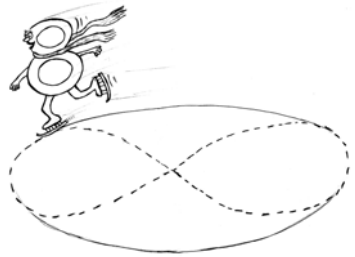
Math Tips for Parents
Grades K-5



MATHNASIUM®
The Math Learning Center

Introduction



These strategies can be started as early as kindergarten, first, and second grade. They are appropriate for any person of any age who needs help with basic mathematics concepts and skills. The trick is to do these exercises both *orally* and *visually*, with little or no writing. Pictures can be used as visual aids. Real–world objects (coins, blocks…) should be used as appropriate.

Counting

The most basic skills in mathematics are *counting* and *grouping* ("seeing" numbers in groups). To develop counting skills, help children learn to count *from* any number, *to* any number, *by* any number. Do all counting forward and backward.

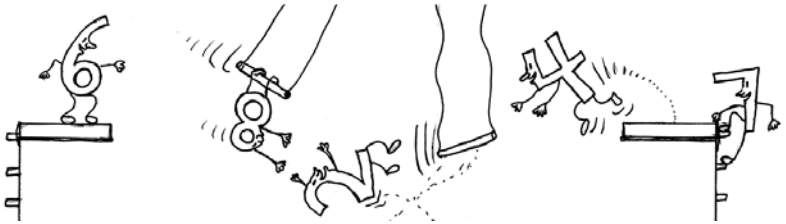
- Count by 1s, starting at 0 (0, 1, 2, 3…250…),
  - then starting at any number [e.g., 28 (28, 29, 30…40…)].
- Count by 2s, starting at 0 (0, 2, 4, 6…24…),
  - then starting at 1 (1, 3, 5…25…),
  - then starting at any number [e.g., 23, 25, 27…49…].
- Count by 10s, starting at 0 (0, 10, 20…500…)
  - then starting at 5 (5, 15, 25…205…)
  - then starting at any number [e.g., 37, 47, 57, 67…347…].
- Count by ½ s starting at 0 (0, 1/2, 1, 1 1/2…5…),
  - then by 1/4s starting at 0 (0, 1/4, 2/4 [1/2], 3/4, 4/4 [1], 1 1/4…)
  - then by 3/4s starting at 0 (0, 3/4, 1 1/2, 2 1/4, 3…).
- Count by 15s, starting at 0 (0, 15, 30…120…).
- Count by 3s, 4s, 6s, 7s, 8s, 9s, 11s, 12s, 20s, 25s, 50s, and 100s, starting at 0.

The benefits of this type of counting practice are strong addition skills and the *painless* development of Times Tables.

Grouping

To expand children's thinking processes and help them "see" groups, ask questions like:

- "7 and how much more make 10?" "70 and how much more make100?" "700 and how much more make 1,000?"
- "10 and how much more make 15?" "10 and how much more make 18?" "10 and how much more make 25?"
- "17 and how much more make 20?" "87 and how much more make 100?" "667 and how much more make 1,000?"



- "How far is it from 6 to 10?" "How far is it from 89 to 100?" "How far is it from 678 to 1,000?"
- "How many 10s are there in 70?…100? …200? …340?…500? …1,000? …10,000?…1,000,000?…a quadrillion (there are 15 zeros)?"
- "How many 4–person teams can you make out of 12 kids?…20 kids?... 100 kids?…50 kids?"
- "How much is 5, four times? …ten times? …a hundred times? …a thousand times?"

Notice how these questions focus on the number 10, multiples of 10, and powers of 10. These exercises can all be done by counting *mentally*, and do not require students to do pencil–and–paper computations.

Fractions

As counting skills begin to develop, fractions can be introduced. Long before introducing words like numerator and denominator, teach children that half means "2 parts the same," and have them use this knowledge to figure out things like:

- "How much is half of 6? …10? …20? …26? …30? …50? …100? …248? …4,628?"
- "How much is half of 3? …11? …15? …21? …49? …99? …175? …999? …2,001?"

As the ability to split numbers in half develops, add questions like:

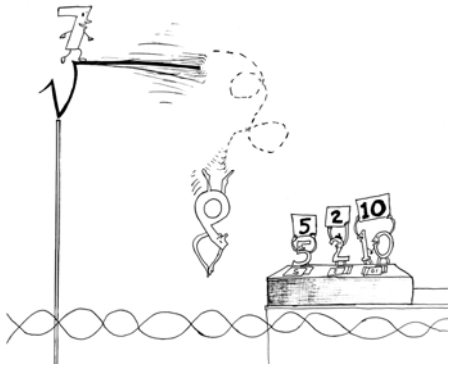
- "How do you know when you have half of something?"
- "Half of what number is 4?…25?…$2^1/_2$?"
- "How many half sandwiches can you make out of three whole sandwiches?"
- "How much is 2 plus $2^1/_2$?" "How much is $3^1/_2$ plus 4?"
- "How much is 7 take away $2^1/_2$?" "How much is $7^1/_2$ take away 2?"
- "How much is $2^1/_2$, four times? …seven times? …two–and–a–half times?"
- "How much is a half plus a quarter?"
- "What part of 12 is 6? …is 4? …is 3? …is 1?…is 9? …is 8?…is 12? …is 24? …is 30?"

Don't be afraid to ask these questions of kindergarteners and first graders. The ability to "see" a whole as being a collection of parts should be learned in the early grades.

Problem Solving

Children become good problem solvers when they are asked to solve a broad range of problems early on, at home and at school. Start with easy questions; let the level of difficulty increase as the child's ability grows.

Ask children questions like:



- "I'm 38 years old and you are 6. How old will I be when you are 10?"
- "If 3 pieces of candy cost 25 cents, how much do 6 pieces cost? …9 pieces?"
- "How many pieces can you buy for a dollar?"
- "Which would you rather have: 1 piece of a candy bar cut into 3 equal–size pieces, or 1 piece of the same candy bar cut into 6 equal–size pieces? Why?"
- "How can you share 6 candy bars evenly with 3 kids?"
- "How can you share 2 candy bars evenly with 3 kids?"
- "A boy and a girl went to the movies. They spent half of the money they had for their tickets, and they spent half of what they had left on snacks. Finally, they had $5.00 left. How much money did they start with?"

Questions like these help a child's thought processes become animated. Try it. You'll see!

Money

By the end of second grade, children should know the names and values of the U.S. coins:

- a penny = 1 cent
- a nickel = 5 cents
- a dime = 10 cents
- a quarter = 25 cents
- a half–dollar = 50 cents
- a whole ("silver") dollar = 100 cents

Preschool and kindergarten are appropriate times to begin this training. It is best that parents take care of these things at home, rather than have teachers spend valuable classroom time on them.

By the end of third grade, children should have learned the basic equivalents:

- 20 nickels = 10 dimes = 4 quarters = 2 half–dollars = 1 dollar
- 1 dime = 2 nickels
- 1 quarter = 5 nickels
- 1 half–dollar = 5 dimes = 10 nickels

Other combinations, like 3 quarters = 15 nickels and 15 dimes = 6 quarters, should also be explored. Next come questions like, "How many dimes have the same value as 6 quarters? …40 quarters?"

Counting piggy–banks full of coins is an excellent way to develop these skills.

"Making Change" is a skill that can be introduced in late first grade or early second grade, and can be mastered by fourth grade. Children should learn to make change from:

- a dime
- a quarter
- a half–dollar
- one dollar
- two (…five …ten …twenty …hundred…) dollars

Questions can take the form of :

- "You have a dime. If you spend 6 cents, how much will you have left?"
- "If you want to buy something that costs 50 cents, and all you have is 47 cents, how much more do you need?"
- "If you want to buy something that costs a dollar, and all you have is 78 cents, how much more do you need?"
- "If you buy something that costs 18 cents, how much change will you get from $2.00?"
- "If you buy something that costs $1.46, how much change will you get from $2.00?"
- "If you buy something that costs $12.89, how much change will you get from a twenty dollar bill?"

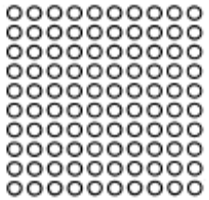
Other money related questions:

- "A roll of dimes is worth $5.00. How many dimes are in a roll?"
- "A roll of quarters contains 40 quarters. How much is the roll worth?"

Money is the best model of our base 10 (decimal) number system.

Visual Elements

Pictures are useful in presenting and reinforcing many concepts.



- "How many circles are there in the picture?"
- "If each circle is a penny, how much money is shown in the picture?"
- "If each circle is a dime (…a nickel …a quarter…), how much money is shown in the picture?"
- "Shade–in half of the circles. How many circles are not shaded–in?"
- "Shade–in half of the circles that are not shaded–in. Now how many circles are not shaded–in?"
- "Again, shade–in half of the circles that are not shaded–in. Now how many circles are not shaded–in?"

Learning Addition and Subtraction Facts

Here is the structure of the process of learning addition and subtraction facts.

Addition

"Doubles"

1) 5 + 5 = _____ **2)** 9 + 9 = _____

"Doubles plus 1" "Doubles minus 1"

3) 5 + 6 = 5 + 5 + 1 = _____ **4)** 8 + 7 = 8 + 8 – 1 = _____

"Counting on (start at x and count-up by y)"

5) 7 + 2 = _____ **6)** 8 + 3 = _____

"Breaking–down Numbers"

7) 6 + _____ = 9 **8)** _____ + 7 = 11

"How far apart are two numbers?" "How far is it from x up to y?"

9) How far apart are 6 and 10? __ **10)** How far is it from 9 up to 12? ____

"Combinations that make 10"

11) 8 + 2 = _____ **12)** 6 + 4 = _____

"10 plus a number"

13) 10 + 7 = 17 **14)** 10 + 9 = 19

"10 plus what number"

15) 10 + _____ = 16 **16)** 10 + _____ = 19

"Putting it all together"

17) "8 + 6 = ": 8 plus how much makes 10 (**2**) ...[6 – **2** = 4]...10 plus the left–over (4) ... 10 + 4 = 14

18) "9 + 7 = ": 9 plus how much makes 10 (**1**) ...[7 – **1** = 6]...10 plus the left–over (6) ... 10 + 6 = 16

Subtraction

Subtraction has two aspects:

- the notion of "how much is left," and
- the notion of "how far apart are the two numbers" (how far is it from the smaller number up to the bigger number.)

Use the notion of "how much is left" when the numbers are fairly far apart, and count down.

> For example, "12 – 3" is best thought of "counting down from 12 by 3."

On the other hand, use the notion "how far apart are the two numbers" when the numbers are fairly close to each other, and count up.

> For example, "12 – 9" is best thought of "how far is it from 9 up to 12."

After a good deal of practice with both methods, the right one will automatically come to mind as you are doing problems.

Try these:

1) Which method would you use for "100 - 98"? **(CIRCLE ONE)**

HOW FAR APART **HOW MUCH IS LEFT**

2) Which method would you use for "100 - 3"? **(CIRCLE ONE)**

HOW FAR APART **HOW MUCH IS LEFT**

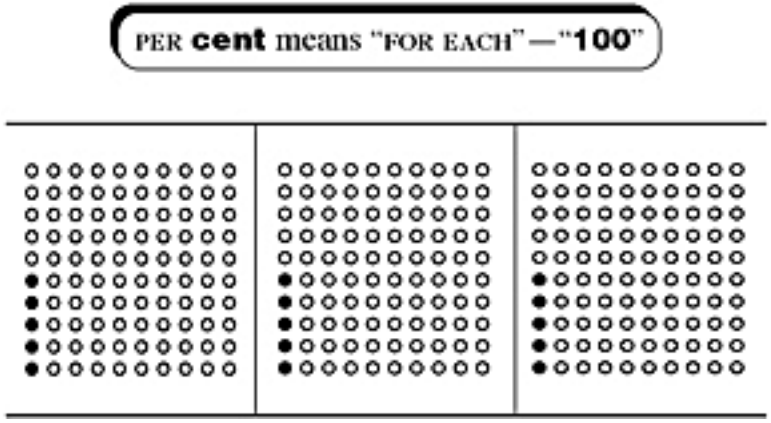
3) Which method would you use for "100 - 87"? **(CIRCLE ONE)**

HOW FAR APART **HOW MUCH IS LEFT**

4) Which method would you use for "100 - 15"? **(CIRCLE ONE)**

HOW FAR APART **HOW MUCH IS LEFT**

A Different Way to Think about Percent



Example: Find **5%** of **300**.

5% of **300** = **15**

because

5% means **"count 5 *for each* 100,"** so,

For **300 (100 + 100 + 100),**

count **5, three** times (5 + 5 + 5 = **15**).

1) 7% of 300 = _____ **2)** 6% of 500 = _____

3) 15% of 300 = _____ **4)** 25% of 400 = _____

5) 20% of 500 = _____ **6)** 12% of 300 = _____

7) 6% of 200 = _____ **8)** 6½% of 200 = _____

9) 8% of 50 = _____ **10)** 7% of 50 = _____

11) 6% of 150 = _____ **12)** 12% of 250 = _____

13) 8% of 225 = _____ **14)** 7% of 250 = _____

Conclusion

These tips will help you develop your child's interest and understanding of math. Doing some of these activities at home will help your child feel more comfortable doing math.

Mathnasium's Philosophy:

Children don't hate math.
They hate being confused and intimidated by math.
With understanding comes passion.
And with passion comes growth—a treasure is unlocked.

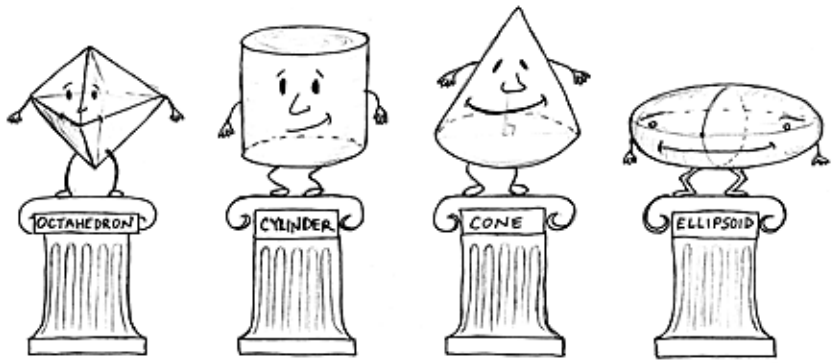
MATHNASIUM

Teaching Children Math in a Way That Makes Sense to Them

The *Math Tips for Parents* booklet was developed by the creator of the Mathnasium Method, Larry Martinek. The strategies outlined incorporate Mathnasium's program philosophies and draw deeply on Larry's 30+ years experience as a math teacher, educational consultant and father. This booklet serves as a guide for parents who want to help their children to learn and love math.

32 years ago, Larry was inspired to find a better way to teach children math. As a teacher trainer and consultant in public schools as well as top private schools, and father to a mathematically gifted son, Larry possessed an incredible comprehensive view of education. In his work with stellar and struggling math programs, he clearly identified a common theme in mathematics instruction: a "serious disconnect between students' basic skills training and the curriculum they are expected to master in the years to come." Spurred by the failures in math education, Larry decided to find an approach that would provide young children with the strong mathematical foundation they need to succeed.

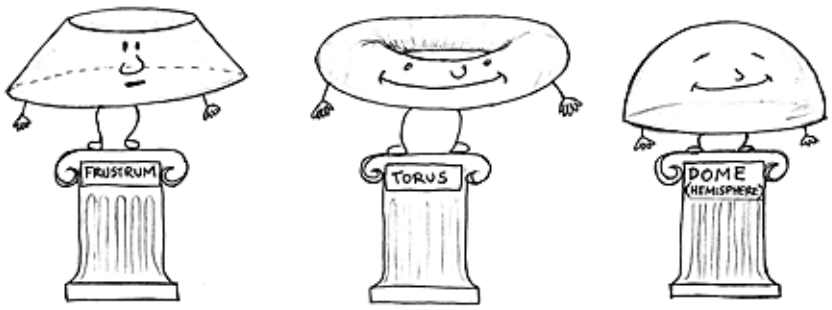
Over the next three decades, Larry painstakingly developed and assembled a blend of methods and materials that proved more powerful and effective that anything available in schools. Instead of relying on traditional rote memorization and repetitive exercises, Larry's work focused on helping children build deep mathematical understanding through the fundamental experience of working with numbers.



His book of tips focused on introducing children to math through oral, visual, mental, as well as written modalities. Classroom experience showed that teaching children to work with numbers beyond written exercises helps them to access Number Sense; an important step before they can apply their understanding on paper. His approach was groundbreaking; he taught kids math in a way that made sense to *them*.

As Larry's innovative materials gained increasingly wide circulation over the years, he became recognizable in the Los Angeles as "Larry, the Math Guy." Schools began teaching from his materials instead of their textbooks and test scores skyrocketed at every grade he impacted within two years. He gradually expanded his work to develop a complete and integrated curriculum from pre-Kindergarten math to Pre-Calculus. With his curriculum ready, Larry looked forward to a day when he could transform the way children everywhere learn math.

In spring of 2002, Larry's dream came true. Peter Markovitz and David Ullendorff, leaders in the field of the Education Business, made Larry and his curriculum the driving force of Mathnasium. Larry introduced his curriculum as the Mathnasium method at their first math learning center in Westwood, CA. Students of all ages find the curriculum to be incredibly powerful and engaging, and centers have sprung up across North America, South America, Europe and Asia. The hallmark of the Mathnasium program has been the way it engages kids and gets them to know math at a level far beyond adult expectations. Today, over thirty years after its inception, the Mathnasium Method is providing children all over the world with confidence, critical thinking skills, and mathematical ability to last a lifetime.



Mathnasium is a learning center where kids go after school to improve their math skills. We are highly specialized; we teach only math.

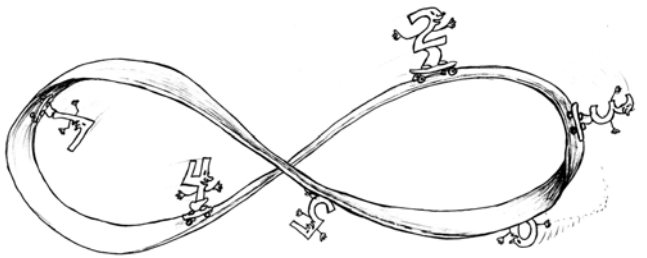
Students attend once or twice a week—or as often as they like—for up to 90 minutes. Like at a gym, members can drop in anytime. Our goal is to enhance your child's math skills, understanding of math concepts and overall school performance. At the same time, we build confidence, yielding overwhelming results.

What distinguishes the Mathnasium Method?

Comprehensive Written and Oral Evaluation
A Mathnasium student takes a two-part diagnostic test—both written and oral. We use the results to create a learning plan tailor-made for your child.

Customized Program for your Child
- Highly trained instructors
- Personal attention
- Periodic assessment to keep your child on track

Results
Your children's progress is measured by their grades in school, advancement in our program, and most importantly their love of mathematics.



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