

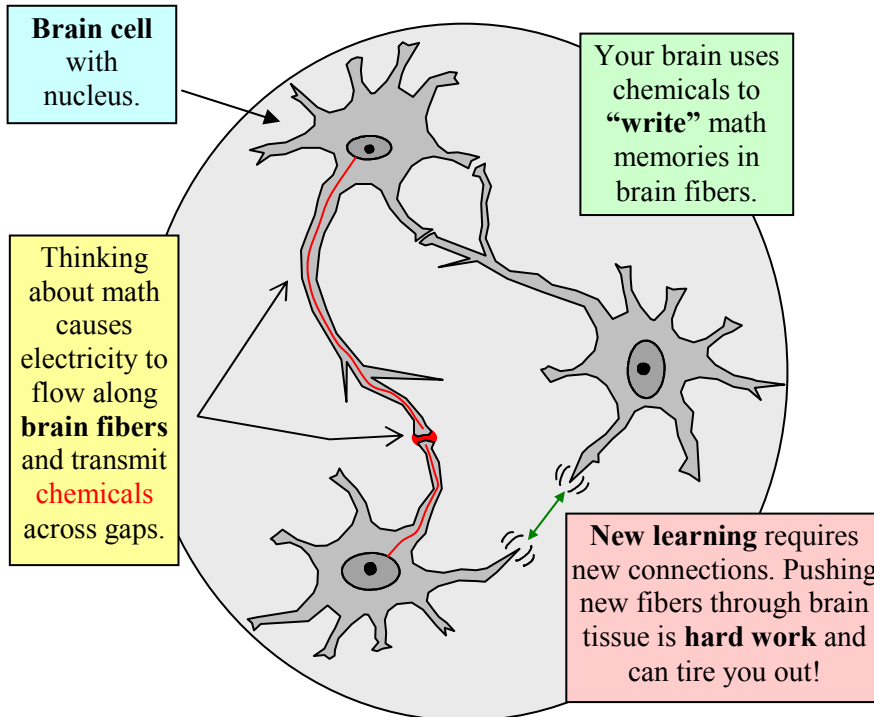
Math Tips

To help you learn and retain math!

Make Math Memories

Question: How is it you can remember a math fact or procedure?

Answer: Like ink on paper, your brain “wrote” it down for you!



Why do I yawn when learning math?

Assuming you’re getting enough sleep, yawning may be your brain’s way of getting more oxygen to grow new brain fibers!

Repetition

Ink fades, but if you repeatedly trace over your notes with a pen, they’ll last longer.

Memories fade, but if you repeatedly “trace over” your mental notes by repeatedly thinking about them, they’ll become **long-term** memories.

When Repetition is Not Enough

Why must teachers reteach the *same* math concepts *year after year* in school? Because most students mindlessly follow procedures, remembering them only long enough to complete the homework task or take the test. Even with repetition, they fail to form long-term memories.

To combat these short-term results, it helps to use BrainAids and stories, which are more easily remembered than dry math facts and procedures.

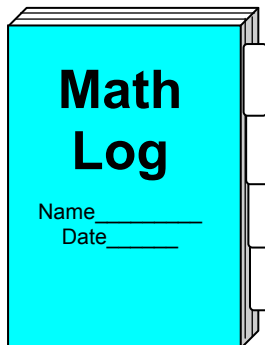
Keep a Math Log

Your Brains on Paper!

Repetition is not always enough to retain memories, and there are just too many terms, rules, and procedures to remember, so get a notebook and label it **Math Log** with your name and date on the cover. It will become your “brains on paper.”

Recommendation: Use a 3-ring binder organized by tabbed sections (Arithmetic, Fractions, Algebra, etc.) so you can insert and rearrange pages as needed.

Write down everything you learn. Like the captain of a ship, “log” the dates and details of your math journey.



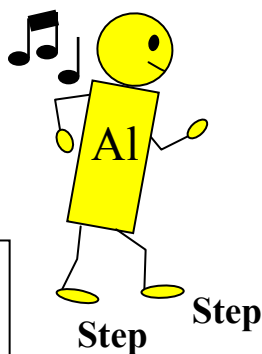
Writing things down will help you organize your thoughts and remember more. As time goes on and memory fades, your Math Log will be a great reference and review tool.

Appreciate Algorithms

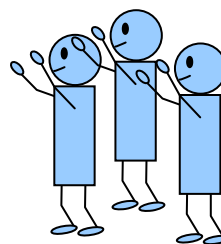
An algorithm [AL-goh-RITHH-um] is a *step-by-step procedure*.



Imagine a dancer named Al moving to a lively tune: *Al got music, Al got rhythm!* as the admiring crowd shouts for him to “Go Pro(fessional)” with his step-by-step procedure!



Al got rhythm!
Al-go-rithm!
Al Go Pro!



Observe the different spellings: algorithm vs. rhythm.

Addition Algorithm

- Add the 1's-place values. 56
- If 10 or more, carry 1. $+38$
- Add the 10's-place values. 94

Without the Addition Algorithm you'd have to count (1, 2, 3...) up to 56, then count 38 more times (57, 58, 59...) up to 94!

So the next time you're confused by an algorithm, remember how hard it would be without it!

To help you remember algorithms, we'll use stories and scenarios like:

Elevator Addition
Borrow & Spend Subtraction
Popcorn Multiplication
Rainbow Division

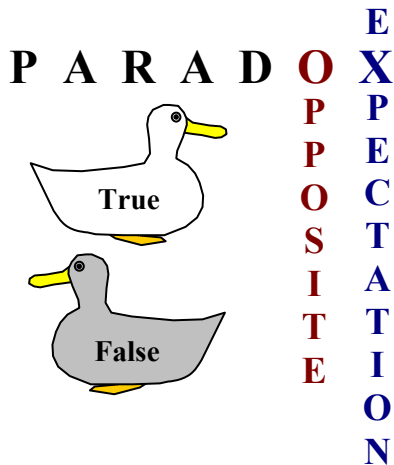
Pal with Paradoxes

A paradox [PAIR-uh-dawks] is a statement that creates an *opposite expectation*.

Math is full of paradoxes, and it pays to recognize and become “pals” with them, because they seem to defy common sense.

For example, you’d expect the Greatest Common Factor (GCF) to be a large number. But you get the opposite: a number *smaller* than the products it’s extracted from.

On the other hand, the Least Common Multiple (LCM) is *greater* than the factors that created it.



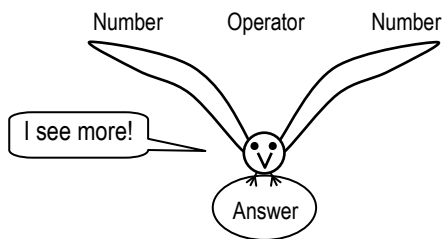
BrainAid

Imagine a “Pair a ducks!”

You expect a True duck but get the opposite, a False duck.

SeeMore Solutions

Let SeeMore and friends guide you to the final answer.



SeeMore the Seagull!

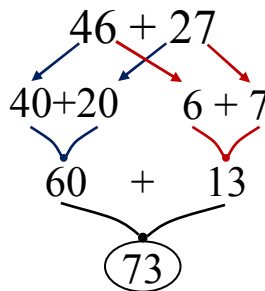
Place numbers on each wing, give SeeMore an operation to perform, and he’ll lay an answer egg.

$1 + 2$

3

It’s easier to follow and trace a procedure when you use lines and arrows to show the direction of movement.

For example:
Split & Attach



Draw arrows to show split into 10’s and 1’s digits.

Draw SeeMore’s seagull friends to separately combine 10’s and 1’s.

Have SeeMore lay the final answer egg.

KISS and Make Up!

Do It Yourself (DIY) Problems!

Make 'Em Up!

Why should teachers and test makers have all the fun?

Whatever algorithms you're studying, make up some problems of your own and solve them.

Better yet, exchange problems with friends and make it a game to see who gets the most right.



KISS

Keep It Solution Simple!

Keep numbers in your made-up problems simple enough that they don't "get in the way" of learning.

Once you master an algorithm with simple numbers, you'll be able to apply it to more complicated numbers.

Teach!

You don't really know it unless you can teach it!

Volunteer to Help!

Once you feel confident in a technique, volunteer to help someone else learn it, especially a younger person.

Effective teaching will force you to explain and demonstrate algorithms correctly and in the proper order.

Be Creative!

When your students don't "get it" is when the fun starts.

This is your chance to devise creative ways to help them learn.

Tip: Relating problems to money and coins often works.

