Mortensen Math
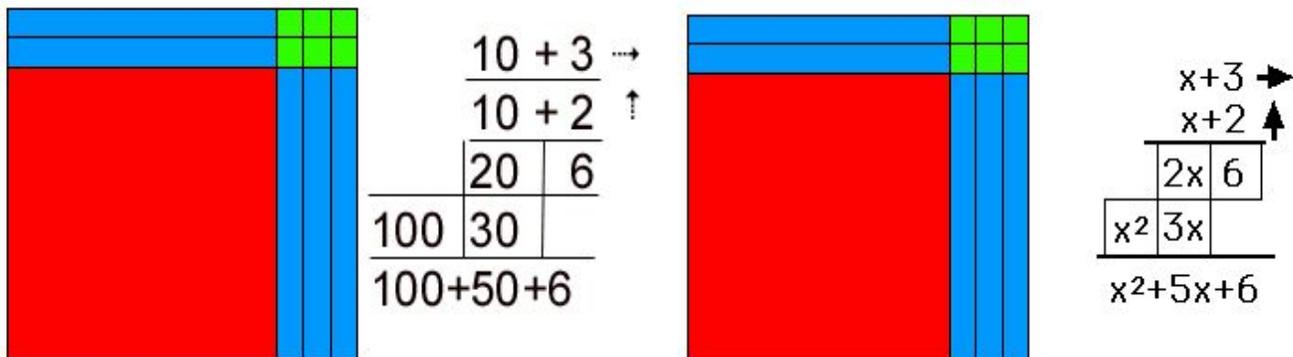
"The purpose of teaching mathematics is to foster logic and analytical thinking skills."

-Judith Townsend

❖ Mortensen materials have been designed so that it is logical to apply the same arithmetic rules, using base ten, to algebra.

❖ The Mortensen methodology has a unified approach to the teaching of arithmetic. The mathematical constructions for division, problem solving, fractions, algebra, and calculus all have a related geometry which makes the learning of a new concept easy.

❖ Mathematical concepts become clearer, simpler, and more available to more students.

"What's the best way to do it? The way the student learns best."*

You have to know multiple ways to teach math. You need to know multiple algorithms for each student.

The student is the determining factor, not the textbook, not the teacher, not the blocks.

If you want to teach math, present it at the child's level and MAKE IT FUN!

[The Gospel According to Jerry Mortensen](#)

[understood.org/en/learning-attention-issues/child-learning-disabilities/math-issues/is-there-such-a-thing-as-orton-gillingham-for-math](#)

"No math concept is beyond the grasp of a child, if it is presented at the child's level." ~Jerry Mortensen

The Five Basic Concepts

1. Math is the study of numbers and all we do with numbers is count. The highest number we count to is "9". *Places tell us what kind. Numbers tell us how many.*

2. Before we can count, they must be SAME.

3. We make rectangles to make counting easy.

4. Hero Zero! **HZ** Zero can't be touched by multiplication or division!

5. No Fun Get Back To One. **NFGBTO**

What do we need? 5 Things

1. Skillset - one-to-one correspondence, 45 addends (focus on 9s & 10s), 400 multi. facts

2. Mindset - math is easy, it is wondrous and fun

3. Concepts - the 5 Concepts

4. Tools = manipulatives

5. Practice = **PLAY** with blocks - practice, practice, practice.

- Numbers are made of other numbers.
- All the other numbers want to be 10.
- Use the fewest blocks possible to represent numbers. Substitute/Exchange.
- There are two parts to a number's name; the *"how many"* part and the *"what kind"* part.
- We count the big ones first.
- The equals sign means "same" or "same as." The equals sign never lies.
- Remove the **"no"** from the lesson.
- The more senses you use, the easier it is to learn and the more you remember.
- The idea of <u>Not Failing</u> does not mean you always get the right answer. It means each time you don't, you get more information which gets you closer to the right answer. You may not get the answer right the first, or the second time, but you will.
- Tell Students what they have, not what they don't have; what they are doing and what you want them to do, not what they did wrong.

http://www.crewtonramoneshouseofmath.com/concepts.html

"No math concept is beyond the grasp of a child, if it is presented at the child's level." ~Jerry Mortensen
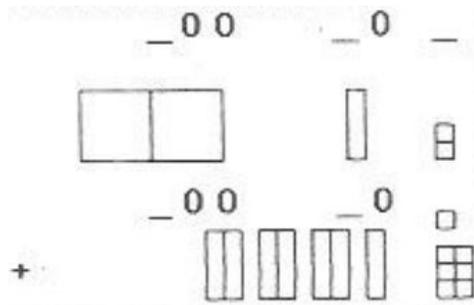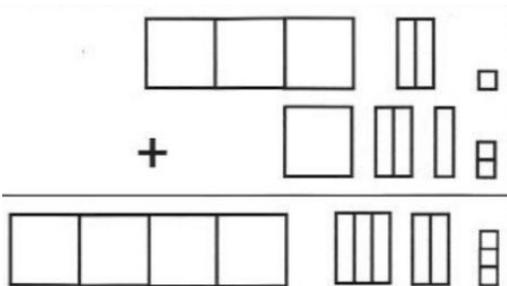
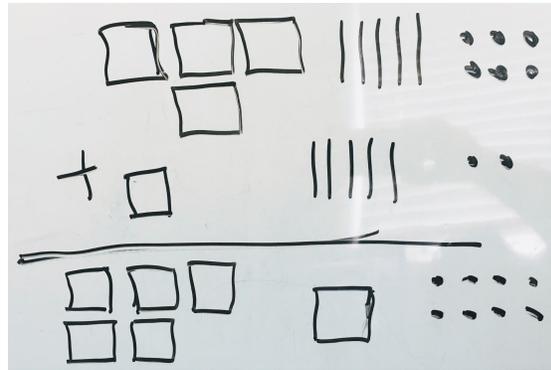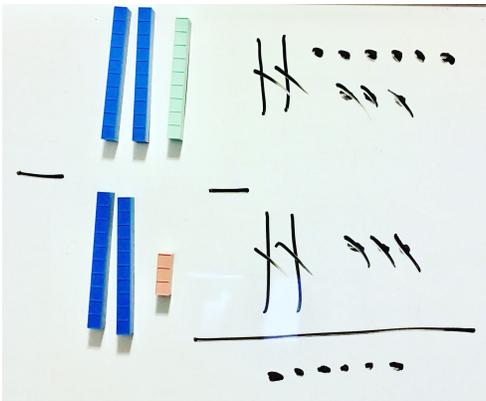CONCRETE

DRAWING   SYMBOLS
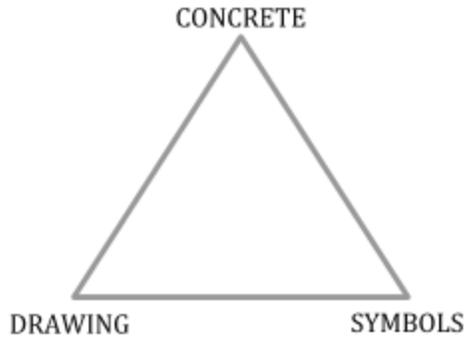
Concrete. The "doing" stage using concrete objects to model problems

Representational. The "seeing" stage using representations of the objects to model problems

Abstract. The "symbolic" stage using abstract symbols to model problems

Research-based studies show that students who use concrete materials develop more precise and more comprehensive mental representations, often show more motivation and on-task behavior, understand mathematical ideas, and better apply these ideas to life situations.
Students don't have to draw every problem, but they do need to draw every kind of problem.
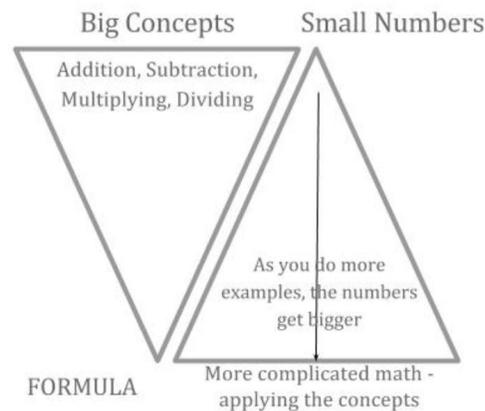Drawing is a very powerful way to increase understanding and retention.

"Use lots of Micro Lessons over time to make the concepts easy and understandable."

Where does most learning take place? The subconscious mind - because the subconscious mind is where you work out all your problems.

Start small. You don't want to model every single problem. Use the blocks to get the concepts down then move on to pictures and the abstract.

Start out with big concepts and small numbers. Do 3 examples with small numbers. Make sure the student understands the concept by asking a "What if…" question.

Start with easy problems then slowly increase the size/difficulty.

Big Concepts   Small Numbers

Addition, Subtraction, Multiplying, Dividing

As you do more examples, the numbers get bigger

FORMULA   More complicated math - applying the concepts

Comment from Crewton Ramone -
Also the concepts triangle ought be on the left, because we can talk about CONCEPTS
BEFORE *we even start talking about and get specific with numbers…for example sticking some grapes together with some more grapes…and then counting all the grapes…that's called addition, we didn't even talk about "how many" specifically yet. Same if we take our grapes and divide them up equally…key concept equally…that's called division, again we haven't even started talking about "how many"…or using a rectangle, just that we have some amount of something and are going to divide it up among the two of us…we have to know how many we have and how many we are going to be giving them to…which could lead to a discussion about dividend, divisor and quotient…and what those words mean… (assuming you're in a group of teachers--kids don't care) all before we've so much as picked up a block or started counting (assigning number) to anything.*

"No math concept is beyond the grasp of a child, if it is presented at the child's level." ~Jerry Mortensen

You want to build a ladder with many, many rungs of little successes. The more successes, the more positively the child feels about math and the higher the self esteem.

Break concepts down to their components.

Ideally, each rung is something the student discovers on their own. (Directed Discovery)

Which ladder would you rather climb?

Always Use a 3 Period Lesson

1. This is
2. What's this
3. Show me

1. Naming Period
2. Recognition & Association
3. Recall

I Do   We do   You do

Place Value   (Concept #1)

There are two parts to a number's name; the *"how many"* part and the *"what kind"* part.
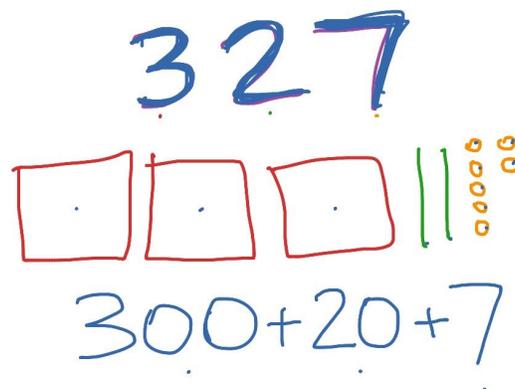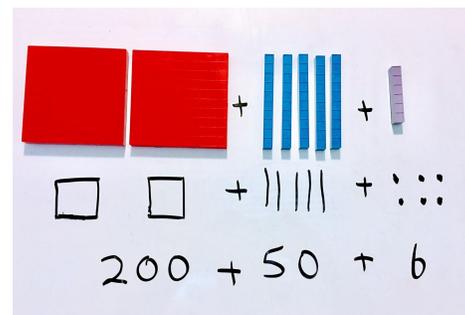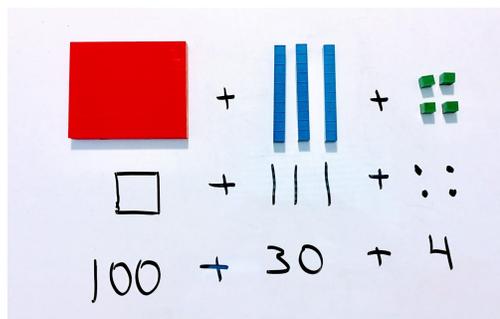
When we have more than 9 items, we start another column - the "tens" column - and we write down how many "tens" we have, followed by how many "ones" (also called "units").
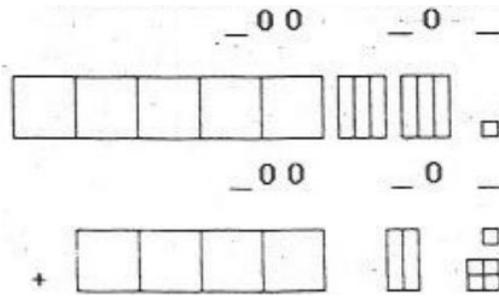
One thing that helps is when a student has finished building a problem, ask "how many hundreds," "how many tens," and "how many ones?"

Spend some time writing numbers in expanded notation to reinforce this.

http://www.showme.com/sh/?h=9V4aIFM

The Gospel According to Jerry Mortensen

https://annasmathpage.com/guide-to-mortensen-more-than-math-manipulatives-and-books/

"MORTENSEN MATH uses hands on tools which draw upon the senses. Students learn mathematics by seeing, touching and moving colorful blocks and tiles. This method has been instrumental in producing America's top mathematical students. The secret, in part, is that **children using this method grow up loving math**. There is never any fear of failure.

No mathematical concept is beyond one's grasp if it can be presented in visual, tactile form. **You will be amazed to discover how simple and obvious math concepts are** — concepts that you may have believed only a few could grasp. No one fails with Mortensen Math."

Mortensen more than Math Principles:

1. No mathematical concept is beyond the grasp of a child if the teacher is willing to present it on the plane of the child. Algebra and Trigonometry can be easily understood at the First-grade level.
2. Mathematics is a VISUAL form. Understanding math comes from the ability to SEE the concepts and not in working with abstract numbers and mechanical processes.

3. Math is HIGHLY SENSORIAL. Students must work the problems with their EYES and their HANDS before they move to the abstract.
4. Mathematics is a road travelled in small steps. Any successful program must lead the student through small increments of understanding, and have a built-in 'check for error' as well as a built-in system of rewards.
5. Careful repetition is the key to internalization of the math. Each new concept must be repeated thoroughly before moving on.
6. A successful math program must have a unifying element: A sense of conformity to a common idea. In the Mortensen Math system, every concept that is encountered is taught through the action of building rectangles, a simple and clear concept that bonds everything together.

The program design provides transitional bridges as the student moves from working with manipulatives. to drawing/interpreting sketches, to working with symbols, and finally to visualizing and thinking abstractly.

Mortensen Math is the power of simplicity in a concrete conceptual model that focuses on five areas or strands of mathematics,

1. Arithmetic
2. Algebra
3. Measurement
4. Problem Solving
5. Calculus

Citations:

Images on page one are from
http://www.crewtonramoneshouseofmath.com/mortensen-math.html

❖ Judith Townsend quotes are from
http://www.crewtonramoneshouseofmath.com/support-files/townsend-mortensen.pdf

Most of the text on page one and two, and ladder image on page four can be found here
http://www.crewtonramoneshouseofmath.com/concepts.html

*"What's the best way to do it? The way the student learns best." - Crewton Ramone

Black & White images on pages 3 & 6 are from Mortensen Math workbooks. Color images are personal photos.