# Math Makes Sense, and Math is Fun Doug Curry Coordinator for No Excuses Schools and Neighborhoods-Amarillo ISD Director for No Excuses Neighborhoods-NEU Network <u>doug@noexcusesu.com</u> Twitter: @FastLlama <u>www.fastllama.com</u> Available on www.noexcusesu.com: <u>How to Train a Llama—Exceptional Classroom</u> <u>Management</u>

## Math Makes Sense, and Math is Fun

Jaime Escalante once said, "Math does not have to be made easy. It is easy." How come so many students struggle with Math if this is true? There are so many of us who unknowingly use techniques that actually get in the way of helping our students to truly understand Math. In this session, which is designed for all grade levels, we will examine these types of errors and then explore techniques that will ultimately prove to be more effective. As well as being easy, Math should be fun! We will discuss ways to turn needed Math practice from drudgery into entertainment.

# Fun Practice-Math Study Cards

Any set of Math problems can be turned into study cards. This can be done electronically by simply cutting and pasting. Many Math databases offer the option of creating custom study card sets with answer keys. ACCES software can be purchased at <u>www.educaide.com</u>. This software has a study card (flash card) option.

## Study Card Configurations

- Since anyone can run a study card group, including students, as it just involves checking to see if students get problems correct, then one configuration is to put 4 small groups in the corners of the classroom, each group being run by a student helper. The teacher is free to be in the middle of the room to help any student who needs help.
- At Travis and San Jacinto, we used study cards for Saturday Schools in preparation for our state tests. We assigned students to groups run by teachers, assistants, or even students. At a central table, we placed all of our "experts", teachers well versed in the subject being practiced. Students are free to go to the experts as much as needed.
- Any time that you use study cards, be sure to keep score and have prizes of some sort!

#### How to Clone Yourself

Don't you wish that there were about 10 more of you available to help students master Math content, especially those building block concepts that are so vital? With today's technology, there is a way to do almost exactly that!

1. Make a set of videos of you providing in-depth instruction of each major concept. These do not have to be fancy! There are a number of ways to do this. If you do this with an Ipad, use the app: Explain Everything.

2. Does your district have a special server in which you can house these videos? If possible, could you link these to your campus website? If not, can they just be on a local server? Or, if need be, just burn them to an easily used CD.

3. When students just continue to fail to master a particular skill, now you have a "clone" of you that the student can reference. If you don't want to clone just you, then have students make similar videos so that you develop a large library.

Teach from Concrete to Abstract

You <u>owe</u> it to me to teach me Math so that I truly understand it. All Math is an abstract representation of something concrete. Therefore, it is imperative that I understand the concrete meaning behind the abstract representation.

Concrete \_\_\_\_\_ Semi-Concrete \_\_\_\_\_ Semi-Abstract \_\_\_\_\_ Abstract

As much as possible, if you can follow this progression as you teach, students will then be able to have a better grasp of what they learn.

The trick to going from concrete to abstract effectively is insuring that students can still refer back to the concrete even while working in the abstract. There is no perfect way to do this! Here is an example of how to progress through these steps while teaching a concept such as subtraction.

Example: You learn place value with manipulatives. This is the concrete level.



You do actual subtraction problems using real manipulatives. This is still the concrete level.



How do we transition through the four steps?



Next, we do a subtraction problem by pretending that we have the actual manipulatives. This is semiconcrete.



Next, on regular paper, we do a subtraction problem while still pretending we have the actual manipulatives. This is semi-abstract



Finally, on regular paper, we learn to work the problem. This is abstract. However, we don't ever want to forget the concrete example!





### Control Your Independent Practice

Don't let your curriculum control you! Control your curriculum. You know from day to day what your students need to practice on the most.

When practicing a new skill, certainly students need repetitions to learn the skill. However, every day students should be presented with "spiraling" practice. This is daily work that requires the students to use what has already been learned in continual new ways.

What if you could control the kind of practice that students get every day? It is worthless for students to do 30 of the same problems on a sheet when they could be continually reviewing what they have learned, and applying this learning in new situations.

If possible, choose your own problems to give each day. How?

Take your resources and cut, glue, file, and compile:



Create a spreadsheet and keep track of which types of problems you give each day:

	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Place Value-Reading Numbers	X		x		x		X
Comparing and Ordering Numbers		x		x	x	x	
Reading and Writing Decimal Numbers	x		x		x		x
Fractions-Part of a Whole		x		x		x	
Fractions-Part of a Group	x		x		x		x
Mixed Numbers and Improper Fractions		x		x		x	
Equivalent Fractions	X		X		×		×
Reducing Fractions		X		х		X	
PROBLEM SOLVING	х	х	х	х	Х	х	x

Problem Solving

The purpose of Math is to solve problems. Over 80% of your state test will be problem solving. Therefore, you must practice problem solving every day.

However, avoid tricks such as code words or key words! Students must learn to visualize problems. Problems on paper are simply real-life problems that just happen to be written in words.



Maximize your class period:



What Do Great Math Teachers Do?

- 1. They teach for meaning and understanding.
  - No tricks-Tricks are to be taught only when students completely understand

Meaning Test

Question #1: Does it teach Math with meaning?

Question #2: Is it simply a trick or practice that actually prevents students from learning Math with meaning?

Question #3: Does the trick or practice assume that the students can't actually learn the concept?

Question #4: Is it a trick or practice that actually keeps the student from reading and visualizing the problem?

- 2. Great Math teachers teach problem solving every day.
- 3. Great Math teachers insure that students master the fundamentals of Math.
- 4. Great Math teachers understand that each concept must be taught in a concrete manner, but ultimately tested abstractly.
- 5. Great Math teachers teach for mastery. They use an "exceptional system" to know where each student is academically at all times.
- 6. Great Math teachers recognize the need for outstanding lessons every day in introducing new concepts.
- 7. Great Math teachers provide adequate guided practice.
- 8. Great Math teachers choose independent practice wisely; they recognize the need for spiraling practice.
- 9. Great Math teachers use open ended problems as often as possible.
- 10. Great Math teachers assess frequently.
- 11. Great Math teachers believe in their kids, but they also believe in their ability to influence, persuade, and ultimately help their kids be successful.
- 12. Great Math teachers are fearless!

### Math Rocks Examples

1<sup>st</sup> Grade Example:

 In Beantown Dog School, 2 dogs were sent to Mrs. Radish because they would not stop barking. Mrs. Radish put them in the Trouble Room for 5 days. The first day was Thursday. What will their last day in the Trouble Room be? Dogs do not go to school on the weekend.

# 5<sup>th</sup> Grade Example:

 Jake decided to hold his breath to see if he could get his own way. He began holding his breath on a Monday. He finished holding his breath on the 133<sup>rd</sup> day. On the 133<sup>rd</sup> day, his class wanted to give him a special award for his accomplishment. If the Monday he started was the first day, was the 133<sup>rd</sup> day on a school day or a weekend?

If there are resources you need, feel free to email me at doug@noexcusesu.com.

## Doug Curry Consulting

**Doug Curry** has 37 years in education, with the majority of those years being in schools with high numbers of students living in poverty. His experience ranges from teaching 4<sup>th</sup> grade, working with curriculum, and serving in principal roles in elementary, middle school, and alternative schools. Doug now serves as the Coordinator for No Excuses schools in Amarillo, Texas. Amarillo is known as the "epicenter" of the No Excuses movement as there are currently 22 Amarillo NEU schools, including Amarillo College, the first NEU college, the first NEU church, and the first NEU preschool. San Jacinto Elementary School, where Doug served as principal for 6 years, was the first NEU in Texas. The NEU movement in Amarillo has grown to the point where there now exists "No Excuses Neighborhoods", where entire families are persuaded to further their educations and ultimately achieve living-wage careers. Over 100 adults in these neighborhoods have earned a GED by working inside of Amarillo NEU schools. The No Limits/No Excuses movement in Amarillo is comprised of 41 community partners representing businesses, local colleges, community agencies, and individuals. While working with Amarillo schools and the No Limits, No Excuses program, Doug also presents locally, statewide, and nationally, particularly in the area of transforming school cultures. He also presents full day staff development sessions in Successful Classroom Management, Parent Involvement and Creating No Excuses Neighborhoods, and Teaching Math with Meaning. His first book, How to Train a Llama-Exceptional Classroom Management, is now available at www.noexcusesu.com. Check out Doug at www.fastllama.com !