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NCELA
National Clearinghouse for English Language Acquisition and Language Instruction Educational Programs

presents

What Teachers Need to Know to Assist ELLs in Math

Anita Bright, Ph.D., Fairfax County Public Schools, VA

and

Ms. Alexandra Dominguez, Region 20, TX

NCELA is operated under contract ED-04-CO-0094/0002 from the US Department of Education to The George Washington University. Our mission is to provide technical assistance information to state education agencies, local education agencies, and others regarding the education of English language learners.

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Welcome

- Welcome to the second Webinar of the school year on “What Teachers Need to Know to Assist ELLs in Math.” Today’s webinar is hosted by the National Clearinghouse for English Language Acquisition, NCELA, located at the Graduate School of Education and Human Development at The George Washington University, funded through a contract with the U.S. Department of Education's Office of English Language Acquisition.

- NCELA's mission is to provide technical assistance information to state and local educational agencies on issues pertaining to English language learners.

- My name is Kathia Flemens, Ph.D., a Research Associate at NCELA and your Webinar facilitator.

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Today our presenters are:

- Anita Bright, Ph.D., is the Secondary ESOL Mathematics Instructional Support Teacher in the FASTMath program at Fairfax County Public Schools in Virginia. Dr. Bright works with approximately 100 secondary teachers in about 60 schools in the region of Northern Virginia. Dr. Bright will be presenting an overview of the FASTMath program.

- Ms. Alex Dominguez is an Educational Specialist and member of the Mathematics Achievement = Success (MAS) Content Advisory Team. She works directly with Region 20 districts in Texas implementing MAS in the summer and will also present an overview of her program.

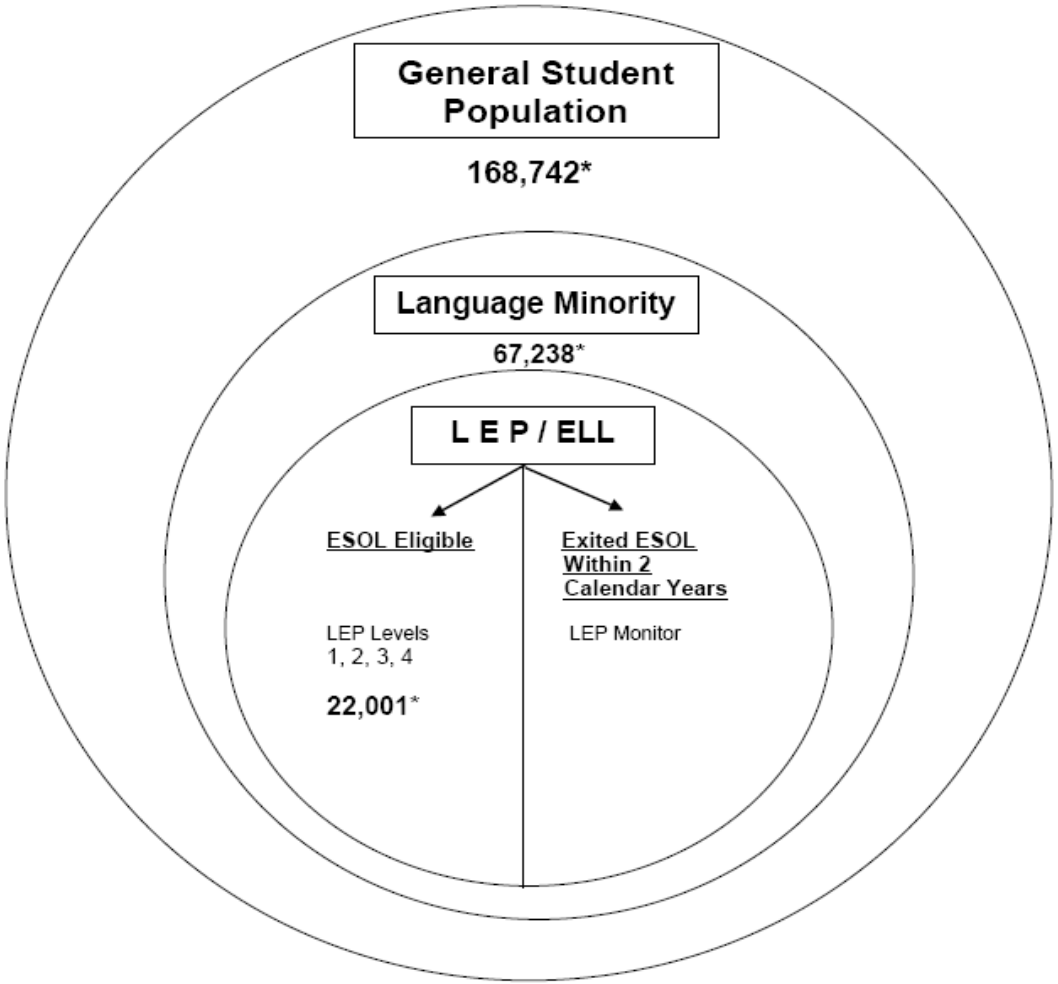
FAST Math
in Fairfax County Public Schools, Virginia

- **F**ocus on
- **A**chieving
- **S**tandards in
- **T**eaching
- **Math**ematics

What is FAST Math?

- Mathematics program for certain ELLs
- Includes a dual focus on English language acquisition ***and*** mathematics
- Tailored to unique needs of each learner

The context of Fairfax County Public Schools



Our FAST Math students

- Enrolled in grades 7 – 12
- Beginning level of English language proficiency
- At least two years below grade level in mathematics

All newly arriving Language Minority students are assessed with the

Entry
Assessment
Mathematics
Evaluation

(called the "EAME")

The EAME

- Administered in heritage language if available

(we have approximately 35 translations)

- Covers mathematics content from grades 1 through 8

- Based on Virginia state standards

If students qualify, they are scheduled for FAST Math

- Designed to be taught by *either* a mathematics or an ESOL certified teacher

The big ideas

- Goal is to prepare students for Algebra as quickly as possible
- Includes a dual focus on ENGLISH and MATHEMATICS
- Interactive and manipulative-based

Everything is aligned to the Virginia Grade 7 Mathematics Standards of Learning

Middle School FAST Math Year at a Glance			
Quarter 1			
Topic	*SOLs*		*Big ideas*
	All students	*Gr. 8 only*	
Statistics 3 weeks	7.16		Measures of central tendency, frequency distributions, histograms, line plots, scatter plots, box-and-whisker plots, stem-and-leaf plots
	7.17		
	7.18		
Integers 3 weeks	7.5		Addition, subtraction, multiplication, division, application problems
Number Systems and Properties 1 week	7.3		Properties of real numbers: commutative, associative, additive and multiplicative identity, additive and multiplicative inverse, multiplicative property of zero, distributive
		8.2	*Real number system (natural, whole, integers, rational, irrational)*
Quarter 2			

All students are working
TOWARDS
the Grade Level Standard

But… students in FAST Math are missing foundational skills

Quarter

Quarter 1

Standard	**MTH.G7.16** **SOLVE PROBLEMS INVOLVING MEASURES OF CENTRAL TENDENCY AND RANGE**
Benchmarks	MTH.G7.16.a Solve Problems Involving Measures of Central Tendency and Range MTH.G7.16.b Analyze Data for Patterns and Trends
Indicators	MTH.G7.16.a 1 Examine the range to understand the spread or dispersion of the data MTH.G7.16.a.2 Describe the three measures of central tendency (mean/median/mode) MTH.G7.16.a.3 Solve problems by finding the mean of a set of data MTH.G7.16.a.4 Solve problems by finding the median of a set of data MTH.G7.16.a.5 Solve problems by finding the mode of a set of data MTH.G7.16.a.6 Identify the mode in a set of data MTH.G7.16.a.7 Solve problems by finding the range of a set of data MTH.G7.16.a.8 Solve problems for which the mode is the best descriptor MTH.G7.16.a.9 Solve problems for which the median is the best descriptor MTH.G7.16.a .10 Solve problems for which the mean is the best descriptor MTH.G7.16.b.1 Determine values for extremes, quartiles, and ranges of data sets

Info from Virginia Dept of Ed

All the standards you may teach

Prerequisite/ Foundational Skills	6.4	Compare and order whole numbers, fractions and decimals
	6.19	Describe mean, median, mode and range and determine their meaning
	5.3	Create and solve problems involving operations with whole numbers
	5.5	Find the quotient and remainder
	5.19	Find the mean, median, mode, and range of a set of data
	4.7	Find the product of two whole numbers
	4.8	Estimate and find the quotient of two whole-numbers
	4.20	Collect, organize, display and interpret data
	3.1	Read/write six-digit numerals and identify place value for each digit
	3.8	Solve problems involving the sum or difference of two whole numbers
	3.9	Recall the multiplication and division facts through the nines table
	3.10	Represent multiplication and division and solve multiplication problems
	2.1	Read/write/identify place value of each digit in a three-digit numeral
	2.3	Count an ordered set of objects, using the ordinal number words *first* through *twentieth*.
	2.6	Recall basic addition facts and the corresponding subtraction facts
	2.7	Estimate and find the sum of 2 whole numbers (each 99 or less)
	2.8	Estimate and find the difference of 2 whole numbers (each 99 or less)
	2.10	Given a simple addition/subtraction fact, recognize related facts
	1.1	Count between 1 and 100 objects and write the corresponding numeral
	1.2	Develop understanding of place value by grouping objects
	1.8	Recall basic addition facts to 10 and corresponding subtraction facts
	1.19	Interpret information displayed in a picture or object graph

Essential Understandings
All students should:

- Understand and appropriately use measures of central tendency for a data set.
- Understand that range indicates how data is spread out or dispersed.

FAST Math lessons

- 6.5, 6.6
- 5.3
- 4.2
- 3.1, 3.8, 3.9, 3.10
- 2.1, 2.6, 2.7
- 1.1

State notes:
1. Measures of central tendency are types of averages for a data set. They represent numbers that describe a data set. Mean, median, and mode are measures of central tendency that are useful for describing the average for different situations.
2. Mean works well for sets of data with no very high or low numbers.
3. Median is a good choice when data sets have a couple of values much higher or lower than most of th others.
4. Mode is a good descriptor to use when the set of data has some identical values.
5. The mean of a set of numbers is the sum of the set of numbers divided by the number of numbers set.
6. The median is the middle number of a set of data when the numbers are arranged from least to greate the mean of the two middle numbers when the set has two middle numbers.
7. The mode is the number that appears most frequently in a set of data. There may be one, more than one, or no mode.
8. The range is the difference between the greatest number and the least number in a set of data.
9. Range indicates how data is spread out or dispersed.
10. For any given problem situation involving a set of data, the analysis is likely to include examination of measures of central tendency and dispersion of this data.

Essential New Mathematics Vocabulary:
Data, mean, median, mode, range, measure of central tendency, line plot, frequency distribution, histogram, interval, stem-and-leaf, box-and-whisker plot, lower extreme, lower (1st) quartile, upper (3rd) quartile, upper extreme, interquartile range, outlier, scatterplot (scattergram)

Essential English Vocabulary:
Solve, add, count, divide, compare, order, first, last, greatest, smallest, least, value

Big ideas of the standard

FAST Math lessons that work towards this standard

Explanation of this standard (answers the question, "What is this content?)

Language you will need to teach

But what should be taught?

We created pre-assessments for each Grade 7 standard

1. Using the following set of data 11, 13, 1, 3, 21, 33, 22, 10, 20 Count the numbers. How many? _____ *1.1*	2. 41 + 51 + 17 = _____ *3.8*
3. $3\overline{)348}$ _____ *4.8*	4. What is the median (middle number)? 17, 21, 22, 30, 35 _____ *5.19*

SOL 1.1: **Count, read, represent numbers with place value materials, group, regroup numbers to 100.**

Vocabulary

eleven, twelve, thirteen
fourteen, fifteen, sixteen
seventeen, eighteen, nineteen
twenty, thirty, forty, fifty, sixty
seventy, eighty, ninety
one hundred
group
regroup
unit
rod
flat
column

Materials

wall-mounted Number Line 1-100
base 10 blocks (3 rods and 25 units)
chart paper
Tens Number Cards
labeled 1 ten to 10 tens (teacher-made)
cubes, counters or other small objects

Student Copies:

- Hundreds Board
- Numbers 10-20
- Place Value Board
- Place Value Recording Sheet
- Matching Activity
- Matching Numbers with Words (A)
- Matching Numbers with Words (B)

Language Foundation

1. The new vocabulary will be introduced using manipulatives in steps 1-3 in the math component. A daily review of numbers and number words would facilitate students' use of these terms.

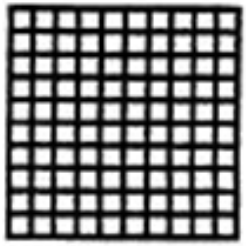
2. The number 13 and 30 are "close confusers," as are the other pairs such as 14 and 40, 15 and 50, etc. At the beginning, students have difficulty **hearing** the difference in the two words and making the distinction. Take time to pronounce them distinctly and write them as you say them to help students build the ability to hear the difference. This is a listening skill that may take more than a year to develop.

3. Throughout the year as you work with the base ten blocks, you will need to decide if you will call the small cube a "one" or a "unit." Either is fine, but at the beginning be consistent when you name them for the student and when you refer to them. The same applies for the "rod" or "ten" and the "hundred" or "flat."

4. As the students work in pairs on these activities, encourage them to talk in order to build math language. Encourage the use of English, especially with you, but do not discourage the use of first language.

Mathematics Component

Warmup: Since this may be the students' first experience using base ten blocks, provide some time for them to explore with the manipulatives before starting the lesson. After they have had time to explore, introduce the names of each of the base ten blocks (unit, rod, and flat). Put a **flat**, a **rod**, and a **unit** on the overhead and lead the students to notice that a **rod** is equal to 10 **units** and a **flat** is equal to 10 **rods**. (Some students may discover the relationship among the blocks on their own.)



flat (100)

rod (10)

unit (1)

1. Give each student a Hundreds Board (TR) and a bag of base ten blocks. Put up the Hundreds Board transparency. Ask students to put a unit on the number 1 as you model and say, "**one.**" Continue placing units on each number through 10, counting out loud as students do the same. Remove the units from the hundreds board and put a rod next to the number 10 and have students do the same as you say, "a rod is equal to 10 units."

2. Put the Tens Number Cards **in numerical order** on the chalkboard tray. Write the number 10 on the blackboard above the card labeled 1 ten. Repeat this procedure with the remaining cards naming and writing the corresponding number above each card. (10, 20, 30...) Introduce the word names for each card, writing these above the numbers on the board. (**ten, twenty, thirty...**) Have the students count by 10s as you point to each number and show the appropriate number of rods. Ask students to work with a partner to count by 10s to 100 as they point to the numbers on the hundreds boards.

Questions?

Education Service Center, Region 20

Working Together to Make Mathematics Achievement = Success (MAS)

What is MAS?

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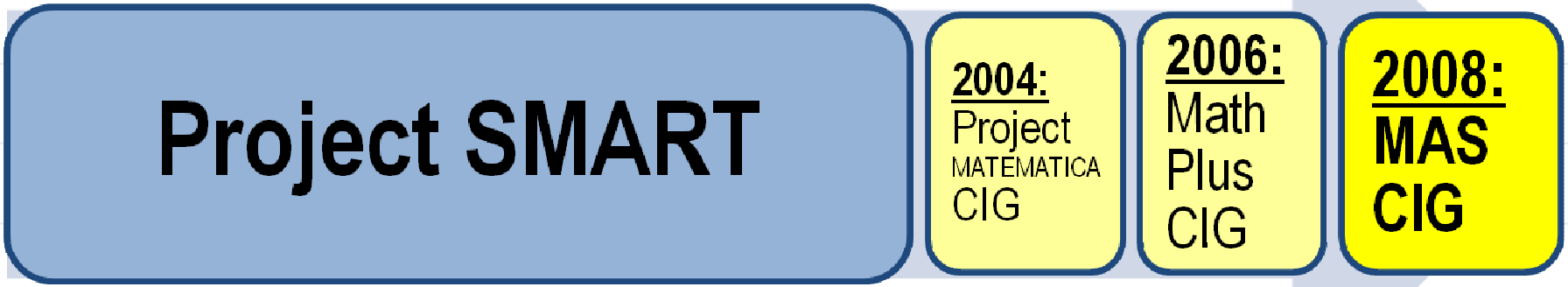
Project SMART and MAS



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MAS Consortium States

Texas, Lead State

Arkansas

Illinois

Montana

New York

Wisconsin

Missouri

Colorado

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Goal

- The goal of MAS is to ***increase migrant student achievement in mathematics through a multi-state consortium that provides high quality K -12 curriculum, instruction, assessment, innovative uses of technology, professional development, and parent involvement through interstate and intrastate collaboration.***

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A majority of our migrant students are English Language Learners.

An approach to learning mathematics that incorporates techniques shared in common by Balanced Literacy, Sheltered Instruction and Cognitively Guided Instruction

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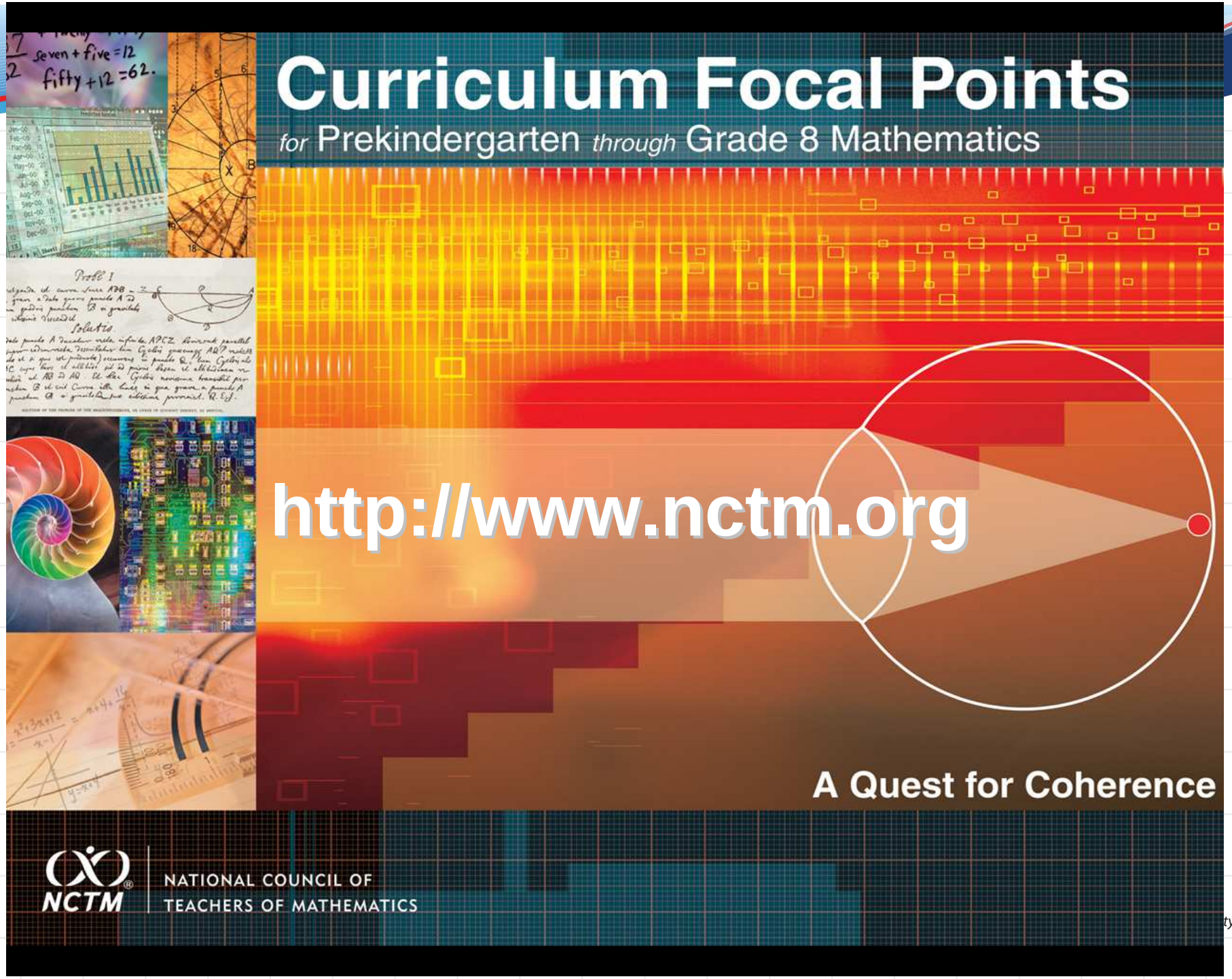
Curriculum Focal Points
for Prekindergarten through Grade 8 Mathematics
http://www.nctm.org
A Quest for Coherence
NCTM
NATIONAL COUNCIL OF
TEACHERS OF MATHEMATICS

Foundations for Success

National Mathematics Advisory Panel

Final Report, March 2008

www.ed.gov/**MathPanel**

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Core Principles of Math Instruction

- Streamline the mathematics curriculum in grades PreK-8
- Emphasize a well defined set of the most critical in the early grades

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- **Focus on the Critical Foundations for Algebra**
  - **Proficiency with Whole Numbers**
  - **Proficiency with Fractions**
  - **Particular Aspects of Geometry and Measurement**

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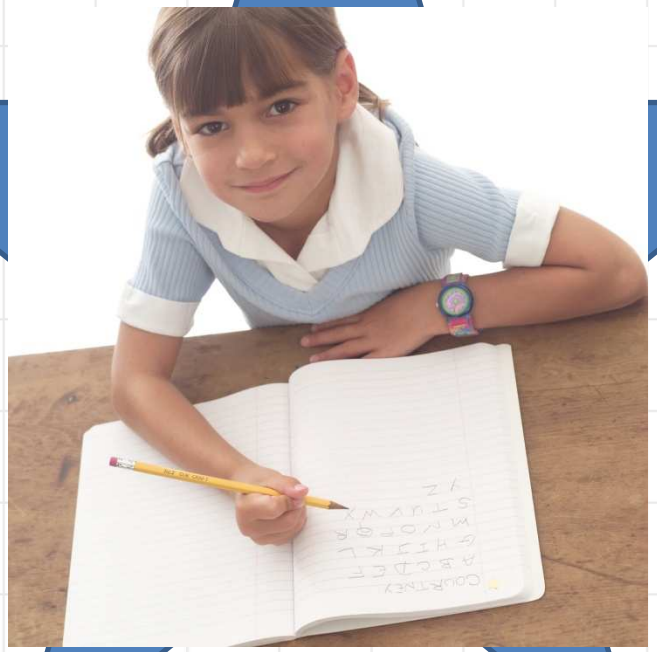
Five Dimensions of Mathematical Proficiency

Conceptual Understanding

Procedural Fluency

Strategic Competency



Productive Disposition

Adaptive Reasoning

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Curriculum Components

- Sheltered Instruction
- Balanced Literacy
- Cognitively Guided Instruction

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What is Sheltered Instruction

- A research-based approach to lesson planning which has proven effective with English Language Learners (ELLs) throughout the United States
- A lesson delivery system that allows teachers to deliver lessons that…
  - incorporate strategies consistently
  - considers the unique academic needs of students learning English
  - allows students to learn English while acquiring grade level content
  - assist students as they develop language skills (listening, speaking, reading, writing)

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Sheltered instruction Components

- Lesson Preparation
- Building Background
- Comprehensible Input
- Strategies
- Interaction
- Practice/Application
- Lesson Delivery
- Review Assessment

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Cognitively Guided Instruction

- Children enter school with a great deal of informal or intuitive knowledge of mathematics
- Without formal or direct instruction children can construct viable solutions to a variety of problems

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Balanced Literacy

- No longer “whole language v. phonics”
- No longer “child-centered v. curriculum-centered”

“Balance requires teachers to choose from numerous instructional strategies to provide a balance that is appropriate for each child.”

David Denton, 1999

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What is balanced literacy?

A balanced approach to literacy development is a decision-making approach through which the teacher makes thoughtful choices each day about the best way to help each child become a better reader and writer … it is an approach that requires and frees a teacher to be a reflective decision maker and to fine tune and modify what he or she is doing each day in order to meet the needs of each child.

Dixie Lee Spiegel, October 1998

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MAS: Balanced Literacy Extensions

- What was considered
  - Before, during, after
  - Reading, writing, listening, speaking, thinking
  - Five components of literacy
  - Flexible grouping
  - Components of Balanced literacy
  - 6 + 1 traits of writing
- What is included
  - Ideas for promoting comprehension
  - Teaching points for mini-lessons with small groups
  - Vocabulary to consider
  - Literacy extension activities
  - Opportunities for writing

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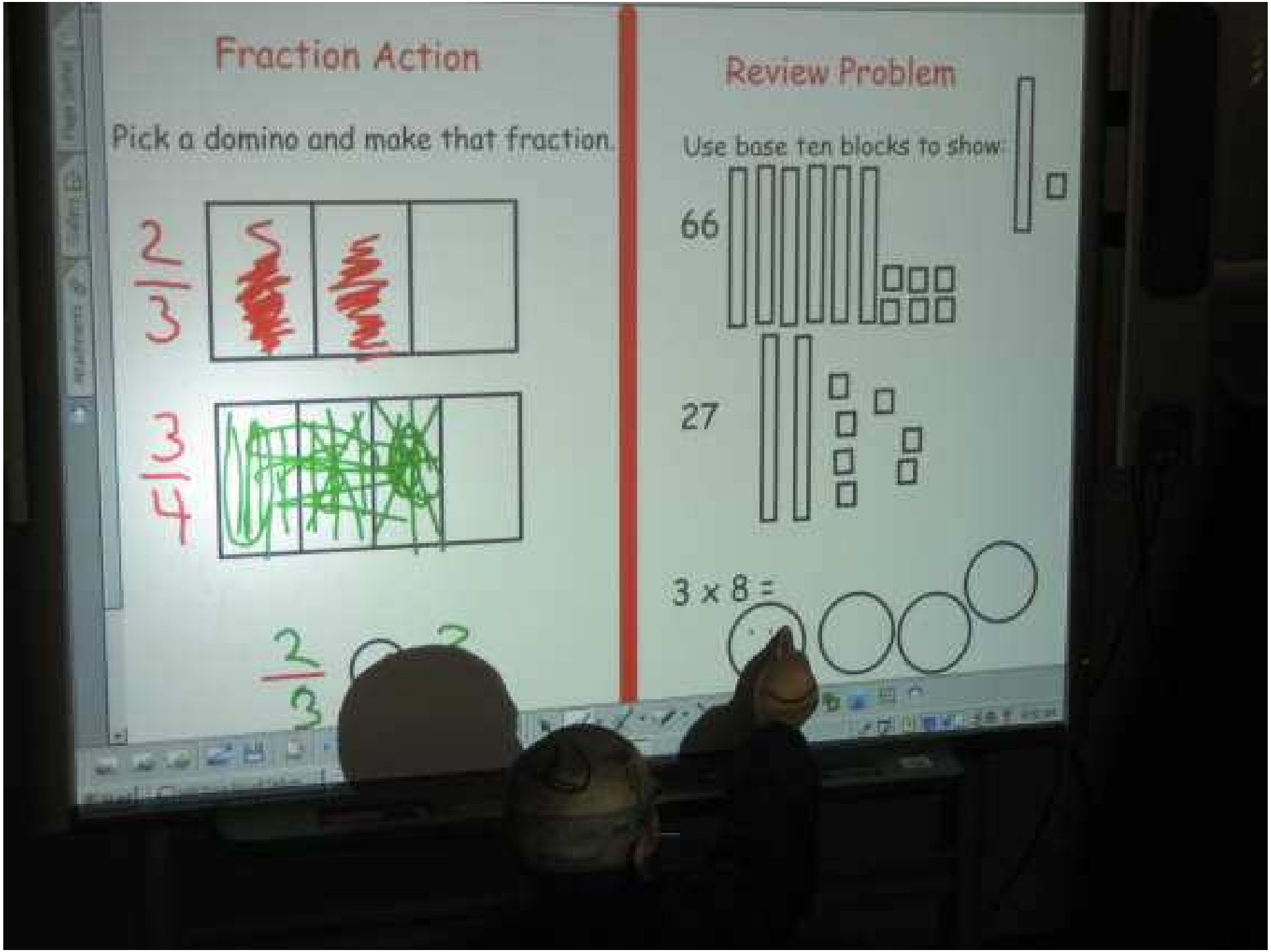
Daily Routine


Fraction Action
Pick a domino and make that fraction.
1/2
1/3
Review Problem
Use base ten blocks to show:
66
27
3 x 8 =

Today is:
July
Measurement
Fraction Action
Graphing
Our Favorite Food

Course: MAS Space K-1 Student Portal - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://moodle.esc20.net/course/view.php?id=71

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MAS Space K-1 Student Portal

You are logged in as Admin User (Logout)

People
- Participants

Administration
- Turn editing on
- Settings
- Assign roles
- Grades
- Outcomes
- Groups
- Backup
- Restore
- Import
- Reset
- Reports

Topic outline

Welcome to MAS Space!
¡Bienvenidos a MAS Space!

Hola, amigos. My name is Osito MAS. We are going to practice lots of math this summer.If you have a question for me, click on

Latest News

Add a new topic...

9 Jul, 13:06
Roxanna Bazaldua
Missoula sees math everyday! more...

18 Jun, 22:11
Roxanna Bazaldua
Ositos Home Videos coming soon! more...

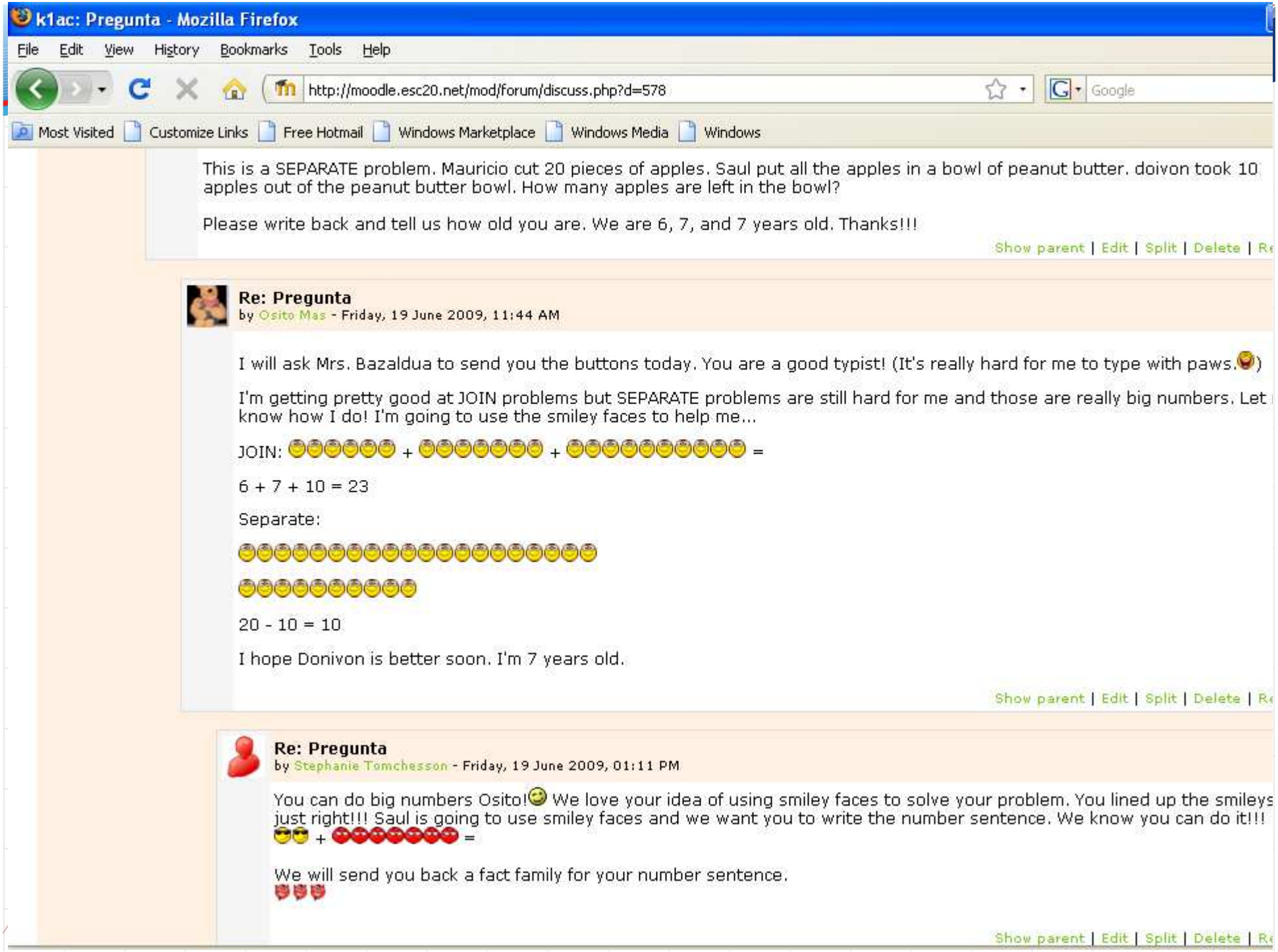
15 Jun, 17:39
Roxanna Bazaldua
Osito wants to get to know you! more...

29 May, 15:40
Admin User
Questions about MAS Space? more...

Older topics ...

Done

start | 2 Novell Group... | OME | Microsoft PowerP... | Course: MAS Spa... | Links | 1:11 PM


k1ac: Pregunta - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://moodle.esc20.net/mod/forum/discuss.php?d=578
Google
Most Visited Customize Links Free Hotmail Windows Marketplace Windows Media Windows
This is a SEPARATE problem. Mauricio cut 20 pieces of apples. Saul put all the apples in a bowl of peanut butter. doivon took 10 apples out of the peanut butter bowl. How many apples are left in the bowl?
Please write back and tell us how old you are. We are 6, 7, and 7 years old. Thanks!!!
Show parent | Edit | Split | Delete | Re
Re: Pregunta
by Osito Mas - Friday, 19 June 2009, 11:44 AM
I will ask Mrs. Bazaldua to send you the buttons today. You are a good typist! (It's really hard for me to type with paws.)
I'm getting pretty good at JOIN problems but SEPARATE problems are still hard for me and those are really big numbers. Let
know how I do! I'm going to use the smiley faces to help me...
JOIN: + + =
6 + 7 + 10 = 23
Separate:
20 - 10 = 10
I hope Donivon is better soon. I'm 7 years old.
Show parent | Edit | Split | Delete | Re
Re: Pregunta
by Stephanie Tomchesson - Friday, 19 June 2009, 01:11 PM
You can do big numbers Osito! We love your idea of using smiley faces to solve your problem. You lined up the smileys
just right!!! Saul is going to use smiley faces and we want you to write the number sentence. We know you can do it!!!
+ =
We will send you back a fact family for your number sentence.
Show parent | Edit | Split | Delete | Re

k1ac: Literature Corner/Rincon Literario - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://moodle.esc20.net/mod/forum/view.php?id=3352

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Update this Forum

This forum allows everyone to choose whether to subscribe or

Force everyone to be subscri

Show/edit current subscri

Unsubscribe from this fo

Have you ever been to an apple orchard or a farm? What was it like? Was it like the story Apple Farmer Annie?

¿Has visitado un manzanar alguna vez? ¿Cómo fue? ¿Se pareció al manzanar del cuento?

Add a new discussion topic

Discussion	Started by	Replies	Last post
Apples	Admin User	2	Dato Mas Wed, 3 Jun 2009, 02:36 PM

Course: MAS Space 4th-5th Student Portal - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://moodle.esc20.net/course/view.php?id=73

Most Visited Customize Links Free Hotmail Windows Marketplace Windows Media Windows

3

Unit 3

Let's train hard for math!

- Math Maniac Puzzle of the Week
- Unit 3 Challenge
- Literature Corner
- Technology Links Unit 3

Exercise Your Brain!

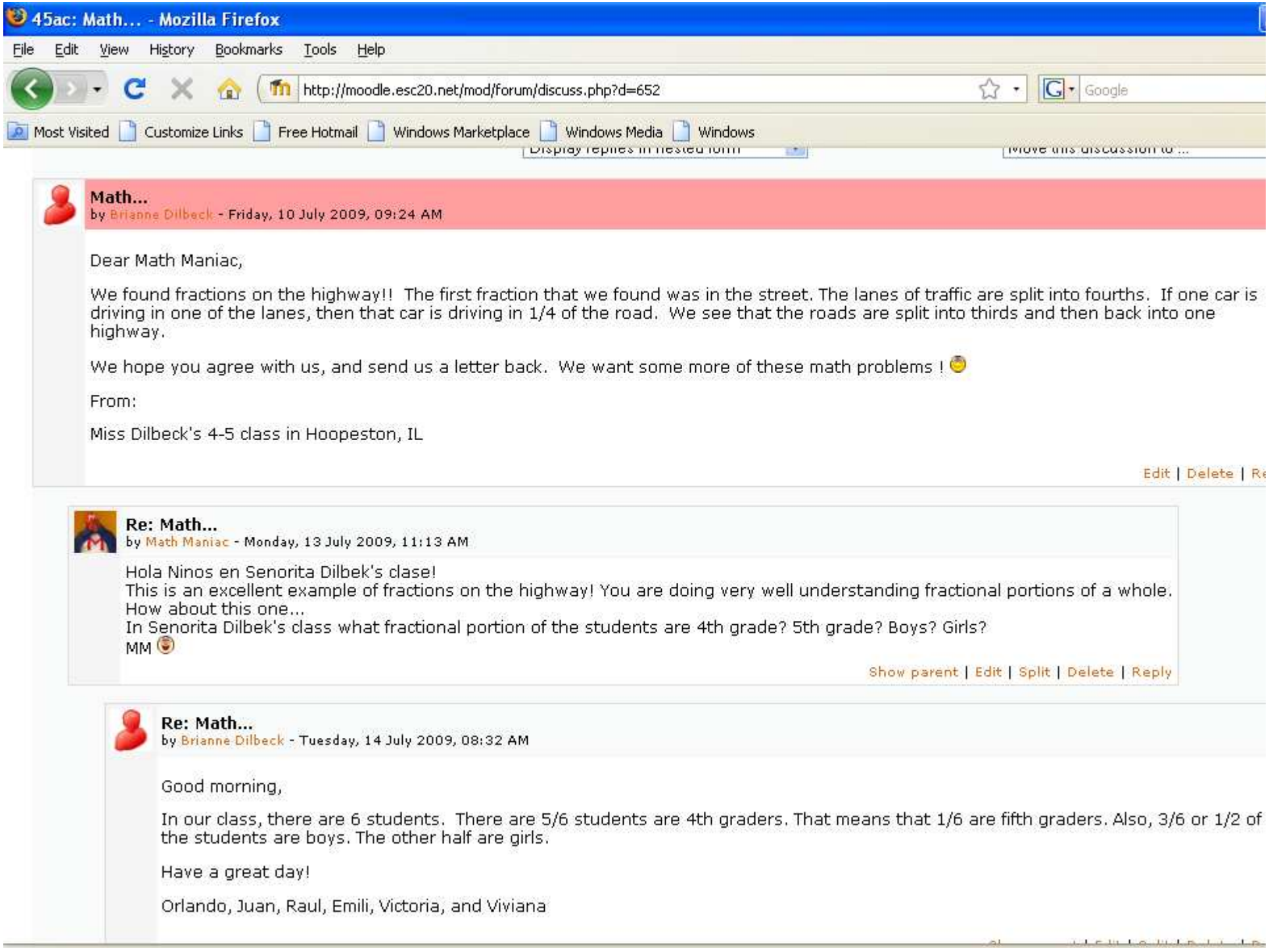
Watch as Math Maniac measures a wrestling ring:
Measuring Wrestling Ring

- MM's Wrestling Ring Measurement Blog
- MAS Vocabulary

4

Unit 4

Take me out to the ballpark, let me practice some math!


45ac: Math... - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://moodle.esc20.net/mod/forum/discuss.php?d=652
Google
Most Visited Customize Links Free Hotmail Windows Marketplace Windows Media Windows
Math...
by Brianne Dilbeck - Friday, 10 July 2009, 09:24 AM
Dear Math Maniac,
We found fractions on the highway!! The first fraction that we found was in the street. The lanes of traffic are split into fourths. If one car is driving in one of the lanes, then that car is driving in 1/4 of the road. We see that the roads are split into thirds and then back into one highway.
We hope you agree with us, and send us a letter back. We want some more of these math problems !
From:
Miss Dilbeck's 4-5 class in Hoopeston, IL
Edit | Delete | Re
Re: Math...
by Math Maniac - Monday, 13 July 2009, 11:13 AM
Hola Ninos en Senorita Dilbek's clase!
This is an excellent example of fractions on the highway! You are doing very well understanding fractional portions of a whole.
How about this one...
In Senorita Dilbek's class what fractional portion of the students are 4th grade? 5th grade? Boys? Girls?
MM
Show parent | Edit | Split | Delete | Reply
Re: Math...
by Brianne Dilbeck - Tuesday, 14 July 2009, 08:32 AM
Good morning,
In our class, there are 6 students. There are 5/6 students are 4th graders. That means that 1/6 are fifth graders. Also, 3/6 or 1/2 of the students are boys. The other half are girls.
Have a great day!
Orlando, Juan, Raul, Emili, Victoria, and Viviana

urse: MAS Space Grade 4-5 Teacher Portal - Mozilla Firefox

Edit View History Bookmarks Tools Help

http://moodle.esc20.net/course/view.php?id=81

Google

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you want Firefox to remember this password? Remember Never for This Site Not Now

ministration

Turn editing on
Settings
Assign roles
Grades
comes
Groups
Backup
Restore
Import
Reset
Reports
Questions
Files
Profile

urse categories

Staff Development
Miscellaneous
TOPP Courses
Transfer Courses
Main Courses for Cloning
K-12 Databases
Training
Training with Moodle
Science Framework
Math Framework
Head Start

- Posting to a Blog
- Internal E-mail
- Using Chat

I'm Cassie Boatwright, the television teacher for grades 4-5. We've been busy with the televised classes and have incorporated some exciting changes this year, including our new helper Math Maniac!

Please encourage your students to participate in student online community. It will give them an opportunity to interact with me, Math Maniac and other MAS students around the country. I hope you will enjoy our teacher online community, as well. You'll find all of the technology links, parent videos, and discussion questions as well as anything else you'd like to add.

If you have any questions or suggestions, please email me. Click on the "Compose" link in the Email list block to the right. Choose my name from the list of contacts and click "To" next to my name. For more detailed instructions, watch the short video at the top of the page.You may also leave a message for me at 1-866-231-5049. Please leave your telephone number and a good time to reach you and I'll call you back as soon as possible. See you in class!

News forum
TOT Video Training
TOT Training Video for Mobile Devices
Teacher Chat
Daily Routine Links

There are no new messages

Inbox
Compose

Calendar

◄ October 2009 ►

Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

Events Key

Global Course
Group User

Messages

No messages waiting

Messages...

MAS Online

- Mathematical Thinking (New!)
- Balanced Literacy
- Sheltered Instruction
- Cognitively Guided Instruction

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Resources

- **Math Plus and MATEMATICA, visit MERC website at: http://mercweb.org**
- **More Information regarding MAS visit http://projectsmart.esc20.net/**

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Questions?

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National Clearinghouse for English Language Acquisition and Language Instruction Educational Programs

Thank you

Thank you for having participated in today's webinar on "What Teachers Need to Know to Assist ELLs in Math" presented by Anita Bright, Ph.D., and Ms. Alexandra Dominguez; hosted by National Clearinghouse for English Language Acquisition, NCELA, located at the Graduate School of Education and Human Development at The George Washington University.

- For more information or if you have additional questions contact:
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