Welcome to the eighth annual UCLA Mathematics Department’s Philip C. Curtis Jr. Center for Mathematics and Teaching Conference! The conference will focus on preparing teachers to teach Common Core and is composed of two plenary sessions and two sets of breakout sessions. This year’s plenary session speakers are Common Core primary author, Dr. Phil Daro, and Lydia Stack, Consultant with the Council of Chief State School Officers. In addition, an outstanding group of mathematics educators, teachers, and mathematicians have agreed to present in the breakout sessions. We believe the day will be thought provoking and worthwhile for any member of the mathematics education community!

The Curtis Center

The Curtis Center is a place where mathematicians and teachers work together to develop and support high quality mathematics programs that interface with the K-16 community. Our programs include outreach for K-12 students, professional development for K-12 teachers and mathematics teacher preparation programs for UCLA undergraduates.

The UCLA site of the Mathematics Diagnostic Testing Project (MDTP)

MDTP is a joint CSU/UC project that develops diagnostic tests that measure student readiness for courses from prealgebra to calculus. MDTP’s 10 regional sites make these tests and associated written response items available to California teachers free of charge. These sites score tests, provide diagnostic test result reports, and offer assistance to teachers regarding the interpretation of test results and their use as part of formative assessment in their classes. These reports help teachers and students focus on topics, skills, and understanding that can increase the chances of students succeeding in learning collegiate mathematics. The UCLA site serves Los Angeles and Ventura counties.

UCLA CalTeach-Math

UCLA CalTeach-Math is an undergraduate program that aims to graduate high quality, CA credential program-ready mathematics teacher candidates. The program prepares undergraduates for careers in teaching mathematics through early field experiences, coursework focused on the mathematical and pedagogical knowledge necessary for teaching secondary school mathematics, career guidance, professional networking activities, and a number of scholarships.

www.curtiscenter.math.ucla.edu  twitter.com/uclacurtisctr
AM Plenary Session 9:00 – 10:15 am

Lydia Stack
Council of Chief State School Officers & Stanford University

CCSSO Guidelines for Teaching Common Core to ELS

MOORE HALL 100 (MAX 419)

The Common Core State Standards spell out sophisticated language competencies. These include constructing effective arguments to support conclusions, constructing and testing models and predictions, and strategically choosing and efficiently implementing procedures to solve problems. They also implicitly demand students acquire an ever-increasing command of language. As a result, teachers must determine what supports need to be put in place to provide ELLs with the help they need to access grade-level content while building their language proficiency.

The Council of Chief State School Officers (which collaborated with the National Governor's Association to create the Common Core) has developed the English Language Proficiency Development Framework corresponding to the Common Core State Standards which outlines the underlying English language practices found in the CCSS and communicates the language that all ELLs must acquire in order to successfully engage the CCSS. In this session, Lydia Stack, from the CCSSO shares the Framework with us, and discusses how we as mathematics teachers can help our large EL Southern California population succeed with the increased language demands of the Common Core Mathematics Standards.

AM Breakout Session 10:25 – 11:40 am

LEVEL: GENERAL

Michelle Sidwell
The Curtis Center

Utilizing The Curtis Center Common Core Mapping Website for Professional Development

MS 5127 (MAX 40)

The Curtis Center has prepared an interactive website map that visually displays prerequisite relationships between all K-12 Common Core Math Standards. The map also allows the user to focus in one content standard to investigate the standards in previous grades that build toward it, and the standards in subsequent grades that depend on it. In addition, it shows an overlay of the math practices onto the content standards and where key definitions given in the CCSS-M appear. In this session, we investigate how this resource can be used by teacher leaders to provide meaningful professional development.

Bruce Arnold
Mathematics Diagnostic Testing Project & University of California, San Diego

Preparing Students for State Assessments: Cautions and Suggestions

MS 5137 (MAX 42)

The 2011 NRC report, "Incentives and Test-Based Accountability in Education", highlighted the limitations of test-based incentives like NCLB and recommended some actions to overcome these limitations. How does this report apply to California's statewide assessments, specifically the Smarter Balanced assessments that will be implemented in 2014-15? How can (and should) a teacher prepare her students for these assessments and other tests? Surprisingly, there is much agreement between the CDE and California's higher education institutions about how to prepare our students.

LEVEL: ELEMENTARY SCHOOL

Sunny Chin-Look
Alhambra Unified School District

Understand Math Misconceptions

YOUNG HALL CSS0 (MAX 352)

Students form misconceptions as a mechanism to sort out things that does not make sense to them. In this session, we will look at an array of mathematical misconceptions in K-8 and focus on some teaching strategies for helping remediate the misconceptions.
Practice Makes... More Proficient Math Students
MS 6620B (MAX 35)
How can teachers efficiently integrate the Math Practice Standards into daily math instruction? This session will provide ideas for increasing students' proficiency with the Math Practice Standards through various daily routines. Participants will trace the development of the Practice Standards from kindergarten through grade 3 and leave with a repertoire of activities for teaching.

Exploring Addition Fact Strategies
MS 6620A (MAX 35)
In this talk, we look at ways of helping primary-grade students practice, describe, and document a range of addition strategies as part of their development of addition fact fluency. The model lesson is from Everyday Mathematics (EM), developed by the University of Chicago Mathematics Project. The speakers will be able to address general questions about EM's resources for Common Core instruction.

LEVEL: MIDDLE SCHOOL

Addressing the New Common Core Emphasis on Proportional Relationships
MS 3915D (MAX 24)
Developing patterns in proportional relationships is designed to build on students' prior knowledge involving ratios, rates, and proportional reasoning developed in previous content. Participants will learn how to analyze relationships using tables and graphs, and develop algebraic equations that describe the relationships. Participants will also explore various patterns using hands-on manipulatives to develop skills in predicting future iterations of a pattern by developing equations. The lesson is from the Agile Mind middle school program, and participants will be able to ask the presenter general questions about the program as well.

The Common Core Middle School Stats Standards
MS 6221 (MAX 25)
In this session, we look at the mathematics and pedagogy required to teach the middle school Common Core stats standards. We look at drawing conclusions from random samples and using them together with measures of center to draw informal inferences about two populations. Participants are encouraged to bring their graphing calculators/and or iPads as we'll be participating in model lessons.

"How Does It Grow?" — Developing A Representation Web
MS 3915G (MAX 24)
In this session, we will discuss how to teach students about linear growth using tile patterns. We will use multiple representations of linear growth using patterns, tables and rules, and then move to equations and graphs. Our work with a graph will lay the foundation for slope in the context of a "growth factor" and we'll show its connection to each of the representations. We show how students can learn to create a "Representations Web" where, given any one representation, they generate all of the others. The lesson is part of the College Preparatory Mathematics curriculum, and the presenters will be able to share their experiences with this middle school Common Core curriculum as well.
**LEVEL: MIDDLE SCHOOL/HIGH SCHOOL**

**Caline Khavarani Smith**  
Da Vinci Science High School

**Mathematical Modeling In Algebra**

**MS 6201 (MAX 28)**

At last year’s Curtis Center Conference, I focused my session on modeling in geometry; this year, I will shift that focus to algebra. We will work through engaging, hands-on lessons from the College Preparatory Mathematics curriculum (CPM), from which I currently teach, that reflect everyday life, work, and decision-making.

**Mary Siroyd**  
Mathematics Diagnostic Testing Project & The Curtis Center

**Transitioning To The Common Core Using MDTP Written Response Materials**

**MS 3915A (MAX 24)**

MDTP written response materials are a rich, field-tested resource of classroom tasks and extensions that are offered at no charge to California secondary math educators to help improve students’ ability to think and communicate effectively about mathematics and help teachers learn about their student’s conceptual understanding of important math topics. In this session we explore MDTP written response materials and how to use them to support CCSS instruction.

**William McCloud**  
New Designs Charter School

**The Weather Project**

**MS 5118 (MAX 45)**

During this presentation, we will explore and come up with a best fit model for weather in different cities around the world. We will go through the lesson and talk about how it applies to the Common Core Content and Math Practices.

**LEVEL: HIGH SCHOOL**

**Josh Chesier**  
California State University, Long Beach

**Expressions, Equations, And Functions In The CCSSM**

**MS 5117 (MAX 40)**

We will explore connections between expressions, equations, and functions in the CCSSM. The focus will be on grades 9-11, but we will also discuss the development of these ideas in K-8.

**Sky Ritchie**  
Scottsdale Preparatory Academy

**Teaching To Develop Mathematical Habits Of Mind**

**MS 6943 CHAIR’S CONF. (MAX 20)**

Problem solving and proof are practices fundamental to the work of a professional mathematician. In this session, we engage in a simulated class setting which demonstrates how to engage students in these practices. We’ll investigate perpendicular bisectors through a sequence of problems from the mathematics curriculum developed at the Phillips Exeter Academy, discussing our solution approaches in groups and presenting our ideas to one another. Through this class simulation, secondary teachers will see how one can use an entirely problem-based curriculum and classes that are almost entirely discussion-based to actively engage students both with mathematics and with one another, helping them to learn to think like a mathematician by deriving formulas and proving theorems for themselves.
Mathematical Image Processing: A Current Example of Mathematical Modeling

Luminita Vese
University of California, Los Angeles

MS 6627 (MAX 50)

Image processing is an essential field in many applications, including medical imaging, astronomy, astrophysics, surveillance, video, image compression and transmission, just to name a few. In one dimension, images are called signals. In two dimensions we work with planar images, while in three dimensions we have volumetric images (such as magneto-resonance images). These can be gray-scale images (single-valued functions), or color images (vector-valued functions). Noise, blur and other types of imperfections often degrade acquired images. Thus such images have to be first preprocessed before any further analysis and feature extraction. In this talk I will try to inform the audience in simple mathematical terms about several image processing tasks: image denoising, image deblurring, image enhancement, image segmentation, and edge detection.

Lunch Banquet 11:45 – 1:00 pm | UCLA Faculty Center

PM Plenary Session 1:05 – 2:20 pm

Phil Daro
Common Core Co-Author

Common Core State Standards — Mathematics: A Perspective From A Member Of The Writing Team

MOORE HALL 100 (MAX 419)

The Common Core State Standards - Mathematics (CCSS-M) were designed to solve an educational problem, not a political problem. The good intentions of the design, however, can drown in the politics of accountability, teacher policy and public education. The biggest education problem in school mathematics on which the writing team focused its efforts was the "mile wide, inch deep" configuration of the American school mathematics curriculum. This phrase refers to findings from international comparisons (TIMSS and PISA) that the U.S. curriculum was incoherent, out of focus, redundant, shallow, and cluttered with too many topics. The emphasis within each of the (too many) topics was too narrow and superficial. The CCSS-M propose a shift in the perspective toward mathematics taught in schools: less emphasis on a fragmented multitude of special solution methods, especially tricks that avoid underlying mathematical principles; more emphasis on core principles and practices that unify and focus mathematical thinking.

Standards can help solve this kind of curriculum architecture problem, but we all face more detailed and difficult challenges of instructional materials, assessment, and program design. Even more important and, perhaps challenging is teacher preparation and continuing education. The CCSS-M offer an opportunity to rethink and the challenge to improve how we prepare and support teachers. The speaker will reflect on how the good intentions of the writing team a few years ago are breaking on the rocky shores of today’s realities.

PM Breakout Session 2:30 – 3:45 pm

LEVEL: GENERAL

Michael Nakamaye
University of New Mexico

Open Ended Problems And The Common Core

MS 6627 (MAX 50)

We will discuss and work on several open ended problems connected directly to the CCSSM (including 5.OA.1, G-GPE.B, and G-MG). We will talk about how to adapt open ended problems to a given audience and how they support the standards of mathematical practice of the Common Core. Time permitting, we will also discuss briefly the common origin of these problems, namely they were all developed for Math Teachers’ Circles.
Secondary Mathematics Classroom Observation Framework For Supporting Teacher Development

MS 5118 (MAX 40)

An observation framework for secondary mathematics classrooms will be shared in this presentation. The observation framework includes four categories: 1) academic rigor, 2) academic discourse, 3) access to content and 4) classroom ecology. The presenter will share briefly how it was developed and how it has been used with pre-service teachers in a teacher education program as ways to provide both feedback and evaluate teacher performance. Participants will have an opportunity to use the observation tool as they view selected video clips.

LEVEL: ELEMENTARY SCHOOL

Making Nets For Rectangular Prisms (Grades 5-6)

MS 6620B (MAX 35)

Participants will find the volume of right rectangular prisms and solid figures composed of two non-overlapping right rectangular prisms by packing them with cubes. Solve real-world and mathematical problems involving volume.

A Teacher/Author’s Perspective on the EngageNY K-12 Common Core Math Curriculum

MS 6221 (MAX 25)

The EngageNY K-12 Common Core curriculum is free online for your entire community: teachers, administrators, and parents. Written for the state of New York under the direct supervision of Student Achievement Partners, it is an important interpretation of the Common Core, written by teachers while supervised and edited by mathematicians for coherence and fidelity to the math. Engage NY can inform instruction or be implemented best when its structure is understood. Robin Ramos, one of the authors, will help you understand this structure so that you can better access this online resource.

Denominators – The Key to Understanding Fractions for Elementary School Students

MS 6620A (MAX 35)

How can teachers build, in their students, a deep, knowledge of denominators to insure students conceptually understand addition, subtraction, multiplication and division of fractions with unlike denominators? This session will explore fractions in the progression from 3rd through 6th grades through real life situations, manipulative use, and number line use. For teachers just beginning the implementation of Common Core math, students will need this background knowledge to be able to model and explain these math concepts.

Practice Makes... More Proficient Math Students

MS 3974 (MAX 45)

How can teachers efficiently integrate the Math Practice Standards into daily math instruction? This session will provide ideas for increasing students’ proficiency with the Math Practice Standards through various daily routines. Participants will trace the development of the Practice Standards from kindergarten through grade 3 and leave with a repertoire of activities for teaching.
Area Formulas...How Did They Figure Them Out?

MS 5127 (MAX 40)

One of the expectations under Common Core is that students should be developing and justifying formulas instead of teachers simply telling them these formulas. In this session, we will engage in an inquiry based lesson in which students themselves develop formulas for computing the area of triangles, trapezoids, kites, parallelograms and circles by composing into rectangles or decomposing into triangles and other shapes (Common Core standards 6.G.1). In the lesson, students engage in MP7 and MP3 as they "notice and use structure" and "construct viable arguments" to develop these area formulas.

Acceleration, Access, And Equity: Pathways For Success In The Common Core

YOUNG HALL CS50 (MAX 352)

In this session, a panel will discuss the equity issues schools and districts should consider when choosing acceleration pathways at the middle or high school level. In addition, we will discuss the role of AP Calculus in equity issues at the secondary level.

Solving Systems Of Equations And Inequalities

MS 5117 (MAX 40)

We will explore CCSS-M content standards related to solving systems of equations and inequalities. The focus will be on developing the ideas from middle grades thru algebra.

Similar Triangles And The "Flutterbye"

MS 5147 (MAX 42)

In this talk, we examine a toy constructed from two discs, such that one disc is impaled on the other at a right angle. Surprisingly, the toy rolls along merrily like a wheel. We investigate how the toy works, and in so doing uncover an amusing use of similar triangles and the Pythagorean Theorem.
Addressing The New Common Core Emphasis On Rates Of Change
MS 3915D (MAX 24)
Understanding the rate at which one quantity changes with respect to another is key to understanding how the two quantities are related. During this presentation, participants explore the concept of rate by analyzing motion over time. Participants investigate the rate at which distance changes numerically and graphically by using an animated motion detector experience. The lesson is from Agile Mind Intensified Algebra, an intervention program for an extended-time class that helps significantly behind students become successful in Algebra within one academic year. Participants will be able to ask the presenter general questions about Intensified Algebra as well.

LEVEL: HIGH SCHOOL

Modeling Functions: Progressions And Practices
MS 5137 (MAX 42)
In this presentation, participants will be working with a task that introduces the concept of an arithmetic sequence. The task provides opportunities for developing both explicit and recursive equations, along with generating ideas about rates of change looking at both tables and graphs. We will explore how this task is part of a progression that leads to the development of linear functions, geometric sequences, and exponential functions. Classroom video will be used to demonstrate teacher actions that facilitate student discussion and sense-making during the lesson. The lesson is from the Mathematics Vision Project (MVP), a free online curriculum designed from the ground-up to implement the vision of the Common Core.

The Why And How Of Basic Transformations In Geometry
MS 6201 (MAX 28)
We will offer motivation for this current emphasis on the transformation approach to high school geometry, along with some procedural cautions, and highlight certain essential topics. Participants should bring drawing tools for hands-on activities.

Using Anchor Tasks To Drive Instructional Shifts As We Transition To The Common Core
MS 5138 (MAX 42)
How do we provide for the curricular needs of our teachers so we can drive the instructional shifts needed to implement the CCSS? Come and see how one high school district is using Anchor Tasks as we patiently wait for good Common Core curriculum. At least one of the tasks will be investigated.

"How Does The Pattern Grow?"; Representing Exponential Growth
MS 3915G (MAX 24)
In this session, we will discuss how to teach students about exponential growth using the context of population growth in a community of rabbits. We will use multiple representations to represent the exponential growth with a diagram, a table and a graph. We will then write descriptions of the patterns of growth we observe in the tables and use these descriptions to make predictions. The lesson is part of the College Preparatory Mathematics curriculum, and the presenters will be able to share their experiences with this middle school Common Core curriculum as well.
Conference Location And Parking

Check-in begins at 8:00 AM in Mathematical Sciences 6620. Parking will be arranged under the name “Curtis Center Conference” in Lot 2, at the corner of Hilgard Avenue and Westholme Avenue. **Last names beginning with A-L should enter from the Westholme ramp. Last names beginning with M-Z should enter from the Charles E. Young Drive East.** If you arrive after 9:00 AM, you can obtain a parking pass from the Westwood Plaza Kiosk. Take Charles E. Young Drive East and turn right onto Westwood Plaza. The kiosk will be on your left.

There will be no refunds, but substitutions are allowed. There will be no on-site registration. Conference Sessions will be held in the UCLA Mathematical Sciences Building, Moore Hall and Young Hall. The luncheon will be held in the Faculty Center.

Directions To UCLA

**FROM SOUTH**
- Take I-405/San Diego Fwy North toward Santa Monica
- At exit 55B, take ramp right for Wilshire Blvd toward Westwood
- Turn left onto Westwood Blvd
- Take the first right on Lindbrook, which curves around to become Hilgard
- Follow Hilgard to the Westholme entrance to UCLA
- Turn left on Westholme
- Lot 2 entrance will be on your left
  - A-L enter from the Westholme ramp
  - M-Z enter from Charles E. Young Dr. East

**FROM NORTH**
- Keep straight onto US-101/Ventura Fwy North
- Take ramp right for I-405/San Diego Fwy South toward Santa Monica
- At exit 55B, take ramp right for Wilshire Blvd going East toward Westwood
- Turn left onto Westwood Blvd
- Take the first right on Lindbrook, which curves around to become Hilgard
- Follow Hilgard to the Westholme entrance to UCLA
- Turn left on Westholme
- Lot 2 entrance will be on your left
  - A-L enter from the Westholme ramp
  - M-Z enter from Charles E. Young Dr. East
EXERCISE YOUR COMMON CORE!
2014 SUMMER WORKOUTS FOR MATH TEACHERS

Introductory Workouts

The WORKOUTS are designed to give you a coherent hands on preparation for teaching the Common Core State Standards for Mathematics. In the Workout, we aim to help you understand the BIG picture AND get specific examples that help you hit the ground running by:

1. Engaging you in several inquiry based classroom-ready lessons EACH DAY to help you understand AND teach some of the most challenging new standards.
2. Helping you understand the math practices by showing you specific examples of them in the content standards and in the model lessons we do together.
3. Showing you what you no longer have to teach at your grade level and what is new to your grade level.
4. Looking together at the latest SBAC selected response tasks AND performance tasks.

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Advanced Workouts

The ADVANCED WORKOUTS are designed for teachers who have already completed a Summer Workout with us in 2012 or 2013, or for those who have had experience with the complete content of our Summer Workouts.

In the Advanced Workouts, we will:

1. Work with you to build an entire unit of Common Core instruction around a particular group of Common Core standards. This will include:
   a) looking at several inquiry based classroom-ready lessons to help you understand the chosen group of standards.
   b) showing you what formative assessments and unit exams for Common Core should look like.
   c) applying the concrete context » conceptual understanding » formalism instructional sequence introduced in previous Curtis Center trainings.

2. Take a look at “teacher level” understanding of the mathematics of the unit.

3. Look together at the latest SBAC selected response tasks AND performance tasks relevant to the unit.

Register Online at www.curtiscenter.math.ucla.edu