

NCSM President  
2013-2015

***Valerie L. Mills***

Ypsilanti  
Michigan

# National Council of Supervisors of Mathematics

---

- N - Network and collaborate** with stakeholders in education, business, and government to ensure growth and development of mathematics education leaders.
- C - Communicate** current and relevant research to mathematics leaders.
- S - Support and sustain** student achievement through the development of leadership skills
- M - Motivate mathematics** leaders to maintain a lifelong commitment to provide equity and access for all learners.



# **JUMP START**

## **Formative Assessment**

National Council of Supervisors of Mathematics  
JUMP START Formative Assessment Webinar



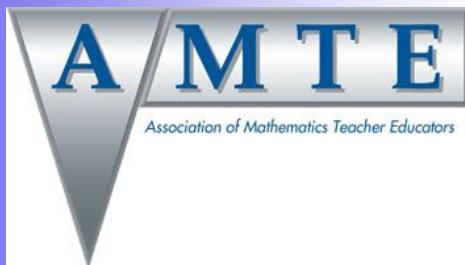
## ***Ana Floyd***

K-5 Mathematics & Science  
Lead Teacher  
Randolph County School District  
Randolph, North Carolina



## ***Wendy Rich***

Director of Elementary Curriculum  
& Instruction  
Asheboro City Schools  
Asheboro, North Carolina



# **JUMP START**

## **Formative Assessment**

**National Council of Supervisors of Mathematics**

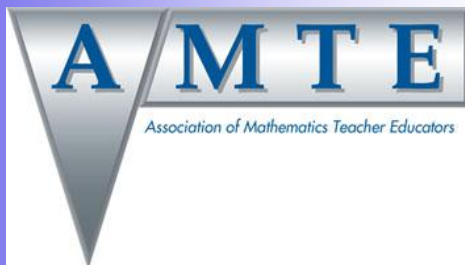
**JUMP START Formative Assessment  
Webinar**



# Connections to Formative Assessment

What are your teachers doing well related to formative assessment?	What are your needs related to formative assessment?





# JUMP START

## Formative Assessment Our Position

*The National Council of Supervisors of Mathematics (NCSM) and the Association of Mathematics Teacher Educators (AMTE) affirm the centrality of research-based, mathematically focused, formative assessment—a key element in the national effort to improve mathematics proficiency. Formative assessment needs to be intentionally and systematically integrated into classroom instruction at every grade level. This requires adequate attention in the preparation of new teachers of mathematics and in the continuing education and professional development of current teachers.*



# Audience for “Jump Start” Series

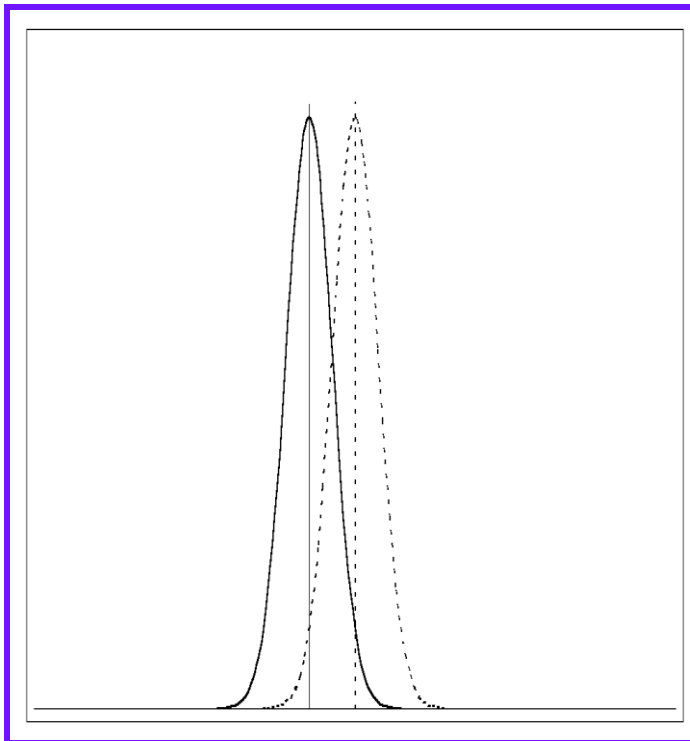
- Math coaches, math specialists, faculty who teach mathematics education courses, teacher leaders might use the series with professional learning communities and informal gatherings of colleagues
- Ultimately, classroom teachers and students will implement and benefit from the strategies
  - Teachers will know more about their students’ thinking and reasoning and students’ misunderstandings
  - Teachers will use this knowledge to modify instruction to better meet students’ needs
  - Students will be supported in taking greater responsibility for their own learning

# Overarching Goals for “Jump Start”

- To provide teachers with understanding that formative assessment is a *process* of gathering evidence about what students know and understand, their misconceptions, and their incomplete knowledge
- To support teachers in using strategies that inform teaching and learning and shape their instructional decisions “in the moment” and in short and long-term planning
- To suggest strategies for encouraging greater involvement of students

# Formative Assessment Makes a Difference!

Black and Wiliam (1998) report, based on their extensive review of research, typical effect sizes of formative assessment experiments are between 0.4 and 0.7



Effect Size = The number of standard deviations between the means of the experimental and control groups

A positive effect size indicates that the experimental group performed better than (that is, outscored) the control group

(Dynamic Classroom Assessment 2004)

# Formative Assessment Makes a Difference!

- According to Black and Wiliam (1998), these gains are
  - Larger than most instructional innovation strategies,
  - Particularly helpful to pupils who have previously struggled,
  - Consistent across countries (i.e., US, Canada, England, Israel, and Portugal), across age brackets, and content areas, and
  - Sustained over extended periods of time (Wiliam, 2005)
- *It's really not surprising that formative assessment works so well. What is surprising is how few U.S. teachers use the process. (Popham, 2013)*

# Defining Formative Assessment

Formative assessment has three key elements:

- Elicit evidence about learning to close the gap between current and desired performance
- Adjust the learning experiences to close the performance gap through useful feedback
- Involve students in the assessment learning process

Adapted from Margaret Heritage, 2008



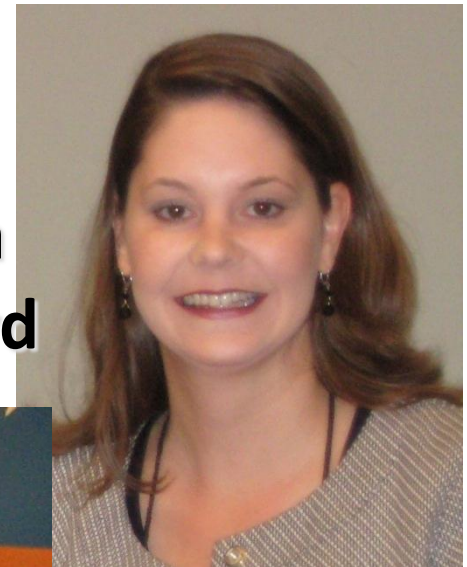
# Description of **JUMP START** Sessions

# JUMP START

## Authors



**Jeane  
Joyner**



**Ana  
Floyd**



**Mari  
Muri**



**Wendy  
Rich**



**Catherine  
Schwartz**

**Katherine  
Mawhinney**





# “Jump Start” Modules

- Module 1: Overview
- Module 2: Identifying Learning Targets
- Module 3: Activating Prior Knowledge
- Module 4: The Answer is Wrong
- Module 5: Feedback to Students
- Module 6: Asking Productive Questions

# Structure of JUMP START Series

- PowerPoint presentations with discussion notes, activities, and suggestions for follow-up
- Single-topic focus for each session
  - Grade-level groups, department meetings, faculty discussions, PLCs
  - Web search ideas for further information
- Technology requirements: computer and projection device; internet connection
- Leader notes for each session and discussion ideas for each slide; participant alerts (e.g., alternative ways to implement strategies, cautions)

# NCTM Research Brief: Five Key Strategies

## National Council of Teachers of Mathematics (2007) Five “Key Strategies” for Effective Formative Assessment

- Clarifying, sharing, and understanding goals for learning and criteria for success with learners
- Engineering effective classroom discussions, questions, activities, and tasks that elicit evidence of students' learning
- Providing feedback that moves learning forward
- Activating students as owners of their own learning
- Activating students as learning resources for one another



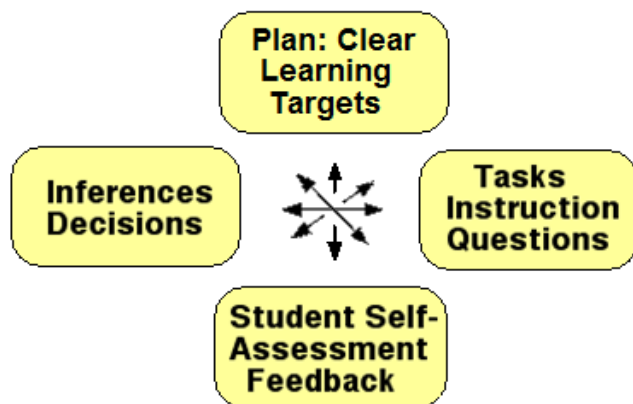
# Identifying and Planning Clear Learning Targets

*Teaching begins with clear learning targets*

- What do we expect students to learn?
- How are they going to learn it?
- How will we know when they have learned it?
- How will they know when they have learned it?
- How will we respond when they don't?
- How will we respond when they do?

*Learning takes place as students make sense of the  
mathematics in their lessons*

## Teaching-Learning Cycle



ion has always been part of instructional planning. What this session “At the end of the day, what do I want my students to get out of the lesson?” al issues that are not addressed are (1) including the students as informed ng-learning cycle, and (2) how learning targets might be shared with and or these to be addressed in other sessions.

and be able to do? Learning targets allow us to specifically define what st do with that knowledge. If we don’t begin with clear statements of nd assessments. And without sound assessments, we cannot create the ur students to achieve the targets. (Marzano, 2004)

tent that students are expected to learn and teachers are expected to teach. ain sizes” depending upon the authors. Examples of such terms are essential s, and objectives. Knowledge of learning trajectories or learning he standards and goals for their particular year or course fit into a bigger pending upon the time available for this session, you may wish to have alogy or use curriculum and text materials with which your audience is

8

	<p>familiar to walk through an example of the information in this chart. This slide is an effort to be clear about how daily learning targets fit into the broader picture and how teachers go about determining their instructional priorities.</p>
<p><b>Assessment Guides Instructional Priorities</b></p> <p>Assessment should reflect the mathematics that all students need to know and be able to do, and it should focus on students’ understanding as well as their procedural skills.</p> <p>Teachers need to have a clear sense of what is to be taught and learned, and assessment should be aligned with their instructional goals.</p> <p><small>©2010 NCTM</small></p>	<p>7. It is imperative that teachers imbed assessment into their instructional programs so that adjustments to plans reflect what students are learning and attend to what still needs to be learned. Assessment is not an add-on; rather it is a tool for making decisions. NCTM’s <i>Principles and Standards for School Mathematics</i> continues to be a resource for teachers.</p>
<p><b>Teaching-Learning Cycle</b></p>	<p>8. There are many variations of a model such as this one as authors attempt to illustrate the interactions that are involved in teaching and learning. The points to be made here are that each of these cells involve teachers with content and students, that students should be heavily involved in the teaching and learning cycle, and that instruction begins with a clear understanding of the goals with adjustments made throughout the teaching-learning cycle to support students’ attainment of the learning targets. Each of the parts of the teaching and learning cycle are platforms for formative assessment.</p> <p>Teaching-Learning Cycle develops the cyclic nature of teaching and learning and how formative assessment drives the cycle. The cycle highlights clear learning targets as a point of entry and develops the notion of teaching as a practice that teachers can reflect upon and improve.</p>

# Another Prior Knowledge Strategy

## *Pose a multiple choice discussion prompt*

- There are four dogs. One of the dogs weighs 50 pounds. What is true? Explain
  - A. The median could be 12, but the mean could not be 12
  - B. The mean could be 12, but the median could not be 12
  - C. Both the median and the mean could be 12
  - D. Neither the median nor the mean could be 12
  - E. There is not enough information to know

*What might you infer when students choose each of these answers?*

## Example: “Quick Writes” As a Strategy

- Students often approach lessons involving fractions as if they had no prior knowledge
- Quick writes can get students thinking about what they learned in previous years
  - Model  $\frac{3}{4}$  in three different ways
  - Give an example to show that one-fourth is not always smaller in size than one-half
  - What do you know about whole number operations that will help you compute with fractions?



# Activating Students' Prior Knowledge

- The focus is “in the moment” assessment
- Students recall what they know about a topic
- Teachers have immediate feedback on “where the group is”
- Begins the lesson with students thinking about the topic and what they already know
- Is usually short (4-6 minutes)
- Can be introductory in nature as a launch or a quick review

# When the Answer Is Wrong...

This session has two main goals:

- To consider strategies that support what is correct in students' thinking yet address misconceptions, incomplete understanding, and wrong answers
- To identify one or more strategies that fit with each participant's instructional practices and to plan ways to implement the strategy

# What Would You Say?

Scenario: Students are working on this problem; you call on Cary

■  $[18 \div 2 - (3 \times 2) - 5] + 3 =$

Cary has written

☐  $[9 - 6 - 5] + 3 =$

☐  $[9 - 11] + 3 =$

☐  $2 + 3 = 5$

- What does Cary understand? What does Cary not understand? What might you say when Cary answers “5” to offer support but acknowledge that the answer is incorrect?

# What Would You Say?

Students are working on this problem; you call on a student

- $4x(2x - 9) - 2(5x - 6)$

The student has written

$$4x(2x - 9) - 2(5x - 6)$$

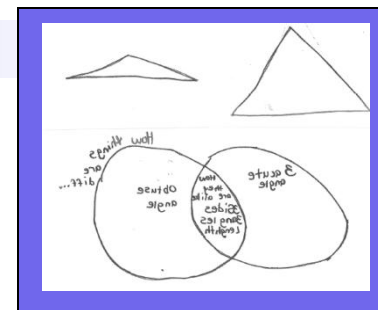
$$8x - 36x - 10x + 12$$

$$-38x + 12$$

- What does the student understand? What does the student not understand? What would you say to this student to offer support but acknowledge that the answer is incorrect?

# Feedback to Students

- Timely, actionable feedback helps students know what is correct and what they need to rethink
- Either oral or written, quality feedback moves student learning forward
- In this session there are opportunities to identify feedback that is not very helpful and turn it into comments that support student learning



# Examining Student Work

- *Students' Task:* Draw two different triangles. Use a Venn diagram to show how they are alike and how they are different
- With your partner discuss the student work
  - ☐ What information would you expect in a strong response?
  - ☐ What is the nature of the misconceptions or mistakes on the students' papers?
  - ☐ Which students do you want to question?
  - ☐ What “next steps” instructionally would you plan for this class?



Student samples: JUMP START Feedback session

Student A

3 acute angle

How things are diff...

obtuse angle

How they are alike: 3 sides, 3 angles, lengths

Student B

right triangle

90°

3 sides

cone shaped

acute triangle

less than 90°

Triangle Task Student Work

JUMP START Feedback Session

Student C

2 acute angles

no right angle

scalene

3 sides

all angles less than 90°

no right angle

scalene

Student D

different

one is a regular triangle, one is a different shape

Alike different

one is a right triangle, one adds to 180°, one has a 90° angle

They are triangles, they have 3 sides

Student E

has 3 acute angles

is equilateral

has a right angle

has 2 acute angles

is isosceles

they both have 3 sides and angles

Student F

no right angle

3 acute angles

no equal angles

1 right angle

2 acute angles

2 equal angles

both triangles 3 sides

Work

JUMP START Feedback Session

3



# Writing Helpful Feedback

- After examining the student samples, consider what feedback you might give to the class
- Would you divide the students into groups?
  - ☐ If yes, how would you group them?
  - ☐ What would you say to the different groups?
- Divide the student examples so each person has at least 2 samples
- Write feedback to these students
- Share your feedback examples with others

# Asking Productive Questions

- To examine different purposes for classroom questions
- To differentiate types of questions that support student learning and inform instruction
- To reflect on personal use of questions in the classroom

# Conjecturing About Functions

- Video is of an 8th grade class
- Content is making conjectures about functions
- Teacher is Audra McPhillips
- URL for future viewing and reading web discussion is <https://www.teachingchannel.org/videos/conjecture-lesson-plan>
- Directions: Pay particular attention to the questions that the teacher asks and her comments about why she does different things

# Reaction: Conjecturing About Functions

- What did you notice about the classroom environment?
- How did this lesson build on previous work?
- What evidence do you have that the teacher is using her knowledge of students' thinking in moving this particular lesson forward?
  - ☐ Her depth of knowledge of the mathematics content?
  - ☐ Her general knowledge about students' as they learn this content (difficulties or possible misconceptions)?
  - ☐ Real time interactions with the students?

# Plans Call For Additional Topics

- Inferences About Students' Thinking
- Student Self-Assessment
- Intentional Listening
- Using Student Data To Make Instructional Decisions
- Students Becoming Resources



# Connections to Formative Assessment

What are your teachers doing well related to formative assessment?	What are your needs related to formative assessment?



# Feedback

- Please share your feedback and suggestions with the writing team
  - <https://www.surveymonkey.com/s/3BQ2H8M>

# JumpStart Modules

The screenshot shows the NCSM Leadership Resources page. The header includes the NCSM logo and navigation links: HOME, ABOUT NCSM, GET CONNECTED, CONFERENCES & EVENTS, LEADERSHIP RESOURCES, MEMBERSHIP, SPONSORS, CCSS, COACHING CORNER. The main content area is titled "Jump Start Formative Assessment" and includes a "JUMP START Formative Assessment" section. It describes the National Council of Supervisors of Mathematics (NCSM) and the Association of Mathematics Teacher Educators (AMTE) affirming the centrality of research-based, mathematically focused, formative assessment. It also mentions that these professional development modules assist leaders in "jump starting" formative assessment, K-16. The page includes a sidebar with a quote from Wanda Audrikt, Curriculum & Instruction Coordinator, and a section for the NCSM Calendar.

## Leadership Resources

### The Modules

#### Module 1 - Overview (Free Preview)

[Presentation](#)

[Leaders Notes](#)

[Position Paper](#)

#### Module 2 - Identifying Learning Targets

[Presentation](#)

[Leaders Notes](#)

[Hikers Analogy](#)

#### Module 3 - Activating Prior Knowledge

[Presentation](#)

[Leaders Notes](#)

[Handout](#)

#### Module 4 - The Answer is Wrong

[Presentation](#)

[Leaders Notes](#)

#### Module 5 - Feedback to Students

[Presentation](#)

[Leaders Notes](#)

[Sorting Cards](#)

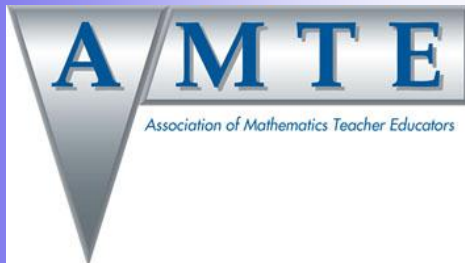
[Student Samples](#)

<http://www.mathedleadership.org/resources/jumpstart/index.html>



# References

- Black, P., Harrison, C., Lee, C., Marshall, B., & Wiliam, D. (2004). Working inside the black box: Assessment for learning in the classroom. *Phi Delta Kapan*, 86(1), 8-21.
- Heritage, Margaret (2008). Learning Progressions: Supporting Instruction and Formative Assessment  
<https://www.k12.wa.us/assessment/ClassroomAssessmentIntegration/pubdocs/FASTLearningProgressions.pdf>
- Leahy, S., Lyon, C., Thompson, M., and Wiliam, D. (2008). Classroom Assessment: Minute by Minute, Day by Day. *Educational Leadership*, 63(3), 19-24.
- National Council of Teachers of Mathematics (2007). Five “Key Strategies” for Effective Formative Assessment.
- Popham, J. (2013) Formative assessment’s advocatable moment. *Education Week*, 32(15), 29.



# **JUMP START**

## **Formative Assessment**

JUMP START Authors

Ana Floyd

Randolph County Schools, NC

Jeane Joyner

Meredith College, NC

Katherine Mawhinney

Appalachian State University, NC

Mari Muri

Wesleyan University, CT

Wendy Rich

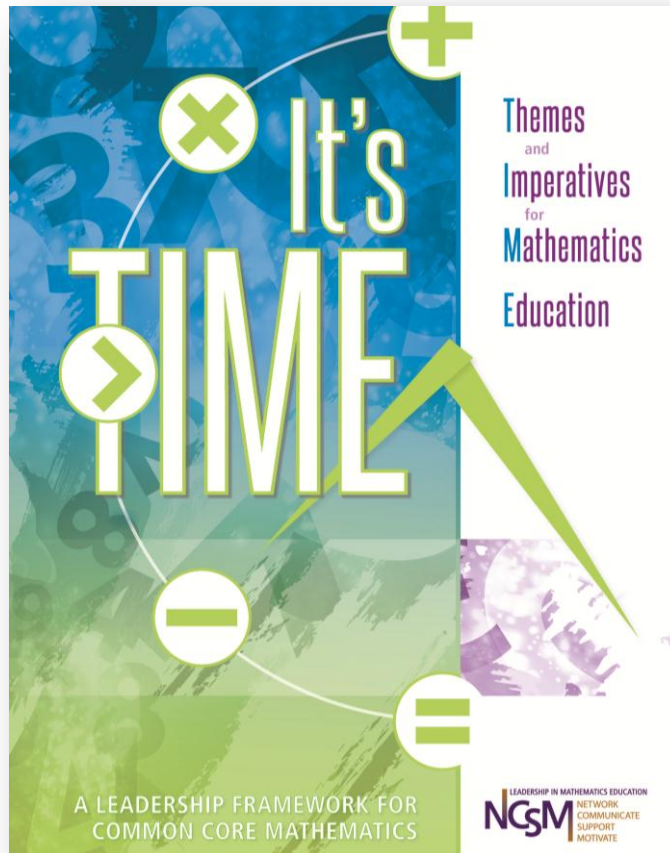
Asheboro City Schools, NC

Catherine Schwartz

East Carolina University, NC

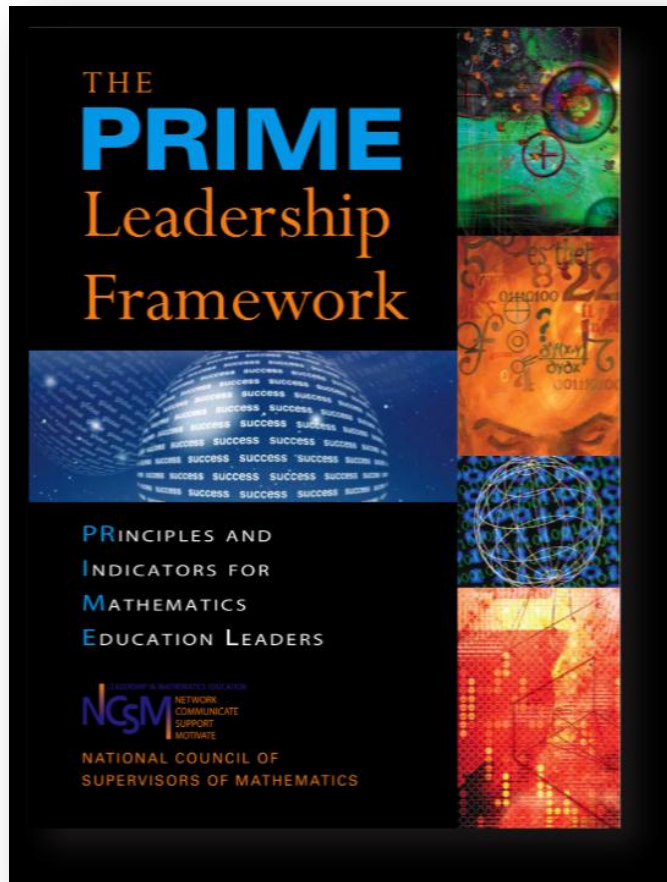
# NCSM's PRIME companion....

---



*It's TIME:  
Themes and  
Imperatives  
for  
Mathematics  
Education*

# Leadership Training for Mathematics Leaders



## PRINCIPLES AND INDICATORS FOR MATHEMATICS EDUCATION LEADERS

## **2014 NCSM FALL LEADERSHIP SEMINAR:**

# ***It's TIME:* Using Imperatives to Support and Motivate Leaders in Mathematics Education**



*Join Steve Leinwand, Valerie Mills, Catherine Fosnot,  
and other leaders in mathematics education  
at these one-day seminars!*

### **THREE DATES AND LOCATIONS**

The NCSM Leadership Seminar is held on Wednesday in conjunction  
with the NCTM Pre-Conference Meeting from 8:00AM–4:00PM

**OCTOBER 29, 2014**  
**NOVEMBER 12, 2014**  
**NOVEMBER 19, 2014**

**INDIANAPOLIS, IN**  
**RICHMOND, VA**  
**HOUSTON, TX**

**One  
Value-Packed  
Day**



# Publications

Get ideas, inspiration and much more from NCSM's publications.



**Events** NCSM Fall Seminars  
10/29, 11/12, 11/19

**CCSS**  
Explore the latest news in Common Core

**COACHING CORNER**  
Coaches Love NCSM and NCSM Loves Coaches!

**Publications** Newsletters  
Journals  
Position Papers  
PRIME

## Connect with Other Educators

Linked in



twitter



facebook



Illustrating the Standards for Mathematical Practice

Professional Learning Module Index

View a full list of all modules on the right margin.

	4-5	6-8	9-12
Positioning & Orientation	1	2	3
Planning & Designing	4	5	6
Implementing & Evaluating	7	8	9
Reflecting & Improving	10	11	12

eNews: Our FREE Newsletter

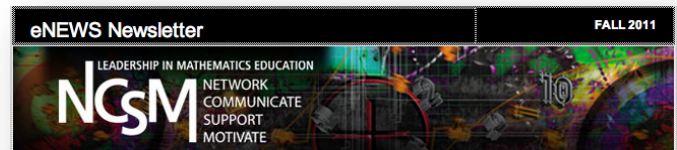
**Sign-Up Today**

**Gold Sponsor**





# NCSM Mathematics Leadership Publications



## LEADERSHIP IN MATHEMATICS EDUCATION NCSM NETWORK COMMUNICATE SUPPORT MOTIVATE NEWSLETTER Spring 2014, Volume 44, Number 3

### First Things First for the 21st Century

*Dr. Mike Schmoker is this year's annual conference keynote speaker. In his keynote address, First Things First for the 21st Century, the audience will learn precisely where to focus their precious time, efforts, and resources to ensure that all students are prepared for the 21st century demands of college, careers, and citizenship. The audience will also learn about the three most essential elements of good schooling, and how to implement them immediately, successfully and on a very clear, straightforward model.*



Dr. Mike Schmoker  
Keynote Speaker  
46th NCSM Annual Conference  
New Orleans, Louisiana  
April 7-8, 2014

Despite their unrivaled power for improving performance in any and every school, these elements continue to be misunderstood—and grossly under-implemented; therefore, they should be **our first and highest priority**.

The audience will leave this session knowing both *what* to do and *how* to do it, in ways that will yield immediate and significant results. Dr. Schmoker has offered to autograph his book after the session so don't forget to bring a copy! NCSM also hopes to have copies of *FOCUS: Elevating the Essentials to Radically Improve Student Learning* for purchase.

Dr. Schmoker is the author of the best-selling book entitled *FOCUS: Elevating the Essentials to Radically Improve Student Learning*. His previous bestseller, *RESULTS NOW*, was selected as a finalist for "book of the year" by the Association of Education Publishers. He is also a featured author in ASCD's (Association for Supervision and Curriculum Development) Master Class DVD series.

As a former administrator, English teacher, and football coach, Dr. Schmoker has written several books and educational articles. He is also known for his keynote addresses at state and national conferences and continues to consult with schools and state and provincial departments of education. He has worked with McREL (Mid-Continent Regional Educational Laboratory) in Denver, Colorado as a senior consultant.

### The 46th NCSM Annual Conference at a Glance

■ Sunday, April 6, 2014

On-site registration and conference check-in will be held at the Registration Area on the 1st floor of the Hilton Riverside, New Orleans Hotel Conference Center from 2:00-6:00PM.

If you have preregistered, bring your confirmation letter or picture ID to pick up your conference materials.

All meal functions, except Monday's Box Lunch, will be held in Grand Ballroom CD.  
The Sponsor Display Area is in the Hilton Exhibition Center on the 2nd floor.

... continued on page 4

### In this issue

From the NCSM President .....	2
2014 Fall Leadership Seminar Series .....	6
Book Review (Lamburg) .....	6
NCSM Election News .....	6
The Mathematics Student Recognition Program .....	7
Smarter Balanced .....	8
Help ... Help ... Help ... Help .....	9
Photos from the 2013 NCSM Summer Leadership Academy .....	10
Five: The Key to Sustained Practice .....	11
Leadership Tips .....	12
Book Review (Moynihan) .....	12
What Will History Say About the Common Core Mathematics Era? .....	13
NCSM Member Spotlight on Debbie Durall .....	13
NCSM Member Spotlight on Greta Staley Robertson .....	16
NCSM Member Spotlight on Lisa Unher-Gusta .....	16
NCSM Member Spotlight on Kitty Rutherford .....	17
NCSM Member Spotlight on Denise Trakas .....	19
Technology Counts .....	20
The Coaching Corner .....	23
Regional Report .....	26
Reflections on the 46th Annual Conference, Denver, Colorado .....	27-29
NCSM Professional Learning Opportunities .....	29
The NCSM Mission and Vision .....	30
About Your NCSM Newsletter .....	30
NCSM Membership Application and Order Form .....	31
Calendar Reminders .....	32

See last page for Board member contact info.

### Welcome

Welcome to this edition of the NCSM e-Newsletter. In this edition, you will find current news and events as you get started with the new school year. The eNews continues to be a work in progress, so suggestions are welcome and appreciated. In the future, the eNewsletters will become a regular feature of your inbox as the frequency of their arrival will increase to monthly. In this edition, look for up to date news regarding the Common Core State Standards, happenings at NCSM, and leadership tidbits as well as a message from President, Dr. Suzanne Mitchell. I hope you enjoy the e-news and if you have any ideas to add, please feel free to contact me at [mhall@astate.edu](mailto:mhall@astate.edu).

<http://www.corestandards.org/> where updates are continually added.

-PARCC is seeking public input on the Common Core State Standards:  
Public Input Sought on Draft Model Content Frameworks  
Frameworks provide focus for common assessments in English, mathematics. For more information or to view the frameworks, visit <http://www.parcconline.org/parcc-content-frameworks>

### Equity in Mathematics Education

Check out the latest news on equity from the Equity Trust at [http://org2.democracynaction.org/o/6879/blastContent.jsp?email\\_blast\\_KEY=1172497](http://org2.democracynaction.org/o/6879/blastContent.jsp?email_blast_KEY=1172497)

For up-to-date information regarding equity in mathematics education, please check out the TODOS homepage at <http://www.todos-math.org/> for all of your equity needs.

### Leadership Corner

This edition of the leadership corner comes from Derek Keenan's *5 Traits of 21st Century Educational Leadership* and can be found

# New Position Papers:

The National Council of Supervisors of Mathematics Improving Student Achievement Series No. 13/Spring 2014  
**Research-Informed Answers for Mathematics Education Leaders**



## Improving Student Achievement by Implementing Highly Effective Teacher Evaluation Practices

*"A commitment to professional learning is important, not because teaching is of poor quality and must be 'fixed,' but rather because teaching is so hard that we can always improve it. No matter how good a lesson is, we can always make it better. Just as in other professions, every teacher has the responsibility to be involved in a career-long quest to improve practice."*

Charlotte Danielson, 2011

### Our Position

It is the position of the National Council of Supervisors of Mathematics (NCSM) that teacher evaluation should be a multifaceted-collaborative process between teacher and administrator informed by a variety of data sources. There is no one "evaluation-fits-all" that automatically works for every school, district, or state. However, there are commonalities and processes that can be followed to ensure that evaluations are conducted consistently and accurately. The suggestions from this position paper are intended to offer specific mathematics requirements for inclusion into an already existing evaluation system.

NCSM defines a mathematics teacher as one who is certified to teach mathematics or as one defined as one who teaches mathematics and other subjects in elementary grades (e.g. generalist). There is much at stake for the teacher in the evaluation process. Our position views evaluation as a formative, teacher-centered process where teachers are continually receiving feedback and given opportunities for "targeted and specific professional learning opportunities" (Ball, 2013). The United States Department of Education in the *Race to the Top Program Summary* (U.S. Department of Education, 2009) included as one criterion for awarding of grants to "Design and

implement rigorous, transparent, and fair evaluation systems for teachers and principals that (a) differentiate effectiveness using multiple rating categories that take into account data on student growth as a significant factor, and (b) are designed and developed with teacher and principal involvement p. 9." Our position can be accomplished when leaders help schools and districts:

- Ensure reliability (consistent results) and validity (measure of what's intended) of all rating instruments used in the evaluation process;
- Ensure classroom observation rating instruments focus on grade level content, instruction, and student response to instruction;
- Provide training for individuals who use the evaluation instruments, including the administrator, peer teacher, and/or third party evaluators;
- Determine multiple data sources for the evaluation process; and
- Identify targeted professional development correlated with areas of needed growth.

Teachers must have an active role in reaching the ultimate goal of evaluation, increased teacher effectiveness, and improved student performance (Martin, 2007). Data from appropriately trained administrators, third parties, and peers will come primarily from classroom observations. Some states and districts will additionally require student-growth and student perception or feedback data. An integral part of

*The NCSM Improving Student Achievement Series is a set of position papers designed to provide research-based practices for school and district mathematics education leaders.*

## Improving Student Achievement in Mathematics Through Formative Assessment in Instruction

—A Joint Position Paper with AMTE—

*It's really not surprising that formative assessment works so well. What is surprising is how few U.S. teachers use the process.*  
Popham, 2013

### Our Position

The National Council of Supervisors of Mathematics (NCSM) and the Association of Mathematics Teacher Education (AMTE) affirm the centrality of research-based, mathematically focused, formative assessment—a key element in the national effort to improve mathematics proficiency. Formative assessment needs to be intentionally and systematically integrated into classroom instruction at every grade level. This requires adequate attention in the preparation of new teachers of mathematics and in the continuing education and professional development of current teachers.

### What is Formative Assessment?

Formative assessment is a process of gathering evidence within the stream of instruction in order to inform teaching and learning (Black, Harrison et al., 2004). To be considered formative, the evidence must be "elicited, interpreted, and used by both teachers and learners" (William, 2011, p. 43). In contrast, summative assessment is used to evaluate progress and achievement, assign grades, and appraise programs. "Formative assessment involves getting the best possible evidence about what students have learned and then using this information to decide what to do next" (p. 50). "In a classroom that uses assessment to support learning, the divide between instruction and assessment blurs. Everything students do—such as conversing in groups, completing seatwork, answering and asking questions, working on projects, handing in homework assignments, even sitting silently and looking confused—is a potential source of information about how much they understand" (Leahy et al., 2005). "When classroom practice is based on formative assessment, teachers and students together develop a framework for what can be expected in students' learning, for what it means to move toward intended mathematics learning goals, and for a common goal of continuous and progressive learning. Formative assessment is a crucial tool for simultaneously improving classroom practice and students' performance" (Petit & Zawojewski, 2011).

### Evidence from Research and Practice That Supports Our Position

There is a growing body of research emphasizing the use of formative assessment in classroom instruction as a means to improve student achievement. In their synthesis of studies, Black & William (1998) note evidence of greater student achievement in classrooms where teachers use such techniques. Similar findings are replicated in a meta-analysis by Ehrenberg et al. (2001). In particular, they report the impact of formative assessment on student achievement being four to five times greater than the effect of reducing class size. Additionally, in an analysis and synthesis of studies, Leahy et al. (2005) identify strategies supporting the use of formative assessment:

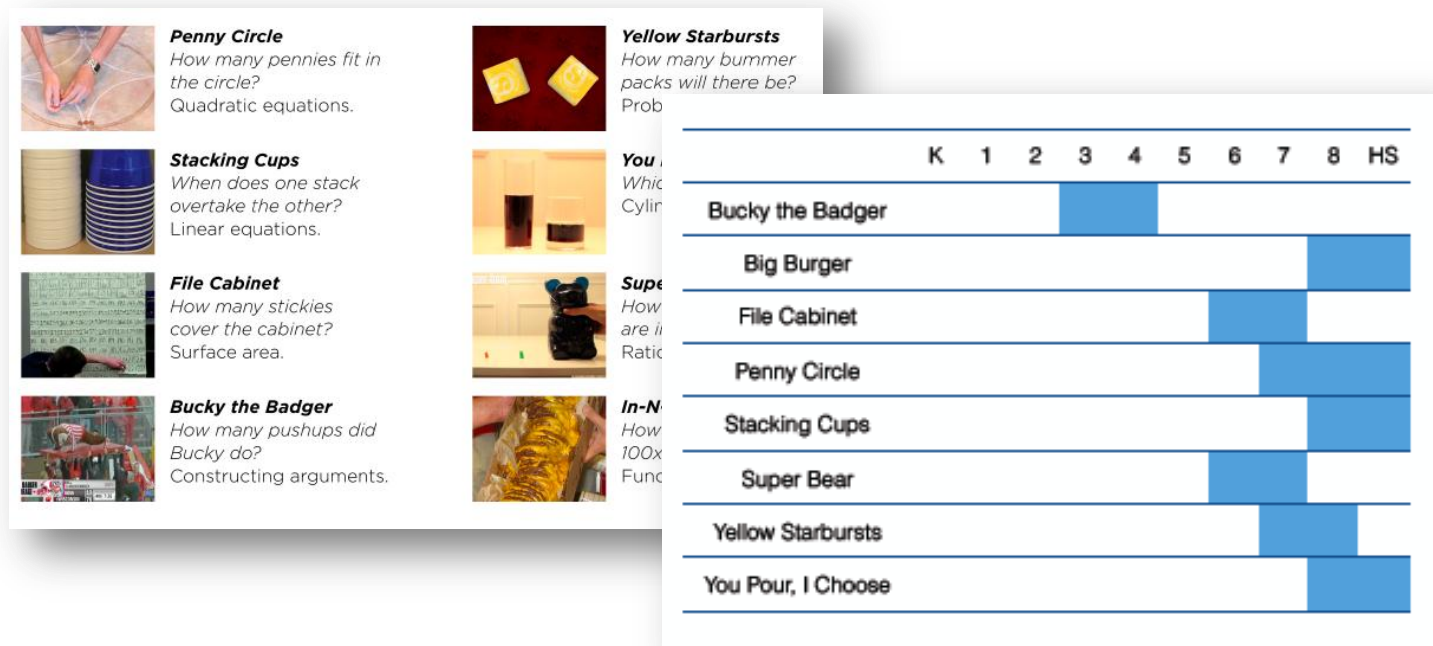
- Clarifying and sharing learning intentions and criteria for success;
- Engineering effective classroom discussions, questions, and learning tasks;
- Providing feedback that moves learners forward;
- Activating students as the owners of their learning and;
- Activating students as resources for one another.

See inset on next page for an explanation of the five strategies.



New

# Great Modeling Tasks in Three Acts



- Photos & videos
- PowerPoint slides
- Lesson plans
- Teaching notes
- Extension tasks
- Student work

**Andrew Stadel, Dan Meyer, Eric Milou, Gwen Zimmermann, and Robert Kaplinsky**

New!

# **JUMP START**

## **Formative Assessment**

Professional development modules to assist leaders in “jump starting” formative assessment, K-16. The collection contains an overview and modules, each highlighting one aspect of formative assessment with PowerPoints, Leaders’ Notes, and handouts as needed.

- 1. Overview**
- 2. Identifying Learning Targets**
- 3. Activating Prior Knowledge**
- 4. The Answer Is Wrong**
- 5. Feedback to Students**

# ePublications

## [www.mathedleadership.org](http://www.mathedleadership.org)

K 1 2 3 4 5 6 7 8 HS

Bucky the Badger

Big

File

Pen

Stack

Sup

Yellow

You Po

LEADERSHIP IN MATHEMATICS EDUCATION NETWORK COMMUNITY SUPPORT MOTIVATE

NGSM

**JUMP START**

Formative Assessment

Thank you to the  
Noyce Foundation  
for generously  
funding this project.

Module Index

Content at a Glance

Introduction

Problem Solving & Precision

Problem of the Month

Properties of Quadrilaterals

Reasoning & Explaining

Properties of Operations

COMMON CORE STATE STANDARDS

### Illustrating the Standards for Mathematical Practice

Module Index

Introduction to the CCSS Standards for Mathematical Practice

**Professional Learning Module Index**  
*Powerful PD resources at your fingertips!*

Click a button below to view resources for that module.

	K - 2	3 - 5	6 - 8	9 - 12
Problem Solving & Precision	Problem of the Month			Properties of Quadrilaterals
Reasoning & Explaining	Properties of Operations	Button Pattern	Congruence and Similarity	Similarity, Slope and Lines
Modeling & Using Tools	Penny Jar	Representing Number Sentences	Comparing Linear Functions	Properties of Quadrilaterals
Scale Factors			Odd	Sidewalk Patterns

Each of the modules is designed for 2-3

Professional development modules for math leaders in "jump starting" formative assessment, K-16. The collection contains an overview and modules, each highlighting an aspect of formative assessment with PowerPoints, Leaders' Notes, and Handouts as needed.

### SUCCESSFUL COACHING

Tools for Math Coaches and Math Specialists to develop programs, define roles, improve relationships, and evaluate the success of their programs

**PRINCIPLE 1**  
Equity Leadership

Coaching tools to ensure high expectations and access to meaningful mathematics learning for every student

**PRINCIPLE 2**  
Teaching and Learning Leadership

Coaching tools to ensure high expectations and access to meaningful mathematics instruction everyday

**PRINCIPLE 3**  
Curriculum Leadership

Coaching tools to ensure relevant and meaningful mathematics in every lesson

**PRINCIPLE 4**  
Assessment Leadership

Coaching tools to ensure timely, accurate monitoring of student learning and adjustment of teacher instruction for improved student learning

LEADERSHIP IN MATHEMATICS EDUCATION NETWORK COMMUNITY SUPPORT MOTIVATE

NGSM





# SHINING THE LIGHT ON LEARNING

A VISION FOR MATHEMATICS LEADERS!



**NCSM 47<sup>TH</sup> ANNUAL CONFERENCE**  
**APRIL 13–15, 2015 • BOSTON**

Plan now to join us!

Leading speakers  
presenting over 300  
sessions

- ✓ Leading instruction
- ✓ Leveraging technology in support of teaching and learning
- ✓ Advancing formative assessment
- ✓ Exploring strategies and tools for coaches
- ✓ Shifting practices to effectively implement the CCSS

# Get Involved - Volunteer

- ✓ State Team Leader
- ✓ Disseminate NCSM member materials
- ✓ Present a PRIME and/or CCSS leadership session(s)
- ✓ Write/Review for NCSM Journal or Newsletters
- ✓ Conferences: review proposals; help onsite; submit speaker proposal
- ✓ Join a committee: Awards, Nominations, Publications, Projects

# 2014 NCSM Fall Leadership Seminars

*It's TIME: Using  
Imperatives to Support  
and Motivate Leaders  
in Mathematics  
Education*

October 29<sup>th</sup>

Indianapolis, IN

November 12<sup>th</sup>

Richmond, VA

November 19<sup>th</sup>

Houston, TX





# Jump Starting Formative Assessment: A Resource for Leaders

---

<http://www.mathedleadership.org/events/webinars.html>



**Ana Floyd**

K-5 Mathematics and Science Lead Teacher  
Randolph County School District, NC



**Wendy Rich**

Director, Elementary Curriculum & Instruction  
Asheboro City Schools, NC