

Principal Partnerships: Maximizing Teaching and Learning

Virginia Council of Mathematics Specialists 2017

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Recalculating Your Math Leadership Role

Goal:

- Participants will enhance math leadership skills as they examine research-informed practices related to working with adults, facilitating PLCs and grade level meetings.

Welcome/Introductions

Numbers About Me

- Make a Name Tent.
- In the upper left hand corner, write the number of years you have been in education.
- In the upper right hand corner, write your role and the number of years you have been in your current position
- In the bottom two corners, write numbers that tell something about you personally.

*Share the meaning of the **bottom** numbers with a “shoulder partner” (not from your district) who will use them in introducing you to the whole group.*

Table Top Conversations:

- *Each person chooses an item from the center of the table to complete this statement:*

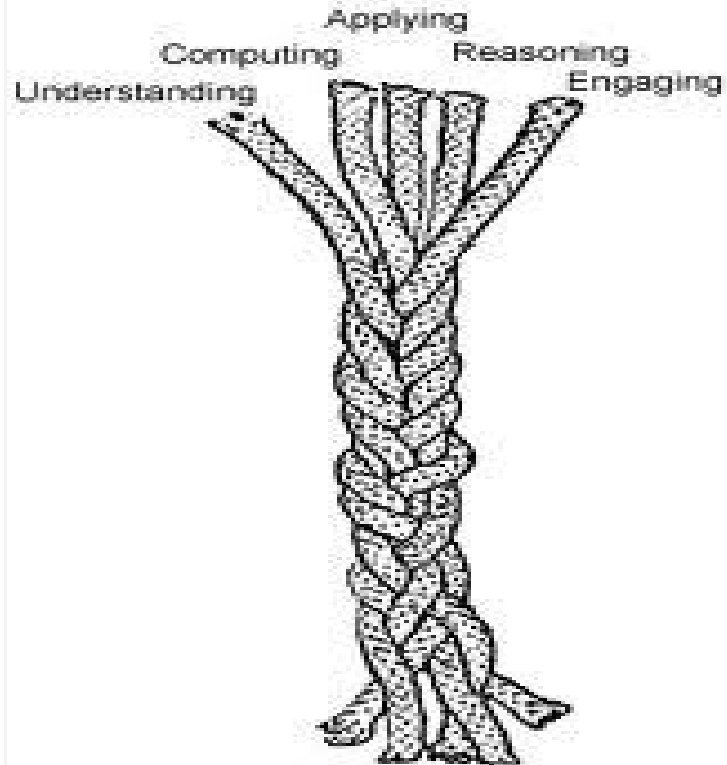
“Supporting the math instruction at my school is like _____ because _____.”

- *Be ready to share out to whole group.*



Mathematical Proficiency

Weaving The Strands

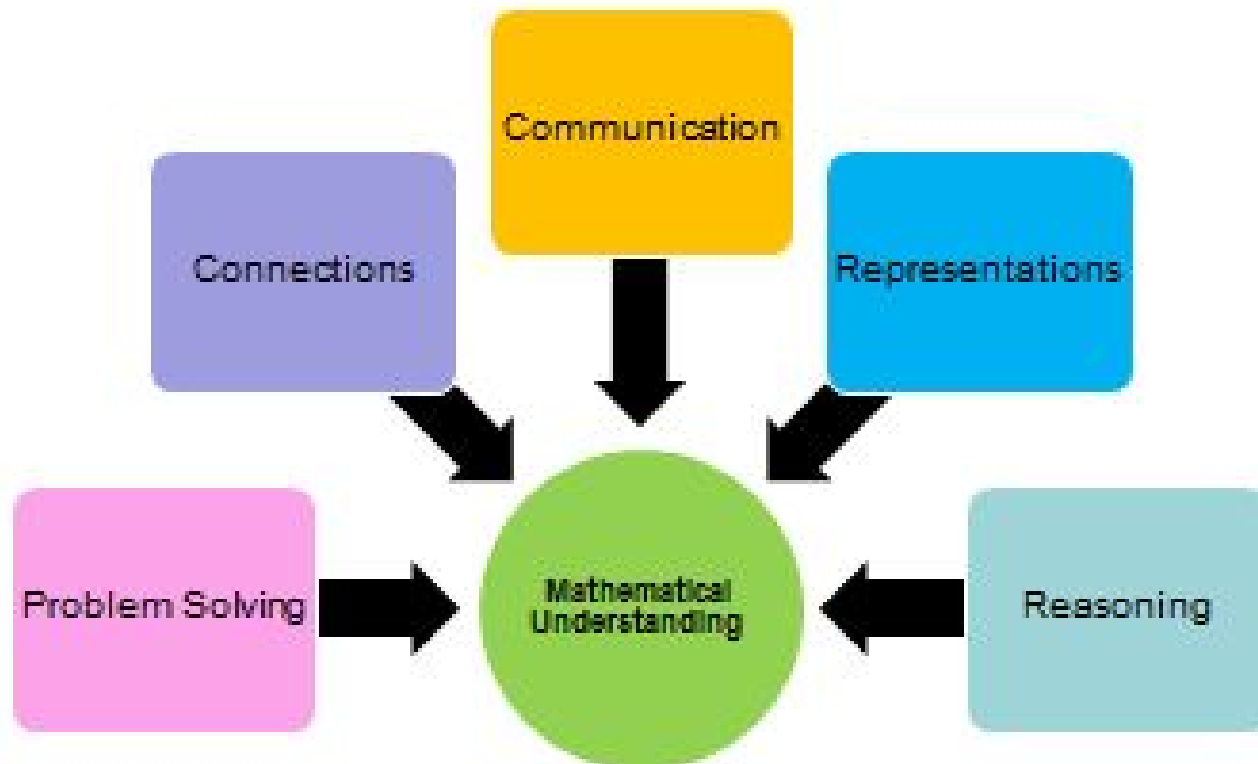




Virginia's Process Goals for Students in Mathematics

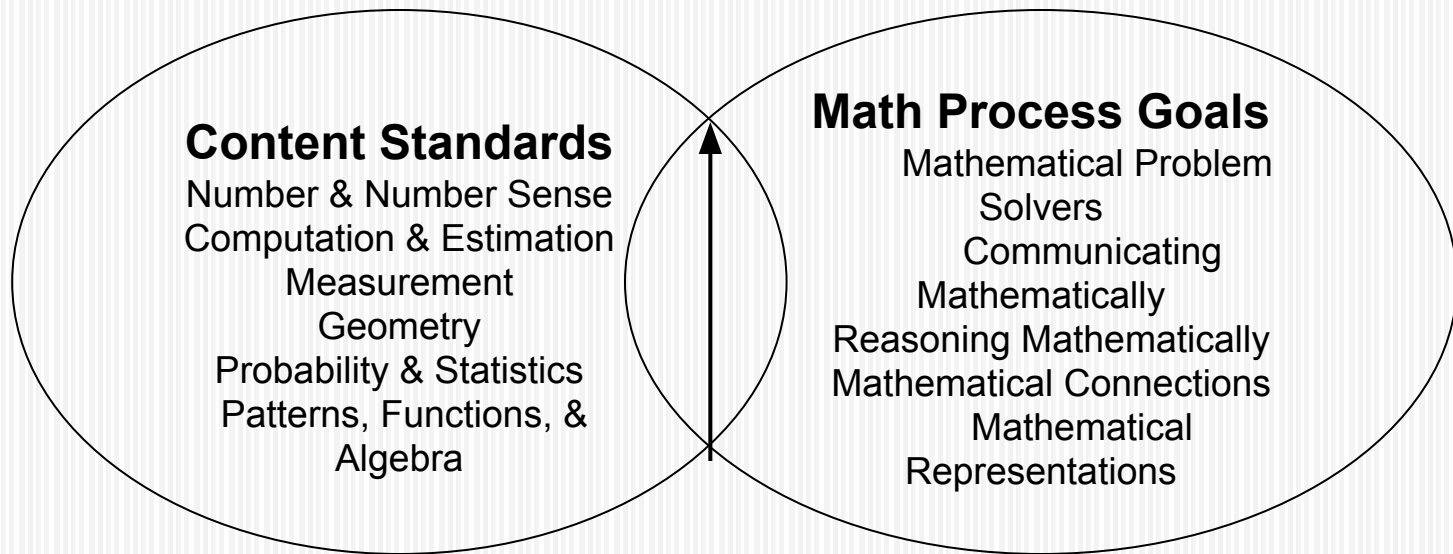
“The content of the mathematics standards is intended to support the five process goals for students”

- 2009 and 2016 *Mathematics Standards of Learning*



Mathematics Standards of Learning

True mathematical understanding lies at the intersection of the Content and Process Standards.



Teaching Mathematics for Understanding

What does instruction look like when teachers are *teaching mathematics for understanding*?

Effectively Teaching Mathematics for Understanding

- What are teachers doing?
- What are the students doing?

Teaching Mathematics for Understanding

- Think about the math instruction in your building
- Place x's on the continuum for your teaching or your teachers



Five goals...for students to

- become mathematical **problem solvers** that
- **communicate mathematically**;
- **reason mathematically**;
- **make mathematical connections**; and
- **use mathematical representations** to model and interpret practical situations.

Process Goals

TABLE GROUP DISCUSSION

What teaching practices should be employed to ensure students are engaged in these processes in ways that deepen their mathematical understanding?

Characteristics of a Highly Effective Mathematics Classroom

- Discuss in your table groups the characteristics that make those mathematics classrooms highly effective when considering what teachers and students are doing in those classrooms.
- Decide as a group what your top 5-7 characteristics would be and put those on chart paper.

Principles to Actions Ensuring Mathematical Success for All pg. 10 NCTM



Principles to Actions: Ensuring Mathematical Success for All

The primary purpose of *Principles to Actions* is to fill the gap between the adoption of rigorous standards and the enactment of practices, policies, programs, and actions required for successful implementation of those standards.



NCTM. (2014). *Principles to Actions: Ensuring Mathematical Success for All*. Reston, VA: NCTM.



NATIONAL COUNCIL OF
TEACHERS OF MATHEMATICS



Principles to Actions: Ensuring Mathematical Success for All

- Describes the **supportive conditions, structures, and policies** required to give all students the power of mathematics
- Focuses on **teaching and learning**
- Engages students in **mathematical thinking**
- How to ensure that mathematics achievement is maximized **for every student**
- Not specific to any standards; **it's universal**



NCTM *Principles to Actions* *Ensuring Mathematical Success for All*

High Leverage Mathematics Teaching Practices

1. Establish mathematics goals to focus learning.
2. Implement tasks that promote reasoning and problem solving.
3. Use and connect mathematical representations.
4. Facilitate meaningful mathematical discourse.
5. Pose purposeful questions.
6. Build procedural fluency from conceptual understanding.
7. Support productive struggle in learning mathematics.
8. Elicit and use evidence of student thinking.

Adapted from Leinwand, S. et al. (2014) *Principles to Actions – Ensuring Mathematical Success for All*, National Council of Teachers of Mathematics. https://www.nctm.org/uploadedFiles/Standards_and_Positions/PtAExecutiveSummary.pdf



“Effective teaching is the non-negotiable core that ensures that all students learn mathematics at high levels.”

NCTM, *Principles to Action* Executive Summary, 2014

A Few Broad-Brush Things to Consider

- Who is doing the mathematical thinking - teachers, students, or both?
- What is the goal of the instruction - understanding mathematics or simply getting answers?
- What is the cognitive demand of the tasks the students are being asked to do? What happens to the demand as teachers introduce the task, and as students work on the task?
- To what extent are all students engaged in mathematics learning?

Principles to Actions Ensuring Mathematical Success for All pg. 10 NCTM

How do teachers' beliefs determine the experiences they provide for their students?



A VDOE Document to Consider

- Review the VDOE Essential Actions-School Lesson Planning document at your tables.
- Determine if anything on the VDOE research-based list needs to be added to your group's list.

Let's Do Some Reading

What are others telling us about teaching mathematics?

1. *Never Say Anything a Kid Can Say* – Steven Reinhart
2. *What to Look for in Your Mathematics Classroom* – Barbara Scott Nelson and Annette Sassi
3. *Orchestrating Classroom Discussions* – Smith, Hughes, Engle and Stein
4. *Modifying Our Questions to Assess Students' Thinking* - Chappell and Thompson

Article Reflections

- Choose three words that are significant to you and represent the main meaning of the article. Write each word on a separate post-it note.
- Collect the words of all group members and post them at the bottom of your chart paper.
- Use your collected words to write 3 sentences that capture the message from the article that you want to share with your colleagues.
- Each group will share their messages and one idea about how they might use the information from the article.

Speed Dating Reflection

What information from the articles you just discussed can you use to help increase the number of highly effective mathematics classrooms in your school?

Individual Reflections

Using the information from the articles you just discussed, revisit your group list of the characteristics of a highly effective mathematics classroom.

As you think more now about the list:

1. How do your current classroom practices align with those characteristics?
2. Would you change any of your placements on the Teaching and Learning Principles line?

NCTM *Principles to Actions* *Ensuring Mathematical Success for All*

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Next Steps

- How can you use these articles and protocols to enhance the math instruction at your school?
- Turn and talk:
 - What is your goal?
 - What will you do first?

Exit Questions

- What information from today's work about good mathematics instruction will you take back to your school to support students learning mathematics with understanding?
- What questions do you still have?
- What resonated well with you?
-

References:

VDOE 2017 Math Institutes: (all resources available online)

http://www.doe.virginia.gov/support/virginia_tiered_system_supports/training/cohort/2015/jan/supporting_the_mathematics_process_goals_through_research-based_teaching_practices.pdf

Principals and Teacher Leaders Partnering to Support High Quality Mathematics Instruction

Mathematics Standards of Learning for Virginia Public Schools, 2016

- Rigor has been increased
- Repetition has been decreased
- Retention and application of content from previous years is required
- Vertical alignment has been improved

Highly Effective Classrooms & Mathematics Standards of Learning

What do we know about the Mathematics Standards of Learning, 2016?

How do they clearly support teaching mathematics for understanding?

Introductory Statements - Jigsaw

- Assign an Introductory statement to each group member

1. Instructional Technology
2. Computational Fluency
3. Algebra Readiness
4. Equity



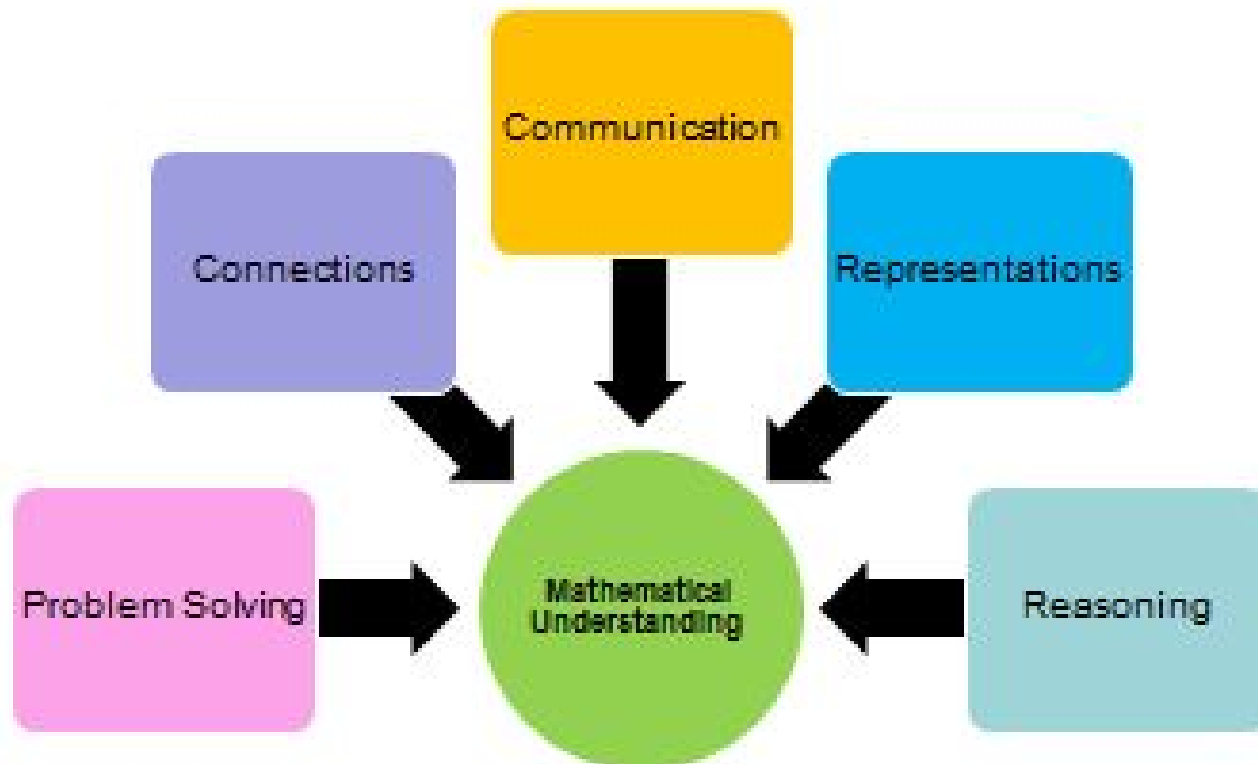
- Read the statement and underline or highlight important ideas that will help you to make meaning of the passage
- In round robin format, each group member will summarize their assigned statement for group
- As a small group, members will discuss each statement and the implications on mathematics instruction



Virginia's Process Goals for Students in Mathematics

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Learning More About the Process Goals- Expert Groups Read-Discuss-Create a Poster

Process Goal: _____

Key Points

In a recipe for classroom instruction that leads to mathematically proficient students-

Create an analogy:

The process goal _____ is like _____ because _____.