Math Coaching

Twitter Math Camp 2017 Morning Session

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#TMC17

#MathCoachTMC

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Month
Day
CALIFORNIA

Our Axioms

Teacher action is the difference.

"The greatest influence in the quality of the education that a student receives is the decisions that a teacher makes on a daily basis."

-- Dr. William Schmidt, University of Michigan

Leadership action is critical.

"Indeed, there are virtually no documented instances of troubled schools being turned around without intervention by a powerful leader."

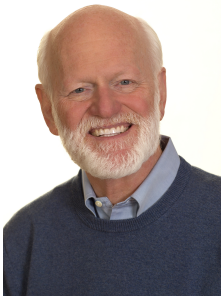
-- Dr. Kenneth Leithwood, University of Toronto

A program and a plan are imperative.

"The meta-research shows that math coaches are effective. We see small bumps in student data in years 1 & 2, and large spikes in years 3 & 4."

-- Dr. Maggie McGatha, University of Louisville

Coaches are the Bridge.



"Coaching is destined to be the leadership approach of the twenty-first century."

-- Marshall Goldsmith, *Coaching for Leadership*

The Bridge Builders

Vision
Followers
Humility
Influence

Passion
Faith
Focus
Impact

What is the vision for your math program?

Things you would see a your 21st Century classroom.

Your vision statement in 18 words of less.

Getting into the Classrooms
4 Major Coaching Models

Invitation

Rotation

Application

Prescription

Which are you working in?

Opportunities to Build Relationships

- **PLC Support**
- **PLC Participation**
- **Social Hangouts**
- **Cross Traffic**
- **Working Observations**
- **Handshake Introductions**
- **Visitations**
- _____
- _____
- _____

Jim Knight's

Principles of Partnership

Equity:
Instructional coaches and teachers are equals.

Choice:
Teachers should have choice in what and how they learn.

Voice:
Teachers should have opportunities to express their point of view.

Dialogue:
To arrive at mutually acceptable decisions, partners engage in authentic dialogue.

Reflection:
The freedom to consider ideas before adopting them is an integral part of professional learning.

Praxis:
Teachers should apply their learning as they learn.

Reciprocity:
Instructional coaches should expect to get as much as they give.

How Instructional Coaches Can Build Teachers' Trust

Carla Finkelstein of Towson University claims that there are plenty of reasons for resistance to being "helped" by an instructional coach:

- Teachers believing that they've been singled out as deficient;
- Fear of being judged and exposed as ineffective with students;
- Fear that deficiencies unrelated to the presenting issue will be revealed;
- A belief that the instructional coach may report on them to the principal;
- Worries about being admonished by the principal;
- Discomfort examining their own practice;
- Anxiety about having to change.

"The coach is responsible for mitigating resistance. Unless the coach successfully does this, many teachers never sincerely engage in the learning process."

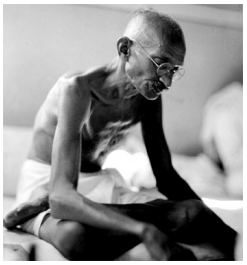
Finkelstein offers the following recommendations in building trust and overcoming resistance:

- *Let the teacher "drive" the process*.
- *Adopt a curious, problem-solving stance*.
- *Walk the walk*.
- *Communicate clearly and transparently*.

"Trust is not something coaches can achieve at some magical point and then ignore," Finkelstein concludes. "These recommendations are ongoing, recursive, and interconnected. Effective coaches attend to trust building at all times."

"Thank You So Much for the Truth!" by Carla Finkelstein in *Phi Delta Kappan*, April 2016 (Vol. 97, #7, p. 19-24)

How are you going to build your relationships?



The New Classroom

"In a nutshell, the CCSS expect that, instead of knowing the answer, students must now be able to create the answer, make claims and produce evidence from text to support their claims.

Instead of working mathematics problems, students must be able to apply mathematics concepts to real-world situations and write about their thinking in moving to a solution. This change requires a different style of instruction than what many have come to call "sit and get."

In the past, teachers have been giving students the answers and expecting them to give the answers back. Now, students must find the answers, demonstrate understanding by applying their knowledge to real-world situations and explain them in writing. That means that, in most cases, teachers will have to encourage much more student work and student discourse and engage in far less teacher talk."

-- Achieve The Core

Guiding Principles for School Mathematics

Full statements of the Guiding Principles follow; *Principles to Actions* elaborates the unique importance of each, as summarized briefly below each statement. The first Guiding Principle, Teaching and Learning, has primacy among the Guiding Principles, with the others serving as the Essential Elements that support it.

Teaching and Learning.

An excellent mathematics program requires effective teaching that engages students in meaningful learning through individual and collaborative experiences that promote their ability to make sense of mathematical ideas and reason mathematically.

Access and Equity

An excellent mathematics program requires that all students have access to a high-quality mathematics curriculum, effective teaching and learning, high expectations, and the support and resources needed to maximize their learning potential.

Curriculum

An excellent mathematics program includes a curriculum that develops important mathematics along coherent learning progressions and develops connections among areas of mathematical study and between mathematics and the real world.

Tools and Technology

An excellent mathematics program integrates the use of mathematical tools and technology as essential resources to help students learn and make sense of mathematical ideas, reason mathematically, and communicate their mathematical thinking.

Assessment

An excellent mathematics program ensures that assessment is an integral part of instruction, provides evidence of proficiency with important mathematics content and practices, includes a variety of strategies and data sources, and informs feedback to students, instructional decisions, and program improvement.

Professionalism

In an excellent mathematics program, educators hold themselves and their colleagues accountable for the mathematical success of every student and for personal and collective professional growth toward effective teaching and learning of mathematics.

Effective Mathematics Teaching Practices
Establish mathematics goals to focus learning. *Effective teaching of mathematics establishes clear goals for the mathematics that students are learning, situates goals within learning progressions, and uses the goals to guide instructional decisions.*
Implement tasks that promote reasoning and problem solving. *Effective teaching of mathematics engages students in solving and discussing tasks that promote mathematical reasoning and problem solving and allow multiple entry points and varied solution strategies.*
Use and connect mathematical representations. *Effective teaching of mathematics engages students in making connections among mathematical representations to deepen understanding of mathematics concepts and procedures and as tools for problem solving.*
Facilitate meaningful mathematical discourse. *Effective teaching of mathematics facilitates discourse among students to build shared understanding of mathematical ideas by analyzing and comparing student approaches and arguments.*
Pose purposeful questions. *Effective teaching of mathematics uses purposeful questions to assess and advance students' reasoning and sense making about important mathematical ideas and relationships.*
Build procedural fluency from conceptual understanding. *Effective teaching of mathematics builds fluency with procedures on a foundation of conceptual understanding so that students, over time, become skillful in using procedures flexibly as they solve contextual and mathematical problems.*
Support productive struggle in learning mathematics. *Effective teaching of mathematics consistently provides students, individually and collectively, with opportunities and supports to engage in productive struggle as they grapple with mathematical ideas and relationships.*
Elicit and use evidence of student thinking. *Effective teaching of mathematics uses evidence of student thinking to assess progress toward mathematical understanding and to adjust instruction continually in ways that support and extend learning.*

8 Practices

Mathematical Practices

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Teaching Students to

THINK, COMMUNICATE, COLLABORATE & CREATE

through Effective Teaching Principles

4 Claims:

Concepts & Procedures, Problem Solving, Communicate Reasoning, Modeling & Data Analysis

Math Goals

(Dual Targets)

Content Target:

Practice Target

COMMON CORE STATE STANDARDS INITIATIVE

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Representations

(Multiple Representations)

Meaningful Discourse

(Feedback)

Purposeful Questioning

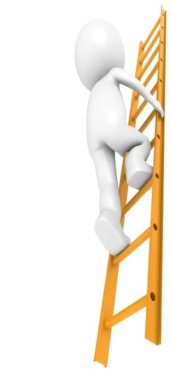
(Dig Deeper & Reach Higher)

Procedural from Conceptual

(Progression)

Tasks & Access

(Engagement & Low Floor/High Ceiling)



Productive Struggle

(Monitor & Adjust)

Evidence of Student Thinking

(Collect & Reflect)

Rigor: Fluency, Deep Understanding, Application, Dual Intensity

The Hour Glass of Coaching Conversations

Affirm
Frame
Listen
Ask
Tell
Results
Encourage
Offer
Follow-Up

= 

≠ 

How will you serve the new 21st Century classroom?

3 Giant Needs of Teachers

Time

Resources

Training

Need	Systems	Structures
Time	**Pre-Conferences** **Post-Conferences**	**Late Starts** **Release Days** **New Staff Meetings**
Resources	**"Curate, don't create"**	**Google Drive** **Wed Site** **Learning Management System (Haiku)** **180 Blog**
Training	**Elbow Coaching** **Observation** **Feedback** **Long-Term P.D.** **After School P.D.**	**Lesson Study** **Learning Walks** **Hotties** **Peer Fairs/Mini-Conferences**

Great Oak High School Release Day Note Format

Members in Attendance:

Norms

➢

Strengths

➢

Obstacles

➢

UPO Analysis

(*) Common Core Standard (*if priority)
Academic Vocabulary:
- ➢ Unwrapped Concept (Students need to know)
  - o Unwrapped Skill/Sub Skills (Students need to be able to do)
    - ▪ DOK Level
      - • CIA Questions (e.g. CR #3, SR #5, PT #1)

CCSS Notation - Standard text
Academic Vocabulary:
- ➢ Unwrapped Concept (Students need to know)
  - o Unwrapped Skill/Sub Skills (Students need to be able to do)
    - ▪ DOK Level
      - • CIA Questions (e.g. CR #3, SR #5, PT #1)

CIA Decisions

➢

Planning/Schedule/Lessons

➢

Resources

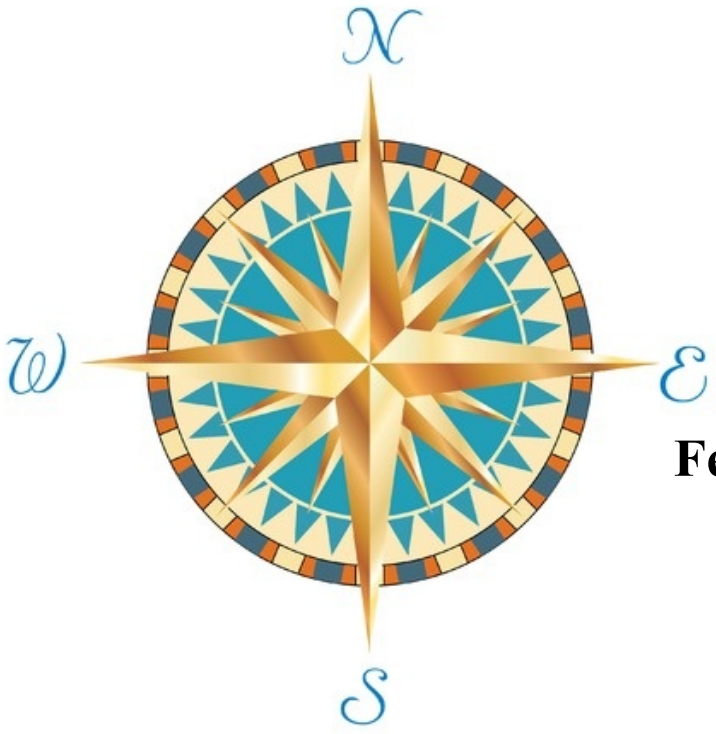
➢

Parking Lot Discussions

➢

Ways to Influence

Advocate for the 3 Giant Needs: Time/Resources/PD & Educate Them



Meet and Learn with your Fellow Math Coaches

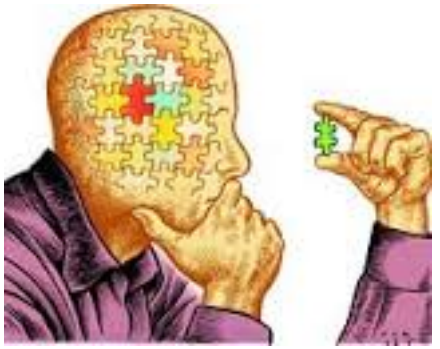
- **Frame the Dialogue**
- **Communicate Best Practices**
- **Fulfill their 3 Giant Needs**
- **Relentlessly Advertise**
- **Show & Share Results**
- **Teach like a 21st Century Champion**
- _____
- _____

The Spectrum of Coaching Effectiveness

Spectrum of what teachers want.

Resources

Co-Teaching



Teacher Reflection

Spectrum of what works.

Dr. Maggie McGatha, University of Louisville, NCSM, Boston, 2015

Coaches' Top 20
Ranked Results of Math Coaches Survey of Important Topics
Provided by So Cal Math Specialists Network

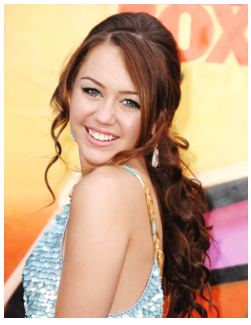
1) **Math Performance Tasks**
2) **SBAC/PARCC information, resources and how to use them**
3) **Pedagogy**
4) District assessments
5) **Supporting teachers with increasing content knowledge**
6) **Professional development ideas, including the role of administrators**
7) **Good sites or resources**
8) **"Those Kids," How to support struggling and unmotivated learners**
9) Building relationships with teachers, administrators, and others
10) Role of professional social media (Twitter, blogs, Edmodo, etc.)
11) Math Apps
12) Coaching Models
13) The new state data and reports
14) Course Pathways & Placement
15) CCSS progression documents/ Unit Planning Organizers
16) Textbooks adoption/piloting
17) Community inclusion
18) State framework document & unpacking of standards
19) Classroom management
20) STEM connections

BOLD Type: 7 of the top ten correlate with the 3 Giant Needs of teachers.

What do you need from your North?

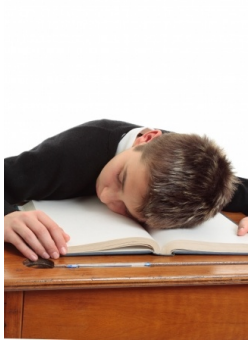
What do you need from your East/West?

What do you need for your South?



Passion

No-Options Engagement



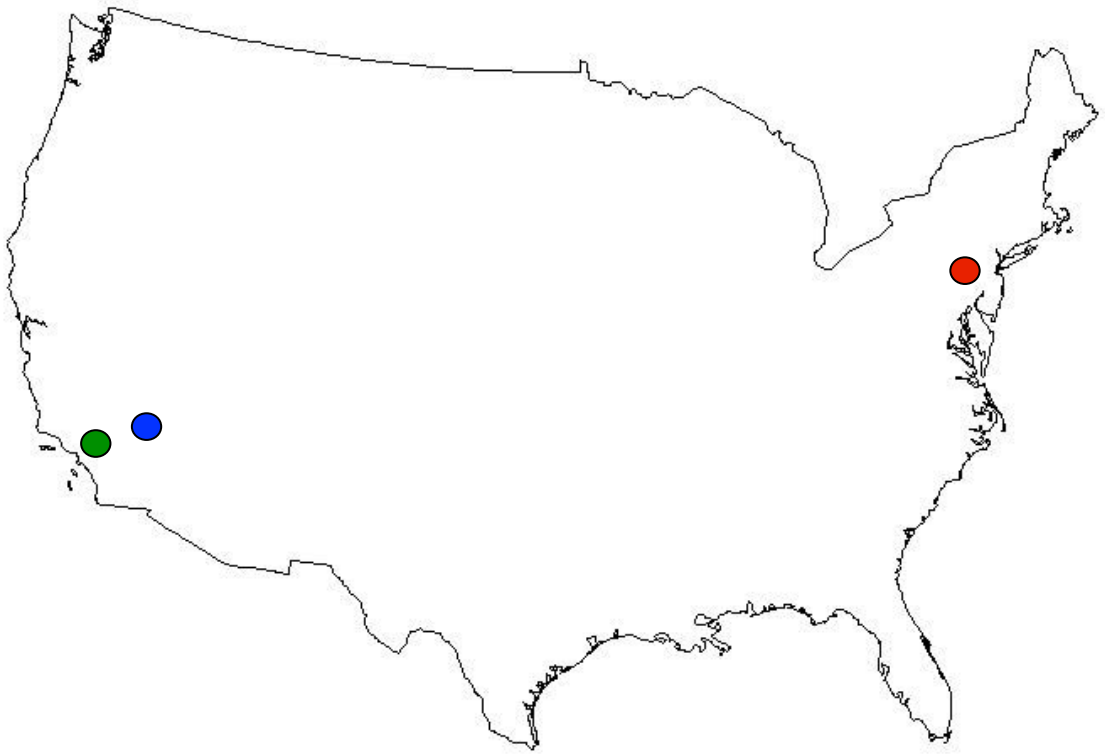
- Demand Their Best Effort. It is the most loving thing we can do.
- No-Options: Make failure more painful than success.
- Engagement: No Quiet Deals, No Gravity Storms.
- 100% Gradebook
- It's not an issue of knowledge; it's a matter of will.

Boot Camp Numeracy

- Numeracy is the #1 indicator of math success.
- Students don't flunk current content; they flunk prior content.
- Refresh, Refine & Accelerate.
- Before a lesson, week, or unit.
- Use your textbook pre-assessment for prerequisite skills

Which Passion resonates most?
(No-Options Engagement,
Boot Camp Intervention)

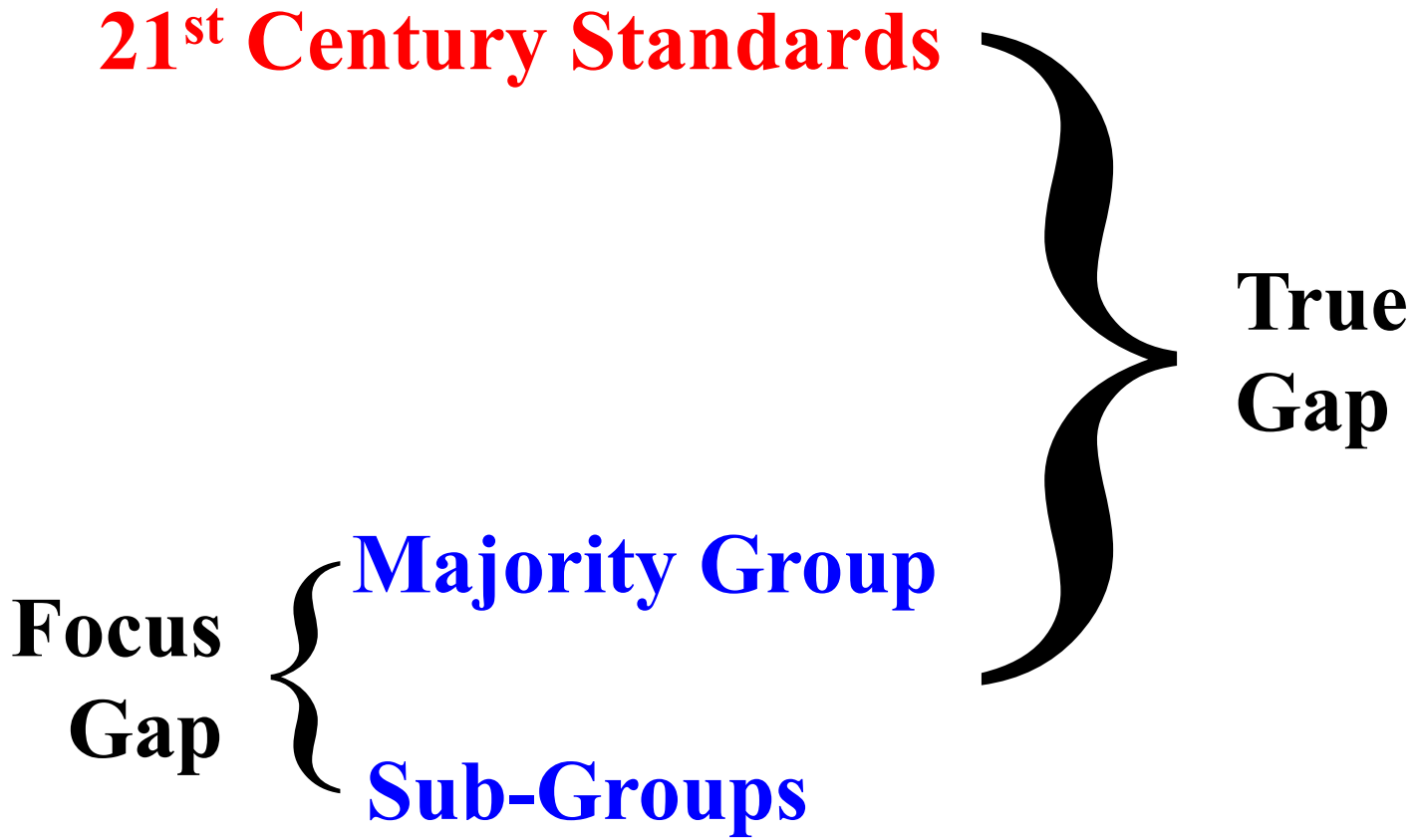
Which Teachers Do You Want to Move?



GOAL = MOVE THE WHOLE TRAIN

MOST POTENTIAL = AVERAGE TEACHERS

Close the True Gap



Collect and Reflect

Compare

Team Data to the Goal

not

Teacher Data to Teacher Data

TVUSD Secondary Mathematics

Mile Markers
Purpose & Directions
End of Year Math Performance Task Anchor Papers

Purpose

As we travel down the road towards teaching students 21st Century, we need "Mile Markers" to show us how much progress we are making. That progress is measured in the students' ability to Think & Communicate, therefore, we need some evidence from year to year on our improvement in this endeavor.

Since the Performance Task is the best indicator of our progress with the new standards, our Semester 2 Final PT can easily serve as that piece of evidence. Rather than write these ourselves, course leaders chose from a set of professionally vetted tasks for each core math class. (Math 6, 7, 8, Accelerated 7, 8, Compacted 6, 7, 8, Algebra 1, Geometry, Algebra 2).

Since we are on this journey together, ONE collective set of THREE samples for each these Mile Markers (a high, medium and low anchor paper) will serve as our odometer. That will allow us to look at *our* results from year to year, and assist us in our collaborative instructional decisions.

Directions

All you need to do is …

1) Give the Semester 2 CIA Performance Task sometime within the last 2 weeks of the school year. Strands at each site should agree upon the same day.
2) Don't "grade" the task. Simply sift through and sort into piles of High, Medium and Low. From those categories, chose ONE High, One Medium, and One Low example.
3) Give these THREE samples to your Department Chair.

A Math Coach will collect these samples from your site's Department Chair. From these samples, the Math Coaches will select one high, one Medium and one Low example for each secondary core math course. These will be entirely anonymous. Any students' names will be blanked from photocopies. Please do not have teacher or school names on the papers.

These three examples will serve as the "District Mile Markers" for the next year. They will be posted on the math web site and shared in the Google drive for our collaborative use.

Thank you in advance for your cooperation.

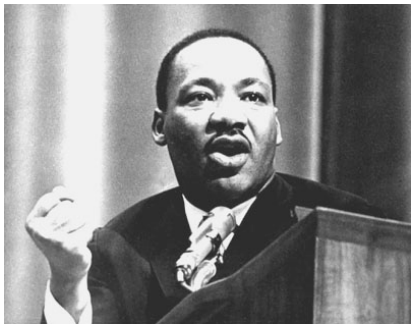
Gratefully,
Your Math Coaches

Leading & Lagging Indicators

Leading (inputs/control)

Lagging (outputs/goals)

What will be your progress monitoring protocols?



The Mindset Shift

Fixed Mindset → Growth Mindset ….

… of the teachers!

They are that smart

&

We are that good!

What excuses and distractions do you need to eliminate?

Ditch Meeting

My burning question is …

The answers I received are…

Math Team TVUSD

8-Year Plan (2013-21)

Our Noble Cause

21st Century Skills

Think & Communicate

Claims-Based Grading

Technology

PLC Focus =

What do we do when they know it?

Mile Marker

Principles to Action
Lesson Study (SMP)
Learning Walks (ECI)

No Option Engagement

PLC Focus =

What do we do when they don't know it?

Mile Marker
CAASPP

Principles to Action
1st Instruction Training
(Progression:
Conceptual > Procedural > Practice
thru Tasks)

Boot Camp Intervention
(Tier 2)

Data Analysis/External Measures
(MDTP)

Revisit Pathways/Placement

PLC Focus =

How do we know if they learned it?

Mile Marker
+2% Final Exam
+1% EAP
CAASPP

Curriculum Support
UPO's/Pacing Guides/CIA's
Resources
Release Days (District & Site Strands)
After School Content Training

Boot Camp Intervention
(Tier 1)

Rubric Grading/ Calibrate Grades

PLC Focus =

What do we want them to learn?

Mile Marker
+2% Final Exam
+1% EAP
CAASPP

Infrastructure
Dual Web Site: Blog & Haiku
Organic Curriculum

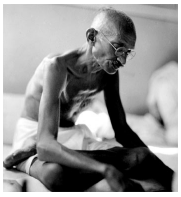
MATH COACHES /*TEACHERS* / STUDENTS

IMPACT

21st Century Classroom Action Plan for _____

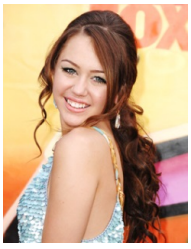
How will you …

Communicate your **Vision**?



Develop ***Relationships***?

Serve your teachers in ***The New Classroom****?*



Influence your **North?** Your **East & West?** Your **South***?*

Fire up your teachers for ***Engagement*** **and** ***Boot Camp***?

Develop your **PLC/Data Collection** protocols? (Move the whole train.)

Clear the **Donkeys** from the Bridge?

Other Ingenious Ideas:

Next Steps:

Quotes on Math Coaching

A coach is a trusted friend to educators,
a colleague,
a sounding board, and
a witness to the good.

-- Jim Knight

The purpose of the Instructional Coaching Model is to help close the student achievement gap and accelerate learning for all students by building teacher capacity through implementation of effective instructional practices

-- Katherine Casey

We have found that the single factor common to every successful change initiative is that relationships improve. If relationships improve, things get better. If they remain the same or get worse, ground is lost.

-- Jim Knight

Coaches move a school forward one conversation at a time.

-- Jim Knight

For both our students and our teachers, we need a more noble destination than the end of Unit 10 by the end of June.

-- Chris Shore

Few people can be more confident that they are making a difference than a coach. If you want to make our world a better place, there are few ways more powerful than being a coach.

-- Jim Knight