

Building a Foundation for Mathematical Rigor at Your School



Introductions

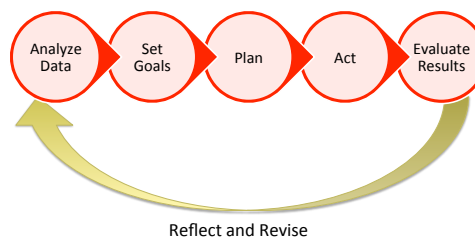
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Learning Intentions & Success Criteria

- Participants will organize a framework of professional development that is tailored to the needs of their school and that will result in increased rigor throughout the building.
- I can apply the framework to the needs of my school.
- I can describe the steps of the framework for planning mathematics professional development.

Professional Learning Framework



Framework

Where to Begin

Considering the adult learner, we need to keep in mind that whatever we do, it needs to be concise, targeted, and presented in a respectful manner.

In her book, *Learning to Listen, Learning to Teach*, Jane Vella states, "Listening to learners' wants and needs helps shape a program that has immediate usefulness to adults."

Needs Assessments

Our elementary teachers, early career or veteran, are faced with teaching a curriculum that most likely does not represent the manner in which they learned math, the way they were taught to teach, or the way they have been teaching. Therefore they are being asked to teach math that they might not understand. In order to build the depth for our students, we need to support our teachers.

Data

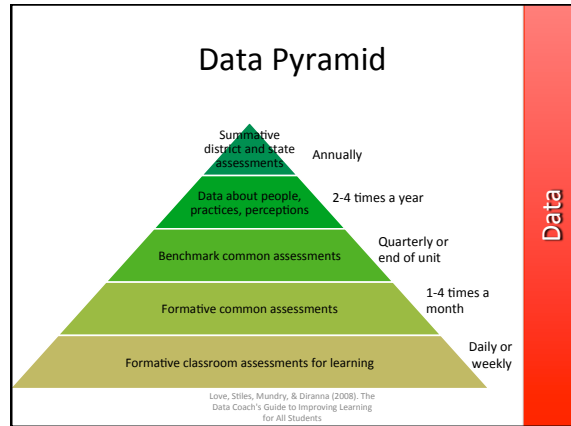
Needs Assessment Examples

[CCSS Toolkit: Needs Assessment](#) (Oregon)

[Survey of Instructional Practices: Grades K-12 Mathematics \(CCSSO\)](#) (2012)

[Nebraska MSP Needs Assessment](#) (2015)

Data



Caution

- Students in low-ability classes and low income school often have fewer opportunities to engage in higher-order thinking, problem solving and rigorous mathematics.

Data



Four Goals for Professional Development

- Student learning
- Teacher learning
- Teaching practice
- Organization

Set Goals

Interconnected Outcomes

- Enhancing teachers' knowledge
- Enhancing quality teaching
- Developing leadership capacity
- Building professional learning communities

Set Goals

So, What's Next?

Once you have determined the needs of your staff, the work begins.

1. Identifying groups with similar deficits
2. Planning a course of action that identifies the who, what, and when of the professional development.

Set Goals

Reflect



Plan

- Once goals are set...choose strategies
 - Given the goals, what is the best combination of strategies we should implement?
 - If the goals are focused on increased content knowledge, what strategies should we use?
 - What strategies will help teachers translate their new knowledge into improved classroom practice?
- Develop a plan and timeline for what evaluation data to gather and how

Plan

Strategies: Four Clusters

- Immersion in Content, Standards, and Research
- Examining Teaching and Learning
- Aligning and Implementing Curriculum
- Professional Development Structures

Plan

Immersion in Content, Standards, and Research

- Curriculum topic study
- Immersion in problem solving in mathematics
- Content courses

Plan

Examining Teaching and Learning

- Examining student work and thinking
- Demonstration lessons
- Lesson study
- Action research
- Case discussion
- Coaching
- Mentoring

Plan

Aligning and Implementing Curriculum

- Instructional Materials Selection
- Curriculum Implementation

Plan

Professional Development Structures

- Study groups
- Workshops, institutes, seminars
- Professional networks
- Online professional development

Plan

Math Content

In their 2014 study, Campbell, Nishio, Smith, etc. "identified a significant relationship between upper-elementary teachers' mathematical content knowledge and their students' mathematics achievement."

Plan

Options


- District/state endorsement classes
- Self study programs
- On site
 - When: PLC's, before/after school
 - Who: In-house math expert, district coach
 - Consider: vertical teams, time limits of 30 minutes, CRA approach to all topics

Plan

Reflect



Monitoring Implementation

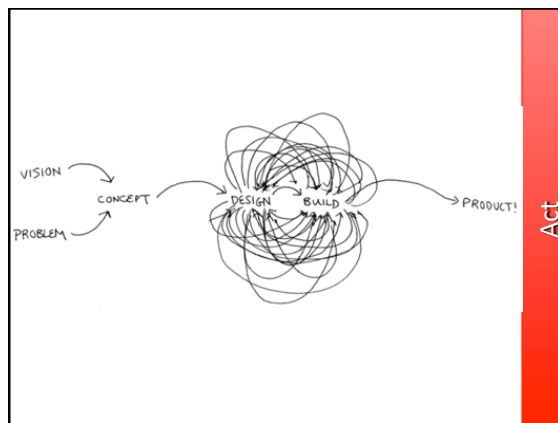


Act

Monitoring Implementation

- Need to monitor...
 - How are teachers reacting to and engaging with the content?
 - What adjustments do we need to make?
 - What are they learning?
 - What are they having difficulty with? How will we reteach it?
 - How can we support them to set realistic goals for taking their learning back to the classroom?

Act



Beyond Content

We know that the content standards build as students move up through the grades, so we have to ensure that the opportunities for discourse, writing, and problem solving (math tasks) also build as students grow.

Act

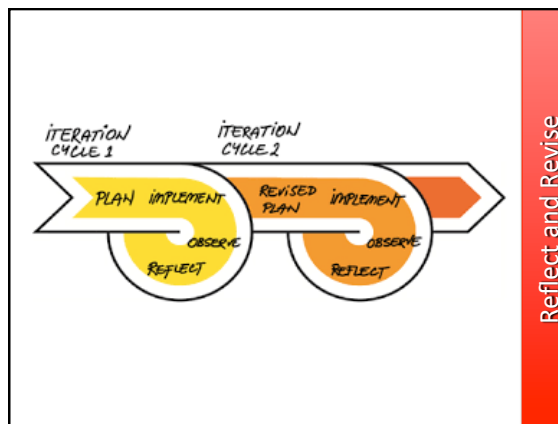
Reflect

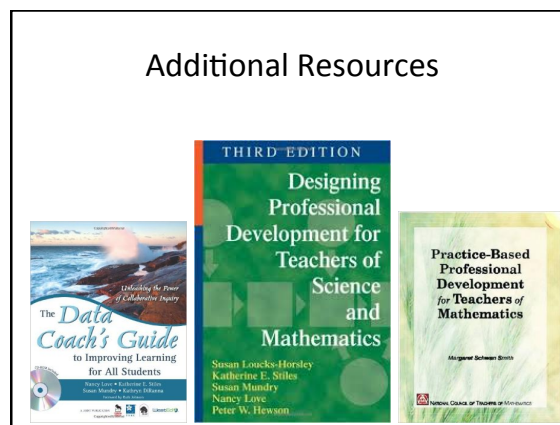
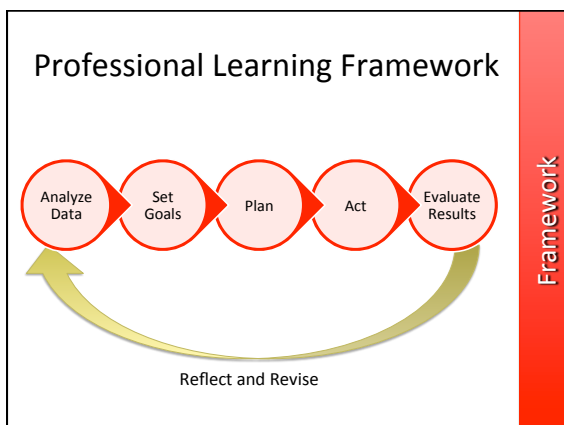


Evaluating Effectiveness

- What are the goals or desired outcomes?
- What evidence would demonstrate accomplishment of the program's outcomes?
- How do you gather data on program outcomes and evaluate changes in practice over time?
- How do you take advantage of evaluation as a learning experience?

Evaluate Results





THANK YOU

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