

Contributing to a Culture of Coaching for Numbers and Operations

John Sutton
Arlene Mitchell
Clare Heidema

National Council of Teachers of Mathematics
New Orleans, LA
April 10, 2014



Rate this presentation on the conference app!
www.nctm.org/confapp

Download available presentation handouts from
the Online Planner! **www.nctm.org/planner**

Join the conversation! Tweet us using the
hashtag **#NCTMNOLA**

Research Contributors



University of Idaho

Principal Investigators

Elizabeth A. Burroughs, Montana State University

John Sutton, RMC Research Corp.

David Yopp, University of Idaho

Contributing Researchers

Mark Greenwood, Megan Higgs, and Jennifer Luebeck (Montana State University);

Clare Heidema, Dan Jesse, Brandie Good, and Arlene Mitchell (RMC Research Corp.)



Funded under NSF Award No. 0918326. Any opinions expressed herein are those of the authors and do not necessarily represent the views of the National Science Foundation.

Welcome!

In this session, you will learn about:

- a definition of a mathematics coach;
- the multiple roles of a mathematics coach;
- characteristics of a coach;
- the instructional coaching cycle; and
- setting expectations to create a culture of coaching for your school.



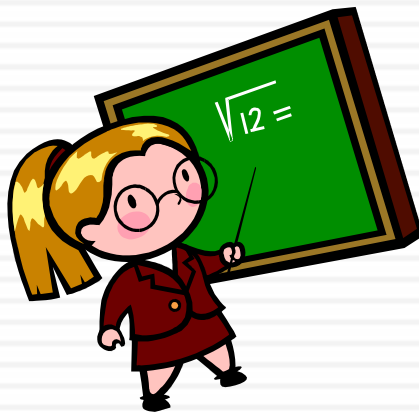
(Re) Introductions



- Pair up with someone, preferably someone you do not know yet.
- Spend **two** minutes introducing yourselves to each other. Jot down notes if you want.
 - Name
 - School & Grade Level(s)
 - Something that probably makes this person unique in the room
- (In a workshop setting) When the two minutes are up, introduce your partner to the full group.



Rationale and Coaching Roles



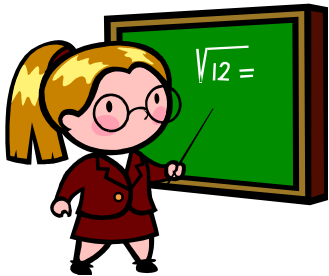
MATHEMATICS COACHING

Mathematics classroom coaching is gaining popularity as a school-based effort to increase teacher effectiveness and student achievement.

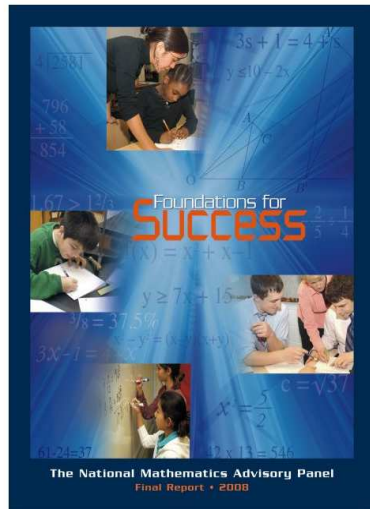


MATHEMATICS COACHING

- Coaching is a promising model for enhancing K-8 mathematics teachers' abilities to provide quality mathematics education.
- Coaching can be implemented at any point in a teacher's career (as opposed to mentoring).

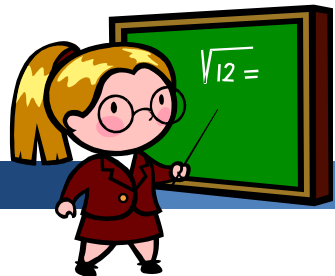


MATHEMATICS COACHING



The National Mathematics Panel (2008) reports that schools across the nation are using mathematics specialists, including mathematics coaches.

What makes for effective coaching in mathematics is being researched at various sites across the United States.



MATHEMATICS COACHING

- Studies are demonstrating what types and depths of knowledge effective mathematics coaches hold.
- Implementing mathematics coaching involves cost and logistical effort for schools and districts.

MATHEMATICS COACHING DEFINED



How do you define “**coaching**?”

What images and phrases come to mind when you think of a **coach**?

Reflect for a few minutes...list your ideas... then we'll share thoughts as a group.



Coaches have many names...
...and many responsibilities.



Ten Roles for Coaches

(Killion, 2009)



- Data coach
- Resource provider
- Mentor
- Curriculum specialist
- Instructional specialist
- Classroom supporter
- Learning facilitator
- School leader
- Catalyst for change
- Learner

Underneath the titles and tasks,
there are certain
characteristics that are shared
by all good coaches.



Characteristics of a Coach

- Stands alongside teacher.
- Doesn't do the work for teacher.
- Supports teaching efforts, even if he/she is not necessarily an "expert."
- Knowledgeable of classroom situation, its challenges and how to overcome them.



What teachers appreciate about coaches . . .



- Oversight of curriculum fidelity and pacing
- Gathering, analyzing, and sharing data
- Finding resources and answering questions
- Team building and facilitating discussion
- Helping with parents, resources, administration
- Reducing the workload

What teachers **desire** from coaches . . .



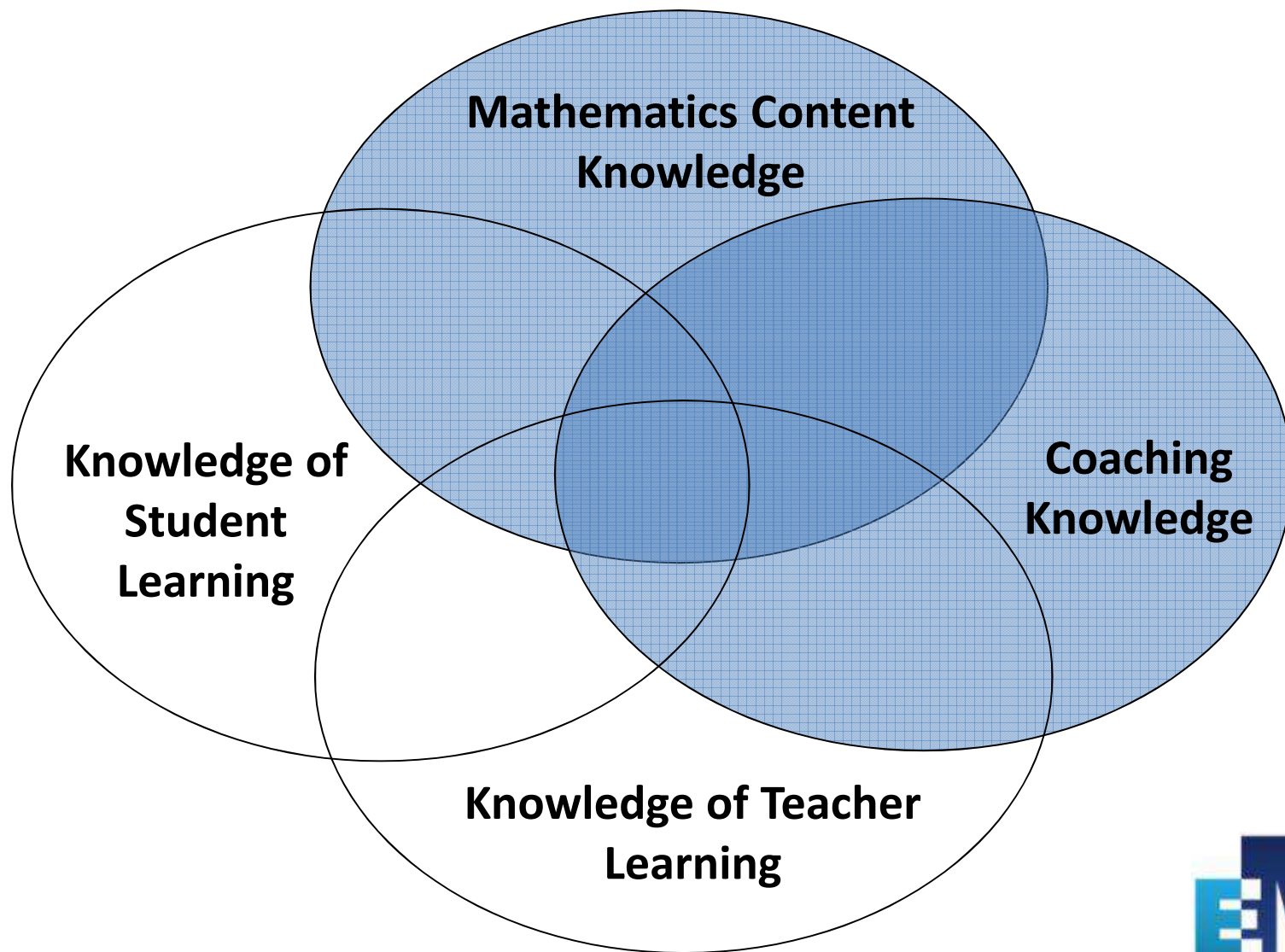
- One-on-one work
- Observation and feedback
- More observation and feedback
- Modeling lessons and strategies
- Help with: differentiation, cultural relevance, student engagement, assessment

MATHEMATICS COACHING DEFINED

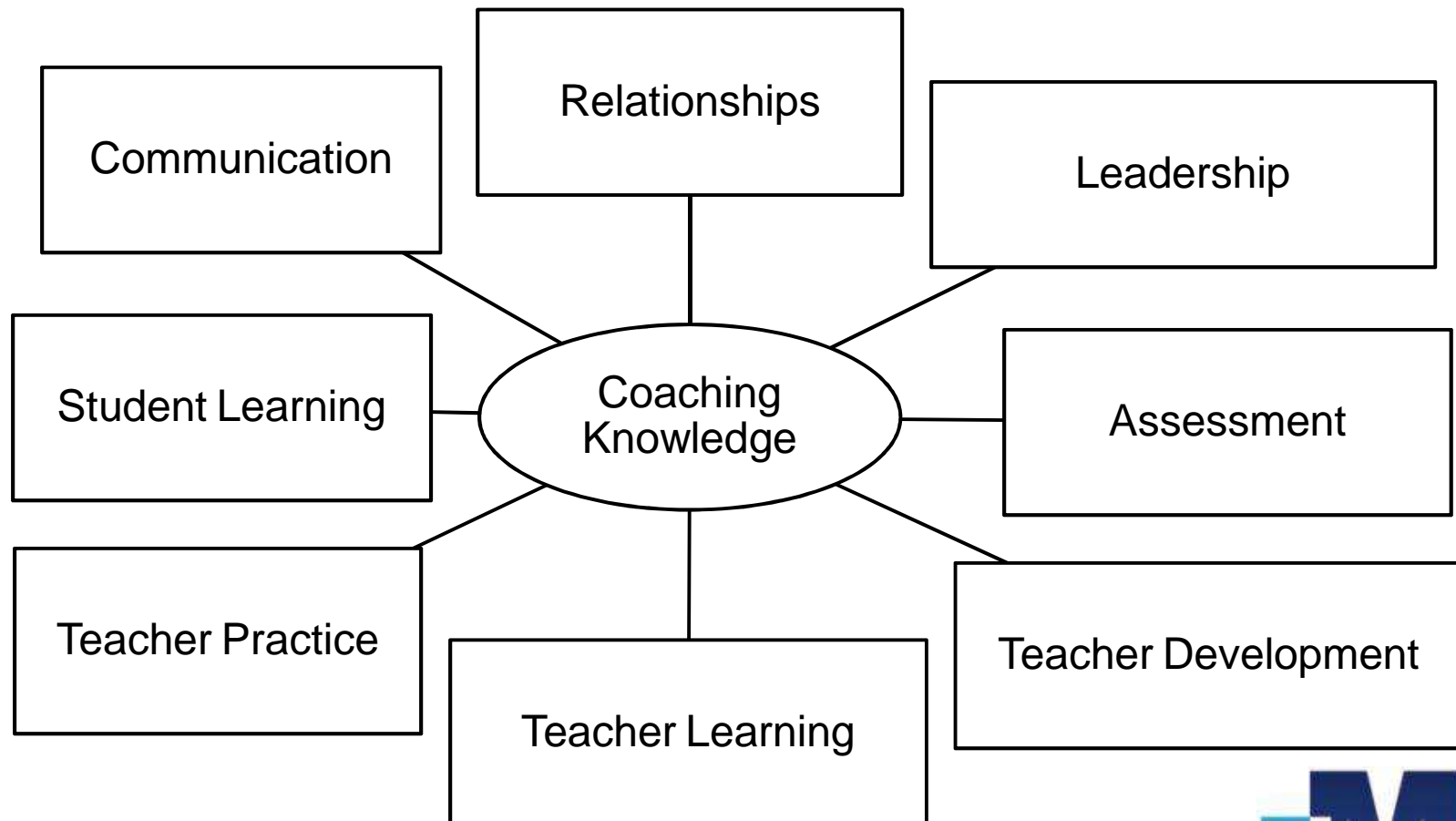
A mathematics coach is an **on-site professional developer** who enhances teacher quality through **collaboration** focusing on **research-based, reform-based, and standards-based instructional strategies and mathematics content** that includes the **why, what, and how** of teaching mathematics.



COACHING KNOWLEDGE DOMAINS



Coaches know about mathematics content and . . .



EFFECTIVE COACHING PRACTICE

A coach should:

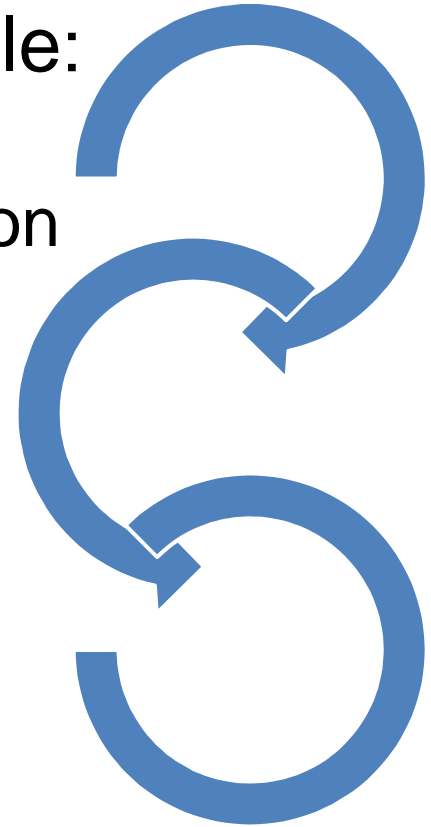
- Ask reflective questions
- Provide feedback
- Share materials and resources
- Maintain confidentiality



EFFECTIVE COACHING PRACTICE

A coach should use a coaching cycle:

- ▣ Gather information before the lesson
- ▣ Observe a complete lesson
- ▣ Collect and document evidence
- ▣ Debrief and reflect after the lesson



BOUNDARIES OF COACHING

A coach generally does not:

- ❑ Evaluate teachers.
- ❑ Take over during a lesson.
- ❑ Impose specific lessons or instructional strategies.
- ❑ Tutor struggling students.
- ❑ Perform the support services of an aide.

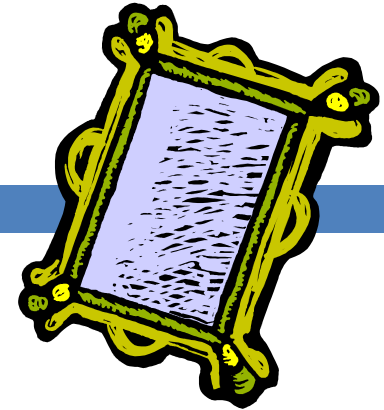


To make the most of coaching...

- ...focus on instructional issues.
- ...focus on mathematics content.
- ...follow a coaching framework.
- ...follow a coaching schedule.
- ...work collaboratively with your teachers and school administrator(s).



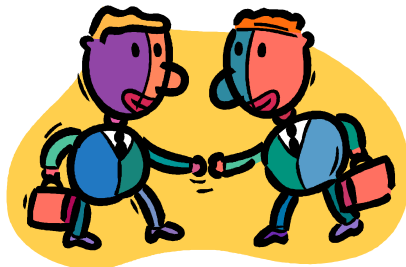
WHAT'S MISSING FROM THE PICTURE?



- The coach is not the only one responsible for **partnership, relationship, and collaboration.**
- Coaches are only as effective as their teachers will allow.

COMPLEXITY OF COACHING

- Coaching is a collaborative process that is done with teachers, not to teachers.
- Coaching is a joint effort from both the coach and the teacher(s) involved.
- Coaching support is useful only if the teacher and coach are prepared, and willing to listen, internalize, and respond accordingly.





BECOMING CONSUMERS OF COACHING

A commitment to creating a collaborative and rewarding coaching relationship will help maximize the benefits of coaching.

- A wise consumer of coaching makes the most of this educational investment.
- Consumer of coaching addresses the teacher's role in coaching process.

BECOMING CONSUMERS OF COACHING



Discuss with a neighbor:

***What might be the expectations
from teachers
who are being coached
in order
to make coaching
effective and collaborative?***

CONSUMER OF COACHING FRAMEWORK



- Feedback
- Reflection
- Classroom expectations
- Content
- Structure
- Communicating needs

FEEDBACK

- Effective coaching requires feedback.

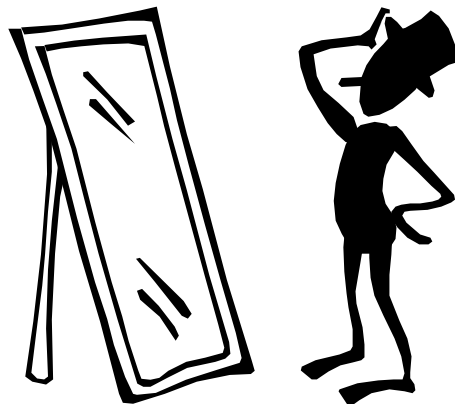
An effective consumer of coaching asks the coach for targeted feedback.



REFLECTION

- Coaching is a reflective process.

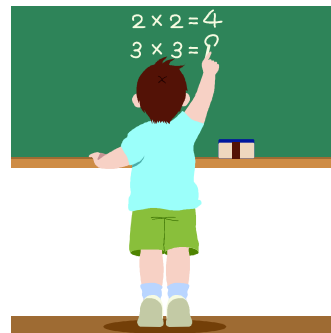
An effective consumer of coaching is open to reflection and is an active participant in the reflective process.



CLASSROOM EXPECTATIONS

- Effective coaching requires teachers to communicate their expectations for coaches as the lesson transpires.

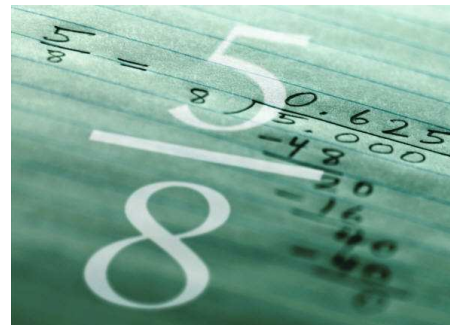
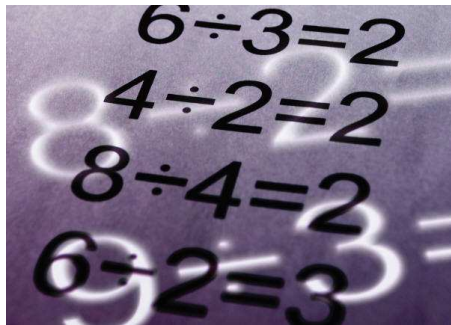
An effective consumer of coaching tells their coach what kind of classroom interaction he/she desires.



CONTENT

- Effective coaching is content-based.

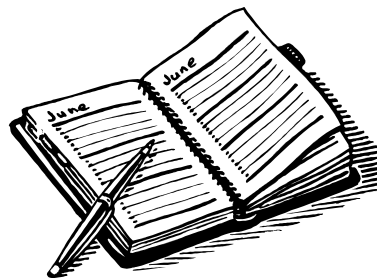
An effective consumer of coaching is willing to examine her or his own mathematics content knowledge.



STRUCTURE

- Effective coaching is structured and involves at least three components:
a pre-lesson conference, a lesson observation,
and a post-lesson conference.

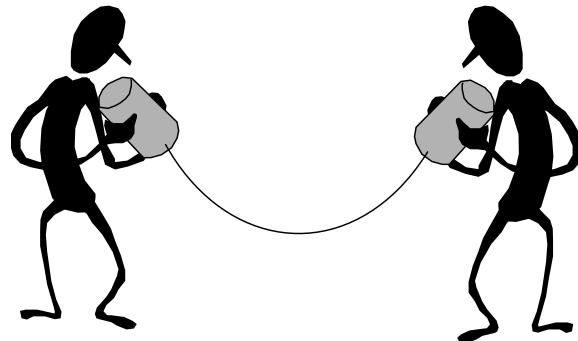
*Effective consumers of coaching
help coaches schedule the 3-part cycle.*



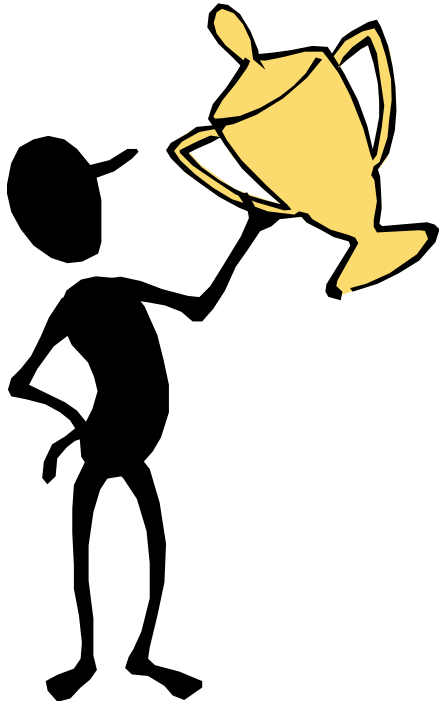
COMMUNICATING NEEDS

- Effective coaching requires teachers to communicate their needs.

An effective consumer of coaching tells the coach what he/she needs.



CONSUMERS OF COACHING ARE ABLE TO:



- assess their own needs;
- assess their performance;
- ask for help from others;
- provide context as needed;
- listen to and hear ideas;
- overcome anxious feelings;
- assess and communicate needs;
- assist in scheduling.

Coaches and Administrator

Coaches and teachers need to keep administrators informed of your activities and help them identify ways to support you.

How can coaches and administrators (and other school personnel) support each other in the mathematics coaching process?



Administrator Support



- Acknowledge the significance and value of coaching to improved practice and student learning.
 - Advocate to the school community for coaching as a professional learning model.
- Support time commitment for coaching.
 - Ask about progress and what each are learning, in general terms.
- Communicate clear expectations to everyone for shared responsibilities.
 - Cultivate a positive, productive relationship among teachers and coaches



Culture of Coaching

School Leaders	Mathematics Coach	Teacher
<ul style="list-style-type: none"> • Commit to implement coaching as a professional development model • Set aside time for coaching within the daily schedule • Share goals and beliefs of coaching to entire school • Articulate clear expectations for coaching • Budget appropriate resources (time and personnel) to support coaching • Make mathematics coaching a priority 	<ul style="list-style-type: none"> • Ask reflective questions of teachers • Provide feedback to teachers • Share instructional materials and resources • Maintain confidentiality with teachers about coaching sessions • Use a structured approach for coaching: <ul style="list-style-type: none"> ○ Gather information before the lesson ○ Observe complete lesson ○ Collect and document evidence from lesson ○ Debrief and reflect with teacher after lesson • Be flexible and dependable • Make mathematics coaching a priority 	<ul style="list-style-type: none"> • Communicate specific instructional needs to coach • Ask for specific types of support from the coach • Listen to hear ideas being presented • Take shared responsibility for cultivating a positive and productive coaching relationship • Set aside appropriate amount of time for coaching sessions • Be open to try new instructional practices • Make mathematics coaching a priority

Coaching and Number Sense: Scenario on Fraction Models

Roles

- **Coach**
- **Teacher**
- **Observer**

Process

- Individual prep (quiet time): 4 minutes
- Role play: 5 minutes
- Debrief: 6 minutes
 - 1st: Observer
 - 2nd: Teacher
 - 3rd: Coach
- Large group discussion: 5 minutes

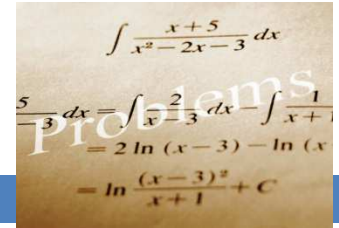
Coaching and Number Sense: Multiply or Divide?

Which of the following problems are solved by:

$$2\frac{1}{2} \times \frac{3}{4} \text{ OR } 2\frac{1}{2} \div \frac{3}{4}?$$

1. How many cups of sugar do you need to make $\frac{3}{4}$ batch of cookies if a full batch takes $2\frac{1}{2}$ **cups of sugar**?
2. How many posters can you paint with $2\frac{1}{2}$ **cans of paint** if **one** poster takes $\frac{3}{4}$ can of paint?
3. How many pounds of birdseed do you need to fill a bird feeder if $2\frac{1}{2}$ **pounds of birdseed fills the bird feeder** $\frac{3}{4}$ **full**?
4. What is the area, in square yards, of a rectangular garden that is $2\frac{1}{2}$ **yards long by** $\frac{3}{4}$ **yard wide**?
5. How many servings of lemonade can you make if you have $2\frac{1}{2}$ cups of lemonade and a serving is $\frac{3}{4}$ cup?

Coaching and Number Sense: SBAC Released Item



43048



Choose True or False for each equation.

- A. $37 \times 4 = 1,480 \div 10$ True False
- B. $215 \times 39 = 2,487 \div 3$ True False
- C. $4,086 \times 7 = 32,202$ True False
- D. $9,130 \times 86 = 785,180$ True False

We appreciate you joining us today!



Rate this presentation on the conference app!
www.nctm.org/confapp

Download available presentation handouts from
the Online Planner! **www.nctm.org/planner**

Join the conversation! Tweet us using the
hashtag **#NCTMNOLA**

Thank you!

<http://www.math.montana.edu/~emc>

John Sutton, sutton@rmcres.com

Arlene Mitchell, mitchell@rmcres.com

Clare Heidema, cheidema@comcast.net



HOW TO BE *a* WISE CONSUMER *of* COACHING

STRATEGIES TEACHERS CAN USE TO MAXIMIZE
COACHING'S BENEFITS

By David Yopp, Elizabeth A. Burroughs,
Jennifer Luebeck, Clare Heidema, Arlene Mitchell,
and John Sutton

Instructional coaching is gaining popularity as a school-based effort to increase teacher effectiveness and student achievement. A coach can be broadly defined as a person who works collaboratively with a teacher to improve that teacher's practice and content knowledge, with the ultimate goal of affecting student achievement.

By its very nature, coaching requires effort from both the coach and teacher. Because instructional coaching is collaborative rather than directive, it will be most effective when teachers share responsibility for the outcomes. In our work with coaching in schools, we've observed behaviors that make teachers effective consumers of coaching.

Effective coaching requires feedback. An effective consumer of coaching asks the coach for targeted feedback.

One mathematics coach recalled beginning a post-lesson conference by asking, "Do you want some feedback from me?" The teacher said no, and the coach was left wondering what to do next. In another instance, a coach asked a teacher in a prelesson conference what she would like the



coach to look for. The teacher said, "Anything. Any advice would be helpful." In a third case, when asked what she would like the coach to look for, the teacher responded that she'd recently tried to get more students responding to her high-level, open-ended mathematics questions. "Would you watch my questioning strategies and student reactions to help me improve this aspect of my teaching?" she asked.

The teachers in the first two scenarios were not being good consumers of coaching. Because the coach in the first scenario was working with Knight's (2007) concept of choice and respected the teacher's right to refuse feedback, the coaching session was essentially over when the teacher said no.

The second teacher could have contributed more to the optimal coaching situation. While the coach appreciated the teacher's openness, the coach was left wondering what

observations would be most helpful. The coach might point out aspects of teaching the teacher felt she was already good at, possibly offending the teacher and reducing the coaching session's effectiveness.

The third teacher exhibited traits of a good consumer of coaching. The coach knew exactly what the teacher wanted to work on, and the teacher and coach had several coaching sessions in which questioning strategies were the focus. The coach was able to help the teacher increase her wait time, develop more challenging content-focused questions, and incorporate strategies to ensure that the majority of students were engaged in important mathematical thinking.

Coaching is a reflective process. An effective consumer of coaching is open to reflection and is an active participant in the reflective process.

A coach asked a teacher during a post-lesson conference, "How do you think it went?" and the teacher answered, "Fine." The coach asked if there was anything that the teacher had hoped would go better, and the teacher said no. The coach then asked if the teacher would like some feedback, but the teacher appeared to have already disengaged from this reflective opportunity.

In a session with a different teacher, when the coach asked the teacher how she felt it went, the teacher said she felt it went well but was concerned that the students didn't really comprehend how the use of manipulatives in the mathematics lesson demonstrated the meaning of addition of fractions. The coach reported, "We engaged in a rich conversation about what we thought the students did learn and ways to plan lessons that focused students on the purpose of the lesson. We also developed formative assessments that would help us monitor students' understanding the next time the lesson was taught. It was a collaborative process where the teacher and I shared ideas and cooperatively developed a more effective lesson."

These two examples demonstrate the importance of reflection. Reflection differs from feedback. Reflection describes a cooperative process between teacher and coach. This might occur during a prelesson conference when a teacher and coach discuss the purpose of an upcoming lesson the coach will observe or reflect on what important content they expect students to learn. Does the lesson involve discovery learning? Will the teacher use direct instruction? What difficulties does the teacher anticipate students will encounter?

Knight (2007) and Hull, Balka, and Miles (2009) discuss the importance of reflection in adopting new teaching strategies and in monitoring, evaluating, and modifying them. These discussions target the coach's role in helping teachers to reflect. Yet, for reflection to take place, the teacher must participate in the process and share responsibility with

the coach for setting the stage for reflection.

During the post-lesson conference, a coach might ask the teacher, "How do you think it went?" — a reflective question suggested by West and Staub (2003) to set the stage for careful consideration and critical assessment of a recently delivered lesson. Teachers must reflect on their broad goals for instruction and communicate them to the coach. What do they expect from the students in the subject area? Is it to become better problem solvers? To engage in more inquiry and exploration? A good consumer of coaching is open to answering these types of questions.

Effective coaching requires teachers to communicate their needs. An effective consumer of coaching tells the coach what he or she needs.

During the first prelesson conference with a coach, one teacher said, "I need help getting my students interested in mathematics. They don't pay attention during my lessons, and even when I do group work, they don't stay focused. Before long, they are off doing other stuff or causing trouble."

The coach watched one of this teacher's lessons that involved group work and noticed several issues. The coach reported, "I saw ways to improve the tasks she assigned so that instruction was more relevant to the students' experiences, ways to present the task so that students would be more engaged and better understand their roles, and ways to improve how she monitored the students as the task unfolded. I modeled a lesson for the teacher, illustrating some strategies for the aspects described above, and together we planned a similar lesson for her to deliver. The teacher came to realize that the problem she had called 'students' interest in mathematics' was better addressed by asking how we could engage the students and keep them engaged during a mathematics lesson."

This scenario demonstrates how important it is for a coach to understand a teacher's needs. Coaching authors offer advice on how to assess teaching needs (Hansen, 2008), develop links between a coach's goals and a teacher's goals (Morse, 2009), inquire into a teacher's interest (Knight, 2007) and give teachers choices on what to be coached on (Knight, 2007; Hull, Balka, and Miles, 2009). This advice targets the coaches: What advice do teachers need?

Good consumers of coaching find ways to clearly communicate their needs to coaches. In our work with teachers and coaches, we use a survey that a coach gives to teachers at the beginning of the semester to set the stage for coaching (see p. 53). This instrument asks teachers to reflect on aspects of their teaching and to indicate whether

Because instructional coaching is collaborative rather than directive, it will be most effective when teachers recognize and share responsibility for the outcomes.

they would like to be coached on these topics. Teachers can help coaches target their needs by providing this information at the beginning of a school year.

Effective coaching requires teachers to communicate their expectations for coaches as the lesson transpires. An effective consumer of coaching tells his or her coach what kind of classroom interaction he or she desires.

One of the coaches with whom we've worked reported observing a lesson where, in the middle of a mathematical explanation, the teacher turned to the coach and asked, "Do you know a better way to explain this?" The coach was taken aback and had difficulty responding. The coach reported that she would have been better prepared had she known that the teacher wanted that type of involvement.

Another coach reported team teaching lessons with a teacher. She and the teacher would even pause lessons to have sidebar chats about what was transpiring and what to do next. This teacher and coach had developed a clear understanding about what role the coach would play during lessons. This same coach reported that she didn't always have this type of role in the teachers' classrooms. Her role was always based on a teacher's preferences, goals, and comfort level.

In contrast, a different coach reported that on her first visit, a teacher invited her to sit in a corner and observe the lesson. The coach took her place on a stool in back and never got up during that lesson or any other. The teacher might have been open to the coach circulating among the students and observing student work, but the coach never broached the subject.

In this last example, we could point the finger at the coach for not clarifying her role with the teacher. But the remedy to the issue was communication, and communication is two-sided. Good consumers of coaching are willing to initiate discussions with their coaches about what level of interaction they expect from coaches in their classrooms.

Effective coaching is content-based. An effective consumer of coaching is willing to examine her or his own content knowledge.

Many teachers with whom we have worked ask to be coached on teaching strategies that are not content-focused, such as cooperative learning, classroom management, engagement strategies, and wait time. While these are important concerns, such topics need not dominate coaching sessions. There is almost always a way to relate such issues to teaching and learning within a content area. In mathematics, for example, strategies such as cooperative learning that are not unique to mathematics can be discussed in the context of how they enhance specific mathematics content learning.

This point is made salient in recent research. Lockwood, McCombs, and Marsh (2010) found evidence that reading coaches improved student achievement in reading, but they did

not find the same level of evidence in students' mathematics scores. They had looked at mathematics achievement scores because they knew the state mathematics assessments involved a significant amount of reading in the mathematics questions' development. This result does not suggest that mathematics coaching is not effective. Instead, it suggests that coaching should target specific subject content.

Because coaches are often trying to focus on teacher-stated needs, a coach might bypass conversations about content if he or she doesn't sense a willingness from the teacher to discuss them. A good consumer of coaching can help keep the coaching conversations grounded in content by expressing a willingness and desire to discuss content and constantly ask how specific strategies improve learning of particular content.

Effective coaching is structured and involves at least three components: a prelesson conference, a lesson observation, and a post-lesson conference. Effective consumers of coaching help coaches schedule these.

Coaches often report difficulties in scheduling the components of a coaching cycle with teachers. Too often we find that this difficulty comes from teachers being unaware of what coaching entails. A teacher needs to know that the three components of coaching — prelesson conference, classroom observation or modeling, and post-lesson conference — come as a package. In one setting we experienced, when coaches themselves did not schedule the time to visit with teachers but relied on district personnel to set up the schedules, there was little or no time for a prelesson conference or post-lesson reflection. At the same time, teachers reported through surveys that they valued being coached, and many said they would have liked to have more time to discuss issues with their coach. We have found that it is critical for teachers to ensure that time will be available at both ends of the lesson observation. Coaches are sometimes hesitant to interfere with busy schedules. By taking responsibility for scheduling coaching, teachers become good consumers of coaching.

COMMITMENT TO COLLABORATION

There is no single recipe for effective coaching, and approaches to coaching vary as widely as do the teachers, coaches, and schools involved. What remains constant is the teacher's responsibility to become a consumer of coaching. A commitment to creating a collaborative and rewarding coaching relationship will help maximize its benefits.

REFERENCES

- Hansen, P. (2008).** *Mathematics coaching handbook: Working with teachers to improve instruction.* Larchmont, NY: Eye on Education.
- Hull, T. H., Balka, D.S, & Miles, R.H. (2009).** *A guide to mathematics coaching: Processes for increasing student achievement.* Thousand Oaks, CA: Corwin Press.

WHAT DO TEACHERS NEED FROM COACHES?

Sample items from a teacher’s needs inventory used in mathematics coaching programs (Yopp, Sutton, & Burroughs, 2010).

1. How confident do you feel creating and teaching mathematical applications and connections to other areas of mathematics?

Not at all confident				Very confident	I would not like to partner with my coach on this topic.	Not sure if I would like to partner with my coach on this topic.	I would like to partner with my coach on this topic.
1	2	3	4	5	-	0	+

2. How confident are you with the mathematical reasoning behind the mathematics you teach (understanding why we teach it), how it relates to other mathematics topics, and why it is valid?

Not at all confident				Very confident	I would not like to partner with my coach on this topic.	Not sure if I would like to partner with my coach on this topic.	I would like to partner with my coach on this topic.
1	2	3	4	5	-	0	+

3. How confident do you feel managing a classroom where students are engaged in inquiry-based or discovery-based tasks?

Not at all confident				Very confident	I would not like to partner with my coach on this topic.	Not sure if I would like to partner with my coach on this topic.	I would like to partner with my coach on this topic.
1	2	3	4	5	-	0	+

4. How confident do you feel encouraging student participation?

Not at all confident				Very confident	I would not like to partner with my coach on this topic.	Not sure if I would like to partner with my coach on this topic.	I would like to partner with my coach on this topic.
1	2	3	4	5	-	0	+

5. How confident do you feel creating an environment where students listen to one another?

Not at all confident				Very confident	I would not like to partner with my coach on this topic.	Not sure if I would like to partner with my coach on this topic.	I would like to partner with my coach on this topic.
1	2	3	4	5	-	0	+

Knight, J. (2007). *Instructional coaching: A partnership approach to improving instruction.* Thousand Oaks, CA: Corwin Press.

Lockwood, J.R., McCombs, J.S., & Marsh, J. (2010, September). Linking reading coaches and student achievement: Evidence from Florida middle schools. *Educational Evaluation and Policy Analysis, 32*(3), 372–388.

Morse, A. (2009). *Cultivating a math coaching practice: A guide for K-8 math educators.* Thousand Oaks, CA: Corwin Press.

West, L. & Staub, F.C. (2003). *Content-focused coaching.* Pittsburgh, PA: University of Pittsburgh.

Yopp, D., Sutton, J., & Burroughs, E. (2010). *Teacher*

needs inventory. Bozeman, MT: Examining Mathematics Coaching (EMC), Montana State University and RMC Research Corporation.

•
David Yopp (yopp@math.montana.edu), Elizabeth A. Burroughs (burrough@math.montana.edu), and John Sutton (sutton@rmcdenver.com) are co-principal investigators of the Examining Mathematics Coaching (EMC) project, NSF Discovery Research K-12 program. Jennifer Luebeck (luebeck@math.montana.edu), Clare Heidema (heidema@rmcdenver.com), and Arlene Mitchell (mitchell@rmcdenver.com) are senior researchers on the project. ■