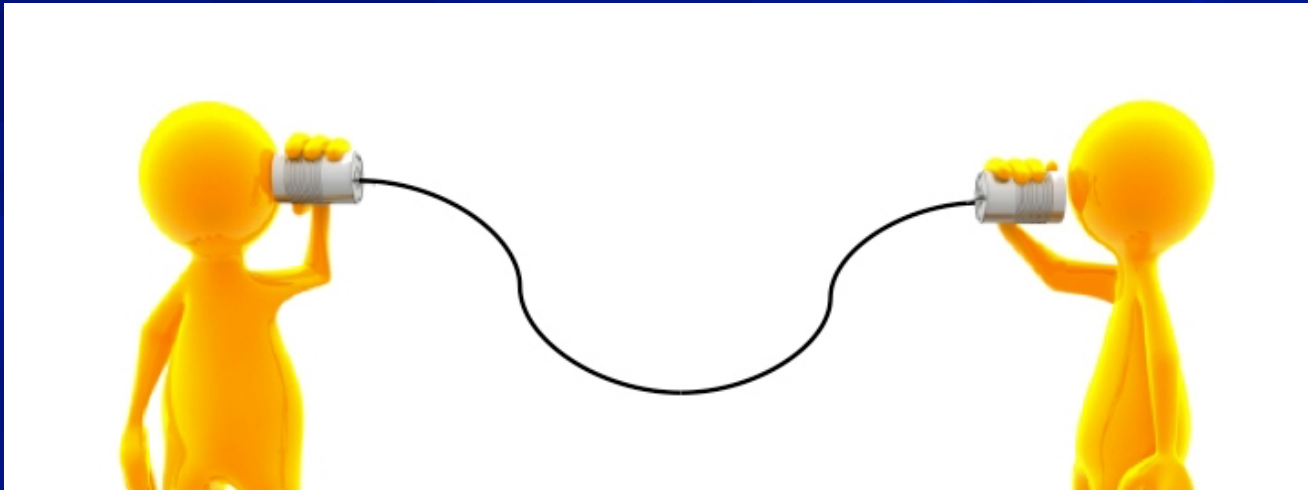


Noticing and Wondering: A Feedback Approach for Collaboration



Sarah A. Roller
University of Alabama in Huntsville

NCTM Annual Meeting and Exposition, San Antonio, TX
April 8, 2017

Let's take a minute to see who is here today

■ What is your role?

- Teachers
- Math Coaches or Math Specialists
- Principals/Administrators
- College Professors

■ What grade level do you teach?

- Middle School
- Elementary School
- High School
- Higher Education/Teacher Preparation Programs

■ Describe your experience with feedback/ conversations following a teaching observation.

- Positive and Productive
- Middle of the road
- Negative, No change, Upset



The Story Behind This Session

Field Placement
Mentor



Methods Course
Instructor



Goals for Today

- Learn an easy and effective language for talking & inquiring about math teaching.
- Practice using *noticing and wondering language* to provide feedback and encourage discussion about math teaching episodes
- Brainstorm situations where noticing and wondering language might be beneficial and how specific lenses can guide observation.

Noticing and Wondering Language

- **I noticed** you moved throughout the room to monitor student work and progress.
- **I noticed** Sarah blurted many answers and started to make class a fast conversation between you and her. **I'm wondering** how this hinders other students from thinking about the answers and also how you stop the behavior without discouraging her.
- Safe way to ask about teaching
- Constructive/Approachable
- Encourages Reflection and revisiting moments in the lesson

■ Noticing and Wondering language is from "Talking about Teaching: A Strategy for Engaging Teachers in Conversations about Their Practice" by Margaret Smith published in Empowering the Mentor of the Preservice Mathematics Teacher

Noticing and Wondering Olivia's Lesson

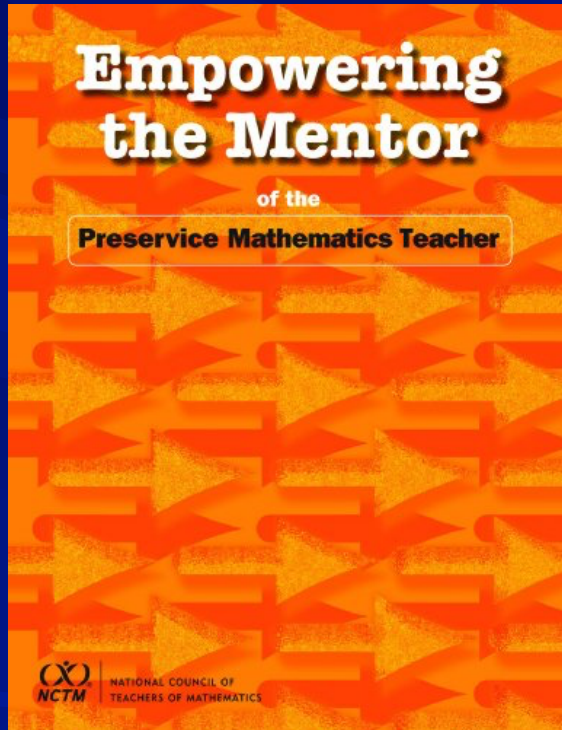


Fig. 4.1. Olivia's drawing

- This story is taken from “Talking about Teaching: A Strategy for Engaging Teachers in Conversations about Their Practice” by Margaret Smith published in Empowering the Mentor of the Preservice Mathematics Teacher

Noticing and Wondering Olivia's Reflection

Mentor: How do you think the lesson went?

Olivia: I think it went okay, but some students seemed to confuse rise and run. I'm not exactly sure why, but when they were working on problems a few were really struggling.

Noticing and Wondering

Olivia's Mentor's Feedback

- *"I noticed the diagram on the board at the beginning of class but wondered whether the labeling of the diagram might have been a source of the students' confusion."*
- Led to conversation about misinterpretation and other helpful visuals
- *"I noticed you asked questions that made students think, as evidenced by their responses. For example you asked, 'If I give you a graph and you want to find the slope, what would you look for?' and one student responded..."*
- Encouraged behavior

The Power of Wondering

- Three analytic stances can be taken when talking about teaching (van Es, 2011).

Descriptive	Evaluative	Interpretive
Creates a picture of the video moment observed through script and/or detailed description	Makes a judgment that approves, disproves, or critiques the video moment in terms of how something should have been done	Statements or questions that attempt at understanding and explaining a particular observation

- An interesting pattern was revealed in a small study (Roller, 2015) that introduced noticing and wondering language to mentor teachers and interns/student teachers.

	Descriptive	Evaluative	Interpretive
Pair 1 (Pre)	25% (3; 1N)	67% (8)	8% (1)
Pair 1 (Post)	14% (8; 3N)	53% (31; 2N)	33% (19; 1N 3W)
Pair 2 (Pre)	20% (8)	68% (27)	13% (5; 1W)
Pair 2 (Post)	11% (4; 2N)	77% (27; 2N)	11% (4)

Observation: Cody is off task and refusing to start the set of questions assigned in the book. A few students try to help Cody, but he completely refuses and the bell rings before he's able to get anything done.

- Intern – I noticed Cody didn't get much accomplished today. I'm wondering if you have ideas for motivating him or if he has any learning disabilities that I should know of before I teach.

VS

- ~~Why did you let Cody do nothing today? Can he not do this work?~~

- Mentor – I noticed Cody didn't get much accomplished today. I'm wondering were there things you might have been able to do as a teacher to help get him started or to support his learning better.
(Cool/Challenging depending on student)

VS

- ~~Do you realize Cody didn't start anything? Why didn't you do something?~~

Let's Try It!

(Feel free to discuss with a neighbor too!)

- You just watched your colleague teach a math lesson.
- The **next slide** has your observation.
- Write a Noticing/Wondering statement connected to the observation.

Observation #1

Ms. Smith is teaching 7th grade math. She has a task where students are looking for the most efficient way to package pop cans for Best Cola Company. The students are instructed to work for five minutes on their own and then work together in the groups. Shortly following the start of group time, Leonard rips his paper in half and screams, “I don’t care! Make it however you want!”

Ms. Smith calmly walks over to the group and has a quiet discussion with them. When she walks away, Leonard is getting out another sheet of paper and the group seems to be waiting for him so they can work together.

What did we notice & wonder about?

- I **noticed** students were working in groups and I **wondered** how students knew who to work with.
- I **noticed** Leonard yell and rip his paper but then manage to get back on task. I **wonder** what you said to the group.
- I **noticed** Leonard had some pretty explosive behavior and I'm **wondering** if this happens regularly.
- I **noticed** you had students working on an area task. I didn't get around to seeing student's papers, but I'm **wondering** what mathematical ideas popped up.



The Lens Matters



- The lenses we wear guide the feedback we are able to give following a teaching observation.

- Thus, we could make the argument:

If we want to **improve math instruction** or **increase student math achievement**, then we need to wear a **math lens**.

Standards of Mathematical Practice

(Students are doing.)

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.

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.

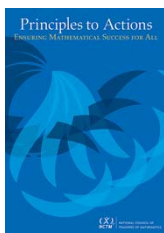
Facilitate meaningful mathematical discourse. Effective teaching of mathematics facilitates discourse among students to build shared understanding of mathematical ideas by analyzing and comparing student approaches and arguments.

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.



National Council of Teachers of Mathematics. (2014). *Principles to actions: Ensuring mathematical success for all*. Reston, VA: Author.

Writing Team: Steve Leinwand, Daniel J. Brahier, DeAnn Huinker, Robert Q. Berry III, Frederick L. Dillon, Matthew R. Larson, Miriam A. Leiva, W. Gary Martin, and Margaret S. Smith.

www.nctm.org/principlestoactions



NATIONAL COUNCIL OF
TEACHERS OF MATHEMATICS

Effective Mathematics Teaching Practices (Teacher is doing.)

*Principles to Actions:
Ensuring Mathematical
Success for All*, NCTM, 2014
<http://www.nctm.org/Conferences-and-Professional-Development/Principles-to-Actions-Toolkit/Resources/7-EffectiveMathematicsTeachingPractices//>

Let's Try it with a Math Teaching Lens now!

(Feel free to discuss with a neighbor too!)

- You just watched your colleague teach a math lesson.
- The **Next Slide** has your observation.
- Write a Noticing/Wondering statement connected to the observation.

Observation #2

Ms. Smith is teaching 7th grade math. She has a task where students are to figure out the most efficient way to package pop cans for Best Cola Company. Ms. Smith holds up two rectangular prisms of cans (3x4 and 2x12). With these examples, she asks students, “What formula do we use to calculate area? And how do we find the surface area?” As the students explain that you would need to find the area of each side of the box, Ms. Smith points to the sides of the box.

Students begin to work individually on paper finding the volume and surface area of the two pop can boxes. A few students draw pictures, but most have $V = l \times w \times h$. When Jane gets stuck, Ms. Smith asks her “How do we find the area of one side? And this side? And this side? Now add them up. You got it!”

What did we notice & wonder about?

- I **noticed** the questions you asked Jane sort of funneled her into your way of thinking, and it makes me **wonder** how Jane was thinking about it.
 - Provide space for the teacher to share
- (Potential follow-up) I **wonder** what questions we might ask to elicit what Jane knows and understands about surface area and volume.
- I **noticed** that most students solved the problem similar to review provided during the launch (calculations), and I'm **wondering** if this supported or inhibited students from making sense of the problem and persevering to solve it (SMP1). I wonder if there would be another way to launch the task or still offer scaffolding that wouldn't funnel students into those procedures but instead could support productive struggle.

“Let’s Try It!”

Concluding Thoughts

- Take a minute to look across your two noticing and wondering statements now.
 - Discuss how your feedback changed depending on the lens you wore.
 - Discuss your thoughts about using this language to start conversations about teaching.

Debriefing after an observation

Set Up for Success

- Pick a lesson together to observe
- Jot down notes
- Possible Lenses to Observe with:
 - 8 Standards of Mathematical Practices
 - Effective Mathematics Teaching Practices
 - Movement around the room
 - Student involvement/discussion/discourse
 - Response to correct and incorrect answers (Classroom Culture)
 - Evidence of student learning - What do they know or have learned?
 - Language used with students (above/below their level, supportive/destructive)

Lesson Feedback

Warm, Cool, and Challenging

WARM

- Something he/she does well while teaching
- I noticed you did a nice job of using questions to help a group that was stuck.

COOL

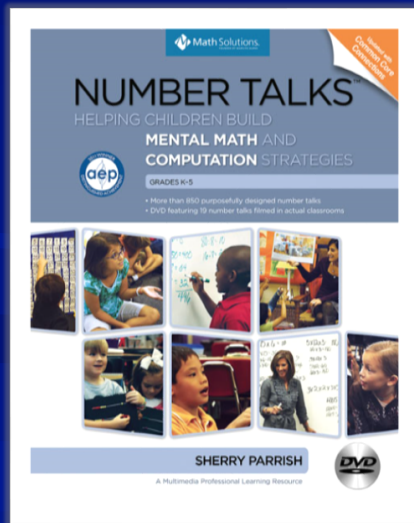
- Something he/she could change about their teaching practice easily, possibly even for the next class.
- I noticed that some students were left without groups when you let students pick out their own and I'm wondering how this might affect students, as well as how else you might consider helping students make groups.

CHALLENGING

- Something that will take time to change in her/his teaching practice. These tend to be items that even beginning teachers struggle with into their first years of teaching.
- I noticed that you referred to the students as "you guys" and I'm wondering what implications this has for the class learning environment (i.e.. You guys need to be quiet! You guys did a great job! What about the girls?)

Let's Try It with Video

1. Jot down notes while you are observing the lesson.
2. Write one Noticing/Wondering statement.



Parrish, S. (2010). *Number talks: Helping children build mental math and computation strategies, grades K-5*. Math Solutions.

Share Statements

Revisiting Our Goals for Today



We learned an easy and effective language for talking & inquiring about math teaching.



We practice using *noticing and wondering language* to provide feedback and encourage discussion about math teaching episodes



We brainstorm situations where noticing and wondering language might be beneficial and how specific lenses can guide observation.

References

- National Council of Teachers of Mathematics. (2014). Principles to actions: Ensuring mathematical success for all.
- National Governors Association Center for Best Practices & Council of Chief State of School Officers. (2010). *Common Core State Standards Mathematics*. Washington, D.C.: Authors.
- Parrish, S. (2010). *Number talks: Helping children build mental math and computation strategies, grades K-5*. Math Solutions.
- Roller, S. A. (2015). *Learning about teaching from mentor-intern conversations – Does the form and focus matter?* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database. (Order No. 3718852).
- Smith, M. (2009). Talking about teaching: a strategy for engaging teachers in conversations about their practice. In *Empowering the Mentor of the Preservice Mathematics Teacher* (pp. 39-40). Reston, VA: National Council of Teachers of Mathematics, Inc.
- van Es, E. (2011). A framework for learning to notice student thinking. In Sherin, M.G., Jacobs, V. R., & Philipp, R. A. (Eds.), *Mathematics teacher noticing: Seeing through teachers' eyes*, (pp. 134-151). New York, NY: Routledge.

Questions, Comments, & Discussion

Thank you for attending! If you have further questions, please feel free to email me.

sarah.roller@uah.edu

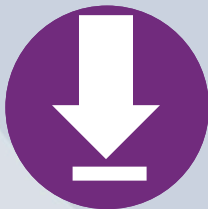


Rate this presentation on the conference app!

Search “**NCTM**” in your app store or follow the link at nctm.org/confapp to download



Join in the conversation! **#NCTMannual**



Download available presentation handouts from the online planner at nctm.org/planner