Engaging Math Classrooms: What to Look for in Administrative Walkthroughs

Traci Phillips-Roach
Lead Manager of School Partnerships
WE CAN improve instruction…

• **We can** find ways to get into classrooms more often, thereby enhancing our role as instructional leaders.

• **We can** positively impact teaching & learning by doing so.
What is your role with respect to improving student achievement?
OBJECTIVES

Participants will:

• Understand how the Standards for Mathematical Practices require teachers to shift to a student-centered classroom

• Develop a deeper understanding of the student-centered classroom to recognize best teaching strategies in mathematics

• Develop an understanding of how classroom walkthroughs improve instruction to encourage a cycle of continuous improvement and reflection

• Develop an understanding of the administrator’s role to support teacher effectiveness
“The greatest enemy to student learning is the talking teacher.”

John Holt, famous American educator
Then, by allowing students to interact with and struggle with the mathematics using their ideas and their strategies – a student-centered approach – the mathematics they learn will be integrated with their ideas; it will make sense to them, be understood and be enjoyed.

John Van de Walle
Standards for Mathematical Practice

*NCTM and NRC inspired…*

- Describe varieties of expertise that mathematics educators at all levels should seek to develop in their students.
- Processes and proficiencies
  - NCTM’s Process Standards
  - National Research Council’s strands of mathematical proficiency (*Adding it Up*)
Standards for Mathematical Practice

1. Make sense of problems and persevere in solving them. “Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution.”

2. Reason abstractly and quantitatively. “Mathematically proficient students make sense of quantities and their relationships in problem situations.”

3. Construct viable arguments and critique the reasoning of others. “Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments.”

4. Model with mathematics. “Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace.”
Standards for Mathematical Practice

5. Use appropriate tools strategically. “Mathematically proficient students consider the available tools when solving a mathematical problem.”

6. Attend to precision. “Mathematically proficient students try to communicate precisely to others.”

7. Look for an make use of structure. “Mathematically proficient students look closely to discern a pattern or structure.”

8. Look for and express regularity in repeated reasoning. “Mathematically proficient students notice if calculations are repeated, and look both for general methods and for shortcuts.”
What do good problem solvers do?

- Use number sense when representing a problem
- Be precise with words, numbers, and symbols
- Use tools and technology strategically
- Look for and create efficient strategies
- Make conjectures and prove or disprove them
- Use math to describe a real situation or problem
- Look for and use patterns and connections
- Do what makes sense and be persistent
Documents to Grab

- Math Classroom Look Fors
- Standards of Mathematical Practice Teacher Rubric
<table>
<thead>
<tr>
<th>THE CLASSROOM WILL HAVE:</th>
<th>TEACHER WILL BE:</th>
<th>STUDENTS WILL BE:</th>
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<tbody>
<tr>
<td>□ Student work displayed</td>
<td>□ Maintaining the pace of the lesson to achieve the objectives</td>
<td>□ Making meaningful connections between knowledge, real-world examples, and/or technology</td>
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<tr>
<td>□ Desks or tables arranged to encourage student collaboration, as well as teacher access to all students</td>
<td>□ Initiating and facilitating student discourse</td>
<td>□ Discussing mathematical ideas with one another</td>
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<td>□ Necessary materials readily available</td>
<td>□ Well-planned and prepared to:</td>
<td>□ Working in groups or pairs to solve mathematics as they make sense of the problem, learning, as well as taking responsibility for their own learning</td>
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<tr>
<td>□ Word walls (Optional)</td>
<td>▢ Extend tasks</td>
<td>□ Able to communicate effectively as a whole class, small group, pair, or individual</td>
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<tr>
<td>□ Warm-up or bell-ringer</td>
<td>▢ Accommodate individual student differences</td>
<td>□ Determining the correctness of their thinking or process</td>
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<td>□ Launch problem scenario to check for student understanding</td>
<td>▢ Connect classroom work to lab work</td>
<td>□ Able to describe their mathematical thinking or process</td>
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<tr>
<td>□ Students engaged in solving mathematical problems and communicating their understandings</td>
<td>▢ Summarize mathematical concepts of the lesson</td>
<td>□ Choosing a variety of methods to communicate (i.e. tables, graphs, models, diagrams, oral, written, technology)</td>
</tr>
<tr>
<td>□ Lesson closure and summary of primary mathematical objectives from the day</td>
<td>□ Connecting class work to work in the software</td>
<td>□ Able to use precise mathematical vocabulary</td>
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<td></td>
<td>□ Using effective questioning strategies to:</td>
<td>□ Holding each other accountable for specific discussions</td>
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<td></td>
<td>▢ Access prior knowledge</td>
<td>□ Actively engages in class with ownership of learning activities and self-regulation of effort</td>
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<td></td>
<td>▢ Clarify student thinking</td>
<td>□ Preparing to convince other students of the correctness of their thinking or process</td>
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<td>▢ Assess student understanding of the mathematics</td>
<td>□ Regularly taking responsibility for individual accountability</td>
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<td></td>
<td>▢ Ensure individual accountability</td>
<td>□ Summarize mathematical concepts of the lesson</td>
</tr>
<tr>
<td></td>
<td>▢ Connect multiple representations</td>
<td>□ Taking responsibility for personal learning and success</td>
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</table>

**Note:** The checklist items are represented in a table format for clarity.
**SMP Teacher Rubric:**

Review each row corresponding to a mathematical practice. Use the boxes to mark the appropriate teacher actions during the lesson. It is not expected that all SMPs are addressed in a lesson. However, every task should address at least three key SMPs.

- The teacher descriptors can be used during the lesson to evaluate how the task was carried out by the teacher.
- The column titled “proficient” describes the expected norm for the teacher, while the column titled “exemplary” includes all features of the proficient column and more; a teacher must meet criteria in both columns.

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<th>Practice</th>
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<th>Emerging (Teacher does thinking)</th>
<th>Proficient (Teacher does most of the mathematics)</th>
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| Make sense of problems and persevere in solving them | - Does not allow for wait time; asks leading questions to rush through task.  
  - Does not encourage students to individually process the tasks.  
  - Is focused solely on answers rather than processes and reasoning. | - Allots too much or too little time to complete task.  
  - Encourages students to individually complete tasks, but does not ask them to evaluate the process used.  
  - Explains the reasons behind procedural steps.  
  - Does not check errors publicly. | - Allows ample time for all students to struggle with task.  
  - Expects students to evaluate processes implicitly.  
  - Models making sense of the task (given situation) and the proposed solution. | - Differentiates to keep advanced students challenged during work time.  
  - Integrates time for explicit meta-cognition.  
  - Expects students to make sense of the task and the proposed solution. |
| Reason abstractly and quantitatively         | - Does not expect students to interpret representations.  
  - Expects students to memorize procedures with no connection to meaning. | - Expects students to model and interpret tasks using a single representation.  
  - Explains connections between procedures and meaning. | - Expects students to interpret and model using multiple representations.  
  - Provides structure for students to connect algebraic procedures to contextual meaning.  
  - Links mathematical solution with a question’s answer. | - Expects students to interpret, model, and connect multiple representations.  
  - Prompts students to articulate connections between algebraic procedures and contextual meaning. |
| Construct viable arguments and critique the reasoning of others | - Does not ask students to present arguments or solutions.  
  - Expects students to follow a given problem path without opportunities to make conjectures. | - Does not help students differentiate between assumptions and logical conjectures.  
  - Asks students to present arguments but not to evaluate them.  
  - Allows students to make conjectures without justification. | - Identifies students’ assumptions.  
  - Models evaluation of student arguments.  
  - Asks students to explain their conjectures. | - Helps students differentiate between assumptions and logical conjectures.  
  - Prompts students to evaluate peer arguments.  
  - Expects students to formally justify the validity of their conjectures.|

ADAPTED from Institute for Advanced Study/Park City Mathematics Institute, Secondary School Teachers Program/Visualizing Functions, Summer 2011 and Thinking Through the Lesson Protocol from Smith, Bill, and Hughes (2008).
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<td>Model with mathematics.</td>
<td>- Identifies appropriate variables and procedures for students.</td>
<td>- Verifies that students have identified appropriate variables and procedures.</td>
<td>- Asks questions to help students identify appropriate variables and procedures.</td>
<td>- Expects students to justify their choice of variables and procedures.</td>
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<tr>
<td></td>
<td>- Does not discuss appropriateness of model.</td>
<td>- Explains the appropriateness of model.</td>
<td>- Facilitates discussions in evaluating the appropriateness of model.</td>
<td>- Gives students opportunity to evaluate the appropriateness of model.</td>
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<td>Use appropriate tools</td>
<td>- Does not incorporate additional learning tools.</td>
<td>- Demonstrates use of appropriate learning tool.</td>
<td>- Chooses appropriate learning tools for student use.</td>
<td>- Provide meaningful, real world, authentic performance-based tasks.</td>
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<td>strategically.</td>
<td></td>
<td></td>
<td>- Models error checking by estimation.</td>
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<td>Attend to precision.</td>
<td>- Does not intervene when students are being imprecise.</td>
<td>- Inconsistently intervenes when students are imprecise.</td>
<td>- Consistently demands precision in communication and in mathematical solutions.</td>
<td>- Allows students to choose appropriate learning tools.</td>
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<td></td>
<td>- Does not point out instances when students fail to address the question</td>
<td>- Identifies incomplete responses but does not require student to formulate further response.</td>
<td>- Identifies incomplete responses and asks student to revise their response.</td>
<td>- Creatively finds appropriate alternatives where tools are not available.</td>
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<td>completely or directly.</td>
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</tr>
<tr>
<td>Look for and make use of</td>
<td>- Does not recognize students for developing efficient approaches to the task.</td>
<td>- Identifies individual students’ efficient approaches, but does not expand understanding</td>
<td>- Facilitates all students in developing reasonable and efficient ways to accurately perform basic operations.</td>
<td>- Demands and models precision in communication and in mathematical solutions.</td>
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<tr>
<td>structure.</td>
<td>- Requires students to apply the same algorithm to a task although there may be</td>
<td>to the rest of the class.</td>
<td>- Continuously questions students about the reasonableness of their intermediate results.</td>
<td>- Encourages students to identify when others are not addressing the question completely.</td>
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<tr>
<td></td>
<td>other approaches.</td>
<td>- Demonstrates the same algorithm to all related tasks although there may be other more</td>
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<tr>
<td></td>
<td></td>
<td>effective approaches.</td>
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<td></td>
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<tr>
<td>Look for and express</td>
<td>- Does not show evidence of understanding the hierarchy within concepts.</td>
<td>- Hides or does not draw connections to prior or future concepts.</td>
<td>- Connects concept to prior and future concepts to help students develop an understanding of procedural</td>
<td>- Encourages students to connect task to prior concepts and tasks.</td>
</tr>
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<td>regularity in repeated</td>
<td>- Presents or examines task in isolation.</td>
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<td>shortcuts.</td>
<td>- Prompts students to generate exploratory questions based on current task.</td>
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<td>reasoning.</td>
<td></td>
<td></td>
<td>- Demonstrates connections between tasks.</td>
<td>- Encourages students to monitor each other’s intermediate results.</td>
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Math Classroom Look Fors
The Classroom Will Have…

- Student work displayed
- Desks or tables arranged to encourage student collaboration, as well as teacher access to all students
- Necessary materials readily available
- Word walls (Optional)
- Warm-up or bell-ringer
- Launch problem scenario to check for student understanding
- Students engaged in solving mathematical problems and communicating their understandings
- Lesson closure and summary of primary mathematical objectives from the day
The Teacher Will Be…

- Maintaining the pace of the lesson to achieve the objectives
- Initiating and facilitating student discourse
- Well-planned and prepared to:
  - Extend tasks
  - Accommodate individual student differences
  - Connect classroom work to lab work
  - Summarize mathematical concepts of the lesson
- Connecting class work to work in the software
- Using effective questioning strategies to:
  - Access prior knowledge
  - Clarify student thinking
  - Assess student understanding of the mathematics
  - Ensure individual accountability
  - Connect multiple representations
The Student Will Be…

- Making meaningful connections to prior knowledge, real-world experiences, tools and/or technology
- Discussing mathematical concepts with each other
- Working in groups or pairs focusing on mathematics as they manage their own learning, as well as taking an active role
- Able to communicate effectively within a whole class, small group, partner, or individual activities
- Determining the correctness of answers
- Able to describe their mathematical thinking or process
- Choosing a variety of methods to communicate (i.e. tables, graphs, models, diagrams, oral, written, technology)
- Able to use precise mathematical vocabulary
- Holding each other accountable during discussions
- Actively engaged in class work taking full ownership of learning activities, displaying high levels of energy, willingness to ask questions and take risks
Standards of Mathematical Practice Teacher Rubric
Criteria

8 Mathematical Practice Standards

• The teacher descriptors can be used during the lesson to evaluate how the task was carried out by the teacher.
• The column titled “proficient” describes the expected norm for the teacher, while the column titled “exemplary” includes all features of the proficient column and more; a teacher must meet criteria in both columns.
  • Needs Improvement
  • Emerging (Teacher does thinking)
  • Proficient (Teacher does most of the mathematics)
  • Exemplary (Students do most of the mathematics)
Let’s Look at a Classroom

Algebra Classroom
What Can Leaders Do to Help Support the Shift to the Student-Centered Classroom? (and thus, Increase Student Achievement)?
Instructional Walk-Throughs

1. The walkthrough process is a manifestation of instructional leadership.
2. Instructional leadership leads to greater teacher effectiveness.
3. Effective teaching yields increased student achievement.
Importance…

- Administrators become more familiar with the school’s curriculum and teachers’ instructional practices.
- Administrators can gauge the climate of a school (Are students actively engaged? Are teachers moving to a truly student-centered classroom? Are new teachers catching on?)
- Students see that both administrators and teachers value instruction and learning.
- Administrators establish themselves as campus leaders and instructional mentors, influencing teaching, learning, and continuous improvement – which leads to STUDENT ACHIEVEMENT.
Before you go in:

Communicate with teachers

- cultivate a team culture focused on student improvement in mathematics
- build a teaching-learning collaboration
- communicate the norm of continuous learning for students and adults
- focus on the purpose of supporting strong instruction for all students
- state purpose and plans for classroom visits
- talk about the process--what to expect
- ask teachers what would be most helpful for them as part of the classroom visit process
• defuse anxiety
  – be positive, affirming, supportive & collaborative
  – state that you are learning, too
  – ask for their feedback on the process
  – clearly separate evaluation from instructional support

• Coordinate observations across staff:
  – Schedule and track your visits
  – Differentiated across staff, based on need for instructional support
  – Include all who teach mathematics
  – Include observations of all instructional groups
  – Guard against “convenient location” as a factor
  – Guard against tendency toward “comfort zones”
The HOW...

- Informal and collaborative
- 3-8 minutes
- Curriculum as well as instructional focus
- Walk-through time is throughout the day and unannounced
- Focus on curricular and instructional decision points of the teacher
- Coaching focus (NOT evaluative)
- Follow-up occurs as a brief dialogue and/or written narrative
- Ultimately leads to reflective conversation
- Focus is on professional growth
The CONTENT...

• General Lenses for Walkthroughs
  – **Curriculum**: What is being taught?
  – **Teaching**: How Teachers plan and deliver lessons
  – **Learning**: How students engage, process and resources used.
  – **Assessing**: How teacher’s assess and students perform
  – **Classroom Environment**: How a space feels, its organization and use.
The PROCESS...

• Ensure you are not interrupted..

1. No greetings! Teacher keeps teaching, students keep learning

2. Make a mental note of the time, taking it all in… allow 30 seconds to 1 minute to pass before you…
   a) Walk the perimeter
   b) Converse with 1-2 students or 1 group. Ask “what are you learning?”
   c) Continue to observe
   d) Check the time… nod to the teacher.. complete notes in hallway.
Positive Statement: Start with a positive statement based on what you heard or noticed

Invite Reflection: How do you think your lesson went today?

Question: Ask a question in relation to the lenses (curriculum, teaching & learning, assessing, classroom environment)

Decision Making: Probe for the criteria in relation to the question

Reflect: end/exit conversation with cues for further reflection
Reflective Inquiry

FOLLOW UP

• Feedback should be:
  – positive (Newbies – for encouragement)
  – developmental (Veterans – reflection for growth)

• ask questions/reflective probes
  – Look Fors and SMP Rubric
    • to get them thinking about teaching & learning
How can YOU make instructional walkthroughs a PRIORITY?
Making It Happen….
You Actually Have to MAKE the Time!

• Schedule classroom walk-throughs into your personal calendar on a daily/weekly basis
• Make an “appointment with yourself” to be in classrooms
• Mostly during mathematics instruction
• Cover the range; differentiate your time
• Use self-monitoring (goal-setting & feedback) to lend motivation & track your progress in meeting this goal
• Have your school secretary or another office person “kick you out of the office” and “send you to the classroom”
• Share your calendar of planned times with office staff
• Ask staff to remind you, if needed, that it’s time to go to the classrooms
• Ask staff to protect this time from intrusions
• Ask staff to help you track & self-monitor visits
• Make classroom visits part of the annual goals you set with your supervisor - report to him/her monthly on your progress
• Use public posting of this goal and your progress in meeting it in the staff room, with feedback from staff
• Set up an arrangement with another person (administrator) to follow-through on being in classrooms
• Pair up with the coach periodically to walk through a few classrooms and debrief together (a great learning experience)
• Invite a teacher to join you on a “learning walk”
• set up a relationship with a mentor who will prompt you and provide support, ideas and feedback
WE CAN improve instruction...

- **We can** find ways to get into classrooms more often, thereby enhancing our role as instructional leaders.
- **We can** positively impact teaching & learning by doing so.
- How we...
  - spend our time
  - focus our attention
  - spark teacher reflection & change...
- all speak volumes about what we stand for.....
- As we build a culture of collaboration around student achievement, we empower each other to do our very best work and thereby give students their very best chance for success--in school and in life.
Reach For the Stars

• What do you want the classrooms experiences in your school to look like, sound like and feel like for your students?
• How do you want your students to feel when they leave your school?
References

Effective Walkthroughs in Math and ELA Classrooms
Dr. Susan Abelein PhD – April 2014

Teaching Student-Centered Mathematics
by John A. Van de Walle and LouAnn H. Lovin

Video: Function patterns: Getting out of line
www.pbslearningmedia.org