

Building Administrator Knowledge and Skills in Supervising Math Instruction

Kristi Kahl, Senior Director, Middle & K-8 Schools

Edward Samuels, Middle School Principal

Becky Afghani, Secondary Math Curriculum Leader

Stacey Benuzzi, Middle School Math Assistant Principal

Presentation Overview



Background of the Work



Simulation of Professional Learning



Impact of Instructional Leadership

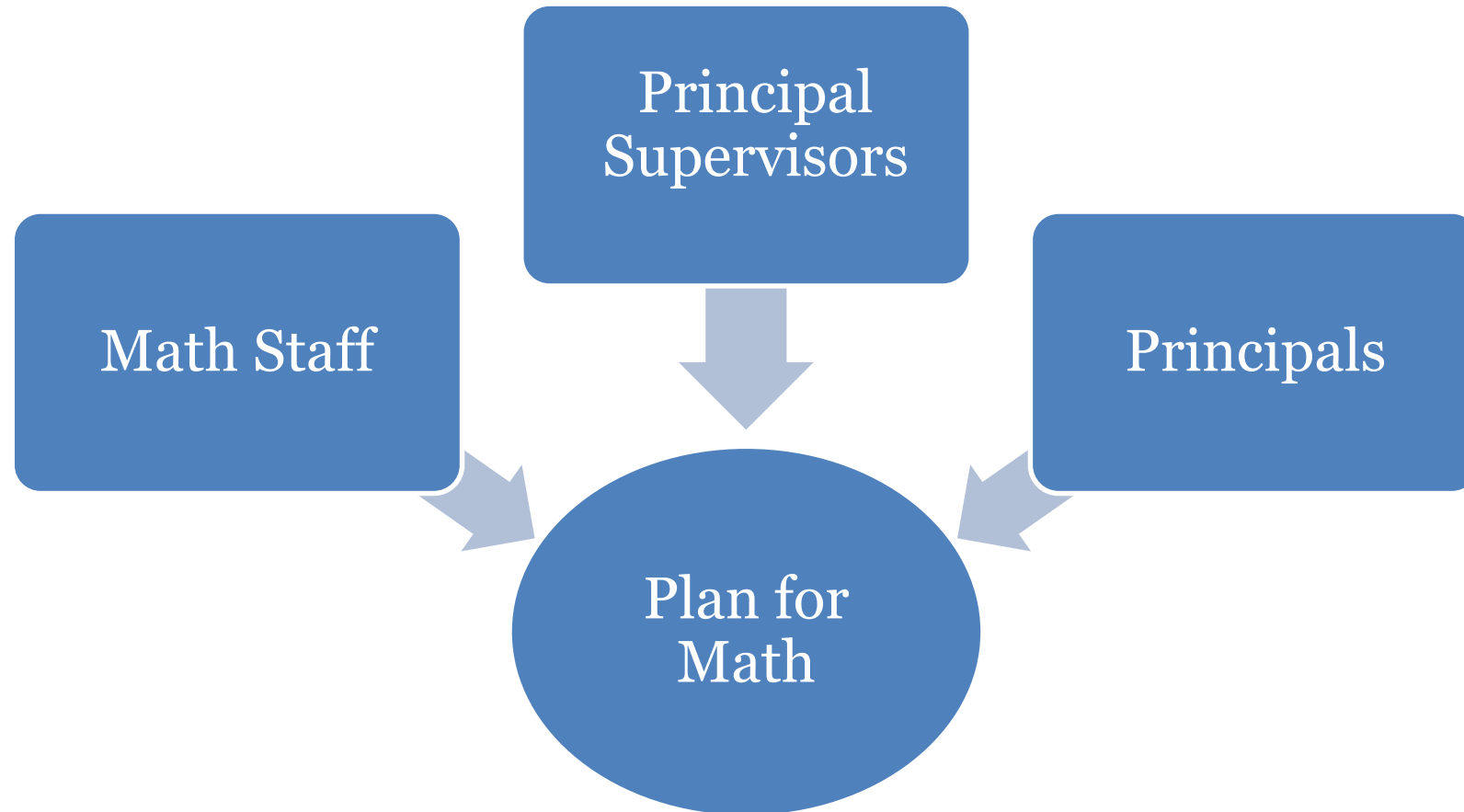


Q & A

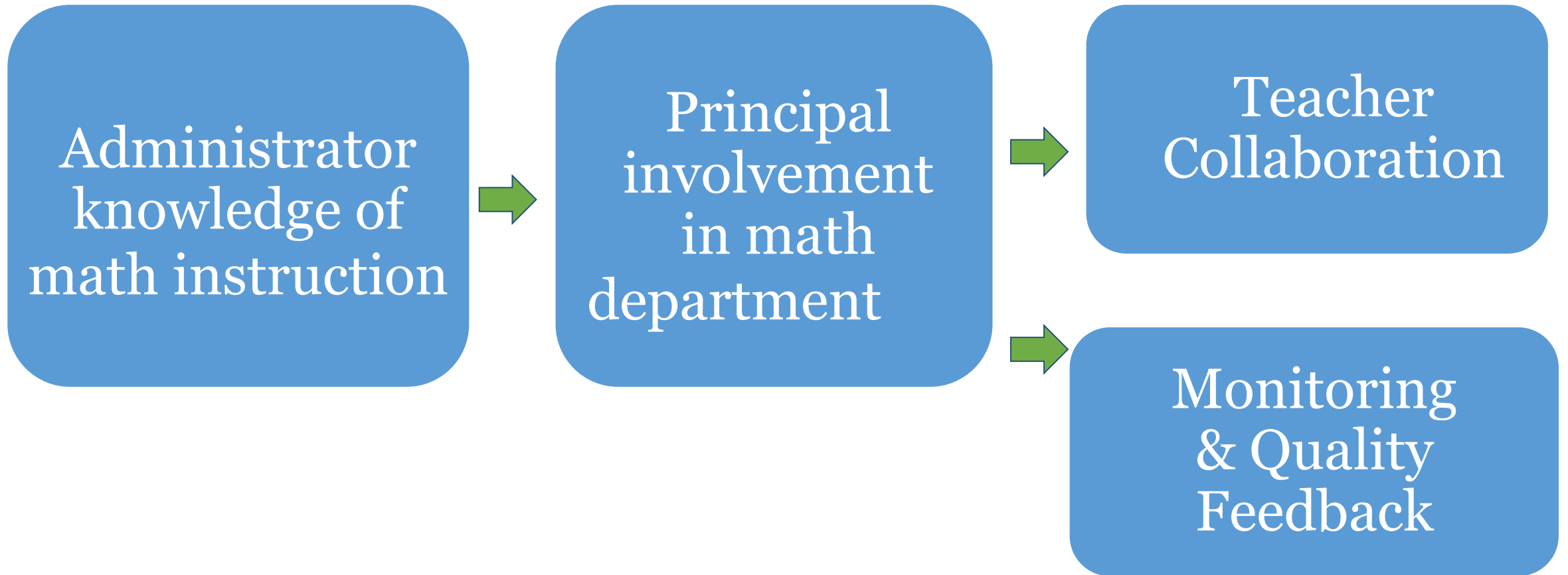
Need for Principal Professional Learning

- Teacher professional learning 2013-2016
- SBAC scores 2015
- “I don’t know what I’m looking for”
- Focus on pedagogy first, then content

Collaborative Approach



The Path to Improved Instruction



Building Knowledge of Instruction

- Monthly Principal and AP meetings
- *Principles to Actions* book study
- Videos and calibration activities
- Year at a Glance and Unit Guides





Mathematics Teaching Practices

- Establish mathematics goals to focus learning
- Implement tasks that promote reasoning and problem solving
- Use and connect mathematical representations
- Facilitate meaningful mathematical discourse
- Pose purposeful questions
- Build procedural fluency from conceptual understanding
- Support productive struggle in learning mathematics
- Elicit and use evidence of student thinking

Administrator Training in Math (ATM)

- Half-day school visits
- 12 administrators, 2 math coaches
- Large group upbrief
- Small group classroom visits - discuss evidence
- Large group debrief - draft feedback

ATM – Administrators Training in Math
 Hamilton Middle School
 Wednesday, October 24, 2018

Agenda:

- 9:30 – 10:15 Opening session
 - Introductions
 - Review goals for the day and norms
 - Review math teaching practices – teacher and student actions
 - Identify groups and assign practices
- 10:20 – 12:00 Classroom visits in small groups, debrief shortly after each one
- 12:00 – 12:45 Whole group debrief
 - Administrators lead discussion
 - Use the math teaching practices – recording sheet
 - Identify an area of strength and opportunity for improvement for each teacher
 - Craft TRUE-SpEAK for hypothetical teacher feedback

Classroom Visit Schedule – Periods 2 and 3

	Group #1	Group #2
10:20 – 10:50	Math 8 Daniela Manole, Rm. 503	Math 7 Maria Hernandez, Rm. 710
10:50 – 11:15	Debrief/Break	Debrief/Break
11:15 – 11:45	Math 7 Maria Hernandez, Rm. 710	Math 8 Daniela Manole, Rm. 503
11:45 – 12:00	Debrief	Debrief

Register here: <https://qoo.gl/forms/mSOXVTVQpuOQOS352>

ATM Upbrief - Understand the Practices

Mathematics Teaching Practices		
Write notes to describe actions that are observed and not observed.		
Mathematics Teaching Practice	Teacher Actions	Student Actions
1. 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.	<ul style="list-style-type: none"> Establishing clear goals that articulate the mathematics students are learning as a result of instruction in a lesson, series of lessons, or unit. Identifying how the goals fit within a mathematics learning progression. Discussing and referring to the mathematical purpose and goal of a lesson during instruction to ensure that students understand how the current work contributes to their learning. Using the mathematics goals to guide lesson planning and reflection and to make in-the-moment decisions during instruction. 	<ul style="list-style-type: none"> Engaging in discussions of the mathematical purpose and goals related to their current work in the mathematics classroom (e.g., What are we learning? Why are we learning it?) Using the learning goals to stay focused on their progress in improving their understanding of mathematics content and proficiency in using mathematical practices. Connecting their current work with the mathematics that they studied previously and seeing where the math is going. Assessing and monitoring their own understanding and progress toward the mathematical goals.
4. 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.	<ul style="list-style-type: none"> Engaging students in purposeful sharing of mathematical ideas, reasoning, and approaches, using varied representations. Selecting and sequencing student approaches and solution strategies for whole-class analysis and discussion. Facilitating discourse among students by positioning them as authors of ideas, who explain and defend their approaches. Ensuring progress toward mathematical goals by making explicit connections to student approaches and reasoning. 	<ul style="list-style-type: none"> Presenting and explaining ideas, reasoning, and representations to one another in pair, small-group, and whole-class discourse. Listening carefully to and critiquing the reasoning of peers, using examples to support or counterexamples to refute arguments. Seeking to understand the approaches used by peers by asking clarifying questions, trying out others' strategies, and describing the approaches used by others. Identifying how different approaches to solving a task are the same and how they differ.

Mathematics Teaching Practice		
Mathematics Teaching Practice	Teacher Actions	Student Actions
6. 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.	<ul style="list-style-type: none"> Providing students with opportunities to use their own reasoning strategies and methods for solving problems. Asking students to discuss and explain why the procedures that they are using work to solve particular problems. Connecting student-generated strategies and methods to more efficient procedures as appropriate. Using visual models to support students' understanding of general methods. Providing students with opportunities for distributed practice of procedures. 	<ul style="list-style-type: none"> Making sure that they understand and can explain the mathematical basis for the procedures that they are using. Demonstrating flexible use of strategies and methods while reflecting on which procedures seem to work best for specific types of problems. Determining whether specific approaches generalize to a broad class of problems. Striving to use procedures appropriately and efficiently.
8. 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.	<ul style="list-style-type: none"> Identifying what counts as evidence of student progress toward mathematics learning goals. Eliciting and gathering evidence of student understanding at strategic points during instruction. Interpreting student thinking to assess mathematical understanding, reasoning, and methods. Making in-the-moment decisions on how to respond to students with questions and prompts that probe, scaffold, and extend. Reflecting on evidence of student learning to inform the planning of next instructional steps. 	<ul style="list-style-type: none"> Revealing their mathematical understanding, reasoning, and methods in written work and classroom discourse. Reflecting on mistakes and misconceptions to improve their mathematical understanding. Asking questions, responding to, and giving suggestions to support the learning of their classmates. Assessing and monitoring their own progress toward mathematics learning goals and identifying areas in which they need to improve.

Leowood, S., Beaber, D.J., Utvikler, D., et al. (2014). Principles to Actions: Ensuring Mathematical Success for All. Reston, VA: NCTM.

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ATM Classroom Visit (Scenario)

Math 7 Scenario
 Date of observation: 10/18/17

Learning Target: Students will add fractions.

You enter the class as the students are starting to take notes. Students are sitting in rows. All have notebooks out and have written down the title of the notes, "Adding Fractions."

The teacher starts the lesson by saying, "You need to write down these steps so we know how to add fractions:

- Step 1: LCM or LCD
- Step 2: Multiply both rows by "missing" amount.
- Step 3: Add numerators (top row) only.
- Step 4: Simplify if possible.

Students copy down the steps.

The teacher then explains, "Let's use these steps to add $\frac{3}{8} + \frac{5}{6}$. Step 1 is to find the LCM or LCD. The LCM and the LCD are basically the same thing. What's the LCD for this problem?" One student responds, "2." The teacher exclaims, "No. 2 is the GCF, not the LCD. The LCD is 24."

The teacher rewrites the problem to look like this: $\frac{3}{8} + \frac{5}{6}$

Then the teacher continues working out the problem by saying, "Now we do step 2. To do this I ask myself, 'How did I go from 8 to 24?' and I know I multiplied by 3. So I have to multiply the top and bottom by 3. And I do the same thinking for the other fraction."

The teacher writes this in her notes:

$$\begin{array}{r} \frac{3}{8} + \frac{5}{6} \\ \times 3 \qquad \times 4 \\ \hline \frac{9}{24} + \frac{20}{24} \end{array}$$

Students write down the problem in their notes.

The teacher then finishes the problem by saying, "Now we add the top row only and simplify if possible. This is the last thing you always do—simplify."

The teacher writes and the students copy the following:

$$\frac{9}{24} + \frac{20}{24}$$

$$\frac{29}{24} = 1 \frac{5}{24}$$

Next, students are told to use the steps to try to solve the example problems on their own.

Example 1
 $\frac{1}{7} + \frac{2}{7}$

The teacher asks, "Is the answer $\frac{3}{14}$?" The students shout out, "No!" The teacher then tells them they are correct and that the answer is $\frac{3}{7}$.

You leave the classroom as the next problem, $\frac{1}{9} + \frac{5}{9}$, is written on the board.

	Draft Feedback
Specifics What happened?	
Evidence What was the impact?	
Atmosphere Other factors to consider?	
Kick-Off Next action steps?	

ATM Debrief - Hypothetical Feedback

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Impact of Instructional Leadership

Walkthrough Results Midyear 2017

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Establish mathematics goals to focus learning

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Facilitate meaningful mathematical discourse

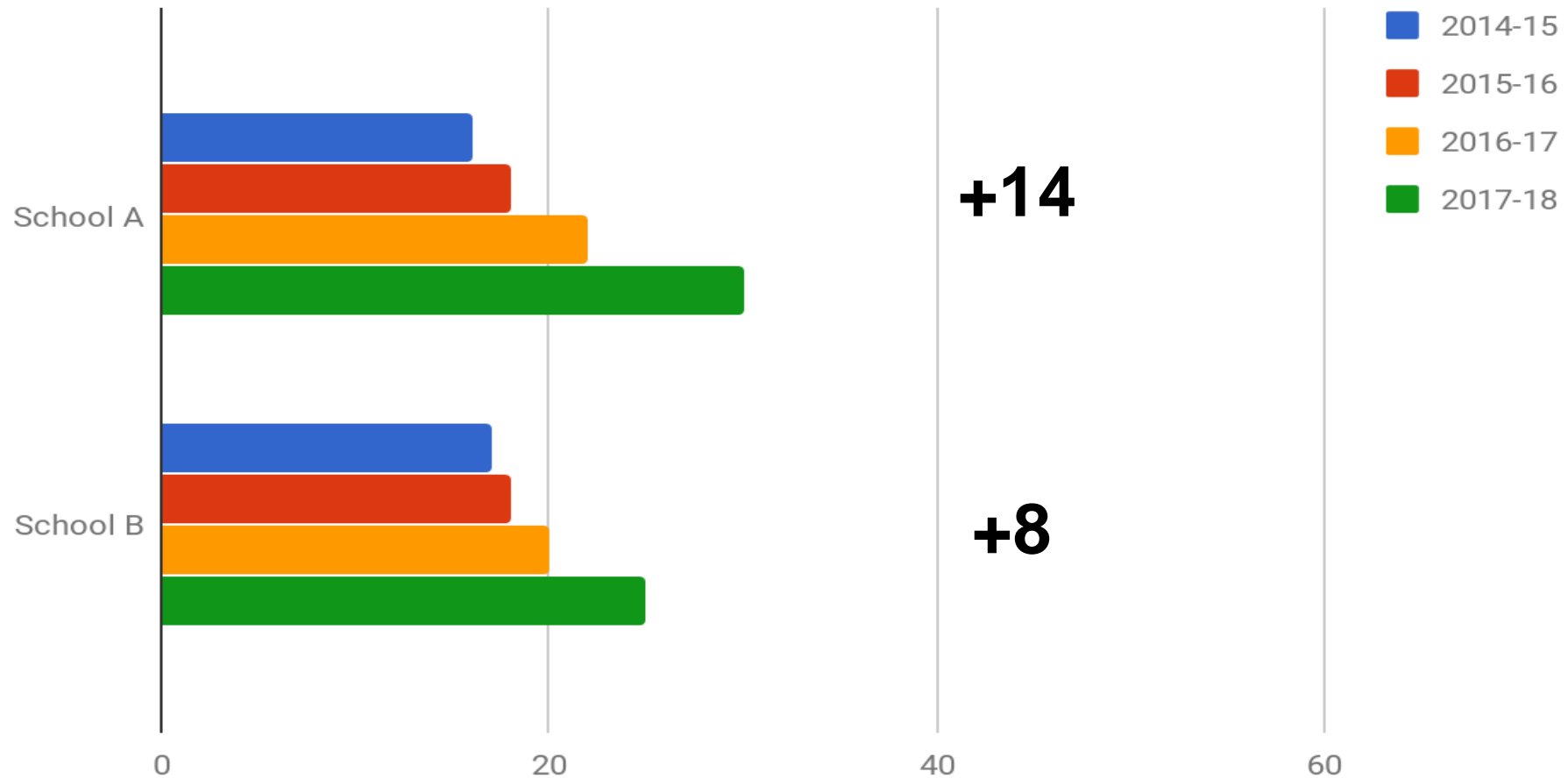
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Build procedural fluency from conceptual understanding

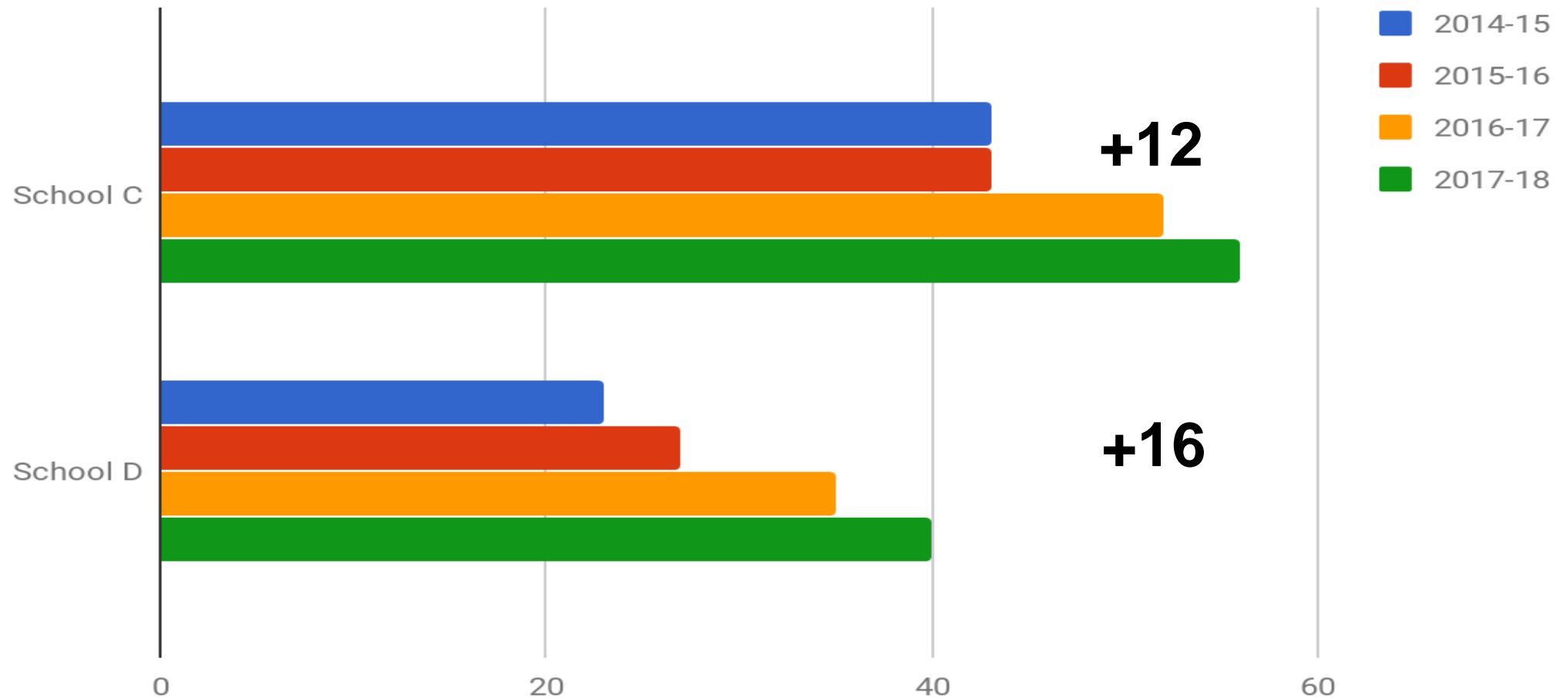
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Elicit and use evidence of student thinking

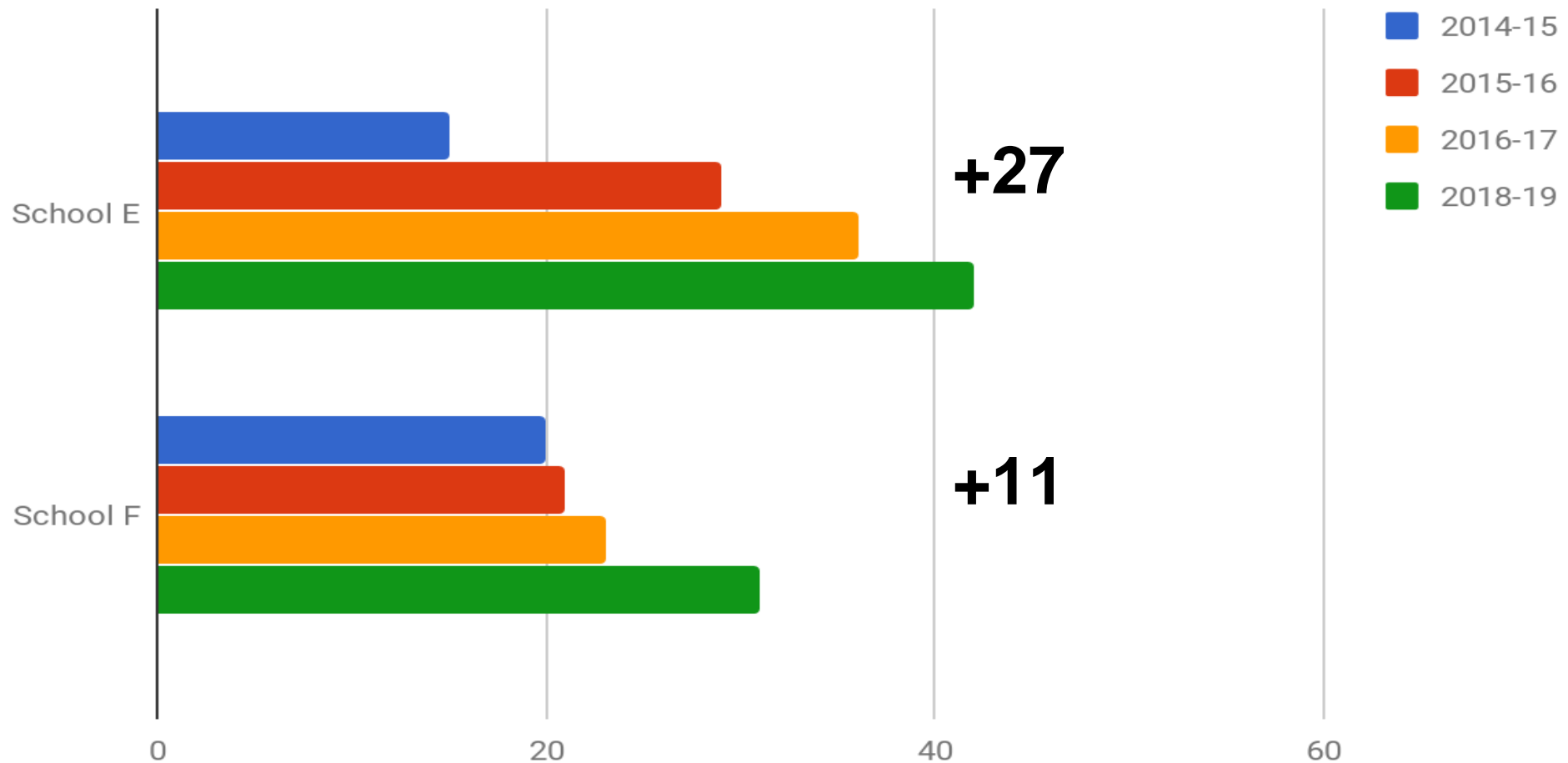
Leadership Impact-Low (3) High (1)



Leadership Impact-Average (2) High (2)



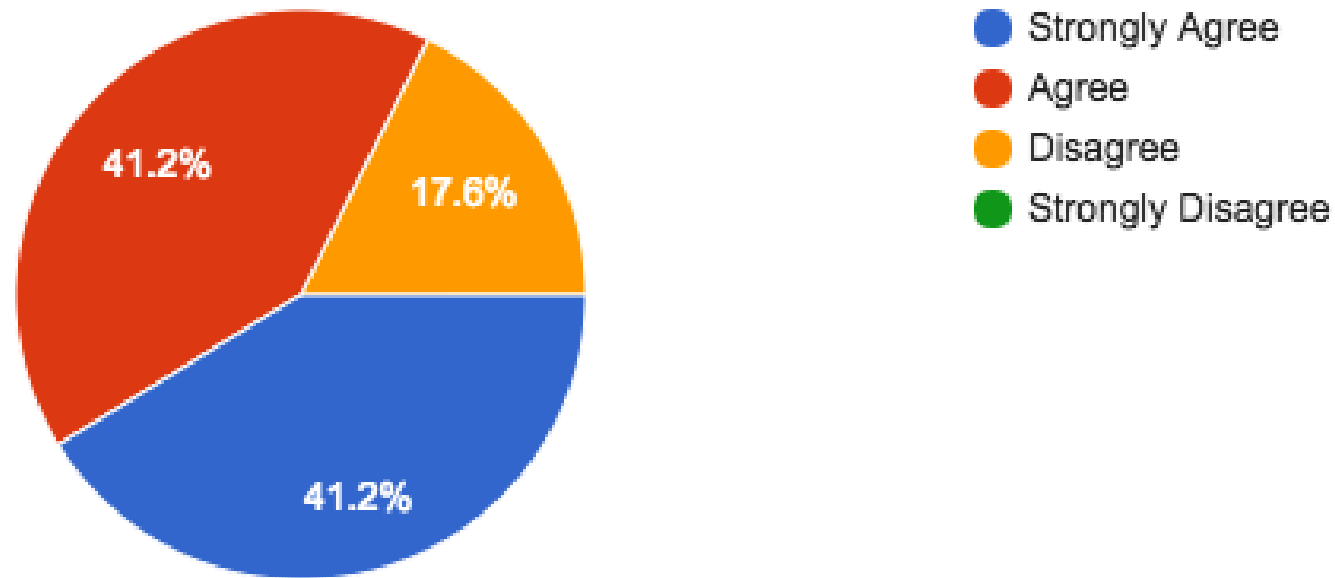
Leadership Impact (w/Depart. Collab)



Principals report...

Our math department chair has taken on a greater instructional leadership role this year.

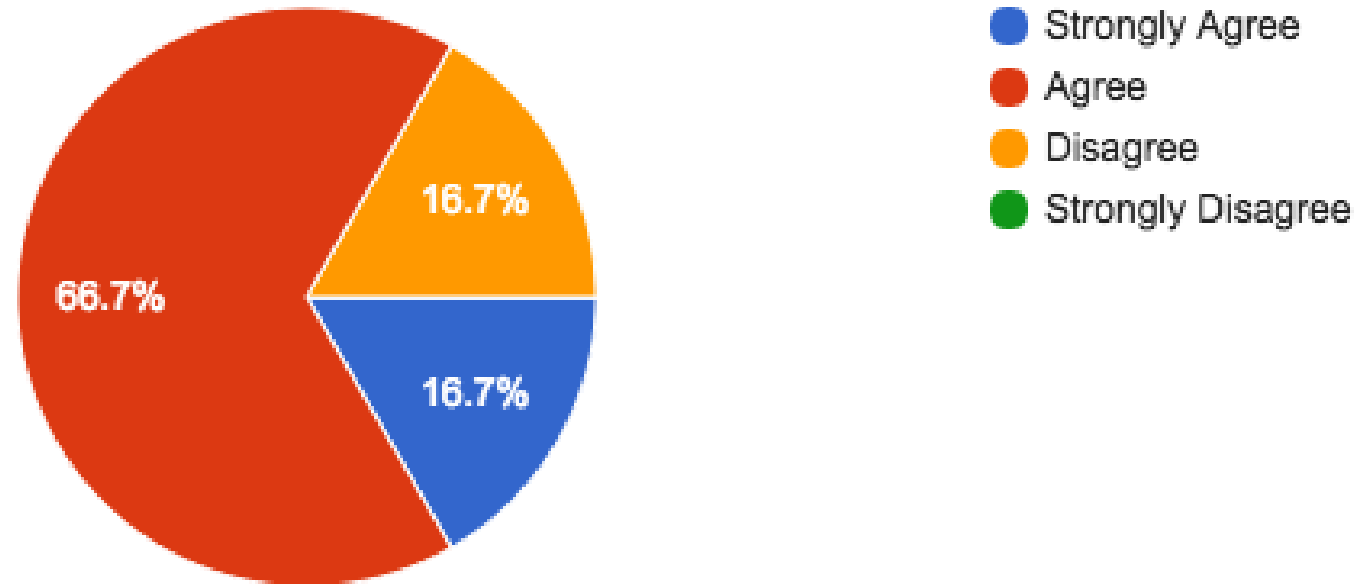
17 responses



Department Chairs report...

My principal is involved in the work of the math department this year.

18 responses



Closing thoughts...

A systems approach to instruction must include building administrator capacity.

Monitoring progress in instruction and providing effective feedback must be part of the approach.

Collaboration at the department level, when accompanied by supervision yields tremendous results.