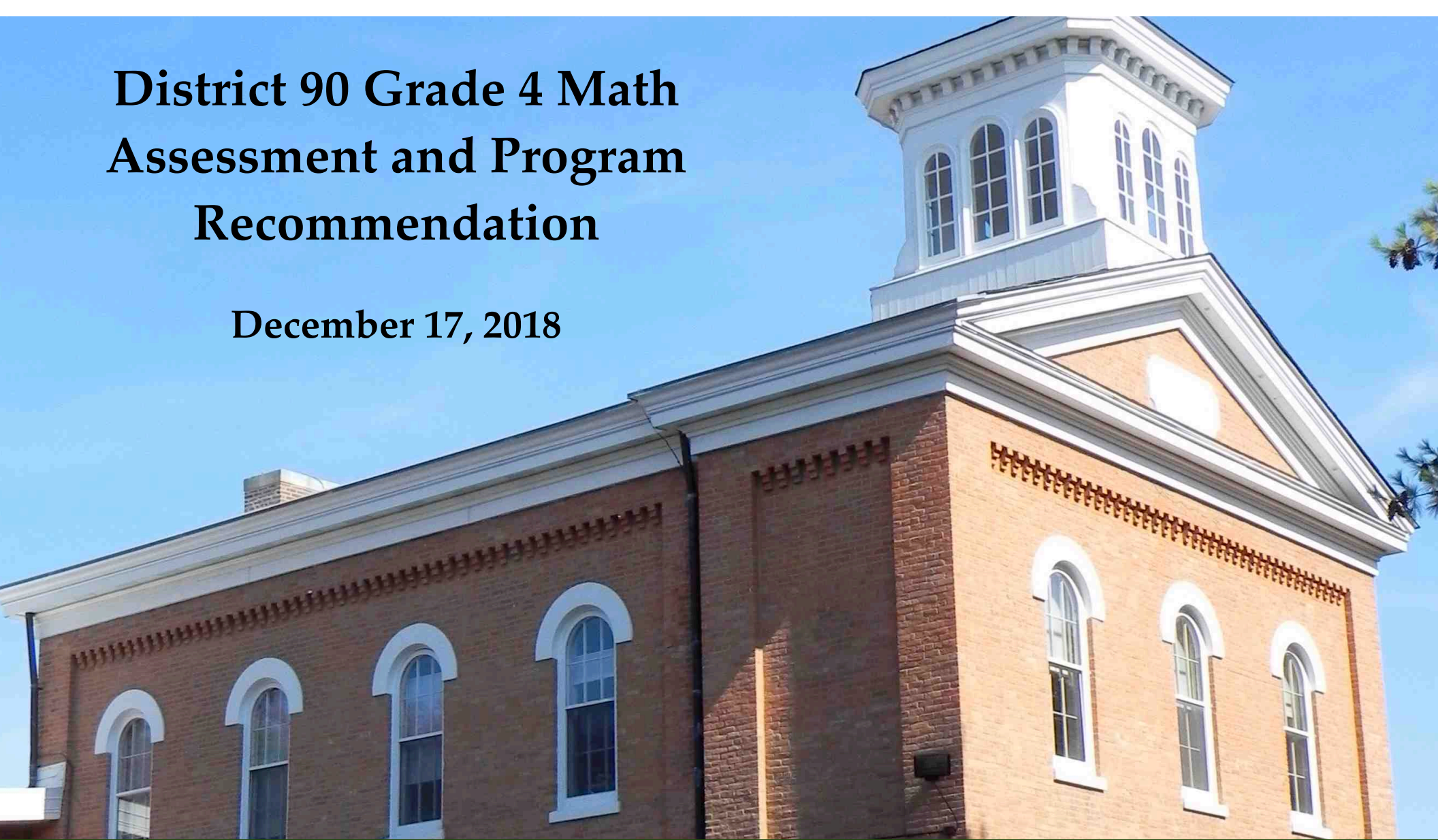


District 90 Grade 4 Math Assessment and Program Recommendation

December 17, 2018



Administration Building
7776 Lake Street
River Forest, Illinois 60305



River Forest
Public Schools

Tel: 708-771-8282
Fax: 708-771-8291

Presentation Goals

- Review drivers for decision-making
- Highlight consensus in the field of mathematics education
- Discuss program and assessment implications
- Define acceleration and rigor
- Provide recommendations and next steps

D90 Vision for Mathematics Education

In District 90 we believe that a high-quality mathematics environment provides.....

- A learning environment that supports multiple approaches to engaging in mathematics
- Curriculum and materials that provide coherent, aligned learning trajectories for students
- Instruction that is flexible, differentiated, and collaborative
- Assessment that is relevant, authentic, and informative
- Professional development that is meaningful, collaborative, and timely

District 90 Vision for Equity

“To ensure that every student feels empowered to achieve to his or her full potential, we commit to provide equitable opportunities for all learners, grow an inclusive school community, and demonstrate we value diversity.”

Illinois Learning Standards for Mathematics

- Provides focused and coherent mathematical progressions K-12
- Moves learning away from “mile wide and inch deep” instruction
- Provides research-based learning progressions reflecting how understanding develops over time
- Requires development of both understanding and procedural skill

Source: corestandards.org

Five Strands of Mathematical Proficiency

Five Strands	Definition
1. Understanding	Comprehending mathematical concepts, operations, and relations - knowing what mathematical symbols, diagrams, and procedures mean.
2. Computing	Carrying out mathematical procedures, such as adding, subtracting, multiplying, and dividing numbers flexibly, accurately, efficiently, and appropriately.
3. Applying	Being able to formulate problems mathematically and to devise strategies for solving them using concepts and procedures appropriately.
4. Reasoning	Using logic to explain and justify a solution to a problem or to extend from something known to something not yet known.
5. Engaging	Seeing mathematics as sensible, useful, and doable - <i>if</i> you work at it - and being willing to do the work.

D90 Math Leadership Team Accomplishments

- Established learning environments that support multiple approaches for engaging in mathematics
- Adopted K-8 curriculum materials that provide coherent, aligned learning trajectories for students
- Identified the essential elements of equitable math classrooms
- Developed process to align assessment practices

Equitable Mathematics Classrooms Require

- Critical examination of who the math program truly serves and who it structurally disenfranchises
- Holding all students to high expectations
- Recognizing inequitable learning opportunities can exist in any setting
- Consistency of instructional delivery across all classrooms
- Understanding heterogeneous classrooms do not reduce achievement levels of strong math students
- Math progressions that offer a pathway to high-level courses for all students

Source: "Equity and Deeper Learning in Mathematics." Pedro Noguera, Keynote Speaker, National Council for the Supervisors of Mathematics National Conference (2018); *Principles to Actions: Ensuring Mathematical Success For All*, National Council of Teachers of Mathematics (2014); *Raising Expectations and Achievement: The Impact of Wide-Scale Mathematics Reform Giving All Students Access to High-Quality Mathematics*. Jo Boaler and David Foster (2016).

High-Quality Assessment Practices

- Requires tight alignment to learning goals
- Must be consistent across grade levels
- Include common assessment tasks collaboratively reviewed by teaching teams
- Provides formative feedback to students
- Should focus on reasoning and problem-solving
- Must shift from performance to understanding

Source: *It's Time: Themes and Imperatives for Mathematics Education*. National Council for Supervisors of Mathematics (2014); *Principles to Actions: Ensuring Mathematical Success for All, Access and Equity*. National Council of Teachers of Mathematics, (2014); *Mathematical Mindsets: Unleashing Potential Through Creative Math, Inspiring Messages, and Innovative Teaching*, Jo Boaler (2016)

Challenge of Using CogAT to Determine Math Placement

- Emphasizes more “traditional” math learning outcomes
- Not aligned to math program goals or learning standards
- Does not assess conceptual based fluency or strategy work
- Does not provide a window into student reasoning or explanation
- Does not assess conceptual understanding or real-world problem-solving
- Does not allow for “out-of-the-box” thinking

Recommendations

- Eliminate CogAT in Grade 3
- Shift elements of the Grade 4 ADL program into classrooms to provide greater access based on student readiness
- Utilize ADL math specialists as classroom supports
- Provide a replacement for CogAT to assess math proficiency

Research on Acceleration and Tracking

- Metrics utilized to determine placement must be aligned with expectations for student understanding
- All students should have an open pathway to high levels of mathematics
- Research shows that all students benefit from heterogeneous math learning environments
- Early advancement can be detrimental for students and can undermine their future math potential in upper grade levels

Source: *"Equity and Deeper Learning in Mathematics."* Pedro Noguera, Keynote Speaker, National Council for the Supervisors of Mathematics National Conference (2018); *Principles to Actions: Ensuring Mathematical Success For All*, National Council of Teachers of Mathematics (2014); *Raising Expectations and Achievement: The Impact of Wide-Scale Mathematics Reform Giving All Students Access to High-Quality Mathematics*. Jo Boaler and David Foster (2016).

What Makes a Mathematics Curriculum Rigorous?

- Balance of procedures, concepts, and applications
- Increasing the variety and quality of student work
- Infusion of performance tasks / projects
- Enhanced written explanations:
 - * Procedures: show steps, explain how it was calculated
 - * Conceptual understanding: explain why something is true
 - * Problem-Solving: explain which method you used to solve the problem
 - * Modeling: explain the assumptions made and implications

Next Steps

- Form Math Leadership Team sub-committee to align tasks currently utilized in Grade 4 ADL class to current Grade 4 scope and sequence
- Ensure that all students have a math thought partner
- Define role of math specialists in Grade 4
- Determine replacement for CogAT assessment
- Refine matrix for Roosevelt placement

Q & A

What Makes a Mathematics Curriculum Rigorous?

Misconception #1: Input vs Output

- It is not what the teacher or materials do (inputs) but what students do (outputs) that matters.
- Inputs tend to focus on coverage and introducing topics at earlier ages vs. looking at topics in greater depth facilitating substantive student outputs.

Misconception #2: Difficulty and Workload

- Using unfriendly numbers for calculations vs. looking deeply into patterns and structure of mathematics
- Results in many hours of rote homework vs. one conceptually challenging problem

Misconception #3: Selectivity and Exclusivity

- Selective or exclusive courses do not necessarily incorporate greater rigor
- Significant systemwide implications for equity and access