DC MATH TASK FORCE

What Does an Evidence-Based Math Class Look Like?

DC Math Task Force, Instructional Resources Working Group

June 2025

This document establishes a baseline of expectations for K-12 core (Tier 1) math instruction in the District of Columbia. **School leaders** can utilize this document to understand the importance of an evidenced-based math education, how DC defines evidence-based math instruction and key components of a daily core math block. This resource provides leaders with a starting point to identify areas for further professional learning and serves as a reference for determining where classroom educators may need additional structure or support. For questions, contact OSSE's Division of Teaching and Learning at osse.tta@dc.gov.

Guiding Principles for Math Instruction

- A **balance of learning opportunities** wherein students will develop conceptual and procedural understanding as well as have opportunities to apply learning to the world around them.
- A **student-centered learning environment**, where students carry the majority of the cognitive load and each student is engaged in sense-making, productive struggle and exchange of ideas about mathematics.
- An **authentic purpose** for learning mathematics in a way that prepares students for a changing world.
- **Positive math identities** wherein all students see themselves and members of their communities as doers of mathematics.
- An **equitable learning experience**, wherein "reasonable and appropriate accommodations are made as needed to promote access and attainment for all students" (NCTM 2000, p. 12).

Why is math important?

With mathematical reasoning and problem solving, we can...

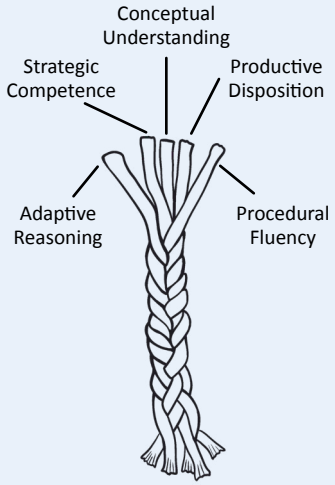
- navigate daily life and understand the world
- make predictions, use patterns and make informed decisions
- solve problems in society
- impact the future

What is evidence-based math instruction? What skills and knowledge do students develop?

Evidence-based math instruction focuses on developing students' conceptual understanding, reasoning, and procedural skills and fluency, along with their capacity to solve everyday problems. Student success depends upon opportunities to engage in problem solving, practice, and the discussion of strategies, methods, and solutions. It also depends upon developing a strong sense of oneself as someone who can do math. A balanced approach to math instruction includes a number of evidence-based practices that are appropriate for different students in different situations.
Source: What is Evidence-Based Math Instruction?

The **Strands of Mathematical Proficiency**, **Standards for Mathematical Practice**, and **Effective Math Teaching Practices** work in conjunction to develop skills and capabilities in students.

Strands of Mathematical Proficiency



These five interwoven strands represent the different aspects of how learners demonstrate mathematical proficiency. Each one is a crucial part of the whole.

- ***Adaptive Reasoning:*** capacity for logical thought, reflection, explanation, and justification
- ***Strategic Competence:*** ability to formulate, represent, and solve mathematical problems
- ***Conceptual understanding:*** comprehension of mathematical concepts, operations, and relations
- ***Productive Disposition*:** habitual inclination to see mathematics as sensible, useful, and worthwhile, coupled with a belief in diligence and one's own efficacy
- ***Procedural Fluency:*** skill in carrying out procedures flexibly, accurately, efficiently, and appropriately

Source: National Academies of Sciences, Engineering, and Medicine. 2001.

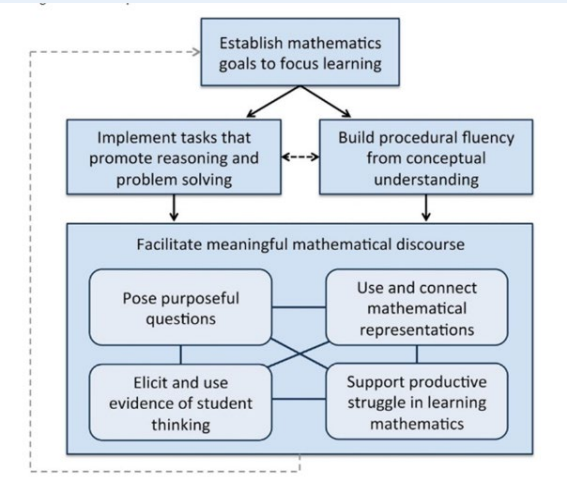
Standards for Mathematical Practice

The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students. ***They should be integrated regularly and meaningfully into grade level content standards.***

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 Math Teaching Practices

The National Council of Teachers of Mathematics' Effective Math Teaching Practices provide research-based guidance on how educators help students become proficient mathematicians.



Source: Principles to Actions, National Council of Teachers of Mathematics.

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.

What should the classroom experience look like?

Below are four core questions about the student experience that leaders can ask as they observe math classrooms:

- Are students experiencing instruction that reflects the demands of the grade level and ensures they are supported to develop grade-level knowledge and skills?
- Are students experiencing instruction that leverages their diverse backgrounds as assets and engages them in learning about, critiquing, questioning and taking action in the world around them through relevant, real-world contexts?
- Are students experiencing instruction that fosters a positive intellectual and emotional environment for learning?
- Are students experiencing instruction that leverages their linguistic repertoires and backgrounds to support multilingualism and the simultaneous development of content knowledge and language?

Source: E2 Learning Walk Tool, Student Achievement Partners

How is daily math instructional time allocated?

Neither OSSE nor the National Council Teachers of Mathematics recommend a specific length of math instructional time. Developing mathematical proficiency takes time and research shows there are essential components of learning that are required during the math instructional block. The key components of a balanced math class are outlined in the sample schedules below. On a daily basis, students need sufficient time to grapple with grade-level content. The sample schedules are designed to assist LEAs and schools in generating potential math instructional time structures. Class and time structures may vary depending on grade level, lesson goals and student need.

Traditional Class Structure		Focus Lesson + Workshop Structure			Math Workshop Structure	
5 min	Bell Ringer/Engager	10 min	Number Sense/ Fluency Routine		10 min	Number Sense/ Fluency Routine
10 min	Number Sense/ Fluency Activity	20 min	Whole Group Focus Lesson		30 min	Math Task (Application/ Problem Solving)
30 min	Whole Group Focus Lesson	35 min	Small Group	Learning Stations	25 min	Task Share/ Student Reflection
10 min	Independent Practice					
5 min	Closing/Homework	15 min	Student Reflection		5 min	Closing/Homework

Source: Math Workshop: five steps to implementing guided math, learning stations, reflection and more by Jennifer Lempp

Overall, how do educators assess math learning?

A variety of assessments should be used throughout the school year to measure student learning. Students need experience with different kinds of assessment tasks, question formats and a diversity of opportunities to demonstrate mathematical understanding. Math assessments should measure student progress toward mastery of grade level content and include extensive work with grade-level problems to meet the intent of grade-level standards. Assessments should be coherent and consistent with the Common Core Standards of Mathematics. Assessments should align with the balance of the Common Core Content Standards, (including conceptual understanding, procedural skills, fluency and engaging applications) as well as the Standards for Mathematical Practice. Educators use a variety of formative assessment strategies during core instruction to elicit evidence of student thinking, such as verbal and written questions, open ended tasks and activities, exit ticket or classroom discussion. Summative assessments measure learning at the end of longer intervals, such as units of study or the entire school year. The table below outlines three major types of assessment to support student learning year-round.

Type of Assessment*			
	Diagnostic/Screener	**Formative**	**Summative**
Purpose	Identify baseline performance and anticipate students' strengths and areas for growth	• Inform daily and real time instructional decisions • Bridge content readiness • Provide in-the-moment feedback to students *The following resources can help leaders and teachers better understand classroom formative assessments:* Using Formative Assessments Effectively, Strategies for Formative Assessment	Inform LEAs – or school-wide – decisions

How do educators ensure that all students access grade level content?

All students receive Tier 1 instruction focused on grade level content, through implementation of high-quality instructional materials. Educators plan and differentiate lessons to ensure accessibility and comprehension for all students, regardless of prior learning, ability and language. When tier 1 instruction does not meet all of a student's learning needs, a school team determines what data and interventions will be utilized to provide additional support for Tier 2 or 3 intervention.

Tier of Instruction	What is it?	Who participates? How often?
Tier 1	*Comprehensive, standards-based core curriculum delivered to all students guided by diagnostic assessment.*	All students daily
Tier 2	*Standardized, targeted small-group instruction using a research or evidence-based intervention program or practice.*	Groups no larger than 8 3-5 times/week in addition to Tier 1
Tier 3	*Individualized intervention, based on frequent and in-depth analysis of student data. The interventionist is following the data-based individualization (DBI) process and maintains fidelity to the individual student plan.*	Groups no larger than 4 45-60 minutes daily, in addition to Tier 1 and any current Tier 2 supports

Intervention is intentional, purposeful and targeted. The chart below identifies common missteps and recommendations for targeted supports and interventions. *Source:* [Student Achievement Partners]

Recommendations for Targeted Math Supports and Interventions	
Common Misstep	**Recommendation**
Blindly adhering to a pacing guide/calendar	**Use formative data** to gauge student understanding and inform pacing
Halting instruction for a broad review	**Provide just-in-time** support within each unit or during intervention
Trying to address every gap a student has	**Prioritize most essential prerequisite** skills and understanding for upcoming content
Trying to build from the ground up or going back too far in the learning progression	**Trace the learning progression, diagnose, and go back just enough** to provide access to grade-level material
Re-teaching students using previously failed methods and strategies	**Provide a new experience** for students to re-engage, where appropriate *See more about re-engagement vs re-teaching here.*
Disconnecting intervention from content students are learning in math class	**Connect learning experiences** in intervention and universal instruction
Choosing content for intervention based solely on students' weakest areas	**Focus on major work** clusters from current or previous grades as it relates to upcoming content
Teaching all standards in intervention in a step-by-step, procedural way	**Consider the aspect of rigor** called for in the standards when designing and choosing tasks, activities, or learning experiences
Over-reliance on computer programs in intervention	**Facilitate rich learning experiences** for students to complete unfinished learning from previous or current grade