ILLINOIS COMPREHENSIVE NUMERACY PLAN

www.isbe.net/Pages/Illinois-Numeracy-Plan.aspx

ILLINOIS STATE BOARD OF EDUCATION

January 2026

Illinois Comprehensive Numeracy Plan

Illinois State Board of Education

Month Year

Acknowledgements

Acknowledgements added here.

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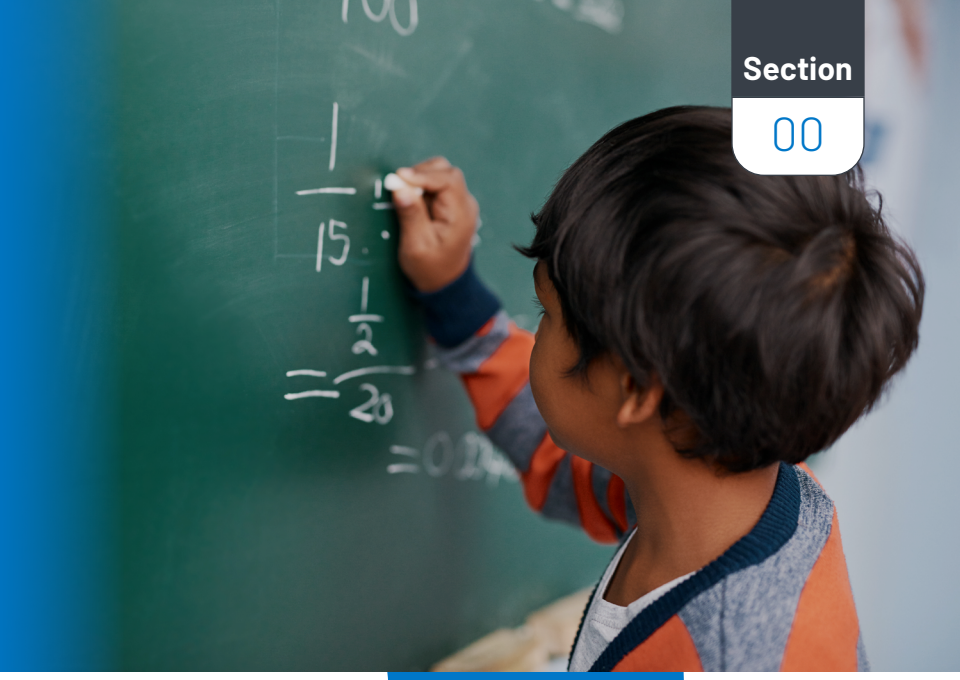
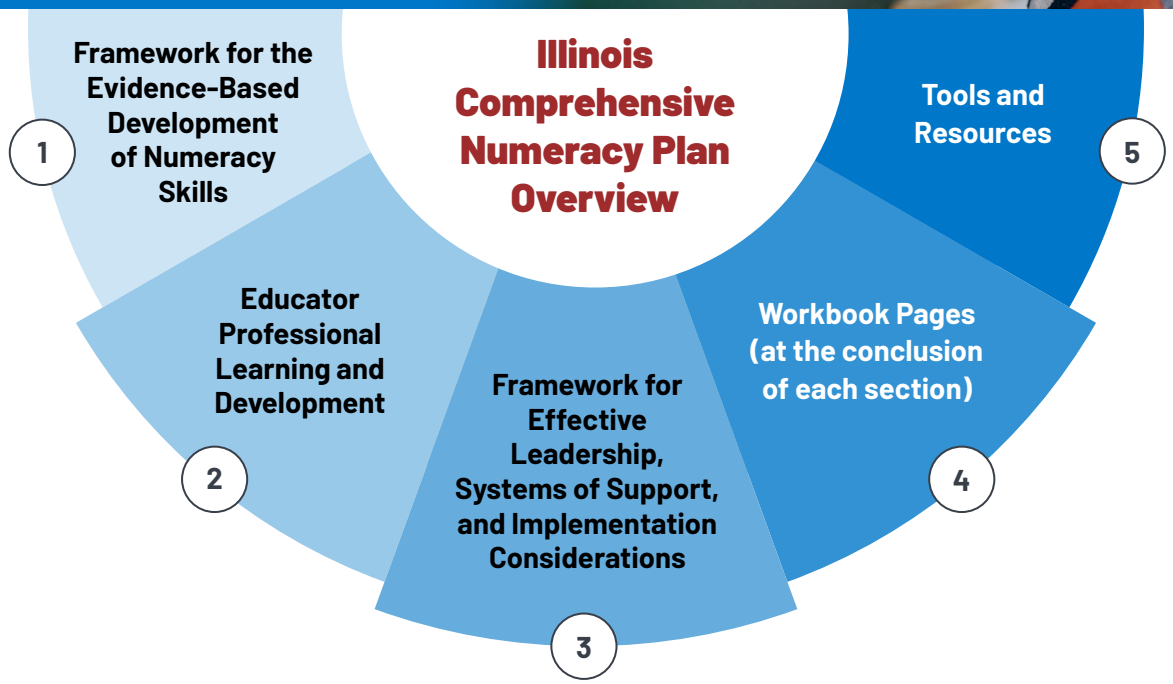
VISION AND PURPOSE

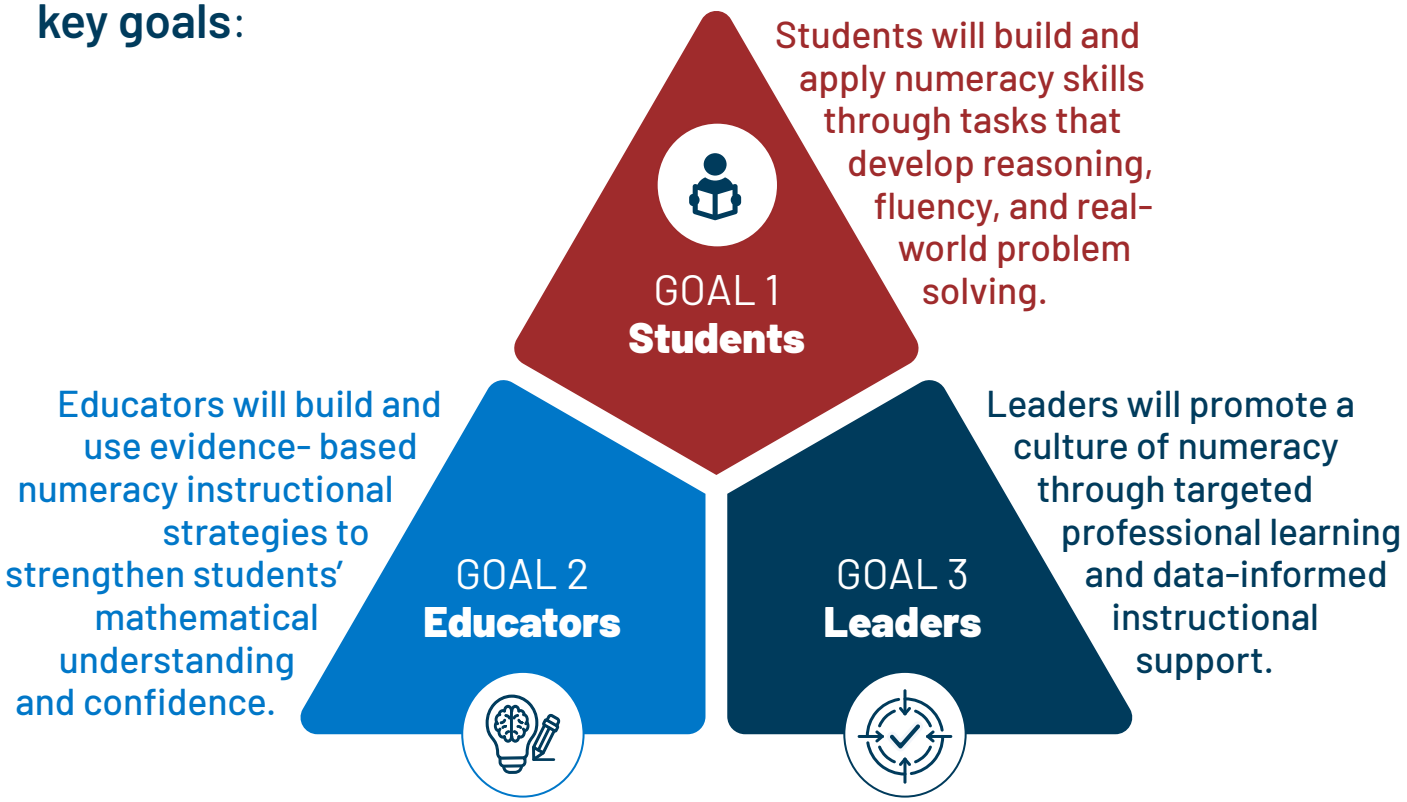




ISBE's Commitment to Equitable Numeracy Instruction

The Illinois Comprehensive Numeracy Plan (ICNP) is founded on the principle that every student, in every classroom, deserves instruction that empowers them to be confident and capable mathematical thinkers. True numeracy extends beyond procedural fluency to encompass reasoning, problem solving, and the ability to communicate and apply mathematical ideas. The Illinois State Board of Education is committed to ensuring equitable access to high-quality numeracy instruction for all students, including culturally, linguistically, and academically diverse student populations. This commitment requires intentionally designing instruction that recognizes and responds to the unique strengths and needs of each learner. This guidance aims to strengthen teaching and learning by building cohesive systems of support for students, educators, and leaders.

Each section works to support **three key goals**:



Flexibility and Local Autonomy

ISBE provides guidance to districts rather than governance, enabling districts to either adopt the numeracy plan or create local plans customized to their unique needs. ISBE hopes districts will find the Numeracy Plan useful in strengthening math teaching and learning.

Illinois is a locally controlled state whereby each individual school district has the responsibility of determining curriculum; the Illinois State Board of Education nor the Illinois Comprehensive Numeracy Plan endorses or recommends any specific curriculum program or instruction method but encourages the use of evidence-based curricular materials.

Vision and Purpose

Provides a call to action and the "why" behind the document.

Student Instruction

Students will build numeracy skills through tasks that develop reasoning, fluency, and real-world problem solving.

Professional Learning

Educators will use evidence-based numeracy strategies to strengthen student's mathematical understanding and confidence.

Leadership

Leaders will promote a culture of numeracy through targeted professional learning and data-informed instructional support.

Workbook

Reflection and discussion questions to enhance numeracy instruction.

Tools and Resources

A list of tools and resources designed to support districts, educators, and families.

Why is This Guidance Important?

Across Illinois, educators, schools, and school districts are working hard to support student success in numeracy, yet the Illinois Report Card reveals persistent disparities. Students begin school with vastly different levels of numeracy preparedness, and these early differences, shaped by access to high-quality early childhood and preschool experiences, family support, and community resources, often widen as students move through K-12 public schools.

The 2025 Illinois Assessment of Readiness results indicate that 38.5% of students in Grades 3–8 met grade-level proficiency standards in mathematics, with post-pandemic recovery progressing more slowly in mathematics than in literacy. High school performance has remained stagnant, and persistent disparities continue across racial, ethnic, and income groups. Results from NAEP, Illinois SAT, and local benchmark assessments confirm these concerns. Achievement gaps by race, income, English proficiency, and disability status remain significant and longstanding, reflecting systemic inequities in access to high-quality instruction, rigorous coursework, and culturally relevant learning opportunities.

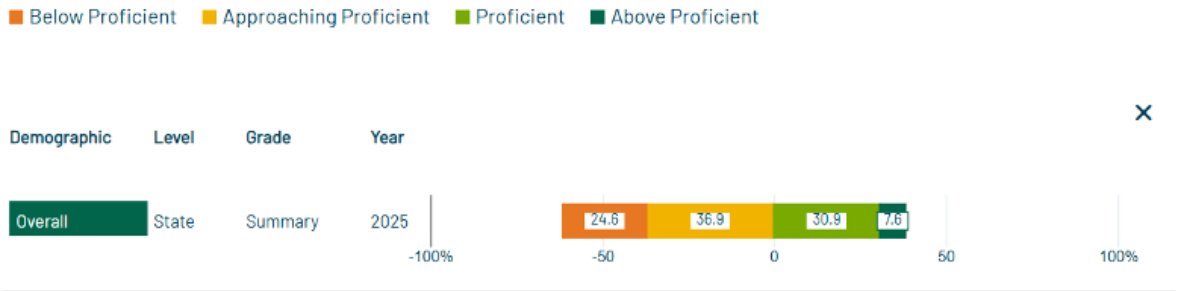


Figure 1: Percentage of students scoring at each of the performance levels for the Illinois Assessment of Readiness by year in 2025

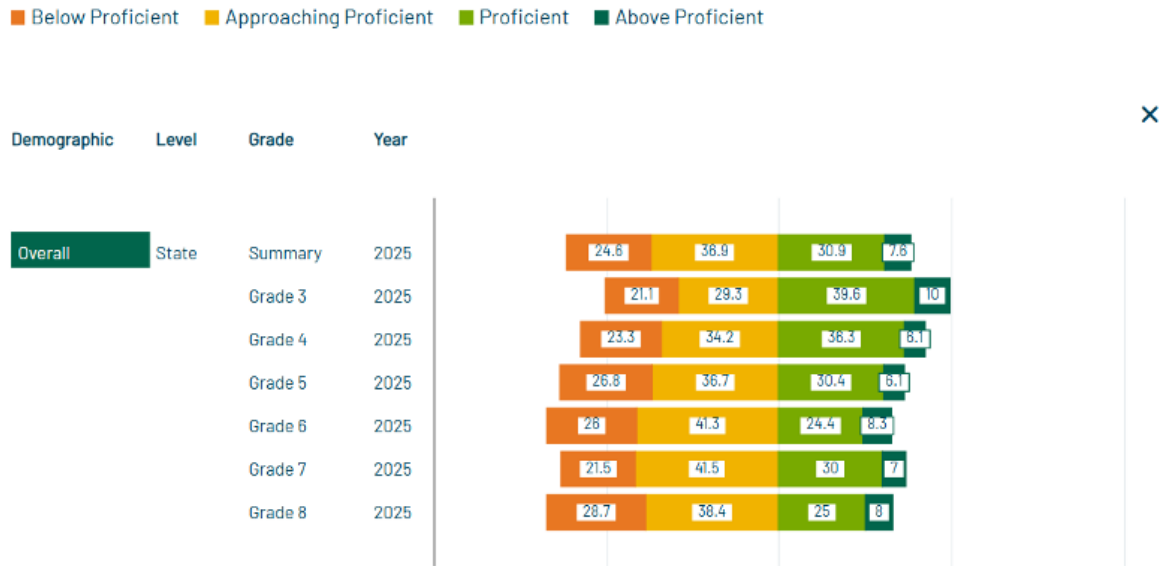


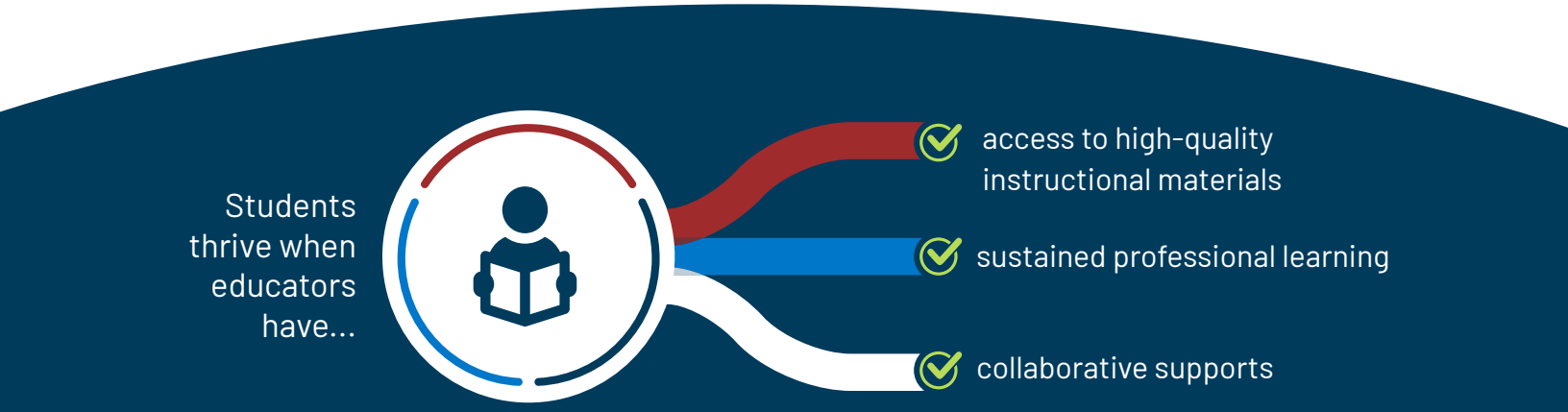
Figure 2: Percentage of students scoring at each of the performance levels for the Illinois Assessment of Readiness by grade level in 2025

Test scores do not capture the full range of student strengths such as creativity, perseverance, character, or potential, but they do provide a starting point for action, and the data must be used to inform meaningful change. While test scores offer a snapshot of student performance, it is essential to recognize that numeracy reaches far beyond academic success—it is a foundational skill that influences lifelong outcomes. Renowned mathematician Andreas Schleicher states, "Good numeracy is the best protection against unemployment, low wages, and poor health," underscoring the critical role it plays in shaping personal and societal well-being. Prioritizing equitable, high-quality math instruction, culturally responsive teaching, and equitable access to resources is essential to ensure all students in Illinois can succeed in mathematics and in life. This guidance, rooted in evidence-based practices and data-driven decision-making, aims to strengthen and align core mathematics instruction across the state.

Building Conditions for Success

Math anxiety and negative perceptions of mathematics further compound the challenge for learners to succeed. People tend to either identify as a "math person" or "not a math person," which is an alarming classification system knowing how impactful numeracy is on long-term success and well-being.[1] Imagine if the same categorization were used in relation to reading and someone said, "I'm just not a person who can read." It has been long accepted that reading is an essential component of everyday life, and that same notion must be extended to mathematics. As the Why Math, Why Now report highlights, mathematics serves as a gatekeeper to postsecondary success, career opportunities, and economic mobility, making systemic improvement essential.[2]

Improving mathematics outcomes requires creating the right conditions for learning.



Research emphasizes that these systemic conditions play a vital role in advancing student success in mathematics.[3] The Illinois Comprehensive Numeracy Plan calls for statewide capacity-building, the expansion of evidence-based strategies, such as high-dosage tutoring, and assessment practices that value both conceptual understanding and procedural fluency. Additionally, this guidance provides an opportunity to **chart a new course** for numeracy in Illinois: one rooted in **evidence**, **equity**, and the belief that **all students** can develop the **skills**, **habits of mind**, and **confidence** needed to **thrive mathematically**. By focusing on **proficiency**, **growth**, and **equity**, Illinois can transform mathematics from a barrier into a **pathway of opportunity** for every learner.

Q: What is Numeracy

A: Numeracy is more than arithmetic or the memorization of procedures. As defined in this guidance, numeracy is the ability for all students to confidently understand, interpret, and apply mathematical concepts across all domains of mathematics in a variety of real-world and academic contexts.

Numeracy begins with strong foundational skills in both conceptual understanding and procedural fluency, applied with accuracy, flexibility, and reasonableness. Such competency is supported by the mathematical practices that promote effective reasoning, problem solving, and communication using mathematical language. Numeracy encompasses all domains of mathematics, including numbers, algebra, geometry, measurement, statistics, probability, and spatial reasoning. Numeracy supports the development of a positive mathematical identity, where students see themselves as capable, persistent, and confident problem solvers. Developing these abilities involves cultivating mathematical habits of mind, such as using a mathematical lens to interpret the world, analyzing and critiquing quantitative information, and connecting reasoning to civic, career, personal, and interdisciplinary contexts. This skill develops into the capacity to reason, solve problems, and make informed decisions. A strong mathematical foundation applies across the full K-12 continuum and supports the development of mathematically literate citizens prepared for the demands of the 21st century. All students have the capacity to develop numeracy when they are provided equitable access to high-quality instruction, culturally relevant learning experiences, and opportunities to engage meaningfully in mathematics.

Audience

The intended audience of the Illinois Comprehensive Numeracy Plan includes all educational partners, including students, caregivers, educators, and educational leaders. ISBE recognizes that each of the following stakeholder groups plays a pivotal role in numeracy education. ISBE believes in the shared responsibility of schools, families, and communities to help every student grow in mathematics and recognizes the value of working together with clear goals, a common language, and consistent practices. When all educational partners work in tandem, students benefit from a cohesive support network that promotes both academic and personal growth.

Audience Descriptions

Students

Students represent a wide range of mathematical experiences, backgrounds, and identities. They develop numeracy through opportunities to reason, explore, and make sense of mathematical ideas. As they grow, students build confidence by engaging in real-world problem solving and expressing their mathematical thinking in multiple ways.

Specific sections of note include:

Teachers

Teachers include classroom educators, interventionists, and specialists who design daily learning experiences that build numeracy. They support students in developing conceptual understanding, procedural fluency, and mathematical reasoning. Teachers foster positive math identities and ensure equitable access to grade-level content.

Specific sections of note include:

Teacher Leaders

Teacher leaders include math coaches, department chairs, bilingual specialists, and instructional leaders who support classroom teachers. They use data and content expertise to guide educators in implementing strong mathematics instruction. Teacher leaders help maintain coherence across grade levels and strengthen schoolwide numeracy practices.

Specific sections of note include:

Audience Descriptions

School Leaders

School leaders, including principals and assistant principals, shape the conditions that support effective mathematics instruction. They guide curriculum implementation, professional learning, and collaborative planning. School leaders analyze data, promote equitable access to grade-level math, and ensure a positive culture for numeracy.

Specific sections of note include:

District Leaders

District leaders such as superintendents, curriculum directors, and instructional administrators oversee systemwide numeracy efforts. They support curriculum adoption, assessment planning, and professional learning. District leaders analyze student data to guide decision-making and promote coherent, equitable mathematics instruction across schools.

Specific sections of note include:

Regional Leaders

Regional leaders, including ROEs and ISCs, provide multi-district support for improving numeracy. They offer professional learning, assist with curriculum review, and analyze regional data to identify needs. Regional leaders help ensure consistent, aligned implementation of evidence-based math practices across communities.

Specific sections of note include:

Audience Descriptions

Educator Preparation Programs

Educator preparation faculty prepare future teachers to understand mathematical development and evidence-based instruction. They introduce candidates to learning progressions, content knowledge, and strategies that promote reasoning and conceptual understanding. These programs help develop confident, well-prepared mathematics educators.

Specific sections of note include:

State Leaders

State leaders, including ISBE and statewide agencies, establish the structures and guidance that support effective numeracy instruction. They monitor statewide data, develop aligned resources, and promote equity across districts. State leaders help create coherent systems that advance mathematics achievement for all students.

Specific sections of note include:

Community & Family

Families and community partners play an important role in supporting students' numeracy development. They encourage mathematical thinking in daily life, reinforce positive attitudes about learning math, and collaborate with schools to strengthen student success. Their engagement helps extend numeracy beyond the classroom.

Specific sections of note include:

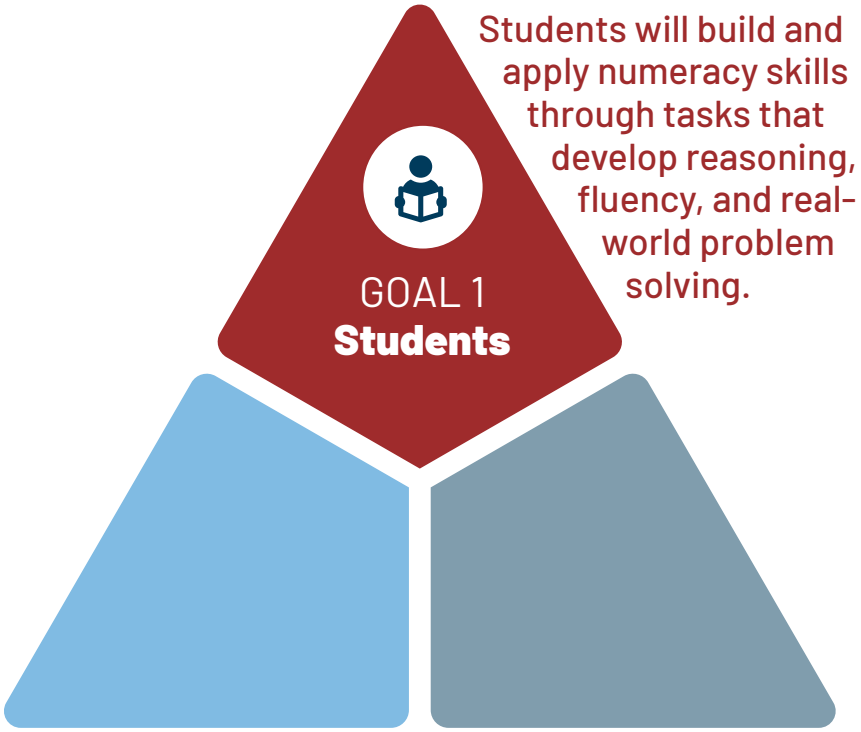
Vision & Purpose End Notes

[1]Parsons, Samantha, and John Bynner. Does numeracy matter more?. 2005.
[2]Bill & Melinda Gates Foundation. Why Math, Why Now. Seattle, WA: Gates Foundation, 2022.
[3]Learning Policy Institute. Conditions for Teaching and Learning: Mathematics Pathways. Palo Alto, CA: Learning

Section 01

FRAMEWORK FOR THE EVIDENCE-BASED DEVELOPMENT OF NUMERACY SKILLS

This section is dedicated to **goal 1**:



Students will build and apply numeracy skills through tasks that develop reasoning, fluency, and real-world problem solving.

This section of the plan will cover the following main topics:

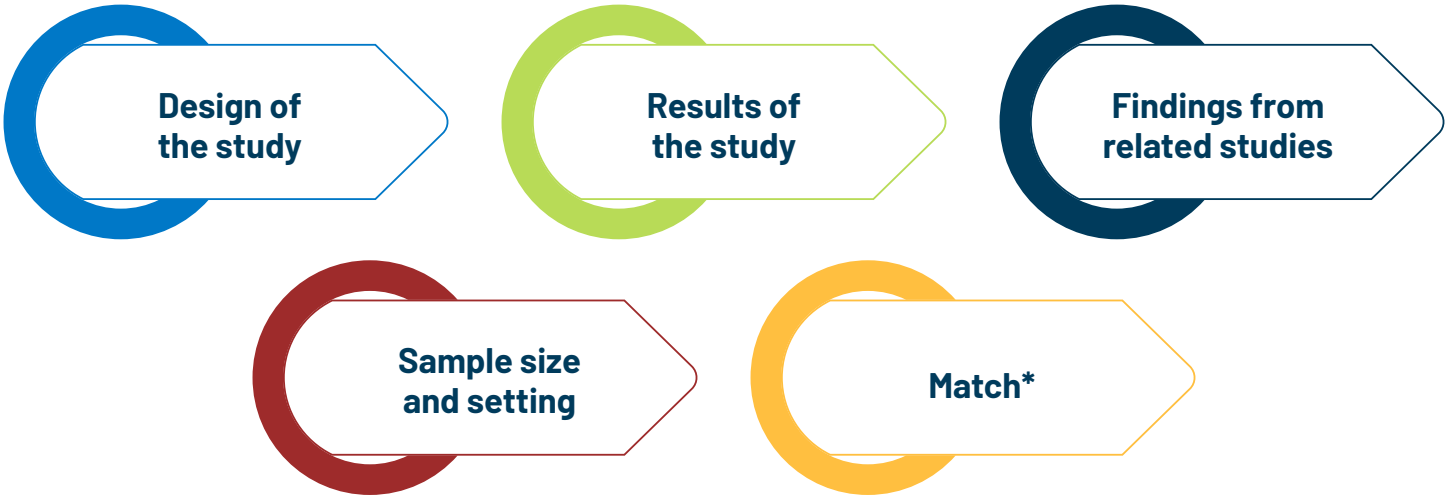
1. **1.** Evidence-based instruction
2. **2.** The six components of numeracy
3. **3.** Cohesive continuum of learning
4. **4.** Instructional considerations
5. **5.** Assessments

This section begins with defining evidence-based mathematics instruction, then discusses the importance of coherent and aligned curriculum to avoid fragmented instruction and create a cohesive continuum for learning. Next, the plan offers insight into the development of mathematical skills and carefully lays out the components of numeracy. This section elaborates on instructional considerations that benefit all learners as well as provides considerations for learners with specialized needs. Lastly, this portion of the plan offers information about assessment, and the plan ends with workbook pages tailored to each audience type and reflection questions regarding goal 1 of the plan.

Evidence-Based Instruction

Evidence-based instruction lays the foundation for the Illinois Comprehensive Numeracy Plan. This type of instruction is grounded in a comprehensive analysis of educational practices that are validated through a spectrum of studies ranging from experimental to correlational. It is a dynamic process that continually adapts and evolves in response to emerging educational research and the ever-changing student populations.

The Illinois Comprehensive Numeracy Plan follows the federal Every Student Succeeds Act (ESSA), endorsing instructional practices based on the Tiers of Evidence framework. This framework classifies practices into four evidence-based tiers, which are determined by five factors:



*The extent to which the characteristics of the study align with the characteristics of the organization that wishes to implement the educational program.

Practices with strong (Tier 1) and moderate (Tier 2) evidence should be prioritized. This approach ensures that teaching methods are not just theoretically sound but also have proven effectiveness in enhancing student learning.

Figure 1: Understanding the ESSA Tiers of Evidence

UNDERSTANDING THE ESSA TIERS OF EVIDENCE

	TIER 1 Strong Evidence	TIER 2 Moderate Evidence	TIER 3 Promising Evidence	TIER 4 Demonstrates a Rationale
Study Design	Well-designed and implemented experimental study, meets WWC standards without reservations	Well-designed and implemented quasi-experimental study, meets WWC standards with reservations	Well-designed and implemented correlational study, statistically controls for selection bias[a]	Well-defined logic model based on rigorous research
Results of the Study	Statistically significant positive effect on a relevant outcome	Statistically significant positive effect on a relevant outcome	Statistically significant positive effect on a relevant outcome	An effort to study the effects of the intervention is planned or currently under way
Findings From Related Studies	No strong negative findings from experimental or quasi-experimental studies	No strong negative findings from experimental or quasi-experimental studies	No strong negative findings from experimental or quasi-experimental studies	N/A
Sample Size & Setting	At least 350 participants, conducted in more than one district or school	At least 350 participants, conducted in more than one district or school	N/A	N/A
Match	Similar population *and* setting to your setting	Similar population *or* setting to your setting	N/A	N/A

a. Findings from experimental and quasi-experimental studies that either (a) meet the first three criteria for Tiers 1 and 2 but not the sample size, setting, or match requirements, or (b) do not meet What Works Clearinghouse (WWC) standards but statistically control for selection bias between the treatment and comparison groups are also eligible to meet Tier 3 Promising Evidence.

From Institute of Education Sciences. ESSA Tiers of Evidence. U.S. Department of Education, 2025.

Figure 2: What Is and Is Not Evidence-Based Instruction

WHAT IS EVIDENCE-BASED INSTRUCTION?

✓ **A Collection of Research to Inform Instruction**

Research about how children learn mathematics and what to do when a child encounters difficulty in learning mathematics. The research informs evidence based instructional practices.

✓ **Ever-Evolving**

New evidence and research are continuously being released. As populations, communities, and approaches evolve, so should practice. New research can impact the weight of evidence. The continuum of rigor and quality for research can help identify the weight of claims stemming from research.

WHAT IS NOT EVIDENCE-BASED INSTRUCTION?

✗ **A Program, Intervention, or a Product for Purchase**

The use of evidence-based instruction is an approach to teaching mathematics that is based on decades of research and evidence. It is not a specific program.

✗ **Complete and Final**

As with any research, it is never complete. Studies are constantly being conducted and new research continues to be released. Leaders, teachers, and families can work together to bring relevant evidence-based practices into the classroom.

Balancing Explicit Instruction and Inquiry Learning

Explicit instruction in mathematics is a structured, teacher-led approach in which the teacher clearly explains and models procedures, guides students through practice, and provides immediate feedback to ensure mastery of skills. It can be misinterpreted as "drill and kill" style instruction in which the teacher remains at the front of the room while students play a passive role in learning; however, effective explicit instruction can be hands-on, interactive, and include the use of manipulatives to support conceptual understanding.

In contrast, inquiry-based, or discovery-based, learning engages students in exploring mathematical ideas, posing problems, and constructing understanding through investigation. A common misconception is that inquiry-based learning means the teacher is completely hands off, but in reality, the teacher actively facilitates and guides students in their learning.

Effective mathematics **instruction** strategically **integrates both approaches**. **Explicit instruction** promotes **accuracy** and **conceptual clarity** when introducing foundational skills or instructing novice learners. **Inquiry-based learning** is most appropriate when students are extending their learning and **fosters problem solving** and **reasoning**.

Figure 3: Components of Explicit Instruction and Inquiry Learning [1]

Component	Explicit Instruction	Inquiry Based Learning
Best For	New, complex, or foundational skills, intervention, vocabulary, and novice learners	Extending learning, collaboration, real-world applications, interdisciplinary connections
Primary Approach	Teacher-led, systematic design that includes modeling, guided practice, and immediate corrective feedback	Student-led investigation of concepts, questioning, and exploration to construct understanding
Teacher Role	Direct instructor: models, guides, and scaffolds learning	Facilitator: guides and supports students' exploration
Student Role	Practice structured steps and procedures	Generate questions, explore, problem solve
Cognitive Load	Lower cognitive load due to systematic instruction, structured modeling, and use of scaffolds	Higher cognitive load; may overwhelm novice learners due to a lack of prior knowledge

The Six Components of Numeracy

Illinois has identified six components of numeracy detailed on the following pages.

Procedural fluency

Conceptual understanding

Strategic competence

Adaptive reasoning

Productive disposition

Discourse

The components, with the exception of discourse, were established by the National Research Council and offer a comprehensive overview of instructional practices. These practices align with the crucial components of numeracy.The instructional framework is not merely a theoretical construct; it is a practical tool for educators that is designed to enhance numeracy teaching and learning throughout Illinois.

The six components of numeracy are not independent of one another; thus, they are not isolated skills. Each component works together to cultivate numeracy in students, which is a vital skill for success in both students' personal and professional lives. Effective mathematics instruction incorporates each component to build numeracy in students.

Procedural Fluency

Procedural fluency extends beyond the ability to perform standard algorithms, but involves understanding mathematical processes and procedures, knowing when and how to apply them effectively, and being able to execute them with flexibility, accuracy, and efficiency.[2] Procedural fluency also includes the ability to accurately estimate and check for reasonableness, which closely aligns with the development of conceptual understanding. A student's ability to perform mental mathematics calculations with little to no errors lays the foundation for higher math as well as allows students to focus on the "why" behind the procedure. Procedural fluency builds the foundation for higher order thinking, advanced mathematics skills, and for real-world applications such as budgeting, calculating a tip at a restaurant, time management, etc. Ultimately, students who are fluent with procedures can easily apply the appropriate strategies to produce the correct answers or reasonable estimates and understand they must remain flexible in their approach to problem solving, as mathematics strategies are not a one-size-fits-all solution.

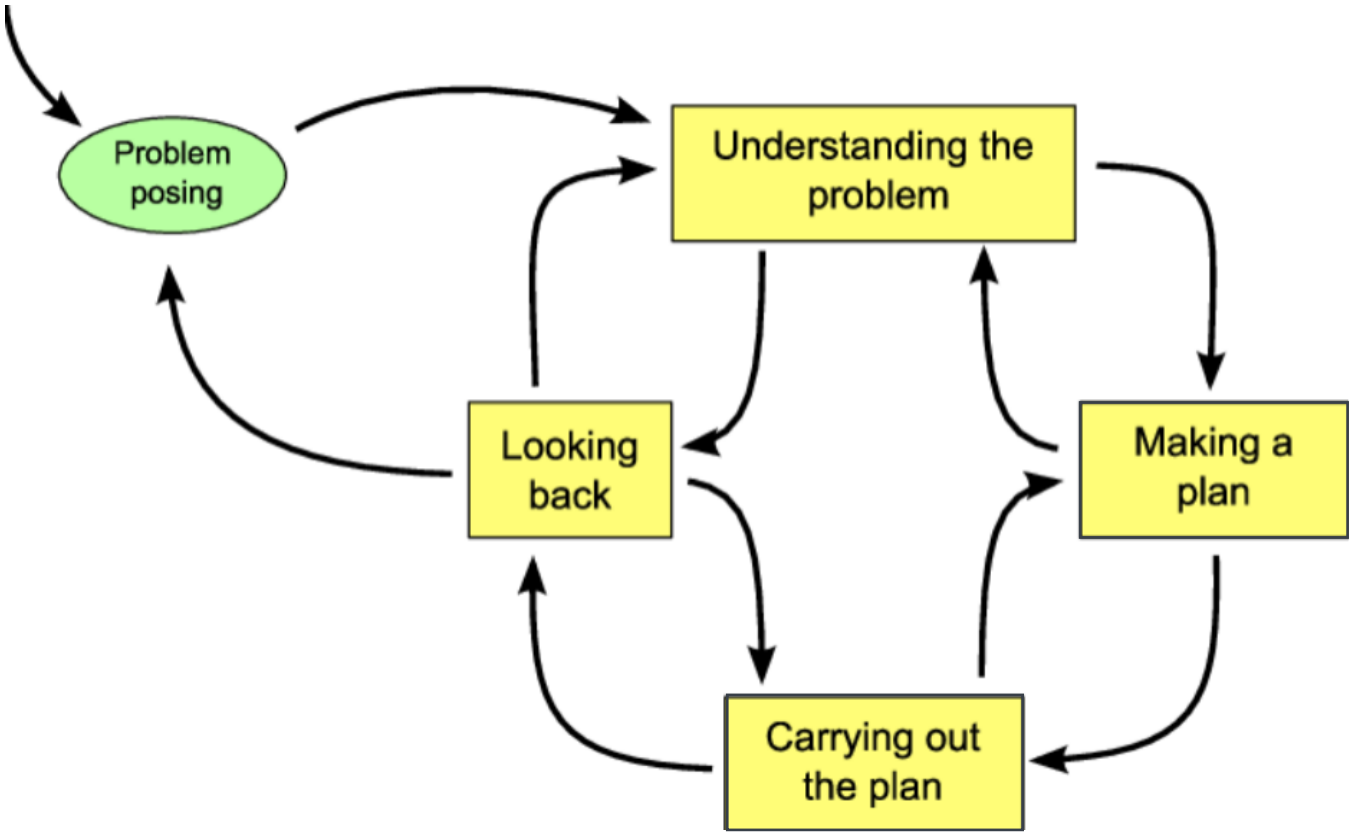
Conceptual Understanding

Conceptual understanding is the ability for students to view mathematical concepts in a connected, meaningful way, recognizing their significance and organizing knowledge so that new concepts are linked to their existing understanding.[3] Benefits of conceptual understanding include increased retention rates of mathematical concepts, fewer computational errors, and students' ability to flexibly apply their knowledge, which ultimately develops their critical-thinking skills.[4] A strong conceptual understanding helps students develop a deep understanding of math concepts and their interconnectedness, and allows them to approach math problems with a variety of strategies.

Strategic Competence

Strategic competence is the capacity to formulate, represent, and solve mathematical problems effectively.[5] It includes problem solving as well as problem formulation and recognizes that real-world scenarios often require students to define the problem before applying a mathematical strategy to solve the problem. The development of strategic competence requires practicing problem formulation, cultivating a repertoire of math strategies, and understanding which strategies are appropriate for a given scenario. Strategic competence allows students to become proficient problem solvers and has strong ties to procedural fluency and conceptual understanding. Strategic competence is closely related to Pólya's problem-solving strategy demonstrated in Figure 7 on the following page.[6]

Figure 5: Dynamic and Cyclic Interpretation of Pólya's Model



From Wilson, J. W., et al. "Mathematical Problem Solving." In Research Ideas for the Classroom: High School Mathematics, 61. New York: Macmillan, 1993.

Adaptive Reasoning

Adaptive reasoning is the ability to think logically about the connections among concepts and situations, evaluate alternative approaches to problem solving, and justify solutions.[7] In mathematics, it serves as the guiding principle that integrates facts, procedures, and ideas into a coherent whole. Students who successfully develop adaptive reasoning apply prior knowledge to justify their answers through reasoning rather than rely on confirmation from teachers or peers.

Productive Disposition

Productive disposition refers to a positive belief that mathematics makes sense, is valuable, and can be mastered through perseverance. It also includes confidence in students' capacity to learn and use mathematics correctly.[8] Productive disposition develops alongside all other components of numeracy, as all components work together to create competent, confident mathematics learners. Teachers play a crucial role in developing productive dispositions among students. It is paramount that teachers model productive dispositions and create learning conditions that help students see themselves as capable problem solvers who understand that mathematics connects to the world around them in infinite ways.

Discourse

Mathematical discourse is the purposeful communication of mathematical ideas, including the tools and practices that make thinking visible. Discourse can take place verbally, visually, or in written formats. It involves students articulating their reasoning, engaging with peers' ideas, and collaboratively constructing mathematical understanding. Mathematical discourse promotes students' understanding of mathematical concepts and procedures, can make a positive impact on productive disposition, and may serve as a formative assessment of learning for teachers.[9]

Mathematical Standards Domains

Illinois Learning Standards for Mathematics are organized into domains that highlight the major areas of focus across grade levels. Each domain represents a coherent body of knowledge, and within each domain, the standards are sequenced to progress across grade levels. It is vital that educators understand how these domains develop across grade levels and design instruction that meets students where they are while also preparing them for future progressions. The domains are:

- Counting and Cardinality
- Operations and Algebraic Thinking
- Number and Operations in Base Ten
- Number and Operations – Fractions
- Measurement and Data
- Geometry
- Ratios and Proportional Relationships
- The Number System
- Expressions and Equations
- Functions
- Statistics and Probability

Together, these domains create a coherent learning continuum from the earliest learning, such as counting to advanced mathematical reasoning. Understanding how the domains are interconnected and progress over time equips educators to create meaningful learning experiences that support student development and ultimately foster numerate students.

The following grade level mathematics standards were compiled from three different sources to allow for comparison and alignment:

- Illinois Early Learning and Development Standards: 3 years old to kindergarten enrollment (IELDS)
- Kindergarten Individual Development Survey (KIDS): Research-based kindergarten learning and development assessment tool
- Illinois Learning Standards for Mathematics

To clearly identify the origin of the standard, the table below uses color-coding to indicate which resource each standard comes from.

Figure 6: Illinois Learning Standards for Mathematics Learning Progressions

Preschool (3 years old to kindergarten enrollment age)	• Demonstrate beginning understanding of numbers, number names, and numerals, location and ordinal position, using appropriate vocabulary • Add and subtract to create new numbers and begin to construct sets • Begin to make reasonable estimates of numbers and measurements • Compare quantities using appropriate vocabulary terms • Measure objects and quantities using direct comparison methods and nonstandard units • Explore tools used for measurement, objects, and patterns • Describe and document patterns using symbols • Recognize, name, and match common shapes • Generate questions and processes for answering them • Organize and describe data and information • Determine, describe, and apply the probabilities of events
Kindergarten	**Counting and Cardinality** • Know number names and the count sequence • Count to tell the number of objects • Compare numbers • Show an increasing ability to recognize, reproduce, and create patterns of varying complexity

Grades K-2	**Operations and Algebraic Thinking** • Show increasing ability to add and subtract small quantities of objects • Understand what addition and subtraction mean and their relationship • Represent and solve addition and subtraction problems within 20 • Work with equal groups of objects to gain foundations for multiplication **Numbers and Operations in Base Ten** • Shows developing understanding of number and quantity • Extend counting sequence • Understand place value • Use place value understanding and properties of operations to add and subtract **Measurement and Data** • Show an increasing understanding of measurable properties such as size, length, weight, and capacity (volume), and how to quantify those properties • Show an increasing knowledge of shapes and their characteristics • Describe, compare, count, and classify objects • Measure and estimate length, relate addition and subtraction to length • Tell and write time • Represent and interpret data • Work with money **Geometry** • Identify and describe shapes • Analyze, compare, create, and compose shapes • Explore objects and patterns • Recognize, name, and match common shapes • Show an increasing ability to compare, match, and sort objects into groups according to their attributes
Grades 1-3	**Geometry** • Reason with shapes and their attributes

Grades 3-5	**Operations and Algebraic Thinking**
	• Grades 3 – 5:
	  • Understand relationship between multiplication and division
	  • Use the four operations with whole numbers to solve problems
	  • Become familiar with factors and multiples
	  • Generate and analyze patterns and relationships
	  • Write and interpret numerical expressions
	Numbers and Operations in Base Ten
	• Grades 3 – 5:
	  • Use place value understanding and properties of operations to perform multi-digit arithmetic
	  • Generalize place value understanding for multi-digit whole numbers, understand the place value system
	  • Perform operations with multi-digit whole numbers and with decimals to hundredths
	Numbers and Operations-Fractions
	• Grade 3:
	  • Develop understanding of fractions as numbers
	• Grade 4:
	  • Extend understanding of fraction equivalence and ordering
	  • Build fractions from unit fractions
	  • Understand decimal notation for fractions and compare decimal fractions
	• Grade 5:
	  • Use equivalent fractions as a strategy to add and subtract fractions
	  • Apply and extend previous understandings of multiplication and division to multiply and divide fractions

Grades 3-5	**Measurement and Data** • Grades 3 – 5: • Solve problems involving measurement and measurement conversions within a given measurement system • Represent and interpret data • Understand concepts of area and relate area to addition and multiplication • Recognize perimeter as an attribute of plane figures and distinguish between linear and area measures • Understand concepts of angle and measure angles • Understand concepts of volume and relate volume to multiplication and to addition
	Geometry • Identify and describe shapes • Analyze, compare, create, and compose shapes • Explore objects and patterns • Recognize, name, and match common shapes • Show an increasing ability to compare, match, and sort objects into groups according to their attributes
Grades 4-5	**Geometry** • Draw and identify lines and angles • Classify shapes based on their properties • Graph points on the coordinate plane to solve real-world problems
Grades 6-8	**Geometry** • Grades 6-8: • Solve real-world problems involving area, surface area, volume, and angle measure • Draw, construct, and describe geometrical figures and describe the relationships between them • Understand and apply the Pythagorean theorem • Understand congruence and similarity using physical models, transparencies, or geometry software

Grades 6-8	**Ratios and Proportional Relationships**
	• Grade 6:
	  • Understand ratio concepts and use ratio reasoning to solve problems
	• Grade 7:
	  • Analyze proportional relationships and use them to solve real-world and mathematical problems
	The Number System
	• Grade 6:
	  • Apply and extend previous understandings of multiplication and division to divide fractions by fractions
	  • Compute fluently with multi-digit numbers and find common factors or multiples
	  • Apply and extend previous understandings of numbers to the system of rational numbers
	• Grade 7:
	  • Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers
	• Grade 8:
	  • Know that there are numbers that are not rational, and approximate them by rational numbers
	• High School:
	  • Use properties of rational and irrational numbers
	  • Use, interpret, and apply operations with complex numbers
	  • Model and compute operations with vectors

Grades 6-8	**Expressions and Equations** • Grade 6: • Apply and extend previous understandings of arithmetic to algebraic expressions • Reason about and solve one-variable equations and inequalities • Represent and analyze quantitative relationships between dependent and independent variables • Grade 7: • Use properties of operations to generate equivalent expressions • Solve real-life and mathematical problems using numerical and algebraic expressions and equations • Grade 8: • Work with radicals and integer exponents • Understand the connections between proportional relationships, lines, and linear equations • Analyze and solve linear equations and pairs of simultaneous linear equations
	Functions • Grade 8: • Define, evaluate, and compare functions • Use functions to model relationships between quantities
	Statistics and Probability • Grade 6: • Develop understanding of statistical variability • Summarize and describe distributions • Grade 7: • Use random sampling to draw inferences about a population • Draw informal comparative inferences about two populations • Investigate chance processes and develop, use, and evaluate probability models • Grade 8: • Investigate patterns of association in bivariate data

High School	**Geometry**
	• Apply and extend understanding of congruence, triangles, and circles • Express geometric properties with equations • Visualize relationships between two- dimensional and three-dimensional objects and explain volume formulas • Model with geometry
	The Number System
	• High School: • Use properties of rational and irrational numbers • Use, interpret, and apply operations with complex numbers • Model and compute operations with vectors
	Expressions and Equations
	• High School • Perform operations on polynomials and rational expressions • Create equations and see structure in expressions • Use reasoning to solve equations, inequalities, and systems of equations
	Statistics and Probability
	• High School • Make inferences, make decisions, and justify conclusions • Interpret categorical and quantitative data • Understand conditional probability and rules of probability

Mathematical Practices

Mathematical practices are skills, dispositions, expertise, and understandings that all students should experience and develop. While the Illinois Learning Standards for Mathematics are grade level specific in their identification of what students should know and be able to do, the eight standards of mathematical practice are the same for each grade level in their description of the "habits of mind" that all students should develop as they progress through the grades.10 These are the foundations for mathematical thinking and practice that are part of being a confident and proficient problem solver. These practices should permeate throughout the whole curriculum, and as such are a unifying theme across the grades (i.e., the practices can be thought of as the "heart and soul" of what it means to do mathematics). Teachers are charged with establishing an environment through which students engage with mathematical practices and provide meaningful experiences for the students to develop these habits of mind for themselves.

The Standards for Mathematical Practice (SMPs) are not discrete grade-level skills but enduring practices that deepen over time. Students apply mathematical practices during the learning of each lesson.[11]

SMP 1:	Make sense of problems and persevere in solving them.
SMP 2:	Reason abstractly and quantitatively.
SMP 3:	Construct viable arguments and critique the reasoning of others.
SMP 4:	Model with mathematics.
SMP 1:	Use appropriate tools strategically.
SMP 2:	Attend to precision.
SMP 3:	Look for and make use of structure.
SMP 4:	Look for and express regularity in repeated reasoning.

Illustrations of SMP progression:[12]

SMP 1: Make sense of problems and persevere in solving them.

- K-2: Students use drawings or counters to represent problems and check by asking, "Does this make sense?"
- 3-5: Students begin to try multiple strategies and use models, such as arrays or number lines.
- 6-8: Students tackle multi-step real-world problems, evaluating efficiency of approaches.
- High School: Students analyze constraints, relationships, and special cases, choosing efficient pathways and justifying with graphs, tables, or equations.

SMP 3: Construct viable arguments and critique the reasoning of others.

- K-2: Students explain their thinking with objects, drawings, or simple words ("I know 3+2=5 because I counted on.").
- 3-5: Students begin to justify strategies mathematically and listen to or question others' reasoning.
- 6-8: Students develop formal mathematical arguments, identify flawed reasoning, and compare solution methods.
- High school: Students construct logical proofs, critique others' justifications, and use counterexamples to refine understanding.

Figure 12 illustrates how mathematical practices evolve: beginning with concrete explanations and representations, then building toward abstract, formal reasoning in later grades. Instruction that highlights both the progression of content standards and the progression of practices ensures that students not only master skills but also develop lasting habits of mathematical thinking.

Cohesive Continuum of Learning

Numeracy skills develop over time as students build on prior knowledge and extend their understanding to new contexts.[13] A cohesive continuum of learning ensures that students experience mathematics as a connected progression of ideas rather than as disconnected topics. Students should encounter mathematical concepts multiple times across grade bands with increasing sophistication to foster students' confidence to apply mathematics flexibly and to transfer learning across domains and contexts.

All mathematics instruction and assessments must be intentionally connected across grade levels and aligned to the Illinois Learning Standards for Mathematics. This coherence ensures that students experience mathematics as a logical progression of ideas rather than isolated skills.[14] This requires educators to have a deep understanding of the breadth and depth of the standards as well as a clear vision of learning within a grade, between grades, and within and between content strands.

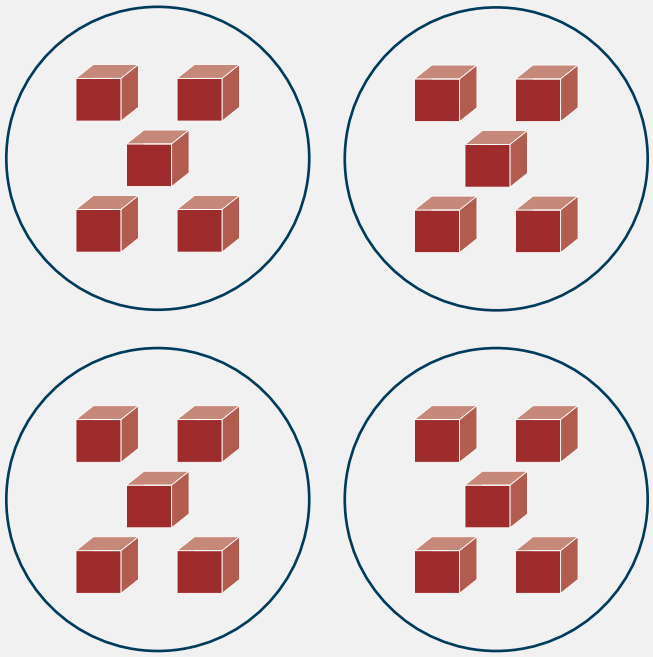
The standards integrate conceptual understanding, procedural fluency, and application. Sometimes this integration occurs within a single standard or across grade levels. For example, multiplication evolves from grouping objects (concrete) to arrays (representational) to symbolic algorithms (abstract) between 2nd and 6th grade.[15] This progression helps students develop flexible problem-solving skills and habits of mind such as modeling (SMP 4), reasoning (SMP 3), and precision (SMP 6). This example of multiplication demonstrates why it is critical for educators to be deeply aware of grade level standards, as this knowledge prevents exposing students to concepts that are not developmentally appropriate such as introducing the formulas or standard algorithm too early in a learning sequence. Lessons must be sequenced so that students first explore concepts hands-on, then transition to visual or diagrammatic representations, and finally to symbolic or abstract reasoning, with opportunities to revisit concrete and representational models to reinforce understanding or address misconceptions.

Manipulatives and visual representations of mathematical concepts are not exclusively for the elementary classroom. Students in all grades benefit from the use of manipulatives in transitioning from concrete to abstract representations. Students need to have access to manipulatives for a significant amount of time—not just one lesson or one week to move from concrete to abstract—and teachers must provide guidance to students regarding the manipulatives to assist them in making the connection between the manipulative, prior knowledge, and the current concept to promote conceptual understanding.[16] Manipulatives should be provided to students until they are able to demonstrate mastery of a concept.

Figures 9 and 10: Concrete-Representational-Abstract (CRA) Progressions of Multiplication

Problem: 4x5=20

Concrete:



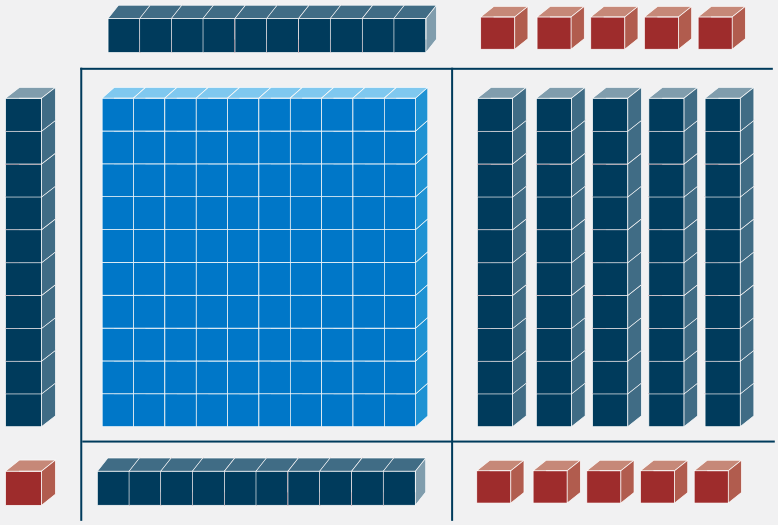
Representational:

Abstract:

4 x 5 = 20

Problem: 15x11

Concrete:



Representational:

	10	5
10	100	50
1	10	5

100 + 50 + 10 + 5 = 165

Abstract:

$$\begin{array}{r} 15 \\ \times\ 11 \\ \hline 15 \\ +\ 150 \\ \hline 165 \end{array}$$

Lastly, selecting high-quality instructional materials is essential for achieving alignment and coherence in mathematics education. Tools such as EdReports and ISBE's Curriculum Evaluation Tool provide frameworks to help educators and school leaders evaluate curriculum quality.

Instructional Considerations

Considerations for All Learners

Ensuring that every student develops numeracy skills requires a commitment to access, equity, and differentiation. Evidence shows that when instruction is designed to meet diverse learning needs, all students are more likely to engage meaningfully with mathematics and to see themselves as capable problem solvers.[17] This section emphasizes that numeracy is not reserved for some students; it is a right for all learners.

Student Engagement and Mindset

Engagement, curiosity, and mindset shape whether students persist with challenging problems, see value in mathematics, and develop confidence in their ability to learn. High-quality mathematics instruction should deliberately cultivate positive mathematical mindsets and mathematical curiosity by:

- Building relevance and wonder: Connecting math to students' interests, cultural contexts, and community issues increases engagement and demonstrates the usefulness of numeracy beyond the classroom. Presenting open-ended problems or puzzles sparks curiosity and invites students to ask "what if?" questions.
- Normalizing productive struggle: Framing mistakes as opportunities for learning helps students see challenge as part of the process, not as a sign of inability. Curiosity grows when students feel safe to explore and experiment and are provided the time to do so.
- Encouraging voice, agency, and discourse: Providing opportunities for students to explain their reasoning, share strategies, ask questions, and engage in rich mathematical discussions fosters ownership of learning.
- Valuing diverse ways of knowing: Inviting multiple approaches and representations allows students to see their thinking as valid and important and encourages exploration of alternative solutions.
- Strengthening belonging: Classrooms that emphasize collaboration, respect, and inclusion counteract stereotypes and help students feel they belong in mathematics.
- Low-floor, high-ceiling tasks: Instruction should also include low-floor, high-ceiling tasks, which provide multiple entry points for learners of varying abilities while allowing all students opportunities to progress and deepen their understanding.[18] Tasks should be authentic and, while also often messy, reflect real-world contexts, current interests, or future possibilities. Authentic tasks challenge students to reason, model, problem solve, and engage in meaningful discourse, which fosters and promotes curiosity through exploration.

Engagement is not only about motivation but also about creating conditions for active participation, exploration of curiosity, and collaborative discourse. When students are engaged in asking questions, investigating patterns, discussing, defending, and critiquing mathematical ideas, they may make connections to other subjects, civic life, and future careers. Building mathematical confidence, curiosity, persistence, and discourse skills ensures that students leave school with the habits of mind, skills, and mindset needed to navigate in the 21st century.[19]

Figure 11: Actions to Build Mathematical Confidence

	Teacher Actions	Student Actions
Introduction of a Concept	Presents a real-world problem (e.g., sharing snacks, calculating discounts, designing a garden) and models the concept using concrete materials, visual representations, and symbolic notation. Uses Universal Design for Learning (UDL) principles to provide multiple entry points (visual, verbal, kinesthetic, digital).	Engages with the concept through manipulatives (concrete), diagrams or drawings (representational), and numerical symbols or equations (abstract).
Problem Solving	Facilitates a group or individual problem-solving activity. Encourages students to try multiple strategies, such as drawing diagrams or models, using manipulatives, applying mental math or algorithms, and exploring patterns and generalizations. Supports collaboration and discussion while scaffolding for diverse learners.	Works with partners or independently to explore solutions using concrete, representational, and abstract methods. Tries multiple strategies, justifies choices, and demonstrates flexibility in finding solutions.
Consolidating Learning	Collaboratively creates anchor charts, graphic organizers, or digital representations with student input. Highlights key strategies, patterns, and connections across representations.	Contributes ideas, examples, manipulatives, diagrams, and equations to the shared reference, reinforcing understanding across Concrete-Representational-Abstract (CRA) stages.
Check for Understanding	Uses formative assessments, such as exit tickets, quick sketches, oral explanations, or short performance tasks, to evaluate understanding across concrete, representational, and abstract stages.	Responds with hands-on materials, drawings, or symbolic work. Demonstrates understanding and identifies areas needing clarification.
Deepening Understanding	Challenges students to explain reasoning, compare multiple approaches, justify solutions, and connect ideas across CRA levels and conceptual, procedural, and application dimensions of the standards as written. Promotes rich discourse and reflection on mathematical thinking.	Explains thought processes, critiques peer strategies, applies reasoning to new problems, and demonstrates mastery through concrete, representational, or abstract methods.
Extending & Enrichment	Provides low-floor, high-ceiling tasks that allow all students to engage meaningfully while offering opportunities to extend reasoning or complexity for advanced learners. Connects tasks to real-world contexts and future applications.	Engages in tasks at their level of readiness, explores advanced or creative strategies, and applies concepts in novel or complex situations.

Differentiation

Effective differentiation in mathematics instruction recognizes the assets students bring to the classroom, including their cultural and linguistic resources, while also addressing gaps that may arise from systemic inequities. Instructional planning should consider all learners, not just the "average" student, ensuring that outliers, both students who need additional support and those who require enrichment, have meaningful access and challenge.[20]

Universal Design for Learning (UDL) instruction is designed to provide multiple means of engagement, representation, and expression. In practice, UDL encourages teachers to present information through diverse modalities, such as visuals, text, audio, manipulatives, or interactive simulations, so students with varying learning preferences can grasp concepts.[21] It also allows students to express their learning in multiple ways, including writing, speaking, drawing, or using digital tools, and provides varied opportunities for engagement through choice, real-world applications, collaboration, and appropriately challenging tasks. This approach ensures that all students can access, participate in, and demonstrate understanding of grade-level content, regardless of learning profile or background.

Low-floor, high-ceiling tasks are intentionally designed to provide an accessible entry point for all students (low floor), while offering opportunities for extended reasoning and challenge (high ceiling). Such tasks allow students to engage at their level, explore multiple solution strategies, and deepen conceptual understanding.[22]

Additional differentiation strategies include:

For example:

Students are asked to design a rectangular 24-square-meter school garden using whole-number side lengths. They must determine all possible dimensions and explain their reasoning. Students who are developing basic multiplication skills can use grid paper or manipulatives to count squares and explore simple length × width combinations, such as 4 × 6 or 3 × 8, providing a low-floor entry point. Advanced students can extend the task by generalizing patterns, calculating perimeter and fencing costs, considering fractional or mixed-number dimensions for irregular plots, or modeling the problem algebraically. They might also opt for additional variables, such as sunlight exposure or plant spacing, creating a high-ceiling challenge that encourages rich mathematical reasoning and multiple solution strategies.

- Offering varied entry points to mathematical concepts through visual, verbal, kinesthetic, or digital modalities.
- Providing scaffolds and extensions such as intervention, remediation, or enrichment to learning so that tasks remain accessible yet rigorous for all learners.
- Encouraging multiple solution strategies and representations to honor diverse ways of reasoning.
- Embedding opportunities for student choice and voice, which builds ownership of learning and affirms students' mathematical identities.

Equity in differentiation requires more than adjusting instruction within classrooms. It also involves ensuring that all students, regardless of background, prior achievement, or learning profile, have access to grade-level content, advanced coursework, and enrichment opportunities. Systemic barriers that track or limit students must be dismantled to create a truly equitable numeracy experience across Illinois schools.[23]

By intentionally planning for outliers and integrating UDL principles with low-floor, high-ceiling tasks, educators can meet students where they are, provide rigorous pathways forward, and ensure that all learners can engage meaningfully in mathematics.

Scaffolding

Scaffolding is an effective teaching method whereby teachers provide targeted supports for students to learn new concepts by building on prior knowledge. Scaffolding is different from differentiation. Scaffolding provides students with supports they may need to complete a task, while differentiation involves creating different tasks for different students based upon student needs. Effective instruction balances support and independence. Scaffolds should be deliberately removed as students develop competence, ensuring they move confidently through concrete, representational, and abstract stages while building mathematical resilience and problem-solving skills.

Figure 12: Do's and Don'ts of Scaffolding [24]

✓ Do	✗ Don't
✓ Personalize scaffolds based upon students' zone of proximal development	✗ Provide all students with the same supports
✓ Guide student thinking through correcting, modeling, cluing, or prompting	✗ Provide students with answers
✓ Gradually fade supports as students become more independent	✗ Remove supports too soon or keep them indefinitely
✓ Attach scaffolds to grade level andstandards-aligned tasks	✗ Use remedial work in place of rigorous learning tasks

Figure 13: Scaffolding Framework [25]

Student is most independent

Definition	Visual	Verbal	Written
Self-Scaffolding Students independently draw on prior knowledge, strategies, and reasoning to plan, monitor, and evaluate their approach to a task. Educators observe, give space for thinking, and intervene only when necessary.	Students independently create visual reminders or organizers (e.g., number lines, arrays, coordinate grids, diagrams, geometric models) that help them consolidate learning.	Students generate questions to support metacognition or next steps (e.g., "What do I know about this type of problem?" "How else could I represent this?" "Does my answer make sense?").	Students independently create success criteria, checklists, or self-evaluation tools to monitor their work. (e.g., multi-step word problems, fraction comparisons).
Prompting Educators provide prompts that encourage students to apply what they already know without directing them toward a specific method. Prompts nudge students toward productive strategies and independence.	Educators encourage students to identify classroom visuals (e.g., fact families, multiplication charts, geometric vocabulary walls, fraction models) that may support decision-making.	Educators offer reflective or planning questions such as: "What strategy could you try first?" "Where have you seen a problem like this?" "Which representation might help you understand this better?"	Educators encourage students to revisit written scaffolds they have developed previously (e.g., steps for solving equations, writing frames for explaining reasoning, structures for math arguments).
Cueing Educators provide targeted hints that point students toward key information or conceptual connections while still requiring them to think and problem-solve.	Visual cues highlight essential concepts or representations (e.g., equal groups, symmetry, place value shifts, slope triangles, partitioned fraction bars) to support understanding.	Educators offer verbal clues connecting to strategies previously used successfully (e.g., "Think about how the numbers are related," "Check the units," "What operation fits this context?")	Educators provide partially completed examples, sentence starters, word banks that help students engage with a task independently (e.g., labeled number lines, incomplete tables, partially filled area models)

Student is least independent

Definition	Visual	Verbal	Written
Modeling Educators model a process, strategy, or representation so students can observe expert thinking. Students are expected to apply the modeled strategy shortly afterward.	Educators demonstrate the use of manipulatives, diagrams, or models for students to reference when completing their own work.	Educators model high-quality discourse or reasoning (e.g., "If I were justifying my solution, I might start by saying...").	Educators offer worked examples as references, ensuring students apply, but not copy, the structure and reasoning shown.
Correcting Educators identify errors or misconceptions and guide students in understanding the correction. Correcting should be used sparingly and only when conceptual clarity is necessary for learning to continue.	Educators annotate student work or highlight representations that need revision without completing the work for the student.	Educators verbally explain misconceptions (e.g., "This step doesn't follow because... Let's examine the relationship between these quantities again.").	Educators provide accurate models, spellings, or symbolic notation for students to reference or rewrite when appropriate.

Addressing Misconceptions

A key element of maintaining a cohesive continuum of learning is anticipating and addressing common student misconceptions. When teachers know the stumbling points students are likely to encounter, they can plan supports that deepen understanding rather than reinforce errors. Misconceptions, if left unaddressed, disrupt the progression of learning from one grade to the next. For example, when first learning fractions, students often believe that a larger denominator means a larger fraction (thinking $\frac{1}{8} > \frac{1}{4}$). If this misunderstanding persists, students will struggle with comparing fractions, finding common denominators, and eventually with rational number operations in middle school. Addressing this misconception early with visual models and number lines supports a smoother transition into proportional reasoning and algebraic applications.[26]

Collaboration

Collaboration is essential for maintaining this continuum. Educators need structured opportunities to examine standards and progressions across grade levels, identify where students may struggle, and design instructional supports. Families also play an important role in reinforcing numeracy development across a child's lifetime, especially in early years, and should be viewed as educational partners by educators and administrators.[27]

Collaboration and communication between general education and special education staff are crucial to supporting numeracy growth. Successful inclusive instruction requires structured, ongoing communication about what is being taught, how it is taught, and the strategies and accommodations being applied, as well as considerations for advanced learners. When general education teachers bring strong content knowledge and special education teachers contribute expertise in individualized supports and executive functioning, a co-planning model can maximize access for all students

Shared ownership includes:

- Co-planning for differentiation and accessibility in advance of instruction.
- Structured communication protocols between general education teachers, special education teachers, and paraeducators, including discussion of goals, strategies, assessments, classroom observations, and data.
- Intentional scaffolding of mathematical discourse to ensure all students can participate, build understanding, and develop a positive mathematical identity.

Additionally, integrated learning opportunities for students can increase numeracy learning. Mathematics teachers are not solely responsible for numeracy instruction, as all core content areas can support numeracy skills. When students see that mathematical skills can be applied across all content areas, they are more likely to realize that mathematics is necessary and relevant in their everyday lives rather than just a skill they need to pass a test or learn to prepare for the next grade level. Integrated curriculums have been shown to instill a positive mindset among students as well as increase student motivation and achievement.[28] Collaboration among grade level teachers can promote more opportunities for integrated learning of all subjects to better support student achievement, especially in areas in which there is already overlap or close alignment of skills or practice standards.

Specialized Learning Considerations

Students with specialized learning needs, including those with disabilities, English learners, and students requiring additional supports, as well as those who are gifted and talented all benefit from evidence-based practices grounded in the principles of UDL.[29]

Key considerations include:

- Accessibility: Designing tasks and assessments to reduce barriers and allow all students to demonstrate mathematical understanding.
- Scaffolding and Supports: Using tools such as manipulatives, technology, visual aids, and structured peer collaboration.
- Flexible Pacing and Pathways: Recognizing that students may progress through numeracy development at different rates and require personalized supports.
- Strength-Based Approaches: Identifying and building on students' assets.
- Collaboration: Ensuring that general educators, special educators, and support staff work together to deliver coherent and aligned instruction.

When classrooms implement these considerations, students with specialized needs, including those who require intervention or enrichment, not only access the same numeracy content as their peers but also engage in meaningful problem solving, reasoning, and communication. By adopting this approach, Illinois schools can ensure all students, regardless of ability, background, or need, have equitable opportunities to thrive mathematically.

Considerations for Learners with Specialized Education Needs

Professional learning grounded in evidence-based practices, such as those outlined in Institute of Education Sciences Practice Guides, is essential for equipping educators with strategies that are effective for students with learning disabilities and beneficial for all learners. Learners with specialized learning needs must be exposed to grade-level content as well as receive instruction that supports the six components of numeracy. Students should be supported with appropriate learning accommodations. Collaborative efforts between general education teachers and special education teachers must be prioritized to ensure learners with specialized education needs are provided with equitable access to rigorous mathematics instruction. Coteaching, when possible, is the ideal solution to ensure this collaboration as well as to account for the common differences in educator preparation among special education and general education teachers.[30]

Early screening is important to identify students at risk and those with specialized education needs who may need evidence-based supports. Identification takes place via screening and assessment, and learning supports for individuals are determined through individualized learning programs. Explicit and systematic approaches are especially important for specialized education needs.

Considerations for Multilingual Learners

To support English learners (ELs) as they become competent and confident problem solvers and contributors of mathematics knowledge while engaging in a mathematical discourse community, Celedón-Pattichis & Ramirez suggest the following guiding principles for teaching mathematics:

1. **Challenging mathematical tasks**
2. **Linguistically sensitive social environments**
3. **Support for learning English while learning mathematics**
4. **Mathematical tools and modeling as resources**
5. **Cultural and linguistic differences as intellectual resources**

Effective teachers of ELs address these principles by using these practices and actions in their classrooms:[31]

- At the beginning stages of EL development, limit the use of various academic terms for calculations in word problems. Wait until ELs have shown mastery before introducing new terms.
- Use challenging problems and tasks and assess ELs' prior knowledge of the problem's background and context. This includes culturally relevant problems or tasks, planning the use of multiple tools, representations, and models, and focusing on what mathematical and everyday language demands of the problem or task.
- Form groups based on the cognitive demand of the task or problem and awareness of how students may use their native language to process and reason their way to a solution, particularly as the complexity of the problem increases. Try to avoid calling attention to a student who appears to need additional support.
- Sequence problems and tasks carefully to allow ELs to develop competence with mathematics while developing proficiency with language, both mathematical and English.
- Facilitate and model mathematical discourse (e.g., provide sentence starters, visuals, use topics that are familiar, provide models of how to respond or ask questions) in class so that students can develop conceptual understanding and procedural fluency while increasing their language proficiency.
- Provide support through multiple modalities (e.g., visual, auditory, native language) to address complexity of language demands in problems and tasks.
- Allow processing time while recognizing the mental requirements students have with speaking, reading, listening, and writing in a new language.
- Provide opportunities for ELs to read and write about their learning of math, receive feedback that purposefully addresses mathematical language development, and allow students to revise their writing to support students in their learning of language. Include opportunities for problems and tasks with rich mathematical contexts and sophisticated language to help students advance their language development and mathematical learning.

- Provide space in the classroom where mathematical vocabulary and meaning are visible, referred to often during instruction, and frequently used in students' oral and written communications during class.
- Allow for the use of multiple tools and representations to enhance mathematical discourse and understanding. Intentionally teach the use of these tools to ELs. Based on background and/or prior experience, students may be unfamiliar with calculators, math apps, or other manipulatives. Provide students the opportunity to practice with the tools after teaching their use.
- Make visual connections to mathematical models and representations found in the surrounding environment.
- Call attention to the peculiarities between meanings of words (e.g., words with multiple meanings such as year, area, times, and others, as well as homophones like eight and ate) used in both everyday language and mathematical language.
- Meet the needs of students by listening to what they have to say while providing supporting guidance and mentoring and advocating for their rights as students and individuals.
- Learn about students' culture and community, language, dialects, and ways of knowing and understanding to enhance the teacher-student experience. This means being linguistically sensitive as well. Be cognizant of cultural differences in mathematical representations and notations, writing, and problem solving.
- Model acceptance and interest in students' language and culture to show ELs that they are part of the classroom community and valued for what they have to offer the class. This can have a positive effect on students' learning and identity.
- Model making sense of written instructions prior to using these instructions on exams so students are not seeing these instructions for the first time on an exam.
- Be mindful that for some students, writing in cursive may add an additional layer of cognitive demand.
- Communicate and collaborate regularly with your school or district's ESL or bilingual teacher(s).
- Identify the background knowledge a student may need to solve a word problem. Unfamiliarity with the topic of the word problem may be a barrier to the student demonstrating their understanding of the mathematical concepts being assessed. For example, in a math problem about receiving a coupon for a free t-shirt at a football game, the student may be distracted trying to figure out what a coupon is, and whether football and soccer are the same sport.

Considerations for Advanced Learners

Advanced learners are present in every district and across all levels of socioeconomic status, and educators must be equipped with the skills and knowledge to support them. The following strategies and best practices can be used to create a supportive, equitable learning environment for advanced learners:

Figure 14: Considerations for Advanced Learners [32]

Strategy	Description	Additional Information
Acceleration	Allows advanced learners to move through the curriculum at a pace that challenges them appropriately, preventing boredom and stagnation	Examples of acceleration include skipping a grade level, early entrance into kindergarten or college, and entrance into dual credit or Advanced Placement courses
Curriculum Compacting	Allows advanced learners to modify the regular curriculum to skip previously mastered learned material to focus on more challenging numeracy tasks	Educators must begin curriculum compacting by identifying the intended instructional outcomes of a unit. A pre-assessment can then be used to determine which skills students have previously mastered and which skills must still be developed. Based upon results, educators will then provide acceleration or enrichment.
Grouping	Placing students with similar ability levels allows for more advanced instruction and rapid growth	Grouping should be flexible to allow for variation and avoid tracking with the goal of matching student readiness with instruction
Community Partnerships	Collaboration with local businesses, museums, universities, community members, etc.	External partners can provide resources, supports, and offer students opportunities for real-world applications
Enrichment	Activities that extend beyond the standard curriculum that provide opportunities for students to explore numeracy	Enrichment can occur in the classroom or through pull-out programs

Multi-Tiered Systems of Support

A strong Multi-Tiered System of Support (MTSS) is foundational to ensuring that every student in Illinois develops numeracy. This system is designed to enhance the core learning environment and identify struggling students early and offer timely interventions that encompass various aspects of a child's development, including academics, behavior, social and emotional needs, and absenteeism. At its heart, MTSS is about delivering high-quality mathematics instruction, monitoring progress, and engaging all students in meaningful, grade-level learning.

An effective MTSS framework for numeracy includes:

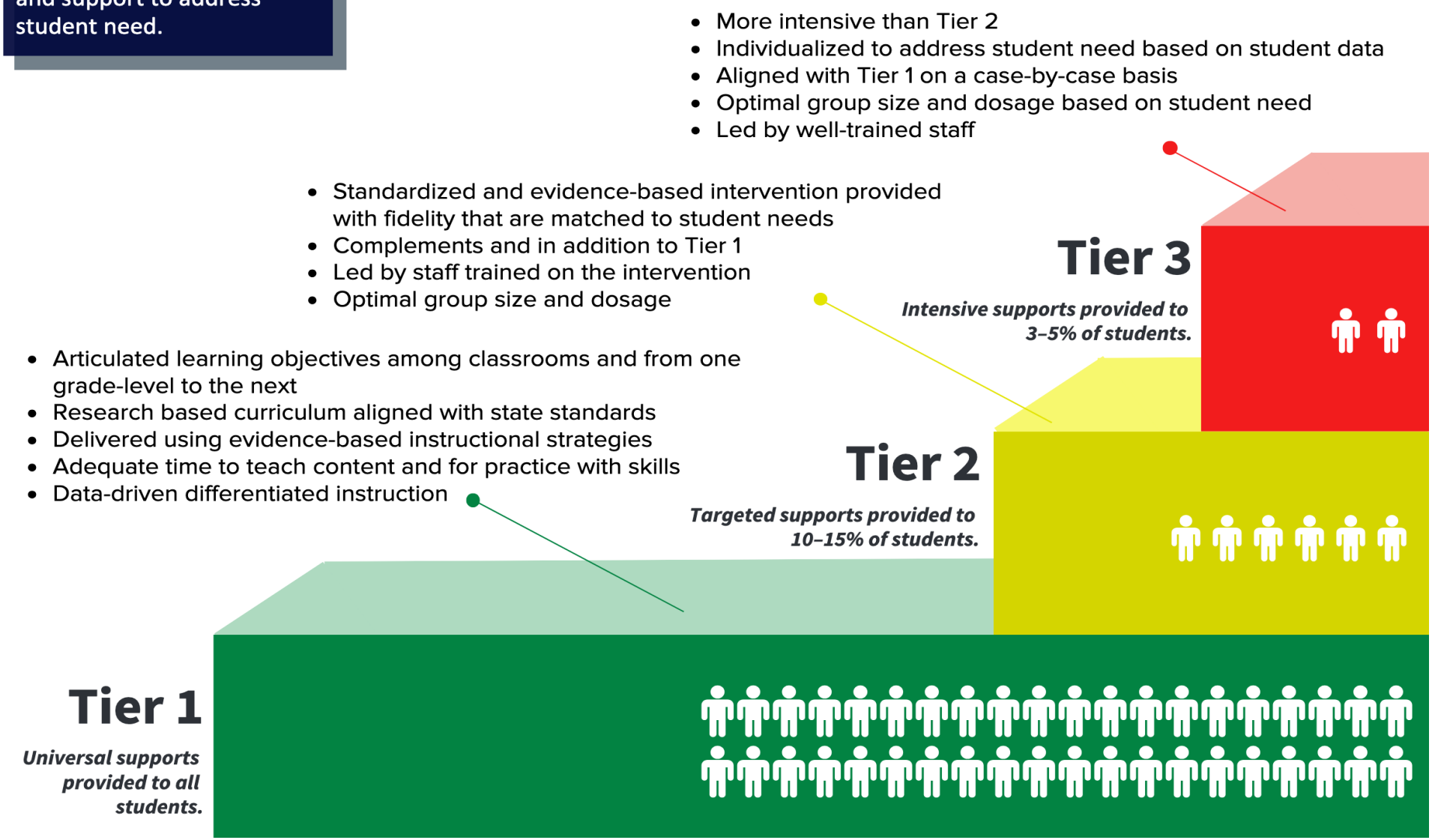
- Tier 1 (Core Instruction): High-quality, evidence-based instruction delivered to all students. This tier is culturally and linguistically responsive, differentiated to meet diverse needs, and aligned across grade levels. Tier 1 instruction emphasizes reasoning, problem solving, and application, which are essential components of numeracy.
- Tier 2 (Targeted Supports): Small-group or supplemental instruction for students who need additional support. These supports are guided by assessment data and may include reteaching of concepts, structured practice, or scaffolded tasks that reinforce mathematical reasoning and confidence.
- Tier 3 (Intensive Interventions): Individualized, intensive supports for students with significant and persistent learning needs. These interventions are evidence-based, tailored to student strengths, and delivered in addition to Tier 1 core instruction.
- Engagement and Belonging: MTSS also addresses student engagement, persistence, and sense of belonging in mathematics classrooms. When students feel safe, valued, and included, they are more likely to participate fully in learning opportunities and develop positive mathematical identities.
- Collaboration: Effective MTSS requires collaboration across general educators, interventionists, special educators, administrators, and families. Working together ensures that supports are coherent, timely, and aligned to each student's developmental needs.

By emphasizing both a strong core and tiered supports, MTSS helps prevent gaps in numeracy development while ensuring that interventions are available and equitable. It ensures that every student, including those with specialized needs, ELs, and those historically marginalized in mathematics, have access to high-quality instruction and the opportunity to thrive.[33]

Figure 15: MTSS Tiers

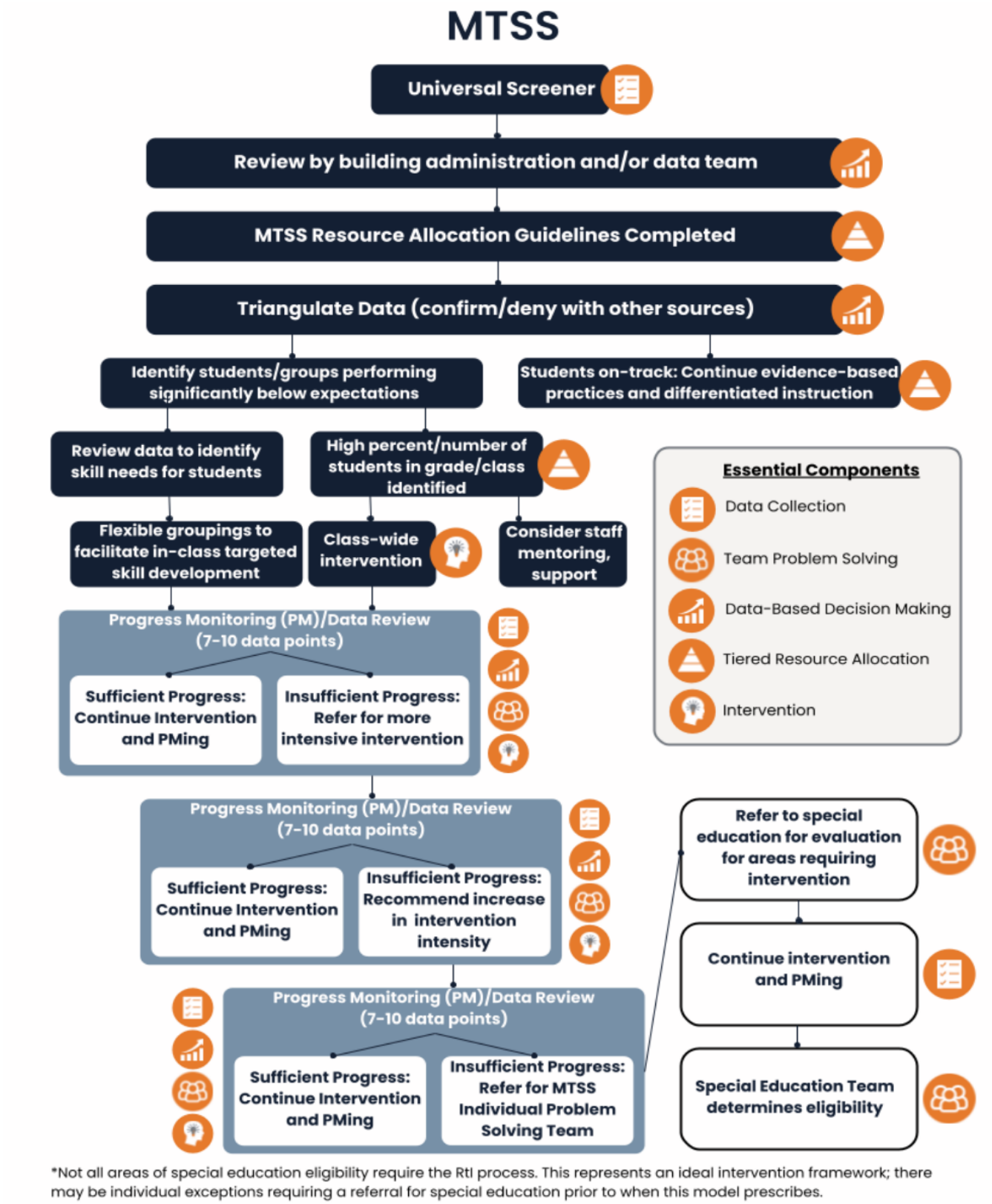
The multi-level prevention system provides increasingly intense levels of instruction and support to address student need.

What is Multi-Level Prevention System?



From National Center on Intensive Intervention at American Institutes for Research. Essential Components of MTSS: Infographic Collection. Washington, DC: NCII.

Figure 16: MTSS Intervention Framework



From SLD Supports Project. The Dyslexia Handbook. Springfield, IL: Illinois State Board of Education, Eastern Illinois Area of Special Education, and Eastern Illinois University, 2024.

Assessments to Support Numeracy

Assessment plays a pivotal role in education, serving as the compass by which educators navigate toward educational goals. It shapes decisions about grades, student placement, progression, instructional needs, curriculum, development, and, in some instances, funding allocation.

ISBE's performance level descriptors (PLDs) as well as samples to success can assist educators in supporting student learning and assessment. PLDs are designed to bridge state assessment to classroom instruction and the systems of formative assessments to inform instruction as well as individual student need.

Universal Design for Learning

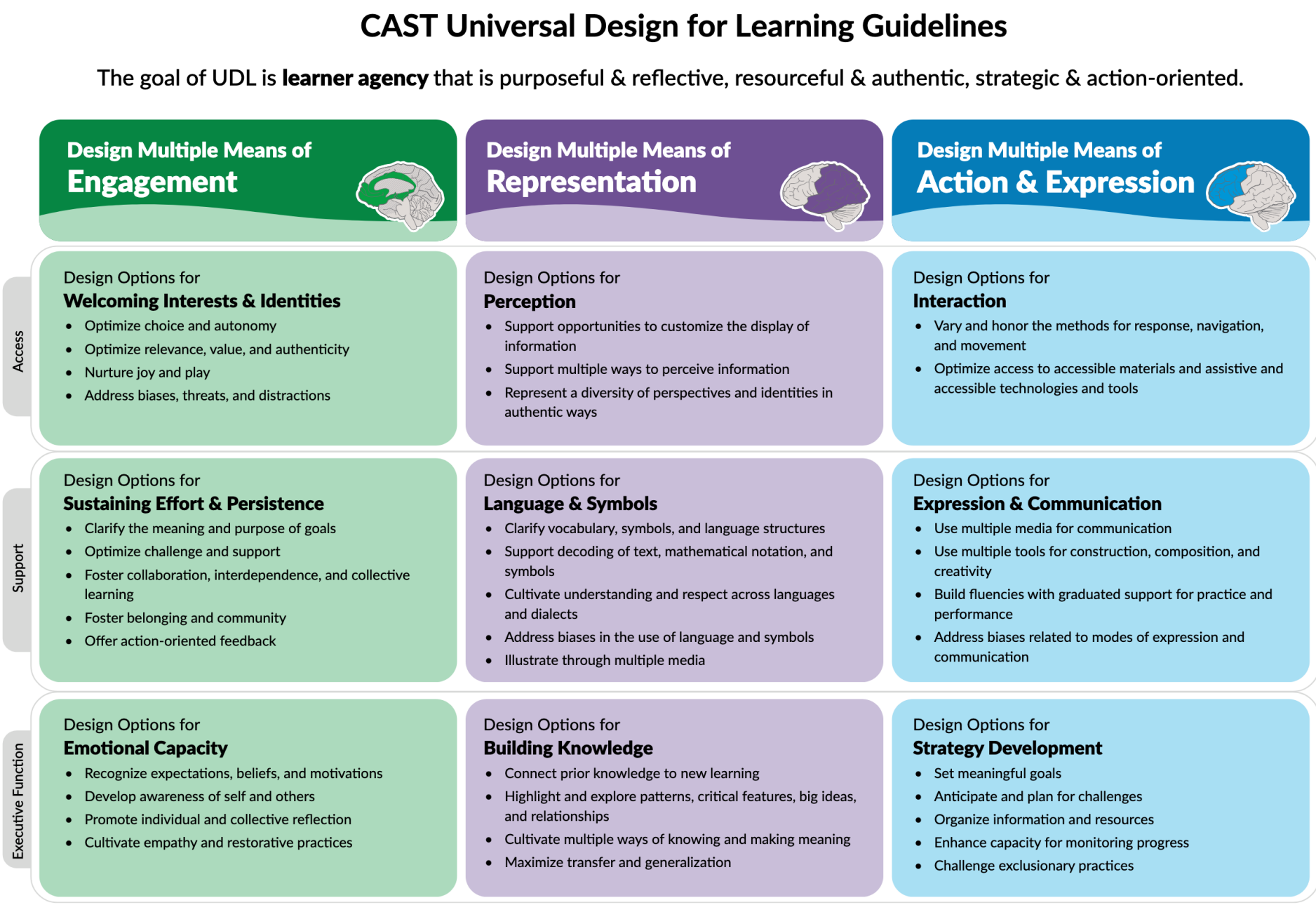
Universal Design for Learning (UDL) is a framework that promotes equitable, rigorous learning for all students. According to CAST, "UDL aims to change the design of the environment rather than to situate the problem as a perceived deficit within the learner."[34]

The UDL framework consists of three guidelines:

1. **Engagement (the why or learning)**
2. **Representation (the what of learning)**
3. **Action and expression (the how of learning)**

By embedding UDL into assessment practices, educators ensure that every learner has equitable opportunities to demonstrate what they know and can do. Traditional assessments often assume that all students can access content, instructions, and response formats in the same way, but this approach unintentionally creates barriers. UDL challenges that assumption by proactively designing assessments that provide multiple pathways for access and multiple ways to express understanding. When assessments are designed through the UDL lens, students encounter content that is accessible from the start. This might mean offering questions with visual supports, read-aloud options, translations, or flexible text formats so that the focus remains on the construct being measured rather than on a student's ability to navigate inaccessible text. Similarly, students are given opportunities to respond in ways that match their strengths. For some, this may include using speech-to-text tools, drawing or modeling solutions, or creating digital artifacts to represent their thinking. These flexible approaches do not dilute rigor; instead, they ensure that the assessment is measuring the intended skill or concept rather than a barrier unrelated to the learning target.[35]

Figure 17: Universal Design for Learning Guidelines



From CAST. Universal Design for Learning Guidelines (Version 3.0): Graphic Organizer. Wakefield, MA: CAST, n.d.

Assessment Types

To effectively support teaching and learning, educators should utilize a combination of equitable, high-quality, standards aligned assessment types. It is important to recognize that not all assessments are created equal; educators are encouraged to consider the purpose of assessments as well as the appropriate time to administer them.

Figure 18: Assessment Types

Type	Purpose	Key Components	Best Practices
Universal Screening	Universal screening assists in identifying students who are thriving, those at risk, and those in need of acceleration through a systematic evaluation of all students within a class, grade, school building, or school district that focuses on critical academic and social-emotional indicators.	• Administered to all students at the beginning of the year • Concise assessment	• Use reliable, valid tools • Establish goals and methods of screening prior to administering • Develop a protocol for how data will be used to assess curriculum, instruction, educational environments, etc.
Benchmarking	Benchmark assessment is a cyclical process that involves using a screening tool multiple times throughout the school year to monitor students' response to core instruction.	• Administered three times throughout the school year • Defines expected skill levels for students at each grade level at specific times throughout the year	• Use data to analyze common learning trends • Use results to inform interventions • Include students in goal setting and communicate benchmark results with parents in a digestible manner
Diagnostic Assessments	Diagnostic assessments identify precise skill gaps and areas of deficit to inform necessary interventions.	• Must occur throughout and after implementation of intervention to assess effectiveness	• Use results to inform interventions • Use results to inform specific skills deficits

Type	Purpose	Key Components	Best Practices
Progress Monitoring	Progress monitoring measures the impact of assigned interventions by tracking growth throughout the intervention period.	• Administered at least every two weeks	• Use results to immediately guide instructional decisions
Formative Assessments	Formative assessments are used during the learning process to gather evidence about student understanding and to guide immediate instructional adjustments.	• Can take place multiple times throughout a lesson in forms such as observation, exit tickets, quizzes, discourse, etc.	• Provide timely feedback and use results to guide instruction throughout the remainder of the learning unit • Promote student reflection
Summative Assessments	Summative assessments evaluate student learning at the conclusion of an instructional period, often for comparison or accountability purposes.	• Standards-aligned • Can include a unit test, projects, performance tasks, student portfolios, etc.	• Students are aware of assessment criteria • Data informs future instruction
State Assessment	State assessments measure the learning of state standards and are often used as accountability measures.	• Standardized, large-scale assessment	• Provide students with appropriate test-taking strategies • Focus on standards-aligned instruction throughout entirety of school year

Goal 1: Workbook

Students will build and apply numeracy skills through tasks that develop reasoning, fluency, and real-world problem solving.

Goal 1

Students will build and apply numeracy skills through tasks that develop reasoning, fluency, and real-world problem solving.

Implementation Considerations

- Classroom environments should promote mathematical reasoning, discourse, and flexible problem solving.
- Students should have access to high-quality instructional materials that build conceptual understanding and procedural fluency.
- Instruction should incorporate multiple representations, including concrete, representational, and abstract models.
- Assessment practices should guide instruction and help identify gaps in conceptual understanding.
- Teachers need ongoing support to implement evidence-based math practices with consistency across grade levels.

Notes

Next Steps

Use high-quality instructional materials and tasks that promote reasoning and conceptual understanding.

Incorporate mathematical discourse routines to help students communicate thinking clearly.

Apply the CRA progression to support students in building strong numeracy foundations.

Collaborate with your grade-level team to strengthen coherence across units and topics.

Monitor student progress using formative assessments and adjust instruction to address misconceptions.

Reflection Questions

1. What does a numeracy-rich classroom environment look and sound like in my grade level?

2. How do I ensure all students access grade-level math content with appropriate scaffolds?

3. What strategies do I use to identify and address common mathematical misconceptions?

4. How do I ensure my assessment practices capture both conceptual understanding and procedural skills?

5. What obstacles impact my ability to implement evidence-based numeracy instruction with fidelity?

Goal 1

Students will build and apply numeracy skills through tasks that develop reasoning, fluency, and real-world problem solving.

Implementation Considerations

- Classroom leaders should help educators strengthen instruction using evidence-based numeracy practices.
- Collaboration across grade levels supports coherent progressions and reduces instructional fragmentation.
- Strong data-analysis routines help identify instructional needs and trends across classrooms.
- Curriculum and resources must align with the components of numeracy and grade-level standards.
- Teacher leaders should model and reinforce the use of multiple representations and mathematical discourse.

Notes

Next Steps

Support educators in implementing high-quality tasks that promote reasoning and problem solving.

Facilitate vertical team discussions to strengthen alignment across grade bands.

Help teachers analyze student work to identify strengths, misconceptions, and instructional needs.

Communicate instructional successes and needs with administrators to inform professional learning.

Guide teachers in using data to adjust instruction and monitor student numeracy development.

Reflection Questions

1. What are teachers supported in using evidence-based math instruction practices?

2. How do I help maintain alignment and coherence across grade-level teams?

3. What trends do I observe in student understanding across classrooms?

4. How do I best support teachers in identifying and addressing misconceptions?

5. What barriers exist in helping teachers implement high-quality numeracy instruction?

Goal 1

Students will build and apply numeracy skills through tasks that develop reasoning, fluency, and real-world problem solving.

Implementation Considerations

- Effective numeracy instruction requires scheduling structures, materials, and training that support strong implementation.
- Equitable access to high-quality math curriculum is essential for student success.
- School-level assessment systems should provide timely data to guide instruction and interventions.
- Collaborative planning time strengthens coherence and instructional quality.
- School leaders need to foster a culture where all students see themselves as capable mathematical thinkers.

Notes

Next Steps

Engage teacher teams in reviewing student data to understand numeracy strengths and gaps.

Evaluate current math curriculum and intervention materials and identify areas for improvement.

Strengthen MTSS processes to identify students needing additional numeracy support.

Build assessment literacy to ensure staff administer and interpret data effectively.

Provide ongoing professional learning aligned to evidence-based mathematics instruction.

Reflection Questions

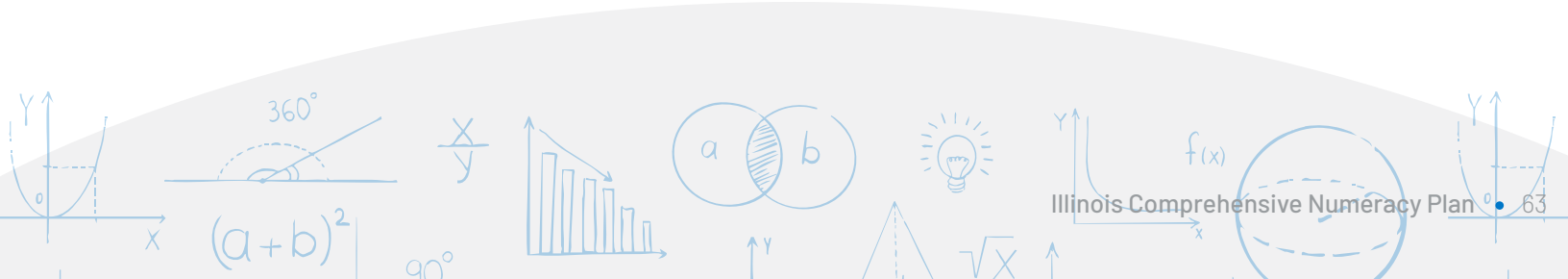
1. Are all students receiving high-quality, evidence-based numeracy instruction?

2. Does the school's curriculum align to the components of numeracy described in the Illinois Comprehensive Numeracy Plan?

3. How effectively does the school use data to guide instruction and interventions?

4. What systems support teacher collaboration and coherence in math instruction?

5. How do school structures promote equitable math learning opportunities?



Goal 1

Students will build and apply numeracy skills through tasks that develop reasoning, fluency, and real-world problem solving.

Implementation Considerations

- District numeracy plans should reflect student data and instructional needs across schools.
- Curriculum adoption processes should prioritize high-quality, standards-aligned math materials.
- Assessment systems must support monitoring of conceptual understanding, procedural skills, and problem solving.
- Vertical coherence is critical from early childhood through high school mathematics pathways.
- Professional learning should be aligned to evidence-based math instruction and accessible across the district.

Notes

Next Steps

Prioritize selection and implementation of high-quality math instructional materials.

Analyze districtwide data to assess achievement and identify areas requiring targeted support.

Strengthen assessment plans to ensure appropriate measures are available across grade levels.

Guide schools in building strong MTSS structures for numeracy.

Identify and reduce inequities in access to resources, coursework, and instructional opportunities.

Reflection Questions

1. What does district data reveal about numeracy outcomes and equity across schools?

2. How well does the district's curriculum support evidence-based numeracy instruction?

3. What instructional and assessment practices are currently successful?

4. Which grade levels or student populations require additional support?

5. How does the district ensure coherence from early numeracy through advanced coursework?

Goal 1

Students will build and apply numeracy skills through tasks that develop reasoning, fluency, and real-world problem solving.

Implementation Considerations

- Regional support should reflect the varied needs of districts and communities. Regional leaders play a critical role in providing professional learning aligned with evidence-based numeracy practices.
- Curriculum review cycles can be strengthened through regional collaboration.
- Data across districts can illuminate regional patterns and resource needs.
- Regional efforts should prioritize equitable access to high-quality math instruction.

Notes

Next Steps

Conduct regional needs assessments to guide professional learning offerings.

Support districts in analyzing numeracy data and addressing instructional gaps.

Facilitate opportunities for districts to review math curriculum and share best practices.

Provide guidance on selecting and implementing evidence-based instructional materials.

Offer targeted support for districts serving high-poverty or high-need student populations.

Reflection Questions

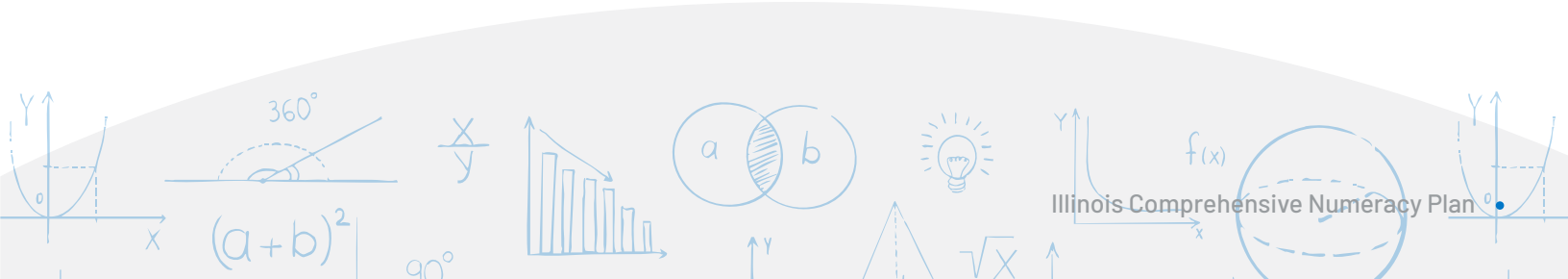
1. How will regional leaders identify and respond to district-level numeracy needs?

2. What structures can strengthen regional collaboration around math instruction?

3. What professional learning supports are most needed across the region?

4. How can regional leaders ensure equitable access to high-quality resources?

5. What barriers limit regional support for numeracy improvement?



Goal 1

Students will build and apply numeracy skills through tasks that develop reasoning, fluency, and real-world problem solving.

Implementation Considerations

- Preparation programs play a foundational role in developing teachers' mathematical content and pedagogical knowledge.
- Candidates must understand numeracy as outlined in the Illinois Comprehensive Numeracy Plan, including reasoning, fluency, and real-world application.
- Coursework should model evidence-based mathematics instruction and UDL principles.
- Early field experiences should reflect high-quality, coherent math practices.
- Preparation programs help shape candidates' beliefs about mathematical identity and capability.

Notes

Next Steps

Align coursework with the Illinois Comprehensive Numeracy Plan's numeracy definition and components.

Provide clinical experiences that reflect evidence-based math instruction.

Strengthen candidate learning around diagnosing and addressing misconceptions.

Incorporate instruction on math discourse, multiple representations, and problem-solving frameworks.

Build partnerships with districts to align expectations and practice.

Reflection Questions

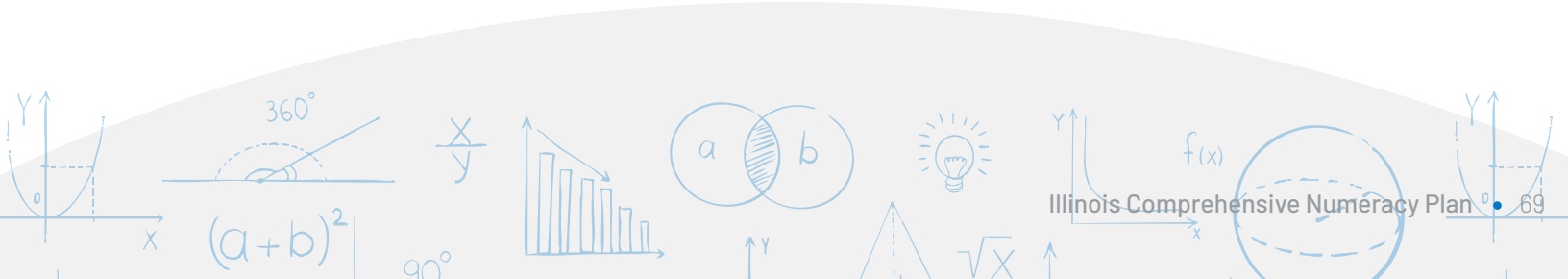
1. How do educator preparation programs introduce candidates to numeracy development?

2. What opportunities do candidates have to observe and practice evidence-based math instruction?

3. How are field placements aligned to high-quality math teaching?

4. How do programs prepare candidates to support diverse learners in mathematics?

5. What additional supports are needed to strengthen candidates' mathematical knowledge for teaching?



Goal 1

Students will build and apply numeracy skills through tasks that develop reasoning, fluency, and real-world problem solving.

Implementation Considerations

- State leaders must ensure equitable access to high-quality math instruction across Illinois.
- Statewide data should guide resource allocation and policy decisions.
- High-quality instructional materials and professional learning should be prioritized.
- State initiatives should promote coherence across districts and regions.
- Policies must reflect the Illinois Comprehensive Numeracy Plan's commitment to equity and evidence-based mathematics instruction.

Notes

Next Steps

Communicate the numeracy plan and support stakeholders with aligned resources.

Provide tools for evaluating high-quality math curriculum and interventions.

Monitor statewide numeracy data to identify trends and inequities.

Allocate resources to support schools and districts with the greatest need.

Ensure professional learning reflects the most current evidence-based mathematics practices.

Reflection Questions

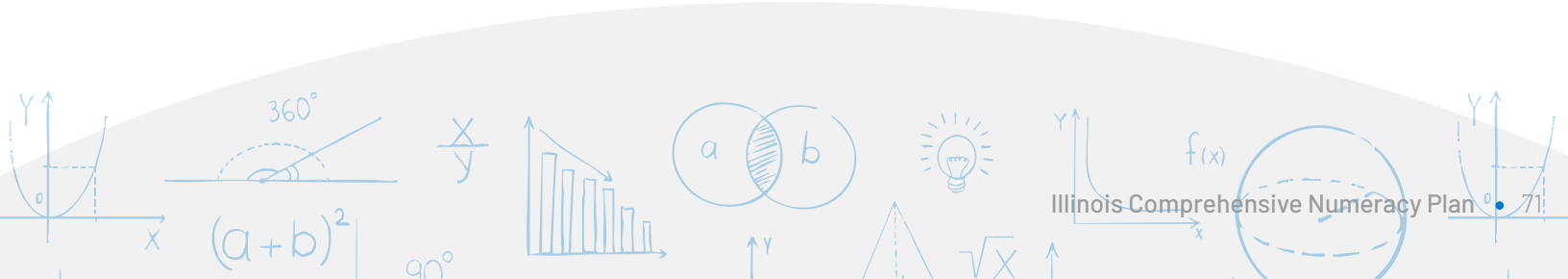
1. How will state leaders promote equitable access to high-quality math instruction?

2. What statewide data trends require immediate attention?

3. How can state policies remove barriers to effective numeracy instruction?

4. How can state leaders support districts in selecting high-quality math materials?

5. What obstacles may limit statewide implementation of the Illinois Comprehensive Numeracy Plan?



Goal 1

Students will build and apply numeracy skills through tasks that develop reasoning, fluency, and real-world problem solving.

Implementation Considerations

- Families and communities contribute to building positive mathematical identities.
- Access to community-based numeracy resources can strengthen learning beyond school.
- Transparent communication about student progress fosters partnership.
- Community organizations can support real-world mathematics experiences.
- Equitable access to numeracy opportunities varies across communities and should be addressed.

Notes

Next Steps

Ask questions and engage with schools to understand numeracy expectations.

Encourage mathematical thinking through everyday activities at home and in the community.

Advocate for accessible resources that support numeracy learning for all students.

Participate in or support programs that strengthen family-school partnerships.

Review assessment information to better understand student strengths and needs.

Reflection Questions

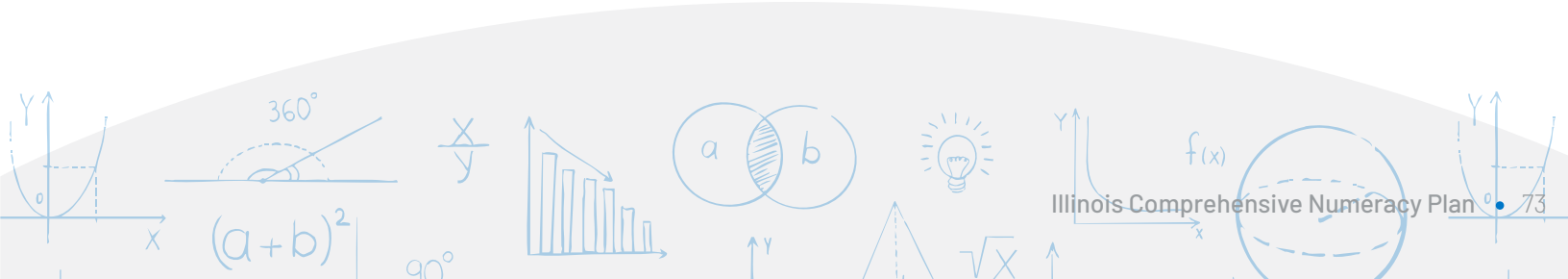
1. How can families and community partners support numeracy development at home?

2. What resources would help families better understand mathematics instruction?

3. How can communities create meaningful real-world math experiences for students?

4. How can partnerships between families and schools be strengthened?

5. What barriers limit community engagement in supporting numeracy?



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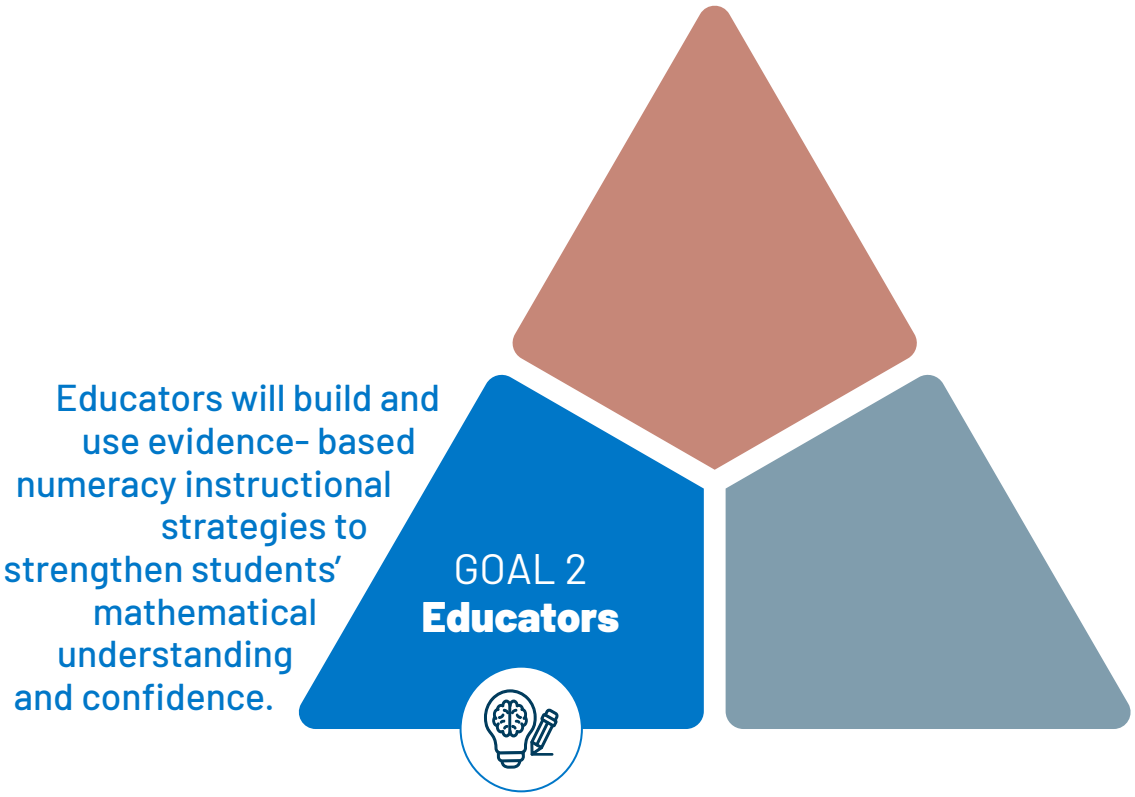
Section 02

EDUCATOR PROFESSIONAL LEARNING AND DEVELOPMENT

This section is dedicated to **goal 2**:



This section of the plan will cover the following main topics:

1. The professional learning continuum

2. The focus of professional learning

3. School and district leaders

4. Educator professional learning

5. Educator preparation

The Professional Learning Continuum

Professional learning in mathematics plays a central role in achieving Illinois' vision in supporting the development of mathematically literate citizens prepared for the demands of the 21st century. Students thrive when educators engage in sustained, evidence-based learning that deepens mathematical knowledge, strengthens teaching practices, and affirms professional and mathematical identities.[1] Professional learning clarifies a shared, evidence-based definition of numeracy: the ability for all students to confidently understand, interpret, and apply mathematical concepts across all domains of mathematics in a variety of real-world and academic contexts. With that lens, teachers design instruction that advances reasoning, problem solving, and confidence.[2]

This section addresses educator learning across the continuum, from school and district leaders to educator preparation programs (EPPs). High-quality professional learning does not occur in isolated stages. Instead, it forms a continuum that begins in educator preparation programs, deepens through in-service professional learning, and is sustained and extended by school and district leadership. Each stage builds on the last and depends on the others to achieve Illinois' vision for ambitious and equitable numeracy instruction.

The figures below illustrates how each stage contributes distinct, yet interconnected, responsibilities that, together, sustain ambitious and equitable numeracy instruction.

Figure 20: Components of Educator Learning

FOUNDATION
By engaging in professional learning themselves, providing non-evaluative feedback, and sustaining collaborative structures like PLCs and data teams, leaders ensure that high-quality professional learning becomes part of the fabric of every school and district.[4]

REFINEMENT
Through job-embedded | professional learning like coaching, Professional Learning Communities (PLCs), mentoring, institutes, and equity-focused professional learning, teachers refine their practice, respond to student needs, and grow as instructional leaders. Sustained engagement| ensures that teachers continue to develop across their careers.[3]

SUPPORT
Candidates build mathematical knowledge, develop inclusive practices, and cultivate positive identities as mathematical thinkers. They learn the habits of mind and pedagogical strategies that allow them to launch their careers with confidence.

Figure 21: Continuum of professional learning

Category	Leadership	In-Service Educators	Educator Preparation Programs (EPPs)
Content Knowledge	• Provide and actively participate in professional learning through institutes, PLCs, coaching cycles, and mentoring alongside educators to model shared commitment and extend knowledge of numeracy • Strengthen teacher content knowledge in applied contexts, including interdisciplinary connections to science, CTE, and social sciences	• Actively participate in professional learning through institutes, PLCs focused on numeracy, coaching cycles, and mentoring • Align numeracy instruction and assessments to Illinois Learning Standards for mathematics and SMPs	• Align coursework and clinical experiences with Illinois endorsement standards (23 Ill. Adm. Code 20, 21, 26, 27) and Illinois Licensure Testing System (ILTS) frameworks • Ensure candidates master core content domains
Instructional Best Practices and Pedagogy	• Refine and extend these practices through lesson study, coaching cycles, and induction programs • Support implementation through feedback tools • Align leadership with Professional Standards for Educational Leaders and Illinois Performance Standards for School Leaders	• Incorporate number talks and problem strings regularly • Analyze student work collaboratively • Seek feedback from instructional coaches or content area teams	• Introduce evidence-based practices as instructional approaches supported by rigorous, peer-reviewed research demonstrating a positive impact on student learning • Provide examples such as those outlined by IES

Category	Leadership	In-Service Educators	Educator Preparation Programs (EPPs)
Equity	• Embed Culturally Responsive Teaching and Learning Standards (CRTL) and UDL strategies into ongoing professional learning • Prioritize equity in resource allocation and ensure marginalized students receive targeted support	• Apply CRTL and UDL principles in lesson design • Differentiate instruction for diverse learners • Advocate for equitable access to resources	• Cultivate dispositions that affirm equity and inclusivity
Mentoring	• Offer induction programs and mentoring that reinforce effective practices • Guarantee teachers have protected time and resources for PLCs and data analysis	• Participate in mentoring and peer observation • Use data teams to analyze student progress • Reflect on instructional practices	• Provide clinical practice where candidates rehearse teaching, receive feedback, and analyze student learning
Continuous Improvement	• Evaluate professional learning by collecting feedback, monitoring classroom practice, and analyzing outcomes • Use data from observations and PLCs to guide improvement	• Document growth through portfolios • Share evidence of student learning during PLCs • Engage in continuous improvement cycles	• Require integrative experiences, such as capstones, seminars, or portfolios that demonstrate readiness by connecting content, pedagogy, and equity • Provide opportunities for candidates to self-evaluate their teaching practices and set goals for improvement

Equity in Professional Learning

Equity serves as the foundation of professional learning in mathematics and must be intentionally imbedded across the continuum of educator professional learning.[5] Professional learning should integrate culturally responsive pedagogy, UDL strategies, and tools for supporting multilingual learners and students with disabilities.[6] Administrators play a critical role in ensuring equitable access to high-quality professional learning through intentional allocation of time, resources, and supports. Equity-focused leadership involves using data-based decision making, involving educators in the planning of professional learning, and monitoring the implementation of programs and initiatives to ensure professional learning benefits all students. In-service educators must be provided with equitable professional learning that focuses on differentiation, student data, and asset-based approaches.[7] Educators can also attend to equity by engaging in collaborative learning and identifying and addressing instructional barriers for underserved students. At the pre-service level, teaching educator preparation programs can support equity by embedding culturally responsive pedagogy and inclusive instructional practices. Programs should offer pre-service teachers observation cycles and student teaching placements in diverse school settings. By prioritizing equity, Illinois can reduce achievement gaps and foster mathematics classrooms where every student not only belongs but contributes to learning.

Focus of Professional Learning

Professional learning in mathematics is intentional, comprehensive, and aligned to the developmental trajectory of numeracy as described in the Framework for the Evidence-Based Development of Numeracy Skills. Educators will build numeracy in students by first strengthening their own knowledge, dispositions, and instructional practices. High-quality professional learning develops habits of mind, confidence, and evidence-based practices that bring mathematics to life.[8]

This focus extends beyond content. Professional learning builds teacher identity, advances equity, and connects mathematics to authentic contexts. Teachers benefit when they experience mathematics as learners by engaging in problem solving, reasoning, modeling, and discourse; those experiences translate into instruction that elicits and extends student thinking.[9]

Five interrelated domains of professional learning:

1. Strengthening Educators' Mathematical Knowledge

Teachers must first have strong mathematical reasoning themselves before they can support students in developing it. This understanding includes deepening knowledge of numbers and operations, algebra, geometry, measurement, statistics, and probability.[10]Professional learning should allow educators to explore learning progressions, cross-domain connections, and fluent use of representations, such as manipulatives, visuals, symbols, and real-world contexts. Strong learning systems also nurture teacher confidence and positive mathematics identity.[11] Alignment to endorsement requirements in Illinois administrative code and to Illinois Licensure Testing System (ILTS) frameworks ensures coherence between teacher development and state standards.

2. Advancing Evidence-Based Numeracy Instructional Practices

Evidence-based instructional practices refer to instructional approaches supported by rigorous, peer-reviewed research demonstrating a positive impact on student learning. Teachers need access to instructional strategies that connect fluency with understanding and promote reasoning. Professional learning should focus on fluency as a progression that moves from counting to deriving to mastery and builds on evidence-based strategies.[12] Educators should experience and enact proven routines like Number Talks, Problem Strings, and discourse structures that highlight student reasoning and multiple strategies to solve rich tasks.[13] These practices must always prioritize equity, with explicit integration of the Culturally Responsive Teaching and Leading (CRTL) Standards and UDL so that every student can access rigorous mathematics.[14]

3. Centering Student Thinking and Development

High-quality professional learning positions student thinking at the center of mathematics instruction. Teachers study how mathematical strategies develop from early counting through proportional reasoning and functional thinking.[15] They practice eliciting and extending student ideas, orchestrating classroom discussions, and analyzing student work to guide next steps.[16] Professional learning also helps teachers affirm students' mathematical identities and foster agency, persistence, and productive struggle as essential elements of learning.[17]

4. Ensuring Coherence Across Grades, Content, and Disciplines

Teachers benefit from professional learning that frames mathematics as an interconnected system. Educators should explore how standards progress across grade levels, study cross-domain connections using tools like Achieve the Core's Coherence Map, and connect mathematics to other disciplines such as science, social science, and career and technical education (CTE). These experiences strengthen the ability to design instruction that emphasizes real-world application and reflects the numeracy skills students will need as adults.[18]

5. Aligning with Standards and Professional Expectations

Professional learning must anchor teacher growth in state and national standards. Teachers need explicit opportunities to align their instruction to the Illinois Learning Standards for Mathematics and Standards for Mathematical Practice. Preparation and in-service learning should also reflect national expectations, such as the Association of Mathematics Teacher Educators (AMTE) Standards.[19] For secondary teachers, alignment includes building the capacity to connect instruction to assessments that measure college and career readiness.[20]

These domains guide growth across an educator's career continuum and align with the Illinois Learning Standards, and national expectations for effective mathematics teaching.[21]

High-quality professional learning mirrors the same principles of strong mathematics instruction. It is content-focused, engaging teachers in mathematical ideas and pedagogy; active, providing educators and pre-service educators practice with tools, manipulatives, and strategies; collaborative, creating structures for teachers to learn from and with one another; and sustained, offering ongoing, sequential opportunities for growth.[22] Just as students need repeated practice to master numeracy, teachers need time and multiple experiences to master effective numeracy instruction.

School and District Leaders

To support student learning of numeracy and teachers' evidence-based mathematics instruction, school and district leaders must act as instructional leaders. It is not enough for leaders to understand general, subject-neutral principles of learning and instruction.

When leaders cultivate their own understanding of high-quality mathematics instruction, they create the conditions for teachers and students to thrive. Leaders should engage in mathematics professional learning alongside educators, not only to strengthen their knowledge of evidence-based instructional strategies but also to signal the value of collaborative learning at every level of a system.[23] Leaders can also deepen their understanding by engaging in classroom observations, or "math walks," with coaches and teacher leaders, using structured "look for" tools to focus on evidence of student reasoning, teacher questioning, and equitable participation.[24]

Ambitious and equitable mathematics instruction requires leaders to:

- Develop a vision of high-quality numeracy in partnership with educational leaders, including teachers, community members, and students.
- Promote instruction that aligns to the Illinois Learning Standards, the Standards for Mathematical Practice, and evidence-based practices.
- Ensure that all teachers, regardless of content area or grade level, understand their role in building students' numeracy and for actively promoting a shared, schoolwide commitment to numeracy development.

- Engage in observation and feedback cycles that emphasize teacher growth, reflection, and analysis of student thinking outside and apart from formal evauations.[25]
- Create and sustain collaborative structures, such as Professional Learning Communities (PLCs), vertical teams, and data teams, where teachers analyze student work, examine progressions, and plan instruction together.[26]
- Prioritize equity in professional learning, ensuring that teachers have access to resources, coaching, and collaborative time to meet the needs of all learners.[27]

Specific Learnings for Leaders

Leaders need explicit opportunities to learn *how* to recognize, support, and sustain ambitious and equitable numeracy instruction.

What to Look for in Classrooms	How to Provide Feedback	What Productive Collaborative Structures Look Like
a. Evidence of student reasoning, not just correct answers. **b.** Use of multiple representations (manipulatives, visuals, symbols, and real-world contexts). **c.** Discourse structures that promote equitable participation. **d.** Connections to developmental progressions of content standards and the Standards for Mathematical Practice. **e.** Multiple sources of data such as student work samples, formative assessments, etc., used to drive instruction.	**a.** Use observation tools that are formative, non-evaluative, and tied to instructional practices. **b.** Focus feedback on student learning evidence rather than teacher compliance. **c.** Highlight strengths while identifying 1-2 specific, actionable areas for growth. **d.** Engage in reflective dialogue, asking teachers to analyze student thinking and consider instructional moves.	**a.** PLCs: Teachers gather to co-plan, analyze student work, and reflect on instruction using shared protocols. **b.** Vertical Teams: Educators across grade levels examine math content progressions to strengthen coherence in numeracy. **c.** Data Teams: Teachers use multiple data sources (summative and formative) to inform instruction, focusing on growth, not deficit. **d.** Leaders provide the time, resources, and facilitation to ensure these structures remain teacher-driven and student-centered, and that professional learning is sustained, ongoing, and iterative.

Figure 22: Resources and tools for leaders

Focus Area	Resource/Tool	Purpose/Use
Classroom Observation	Assessing Quality of Mathematics Teacher Candidates; Instructional Practice Guides	Guides leaders in observing mathematical discourse, reasoning, and equitable participation and provides observation "look fors."
Non-Evaluative Feedback	Learning-Focused Feedback Protocol [51]	Helps leaders structure post-observation conversations that prioritize student learning evidence and teacher reflection.
PLCs and Collaboration	Learning by Doing; Achieve the Core Coherence Map [52]	Supports leaders in structuring productive PLCs that focus on progressions and coherence across grades.
Equity and Access	CRTL Standards [53]; UDL Guidelines [54]	Anchors leaders' professional learning in equity and accessibility practices.
Supportive Teacher Collaborative Planning	5 Practices for Orchestrating Productive Mathematics Discussions [55]	Supports leaders in structuring collaborative spaces for teachers to plan for student-centered, problem-based math instruction.
Leadership Development	How Principals Affect Students and Schools [56]; Principles to Actions: Ensuring Mathematical Success for All	Provides evidence-based guidance on how leadership practices influence teaching and learning.

In-Service Educators

Illinois educators need sustained professional learning across their careers to refine practice, deepen mathematical knowledge, and respond to the needs of students. In-service professional learning extends and strengthens the foundation established during educator preparation programs. Districts, schools, and Regional Offices of Education (ROEs) carry shared responsibility for ensuring that educators have equitable access to these opportunities.

In-service learning addresses areas that preparation programs cannot, such as long-term growth in mathematical knowledge for teaching, leadership development, equity-driven instructional design, and advanced assessment literacy. Effective systems recognize that professional growth develops across a career continuum and requires coherent structures that support collaboration, coaching, mentoring, and leadership opportunities.

Core Components

These components reflect the qualities of high-quality professional learning and describe the structures Illinois districts, schools, and ROEs can use to support ongoing teacher growth.

1. Institutes and Intensives

Districts and ROEs can provide summer institutes, intersession programs, or multi-day workshops that strengthen teacher understanding of mathematics content and pedagogy. Institutes must actively engage teachers as learners of mathematics, using the same tools and routines, such as problem strings, discourse structures, and modeling, that they will later implement with students.[28]

2. Professional Learning Communities

Schools can structure Professional Learning Communities (PLCs) where teachers collaborate to analyze student work, unpack standards, and design coherent progressions of learning. High-functioning PLCs go beyond pacing and logistics; they include co-planning, co-teaching, peer observation, and structured reflection to build shared expertise.[29]

3. Coaching and Specialists

Instructional coaching is a critical lever for changing practice. Math specialists and coaches provide modeling, co-planning, feedback, and cycles of observation. Coaches not only model effective strategies but also support teachers as they rehearse and refine these approaches in their own classrooms. Coaching must align to the Illinois Learning Standards and expectations for effective teaching.[30]

4. Mentoring and Induction

Novice teachers require structured support that bridges preparation to independent practice. Induction programs should emphasize lesson design, numeracy-rich routines, and equity-focused practices. Mentors help new teachers build confidence in discourse practices, student reasoning routines, and analysis of misconceptions.[31]

5. Online and Cross-District Networks

Virtual platforms extend access to teachers in rural or under-resourced districts. Online professional learning communities provide video-based lesson analysis, discussion forums, and statewide collaboration.[32] These networks allow teachers to share practice, reflect together, and build professional community.

6. Partnerships

Districts and ROEs should collaborate with universities, nonprofits, and professional associations to expand capacity. Partnerships bring in additional expertise, models of lesson study, and leadership development opportunities. Schools can build effective partnerships by identifying shared instructional goals, designating a point person or committee, and promoting ongoing communication and agreements centered on improving teaching and learning. Illinois examples include the Metro Chicago Mathematics Initiative and the Big Shoulders Fund.

7. **Sustained Engagement and Evaluation**

Professional learning must spiral across time, not occur as isolated events. Teachers need multiple opportunities to revisit ideas, apply them in practice, and refine through cycles of feedback and reflection. Districts and ROEs should monitor participation, collect teacher input, and evaluate impact using classroom observations, reflections, and student outcomes.[33]

Figure 23: Examples of evidence-based professional development practices for in-service teachers

Practice	When Appropriate	Alignment to Professional Standards	Less Impactful Practices
Lesson study cycles with co-planning, observation, and refinement[34]	When schools or districts want to build collective expertise through collaborative lesson design and reflection.	Illinois Learning Standards for Mathematics; Standards for Mathematical Practice (SMP 1, SMP 3, SMP 6); Professional Standards for All Teachers, Standard 2: Content Area and Pedagogical Knowledge (23 Ill. Adm. Code 24.130(b))	Teachers meet to discuss a lesson but do not observe or analyze student learning, leaving no actionable insights.
Long-term coaching cycles that include modeling and reflection [35]	When districts aim to provide individualized, sustained support for teacher growth.	Professional Standards for All Teachers, Standard 8: Collaborative Relationships (23 Ill. Adm. Code 24.130(h)); AMTE Standards (2017); Learning Forward Standards (2022)	A single coaching visit with generic feedback that does not include modeling, observation, or reflection.
PLC protocols for analyzing student work and misconceptions [36]	During grade-level or department meetings where teachers collaboratively examine evidence of student thinking.	Illinois Learning Standards for Mathematics; ILTS Framework performance indicators (Middle Grades 202, Secondary 208); 23 Ill. Adm. Code 26.200	PLCs that focus only on pacing guides or logistics without analyzing student reasoning or addressing misconceptions.

Cross-district online communities with video libraries and discussion forums [37]	When educators in rural or under-resourced schools need access to professional learning networks beyond their district.	Learning Forward Standards (2022); Professional Standards for All Teachers (23 Ill. Adm. Code 24.140)	Teachers access a video library but receive no structure for reflection, collaboration, or feedback.
Equity-centered workshops using culturally relevant contexts and UDL [38]	When schools and ROEs focus professional learning on serving multilingual learners, students with disabilities, and historically marginalized groups.	CRTL Standards (23 Ill. Adm. Code 24.50); UDL Guidelines (CAST, 2018)	One-off workshops that cover equity in theory but do not connect to lesson design, practice, or student work.
Mentoring structures that provide feedback on numeracy routines and discourse[39]	When districts design induction programs to support novice teachers in their first years.	Professional Standards for All Teachers, Standard 8: Collaborative Relationships (23 Ill. Adm. Code 24.140); AMTE Standards (2017)	Assigning a mentor without structured time, focus on numeracy, or observation/feedback cycles.

Teacher Preparation

Illinois Educator Preparation Programs (EPPs) are responsible for preparing candidates with mathematical knowledge, instructional practices, and professional dispositions through coursework and field experiences that form the foundation of numeracy instruction. Teacher preparation should extend beyond teaching mathematics content to also supporting candidates in strengthening their own numeracy as learners. Pre-service educators need opportunities to strengthen their own reasoning, build confidence through identity-affirming practices, and experience mathematics in the same active ways they will later facilitate for their students.

Expected Outcomes at Program Completion

By the conclusion of preparation, teacher candidates should be able to design and facilitate instruction that develops students' numeracy in alignment with the Illinois Learning Standards. They should be able to:

- Design and implement numeracy-rich instruction: Plan lessons that connect content to real-world and cross-disciplinary contexts, incorporate multiple representations, and select tasks that promote reasoning, problem solving, and discourse.
- Elicit and extend student thinking: Use questioning strategies to surface reasoning, recognize developmental stages of numeracy, and analyze student work to address misconceptions.[40]

- Build fluency through understanding: Facilitate number sense routines, math talks, fluency games, visual models, and intentional practice to develop foundational and derived addition and multiplication basic math facts to strengthen fluency grounded in reasoning.[41]
- Support equitable, inclusive numeracy development: Affirm all students as mathematical thinkers through culturally and linguistically responsive pedagogy.
- Engage in reflective, standards-driven practice: Align lessons with the Illinois Learning Standards, reflect on evidence of student learning, and collaborate with colleagues in PLCs.

Coursework and Field Work Integration

Preparation programs provide a balanced structure that integrates mathematics content and pedagogical approaches practiced through field work. High-quality preparation mirrors high-quality professional learning, which is content-rich, active, collaborative, and sustained. EPPs should align their curricula with the following Illinois standards and codes:

- Mathematics Standards for Elementary Teachers (23 Ill. Adm. Code 20.120)
- Mathematics Standards for Mathematics Teachers in Middle Grades (23 Ill. Adm. Code 21.150)
- Code of Ethics for Illinois Educators (23 Ill. Adm. Code 22.20)
- Culturally Responsive Teaching and Leading Standards (23 Ill. Adm. Code 24.50)

The components outlined below are offered as recommended considerations across educator preparation programs and are not intended to serve as requirements.

- Mathematics content courses: Content courses should emphasize reasoning, application, and connections among domains. They model how adults use mathematics in authentic contexts and how children think about and learn these concepts.[42]
- Mathematics methods courses: Methods courses emphasize active learning: Candidates engage in number talks, problem strings, and inquiry-based routines to experience mathematics as learners. Faculty model effective practices and provide opportunities for candidates to design lessons that elicit and extend student thinking.
- Foundational education courses: Programs connect development, psychology, curriculum, assessment, and diversity to numeracy. Research highlights the value of integrating content with foundational knowledge to strengthen instructional decisions.[43]
- Field work and integration: Candidates participate in a variety of field work including but not limited to whole group, small group, one-on-one, and tutoring. Each setting should provide structured cycles of planning, teaching, feedback, and reflection.[44] Integrative experiences such as seminars and a final student teaching or equivalent experience require candidates to synthesize content, pedagogy, and equity practices into a coherent vision of numeracy instruction and demonstrate readiness for licensure.

Educator preparation programs should be organized to include mathematics content courses, mathematics methods/pedagogy courses, foundational education courses, and extensive opportunities to practice through fieldwork. Programs should align all coursework and fieldwork to the Illinois Learning Standards for Mathematics, SMPs, and Illinois endorsement requirements. Strong programs also include collaborations with local schools and actively work to recruit and support teacher candidates that reflect the diversity of Illinois' student population, thus strengthening the educator pipeline.

Figure 24: Examples of evidence-based professional development practices in teacher preparation

Practice	When Appropriate	Alignment to Professional Standards	Less Impactful Practices
Build fluency through reasoning strategies (i.e., number talks, math routines, math games, visual models, and problem strings in methods courses).[45]	During coursework that connects mathematical content to pedagogy, allow candidates to experience mathematics as learners.	Illinois Learning Standards for Mathematics (SMP 2, SMP 3, SMP 4); AMTE Standards (2017)	Instructor lectures about number talks without engaging candidates in the routine or analysis of student thinking.
Structured rehearsal cycles in clinical placements (plan–teach–reflect–revise).[46]	In clinical experience or coursework where candidates practice instructional moves and receive mentor feedback.	23 Ill. Adm. Code 25 (b) (Clinical Experiences); Professional Standards for All Teachers, CRTL Standards (23 Ill. Adm. Code 24.50)	Candidate only observes or teaches a lesson once without feedback or opportunities to revise practice.
Analysis protocols for student work aligned to Illinois Learning Standards.[47]	When building assessment literacy and practicing instructional decision making based on real or sample student artifacts.	Illinois Learning Standards for Mathematics; ILTS Frameworks (Middle Grades 202, Secondary 208); NCATE/CAEP Assessment Standards	Candidate reviews answer keys but does not analyze student misconceptions or reasoning.
Case studies applying CRTL and UDL.[48]	In foundations or methods courses where candidates design responses to common instructional challenges with equity at the center.	Universal Design for Learning Guidelines (CAST, 2018); CRTL Standards (23 Ill. Adm. Code 24.50)	Candidate studies generic lesson plans with no consideration for multilingual learners, students with disabilities, or cultural responsiveness.

Goal 2: Workbook

Educators will build and use evidence-based numeracy instructional strategies to strengthen students' mathematical understanding and confidence.

Goal 2

Educators will build and use evidence-based numeracy instructional strategies to strengthen students' mathematical understanding and confidence.

Implementation Considerations

- Professional learning should deepen mathematical content knowledge and instructional practice.
- Educators benefit from experiencing mathematics as learners through reasoning, discourse, and problem solving.
- Instructional practices should reflect evidence-based routines that support numeracy development.
- Professional learning should be ongoing, collaborative, and connected to classroom practice.
- Equity and accessibility should be embedded in all professional learning experiences.

Notes

Next Steps

Engage in professional learning focused on numeracy progressions and student thinking.

Apply routines such as number talks, problem strings, and discourse structures.

Collaborate with colleagues to analyze student work and instructional impact.

Reflect on how professional learning influences classroom practice.

Seek coaching or mentoring to refine instructional strategies.

Reflection Questions

1. How does professional learning strengthen my understanding of numeracy development?

2. Which instructional practices have the greatest impact on student reasoning?

3. How do I apply learning from PLCs or coaching into daily instruction?

4. What additional support would help me refine my numeracy instruction?

5. How does professional learning affirm my identity as a mathematics educator?

Goal 2

Educators will build and use evidence-based numeracy instructional strategies to strengthen students' mathematical understanding and confidence.

Implementation Considerations

- Teacher leaders support sustained, job-embedded professional learning.
- Professional learning should be aligned to evidence-based numeracy instruction.
- Data and student work should guide collaborative learning.
- Coaching and mentoring are key levers for instructional improvement.
- Equity-focused practices must be reinforced through professional learning.

Notes

Next Steps

Facilitate PLCs focused on numeracy progressions and instructional coherence.

Support teachers in analyzing student thinking and misconceptions.

Model evidence-based instructional routines and strategies.

Use data to identify professional learning needs.

Collaborate with school leaders to align professional learning priorities.

Reflection Questions

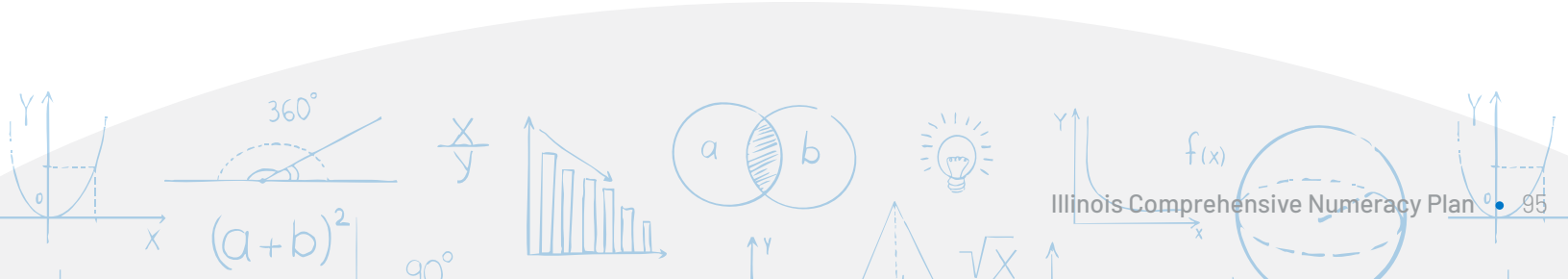
1. How do current professional learning structures support numeracy instruction?

2. How do I help teachers connect professional learning to classroom practice?

3. What patterns emerge in student work across classrooms?

4. How do I support equitable participation in professional learning?

5. What barriers limit the effectiveness of professional learning?



Goal 2

Educators will build and use evidence-based numeracy instructional strategies to strengthen students' mathematical understanding and confidence.

Implementation Considerations

- School leaders play a key role in sustaining high-quality professional learning.
- Professional learning should be aligned to schoolwide numeracy goals.
- Leaders should participate in professional learning alongside educators.
- Collaborative structures support instructional coherence and growth.
- Equity should guide decisions about access to professional learning.

Notes

Next Steps

Allocate time and resources for sustained numeracy-focused professional learning.

Engage in classroom observations and feedback cycles focused on student reasoning.

Support PLCs and coaching aligned to evidence-based practices.

Use data to evaluate the impact of professional learning.

Promote a culture of reflection and continuous improvement.

Reflection Questions

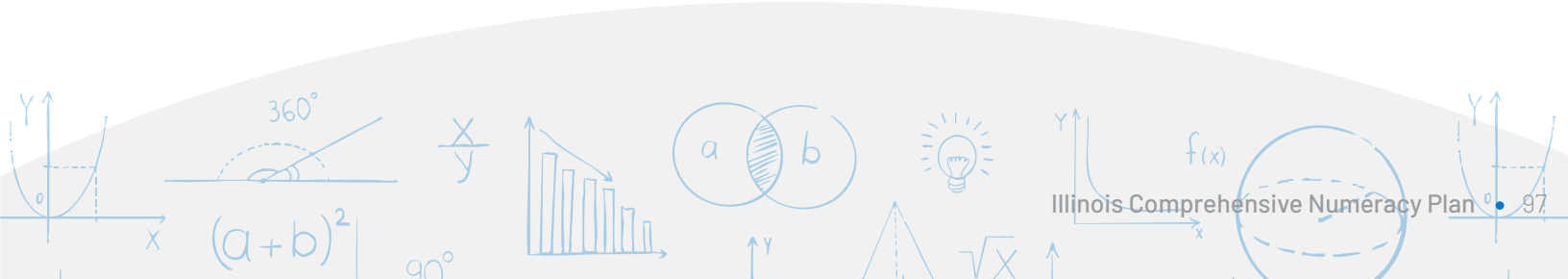
1. How does professional learning support schoolwide numeracy goals?

2. Are educators receiving consistent, high-quality learning opportunities?

3. How do observation and feedback practices support instructional growth?

4. How is equity addressed in professional learning decisions?

5. What structures need strengthening to sustain learning over time?



Goal 2

Educators will build and use evidence-based numeracy instructional strategies to strengthen students' mathematical understanding and confidence.

Implementation Considerations

- District systems should support professional learning across the educator continuum.
- Professional learning should be aligned to curriculum, assessment, and instruction.
- Job-embedded learning strengthens instructional coherence.
- Partnerships expand professional learning capacity.
- Equity should guide access and resource allocation.

Notes

Next Steps

Develop a districtwide numeracy professional learning plan.

Align professional learning with curriculum adoption and implementation.

Support coaching, mentoring, and leadership development.

Monitor participation and impact using multiple data sources.

Address gaps in access to professional learning opportunities.

Reflection Questions

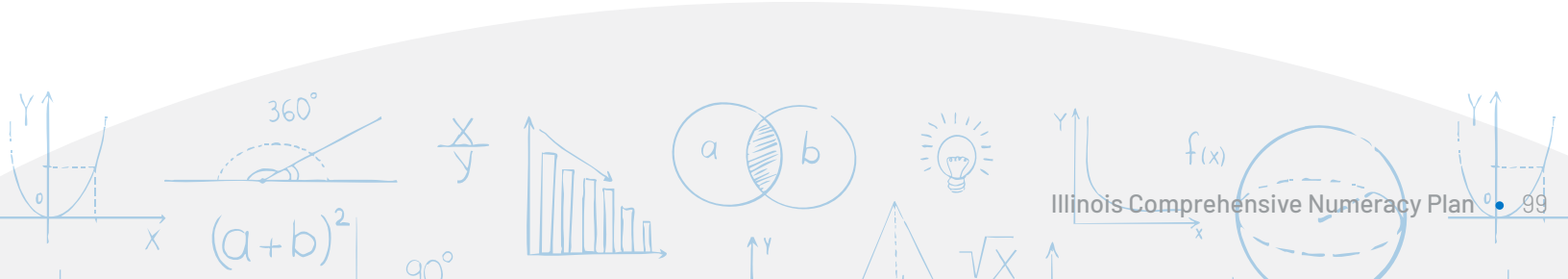
1. How coherent is professional learning across the district?

2. What data informs professional learning priorities?

3. How are leaders supported as instructional leaders in mathematics?

4. How do partnerships strengthen professional learning systems?

5. What inequities exist in access to professional learning?



Goal 2

Educators will build and use evidence-based numeracy instructional strategies to strengthen students' mathematical understanding and confidence.

Implementation Considerations

- Regional leaders support districts through shared learning and collaboration.
- Professional learning should reflect regional needs and assets.
- Cross-district collaboration strengthens instructional capacity.
- Virtual learning expands access to professional learning.
- Equity should remain central to regional support efforts.

Notes

Next Steps

Conduct regional needs assessments related to numeracy instruction.

Provide professional learning aligned to evidence-based practices.

Facilitate cross-district PLCs and learning networks.

Support districts in evaluating professional learning impact.

Coordinate resources to support underserved districts.

Reflection Questions

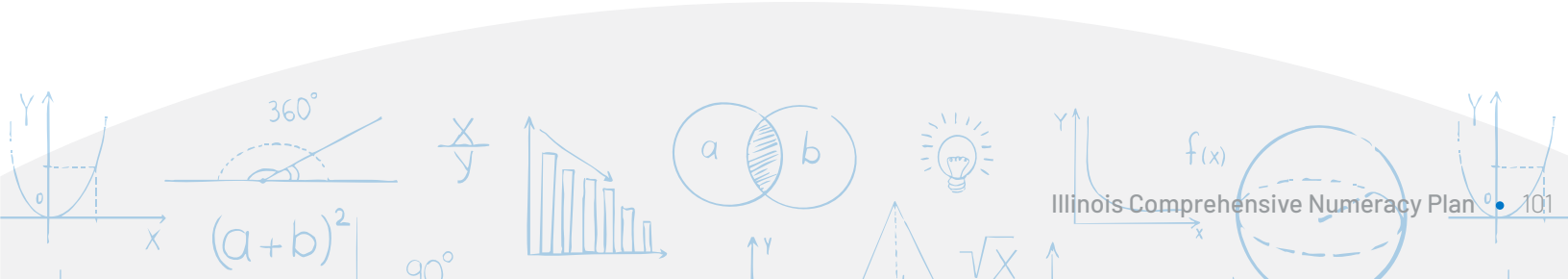
1. How do regional offerings align with district numeracy needs?

2. What opportunities exist for cross-district collaboration?

3. How is equity addressed in regional professional learning?

4. How effective are virtual learning structures?

5. What additional supports are needed across the region?



Goal 2

Educators will build and use evidence-based numeracy instructional strategies to strengthen students' mathematical understanding and confidence.

Implementation Considerations

- Preparation programs form the foundation of educators' numeracy knowledge.
- Coursework should integrate content, pedagogy, and equity.
- Candidates should experience evidence-based instructional practices.
- Fieldwork should reinforce numeracy-rich instruction.
- Alignment to state standards ensures coherence.

Notes

Next Steps

- Align coursework with the ICNP definition of numeracy.
- Embed evidence-based instructional routines into methods courses.
- Provide structured field experiences with feedback cycles.
- Strengthen candidate assessment literacy.
- Collaborate with districts to align expectations.

Reflection Questions

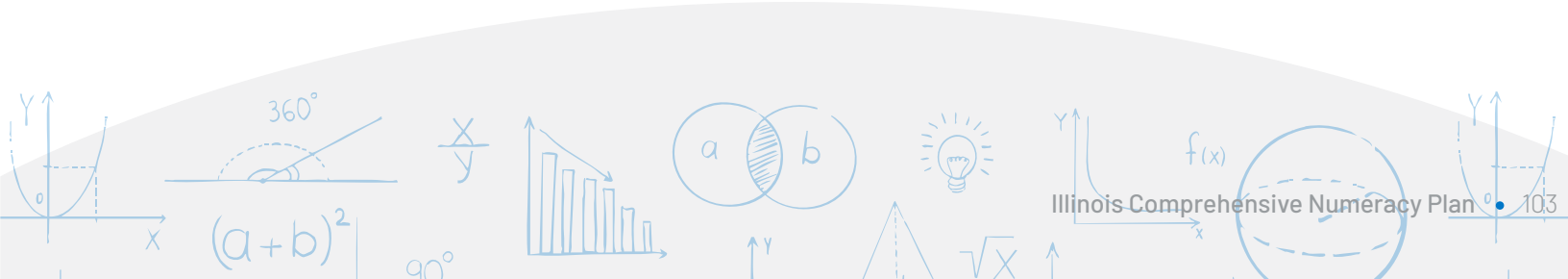
1. How do preparation programs build candidates' numeracy as learners?

2. How are candidates prepared to elicit and extend student thinking?

3. How do field experiences reflect high-quality math instruction?

4. How is equity embedded in preparation experiences?

5. What gaps exist between preparation and classroom expectations?



Goal 2

Educators will build and use evidence-based numeracy instructional strategies to strengthen students' mathematical understanding and confidence.

Implementation Considerations

- State leadership shapes professional learning expectations and supports.
- Professional learning should align with statewide numeracy goals.
- Data should guide investment and improvement efforts.
- Cross-agency coordination strengthens impact.
- Equity should inform statewide professional learning strategies.

Notes

Next Steps

Provide statewide guidance and tools for numeracy professional learning.

Support access to high-quality professional learning across regions.

Monitor statewide participation and outcomes.

Align policy and funding to evidence-based practices.

Address systemic barriers to professional learning implementation.

Reflection Questions

1. How does statewide professional learning support numeracy goals?

2. What trends emerge in educator participation and impact?

3. How can policy better support sustained professional learning?

4. How is equity addressed across statewide efforts?

5. What conditions are needed to scale effective practices?

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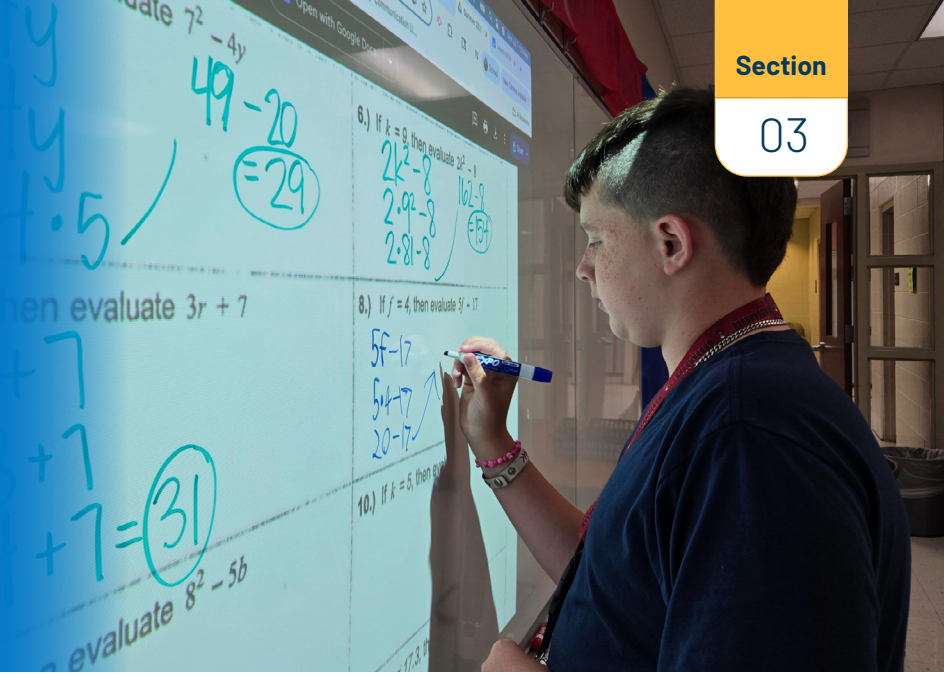
Section 03

FRAMEWORK FOR EFFECTIVE LEADERSHIP, SYSTEMS OF SUPPORT, AND IMPLEMENTATION CONSIDERATIONS



This section is dedicated to **goal 3**:

Leaders will promote a culture of numeracy through targeted professional learning and data-informed instructional support.

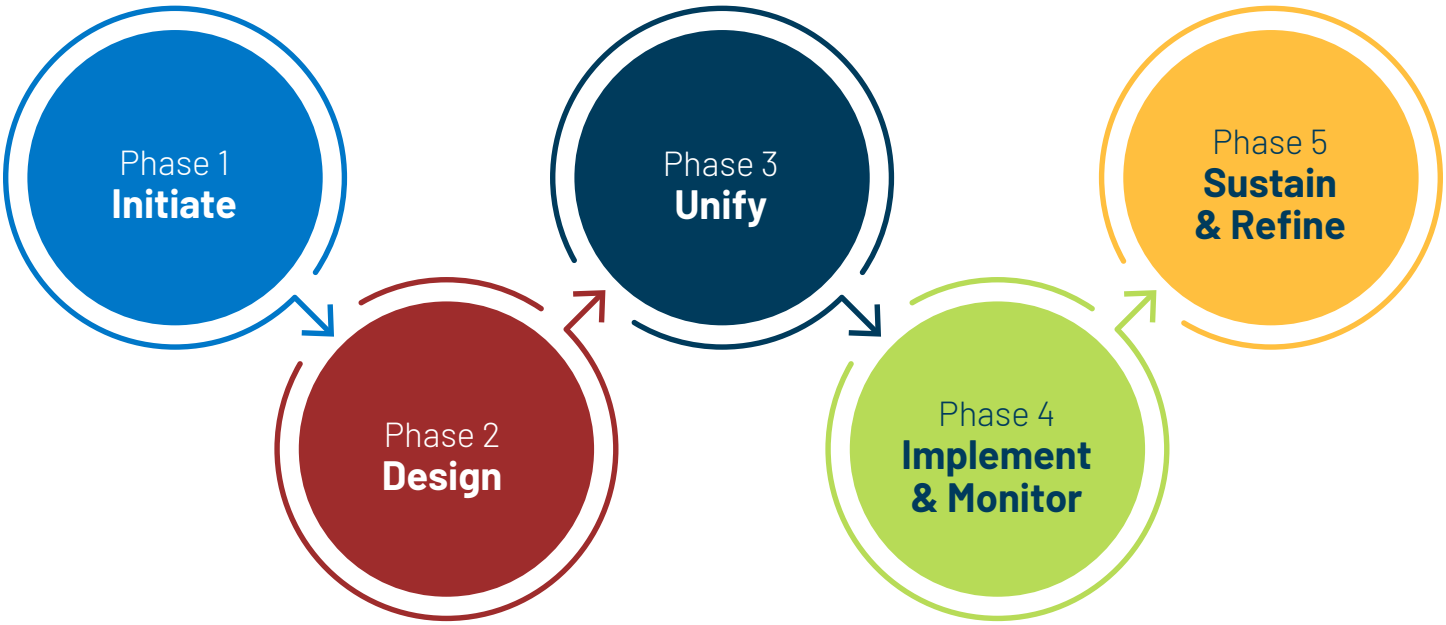
This section of the plan will cover the following main topics:

Local Numeracy Plan Development Overview

This section provides a roadmap for school and district leaders to develop and implement a local plan to improve numeracy teaching and learning.

Improving student outcomes in mathematics requires intentional, systemwide leadership grounded in equity from the very beginning of the work. Building and district leaders play a critical role in strengthening numeracy instruction through establishing a clear vision, supporting coherent implementation, and ensuring that all students have access to high-quality grade-level learning experiences.[1] Leaders must approach mathematics improvement as an ongoing cycle of reflection, collaboration, and refinement to create the necessary structures and supports to improve numeracy, rather than a one-time plan that promises a quick fix.[2] The creation of a local numeracy plan requires leaders to call out continuously to data and consistently call in educational partners to ensure shared ownership to increase achievement.[3]

In this section, leaders and teachers are specifically mentioned to delineate educator roles more clearly. To support districts and schools in systematically improving mathematics outcomes, five interconnected phases have been identified to guide planning, implementation, and continuous improvement efforts for educators:



Phase 1: Initiate

The purpose of phase 1 is to assist building and district leaders in analyzing, clarifying, and creating a shared vision of ownership for a local numeracy plan.

Analyze Current Numeracy Data

- What high-level data is available? (State testing, benchmarking)
- What protocols are in place to analyze data?
- Based upon the data, what are identified strengths and areas of improvement?

Effective mathematics improvement begins with a clear, data-informed understanding of the current state of instruction. Leaders must begin by analyzing the local landscape with honesty and acknowledge the reality that most Illinois students are not meeting expectations for math.[4] To begin this work, administrators should start with a data dive that supports actionable insight. Leaders should consider what high-level data is available such as state assessments, benchmarking, 5Essentials data, and subgroup performance data. Reviewing trends across grade levels, content domains, and subgroups helps identify patterns in learning, including both strengths and areas for improvement as well as possible areas of inequities.[5] Looking at bright spots where strong numeracy instruction is already happening can play a significant role in identifying educators who can participate in a numeracy improvement initiative. This high-level data dive also allows administrators to determine which areas will need a deeper analysis to support their local numeracy plan.

Next, administrators should reflect upon current data analysis protocols within their district or building. An effective data protocol guides the analysis process in a manner that promotes consistency, objectivity, and equity by elevating facts over judgements and interpretations. A structured approach similar to the ATLAS Looking at Data Protocol supports deeper analysis and prevents teams from focusing on solutions before fully understanding the data.

Identify Opportunities for Shared Ownership

- Who are the numeracy experts in the building/district, and how can they be leveraged?
- What opportunities are there for vertical development within and across grade levels and content areas?
- When can time be secured to collaborate with educational partners to ensure sustainability of the plan.

For any improvement plan to be successful, shared ownership must be established early and intentionally.[6] Leaders should reflect upon how they can create a system of shared ownership in which responsibility for mathematics achievement can be distributed across the building or district rather than solely the responsibility of a single role or team. When principals and superintendents distribute leadership responsibilities and genuinely leverage teacher expertise, they create conditions for sustainable change that extends far beyond any single administrator's tenure.[7]

Additionally, leaders should identify the math experts in their district or building such as classroom teachers, specialists, interventionists, or instructional coaches. Leveraging these individuals as

model classrooms or members of a numeracy leadership team assists in building internal capacity and positions staff as partners in the work. It is important that the team includes voices representing as many impacted groups as possible and includes leaders with enough decision-making authority to ensure the team's ideas make it to implementation.

It is imperative that leaders secure and protect collaborative time to remove logistical barriers in support of the work and to promote shared ownership. Leaders should identify multiple opportunities within the existing calendar such as early release days, institute days, late starts, staff meetings, and common planning times to support collaboration. In some cases, when possible, administrators may need to consider adjustments to the daily schedule to promote common planning times. Additionally, administrators may leverage substitute coverage to allow teachers to meet during the school day. Ultimately, early scheduling decisions can ensure collaboration and shared ownership are core components of a local numeracy improvement plan.

Draft a Vision

- What are the key ingredients for numeracy success?
- What are teacher and student expectations/responsibilities?

Leaders must work collaboratively with educational partners to develop a numeracy vision that honors the principles outlined in the Illinois Comprehensive Numeracy Plan while reflecting their distinctive local context. A local plan should be equitable and ambitious, yet achievable and specific enough to guide daily decision making while remaining flexible enough to evolve based on ongoing learning and experience.

A strong numeracy vision is anchored in fairness, inclusivity, and justice, ensuring that all students can see themselves as capable mathematicians. Effective school leaders recognize that a student's ability to learn mathematics is not limited by race, gender, or other characteristics. Leaders who center equity provide adequate access to resources for all students, focus on student achievement at all learning levels, support student identity development as mathematicians, and nurture student agency.

Phase 2: Design

The purpose of phase 2 is for building and district leaders to collaborate with educators to create the necessary structures, systems, roles, and plans needed to create a local numeracy plan.

Call in the Numeracy Team

- Who is involved in designing this plan, and what are their roles?
- How can the lift of this work be distributed equitably among team members?

Once time and structures are secured, the next step is to convene the numeracy team. This team should include representatives from different roles, grade levels, experience ranges, and school buildings (if applicable) to ensure diverse perspectives and broad communication networks. Consider including support staff and even students in the work. Administrators may consider faculty and staff of community colleges and universities as potential consultants and partners in the work to effectively support implementation of current research and ongoing professional learning related to building numeracy knowledge.[9] They can also be effective partners in crafting professional learning opportunities with other members of the numeracy team. Leadership may consider compensating team members for their additional responsibilities through stipends, additional planning time, or professional learning opportunities they value. It is also important to consider alternatives for funding early in the planning process in the event federal funding sources are no longer available. Community-based agencies and their potential funding resources should be included in the planning process. District leaders should consider how existing funds may be reallocated to implement the necessary components of the initiative.

Cross-district collaboration allows teacher leaders to learn from peers in different contexts while reducing the burden on any single district to develop all resources and expertise internally.[10] Specific opportunities for collaboration include arranging visits to schools with strong numeracy programs. Encouraging teachers to engage with professional organizations like the Illinois Council of Teachers of Mathematics, forming or participating in regional or statewide numeracy networks, and engaging support from the local Regional Office of Education can assist in establishing external partnerships.

Equally important is establishing clear roles and meeting guidelines to support efficient and equitable collaboration. Guidelines clarify expectations for participation and communication and create psychological safety to promote respectful, productive dialogue during challenging conversations.[11] Administrators should guide the team in distributing work equitably so that responsibilities are manageable and aligned to the strengths of individual team members.[12] Team composition, roles, guidelines, and workload should be thoughtfully planned to promote longevity and shared ownership.

Dive Deeper into Data

- What data is available? (Classroom data, curriculum reviews, standards alignment, evidence-based best practices, teacher evaluations, etc.)

- What protocols are in place to analyze data?
- Based upon the data, what are identified strengths and areas of improvement?

Once the numeracy team has been established, the next step is to conduct a deeper data dive focused into classroom-level data. This includes analysis of formative and summative assessments, reviewing curriculum materials and their alignment with the Illinois Learning Standards and Six Components of Numeracy, and considering trends in teacher evaluation data.[13] Using established data analysis protocols ensures the team approaches the work systematically and objectively and grounds discussions in evidence.

This structured analysis allows the team to clearly identify current areas of strength and areas of improvement across grade levels and subgroups. Identified strengths should be scaled and celebrated, and areas for improvement should be approached with asset-based language and recognized as opportunities for improvement through targeted professional learning, instructional adjustments, curriculum changes, etc. At this step, the team will develop a shared understanding of instructional needs and establish the foundation for action planning.

Create Conditions for Success

- What professional learning is needed to ensure successful implementation, monitoring, and continuous improvement of behaviors?
- What time is needed and can be leveraged to create conditions for success?
- What does success look like in year 1, year 2, year 5, etc.?
- What opportunities can be identified for caregivers and community members to be called in?
- How will all staff be informed of the plan and develop professional behaviors to support continuous improvement?
- What are some achievable short- and long-term goals that align to implementation timelines?

Creating conditions for success requires administrators and the numeracy team to intentionally plan for professional learning, defining success and involving all teachers and educational partners in the work. Schools are increasingly facing challenges that impact leaders' ability to effectively administer multiple initiatives, including teacher shortages, funding, and changing public support.[14] School leaders can address these issues by streamlining priorities and focusing on a few high-leverage practices that all teachers can consistently implement. The team should determine what professional learning is needed to support teachers in implementing standards-aligned planning and evidence-based best practices, mathematics intervention, MTSS, and assessment literacy. Leaders must consider what time is required for professional learning, including PLC work, instructional coaching cycles, collaborative planning, etc. It is imperative that professional learning is viewed as a sustained effort that will be embedded over time rather than a disconnected, one-time event.[15] When teachers are agents in shaping their professional growth, they're more likely to engage authentically in the work and less likely to undermine a change effort.[16]

It is important to define what success will look like over time. The team should develop clear benchmarks that reflect instructional practices and student outcomes along with short- and long-term goals. Establishing milestones helps unify efforts, measure progress, and adjust supports as needed.[17]

The team should identify opportunities to involve families, community members, and staff beyond the numeracy team to share the message and strengthen shared ownership. Leaders must plan how staff outside the team will be informed and engaged throughout the process of numeracy improvement. It is important for leaders to clearly communicate that this work is not a reflection of wrongdoing or poor teaching, but a collective effort focused on continuous improvement and better outcomes for students. Clear communication paired with meaningful opportunities for feedback and participation ensures the plan will be supported and sustained across the school community.

Phase 3: Unify

The purpose of phase 3 is for the numeracy team to integrate all educational partners with the design plan, prioritizing professional learning and strengthening mathematical capacity.

Create Shared Ownership

- How is trust and engagement built with newcomers to finalize the vision?
- What will it look/sound like when all educational partners are engaged in continuous improvement to support this vision?

Collaborative-leadership expert David Chrislip writes, "If you bring the appropriate people together in constructive ways with good information, they will create authentic visions and strategies for addressing the shared concerns of the organization or community."[18] Creating shared ownership requires administrators to intentionally build trust and engagement with staff who are not part of the numeracy team as well as caregivers and community partners.[19] The team may consider how to show the need for change through personal stories rather than data. Personal stories should be used to effectively advocate for change. These stories connect individuals' lived experience to wider issues and offer a compelling vision for a different future.[20] While data can signal the need for change in math instruction, educational partners are more likely to support it when they understand current classroom struggles and can clearly see the benefits of what's ahead.

The purpose of the work must be clearly communicated to educational partners. Fostering family engagement with numeracy is essential for developing students' math identity. Decades of research shows that family engagement in school is one of the strongest predictors of childhood success.[21] Furthermore, parental attitudes toward math impact students' sense of self as a learner and the creation of strong math habits of mind.[22] When communicating with students or caregivers, it is important to explain the work with jargon-free descriptions. Administrators can foster trust by inviting all staff to contribute ideas, acknowledge expertise, provide opportunities for engagement, and consistently follow through on commitments. Leaders also have the vantage point of multiple content areas, allowing them to see the cross-subject applications of numeracy and create opportunities for math teachers to collaborate with other content area educators to bring numeracy into a wide array of contexts.[23]

When shared ownership is fully realized, the entire school community works toward a common vision, though the specifics may vary based upon individual schools or districts. Systems of support related to mathematics need to nurture interactions among staff members, helping them to become the instructional leaders who facilitate students' growth as mathematicians.[24] Generally, teachers, specialists, administrators, and support staff engage in frequent evidence-based discussions about mathematics teaching and learning. Conversations are centered on data, student work, and instructional practices and avoid assigning blame. Teams celebrate successes and collaboratively address challenges. Staff across roles and content areas take responsibility for working toward common goals. In this environment, all educational partners are aligned around the vision, contribute their expertise, and sustain momentum toward both short-term and long-term math achievement goals.

Build Capacity

- What tools and skills do staff feel they are effective with, and what areas have they dentified for improvement?
- How can professional learning be differentiated? (I.e., grade level, competency level)
- Who can support professional learning? (I.e., team/department lead, instructional coaches, district coaches, ROE, ISBE, external partners)
- What time will be secured for this professional learning?

Building numeracy capacity in teachers begins with understanding what teachers do well and where they may need additional support. Leaders and the numeracy team can use observation data, assessment data, and teacher self-reflection to make determinations about professional learning. Professional learning should be targeted and aligned to actual classroom needs rather than generalized assumptions. Additionally, professional learning should be differentiated, providing personalized support. Differentiation can occur in small-group workshops, one-on-one coaching cycles, model lessons, peer observations, group lesson planning, etc. Administrators must identify who can support professional learning: instructional coaches, mentor teachers, department leaders, external specialists, etc.

The time in which professional learning will take place must be taken into consideration to ensure its sustainability. Opportunities could include PLC time, early release or late start days, institute days, or common plan times. Thoughtful scheduling helps teachers prioritize professional learning alongside classroom responsibilities and ensures capacity building is practical and ongoing.

Support Community Engagement

- How can the "why" behind this change be communicated with families and caregivers in a jargon-free manner?
- What strategies can be shared with families and caregivers to support numeracy learning at home?
- How can math messaging be incorporated into regularly scheduled school events and communication plans?
- How can growth be consistently communicated with families and caregivers in order to celebrate small wins?
- What tools and strategies can be used to promote active engagement from families and caregivers?

Supporting community engagement begins with clearly communicating the "why" of math improvement efforts. Families are more likely to engage when they understand the purpose and goals of initiatives and how the efforts will directly benefit their child, which is best communicated when educators take the time to understand the unique needs and values of their local community.[25] Educators can use newsletters, school websites, and social media to ensure messaging is consistent and accessible.

Families can also be equipped with strategies to support numeracy development at home such as games, discussion prompts, and real-world math applications. Families need access to models to show how to implement learning at home. They might need support when numeracy work gets challenging or is different from their school experiences.[26] Incorporating math messaging into regularly scheduled school events, such as open houses, family nights, PTA meetings, or parent-teacher conferences, reinforces the idea that math learning is a shared responsibility and encourages ongoing collaboration. Rather than focusing solely on achievement, communication with caregivers should highlight growth and effort over time and celebrate student learning milestones. Two-way communication in which caregivers can ask questions and provide insight can strengthen shared ownership and trust, ensuring the school-community partnership actively supports student numeracy growth.

Phase 4: Implement and Monitor

The purpose of phase 4 is to support teachers in the use of evidence-based instructional practices and ongoing formative and summative assessment data to monitor the plan.

Continue Building Educator Capacity

- What are ways to ensure teacher proficiency in assessment literacy, data-informed decision making, and grading practices?
- How can small wins be tracked and celebrated to maintain momentum?
- How can teacher questions, missteps and misconceptions, and gradual improvement be normalized to increase professional behaviors for continuous improvement?

Ongoing attention to teacher proficiency in key instructional areas such as assessment literacy, data-informed decision making, and grading practices is paramount in the continuous improvement cycle. Administrators and the numeracy team can support teachers through targeted professional learning such as coaching cycles, collaborative planning, structured reflection, walkthroughs, lesson observations, and analysis of student work.

Small wins should be tracked and celebrated to maintain momentum and reinforce progress. This could include recognizing improved student engagement, successful implementation of new instructional strategies, and growth in mathematics domains. Celebrations can occur at staff meetings or shout-outs in newsletters. Celebrating small wins creates a culture where progress is valued and can motivate educational partners to remain in alignment with the vision.[27]

Equally important is normalizing teacher missteps and questions as a natural part of professional growth. When teachers feel safe to take risks, ask questions, and reflect on challenges without fear of judgment or retaliation, professional behaviors are strengthened .[28] This culture of trust ensures that monitoring the plan is experienced as supportive and growth-oriented rather than punitive.

Collect, Analyze, and Monitor Real-Time Data

- What real-time data set will be consistently collected and analyzed? (Formative assessments such as exit tickets, quizzes, etc., and summative assessments such as chapter tests, unit tests, progress monitoring, benchmarking, etc.)
- What protocols can be used to analyze data in a timely manner to effectively inform instruction?
- How can feedback from families and caregivers be used to monitor and strengthen the plan?

Monitoring real-time data focuses on current, actionable information that can immediately inform instruction. Real-time data can include formative assessments, exit tickets, student work samples, classroom observations, and digital learning platform results. This type of data allows educators to

identify trends and gaps as they occur, rather than waiting for summative assessments or benchmark data. Real-time data protocols must be in place to rapidly collect and analyze data to make timely instructional decisions.[29]

Phase 4
Implement & Monitor

Educators must actively communicate student progress with caregivers. Highlighting student growth and sharing examples of classroom strategies reinforces transparency and trust. When families understand how data informs day-to-day teaching practices, they are better equipped to support learning at home and feel connected to the improvement process.[30] Administrators can also continue to respond to family feedback in meaningful ways. Adjusting communication or offering additional learning opportunities based on caregiver input demonstrates family perspectives are valued.

Phase 5: Sustain and Refine

The purpose of phase 5 is to support educators in maintaining the long-term impact of the plan through continuous improvement cycles to sustain numeracy development and achievement.

Celebrate Impact

- What parts of this plan have been successful and can be sustained?
- How can students, teachers, leaders, and educational partners be recognized and celebrated for their work?

Celebrating impact is an essential step in sustaining improvement and reinforcing shared ownership. Administrators and the numeracy team should intentionally reflect upon which parts of the plan have been successful and are ready to be sustained or scaled. Identifying successes allows leaders to preserve effective methods of improvement while using evidence to refine areas that need continued support.

Recognition should be inclusive and intentional, honoring the contributions of students, teachers, leaders, caregivers, and educational partners. These acknowledgements can take place through assemblies, staff meetings, newsletters, social media, or community events and should reinforce that improvement is a collective effort. When celebration is embedded in the improvement cycle, it helps ensure that successful practices are sustained and that all contributors feel valued in advancing the school's vision for mathematics achievement.

Refine Conditions for Success

- How can continuous improvement behaviors be integrated into regular practice to avoid a one-time quick fix and be sustained for the future?
- How can this plan adapt when conditions change?
- What areas of improvement still exist, and how can these be strengthened in future cycles?
- What modifications are necessary for improvement in the next cycle?
- What tools will ensure continuous feedback and iterations of this plan?

Refining conditions for success requires recognizing that school improvement is not a one-time initiative but an ongoing, cyclical process. Administrators and teams should regularly reflect on how well the plan is functioning and remain responsive as conditions change. The plan must adapt when changes such as staffing, student needs, curriculum, or assessment expectations occur. Built-in checkpoints allow leaders to determine whether existing structures and supports should remain the same or need adjustments to sustain progress.

Phase 5
Sustain & Refine

As part of this reflection, the numeracy team should examine where opportunities for improvement still exist. Ongoing data collection and analysis helps identify areas tha require additional focus or refinement. Leaders can determine what modifications are necessary for the next improvement cycle.

To support continuous growth, administrators should utilize tools that promote ongoing feedback and iteration, including regular data reviews, reflection protocols, surveys, coaching conversations, and progress monitoring tools. These structures ensure the plan remains dynamic and responsive. Ultimately, the goal is to carry forward the lessons learned from each improvement cycle, applying insights and effective practices to future initiatives so that continuous improvement becomes imbedded in the culture of the school or district.

Goal 3: Workbook

Leaders will promote a culture of numeracy through targeted professional learning and data-informed instructional support.

Goal 3

Leaders will promote a culture of numeracy through targeted professional learning and data-informed instructional support.

Phase 1: Initiate Reflection Questions

1. What trends, strengths, and areas of need are evident in current high-level numeracy data?

2. What factors (instructional, structural, environmental) may be contributing to the numeracy outcomes reflected in the data?

3. What opportunities exist for educators, families, and community partners to engage in shared responsibility for improving numeracy achievement?

4. What characteristics should define a shared vision for effective numeracy teaching and learning in the district/building?

5. What indicators and data sources will be used to monitor progress toward numeracy goals and determine the effectiveness of implemented strategies?

Notes

Goal 3

Leaders will promote a culture of numeracy through targeted professional learning and data-informed instructional support.

Phase 2: Design Reflection Questions

1. What roles and perspectives should be represented on a numeracy team to ensure a balanced approach to improvement?

2. What structures will enable the numeracy team to operate effectively and sustain long-term focus?

3. What insights emerge when examining data through multiple lenses such as classroom data, curriculum reviews, standards alignment, evidence-based best practices, teacher evaluations, etc.

4. What evidence-based numeracy practices will have the greatest impact on student achievement?

5. What resources and supports are necessary to create an environment where strong numeracy instruction can be consistently implemented and continuously improved?

Notes

Goal 3

Leaders will promote a culture of numeracy through targeted professional learning and data-informed instructional support.

Phase 3: Unify Reflection Questions

1. What systems and routines will ensure that individuals outside of the numeracy team are consistently informed about priorities and action steps?

2. What strategies will support the development of shared ownership among educational partners?

3. What professional learning structures will build educator expertise and confidence in implementing effective numeracy practices?

4. What approaches will strengthen community and caregiver engagement in numeracy improvement efforts and increase understanding of how to support student learning?

Notes

Goal 3

Leaders will promote a culture of numeracy through targeted professional learning and data-informed instructional support.

Phase 4: Implement and Monitor Reflection Questions

1. What ongoing professional learning will deepen educator capacity, when will this occur, and who will provide it?

2. What opportunities will ensure that newly developed skills and strategies are practiced, reinforced, and reflected upon?

3. What processes and tools will be used to collect, analyze, and monitor real-time numeracy data in ways that meaningfully inform instruction?

Notes

Goal 3

Leaders will promote a culture of numeracy through targeted professional learning and data-informed instructional support.

Phase 5: Sustain and Refine

1. What achievements, area of growth, and successful practices should be recognized and celebrated across the school community to reinforce momentum in numeracy development?

2. What qualitative and quantitative data best illustrates the impact of implemented numeracy strategies, and how can this evidence be shared transparently with educational partners?

3. What structures or supports need to be refined or strengthened to ensure continued progress in numeracy teaching and learning?

4. What processes will ensure continuous numeracy improvement in future cycles?

Notes

Framework for Effective Leadership, Systems of Support, and Implementation Considerations End Notes

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Section 04

TOOLS AND RESOURCES

This section of the Illinois Comprehensive Numeracy Plan provides a list of tools and resources designed to support educational partners as they work to enhance numeracy instruction across the state of Illinois. The Illinois State Board of Education sets the Illinois Learning Standards for each content area and delegates the responsibility to the local school district to choose the curricular programs and instructional methods that best fit the needs of their students.

The Illinois State Board of Education does not endorse or recommend any specific curricular program or paid resources. Instead, the tools and resources provided in this section are a compilation of materials that complement the Illinois Comprehensive Numeracy Plan.

It is important to note that this section is dynamic. ISBE will continue to expand and update the list of tools and resources on the Illinois Comprehensive Numeracy Plan webpage.

A Note on Equity

Equity and **inclusivity** must be embedded from the start in every aspect of teaching and learning. It is important for educators and educational partners to recognize that tools and resources used for instruction should **meet the needs of all learners**, including those with specialized needs, multilingual learners, and gifted students. Tools should also be **equitable** for students at all socioeconomic levels, in all geographic locations, and across all cultural backgrounds. Therefore, ISBE encourages school districts, educators, and parents to select resources that not only align with local educational goals but also take into account the individual needs and identities of students. All students must have access to tools and resources that affirm their cultural identities, experiences, and languages.

School districts should frequently evaluate their practices, tools, and resources to ensure equity for all students and take ongoing action to promote fair and inclusive educational opportunities for all learners. **ISBE's Equity Journey Continuum** is a tool designed to assist districts in tracking their **progress** toward **closing gaps** in student achievement, opportunities, and supports. Districts are encouraged to utilize this tool to better view their data through a lens of **equity** and better support their **equity journey**.

The resources listed below are organized by plan section and provide additional information, support, and guidance related to the content discussed in each section.

Vision and Purpose Resources

The federal Every Student Succeeds Act (ESSA) requires states to assess their learning standards for English language arts (ELA), mathematics, and science. Each state also may have a general assessment for the majority of its students and an alternate assessment for the 1% of students with the most significant cognitive disabilities. ESSA also requires that multilingual learners (MLs) be assessed in four domains (reading, writing, speaking, and listening) each year until they reach proficiency.

From the Illinois ESSA Plan: "In Illinois, we believe that a universal culture of high expectations is fundamental to creating and supporting the conditions that provide the best opportunities for all students. ESSA fosters the conditions for Illinois to implement a holistic, comprehensive, and coordinated system of support that prepares each and every student for academic excellence and postsecondary success. Illinois is using the opportunities provided through ESSA to reduce barriers to learning in order to achieve fair access to high-quality educational opportunities for each and every child." The ISBE Assessment Department oversees the assessment of students in Illinois.

The Illinois Report Card is published annually by the Illinois State Board of Education. It shows how the state as a whole, each school, and every public school district are progressing on a wide range of educational goals. The Report Card offers a complete picture of student and school performance to inform and empower families and communities as they support their local schools.

My Data Dashboard is a tool that provides administrators and teachers with detailed data related to critical performance metrics. The goal of this tool is to support data-driven decision-making and deepen understandings of how data can be used within the state, districts, schools, and classrooms.

Resources for Section 1: Framework for the Evidence-Based Development of Numeracy Skills

Supports provided by the Illinois State Board of Education

- The ISBE Standards and Instruction Department is committed to supporting Illinois schools and educators by providing tools, resources, and professional learning on the identification and utilization of high-quality instructional materials to increase student achievement and equitable learning outcomes. The Standards and Instruction Department also provides guidance pertaining to advanced learners. Additionally, the Illinois Learning Compass is housed on the ISBE Standards and Instruction webpage. It is designed to share what all students should know and be able to do by the end of each school year. Educators, students, families, and others can use the Illinois Learning Compass to explore the Illinois Learning Standards. It allows for searching and filtering and enables the extraction of information to an Excel document.
- The ISBE Special Education Services Department ensures compliance with Part B of the Individuals with Disabilities Education Act (IDEA) and drives continuous improvement through Local Education Agencies. It oversees district performance to enhance educational outcomes for children with disabilities.

- The ISBE Multilingual/Language Development Department provides leadership, advocacy, and support to districts, parents, and policymakers by promoting equitable access to language support services for students from culturally and linguistically diverse backgrounds who have been identified as English learners.
- The Early Childhood Department provides leadership and technical assistance to support state programs serving children from prenatal to age 8 and their families. State Prevention Initiative, Preschool for All, and Preschool for All Expansion grants, and a variety of resources for parents, teachers, and administrators, are among services that are provided.
- The ISBE Career and Technical Education (CTE) Department is a dedicated team of education professionals working to provide high-quality educational programs, resources, and training for all Illinois students, teachers, and administrators. The CTE Department provides a blend of academic and CTE educational guidance, leadership, and technical assistance to local districts and regional staff that is designed to support and enhance opportunities for students to be ready for future careers.

Additional information and resources

- The What Works Clearinghouse is an investment of the Institute of Education Sciences (IES) within the U.S. Department of Education (ED) that was established in 2002. The work of the What Works Clearinghouse is managed by a team of staff at IES and conducted under a set of contracts held by several leading firms with expertise in education, research methodology, and the dissemination of education research.
- The Illinois MTSS Network provides high-quality professional learning and coaching for schools and districts to develop and sustain a Multi-Tiered System of Supports (MTSS). MTSS is a framework for continuous improvement that is systemic, prevention-focused, and data-informed, providing a coherent continuum of supports to meet the needs of all learners.
- The Multitiered System of Supports for English Learners provides model demonstration research sponsored by the ED Office of Special Education Programs.
- The Center: Resources for Teaching and Learning is a not-for-profit organization that serves as the umbrella organization for specific programs that address different, but often related, aspects of high-quality education for students who may be at risk of academic failure. This includes students of all ages from linguistically and culturally diverse backgrounds—English learners, including adults; young children at risk of failure because of poverty, family issues, disabilities, or other circumstances; refugee and immigrant populations; and others.
- The Self-Assessment of MTSS Implementation is a needs assessment tool that helps leadership teams understand the status of MTSS implementation at the school level. The tool supports teams to engage in active discussions to identify strengths and challenges in current MTSS implementation. It is designed to help the local system identify current practices, areas of strength, and areas for growth and refinement, and enable faculty and staff to prioritize and focus resources on those areas in need of the most attention or support.

- The Newcomer Toolkit, provided by ED, is a comprehensive resource designed to assist educators and community members in supporting immigrant and refugee students, referred to as multilingual learners. This toolkit is particularly valuable for state, local, and school leaders, as well as general education educators who work directly with newcomers.

Resources for Section 2: Educator Professional Learning and Development

- The ISBE Department of District and School Leadership partners with stakeholders to foster a robust leadership pipeline that reflects the diversity of Illinois students. The department also supports stakeholders as they recruit, coach, and retain high-quality, equity-minded education leaders who support and reflect the diversity of students.
- The Regional Offices of Education and Intermediate Service Centers help ensure that every school district has a locally based point of access to numerous supports and services.
- Organizations that provide support to administrators include:
    - Illinois Principals Association
        - The Ed Leaders Network (ELN) is grounded in the belief that educational leaders impact student performance. With this foundational belief at ELN's core, multiple state principal associations have partnered together to provide you with high-quality, on-demand professional development to enhance your educational leadership. A dynamic professional networking community also has been created so you can learn and interact with your peers and leadership experts from across the country. ELN's mission is to provide educators with the professional development and capacity-building professional network needed to do what's best for your students and learning community.
    - Illinois Association of School Administrators
    - Illinois Association of School Business Officials
    - Illinois Association of Regional Superintendents of Schools
    - Association of Illinois Rural and Small Schools
    - Superintendents' Commission for the Study of Demographics and Diversity
    - Illinois Alliance of Administrators of Special Education

Resources for Section 3: Framework for Effective Leadership, Systems of Support, and Implementation Considerations

- ISBE's Curriculum Evaluation Tool was designed to support best practices and continuous quality improvement, including an emphasis on equity and diversity, and the selection of high-quality instructional materials. ISBE encourages districts to use this tool to help evaluate their curriculum, foster meaningful discussions, and make decisions about the selection of new materials, as appropriate.

- The Prevention Initiative program, which is funded by the Early Childhood Block Grant, provides intensive, research-based, and comprehensive child development and family support services for expectant parents and families with children from birth to age 3 to help them build a strong foundation for learning and to prepare children for later school success.
- Birth to Five Illinois Councils support local stakeholders in coming together to identify the strengths and determine the early childhood needs within their own communities. Ensuring all children and families have access to the services they need requires a wide range of stakeholders (parents and families, school district officials, child care providers, Head Start leaders, early learning advocates, county and municipal officials, and the business community) working together in every community in Illinois to determine what families need to thrive and then creating new and enhanced services in response. Local leaders may consider utilizing Birth to Five Councils to collaborate and share the importance of early numeracy with communities and families.
- The Illinois Department of Human Services (IDHS) Division of Early Childhood administers community-based prevention and intervention programs to strengthen capacity of children, adolescents, and adults to make healthy decisions, utilize support systems, access opportunities, and achieve self-sufficiency.
- Overseen by IDHS, All Our Kids Early Childhood Networks (AOK Networks) promote healthy pregnancies and the positive growth and development of all children birth to 5 and their parents/caregivers by assuring a well-coordinated, easily accessible, equitable, and just system of services and supports that engages parents as partners in making the system work for them. AOK Networks use a data-driven approach to understand disparities and root causes of locally identified priority issues. The goal of the initiative is to improve outcomes for children and families through the implementation of evidence-based strategies that promote an effective local early childhood system.
- AOK Networks are a collaborative effort of the IDHS Division of Family and Community Services; the Illinois State Board of Education; health departments, and other lead agencies representing health, early care and education, human services, and other service systems; and local stakeholders who care about the health and well-being of very young children and their parents/caregivers. It is the most comprehensive, long-standing, community-based systems development initiative in the state of Illinois.
- AOK Network partners engage in cross-sector, strategic initiatives so that more babies are born healthy, young children are safe, healthy, and developing positively and more children enter kindergarten ready to learn. AOK Networks improve outcomes like these by creating a more connected and coordinated system of services and supports as they address the unique needs, cultures, and strengths of local communities.
- Regional or local health departments may also be a resource for communities.

Glossary of Key Terms

This glossary provides definitions of terms included in the Illinois Comprehensive Numeracy Plan. Entries indicated by one asterisk (*) were taken from the International Literacy Association, and entries indicated by two asterisks (**) were taken from the Literacy Information and Communication System.

Term	Definition
Adaptive reasoning	Adaptive reasoning is the ability to think logically about the connections among concepts and situations, evaluate alternative approaches to problem solving, and justify solutions. (From Adding It Up: Helping Children Learn Mathematics.)
Assessment	Assessment refers to the wide variety of methods or tools that educators use to evaluate, measure, and document the academic readiness, learning progress, skill acquisition, or educational needs of students. (From The Glossary of Education Reform.)
Benchmark assessment	Benchmark assessment is a process of using a screening tool multiple times across the school year to assess the effectiveness of the core curriculum and identify students at risk for failure.
Cognitive load	Cognitive load is the relative demand imposed by a particular task, in terms of mental resources required. (From the American Psychological Association.)
College and career readiness	College and career readiness is the academic preparation that would be sufficient to allow a student to participate successfully in postsecondary education or a career without the need for remedial academic support.*
Conceptual understanding	Conceptual understanding is the comprehension of mathematical concepts, operations, and relations. (From Adding It Up: Helping Children Learn Mathematics.)
Culturally responsive education	Culturally responsive education is the deliberate recognition and inclusion of all forms of student diversity as a pool of resources from and toward which curriculum, instruction, and all aspects of school policy should be designed. In practice, it means the alignment of curriculum and instruction with students' backgrounds, life experiences, and cultures.*
Curriculum	Curriculum is the overall design of instruction or opportunities provided for learning. A curriculum may include materials and textbooks, planned activities, lesson plans, lessons, and the total program of formal studies or educational experiences provided by a teacher or school. (Note: Definitions of curriculum vary widely because of alternative perceptions held by theorists about the nature and organization of formal schooling; adj. curricular.)*
Diagnostic assessment	Diagnostic assessment is an aid to assessment that yields information concerning a learner's strengths and weaknesses in areas such as reading or math.**

Differentiated instruction	Differentiated instruction occurs when the teacher provides multiple options for learners to take information, make sense of ideas, and express what they learn. In providing diverse avenues for learners to access information, the teacher ensures that each learner learns effectively. The components of differentiated instruction include the following: (1) what to teach, or content; (2) how to teach it, or process; (3) how to find out whether learners have learned it; and (4) the environment in which the instruction occurs.**
Direct instruction	Direct instruction is a teacher-centered instructional approach that emphasizes the use of carefully sequenced steps that include demonstration, modeling, guided practice, and independent application. It is characterized by high rates of teacher control during the initial stages of information acquisition, followed by careful performance monitoring as the learner gradually assumes control over application. The instruction is structured, modular, and sequential (simple to complex and concrete to abstract). The teacher provides the learners with much of the information they need, often through lectures, explanations, examples, and problem solving. Most direct instruction techniques allow for only minimal learner-teacher interaction, and they need to be supplemented by review, practice, and group discussions.**
Equity vs. equality	Equity and equality are two strategies used in an effort to produce fairness. Equity is giving everyone what they need to be successful. Equality is treating everyone the same. Equality aims to promote fairness, but it can work only if everyone starts from the same place and needs the same help.*
Evidence-based practices	Evidence-based practices refer to individual practices (e.g., single lessons or in-class activities) or programs (e.g., year-long curricula) supported by scientific evidence. This evidence exists within a continuum of rigor, in which some well-studied practices are highly supported while others may be promising or emerging.
Formative assessment	Formative assessment is the continuing study of student learning in an instructional program as it moves toward its goals and objectives by monitoring the learning progress of its participants. Diagnostic testing and various formal and informal assessment procedures can be used to identify needed adjustments to the teaching and learning activities.*
Inclusion	In education, inclusion is the placement of students of all abilities in the same classroom. The term captures, in one word, an all-embracing societal ideology that involves securing opportunities for students with disabilities to learn alongside their peers without disabilities in general education classrooms.*
Intervention	Intervention is additional small group or individualized instruction that is tailored to children's needs so they can make progress and be on track to meet grade-level learning goals.*

Mathematical discourse	Mathematical discourse is the purposeful communication of mathematical ideas, including the tools and practices that make thinking visible. It involves students articulating their reasoning, engaging with peers' ideas, and collaboratively constructing mathematical understanding.
Mathematics identity	Mathematics identity is a person's attitude and beliefs toward mathematics. It can be shaped by relationships, classroom experiences, cultural messages, etc.
Metacognition	Metacognition refers to higher-order thinking that involves active control over the cognitive processes engaged in learning: knowledge about one's own information processing and strategies that influence one's learning. By prompting learners to reflect on and identify the successful learning strategies that they used to solve a problem, teachers encourage learners to act on this awareness to choose appropriate learning strategies that optimize future learning. Successful learners monitor their own thought processes to decide whether they are learning effectively. Metacognitive activities include planning how to approach a given learning task, monitoring comprehension, and evaluating progress toward the completion of a task.**
Multi-Tiered System of Support	A Multi-Tiered System of Supports (MTSS) is a proactive and preventative framework that integrates data and instruction to maximize student achievement and support students' social, emotional, and behavior needs from a strengths-based perspective. MTSS offers a framework for educators to engage in data-based decision making related to program improvement, high-quality instruction and intervention, social and emotional learning, and positive behavioral supports necessary to ensure positive outcomes for districts, schools, teachers, and students. See Multi-Tiered Systems of Support.
Numeracy	Numeracy is the ability for all students to confidently understand, interpret, and apply mathematical concepts across all domains of mathematics in a variety of real-world and academic contexts.
Procedural fluency	Procedural fluency extends beyond the ability to perform standard algorithms and involves understanding mathematical processes and procedures, knowing when and how to apply them effectively, and being able to execute them with flexibility, accuracy, and efficiency. (From Adding It Up: Helping Children Learn Mathematics.)
Productive disposition	Productive disposition is a positive belief that mathematics makes sense, is valuable, and can be mastered through perseverance. It also includes confidence in students' capacity to learn and use mathematics correctly. (From Adding It Up: Helping Children Learn Mathematics.)
Professional learning	Professional learning is ongoing learning provided to teachers and staff pertaining to specific strategies and skills and often based on a grade level/building/district student learning goal.*

Progress monitoring	Progress monitoring is administered frequently throughout instruction. An assessment is used to determine whether students are making adequate progress and to determine whether instruction needs to be adjusted. See the Reading Rockets Glossary.
Scaffolded instruction	Scaffolded instruction is a process that involves the frequent use of connected questions and collaboratively constructed explanations to create a context for learning based on a learner's prior knowledge. Broad terms refer to various methods of supporting learners as they learn; gradually, these supports are withdrawn as they become capable of independent performance of a task or a skill. Supports may include clues, clarifying questions, reminders, encouragement, or breaking the problem down into steps. This temporary support from a teacher enables learners to take on and understand new material and tasks that they are not quite ready to do independently. The teacher models, assists, or provides necessary information, building on what learners already know; this should eventually lead to independence.**
Standards	Standards are the learning goals promulgated by a state documenting what students should know or be able to do at each grade level.
Strategic competence	Strategic competence is the capacity to formulate, represent, and solve mathematical problems effectively. (From Adding It Up: Helping Children Learn Mathematics.)
Summative assessment	A summative assessment is the final evaluation, usually quantitative, of the degree to which the goals and objectives of a program have been attained. Different types of evidence, such as the final test score of students and the statistical analysis of program results, may enter into summative evaluation. (See formative assessment.)*
Universal Design for Learning	Universal Design for Learning is a framework for designing the educational environment so that it offers flexible learning environments that can accommodate individual learning differences. It is a key to helping all learners achieve. This environment is accomplished by simultaneously reducing or removing barriers from teaching methods and curriculum and providing rich supports for learning.**
Universal screening	Universal screening is the systematic assessment of all students within a given class, grade, school building, or school district on critical academic and/or social-emotional indicators.
Zone of Proximal Development	The Zone of Proximal Development refers to Lev Vygotsky's "zone of readiness," including the actions or topics a learner is ready to learn. It refers to the gap between a learner's current and potential levels of development. This is the set of knowledge that the learner does not yet understand but has the ability to learn with guidance.**

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www.isbe.net/Pages/Illinois-Numeracy-Plan.aspx