

# Teaching Lab's Illustrative Math Teacher Professional Learning Scope & Sequence

**Essential Question:** How can we provide strong, equitable math learning opportunities for all students, aligned to college and career readiness standards and the NCTM Mathematics Teaching Practices using the Illustrative Math curriculum?

## Head, Heart, and Habits: Our Research-Based Model

Research suggests that effective professional learning incorporates three critical components:



**HEAD:** Core academic content embedded in exceptional instructional materials and aligned to research-based practices.

### To strengthen HEAD, teachers will:

- Understand high-quality design features of the Illustrative Math curriculum
- Deepen math content knowledge and understanding of the standards
- Build pedagogical content knowledge through doing and discussing math, reading research, and discussing strategies embedded in the illustrative Math instructional materials
- Discuss research behind instructional strategies that anchor each inquiry cycle
- Make explicit connections between the math content, curricular materials, and research-based instructional practices.



**HEART:** Teacher-led communities that build both social capital and buy-in.

### To strengthen HEART, teachers will:

- Engage in professional learning experiences within the context of “labs” - small groups of educators working with students in similar grade levels and subject areas
- Build teacher leadership through implementing cycles of inquiry with peers
- Build relationships in order to share successes, insights, and learnings from their classroom instruction



**HABITS:** Structured and repeated cycles of learning in the classroom.

### To strengthen HABITS, teachers will:

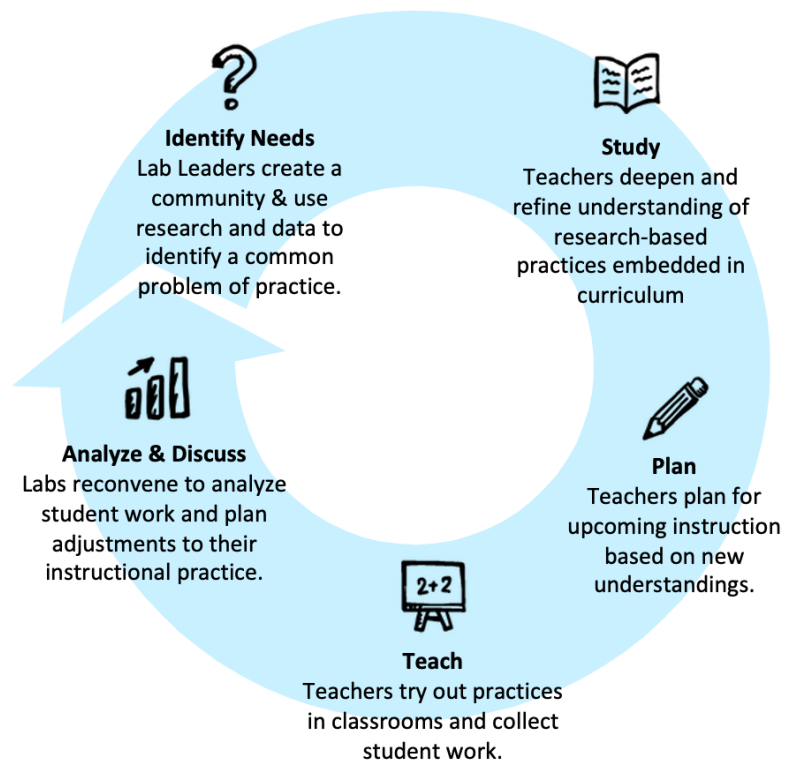
- Internalize content and standards from upcoming units, making connections to the shifts of Focus, Coherence, and Rigor

- Prepare to teach daily lessons and plan for classroom discussions that will strengthen students' understanding of the math content
- Apply learning to their classrooms, reflect on the impact using student work analysis, and refine their understanding and practice
- Evolve vision for strong and equitable instruction based on reflections from each inquiry cycle

## Recommended Sequence and Overview of Sessions

### Vision for Strong and Equitable Math Instruction

Teaching Lab strongly recommends the following sequence of professional learning topics to support teachers, coaches, school leaders, and district staff in creating and achieving a vision for strong and equitable math instruction in their classrooms. We believe strong and equitable learning experiences support all students to achieve college and career readiness in math.



Summer Bootcamp		
Name	# of Days	Topics
Independent Learning	3-4 hours	<p><b>Overview and Review of Focus, Coherence and Rigor</b></p> <p>The Independent Learning activities support teachers, coaches, and administrators as they prepare to teach the Illustrative Math curriculum. By the end of the independent learning activities, teachers will be able to 1) name and describe each math shift; 2) articulate the rationale for each shift 3) consider ways in which current teaching practice may stay the same and how it will shift as a result of the shift</p>
Summer Bootcamp	4 modules (3-4 hours per module)	<p><b>Welcome and Introduction</b></p> <p>Session 1: This session is an introduction to Teaching Lab's mission and model for professional learning. You will learn about Head, Heart, and Habits and the research behind TL's PD design, along with our approach to supporting whole-school improvement. You will end the module by studying the inquiry cycle to see how doing math together, engaging in group discussion, and planning and rehearsing together is a way to build trust and collaboration in a professional learning community. You will be able to describe how you will engage in a professional learning community to strengthen and deepen your instructional practice.</p> <p><b>Equitable Instruction</b></p> <p>Session 2: This session provides a dive into Illustrative Mathematics curricular materials framed with the 5 Equity-Based Mathematics Teaching Practices. You will see how Illustrative Math aligns with the instructional shifts of Focus and Coherence and experience a walkthrough of an Illustrative Math lesson. By drawing connections between the curriculum and the equity-based teaching practices, you will understand that high-quality instructional materials support ambitious and rigorous teaching because curricular design principles align with the instructional shifts as well as frameworks for effective and equitable teaching practices.</p> <p>Session 3: In this session, you will explore the concepts of mathematical identities, effective teaching practices, and equity to deepen your critical consciousness and create vision statements to guide your instruction.</p>

## Effective Instructional Practices

Session 4: In this session, you will build knowledge of NCTM's Mathematics Teaching Practices and how they strengthen instruction to meet the demands of college-and-career readiness standards by engaging in a group problem-solving experiential and implementing an instructional routine. Through practice and reflection, you will continuously ground instructional decision-making in principles of effective and equitable instruction.

Session 5: You will explore math problems and the course narrative to gain an understanding of the scope of learning for the year in this session. You will see how the Illustrative Math curriculum supports ambitious and rigorous teaching because the design principles align with the instructional shifts. You will make use of strong frameworks for planning at the unit level and understand that planning allows for intentionality in instructional decision making.

## Planning for Student Success

Session 6: In this session, you will explore how Mathematical Language Routines, instructional routines, and strategies to address unfinished learning allow access for all. You will also dig into an Illustrative Math lesson to see how the curriculum supports ambitious and rigorous teaching because design principles align with effective and equitable teaching practices. Throughout the section, you will practice grounding instructional decision-making in principles of effective and equitable instruction.

Session 7: In this session, you will build your understanding of mathematical learning goals and why it sits at the center of strong, equitable instruction. You will walk through lesson prep materials in the Illustrative Math curriculum to see how it supports ambitious and rigorous teaching. You will also be introduced to the Lesson Internalization Guide to see how planning allows for intentional instructional decision making. You will also engage in lesson planning and rehearsal in order to prepare for effective and equitable instruction.

## Year 1 of Implementation

Below is the suggested sequencing of topics for Cycles of Inquiry that include learning, application, and analysis of results with peers. Cycles occur across 2 PD days and include: the opportunity to dive into and learn new content, plan for upcoming instruction, implement plans in classrooms & gather evidence of student learning, reconvene to analyze the evidence of student learning and discuss best practices.

Year 1		
Name	# of Days	Topics
Cycle 1	2 modules, separated by 4-6 weeks (~9 sync hours total)	<p><b>ELICITING STUDENT THINKING</b>  <b>How can we elicit student thinking to advance students toward the learning goal of the lesson?</b></p> <p><u>Instructional Focus</u>            Understand research behind, implement, and assess impact of:</p> <ul style="list-style-type: none"> <li>• Asking students to share their developing thinking about the mathematics</li> <li>• Replacing ‘funneling’ questions with ‘focusing’ questions</li> <li>• Asking probing questions after initial student responses</li> </ul> <p>Effectively implement strategies in daily lessons using Illustrative Math problems and routines in order to provide access and support for all students.</p>
Cycle 2	2 modules, separated by 4-6 weeks (~9 sync hours total)	<p><b>MAKING MATH VISIBLE</b>  <b>How can we make math visible to deepen understanding and advance students towards the learning goal?</b></p> <p><u>Instructional Focus</u>            Understand research behind, implement, and assess impact of:</p> <ul style="list-style-type: none"> <li>• Concrete-visual-abstract progression</li> <li>• Multiple representations and solution pathways</li> <li>• Making explicit connections between models and mathematical ideas</li> <li>• Using the board and technology to capture the ‘lesson storyline’</li> </ul> <p>Effectively implement strategies in daily lessons using Illustrative Math problems and routines in order to provide access and support for all students.</p>

Optional Summer Bootcamp		
Name	# of Days	Topics
Summer Bootcamp	flexible	<p>After engaging in partnership and collaborative conversations with districts across the year, we'll identify strengths and areas of need. Teaching Lab will provide support to districts to determine the approach and content for Summer Bootcamp.</p> <p><b>Potential options include:</b></p> <ol style="list-style-type: none"> <li>1. Teaching Lab team supports district team members to facilitate Y1 Bootcamp for new teachers and leaders</li> <li>2. Teaching Lab team supports district team members to create and/or facilitate professional learning for a specific area of need (ie. building math content knowledge, going deeper with an inquiry cycle topic from the previous year)</li> <li>3. Teaching Lab team facilitates Y1 Bootcamp for new teachers and leaders</li> </ol>
Accelerating Learning	1 module (3 sessions, 2-3 hours per session)	<p><b>This module is designed to support teachers when returning and recovering learning loss from the impact of COVID-19. Over the course of three sessions, teachers will:</b></p> <ul style="list-style-type: none"> <li>• Explore and discuss strategies for supporting student learning loss and come to understand that being focused only on remediation will put students further behind;</li> <li>• Understand that intervention efforts need to be grounded in the instructional shifts;</li> <li>• Explore and practice incorporating “just-in-time” supports that work to accelerate student learning during whole group instruction; and</li> <li>• Explore and practice incorporating “just-in-time” supports that attend to students’ diverse learning needs.</li> </ul>

## Year 2

Name	# of Days	Topics
Cycle 3	2 modules, separated by 4-6 weeks	<p><b>FACILITATING MATHEMATICAL DISCOURSE</b>            How can we use mathematical discourse to build student agency and deepen students' understanding of the mathematics?</p> <p><b><u>Instructional Focus</u></b>            Understand research behind, implement, and assess impact of:</p> <ul style="list-style-type: none"> <li>● Student discourse in math classrooms</li> <li>● Encouraging student debate by managing your tell</li> <li>● Shifting conversation patterns from 'ping pong' to 'volleyball' using Talk Moves</li> </ul> <p>Effectively implement strategies in daily lessons using Illustrative Math problems and routines in order to provide access and support for all students.</p>
Cycle 4	2 days, separated by 4-6 weeks	<p><b>CHECKING FOR UNDERSTANDING</b>            How can we check for understanding to increase opportunities for student learning?</p> <p><b><u>Instructional Focus</u></b>            Understand research behind, implement, and assess impact of:</p> <ul style="list-style-type: none"> <li>● In-the-moment formative assessment to gauge understanding</li> <li>● Monitoring student work through anecdotal notes</li> <li>● Responding to data (prioritize problems for discussion, cool down data)</li> </ul> <p>Effectively implement strategies in daily lessons using Illustrative Math problems and routines in order to provide access and support for all students.</p>

Year 3		
Name	# of Days	Topics
Cycle 5	2 days, separated by 4-6 weeks	<p><b>SEQUENCING AND CONNECTING REPRESENTATIONS</b>  <b>How can we sequence and connect representations to strengthen all students' understanding of the mathematics?</b></p> <p><b><u>Instructional Focus</u></b>            Understand research behind, implement, and assess impact of:</p> <ul style="list-style-type: none"> <li>● Anticipating solution strategies and monitoring student work</li> <li>● Avoiding 'show and tell' discussions by selecting, sequencing, and connecting based on lesson goal</li> </ul> <p>Effectively implement strategies in daily lessons using Illustrative Math problems and routines in order to provide access and support for all students.</p>
Cycle 6	2 days, separated by 4-6 weeks	<p><b>SUMMARIZING THE MATHEMATICS</b>  <b>How can we facilitate the summary of the mathematics in order to reinforce the learning goal?</b></p> <p><b><u>Instructional Focus</u></b>            Understand research behind, implement, and assess impact of:</p> <ul style="list-style-type: none"> <li>● Creating opportunities for cognitive dissonance</li> <li>● Allowing students to resolve the tension</li> </ul> <p>Effectively implement strategies in daily lessons using Illustrative Math problems and routines in order to provide access and support for all students.</p>