

Data-Driven Math Improvement Cycle

(All data included is illustrative and non-identifying to protect confidentiality.)

Context & Problem Space

In 2023–2024, our school’s mathematics achievement data revealed a persistent and systemic Challenge of Practice: students were not demonstrating consistent conceptual understanding or procedural fluency across strands, and classroom instruction varied widely in the use of high-impact practices. EQAO results reflected this gap, with only 37% of Grade 3 students and 10% of Grade 6 students achieving at or above provincial expectations (*illustrative data*). At the same time, student survey data showed strong growth-mindset beliefs, indicating that students were willing and motivated to learn — but required more effective instructional conditions to do so.

This combination of low achievement and high learner willingness created a clear improvement opportunity: strengthen Tier 1 and Tier 2 math instruction through consistent, research-aligned practices.

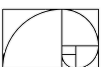
Challenge of Practice

Educators were not consistently implementing the nine High-Impact Instructional Practices (HIIPs) outlined by the Ontario Ministry of Education, resulting in inconsistent instructional quality, limited small-group intervention, and insufficient opportunities for students to engage in meaningful problem solving, math talk, and conceptual reasoning.

This challenge was observable in walkthroughs, teacher self-assessments, and student work samples.

Theory of Practice

If we increase educator knowledge, confidence, and consistent use of the High-Impact Instructional Practices — supported through structured PD, coaching, and iterative data cycles — then classroom instruction will improve, student engagement will increase, and overall mathematics achievement (including EQAO performance) will rise.



Improvement Architecture: A 6-Week Iterative Cycle

The improvement model was intentionally designed as a repeatable 6-week cycle, allowing for continuous learning, implementation, and refinement. Each cycle included:

1. Targeted Professional Learning (Week 1)

- Every six weeks, teachers were released in pairs for a 1-hour session with a board math facilitator (Subject-Matter Expert). Sessions focused on one HIIP at a time, aligned to school needs and board priorities.

2. Teacher Self-Assessment Survey (Weeks 3–4)

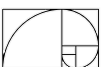
- A Microsoft Form captured two data points for each of the nine HIIPs:
 - Knowledge/Confidence (“How confident do you feel implementing this practice?”)
 - Usage (“How often do you use this practice in your classroom?”)
- Teachers also identified successes, challenges, and supports needed.

3. School Walkthrough (Week 5)

- A structured walkthrough tool — aligned to HIIP and the Board Improvement Plan — was used to collect observational data on:
 - visible learning goals
 - math conversations
 - use of tools and representations
 - small-group instruction
 - problem-solving routines
 - evidence of the newly taught HIIP

4. Data Review & Next-Step Planning (Week 6)

- Leadership and the math facilitator reviewed:
 - survey trends
 - walkthrough evidence
 - teacher feedback
 - classroom artifacts
- This informed the selection of the next HIIP, ensuring the PD sequence remained responsive and data-driven.



Implementation Timeline (18-months)

The full improvement arc combined six PD sessions (two completed, four planned) with ongoing coaching and data collection.

Completed

- Session 1: Math Centres
- Session 2: Tier 2 Small-Group Instruction

Planned Sessions (Based on Data Trends)

- Session 3: Learning Goals, Success Criteria & Descriptive Feedback
- Session 4: Problem-Solving Tasks & Teaching About Problem Solving
- Session 5: Tools & Representations + Math Conversations
- Session 6: Deliberate Practice + Flexible Groupings

These sessions were selected because they represent the highest-leverage practices for improving conceptual understanding, procedural fluency, and student reasoning — and because they align directly with board and ministry expectations.

Measurement Strategy

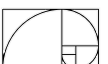
Because EQAO data is annual, the improvement plan relied on multiple data sources to monitor progress throughout the year:

1. Annual Outcome Data

- EQAO achievement
- EQAO student perception data (confidence, enjoyment, mindset)

2. Leading Indicators (Every 6 Weeks)

- Teacher knowledge/confidence survey
- Teacher usage survey
- Walkthrough evidence
- Classroom artifacts (student work, anchor charts, centres)
- Teacher-identified challenges and successes



3. Implementation Fidelity

- Evidence of the newly taught HIIP in classrooms
- Consistency of small-group instruction
- Quality of independent math centres
- Use of tools, representations, and math talk routines

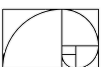
This multi-modal measurement approach allowed the school to track both practice change and early indicators of student impact, even before EQAO results were available.

Results & Early Indicators (Illustrative)

While the data included here is non-identifying, the structure reflects the authentic outcomes observed:

- Increased teacher confidence in using HIIPs
- More consistent implementation of math centres and small-group instruction
- Stronger student engagement during problem-solving tasks
- Greater use of tools and representations to support conceptual understanding
- Improved alignment between learning goals, success criteria, and feedback
- Observable growth in student mathematical reasoning and communication

These early indicators supported the long-term goal of improving EQAO achievement and student confidence in mathematics.



Professional Learning & Implementation Cycle

(Structure is authentic; all data is illustrative to protect confidentiality.)

Week 1 – Targeted Professional Learning (Release Time)

Purpose:

- Build educator knowledge and skill in one High-Impact Instructional Practice (HIIP).

Format:

- 1-hour session, two teachers at a time, with a board math facilitator (SME).

What happens:

- Introduction and modelling of the selected HIIP
- Classroom examples and grade-specific applications
- Co-planning of routines, tasks, or small-group structures
- Teachers leave with an actionable implementation plan for the next 6 weeks

Artifacts generated:

- Session slide deck
- Teacher planning templates
- Classroom look-fors

Week 2 – Classroom Implementation

Purpose:

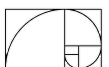
- Teachers apply the new HIIP in their classrooms with real students.

What happens:

- Teachers implement routines, tasks, or small-group structures
- Leadership and facilitator provide informal support as needed
- Teachers collect early evidence (student work, photos, anecdotal notes)

Focus:

- Consistency, not perfection — the goal is to build fluency with the practice.



Weeks 3 & 4 – Teacher Self-Assessment Survey

Purpose:

- Capture teacher perception data on implementation progress.

Survey Includes: (For each of the 9 HIIPs)

- Knowledge/Confidence (“How confident do you feel using this practice?”)
- Usage (“How often are you using this practice?”)
- Qualitative reflections (Successes, Challenges, Support Needs)

Why this matters:

- This provides leading indicators of instructional change before EQAO results arrive.

Weeks 5 – School Walkthrough (HIIP-Aligned)

Purpose:

- Collect observational evidence of instructional practices across classrooms.

What is observed:

- Visible learning goals and success criteria
- Math conversations
- Use of tools and representations
- Problem-solving routines
- Small-group instruction
- Evidence of the newly taught HIIP
- Student engagement and independence

Tool Used:

- School walkthrough tracking guide.

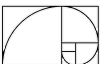
Weeks 6 – Data Review & Next-Steps Planning

Purpose:

- Use evidence to determine the next HIIP and refine support.

Data sources reviewed:

- Teacher survey (confidence, usage, challenges)
- Walkthrough evidence
- Classroom artifacts



- Teacher Feedback
- PLC insights

Decisions made:

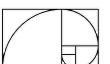
- Which HIIP to teach next
- What supports teachers need
- What adjustments to make to centres, small-group routines, or tasks
- How to align the next cycle with Board PD and school priorities

Cycle Repeats Every 6 Weeks

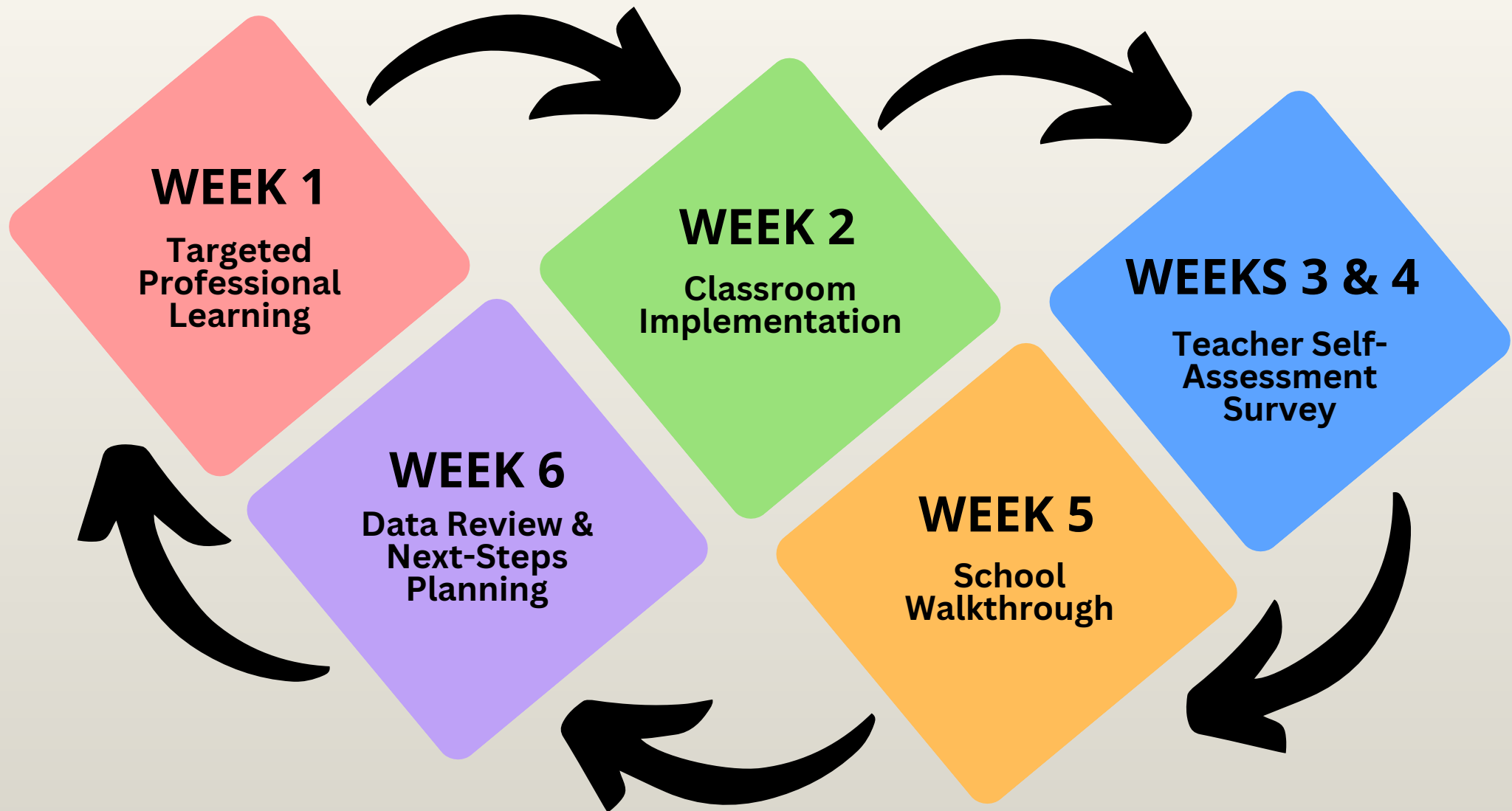
Each cycle builds on the last, creating a coherent, cumulative improvement arc:

1. Learn the practice
2. Implement the practice
3. Measure the practice
4. Refine the practice
5. Select the next practice

Over 18 months, this creates a layered, sustainable instructional ecosystem aligned with the nine HIIPS, Board priorities, and school initiatives.



PROFESSIONAL LEARNING & IMPLEMENTATION CYCLE



18-Month Implementation Timeline

This timeline outlines the full instructional improvement arc, integrating professional learning, coaching, data collection, and iterative refinement. It aligns with Ontario's High-Impact Instructional Practices (HIIPs) and Board Improvement Plan priorities.

PHASE 1 — Establishing Foundations (Months 1–6)

Focus: Math Centres + Tier 2 Small-Group Instruction

Goal: Build the structural conditions required for high-quality Tier 1 and Tier 2 instruction.

Months 1–3

Session 1 — Math Centres (Completed)

- Establish independent learning routines
- Build conditions for small-group instruction
- Begin collecting classroom look-fors
- Provide manipulatives and centres materials

Data Collection:

- Walkthrough #1 (baseline)
- Teacher survey (confidence + usage)

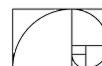
Months 4–6

Session 2 — Tier 2 Small-Group Instruction (Completed)

- Targeted instruction using formative assessment
- Strengthen guided math routines
- Align centres to small-group goals

Data Collection:

- Walkthrough #2
- Teacher survey
- PLC analysis of student thinking



PHASE 2 — Building Instructional Capacity (Months 7–12)

Focus: Core HIIPs that strengthen clarity, reasoning, and problem solving.

Months 7–9

Session 3 — Learning Goals, Success Criteria & Descriptive Feedback

- Co-constructed criteria
- Daily feedback routines
- Alignment to curriculum big ideas

Data Collection:

- Walkthrough #3
- Teacher survey
- Classroom artifacts (anchor charts, criteria)

Months 10–12

Session 4 — Problem-Solving Tasks & Teaching About Problem Solving

- Three-part lesson structure
- Multiple entry points
- Explicit strategy instruction
- Perseverance and reasoning routines

Data Collection:

- Walkthrough #4
- Teacher survey
- PLC review of student work samples

PHASE 3 — Deepening Practice & Ensuring Transfer (Months 13–18)

Focus: Tools, representations, math talk, deliberate practice, and flexible groupings.

Months 13–15

Session 5 — Tools & Representations + Math Conversations

- Concrete → visual → symbolic connections
- Structured math talk routines



- Equity of access for multilingual learners

Data Collection:

- Walkthrough #5
- Teacher survey
- Evidence of student reasoning

Months 16–18

Session 6 — Deliberate Practice + Flexible Groupings

- Purposeful practice after understanding
- Random, mixed, and strategic groupings
- High-quality independent tasks

Data Collection:

- Walkthrough #6
- Teacher survey
- End-of-year reflection
- EQAO data review (annual)

Ongoing Throughout All 18 Months

- PLC cycles every 4–6 weeks
- Tier 2 groupings updated based on formative data
- Resource replenishment (manipulatives, vertical surfaces)
- Family math engagement (games, nights, videos)
- Leadership + facilitator data review meetings
- Dashboard updates (confidence, usage, walkthrough evidence)

End-of-Cycle Outcomes (*Illustrative*)

- Increased teacher confidence and consistency across HIIPs
- Stronger small-group instruction and centres routines
- Improved student engagement, reasoning, and independence
- Clear upward trends in walkthrough evidence
- Improved EQAO achievement and student confidence in mathematics



Logic Model (Data-Driven Math Improvement Cycle)

(Structure is authentic; all data is illustrative to protect confidentiality.)

Inputs

- Board Math Facilitator (Subject-Matter Expert)
- Release time for 6-week PD cycles
- Ontario's High-Impact Instructional Practices (HIIPs)
- Board Improvement Plan priorities
- Walkthrough tool, teacher survey, and tracking templates
- Leadership team (Admin + Math Facilitator)
- Classroom resources (manipulatives, vertical surfaces, centres materials)

Activities

- 1-hour targeted PD sessions every 6 weeks
- Classroom implementation of the selected HIIP
- Teacher self-assessment survey (knowledge, usage, challenges)
- School walkthrough aligned to HIIPs + BIP
- Data review and next-step planning
- PLC conversations focused on student thinking and misconceptions
- Resource replenishment (tools, manipulatives, centres materials)

Outputs

- 6 PD sessions (2 completed, 4 planned)
- Teacher action plans for each HIIP
- Walkthrough evidence reports
- Cycle-over-cycle dashboard
- Classroom artifacts (centres, anchor charts, student work)
- Updated Tier 2 groupings
- School-wide implementation heat map



Short-Term Outcomes (6–12 Weeks)

- Increased teacher confidence in the selected HIIP
- More consistent use of learning goals, success criteria, and feedback
- Stronger small-group instruction routines
- Improved student engagement during centres and problem-solving tasks
- More visible math talk and use of tools/representations

Intermediate Outcomes (3–9 Months)

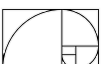
- Consistent implementation of multiple HIIPs across classrooms
- Higher-quality Tier 2 instruction
- More equitable access to math learning through flexible groupings
- Improved student reasoning, communication, and independence
- Stronger alignment between instruction, assessment, and curriculum expectations

Long-Term Outcomes (12–24 Months)

- Improved EQAO achievement (target: +5–10% annually)
- Increased student confidence and enjoyment of mathematics
- Sustainable, school-wide math instructional ecosystem
- Teachers equipped with a full repertoire of high-impact practices
- A culture of continuous improvement grounded in data and collaboration

Impact (System Level)

- A school-wide shift toward evidence-based, equitable, high-quality math instruction
- A replicable model for iterative professional learning and instructional improvement
- A measurable increase in student achievement, engagement, and mathematical identity



School Walkthrough Tracking

Theory of Practice:

If we increase educator knowledge, confidence, and consistent use of the High-Impact Instructional Practices — supported through structured PD, coaching, and iterative data cycles — then classroom instruction will improve, student engagement will increase, and overall mathematics achievement (including EQAO performance) will rise.

Date: _____

Cycle: _____

Educator(s)	Grade	Evidence of Practice & Impact	Next Steps
J. Smith J. Smith	JK/SK		
J. Smith	1		
J. Smith	2		
J. Smith	3		

School Walkthrough Tracking

J. Smith	4		
J. Smith	5		
J. Smith	6		
J. Smith	7		
J. Smith	8		

Teacher Self-Assessment Survey

HIIP Implementation

Demographic Information

1. Grade / Division

2. Date

High-Impact Instructional Practices (HIIPs)

For each practice, please rate:

Knowledge / Confidence "How confident do you feel implementing this practice?"

Scale:

- 1 = Not confident
- 2 = Emerging
- 3 = Developing
- 4 = Confident
- 5 = Highly confident

Frequency of Use "How often do you use this practice in your classroom?"

Scale:

- 1 = Rarely
- 2 = Occasionally
- 3 = Sometimes
- 4 = Often
- 5 = Consistently

3. HIIP 1 - Learning Goals & Success Criteria

	1	2	3	4	5
Knowledge / Confidence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Frequency of Use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. HIIP 2 - Direct Instruction

	1	2	3	4	5
Knowledge / Confidence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Frequency of Use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. HIIP 3 - Problem-Solving Tasks & Experiences

	1	2	3	4	5
Knowledge / Confidence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Frequency of Use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6. HIIP 4 - Teaching About Problem Solving

	1	2	3	4	5
Knowledge / Confidence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Frequency of Use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7. HIIP 5 - Tools & Representations

	1	2	3	4	5
Knowledge / Confidence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Frequency of Use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

8. HIIP 6 - Math Conversations

	1	2	3	4	5
Knowledge / Confidence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Frequency of Use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9. HIIP 7 - Small-Group Instruction (Tier 2)

	1	2	3	4	5
Knowledge / Confidence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Frequency of Use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

10. HIIP 8 - Deliberate Practice

	1	2	3	4	5
Knowledge / Confidence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Frequency of Use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

11. HIIP 9 - Flexible Groupings

	1	2	3	4	5
Knowledge / Confidence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Frequency of Use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Implementation Reflection

12. Successes

What worked well during this 6-week cycle?

(Examples: routines, student engagement, small-group instruction, problem-solving, tools, conversations)

13. Challenges

What barriers or difficulties did you experience?

(Examples: time, materials, student readiness, routines, task selection)

14. Support Needed

What support, resources, or coaching would help you move forward?

15. Evidence of Impact

Share any observations, student work, or moments that show how the practice affected learning.

Next Steps (Teacher Voice)

16. Which HIIP(s) would you like to focus on next?
(Select all that apply)

Learning Goals & Success Criteria

Direct Instruction

Problem-Solving Tasks

Teaching About Problem Solving

Tools & Representations

Math Conversations

Small-Group Instruction

Deliberate Practice

Flexible Groupings

Final Comments

17. Anything else you'd like to share?

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